

Biologic
ENVIRONMENTAL SURVEY

Alcoa Willowdale (Larego Region)
Targeted Carter's Freshwater Mussel Survey



Report to Alcoa of Australia Limited

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3				

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Executive Summary

Alcoa commissioned Biologic Environmental Survey (Biologic) to conduct a targeted survey for *Westralunio carteri* (Carter's freshwater mussel; CFM) in the Larego region (the Survey Area). This species is currently listed as Vulnerable under State (WA *Biodiversity Conservation Act 2016*), Federal (*Environment Protection and Biodiversity Conservation Act 1999*), and international conservation lists (IUCN Red List of Threatened Species).

A targeted CFM survey was conducted in November 2023. Eight sites, including three Haul Road sites (HR1, HR2 and HR3) and five Turbidity Monitoring sites (Conveyor, TM2, TM3, TM4 and TM5) were proposed for the survey. However, only one of the haul road sites was accessible (HR3) at the time of survey due to dense vegetation impeding access at HR1 and HR2. An alternate, accessible location (HR1a) was sampled approximately 660 m downstream of HR1, resulting in a total of two haul road sites and five Turbidity Monitoring sites being successfully sampled.

Survey methods included foraging with mussel rakes, hand searching, intensive searching within quadrats, and sieving of sediments to locate juveniles. Substrate assessments were also undertaken at each site, along with measurements of water quality (including in situ analytes at all sites and laboratory analyses of ionic composition, nutrients and dissolved metals at sites where mussels were found), to evaluate the suitability of in-stream habitat for CFM.

A total of nine CFM was recorded from the Survey Area. Eight individuals between 37 mm and 47 mm in length were recorded from TM3, all of which were deceased at the time of survey, while a single live CFM was recorded during an opportunistic search at TM4 (55 mm). Water quality and habitat data from TM3 found conditions were suitable for CFM at the time of survey, and therefore did not provide any insight into the cause of deaths. However, this assessment was based on spot measurements at the time of sampling, with no indication of whether there were any previous spikes in analyte concentrations or contamination events which may have impacted CFM in this area. There were moderate flows at TM3 at the time of sampling, so it is also possible the deaths could have occurred upstream.

Following the targeted survey and re-assessment of likelihood of occurrence, HR3 was deemed 'Highly Unlikely' to support CFM due to the ephemeral nature of this pool, coupled with the highly compacted sediment in this area, while Conveyor was considered 'Unlikely' to support CFM due to the limited availability of suitable habitat. Sites HR1a, TM2 and TM5 were all considered 'Possible', as favourable habitat was present despite no CFM being found during the survey. The lack of CFM may be due to physical barriers preventing freshwater fish from dispersing the parasitic mussel larvae (glochidia) to these areas. Alternatively, the

absence of CFM at TM5 may have been a result of sampling effort, given the overgrown vegetation at this site made surveying for mussels difficult.

Based on the results of the targeted survey, TM3 and TM4 are the only sites in the Survey Area that support CFM, although it is possible that the population at TM3 is no longer extant. The conservation status of CFM is currently under review due to recent redescription of *Westralunio carteri* and reduction in range as a result. As a species currently experiencing population decline, this reduction has implications for the conservation status of CFM. The importance of existing populations of CFM is likely to become more significant following any reassessment of the species. The mortality event at TM3 should be investigated further, and a repeat targeted survey undertaken in the vicinity to assess whether the area supports any live mussels in future.

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1 Introduction

1.1 Background

Alcoa of Australia Limited's (Alcoa) Western Australian (WA) mining operations comprise the Huntly and Willowdale bauxite mines, which occur in Alcoa's Mining Lease 1SA (ML1SA), located approximately 63 km southeast of Perth in the Northern Jarrah Forest IBRA subregion (Figure 1.1). Alcoa has approval to mine within ML1SA subject to submitting draft five-year mine plans and associated environmental management programs, known as the Mining and Management Program (MMP). The MMP is submitted to the State's Mining and Management Program Liaison Group (MMPLG) on an annual basis.

Alcoa has committed to undertaking ecological surveys for the Huntly Mine (Myara region) and Willowdale Mine (Larego region) as part of its MMP assessment by the MMPLG (Figure 1.1). This includes baseline desktop studies and targeted surveys, which will be used to:

- Amend the conceptual alignment to avoid significant fauna
- Realign waterway crossings to avoid significant fauna
- Inform translocation and environmental management plans as required
- Develop mining avoidance zones for significant fauna
- Assist Alcoa in preparing MMP submission to the MMPLG.

Therefore, Alcoa commissioned Biologic Environmental Survey (Biologic) to conduct a targeted survey for *Westralunio carteri* (Carter's freshwater mussel; CFM) in stream zone areas within the Larego region (hereafter referred to as the Survey Area; Figure 1.1). This species is currently listed as Vulnerable under the State *Biodiversity Conservation Act 2016* (BC Act) and Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is also listed as Vulnerable on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species (IUCN, 2024) (see Appendix A for a description of conservation codes).

1.2 Scope and Objectives

The overarching objective of the targeted survey was to search for and record occurrence of CFM within the Survey Area. This was achieved via:

- Desktop assessment – identify CFM records within a 20 km of the Survey Area. This included a likelihood of occurrence assessment for mussels within the Survey Area.
- Targeted field survey – undertake extensive searches for CFM within the Survey Area at eight locations in 2023 (three Haul Road Crossing sites and five Turbidity Monitoring Points).

380000 400000 420000

6380000 6360000 6340000

Harvey Estuary
Waroona Drain
Meredith Drain
Harvey Diversion Drain
Wellesley Creek
Drakes Brook
Samson Brook
Bancell Brook
Logue Brook
Falls Brook
Harvey River
Murray River
Tallanalla Creek
Harris Reservoir
Waroona
Yarloop
Harvey

IBRA Region
Jarrah Forest
Swan Coastal Plain
IBRA Subregion
Dandaragan Plateau
Northern Jarrah Forest
Perth
Southern Jarrah Forest
Perth
Bunbury

LEGEND
Survey Area
State Road
Major Creek

Scale 1:200,000
0 2 4 6 Km
Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994 Created 19/03/2024

Mandurah
Dwellingup
Waroona
Yarloop
Harvey
Bunbury
Collie

Biologic

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Figure 1.1: Survey Area and regional context

1.3 Compliance

There is currently no technical guidance for targeted CFM surveys. However, freshwater mussels are included, along with all aquatic fauna, under the Western Australian Environmental Protection Authority's (EPA) Terrestrial Fauna environmental factor. Therefore, this targeted survey employed sampling design, methods, and general approaches consistent with the following:

- Technical Guidance, Terrestrial Fauna Surveys (EPA, 2016)
- Environmental Factor Guideline, Inland Waters (EPA, 2018)
- New Zealand Regional Guidelines for Adult Freshwater Mussel Monitoring (Catlin *et al.*, 2017)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018)
- Best practice, following similar targeted CFM surveys undertaken in the South West, including Klunzinger et al. (2012a), Klunzinger et al. (2012b), Biologic (2020), Biologic (2021), Biologic (2022a), Biologic (2022b), Biologic (2023a), Biologic (2023b) and WRM (2020).

1.4 Carter's Freshwater Mussel

CFM is endemic to South West Western Australia. Until recently, it was considered the only species of native freshwater mussel in this region, and the only member of the genus *Westralunio* to occur in Australia. Molecular and morphometric analyses has since found three evolutionary significant units (Klunzinger *et al.*, 2022). As a result, two species of freshwater mussel are currently known, *Westralunio carteri* and *Westralunio inbisi*, the latter of which represents two subspecies. *Westralunio carteri* is now known to be restricted to western coastal drainages, while *Westralunio inbisi inbisi* occurs in southern coastal drainages, and *Westralunio inbisi meridiemus* is found in the Margaret River and Blackwood River catchments only (Klunzinger *et al.*, 2022).

Historically, the distribution of CFM extended from the Moore River in the north, inland to the Avon and Blackwood Rivers, and south to the Bow River (Klunzinger, 2012). This historic range has reduced by approximately 49%, with its distribution lying between Gingin Brook in the north and the Kent River in the south (Klunzinger *et al.*, 2015), with two outlying populations in the Goodga and Waychincup Rivers. The redescription of CFM reduces this range further, with the current distribution for CFM lying between Gingin and to the north and west of the Blackwood River, within 150 km of the coast (Klunzinger *et al.*, 2022). The reduction in range and continuing population decline led to its conservation listing as Vulnerable on State, Federal and International conservation lists (Klunzinger & Walker, 2014). However, it is expected this conservation listing will require reassessment considering the recent taxonomic changes and further reductions in range for CFM as a result.

Like other freshwater bivalves, CFM is a slow-growing, long-lived species. Maximum age range among populations are 36 to 52 years and sexual maturity is reached at approximately four to six years (and ~27 mm in length). Maximum size has been reported to be 72.9 to 82.8 mm in some populations (Klunzinger *et al.*, 2014).

CFM are typically dioecious, though hermaphrodites have occasionally been recorded (Klunzinger *et al.*, 2014). They have an obligate parasitic larval stage (glochidia), which attach to suitable host fish and are transported and deposited into suitable sediment as post-parasitic juvenile mussels. As such, juvenile mussels are only recorded where suitable host fish are present. Little is known about the juvenile stage, though they would require stable sediment to avoid being swept away by currents (Klunzinger, 2012). CFM need sediment that is firm but penetrable, such as sand. They are generally absent from sediments that are too soft or too compact, such as clay and bedrock.

The greatest threats to CFM are salinisation and drying of water systems. CFM have an acute sensitivity to salinity, with a maximum tolerance of 3.5 ppt under lab conditions and are rarely found in water greater than 1.6 ppt (Klunzinger, 2012; Klunzinger *et al.*, 2012b; Klunzinger *et al.*, 2015). CFM also cannot survive exposure to direct sunlight or heat, and do not aestivate, so rarely persist in non-perennial water systems (Klunzinger, 2012), though burrowing into sediments can protect individuals from water emersion to some extent (Lymbery *et al.*, 2020). These threatening processes also adversely impact native fish populations in the South West (Beatty *et al.*, 2011; Morgan *et al.*, 1998; Morgan *et al.*, 2003), leading to further decline in mussel populations due to loss of suitable host fish species (Klunzinger, 2012). High turbidity and suspended solids can also negatively impact the filtration ability of freshwater mussels (Klunzinger, 2012).

2 Desktop assessment

2.1 Methods

A desktop assessment, comprising database searches and a literature review, was undertaken prior to the field survey. The purpose of the desktop assessment was to identify CFM known to occur, or potentially occurring in the Survey Area.

2.1.1 Database Searches

Five databases were searched for CFM records (Table 2.1). Searches were conducted within a 20 km radius of the Survey Area, with the exception of the Index of Biodiversity Surveys for Assessments (IBSA) database, which covered the Northern Jarrah Forest region.

Table 2.1: Details of database searches conducted

Provider	Reference	Database	Parameters
Department of Climate Change, Energy, the Environment and Water (DCCEEW)	DCCEEW (2023)	Protected Matters Database Search Tool. Accessed September 2023	20 km search area around Survey Area
Atlas of Living Australia (ALA)	ALA (2023)	Atlas of Living Australia. Accessed September 2023	20 km search area around Survey Area
DBCA Dandjoo Biodiversity Data Repository (Formally Nature Map)	(DBCA, 2023)	Mollusca Database Search. Accessed September 2023	20 km search area around Survey Area
Department of Water and Environmental Regulation (DWER)	DWER (2023a)	Healthy Rivers Database: *Westralunio carteri*. Accessed September 2023	20 km search area around Survey Area
DWER Index of Biodiversity Surveys for Assessments (IBSA)	DWER (2023b)	IBSA Database Search. Accessed September 2023	All known occurrence records for the Northern Jarrah Forest

2.1.2 Literature Review

A review of relevant available literature was conducted to gather regional context and any additional records not captured in the database searches (Table 2.2). Literature in the vicinity of the Survey Area was limited. In a study investigating age and growth rate of CFM populations in different systems, Klunzinger *et al.* (2014) collected individuals from the Brunswick River, ~28 km south of the Survey Area. A total of 85 CFM from the Brunswick River were marked, and 77 recaptured after 12 months, as part of the age-growth study. No juveniles were captured from the Brunswick River (Klunzinger *et al.*, 2014). Ma *et al.* (2022)

conducted mussel surveys at 32 sites across several river systems in the South West, finding CFM at 26 of these. One site was located in the Harvey River, but no CFM were recorded (Ma *et al.*, 2022). The exact location of the site was not provided, so its proximity to the Survey Area is unknown.

Table 2.2: Summary of relevant literature reviewed

Report title	Survey type	Location
Range decline and conservation status of *Westralunio carteri* Iredale, 1934 (Bivalvia: Hyriidae) from south-western Australia (Klunzinger *et al.*, 2015)	Database search	Vasse, Brunswick and Preston Rivers – exact location not provided
Population structure and microhabitat preference of a threatened freshwater mussel, *Westralunio carteri*, in south-western Australia (Ma *et al.*, 2022)	Targeted mussel survey	Vasse, Brunswick and Preston Rivers – exact locations not provided
Age and growth in the Australian freshwater mussel, *Westralunio carteri*, with an evaluation of the fluorochrome calcein for validating the assumption of annulus formation (Klunzinger *et al.*, 2014)	Targeted mussel survey	Brunswick River – 28 km south of Survey Area

2.1.3 Likelihood of Occurrence

The likelihood of CFM occurrence within the Survey Area was assessed using a decision matrix which considers habitat suitability and the proximity of previous records (Table 2.3).

Table 2.3: Assessment of occurrence decision matrix

		Habitat Categories (within the Survey Area)			
		Core/ critical habitat present	Suitable habitat present/ within known distribution	Marginal habitat present/ adjacent to known distribution	No suitable habitat present/ outside of known distribution
Species records/ Occurrence Categories	Recorded in the Survey Area	Confirmed	Confirmed	Confirmed	Confirmed
	Recorded within <2km	Highly Likely	Likely	Possible	Possible
	Recorded within 2–5 km	Likely	Possible	Possible	Unlikely
	Recorded within 5–20 km	Possible	Possible	Unlikely	Unlikely
	Recorded >20 km	Possible	Unlikely	Unlikely	Highly Unlikely
	Taxa considered locally/regionally extinct	Unlikely	Unlikely	Highly Unlikely	Highly Unlikely

2.2 Results

2.2.1 Desktop Assessment

The desktop assessment found two CFM records from the Atlas of Living Australia (ALA) and two records from the Dandjoo Biodiversity Data Repository, which were only identified to family level (Hyriidae) (Figure 2.1). The coordinates provided by ALA (2023) were generalised to 10 km due to sensitivity concerns.

The Project Matters Database Search Tool indicated CFM habitat was likely to occur throughout the Survey Area (DCCEEW, 2023). The Healthy Rivers Database revealed CFM records at undisclosed sites including the Samson Brook (approximately 2 km south of Waroona), the creeks surrounding the town of Yarloop (approximately 16 km west of the Survey Area), and in the tributaries of the Harvey Dam (on the south west border of the Survey Area) (DWER, 2023a). These two databases do not provide exact locations of fauna records, and only indicate whether CFM have been recorded in any given area.

Three targeted CFM surveys are available on the IBSA database. These include surveys at Gingin Brook (Biologic, 2022a), Bennett Brook (WRM, 2020), and a targeted survey as part of the Byford railway extension project (Stream Environment and Water, 2021). All three surveys were located more than 70 km from the Survey Area.

2.2.2 Likelihood of Occurrence

The likelihood of occurrence at all sites within the Survey Area was assessed as 'Possible' (Table 2.4). While the Survey Area itself has not previously been surveyed for CFM, the potential for suitable habitat (i.e. permanent, fresh water) that could support this species was considered likely to occur within the area, and the nearest known record of CFM was between 5 - 20 km from each site (DCCEEW, 2023).

Table 2.4: Summary of assessment of occurrence

Site	Within current known distribution	Distance to nearest record	Core/critical habitat within Survey Area	Likelihood of Occurrence
HR1	Yes	~13.2 km northwest (DWER, 2023a)	Yes	Possible
HR1a	Yes	~12.8 km northwest (DWER, 2023a)	Yes	Possible
HR2	Yes	~13 km west DWER, 2023a)	Yes	Possible
HR3	Yes	~13.5 km west (DWER, 2023a)	Yes	Possible
Conveyor	Yes	~16.7 km west (DWER, 2023a)	Yes	Possible
TM2	Yes	~16.2 km west (DWER, 2023a)	Yes	Possible
TM3	Yes	~14.8 km south west (DWER, 2023a)	Yes	Possible
TM4	Yes	~13.3 km south west (DWER, 2023a)	Yes	Possible
TM5	Yes	~9.7 km west (DWER, 2023a)	Yes	Possible

395000 410000 425000

6370000 6355000 6340000

Waroona
Yarloop
Harvey

LEGEND

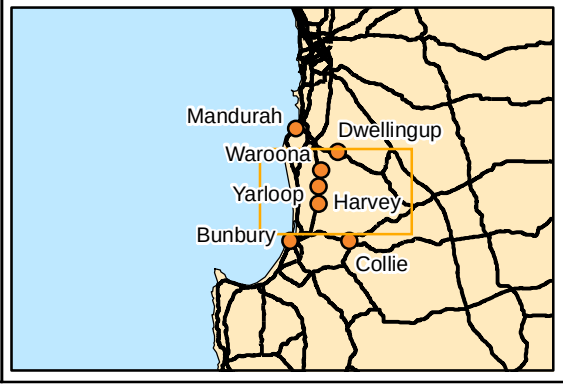
Survey Area
Desktop Assessment Area
State Road
Major Creek

Database

ALA (2023)
DBCA (2023)

Scale 1:150,000
0 2 4 Km

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994 Created 19/03/2024



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Figure 2.1: Previous Carter's freshwater mussel records from the desktop assessment

3 Field Survey Methods

3.1 Survey Timing & Personnel

The targeted survey was undertaken over three days between the 17th and 19th of November 2023. Personnel and licence information is provided in Table 3.1.

Table 3.1: Project team & licences

Biologic Personnel	Project Involvement	Licencing	Experience
Principal Aquatic Ecologist			
Jess Delaney	Project management support, reviewer for quality assurance		22 yrs
Senior Aquatic Ecologist			
Alex Riemer	Field team lead, reporting	TFA 2324-0060 EXEM 251140923	12 yrs
Aquatic Ecologist			
Mahabubur Rahman	Field survey, data management	TFA 2324-0060 EXEM 251140923	4 yrs

3.2 Weather & Climate

There was no rainfall recorded during the survey at nearby Bureau of Meteorology (BOM) station Dwellingup (station 009538). A total of 2.8 mm of rainfall was recorded at Dwellingup in the week prior to the survey. Ambient temperatures were warm during the survey, with a maximum of 31.3 °C (BoM, 2023). River flows and water levels were low during the survey.

3.3 Sampling Sites

Eight sites were originally selected for sampling, however, two Haul Road sites (HR1 and HR2) were heavily vegetated and the team were unable to traverse the area between the track and creek to access the sites. One alternative location approximately 660 m downstream of HR1 was able to be accessed, and therefore an additional sample site was positioned here (HR1a), resulting in a total of seven sites sampled. Site details are provided in Table 3.2 and locations shown in Figure 4.1 (see section 4.1).

Table 3.2: Sampling site details

Type	System	Site Code	Latitude	Longitude	Successfully sampled
Haul Road	Un-named Creek, flowing into Samson Brook Dam	HR1	-32.923431	116.050603	×
	Un-named Creek, flowing into Samson Brook Dam	HR1a	-32.9182506	116.0502079	✓
	Tributary of Un-named Creek flowing into Samson Brook Dam	HR2	-32.925650	116.048450	×
	Tributary of the Harvey River	HR3	-32.9603083	116.05736	✓
Turbidity Monitoring	Tributary of the Harvey River	Conveyor	-32.9557617	116.0922283	✓
	Tributary of the Harvey River	TM2	-32.96022031	116.0879798	✓
	Tributary of the Harvey River	TM3	-32.9905712	116.0916774	✓
	Tributary of the Harvey River	TM4	-33.0041917	116.0860767	✓
	Tributary of Un-named Creek flowing into Logue Brook Dam	TM5	-32.9768733	116.01968	✓

3.4 Water Quality

In situ water quality was measured at each site using a YSI Pro Plus multimeter. Parameters recorded included pH (pH units), redox potential (mV), salinity (parts per thousand; ppt), electrical conductivity (EC; µS/cm), dissolved oxygen (DO; mg/L and % saturation), and water temperature (°C).

At sites where mussels were recorded, undisturbed water samples were collected for laboratory analyses of ionic composition, nutrients, dissolved metals, total suspended sediment (TSS) and turbidity. All water quality variables included:

- General ions and others – calcium (Ca), potassium (K), magnesium (Mg), sodium (Na), bicarbonate (HCO_3), chloride (Cl), sulfur (S), sulfate (S_SO_4), carbonate (CO_3) alkalinity, and hardness (all mg/L)
- Water clarity – TSS (mg/L) and turbidity (NTU)
- Nutrients – total nitrogen (total N), total phosphorus (total P), nitrogen oxides (N_NOx), nitrogen nitrate (N_NO_3), and nitrogen ammonia (N_NH_3) (all mg/L)
- Dissolved metals – aluminium (dAl), arsenic (dAs), boron (dB), barium (dBa), cadmium (dCd), cobalt (dCo), chromium (dCr), copper (dCu), iron (dFe), manganese (dMn),

molybdenum (dMo), nickel (dNi), lead (dPb), selenium (dSe), uranium (dU), vanadium (dV), and zinc (dZn) (all mg/L).

Samples collected for dissolved metals were filtered through 0.45 µm Millipore nitrocellulose filters in the field. Following best practice and to minimise any potential for contamination, all water samples were collected using clean Nalgene sample bottles, and clean/new filters and syringes. In addition, field personnel wore nitrile gloves whilst undertaking water sampling. All water samples were kept cool in an esky while in the field, and either refrigerated (ions, metals, general water), or frozen (nutrients) as soon as possible for subsequent transport to the laboratory. Water quality analyses were undertaken by ALS, a NATA accredited laboratory.

3.5 Habitat Assessment

As CFM are often found partially to fully submerged in fine sediment, details of benthic sediment characteristics were recorded at each site. Sediment data was used to assist in explaining distribution patterns and the presence/absence of CFM. Details of substrate composition included percent cover by bedrock, boulders, cobbles, pebbles, gravel, sand, silt and clay.

3.6 Mussel Sampling

At each site, CFM were targeted using several methods to increase the likelihood of recording individuals, with factors such as access, water depth and salinity considered. Sampling methods included hand searching, mussel rakes and dip nets. Sieving of sediments was undertaken to target juvenile mussels. Sampling comprised a timed survey (minimum 1 hour per team member, total minimum search time effort of 2 hours per site), checking benthic sediments, especially in and around large woody debris, for evidence of mussels. GPS track logs were recorded during the survey to attest to sampling effort expended (Figure 4.1, see section 4.1).

Where access was possible and sufficient water depth was present, up to eight 1 m^2 quadrats were deployed across the site (Plate 3.1). Dense vegetation severely impeded access to most sites and water depth was generally low. As such, the maximum of eight quadrats were deployed at three sites only; TM2, TM3 and TM4. Of the remaining sites, six quadrats were deployed at HR1a, five at Conveyor, four at HR3 and two at TM5.

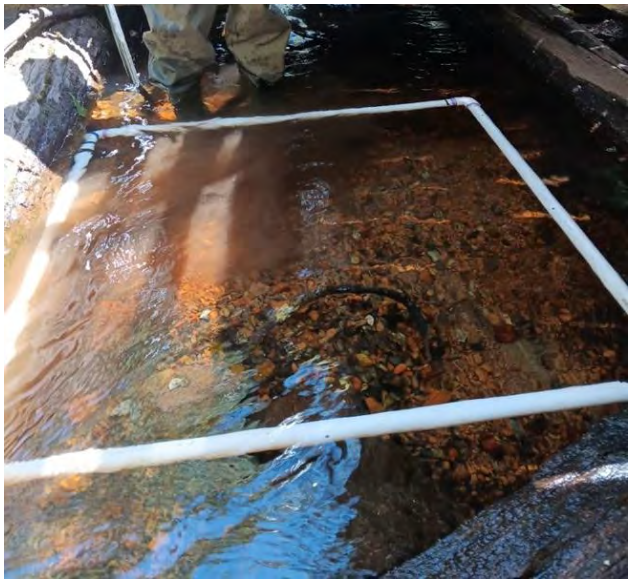


Plate 3.1: A quadrat placed at TM4, ready for hand searching

Morphometric measurements were taken of any mussels found using vernier callipers, including measurements of maximum length (ML) and maximum width (MW). All live mussels were then returned alive to the site of capture. Any dead mussels observed, as indicated by empty shells, were also recorded.

3.7 Data Analysis

3.7.1 Water Quality

Water quality data were compared against the ANZG (2018) default guideline values (DGVs) for the protection of slightly to moderately disturbed aquatic ecosystems in the South West of Western Australia (equivalent to 95% species protection DGVs) (see Appendix B). The primary objective of the guidelines is to "provide authoritative guidance on the management of water quality in Australia and New Zealand and includes setting water quality and sediment quality objectives designed to sustain current, or likely future, community values for natural and semi-natural water resources" (ANZG, 2018). DGVs are provided for a range of parameters designed to protect aquatic systems at a low level of risk. Water quality was compared against the existing DGVs for upland rivers within the South West (ANZG, 2018). Water quality data provides information on the suitability of habitats to support CFM.

3.7.2 Carter's Freshwater Mussel

While growth rates of CFM can be highly variable across populations of different river systems, field observations indicate first maturity is attained at ~27 mm ML (Klunzinger *et al.*, 2014). Therefore, individuals > 27 mm ML were classified as mature adults in this study.

3.8 Assumptions and Limitations

The targeted survey was undertaken by qualified personnel with experience in targeted CFM surveys. Potential limitations and constraints are summarised in Table 3.3.

Table 3.3: Summary of assumptions and limitations in relation to the targeted survey

Potential limitation or constraint	Constraint (Yes/No)	Applicability to this survey
Experience of personnel	No	The Senior Aquatic Ecologist who led the survey has over 12 years' experience undertaking targeted invertebrate fauna surveys, with direct and relevant experience undertaking CFM surveys in the South West region.
Scope (faunal groups sampled and whether any constraints affect this)	No	The scope was to undertake a field survey to determine the presence of CFM at specified sites within the Survey Area, which was completed.
Identification of aquatic fauna	No	CFM are easily identifiable in the field.
Sources of information (recent or historic) and availability of contextual information	No	Relevant database information was provided by Main Roads. Additional databases and literature were accessed from publicly available sources.
Proportion of the task achieved	Minor	Eight sites were originally selected, but due to heavy vegetation, only seven sites were able to be accessed. Dense vegetation and shallow water depths also impeded the number of quadrats deployed at some sites.
Disturbances (fire or flood)	No	There were no recent fires which posed a constraint to sampling effort. The survey was completed in late spring, at a time when river flows from winter rainfall had receded and water depths were wadable and appropriate for hand searching.
Intensity of survey	Yes	Search effort was sufficient at sites that were easily accessible (which included hand searches, mussel rakes and sieving of sediments as appropriate). However, access and sampling was hindered at some sites (especially TM5), and the maximum number of quadrats (8) was only able to be deployed at 3 sites.
Completeness of survey	Minor	Two of the three Haul Road sites were not able to accessed for survey due to dense vegetation. An alternate sampling location was found downstream of HR1 which was successfully sampled (HR1a). Of the seven sites sampled, thick vegetation and low water depth reduced the number of quadrats deployed at each site. Particularly sites HR3 (four quadrats) and TM5 (two quadrats).
Resources (degree of expertise available)	No	All resources required to complete the survey were available.

Potential limitation or constraint	Constraint (Yes/No)	Applicability to this survey
Remoteness or access issues	Minor	Some sites not able to accessed for survey due to dense, overgrown vegetation

4 Results

4.1 Site Descriptions

Descriptions of each site are provided in Table 4.1. Track logs of traverses from the targeted survey show the areas assessed and sampling effort expended (Figure 4.1).

4.2 Water Quality

4.2.1 In Situ

Surface waters were fresh[1] and clear at all sites. EC ranged from 114 µS/cm (at TM5) to 242 µS/cm (at Conveyor), while salinity varied between 0.07 ppt (at HR3, TM4 and TM5) and 0.14 (at Conveyer). EC values were all within the ANZG (2018) DGV for upland rivers of the South West (Table 4.2). Salinity was well below the upper tolerance limit of CFM (1.6 ppt) at all sites (Klunzinger *et al.*, 2015). At sites which supported CFM, turbidity was well below the ANZG (2018) DGV (20 NTU), with measurements of 0.3 NTU at TM3 and 0.4 NTU at TM4 (Table 4.3).

Surface water pH ranged from acidic (6.04 at Conveyor) to neutral (7.38 at HR3). Most sites recorded pH within the ANZG (2018) DGV range, with the exception of Conveyor and TM2. Both sites recorded pH slightly below the lower DGV (Table 4.2). Although no specific tolerance studies have been undertaken on CFM in relation to pH, freshwater mussels in general are considered to be sensitive to low pH (Strayer, 2008). Klunzinger *et al.* (2015) reported records of live CFM from habitats ranging from pH 4.24 to 9.7. However, long-term survival rates and the influence of low pH on different life history stages is currently unknown. Based on the live records by Klunzinger *et al.* (2015), the low pH recorded from Conveyor and TM2 in this study are within the known occurrence range for CFM.

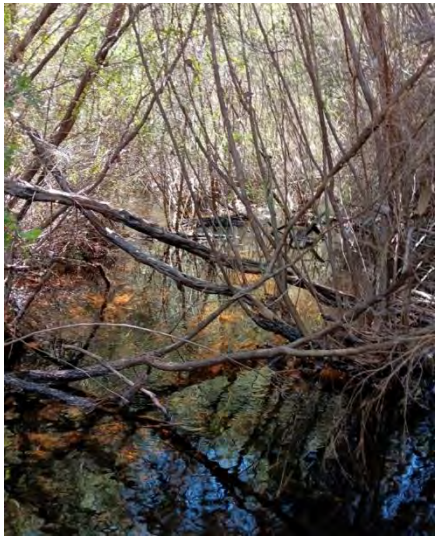
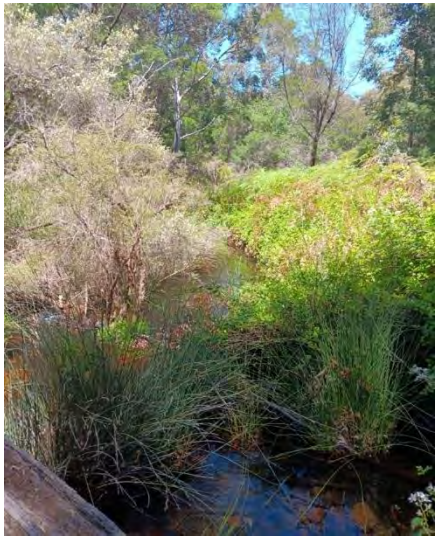
DO saturation was generally considered adequate, and varied between 80.9% (at Conveyor) and 122.8% (at TM4; Table 4.2). Two sites recorded DO levels below the lower ANZG (2018) DGV (Conveyor and TM2). Despite this, DO saturation was still relatively high, and considered adequate to support aquatic fauna, including CFM.

[1] Salinity categories are based on the DWER classification system for freshwater rivers, where fresh/marginal < 1,000 mg/L (~ 1,500 µS/cm), brackish = 1,000 mg/L – 2,000 mg/L (~ 1,500 µS/cm to 3,000 µS/cm), saline = 2,000 mg/L – 10,000 mg/L (~ 3,000 µS/cm – 15,000 µS/cm), and hypersaline > 10,000 mg/L (> 15,000 µS/cm) (Mayer *et al.*, 2005).

Table 4.1: Description of each sampling site

Type	Site	Description	Site Photographs	
Haul Road Crossing	HR1a	A ~50 m section of an un-named creek which flows into the Samon Brook Dam. Site located ~ 660 m downstream of the original crossing (HR1), which was not accessible due to overgrown vegetation. Dense riparian vegetation present. Max depth = 0.4 m.		
	HR3	A ~100 m section of an upper tributary flowing east to the Harvey River. Likely ephemeral. Substrate compacted. Max depth < 0.1 m.		

Type	Site	Description	Site Photographs	
Turbidity Monitoring	Conveyor	A ~100 m length of an unnamed creek, an upper tributary flowing south to the Harvey River. Rocky pool flowing into very narrow and heavily vegetated creek. Max depth = 0.4 m.		
	TM2	A ~100 m length of an unnamed creek, an upper tributary flowing south to the Harvey River. Healthy riparian vegetation with mostly open creek. Max depth = 0.5 m.		

Type	Site	Description	Site Photographs	
Turbidity Monitoring	TM3	A ~100 m length of an unnamed creek, an upper tributary flowing south to the Harvey River. Substantial flows and heavily vegetated. Max depth = 1.2 m.		
	TM4	A ~100 m length of an unnamed creek, an upper tributary flowing south to the Harvey River. Dense riparian vegetation. Max depth = 1.0 m.		

Type	Site	Description	Site Photographs
Turbidity Monitoring	TM5	A ~50 m length of an Un-named Creek flowing into Logue Brook Dam Access impeded by dense vegetation. Max depth = 0.4 m.	 

385000
400000
415000
430000
6360000
6345000

HR1a
Conveyor
HR3
TM2
TM5
TM4
TM3

Waroona
South Western Hwy
Yarloop
Harvey
HR1a
HR1
HR2
HR3
Conveyor
TM2
TM5
TM3
TM4

LEGEND

Survey Area
State Road
Track

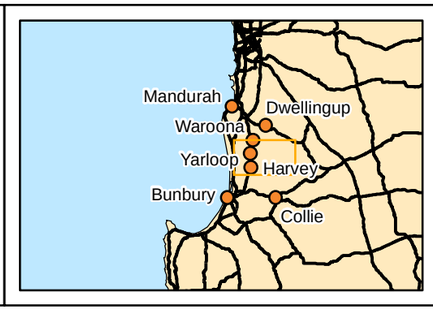
Surface Hydrology
Minor
Major
Stream

Sampling Site
Not Accessed
Quadrat

Biologic

Scale 1:150,000
0 2 4 6 Km

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994 Created 19/03/2024



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Figure 4.1: Sampling sites and traverses

Table 4.2: In situ water quality results in comparison to ANZ (2018) DGVs

Shading indicates values are in excess of: ■ > the 95% DGV

Analyte	Units	ANZG (2018) DGV	HR1a	HR3	Conveyor	TM2	TM3	TM4	TM5
Temperature	°C		15.8	25.3	15.4	15.4	14.6	15.8	14.2
EC	µS/cm	300	178	145	242	198	139	130	114
Salinity	ppt		0.10	0.07	0.14	0.12	0.08	0.07	0.07
pH	pH units	6.5 - 8.0	6.62	7.38	6.04	6.40	6.74	6.55	6.70
DO	mg/L		10.4	7.9	7.9	7.8	10.2	11.9	10.7
DO	%	90%-na	106.7	98.7	80.9	82.1	103.0	122.8	108.2

na – no upper limit provided in ANZG (2018) for DO for upland rivers.

4.2.2 Lab Analyses

Dissolved metal concentrations at TM3 and TM4 were low and in many cases below the limit of reporting (LOR; Table 4.3). No concentrations exceeded the corresponding 95% toxicity DGV, and only one dissolved metal exceeded the 99% toxicity DGV. This was dAl, which marginally exceeded the 99% toxicity DGV (0.027 mg/L) at TM4 (0.030 mg/L).

Nutrient concentrations at TM3 and TM4 were also low. There were no exceedances of nitrogen eutrophication or toxicity DGVs, and at TM4, some concentrations were below the LOR (Table 4.3). Total P concentrations were below the LOR at both TM3 and TM4.

Alkalinity and hardness were low at TM3 and TM4, with alkalinity ranging from 4 mg/L (at TM4) to 7 mg/L (at TM3) (Table 4.3). Alkalinity measures the capacity of the water to resist sudden changes in pH, i.e., it is the buffering capacity of the water. Alkalinity of less than 20 mg/L is considered low, and the system would have limited ability to buffer against rapid changes in pH. This suggests that surface waters at both TM3 and TM4 have low buffering capacity.

Ionic composition was dominated by Na cations and Cl anions at both sites where mussels were present. Mg and S_SO_4 were sub-dominant. Ion concentrations were low, reflecting the low salinity of the surface waters at these sites.

Table 4.3: Concentrations of ions, nutrients and dissolved metals from TM3 and TM4, in comparison to ANZ (2018) DGVs

Shading indicates values are in excess of: ■ > the 99% ANZG (2018) DGV, ■ > the 95% DGV

		ANZG (2018) DGV		Sites	
Analyte	Units	99%	95%	TM3	TM4
Turbidity	NTU		20	0.3	0.4
TSS	mg/L			3	<1
Hardness	mg/L			14	12
Alkalinity	mg/L			7	4
Ca	mg/L			1.1	0.9
Mg	mg/L			2.8	2.4
K	mg/L			1.2	1.0
Na	mg/L			27.6	25.3
HCO_3	mg/L			7	4
Cl	mg/L			41	39
S_SO_4	mg/L			4.89	4.38
CO_3	mg/L			<1	<1
S	mg/L			1.6	1.4
dAl	mg/L	0.027	0.055	0.024	0.030
dAs	mg/L	0.001	0.024	<0.0002	<0.0002
dB	mg/L	0.009	0.37	0.007	0.006
dBa	mg/L			0.0076	0.0066
dCd	mg/L	0.00006	0.0002	<0.00005	<0.00005
dCo	mg/L			0.0004	0.0002
dCr	mg/L	0.00001	0.001	<0.0002	<0.0002
dCu	mg/L	0.001	0.0014	0.00014	0.00012
dFe	mg/L	0.300*		0.098	0.084
dMn	mg/L	1.2	1.9	0.0034	0.0034
dMo	mg/L			<0.0001	<0.0001
dNi	mg/L	0.008	0.011	<0.0005	<0.0005
dSe	mg/L	0.005	0.011	<0.0002	<0.0002
dPb	mg/L	0.001	0.0034	<0.0001	<0.0001
dU	mg/L			<0.00005	<0.00005
dV	mg/L			0.0003	0.0002
dZn	mg/L	0.0024	0.008	<0.001	<0.001
N_NH_3	mg/L	0.32	0.90	0.04	0.06
N_NO_3	mg/L	1.0	2.4	0.01	<0.01
N_NOx	mg/L		0.20	0.01	<0.01
Total N	mg/L		0.45	0.05	0.06
Total P	mg/L		0.02	<0.005	<0.005

*low reliability trigger

4.3 Habitat Assessment

4.3.1 HR1a

Sediment composition of HR1a varied slightly across the site (between quadrats). Quadrats 1 (Q1) and Q2 were dominated by gravel, with some pebbles, sand and silt also present (Figure 4.2). Q1 was the only quadrat containing boulders. Quadrats Q3 and Q4 recorded an even composition of pebbles, gravel and sand, while Q3 was the only quadrat with clay. Cobbles were present in small amounts at Q1, Q2, Q5 and Q6. Quadrats Q5 to Q6, located upstream of the culvert, had sediments more evenly dispersed between pebbles, gravel, sand and silt.



Figure 4.2: Sediment composition (%) within each quadrat at HR1a

4.3.2 HR3

The sediment composition at HR3 was homogeneous throughout the four quadrats, with a relatively even composition of pebbles, gravel, sand, silt and clay. No bedrock, boulders or cobbles were present at this site (Figure 4.3).

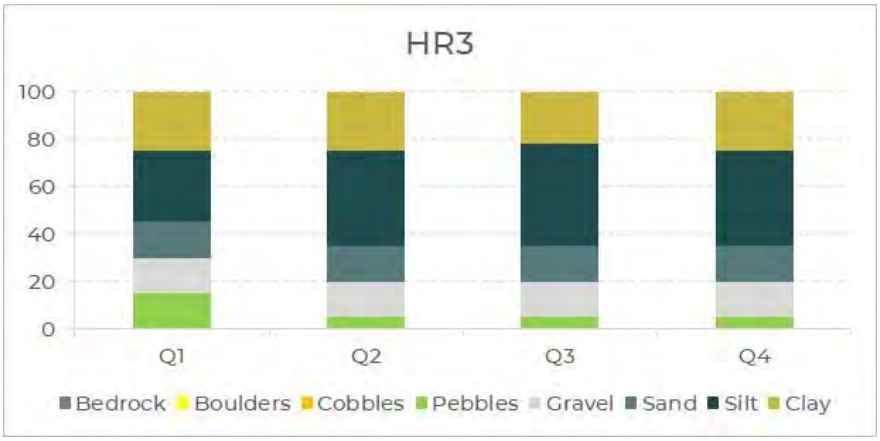


Figure 4.3: Sediment composition (%) within each quadrat at HR3

4.3.3 Conveyor

Sediment composition was variable across the Conveyor sampling site, with boulders dominating the substrate at Q1. Silt and clay were dominant at the remaining quadrats, while Q2 was the only quadrat recording pebbles. Gravel was also present in small amounts at Q1, Q4 and Q5 (Figure 4.4). No cobbles were present within any of the quadrats sampled.

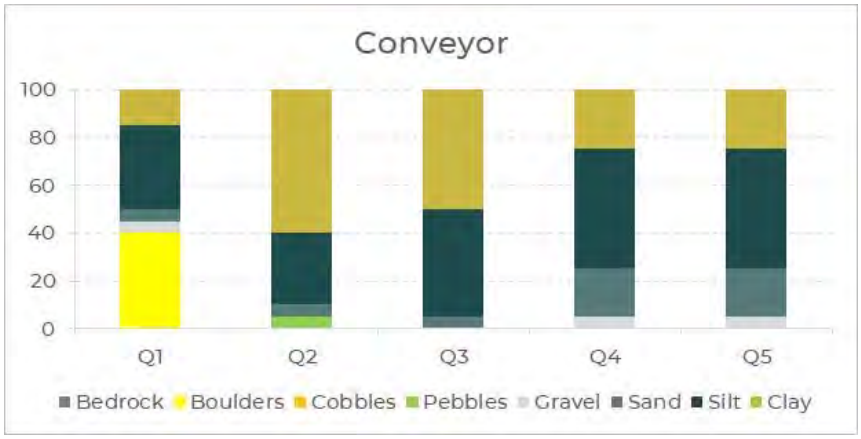


Figure 4.4: Sediment composition (%) within each quadrat at Conveyor

4.3.4 TM2

Sediment composition at TM2 was generally homogeneous with gravel, sand and silt present in all quadrats. Moderate amounts of clay were present at Q1 to Q6, while some cobbles were present at upstream quadrats Q7 and Q8 (Figure 4.5).

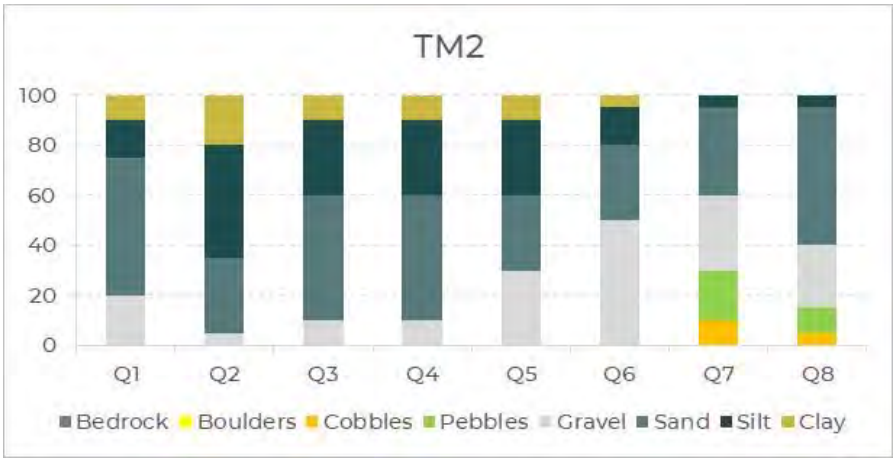


Figure 4.5: Sediment composition (%) within each quadrat at TM2

4.3.5 TM3

Sediment composition at TM3 was dominated by gravel and sand in most quadrats. Q2 had the largest diversity of substrates, with all substrate types present except clay. All other quadrats had varying compositions of pebbles, gravel sand and silt (Figure 4.6).

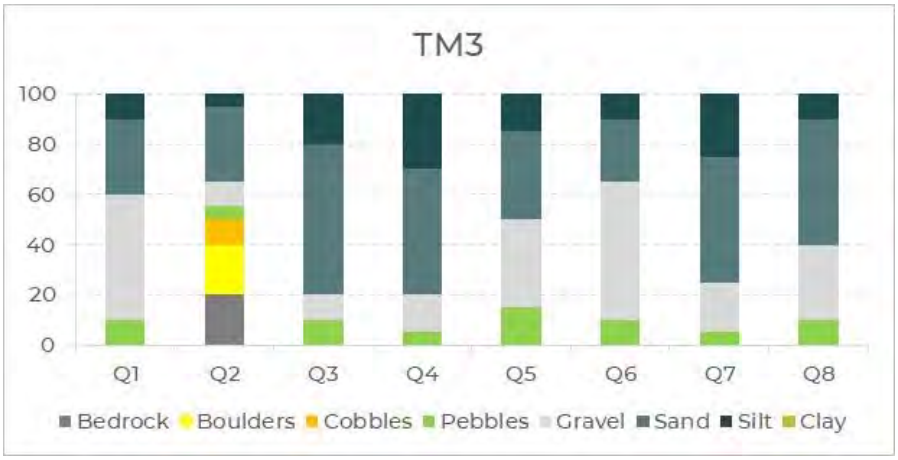


Figure 4.6: Sediment composition (%) within each quadrat at TM3

4.3.6 TM4

Sediment composition at TM4 was homogeneous at quadrats Q1 to Q4, upstream of the walk-bridge crossing, with quadrats in this area generally dominated by gravel, sand and silt. Downstream of the crossing, quadrats recorded higher proportions of larger substrate types such as boulders and cobbles. Gravel was still the dominant substrate at Q5 to Q8, however Q7 was dominated by cobbles (Figure 4.7).

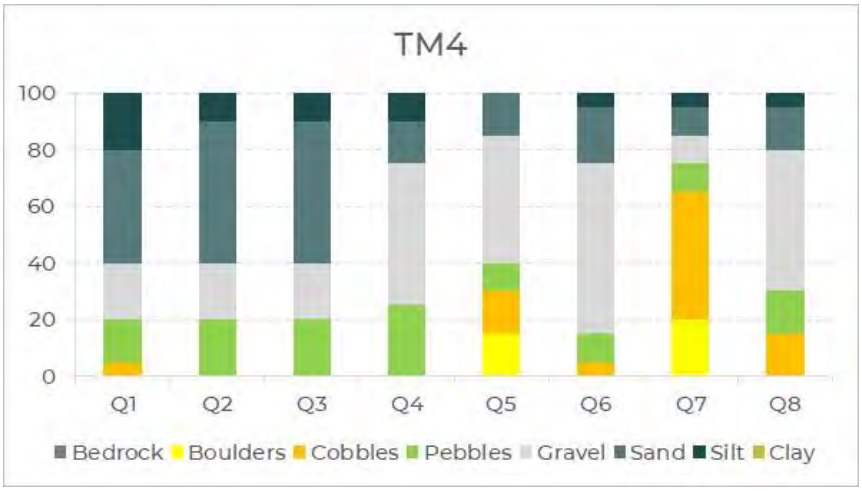


Figure 4.7: Sediment composition (%) within each quadrat at TM4

4.3.7 TM5

Only two quadrats were able to be sampled at TM5 due to the dense vegetation, and difficulties with access. Q1 was heavily dominated by sand with a small proportion of silt, while Q2 was heterogeneous, with boulders, cobbles, pebbles, gravel, sand and silt all present (Figure 4.8).

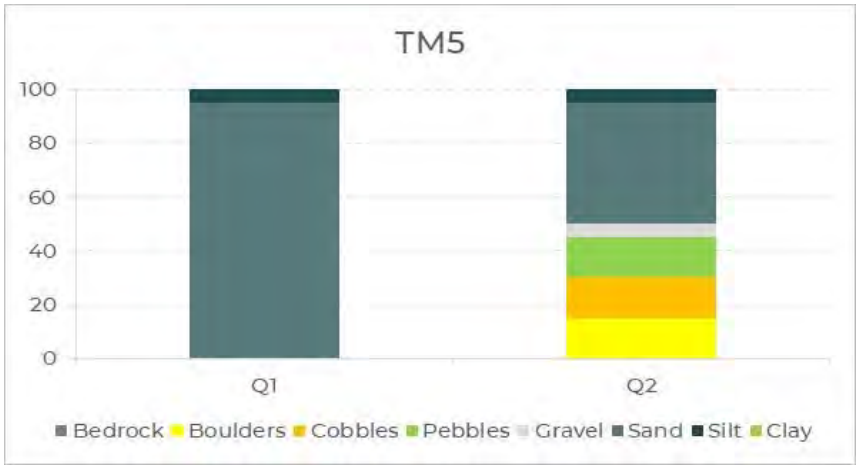


Figure 4.8: Sediment composition (%) within each quadrat at TM5

4.4 Suitable Habitat

The water quality and habitat assessments indicated that the in-stream habitat present in the Survey Area should not preclude absence/ presence of CFM on this basis alone (Figure 4.9). Suitable habitat for CFM occurred at all sites, with the exception of HR3, which is likely ephemeral. At HR1a, Conveyor and TM4 thick detrital layers were present in some areas, which were too soft for CFM. Sections of Conveyor and TM4 also contained unsuitable rocky substrates. A portion of TM5 was unable to be assessed due to the overgrown, dense vegetation (Figure 4.9). Water quality parameters were all within the known range of tolerance for CFM at all sites.

4.5 Carter's Freshwater Mussel

CMF were recorded from two sites within the Harvey River system (TM3 and TM4). Eight deceased CFM were recorded in quadrats at TM3, ranging in size from 37 mm to 55 mm in length (Table 4.4). All CFM at TM3 were therefore considered adults at the time of death. Additional opportunistic searches at this site failed to locate any live individuals. The cause of the deaths is unclear, as they did not appear to be related to water quality based on conditions at the time of sampling. However, this assessment was based on spot measurements, with no indication of whether there were any previous spikes in concentrations or contamination events which may have impacted CFM in this area. There were moderate flows at TM3 at the time of sampling, so it is also possible the deaths could have occurred upstream.

At TM4, one live CFM was recorded outside quadrats during opportunistic searches (Table 4.4). The recorded individual was an adult at 55 mm ML. This individual was found in sand built up inside a car tyre. No other CFM were recorded during the survey from any site.

385000
400000
415000
430000
6360000
6345000

HR1a
Waroona
South Western Hwy
HR1a
Conveyor
HR3
Yarloop
Conveyor
HR3
TM2
TM5
TM3
TM4
TM2
TM5
Harvey
TM4
TM3

LEGEND

Laregro Survey Area
State Road

Surface Hydrology
Minor
Major
Stream

Habitat Assessment
Suitable Habitat
Not Suitable - culvert
Not Suitable - thick detrital layer
Not Suitable - rocky substrate
Not Suitable - ephemeral
Not Assessed

Biologic

Scale 1:150,000

0 2 4 6 Km

Coordinate System: GDA 1994 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA 1994 Created 19/03/2024

Mandurah
Dwellingup
Waroona
Yarloop
Harvey
Bunbury
Collie

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Targeted Carter's
Freshwater Mussel Survey

Figure 4.9: Habitat assessment

Table 4.4: CFM recorded during the survey

Site name	Type	Latitude	Longitude	ML (mm)	MW (mm)	CFM observations
TM3	Quadrat (Q1)	-32.9906	116.0917	39	27	Deceased
TM3	Quadrat (Q1)	-32.9906	116.0917	44	29	Deceased
TM3	Quadrat (Q1)	-32.9906	116.0917	47	29	Deceased
TM3	Quadrat (Q1)	-32.9906	116.0917	45	30	Deceased
TM3	Quadrat (Q2)	-32.9906	116.0917	44	31	Deceased
TM3	Quadrat(Q2)	-32.9906	116.0917	47	29	Deceased
TM3	Quadrat (Q2)	-32.9906	116.0917	45	28	Deceased
TM3	Quadrat (Q6)	-32.9906	116.0917	37	23	Deceased
TM4	Opportunistic	-33.0041	116.0861	55	37	Alive

4.6 Other Aquatic Fauna

While methods for sampling other aquatic species such as fish and crayfish were not used in the targeted CFM survey, other aquatic fauna were observed at the time of sampling. Schools of the native freshwater fish, western minnow (*Galaxias occidentalis*), were observed throughout the creek at TM2, TM3, TM4 and TM5. At Conveyor, a single large (> 300 mm standard length), introduced rainbow trout (*Oncorhynchus mykiss*) was observed in the rocky pool upstream of the quadrats. Crayfish burrows were observed along the banks at most sites. One crayfish species was confirmed (at Conveyor and TM3). This was the native koonac (*Cherax preisii,* Plate 4.1).



Plate 4.1: Native koonac (*Cherax preisii*) at Conveyor

4.7 Reassessment of Likelihood of Occurrence

The likelihood of occurrence of CFM was reassessed following the targeted survey. The likelihood of occurrence at Haul Road site HR1a was reduced from 'Likely' to 'Possible', while HR3 was reduced from 'Likely' to 'Highly Unlikely' as the creek was likely ephemeral in this area, and the highly compacted substrate would make it difficult for CFM to burrow. Turbidity Monitoring sites TM2 and TM5 were reduced from 'Likely' to 'Possible' as no CFM were found but suitable habitat was present. In particular, the latter site was difficult to sample effectively due to the overgrown vegetation. The likelihood of occurrence at Conveyor was reassessed as 'Unlikely' due to limited availability of suitable habitat (Table 4.5).

Table 4.5: Reassessment of likelihood of occurrence of Carter's freshwater mussel based on survey results

Site	Within current known distribution	Suitable water quality within Survey Area	Core/critical habitat within Survey Area	Recorded within Survey Area	Likelihood of Occurrence
HR1	Yes	Not Sampled	Not Sampled	Not Sampled	Possible[d]
HR1a	Yes	Yes	Yes[b]	No	Possible
HR2	Yes	Not Sampled	Not Sampled	Not Sampled	Possible[d]
HR3	Yes	Yes	No[c]	No	Highly Unlikely
Conveyor	Yes	Yes	Limited[b]	No	Unlikely
TM2	Yes	Yes	Yes[b]	No	Possible
TM3	Yes	Yes	Yes[b]	Yes	Confirmed[a]
TM4	Yes	Yes	Yes[b]	Yes	Confirmed
TM5	Yes	Yes	Yes[b]	No	Possible

a.) confirmed, but no individuals were alive

b.) assessment based on current conditions at the time of the targeted survey

c.) pool considered likely to be ephemeral

d.). site not able to be accessed and therefore potential for occurrence remains as 'Possible' given suitable water quality was considered likely based on other sites. It was not possible to extrapolate substrate composition from other sampled sites.

5 Discussion

5.1 Distribution and Abundance of Carter's Freshwater Mussel

CFM have specific habitat and water quality requirements, which limit their distribution. CFM are acutely intolerant of salinity and generally not found in ephemeral habitats (Klunzinger, 2012). Studies of microhabitat preference found CFM abundance is most strongly associated with fine substrate grain size, proximity to the river bank, and presence and height of debris above the surface of the creek bed (Ma, 2018). The ability to burrow into substrates and protection from high flows are also important habitat requirements for this species. Burrowing can protect CFM from water emersion for a short time, as long as riparian vegetation is available to provide shade (Lymbery *et al.*, 2020).

The targeted survey confirmed the presence of CFM in the Survey Area at two of seven sites, although all CFM recorded from TM3 were deceased at the time of sampling. The cause of deaths is unknown and may be related to a previous contamination event or spike in concentration of water quality analytes outside the threshold of CFM. It is also possible that given the moderate flows present at TM3, it is also possible the deaths occurred upstream, with individual shells transported downstream to TM3 with the flow. Spot measurements of water quality at the time of sampling indicated surface waters at TM3 were suitable for CFM at that time.

One live CFM was recorded at TM4. Based on age-at-length estimates in other systems, this individual was estimated to be between 7 to 10 years old (Klunzinger *et al.*, 2014). No juveniles were encountered during the survey. Although sieving of sediments was undertaken at all sites to target juveniles, the high density of vegetation, roots and large woody debris present across the benthic surface made this difficult at most sites. Juveniles are known to be more difficult to locate, especially without sediment sieving, because hand searching tends to bias towards larger mussels (Klunzinger, 2012). CFM density (individuals/m^2) was not calculated due to low abundance and fact that the one live individual was recorded outside the quadrats.

Given the presence of CFM at both TM3 and TM4, the absence of CFM on the Tributary of Harvey River upstream at TM2 was perhaps unexpected, particularly given the favourable sediment composition and water quality present. However, no freshwater fish were observed at TM2, possibly due to some physical barrier between TM3 and TM2. The lack of fish would explain the absence of CFM, as larval glochidia are dependent on freshwater fishes for dispersal into upstream tributaries (Ma, 2018). At Conveyor, further upstream on a Tributary of the Harvey River, the absence of CFM was likely explained by the fact that suitable habitat was less abundant, water levels were low, and there were no fish present.

Suitable habitat and favourable in situ water quality was available at TM5, as well as the presence of abundant freshwater fish (*Galaxias occidentalis)*. Despite this, no CFM were recorded from this site. This could be due to survey effort, as dense vegetation impeded thorough assessment, with the creek being impassable in parts. The Healthy Rivers database search (DWER, 2023b) indicated that a site sampled in close proximity to TM5, also did not record CFM. With CFM recorded <10 km to the west, near Yarloop, and no CFM recorded downstream at Brockman Dam, freshwater fish populations may have been separated from CFM, which would limit reproductive dispersal.

The Haul Road site HR3 also recorded no mussels. This site was relatively small, and the likelihood of occurrence was reassessed as 'Highly Unlikely' to support CFM, due to the site being considered to be ephemeral. The low water level at the time of sampling and compacted sediment would make it difficult for mussels to burrow when water levels recede during the summer months. Haul Road sites HR1 and HR2 were unable to be surveyed due to issues with access, and therefore the likelihood of CFM at these sites remains 'Possible'. Based on water quality readings at other sites, including HR3, it is assumed that HR1 and HR2 would have suitable water quality to support CFM. However, it is not possible to draw conclusions regarding the permanence of water or the sediment composition at HR1 and HR2 without accessing the sites directly.

The CFM record at TM4 represents the only known live record of this significant species in the Survey Area, particularly as nearby sites have failed to record CFM previously (DWER, 2023b). Confirmed records are important for a species experiencing population decline and reduction in available habitat.

5.2 Conclusion

This survey represents the first targeted survey for CFM in the Larego region. A total of nine mussels (eight dead, one alive) were recorded from the Survey Area, in close proximity to the Willowdale mine. Water quality and habitat data could not provide any insight into the cause of deaths at TM3, however, this should be investigated.

The recent redescription of CFM has reduced its current range. As the species is currently listed as Vulnerable (BC Act, EPBC Act, IUCN) and known to be experiencing population decline, the reduction in range due to the recent taxonomic change has implications for the conservation status of CFM. The importance of existing populations is likely to become more significant following any reassessment of the conservation significance of this species.

6 References

ALA, Atlas of Living Australia. (2023). Occurrence search (custom search). Retrieved 2023 http://www.ala.org.au/

ANZG. (2018). Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Retrieved from www.waterquality.gov.au/anz-guidelines

Beatty, S. J., Morgan, D. L., Rashnavadi, M., & Lymbery, A. J. (2011). Salinity tolerances of endemic freshwater fishes of south-western Australia: Implications for conservation in a global biodiversity hotspot. *Marine and Freshwater Research, 62*(1), 91-100.

Biologic. (2020). *Targeted Fauna Survey - Carter's Freshwater Mussel*. East Perth, WA:

Biologic. (2021). *Targeted Carter's Freshwater Mussel Survey: Bridges 0911 and 4362*. East Perth, W.A.:

Biologic. (2022a). *Bridge 0661, Weld St over Gingin Brook: Targeted Carter's Freshwater Mussel Survey*. East Perth, WA:

Biologic. (2022b). *Great Eastern Highway Bypass Interchanges Project: Targeted Carter's Freshwater Mussel Survey*. East Perth:

Biologic. (2023a). *Bridge 0127 South Western Highway over Serpentine River: Targeted Carter's Freshwater Mussel Survey*. East Perth, WA:

Biologic. (2023b). *Busselton Bypass: Targeted Carter's Freshwater Mussel Survey*. East Perth, WA:

BoM, Bureau of Meteorology. (2023). Climate Data Online. Retrieved 2023 http://www.bom.gov.au./climate/data/index.shtml

Catlin, A., Collier, K., Pingram, M., & Hamer, M. (2017). *Regional guidelines for ecological assessments of freshwater environments - standardised protocol for adult freshwater mussel monitoring in wadeable streams*. Hamilton, NZ:

DBCA, Department of Biodiversity Conservation and Attractions. (2023). Dandjoo Biodiversity Data Repository (custom search). Retrieved 2023 https://dandjoo.bio.wa.gov.au/

DCCEEW, Department of Climate Change, Energy, the Environment and Water. (2023). Protected Matters Search Tool (custom search). Retrieved 2023 www.environment.gov.au/erin/ert/epbc/index.html

DWER, Department of Water and Environmental Regulation. (2023a). Healthy Rivers Database. Retrieved 2023 https://rivers.dwer.wa.gov.au/southwest/

DWER, Department of Water and Environmental Regulation (2023b). Index of Biodiversity Surveys for Assessments (IBSA). Retrieved 2023 https://biocollect.ala.org.au/ibsa#max%3D20%26sort%3DdateCreatedSort

EPA, Environmental Protection Authority. (2016). *Technical Guidance: Terrestrial Fauna Surveys*. Perth, Western Australia: Environmental Protection Authority.

EPA, Environmental Protection Authority. (2018). *Environmental Factor Guideline: Inland Waters*. Perth, Western Australia: Environmental Protection Authority.

IUCN, International Union for the Conservation of Nature and Natural Resources. (2024). The IUCN Red List of Threatened Species. Retrieved from www.iucnredlist.org

Klunzinger, M., & Walker, K. F. (2014). *Westralunio carteri*. The IUCN Red List of Threatened Species 2014: e.T23073A58526341. Accessed 2020 from http://dx.doi.org/10.2305/IUCN.UK.2014-3.RLTS.T23073A58526341.en.

Klunzinger, M. W. (2012). *Ecology, life history and conservation status of Westralunio carteri Iredale 1934, an endemic freshwater mussel of south-western Australia. PHD Thesis. Murdoch University, Perth Western Australia.*

Klunzinger, M. W., Beatty, S. J., Allen, M. G., & Keleher, J. (2012a). *Mitigating the Impact of Serpentine Pipehead Dam Works on Carter's Freshwater Mussel*. Murdoch University: The Government of Western Australia.

Klunzinger, M. W., Beatty, S. J., Morgan, D. L., Lymbery, A. J., & Haarg, W. R. (2014). Age and growth in the Australian freshwater mussel, *Westralunio carteri,* with an evaluation of the fluorochrome calcein for validating the assumption of annulus formation. *Freshwater Science, 33*(4), 1127-1135.

Klunzinger, M. W., Beatty, S. J., Morgan, D. L., Lymbery, A. J., Pinder, A. M., & Cale, D. J. (2012b). Distribution of *Westralunio carteri* Iredale 1934 (Bivalvia: Unionoida: Hyriidae) on the south coast of southwestern Australia, including new records of the species. *Journal of the Royal Society of Western Australia, 95*, 77-81.

Klunzinger, M. W., Beatty, S. J., Morgan, D. L., Pinder, A. M., & Lymbery, A. J. (2015). Range decline and conservation status of *Westralunio carteri* Iredale, 1934 (Bivalvia :Hyriidae) from south-western Australia. *Australian Journal of Zoology, 63*, 127-135.

Klunzinger, M. W., Whisson, C., Zieritz, A., Benson, J. A., Stewart, B. A., & Kirkendale, L. (2022). Integrated taxonomy reveals new threatened freshwater mussels (Bivalvia: Hyriidae: *Westralunio*) from southwestern Australia. *Scientific Reports, 12*(20385). doi:https://doi.org/10.1038/s41598-022-24767-5

Lymbery, A. J., Ma, L., Lymbery, S. J., Klunzinger, M. W., Beatty, S. J., & Morgan, D. L. (2020). Burrowing behavior protects a threatened freshwater mussel in drying rivers. *Hydrobiologia*. doi:DOI 10.1007/s10750-020-04268-0.

Ma, L. (2018). *Habitat preference, environmental tolerance and population viability of Westralunio carteri Iredale 1934, a threatened freshwater mussel of south-western Australia.* (PhD), Murdoch University, Perth, WA.

Ma, L., Beatty, S. J., Morgan, D. L., & Lymbery, A. J. (2022). Population structure and microhabitat preference of a threatened freshwater mussel, *Westralunio carteri*, in south-western Australia. *Hydrobiologia, 849*, 3227-3244. doi:https://doi.org/10.1007/s10750-022-04929-2

Mayer, X. M., Ruprecht, J. K., & Bari, M. A. (2005). *Stream salinity status and trends in south-west Western Australia. Report No. SLUI38*.

Morgan, D. L., Gill, H. S., & Potter, I. (1998). Distribution, identification and biology of freshwater fishes in the south-western Australia. *Records of the Western Australia Museum, Supplement, 56*, 1-97.

Morgan, D. L., Thorburn, D. C., & Gill, H. S. (2003). Salinization of the southwestern Western Australian Rivers and the implications of the inland fish fauna – the Blackwood River, a case study. *Pacific Conservation Biology, 9*, 161-171.

Strayer, D. L. (2008). *Freshwater Mussel Ecology: A Multifactor Approach to Distribution and Abundance* (First Edition ed.). Berkley, CA, USA.: University of California Press.

Stream Environment and Water. (2021). *Byford Railway Extension Targeted Fauna Surveyfor Westralunio carteri Carter's Freshwater Mussel*.

WRM. (2020). *MEL Project 27: Bennett Brook Carter's Freshwater Mussel Targeted Survey Memorandum*. Burswood, WA:

Appendix A: Conservation Codes

International Union for Conservation of Nature

Category	Definition
Extinct (EX)	A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Extinct in the Wild (EW)	A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Critically Endangered (CR)	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Endangered (EN)	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable (VU)	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases, great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

Environment Protection and Biodiversity Conservation Act 1999

Category	Definition
Extinct (EX)	Taxa not definitely located in the wild during the past 50 years.
Extinct in the Wild (EW)	Taxa known to survive only in captivity.
Critically Endangered (CE)	Taxa facing an extremely high risk of extinction in the wild in the immediate future.
Endangered (EN)	Taxa facing a very high risk of extinction in the wild in the near future.
Vulnerable (VU)	Taxa facing a high risk of extinction in the wild in the medium-term future.
Migratory (MG)	Consists of species listed under the following International Conventions: Japan-Australia Migratory Bird Agreement (JAMBA) China-Australia Migratory Bird Agreement (CAMBA) Convention on the Conservation of Migratory Species of Wild animals (Bonn Convention)

Biodiversity Conservation Act 2016

Category	Definition
CR	Rare or likely to become extinct, as *critically endangered* fauna.
EN	Rare or likely to become extinct, as *endangered* fauna.
VU	Rare or likely to become extinct, as *vulnerable* fauna.
EX	Being fauna that is presumed to be extinct.
MI	Birds that are subject to international agreements relating to the protection of migratory birds.
CD	Special conservation need being species dependent on ongoing conservation intervention. (Conservation Dependant)
OS	In need of special protection, otherwise than for the reasons pertaining to Schedule 1 through to Schedule 6 Fauna. (Other specially protected species

Department of Biodiversity Conservation and Attraction Priority Codes

Category	Definition
Priority 1 (P1)	Taxa with few, poorly known populations on threatened lands.
Priority 2 (P2)	Taxa with few, poorly known populations on conservation lands; or taxa with several, poorly known populations not on conservation lands.
Priority 3 (P3)	Taxa with several, poorly known populations, some on conservation lands.
Priority 4 (P4)	Taxa in need of monitoring. Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection but could be if present circumstances change.

Appendix B: Default ANZG (2018) Water Quality Guidelines

Default trigger values for some physical and chemical stressors for South West Australia for slightly disturbed ecosystems (TP = total phosphorus; FRP = filterable reactive phosphorus; TN = total nitrogen; NOx = total nitrates/nitrites; NH4+ = ammonium).

Aquatic Ecosystem	Analyte						
	TP	FRP	TN	NOx	NH_4^+	DO	pH
Units	mg/L	mg/L	mg/L	mg/L	mg/L	% saturation	
Upland River[e]	0.02	0.010	0.45	0.20	0.06	90-na	6.5-8.0
Lowland River[e]	0.065	0.040	1.20	0.15	0.08	80-120	6.5-8.0
Lakes & Reservoirs	0.01	0.005	0.35	0.01	0.01	90-no data	6.5-8.0
Wetlands[3]	0.06	0.030	1.5	0.10	0.04	90-120	7.0[e]-8.5[e]

na = not applicable;

e = in highly coloured wetlands (gilven >52 g440m-1) pH typically ranges 4.5-6.5;

f = all values derived during base river flow conditions not storm events;

i = dissolved oxygen values were derived from daytime measurements. Dissolved oxygen concentrations may vary diurnally and with depth. Monitoring programs should assess this potential variability.

Default trigger values for salinity and turbidity for the protection of aquatic ecosystems, applicable to the South West of Australia

Salinity	(µs/cm)	Comments
Aquatic Ecosystem		
Upland & lowland rivers	120- 300	Conductivity in upland streams will vary depending on catchment geology. Values at the lower end of the range are typically found in upland rivers, with higher values found in lowland rivers. Lower conductivity values are often observed following seasonal rainfall.
Lakes, reservoirs & wetlands	300-1,500	Values at the lower end of the range are observed during seasonal rainfall events. Values even higher than 1,500 μScm^{-1} are often found in saltwater lakes and marshes. Wetlands typically have conductivity values in the range of 500-1,500 μScm^{-1} over winter. Higher values (>3,000 μScm^{-1}) are often measured in wetlands in summer due to evaporative water loss.
Turbidity	**(NTU)**	
Aquatic Ecosystem		
Upland & lowland rivers	10-20	Turbidity is highly variable and dependent on seasonal rainfall runoff. These values represent base river flow in lowland rivers.
Lakes, reservoirs & wetlands	10-100	Most deep lakes have low turbidity. However, shallow lakes have higher turbidity naturally due to wind-induced re-suspension of sediments. Wetlands vary greatly in turbidity depending on the general condition of the catchment, recent flow events and the water level in the wetland.

05 July 2024

To	Kristyna Gawith	**Contact No.**	0427232751
Copy to	Brett Lowcock	**Email**	dylan.goldspink@ghd.com
From	Dylan Goldspink	**Project No.**	12565572
Project Name	Alcoa Holyoake Environmental Assessments		
Subject	McCoy Haul Road Fauna Pre-clearance Survey		

1. Introduction

Alcoa of Australia Limited (Alcoa) invited GHD Pty Ltd (GHD) to undertake a targeted Pre-clearance Survey within the McCoy Haul Road and O'Neil region for significant terrestrial fauna constraints. This survey work will build on the baseline studies undertaken at the regional scale since 2021, and specifically for the O'Neil region (GHD 2024a). Alcoa requires 'Targeted Pre-clearance Surveys' to be undertaken within the Conceptual Clearing Area. These results will be incorporated into Forest Clearing Advice (FCA) submission for the McCoy – O'Neil Haul Road Clearing Area.

1.1 Purpose of this Memorandum

The Purpose of the memorandum is to summarise the methodology of the survey, results and limitations of the targeted Pre-clearance assessment for the McCoy Haul Road.

1.2 Survey Area

The McCoy Haul Road Pre-Clearance Survey Area is located in the Peel Region of Western Australia (WA) approximately 27 kilometres (km) east from the township of Jarrahdale. The Survey Area is approximately 563.4 hectares (ha) in size, as shown on Figure 1, Appendix A.

1.3 Scope and limitations

1.3.1 Scope of work

The scope of works was as follows:

- Undertake targeted assessment to identify significant fauna constraints focussing on Significant fauna, including but not limited to, Baudin's Black Cockatoo, Carnaby's Black Cockatoo, Forest Red-tailed Black Cockatoo, Chuditch, Quokka, Woylie and Carters Freshwater Mussel
- Targeted Black Cockatoo Assessment, to assess the quality and extent of Breeding, roosting and foraging habitat and to identify Black Cockatoo Breeding trees and trees of significance
- Prepare a standalone memorandum which summarises findings (this document)
- Prepare a data package of the survey results for the Index of Biodiversity Surveys for Assessments (IBSA) submission. Submitted to Alcoa electronically as part of the reporting package.

1.3.2 Fauna survey limitations

The EPA (2016, 2020) technical Guidance states that flora and fauna survey reports for environmental impact assessments in WA should contain a section describing the limitations and constraints associated with this field survey as discussed in Table 1. Based on this assessment, the survey effort has been subject to two constraints (climate and human disturbances), which affect the results of the assessment. These

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have been taken into account when forming the conclusions around the survey results. The constraints do not affect the accuracy or thoroughness of the assessment but do impact the overall results that might be expected for a survey in the region.

Table 1 Field Survey limitations

Aspect	Constraint	Comment
Sources of information and availability of contextual information.	Nil	Adequate information is available for the Survey Area, this includes: Broadscale (1:1,000,000) mapping by Beard (1979) and digitised by Shepherd et al. (2002) Database searches (DBCA and *NatureMap*). Previous surveys (GHD 2024 a, 2024b and 2024c). Previous broadscale vegetation mapping (Mattiske and Havel 1998)
Scope (what life forms were sampled etc.)	Nil	Significant terrestrial vertebrates were sampled during the survey. Basic fauna assessment sampled significant and non-significant species opportunistically. Terrestrial invertebrate fauna were not surveyed.
Proportion of fauna collected and identified (based on sampling, timing and intensity)	Minor	The Targeted fauna survey included undertaking specific tasks to focus on desired species. In permit application GHD applied for the use of cage traps to undertake trapping transects throughout the Survey Area. DBCA at the time declined the use of cage traps requesting substitution of camera transects instead. Camera transects replicated cage trapping design i.e. 10 units spaced at 200 m intervals and baited with a desirable lure. The advantage of cameras enabled continual data collection of a range of species over time rather than a one of per day. However, the identification of individuals was more difficult despite using the spotted pelage marking identification method. The survey timing was considered not ideal for the purpose of the targeted fauna assessment with five survey periods undertaken from March to June 2024 with below average rainfall. The fauna recorded is detailed in Section 3.2 and a full fauna species list is provided in Species list, Appendix B. A species inventory was compiled for this report as it assists in demonstrating effort when some species are not located.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Nil	The Survey Area was accessed by vehicle and on foot. The Survey Area was adequately surveyed during the field survey in line with the scope. Additional opportunistic sampling was undertaken to develop a comprehensive species inventory although the primary goal of the survey was to target significant fauna. Habitats considered suitable for significant fauna were traversed by foot.
Mapping reliability	Nil	The fauna habitats were mapped using high-resolution aerial imagery obtained from Landgate, topographical features, previous broad scale mapping (Beard 1976) and field data from Mattiske 2023. Data was recorded in the field using hand-held GPS tools. Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The Garmin GPS units and GPS enabled tablets used for this survey are accurate to within 2 to 5 m on average.
Timing/weather/ season/cycle	Moderate	The field survey was conducted in March to June 2024. The region has had prolonged drought like conditions from October 2023 to May 2024, leading to a decrease in fauna activity within survey for opportunistic observations.
Disturbances (e.g. fire, flood, accidental human intervention)	Moderate	Some of the Survey Area has been subjected to historical and recent disturbance events (e.g. clearing – logging and fire – prescribed burning); in some areas these events seem to be reducing the presence of fauna that are usually abundant. Despite all the survey effort no Brushtail Possum were recorded, and large hollow bearing (habitat) trees retained by loggers, have been burnt down in prescribed fires. This is reducing the amount of large habitat trees suitable for use by fauna in the forest. These disturbances impact on the results of the survey, as fauna are less likely to be utilising the area, and therefore less likely to be detected.

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Aspect	Constraint	Comment
Intensity (in retrospect, was the intensity adequate)	Nil	The fauna of the Survey Area was sampled in accordance with EPA (2020). The Survey Area was sufficiently covered by the Senior and Principal zoologists during the survey.
Resources	Nil	Adequate resources were employed during the field survey which included nine staff over 53 person days spent undertaking the survey using two Senior and one Principal Zoologist.
Access restrictions	Nil	The Survey Area was accessible by vehicle and on foot. There were no access restrictions.
Experience levels	Nil	The Senior Zoologists and Principal Zoologist who executed the survey are practitioners suitably qualified and experienced in their respective fields: Senior Zoologist, Brad Maryan, was a field team lead with more than 25 years' experience leading and conducting fauna surveys. Senior Zoologist, Robert Browne-Cooper, was a field team lead with more than 25 years' experience leading and conducting fauna surveys. Zoologist Lucas Hurst has over 7 years' experience undertaking fauna surveys. Principal Zoologist Glen Gaikhorst was a field team lead with more than 25 years' experience leading and conducting fauna surveys.

This technical memorandum has been prepared by GHD for Alcoa of Australia Limited. It is not prepared as, and is not represented to be, a deliverable suitable for reliance by any person for any purpose. It is not intended for circulation or incorporation into other documents. The matters discussed in this memorandum are limited to those specifically detailed in the memorandum and are subject to any limitations or assumptions specially set out.

Accessibility of documents

If this Technical Memorandum is required to be accessible in any other format this can be provided by GHD upon request and at an additional cost if necessary.

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2. Methods

2.1 Survey timing and personnel.

The survey was conducted during March – June 2024 and was led by GHD Zoologist Dylan Goldspink and accompanied by Senior Zoologists, Robert Browne-Cooper and Brad Maryan, and Zoologists Lucas Hurst and Melissa Wood. The Hollow assessments were conducted by GHD Principal Zoologist Glen Gaikhorst, Zoologist Lucas Hurst and Graduate Environmental Scientist Cheri van Rensburg. A breakdown of the field assessments is presented in Table 2.

Table 2 Survey Timing and Personnel

Date	Task	Personnel
Black Cockatoo habitat assessment and Remote camera deployment 05/03/2024 – 08/03/2024	Black Cockatoo Habitat Assessment identifying Black Cockatoo trees of a suitable Diameter at breast height (DBH). Deployment of remote cameras.	Robert Browne-Cooper Brad Maryan Lucas Hurst Dylan Goldspink
Black Cockatoo Habitat Assessment and remote camera collection 21/03/2024 – 26/03/2024	Remote camera collection and Black Cockatoo habitat assessment and Black Cockatoo hollow assessment.	Glen Gaikhorst Brad Maryan Lucas Hurst Dylan Goldspink
Significant tree verification 4/04/2024	Verification of DBH for significant trees	Dylan Goldspink Melissa Wood
Black Cockatoo habitat assessment and Remote camera deployment 4/05/2024 – 10/05/2024 & 21/05/2024 – 22/05/2024	Black Cockatoo Habitat Assessment identifying Black Cockatoo trees of a suitable Diameter at breast height (DBH). Deployment of remote cameras.	Dylan Goldspink Brad Maryan Mellisa Wood
Black Cockatoo Hollow Assessment and Camera Collection 5/06/2024	Black Cockatoo Hollow assessment by ground assessment, pole camera or drone. Collection of remote cameras.	Dylan Goldspink Glen Gaikhorst Cheri van Rensburg

2.2 Field survey

2.2.1 Targeted Remote Camera

Targeted remote cameras were deployed within the Survey Area. A total of 25 Reconyx Remote cameras were deployed within the Survey Area, with a minimum spacing of 400 m apart, along the proposed haul road area. The remote cameras were baited with a combination of sardines, tuna and peanut butter and were deployed to target a number of significant fauna including but not limited to Chuditch (*Dasyurus geoffroii*), Quokka (*Setonix brachyurus*) and Woylie (*Bettongia penicillate ogilbyi*). For each remote camera deployed, the time and date deployed and collected, as well as the GPS coordinates were recorded and presented in Table 3.

Data (images/video) was uploaded to SD cards and downloaded for processing. Images were screened for fauna species present and identified to species level. Where species level could not be achieved, identification was made to species group or best determination to the highest taxonomic level possible. Species presence on camera was classified as an event, with one event occurring every 24 hours (dusk to dawn) unless individual specimens could be identified (i.e. Chuditch with spots or animal sizes or injury

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marks). By restricting data to one event every 24 hours assumes some level of independence of the species.

All non-significant terrestrial fauna species were identified and added to the species list presented in Appendix B.

Chuditch Camera Capture (*Dasyurus geoffroii*) Physical Assessment data

Spot patterns of Chuditch were examined in detail and used to identify individuals from camera trap photographs. To use these patterns to identify individuals, accurate and proportionate sketches were made of the top of the head, back, left and right sides of individual Chuditch from the photographs taken by the remote cameras. Each sketch aimed to provide a useful summary that strongly aided subsequent recognition of individuals (Hohnen et al 2015). The spot patterns were examined to determine whether the Chuditch in question was new or a previously viewed individual. Often two or more key spot patterns were visible in a photograph of a single side (e.g. one group on the shoulder and one on the haunch). When these key collections of spots could be matched and no area of the coat had con-complementary patterns, it was deemed to be the same individual. Therefore, a clear view of a single side was sufficient to confirm the identity of the individual, if that individual had been previously identified. Only good quality images showing two or more clear spot patterns were used for identification and photographs with obscured or blurred patterns were not used (Hohnen et al 2015).

Chuditch spot analysis is presented in Appendix B.

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Table 3 Targeted Camera deployment

Camera	Habitat Type	Latitude	Longitude	Date Deployed	Date Collected	Nights
CAM W6	Jarrah -Marri forest (Reveg)	-32.60283	116.19127	5/03/2024	22/03/2024	17
CAM W3	Jarrah -Marri forest	-32.55722	116.24230	5/03/2024	26/03/2024	21
CAM X1	Jarrah -Marri forest	-32.56057	116.23868	5/03/2024	26/03/2024	21
CAM R59	Jarrah -Marri forest	-32.56313	116.23425	5/03/2024	26/03/2024	21
CAM 16	Jarrah -Marri forest (Recently burnt reveg)	-32.54883	116.15943	6/03/2024	26/03/2024	20
CAM W10	Jarrah -Marri forest (Burnt reveg)	-32.55391	116.16163	6/03/2024	26/03/2024	20
CAM W11	Jarrah -Marri forest	-32.56060	116.15222	6/03/2024	26/03/2024	20
CAM X2	Jarrah -Marri forest	-32.56571	116.23098	6/03/2024	26/03/2024	20
CAM W9	Jarrah -Marri forest	-32.56807	116.22869	6/03/2024	25/03/2024	19
CAM W12	Jarrah -Marri forest	-32.56927	116.22608	6/03/2024	25/03/2024	19
CAM R57	Jarrah -Marri forest	-32.57125	116.22308	6/03/2024	25/03/2024	19
CAM X3	Jarrah -Marri forest	-32.57349	116.21987	6/03/2024	25/03/2024	19
CAM W15	Jarrah -Marri forest	-32.57795	116.21517	6/03/2024	25/03/2024	19
CAM 53	Jarrah -Marri forest	-32.58005	116.21270	6/03/2024	25/03/2024	19
CAM 15B	Jarrah -Marri forest	-32.55616	116.15595	7/03/2024	26/03/2024	19
CAM 20	Jarrah -Marri forest (Burnt)	-32.55700	116.16400	7/03/2024	26/03/2024	19
CAM 28	Jarrah -Marri forest	-32.55981	116.16628	7/03/2024	26/03/2024	19
CAM HF12	Jarrah -Marri forest	-32.55920	116.24656	7/03/2024	26/03/2024	19
CAM W2	Jarrah -Marri forest	-32.55992	116.25249	7/03/2024	26/03/2024	19
CAM YALGOO	Jarrah -Marri forest	-32.56286	116.16903	8/03/2024	26/03/2024	18
CAM 31	Jarrah -Marri forest (Burnt reveg)	-32.58122	116.18489	8/03/2024	22/03/2024	14
CAM R41	Jarrah -Marri forest (Burnt)	-32.59616	116.19253	8/03/2024	22/03/2024	14

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Camera	Habitat Type	Latitude	Longitude	Date Deployed	Date Collected	Nights
CAM 55	Jarrah -Marri forest	-32.59179	116.20027	8/03/2024	25/03/2024	17
CAM W7	Jarrah -Marri forest	-32.58603	116.20573	8/03/2024	25/03/2024	17
CAM W1	Jarrah -Marri forest	-32.55319	116.24634	8/03/2024	26/03/2024	18
CAM 31	Minor drainage line	-32.58392	116.19009	22/03/2024	25/03/2024	3
CAM C43	Jarrah -Marri forest	-32.55155	116.24485	7/05/2024	31/05/2024	24
CAM Z2	Jarrah -Marri forest	-32.55350	116.24214	7/05/2024	31/05/2024	24
CAM Z10	Jarrah -Marri forest	-32.55610	116.23865	7/05/2024	31/05/2024	24
CAM Z4	Jarrah -Marri forest	-32.55964	116.23626	7/05/2024	31/05/2024	24
CAM W8	Jarrah -Marri forest	-32.56126	116.23402	7/05/2024	31/05/2024	24
CAM P4	Melaleuca dampland	-32.56429	116.22960	7/05/2024	31/05/2024	24
CAM Z3	Jarrah -Marri forest	-32.56681	116.22735	7/05/2024	31/05/2024	24
CAM R56	Jarrah -Marri forest	-32.58096	116.21468	7/05/2024	5/06/2024	29
CAM HP2	Jarrah -Marri forest	-32.58396	116.21134	7/05/2024	5/06/2024	29
CAM Z6	Jarrah -Marri forest	-32.58692	116.20799	7/05/2024	5/06/2024	29
CAM GERO F	Jarrah -Marri forest	-32.58939	116.20518	7/05/2024	5/06/2024	29
CAM 5	Jarrah -Marri forest	-32.59267	116.20190	7/05/2024	5/06/2024	29
CAM C42	Minor drainage line	-32.58757	116.18952	7/05/2024	5/06/2024	29
CAM Z7	Jarrah -Marri forest	-32.58977	116.19929	7/05/2024	31/05/2024	24
CAM 21	Jarrah -Marri forest	-32.58000	116.20962	7/05/2024	31/05/2024	24
CAM 14	Jarrah -Marri forest (Burnt)	-32.57534	116.21497	7/05/2024	5/06/2024	29
CAM Z9	Jarrah -Marri forest	-32.56313	116.15313	9/05/2024	4/06/2024	27
CAM Z5	Jarrah -Marri forest	-32.59700	116.19524	9/05/2024	5/06/2024	27
CAM Z1	Jarrah -Marri forest	-32.57687	116.22766	9/05/2024	5/06/2024	27
CAM Z8	Jarrah -Marri forest	-32.57229	116.21803	9/05/2024	31/05/2024	22
CAM 12	Jarrah -Marri forest	-32.57019	116.22724	9/05/2024	31/05/2024	22

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Camera	Habitat Type	Latitude	Longitude	Date Deployed	Date Collected	Nights
CAM 15B	Edge of dampland	-32.56328	116.22761	9/05/2024	31/05/2024	22
CAM 16	Jarrah -Marri forest	-32.55893	116.24416	9/05/2024	5/06/2024	27
CAM 11	Mixed shrub dampland	-32.56518	116.23143	9/05/2024	31/05/2024	22
Total nights						1083

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2.2.2 Carter's Freshwater Mussel Assessment

The Carter's Freshwater Mussel (*Westralunio carteri*) survey approach is based on the methods used by Kluzinger et al. (2012) to study Carter's Freshwater Mussel populations in the lower Vasse River. This method is aimed at detecting species presence on foot.

However, due to the lack of any permanent water bodies (lakes, rivers or streams) identified within the Survey Area and the two ephemeral streams being completely dry (at the time of the survey), the Carter's Freshwater Mussel Assessment was not conducted. A Carter's Freshwater Mussel Assessment would need to be conducted post significant rainfall, when water is present within the streams.

2.2.3 Black Cockatoo assessment

A Black Cockatoo habitat assessment for Baudin's Black Cockatoo (*Zanda baudinii*), Carnaby's Black Cockatoo (*Z. latirostris*), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) was undertaken across the Survey Area to assess the presence, quality, and extent of foraging, breeding and roosting habitat. The assessment involved a visual and aural assessment of the Survey Area, identifying breeding habitat (presence/absence of actual and potential breeding trees), foraging habitat, roosting areas, current species activity and other signs of use by Black Cockatoos. This assessment approach was carried out using the DAWE (2022) *Black Cockatoo referral guidelines* to define breeding, foraging and night roosting habitat.

Breeding habitat

Breeding habitat: Defined by DAWE (2022) as 'habitat that contains known, suitable, or potential nesting trees'. For most tree species such as Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), Blackbutt (*E.patens*) and Flooded Gum (*E. rudis*), suitable DBH is 500mm. For Wandoo (*E. wandoo*) suitable DBH is 300mm. On average, Carnaby Black Cockatoo are known to nest in hollows with an entrance greater than 20cm (Johnstone & Storr 1998, Groom 2011). While the Forest Red-tailed Black Cockatoo is known to nest in hollows with an entrance greater than 12 cm (Johnstone & Storr 1998). Therefore, hollow suitability was assessed in consideration of these hollow requirements.

Breeding habitat was assessed by surveying the entirety of the McCoy Haul Road Survey Area. Breeding habitat was than analysed from the data collected from the field surveys. For each potential nesting tree, details of the tree location, species, DBH, size and numbers of hollows observed, evidence of use and any other significant observations were recorded. All identified potential nesting tree were further checked visually using binoculars for suitable nest hollows. Where trees were recorded to have suitable large hollows that could be used or had signs of being used (potential or likely), trees were revisited by Principal Zoologist, Glen Gaikhorst, where the hollows were checked for Black Cockatoo use by using a drone, pole camera and/or telephoto lens.

Foraging habitat

Foraging habitat is defined by DAWE (2022) as 'Plant species known to support foraging within the range of cockatoo species'. Foraging habitat was assessed to determine if the vegetation with the Survey Area constitutes foraging habitat, and to qualify its value for Black Cockatoos. Foraging scores were calculated using the forage score tool outlined within DAWE (2022).

The flora species identified within the Survey Area from on-site habitat assessment and recent vegetation mapping by Mattiske (Mattiske 2024) were compared with known foraging species (Valentine and Stock 2008). As part of the foraging assessment, the ground below known food plants and trees was searched for any evidence of Black Cockatoo foraging residue such as Marri and Jarrah chewed seed pods, chewed Banksia cones and foliage clippings.

The DAWE (2022) foraging quality scoring tool is based on a set of site attributes:

– Foraging potential

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– Connectivity
– Proximity to breeding and roosting
– Habitat health/disease presence
– Appraisal comments to explain and justify score.

As presented in the DAWE (2022) guidelines, the following criteria were applied to calculate the foraging quality score of the fauna habitat present:

– Starting score of 10 (native vegetation greater than 1 hectare
– Foraging potential (-2 where no evidence of foraging)
– Connectivity (-2 where no other foraging habitat within 12 km)
– Proximity to breeding (-2 where site is greater than 12 km form breeding habitat)
– Proximity to roosting (-1 where site is greater than 20 km form roosting habitat)
– Impacts from plant disease (-1 where dieback is present in site)
– Total score calculated, adjusted and justified by appraisal statement.

The location and extent of plant species suitable for Black Cockatoo species foraging habitat was identified and mapped for the Survey Area, based on the vegetation assemblages and fauna habitat types, and presence/absence of known foraging species. During the field survey any Black Cockatoo foraging activity (actual or evidence) was recorded via GPS. Vegetation and foraging data were used to calculate foraging quality score for all fauna habitat types across the Survey Area as detailed in DAWE (2022).

The foraging score tool and field data collected and associated forage score calculations are summarised in Appendix B.

Roosting habitat

Night roosting habitat is defined by DAWE (2022) as ‘habitat that contains one, or a group of known or potential roosting trees’. Potential night roosting habitat was assessed based on the presence of suitable tall trees within proximity to water. Roosting habitat was also assessed on evidence of roosting activity i.e. feathers, twig clips and proximity of known local or regional roosting sites available from the desktop assessment.

Opportunistic observations, both visual and aural observations of Black Cockatoos within the Survey Area were noted during the survey.

This data was used to calculate estimates of the amount of breeding habitat, amount and quality of foraging habitat, and extent of night roosting habitat within the Survey Area. This information is presented in Appendix B.

Alcoa Black Cockatoo tree definitions

Suitable Black Cockatoo trees were also identified by four tree types as outlined by Alcoa:

Nest Tree: A tree (live or dead) contains one or more hollows suitable as Black Cockatoo breeding habitat (based on hollow size, shape, and entry angle), which shows evidence of use (chewing/scratching around entrance).

Possible Nest Tree: Trees with suitable nesting hollows present, that show no evidence of use.

Habitat Tree: Trees that have the potential to provide nest hollows in the future. These are primarily Marri trees with DBH ≥ 500 mm. The tree should already be starting to develop a hollow or have a form that is conducive to hollow formation.

Significant Tree: Healthy Jarrah trees with DBH ≥2000 mm or healthy Marri trees with DBH ≥1500 mm.

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2.2.4 Masked Owl assessment

Masked Owls (*Tyto novaehollandiae novaehollandiae*) have previously been recorded in the Survey Area via bird acoustic devices (Song Meter) (GHD 2024a) and are associated with Jarrah-Marri Forest and Woodlands and nearby permanent water bodies.

Potential Masked Owl trees were targeted during the survey. Where trees with owl pellets and scats were identified, the tree was recorded as a potential masked owl tree as owl pellets are hard to identify to species level in the field.

2.2.5 Basic fauna assessment

GHD Zoologists undertook a basic fauna assessment during the survey. The Survey Area was traversed by vehicle and by foot over the entirety of the survey and opportunistic fauna species occurring within the Survey Area were recorded. A species list is provided in Appendix B. All survey methods and effort (transects) are presented in Figure 2, Appendix A.

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3. Results

3.1 Fauna habitats

The main habitat type observed within the Survey Area, is Jarrah-Marri forest with smaller habitats of Bullich (*Eucalyptus megacarpa*) woodlands, Flooded Gum (*E. rudis*) woodlands and Rehabilitation Areas (aged between 12 – 16 years). These fauna habitat types have been described previously in the Terrestrial Fauna Assessment for O'Neil (GHD 2024a). The Survey Areas represents a large continuous tract of forest and woodland with good connectivity.

3.2 Fauna diversity

Through the McCoy Haul Road Pre-clearance assessment, a total number of 55 terrestrial fauna vertebrates were identified. These 55 comprised of 11 mammals, 33 birds and nine reptiles and two frogs. Of the 55 terrestrial fauna species three are introduced; Feral cat, Feral Pig and Laughing Kookaburra (for the full species list refer to Appendix B).

3.3 Significant fauna

In total nine significant fauna species were recorded during the survey period:

- Carnaby's Black Cockatoo (*Zanda latirostris*) listed as Endangered under the WA *Biodiversity Conservation Act 2016* (BC Act) and Australian Government *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- Baudin's Black Cockatoo (*Zanda baudinii*) listed as Endangered under the BC Act and EPBC Act
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under the BC Act and EPBC Act
- Chuditch (*Dasyurus geoffroii*) listed as Vulnerable under the EPBC Act and BC Act
- Quokka (*Setonix brachyurus*) listed as Vulnerable under the EPBC Act and BC Act
- Western Brush Wallaby (*Notamacropus irma*) listed as Priority 4 by the DBCA
- Southwestern Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) listed as Conservation Dependent by the BC Act
- Peregrine Falcon (*Falco peregrinus macropus*) listed as Other Specially protected under the BC Act
- Quenda (*Isoodon fusciventer*) listed as Priority 4 by the DBCA.

3.4 Significant fauna recorded

Carnaby's Black Cockatoo (*Zanda latirostris*)

The Carnaby's Black Cockatoo is listed as Endangered under the EPBC Act and BC Act.

Carnaby's Black Cockatoo is endemic to the south-west of WA from near Cape Arid on the south coast through the eastern Wheat Belt and north to about Kalbarri. Carnaby's Black Cockatoo nest in hollows of live or dead eucalyptus, primarily smooth-barked salmon gum (*Eucalyptus salmonophloia*) and Wandoo (*E. wandoo*) (Saunders 1979, 1982) though breeding has been reported in other Wheatbelt tree species and some tree species on the Swan Coastal Plain and Jarrah forest (Saunders 1979, 1982, Stoor 1991, Johnstone & Store 1998). Success in breeding is dependent on sufficient high quality foraging habitat located in proximity of nesting and is nominally a radius of up to 12 km of nesting sites (Saunders 1979, 1982, Saunders and Ingram 1987).

Carnaby's Black Cockatoo were recorded perched in a tree and by their calls at a handful of locations within the Survey Area. In total six individuals were recorded (Table 4) visually or aurally. A total of five Carnaby's Black Cockatoo foraging observations were made, with one being the residue of *Banksia grandis* and four from *Allocasuarina fraseriana* (Sheoak) residue, Table 5. However foraging evidence is not an indication to population size. All foraging locations and bird sightings are located in Figure 4, Appendix A.

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Table 4 Carnaby's Black Cockatoo observations

Date	Evidence	Latitude	Longitude	No. of individuals
8/03/2024	Heard calling	-32.56522	116.17083	1
8/03/2024	Heard calling	-32.56275	116.16970	2
21/05/2024	Perched in tree	-32.5543	116.2433	3
Total observations				6

Table 5 Carnaby's Black Cockatoo foraging evidence

Date	Evidence	Latitude	Longitude
6/03/2024	Foraging evidence of *Allocasuarina fraseriana*	-32.56148	116.15862
6/03/2024	Foraging evidence of *Allocasuarina fraseriana*	-32.56126	116.15997
6/03/2024	Foraging evidence of *Allocasuarina fraseriana*	-32.56288	116.15709
7/03/2024	Foraging evidence of *Banksia grandis*	-32.55873	116.16214
8/03/2024	Foraging evidence of *Allocasuarina fraseriana*	-32.56422	116.17000

** Note that foraging evidence is not an indication to population size

Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)

The Forest Red-tailed Black Cockatoo is listed as Vulnerable under the EPBC Act and BC Act.

The Forest Red-tailed Black Cockatoo is endemic to the south-west humid and sub-humid zones of WA (Mawson & Johnstone1997). It inhabits the dense Jarrah, Karri (*E. diversicolor*) and Marri forests receiving more than 600 mm of annual average rainfall. The current distribution is north of Perth and east of Mount Helena, Christmas Tree Well, North Banister, Mt Saddleback, Rocky Gully and the Upper King River (Johnstone 1997). More recently the species has been utilising and persisting on the northern portions of the Swan Coastal Plain and is now considered a regular sighting (Johnstone et al., 2017). Habitats in which Forest Red-tailed Black Cockatoos occur are throughout the Northern Jarrah forest and within Marri, Jarrah, Wandoo, Blackbutt, Bullich and Flooded Gum present. This region has a general understory of Bull Banksia (*Banksia grandis*), Snottygobble (*Persoonia longifolia*), Sheoak (*Allocasuarina fraseriana*) and other *Banksia* species with scattered ephemeral areas of relevant species (Johnstone & Kirkby 1999). Forest Red-tailed Black Cockatoo roost in emergent Jarrah-Marri Blackbutt habitat on roadsides, paddocks or forest blocks. While the Forest Red-tailed Black Cockatoo feeds on seeds of other species, around 90% of its diet is made up of seeds from Marri and Jarrah.

Forest Red-tailed Black Cockatoos were readily recorded either by visual, aural observations, foraging residue or feathers. A total of 69 birds were observed during the survey period, either flying, calling or loafing, as shown in Table 6 and mapped on Figure 4, Appendix A.

One form of secondary evidence, a Forest Red-tailed Black Cockatoo Tail feather, was found at another location (Table 6).

A total of 38 Forest Red-tailed foraging observations were made with a total of 30 being Marri nuts (Plate 1) and eight Jarrah nuts, Table 7. However, foraging evidence is not an indication to the size of the population. All foraging locations and bird sightings are located in Figure 4, Appendix A.

Table 6 Forest Red-tailed Black Cockatoo sightings

Date	Evidence	Latitude	Longitude	No. of Individuals
5/03/2024	Heard calling	-32.59285	116.19226	2
5/03/2024	Heard calling	-32.59118	116.19107	1
6/03/2024	Observed flying	-32.54897	116.15845	3
7/03/2024	Heard calling	-32.55725	116.15626	1

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Date	Evidence	Latitude	Longitude	No. of Individuals
7/03/2024	Individuals loafing	-32.56126	116.16475	3
8/03/2024	Observed flying	-32.56360	116.17042	5
8/03/2024	Individual loafing	-32.56273	116.16801	1
8/03/2024	Tail feather	-32.56317	116.16585	1
8/03/2024	Individuals loafing	-32.56377	116.16885	2
21/03/2024	Observed flying	-32.60013	116.18974	2
21/03/2024	Observed flying	-32.60106	116.18990	2
22/03/2024	Heard calling	-32.58526	116.19006	2
22/03/2024	Heard calling	-32.60122	116.19110	2
25/03/2024	Heard calling	-32.55955	116.25169	2
4/04/2024	Flying	-32.59640	116.19420	2
7/05/2024	Heard calling	-32.55178	116.24562	1
7/05/2024	Heard calling	-32.55181	116.24476	1
7/05/2024	Heard calling	-32.55667	116.24033	1
8/05/2024	Heard calling	-32.59389	116.20153	1
8/05/2024	Observed flying	-32.59200	116.19985	5
9/05/2024	Observed flying	-32.58775	116.19033	6
9/05/2024	Heard calling	-32.59475	116.19142	1
9/05/2024	Heard calling	-32.59715	116.19525	1
9/05/2024	Observed foraging	-32.59665	116.19593	4
21/05/2024	Heard calling	-32.55224	116.24489	1
21/05/2024	Heard calling	-32.55256	116.24140	1
21/05/2024	Observed flying	-32.55227	116.24093	4
21/05/2024	Observed foraging	-32.55140	116.24010	3
21/05/2024	Heard calling	-32.55715	116.24070	1
31/05/2024	Heard calling	-32.55230	116.24555	1
5/06/2024	Observed foraging	-32.58765	116.18967	1
5/06/2024	Heard calling	-32.59635	116.19612	1
5/06/2024	Observed flying	-32.59288	116.20118	4
Total observations				69

Table 7 Forest Red-tailed Black Cockatoo foraging evidence

Date	Evidence	Latitude	Longitude
5/03/2024	Foraging residue of Marri nuts	-32.60459	116.19172
5/03/2024	Foraging residue of Marri nuts	-32.60019	116.19010
6/03/2024	Foraging residue of Marri nuts	-32.56434	116.15346
6/03/2024	Foraging residue of Jarrah nuts	-32.56369	116.15375
6/03/2024	Foraging residue of Jarrah nuts	-32.56142	116.15222
6/03/2024	Foraging residue of Jarrah nuts	-32.56622	116.23038
7/03/2024	Foraging residue of Jarrah nuts	-32.55727	116.15630

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Date	Evidence	Latitude	Longitude
8/03/2024	Foraging residue of Marri nuts	-32.58667	116.20605
21/03/2024	Foraging residue of Marri nuts	-32.56184	116.17304
22/03/2024	Foraging residue of Marri nuts	-32.58392	116.18915
22/03/2024	Foraging residue of Marri nuts	-32.55684	116.24330
22/03/2024	Foraging residue of Jarrah nuts	-32.58204	116.21007
25/03/2024	Foraging residue of Marri nuts	-32.55958	116.25197
25/03/2024	Foraging residue of Marri nuts	-32.55845	116.24688
25/03/2024	Foraging residue of Marri nuts	-32.55797	116.24573
25/03/2024	Foraging residue of Marri nuts	-32.56270	116.24936
25/03/2024	Foraging residue of Marri nuts	-32.56224	116.24921
4/04/2024	Foraging residue of Marri nuts	-32.55581	116.24373
4/04/2024	Foraging residue of Marri nuts	-32.56360	116.25391
4/04/2024	Foraging residue of Marri nuts	-32.56083	116.25436
6/05/2024	Foraging residue of Marri nuts	-32.58733	116.20578
8/05/2024	Foraging residue of Marri nuts	-32.58028	116.21426
9/05/2024	Foraging residue of Marri nuts	-32.56364	116.15438
9/05/2024	Foraging residue of Marri nuts	-32.56377	116.15507
9/05/2024	Foraging residue of Marri nuts	-32.56357	116.15557
9/05/2024	Foraging residue of Marri nuts	-32.58744	116.18914
9/05/2024	Foraging residue of Marri nuts	-32.57579	116.22519
21/05/2024	Foraging residue of Marri nuts	-32.55275	116.24504
21/05/2024	Foraging residue of Marri nuts	-32.55135	116.24037
21/05/2024	Foraging residue of Jarrah nuts	-32.55657	116.24059
21/05/2024	Foraging residue of Marri nuts	-32.56000	116.24766
21/05/2024	Foraging residue of Marri nuts	-32.55977	116.24719
21/05/2024	Foraging residue of Jarrah nuts	-32.55981	116.24636
21/05/2024	Foraging residue of Marri nuts	-32.55903	116.24390
21/05/2024	Foraging residue of Jarrah nuts	-32.55965	116.24733
22/05/2024	Foraging residue of Marri nuts	-32.57379	116.21529
4/06/2024	Foraging residue of Marri nuts	-32.56378	116.15484
5/06/2024	Foraging residue of Marri nuts	-32.55761	116.24525
Total observations			38

**Note that foraging evidence is not an indication of population size

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Plate 1 Forest Red-tailed Black Cockatoo foraging on Marri Nuts

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Baudin's Black Cockatoo (*Zanda baudinii*)

The Baudin's Black Cockatoo is listed as Endangered under the EPBC Act and BC Act.

Baudin's Black Cockatoo is endemic to the south-west of WA. The range of Baudin's Black Cockatoo varies considerably between the breeding and non-breeding seasons. During the breeding season (from October to January), the species nests in isolated pockets of the far south-west of WA within Jarrah, Marri and Karri forests which receive an average of 750 mm of rainfall annually. In addition to the south-west there is an isolated patch of known breeding recorded at Perth Hills, east of Armadale (Johnstone & Storr 1998, Johnstone & Kirkby 2008). Breeding generally occurs in woodland or forest but may also occur in former woodland or forest now present as isolated trees withing partially cleared parkland or farmland. Nesting occurs in hollows of live or dead Karri, Marri, Wandoo and Tuart (*Eucalyptus gomphocephala*) trees (DSEWPaC 2012). During the breeding season feeding primarily occurs in native vegetation, particularly Marri (DSEWPaC 2012). The range then expands during the non-breeding season (from February) as flocks disperse to forage more widely, congregating on the central and northern parts of the Darling plateau, as far as Mundaring and Gidgegannup (DSEWPaC 2012; Saunders 1974 & 1979).

Baudin's Black Cockatoos did not have any physical observations (sightings of birds), however there were two observations of foraging residue of Marri nuts at two locations within the Survey Area, Table 8. However, foraging evidence does not give an indication to population size. Both Baudin's Black Cockatoo foraging locations are located in Figure 4, Appendix A.

Table 8 Baudin's Black Cockatoo foraging evidence

Date	Evidence	Latitude	Longitude
21/03/2024	Foraging residue of Marri nuts	-32.55508	116.24083
22/03/2024	Foraging residue of Marri nuts	-32.58615	116.20572

**Note, foraging evidence is not an indication to population size

Chuditch (*Dasyurus geoffroii*)

The Western Quoll or Chuditch is listed as Vulnerable under the BC Act and EPBC Act.

The Chuditch is WA's largest extant carnivorous marsupial and is endemic to the south-west. It has mostly brown fur with distinctive white spots (4 to 7 white spots on its body but not on its tail). The head body length is up to 40 cm and tail to 35 cm long. The Chuditch feeds mostly on large invertebrates. It also eats small lizards, birds and mammals. They are also known to consume the red pulp on Macrozamia seeds, small fruits and part of flowers. They utilise hollow logs or burrows for a den during the day and hunt at night. It is an excellent climber and will hunt for prey arboreally. Historically, Chuditch inhabited a wide range of habitats, but today it survives mostly in Jarrah forests and heathlands of the south-west, and woodlands of the Great Southern (DBCA 2017a).

Chuditch (Plate 2) were recorded readily across the survey area via remote cameras, with a total of 30 camera events having recorded at least 7 individuals (as identified from physical features; spots and scars)., Table 9. The highest concentration of Chuditch were recorded in the patches of bush near the McCoy facility, in areas of burnt and unburnt vegetation, Table 9 and presented in Figure 3, Appendix A.

Physical assessments were conducted on the Chuditch, where camera trap images were analysed as described in section 2.2.1 to identify individuals from the spots or other identifiable characteristics. From this assessment 7 different individuals were identified in the Survey Area. There is a likelihood that more individuals reside in the Survey Area as not all images show identifying features.

Of the seven Chuditch identified, three Chuditch were recorded on multiple cameras during the survey period; Chuditch 3, Chuditch 6 and Chuditch 7. Chuditch 3 was recorded on CAM 20 and CAM Yalgoo (Table 3), which were deployed approximately 800 m apart, Chuditch 6 was recorded on CAM W11 and CAM R57 which were deployed approximately 7 km apart and Chuditch 7 was recorded on CAM Z9 and

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CAM R56 deployed approximately 6km apart (Table 10). This assessment only provides an estimation of Chuditch movement patterns within the Survey Area as the Chuditch would not move in a straight line.

No Chuditch den sites were identified during the field survey. However, due to the cryptic nature, variety and number of den sites a Chuditch uses within their home range, a Chuditch den will only be identified if a Chuditch or strong signs of a Chuditch was observed at the assumed den site.

The results of the spot pattern analysis can be seen in the table in Appendix B. All locations of Chuditch observations are presented in Figure 4, Appendix A.



Plate 2 Chuditch recorded via remote camera.

Table 9 Chuditch observations

Date	Habitat Type	Observation method	Latitude	Longitude	Number of individuals
6/03/2024	Jarrah-Marri Woodland (Burnt Reveg)	Remote camera	-32.54883	116.15943	1
6/03/2024	Jarrah-Marri Woodland (Burnt Reveg)	Remote camera	-32.54883	116.15943	1
7/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.56062	116.15222	1
7/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.56062	116.15221	1
7/03/2024	Jarrah-Marri Woodland	Remote camera	-32.57796	116.21517	1
7/03/2024	Jarrah-Marri Woodland	Remote camera	-32.55617	116.15595	1
7/03/2024	Jarrah-Marri Woodland	Remote camera	-32.55391	116.16165	1
8/03/2024	Jarrah-Marri Woodland (Burnt)	Remote camera	-32.54883	116.15942	1
8/03/2024	Jarrah-Marri Woodland (Burnt)	Remote camera	-32.54884	116.15942	1
9/03/2024	Jarrah-Marri Woodland (Burnt Reveg)	Remote camera	-32.54884	116.15943	1
9/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.55701	116.16400	1
9/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.55700	116.16401	1
9/03/2024	Jarrah-Marri Woodland	Remote camera	-32.55616	116.15594	1
9/03/2024	Jarrah-Marri Woodland	Remote camera	-32.55616	116.15595	1

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Date	Habitat Type	Observation method	Latitude	Longitude	Number of individuals
9/03/2024	Jarrah-Marri Woodland	Remote camera	-32.55390	116.16165	1
10/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.56289	116.16903	1
11/03/2024	Jarrah-Marri Woodland (Burnt)	Remote camera	-32.55700	116.16399	1
11/03/2024	Jarrah-Marri Woodland (Burnt Reveg)	Remote camera	-32.55389	116.16164	1
12/03/2024	Jarrah-Marri Woodland (Burnt)	Remote camera	-32.54883	116.15944	1
12/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.55700	116.16400	1
13/03/2024	Jarrah-Marri Woodland (Burnt)	Remote camera	-32.54883	116.15944	1
14/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.54884	116.15944	1
14/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.55701	116.16398	1
17/03/2024	Jarrah-Marri Woodland	Remote camera	-32.57124	116.22308	1
19/03/2024	Jarrah-Marri Woodland (Burnt)	Remote camera	-32.55701	116.16400	1
19/03/2024	Jarrah-Marri Woodland (Burnt)	Remote camera	-32.55701	116.16401	1
22/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.54882	116.15943	1
24/03/2024	Jarrah-Marri Woodland (Recently Burnt)	Remote camera	-32.54882	116.15944	1
26/05/2024	Jarrah -Marri forest	Remote camera	-32.56311	116.15305	1
6/06/2024	Jarrah -Marri forest	Remote camera	-32.58096	116.21474	1
Total observations					30

** Please note that this is the number of camera events and not number of individuals.

Table 10 Chuditch movements estimations via remote camera placements

Chuditch ID	Remote cameras that recorded known Chuditch		Distance (km)
Chuditch 3	CAM 20	CAM Yalgoo	0.8
Chuditch 6	CAM W11	CAM R57	7
Chuditch 7	CAM Z9	CAM R56	6

Quokka (*Setonix brachyurus*)

The Quokka is listed as Vulnerable under the EPBC Act and BC Act

The current distribution of the mainland Quokka includes areas through the south-west forests from Jarrahdale to Walpole. The mainland Quokka lives in the Darling Range and south-west regions of WA, mostly inhabiting densely vegetated swamps and sometimes tea-tree thickets on sandy soils along creek systems and dense heath on slopes. Mainland Quokkas tend to hide in runs among vegetation during the day and forage along the swamp margins at night (Kitchener 1995).

In the southern forest Quokkas occupy a range of forest, woodland and wetland ecotypes. The most commonly occupied sites comprise of Jarrah, Marri, Red Tingle (*Eucalyptus jacksonii*) or Yellow Tingle (*E. guilfoylei*) forest and riparian habitats with a sedge dominated understory (DEC 2013). Habitat supporting a low density of near-surface fuel, a complex vegetation structure and burn patchiness are the factors favouring Quokka occupancy in the southern forest (DEC 2013). The habitat critical to survival for the south coast subpopulations includes a wider range of vegetation types (floristically and structurally) than in the northern Jarrah forest, including swamps, riparian areas, incised gullies and dense coastal heath (de Tores et al 2007).

A single observation of the Quokka (Plate 3) via remote camera in the mixed Shrub damp land was made, and two observations of scats (Table 11. All Quokka observations are presented in Figure 4, Appendix A.

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Table 11 Quokka observations

Date	Habitat	Observation type	Latitude	Longitude	No. of Observations
6/03/2024	Mixed Shrub dampland	Scats	-32.56473	116.23110	1
22/03/2024	Minor drainage line	Scats	-32.58393	116.19013	1
21/05/2024	Mixed Shrub dampland	Remote camera	-32.56517	116.23142	1
Total Observations					3



Plate 3 Quokka recorded via remote camera

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Plate 4 Quokka Scats found in drainage line

Peregrine Falcon (*Falco peregrinus*)

The Peregrine Falcon is listed as Specially Protected under the BC Act.

The Peregrine Falcon is found on and near cliffs, gorges, timbered watercourses, riverine environments, wetlands, plains, open woodlands and pylons and spires of buildings, though less frequently in desert regions (Morcombe 2004, Pizzey & Knight 2012). They are not common but can be found almost anywhere throughout WA and in the southwest including particular at Fitzgerald River, Stirling Range, Porongurup National Parks, Kondinin and Peak Charles, with many more locations north of Perth (Nevil 2013).

A single observation of a Peregrine Falcon was observed soaring over Jarrah-Marri woodland within the Survey Area. The sighting is presented in Table 12 and presented in Figure 4, Appendix A.

Table 12 Peregrine Falcon observations

Date	Habitat	Observation type	Latitude	Longitude	No. of Individuals
7/03/2024	Jarrah-Marri Woodland	Opportunistic observation	-32.57040	116.22437	1

Southwestern Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*)

The South-west Brush-tailed Phascogale is listed as Conservation Dependent (CD) under the BC Act.

It occurs at low densities in the Northern Jarrah forest with highest densities occurring in the Perup/Kingston area, Collie River valley and near Margaret River and Busselton. This species has been

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observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover. Records are less common from wetter forests. They are most active between dusk and dawn (though emerging later in mid-winter) and forage almost exclusively among the tree canopies. Nest sites include hollow tree limbs, rotten stumps and even bird's nests. Lactating females show a preference for large tree cavities with small entrances. They are opportunistic feeders including invertebrates, nectar, small birds and small mammals (DBCA 2017b).

A single Southwestern Brush-tailed Phascogale (Plate 5) was recorded via remote camera in the Jarrah-Marri woodland along the North East road portion of the Survey Area, Table 13 and Figure 4, Appendix A.

Table 13 Southwestern Brush-tailed Phascogale observations

Date	Habitat	Observation type	Latitude	Longitude	No. of Individuals
10/03/2024	Jarrah-Marri Woodland	Remote Camera	-32.5572	116.2423	1



Plate 5 Southwestern Brush-tailed Phascogale recorded via Remote Camera

Western Brush Wallaby (*Notamacropus irma*)

The Western Brush Wallaby is listed as Priority 4 by the DBCA.

The Western Brush Wallaby occurs widely through the South-west of WA although its former distribution was more extensive, having contracted due habitat loss from historical and ongoing land clearing. It is a medium size macropod with a head body of 900 mm and has distinctive pale stripes on its face with black and white ears and black feet and hands (Van Dyck et al. 2013). Western Brush Wallaby is locally common in dry sclerophyll forest and woodlands in the southwest of WA (Menkhorst & Knight 2011). They are predominantly diurnal, grazing on grasses and forbs.

The Western Brush Wallaby (Plate 6) was recorded via remote camera with a total of 43 camera events showing at least one individual across the Survey Area. Four individuals were opportunistically observed in the field and four observations of fresh scat were recorded. Western Brush Wallaby observations are presented in Table 14 and presented in Figure 4, Appendix A.

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Plate 6 Western Brush Wallaby recorded via remote camera.

Table 14 Western Brush Wallaby observations

Date	Habitat	Observation type	Latitude	Longitude	No. of Individuals
5/03/2024	Jarrah -Marri forest	Remote camera	-32.56313	116.23424	1
7/03/2024	Jarrah -Marri forest	Opportunistic observation	-32.55706	116.16415	1
8/03/2024	Jarrah -Marri forest	Remote camera	-32.56313	116.23425	1
8/03/2024	Jarrah -Marri forest	Remote camera	-32.57351	116.21985	1
8/03/2024	Jarrah -Marri forest	Remote camera	-32.56929	116.22607	1
8/03/2024	Jarrah -Marri forest	Remote camera	-32.56060	116.15220	1
12/03/2024	Jarrah -Marri forest	Remote camera	-32.56313	116.23425	1
12/03/2024	Jarrah -Marri forest	Remote camera	-32.56927	116.22605	1
14/03/2024	Jarrah -Marri forest	Remote camera	-32.55920	116.24657	1
14/03/2024	Jarrah -Marri forest	Remote camera	-32.56313	116.23425	1
15/03/2024	Jarrah -Marri forest	Remote camera	-32.55989	116.25250	1
15/03/2024	Jarrah -Marri forest	Remote camera	-32.56059	116.15221	1
16/03/2024	Jarrah -Marri forest	Remote camera	-32.56807	116.22869	1
16/03/2024	Jarrah -Marri forest	Remote camera	-32.57125	116.22310	1
17/03/2024	Jarrah -Marri forest	Remote camera	-32.56313	116.23424	1
17/03/2024	Jarrah -Marri forest	Remote camera	-32.56059	116.15219	1
18/03/2024	Jarrah -Marri forest	Remote camera	-32.55990	116.25247	1
19/03/2024	Jarrah -Marri forest	Remote camera	-32.55992	116.25245	1
19/03/2024	Jarrah -Marri forest	Remote camera	-32.57350	116.21985	1
19/03/2024	Jarrah -Marri forest	Remote camera	-32.56926	116.22606	1
21/03/2024	Jarrah -Marri forest	Remote camera	-32.55920	116.24658	2

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Date	Habitat	Observation type	Latitude	Longitude	No. of Individuals
21/03/2024	Jarrah -Marri forest	Remote camera	-32.56926	116.22604	1
22/03/2024	Jarrah -Marri forest	Remote camera	-32.55319	116.24635	1
22/03/2024	Jarrah -Marri forest	Opportunistic observation	-32.58608	116.20518	1
22/03/2024	Jarrah -Marri forest	Scats	-32.58663	116.20486	1
22/03/2024	Jarrah -Marri forest	Opportunistic observation	-32.58657	116.20491	1
22/03/2024	Jarrah -Marri forest	Remote camera	-32.54882	116.15944	1
23/03/2024	Jarrah -Marri forest	Remote camera	-32.55992	116.25243	1
25/03/2024	Jarrah -Marri forest	Remote camera	-32.55982	116.16628	1
25/03/2024	Jarrah -Marri forest	Remote camera	-32.57349	116.21986	1
26/03/2024	Jarrah -Marri forest	Opportunistic observation	-32.55480	116.24945	1
4/04/2024	Jarrah -Marri forest	Scats	-32.58287	116.20949	1
6/05/2024	Jarrah -Marri forest	Scats	-32.57154	116.22622	1
8/05/2024	Jarrah -Marri forest	Remote camera	-32.55897	116.24421	1
11/05/2024	Jarrah -Marri forest	Remote camera	-32.55892	116.24420	1
12/05/2024	Jarrah -Marri forest	Remote camera	-32.55965	116.23627	1
12/05/2024	Jarrah -Marri forest	Remote camera	-32.56313	116.15315	1
13/05/2024	Jarrah -Marri forest	Remote camera	-32.56315	116.15315	1
14/05/2024	Jarrah -Marri forest	Remote camera	-32.58937	116.20513	1
14/05/2024	Jarrah -Marri forest	Remote camera	-32.55887	116.24416	1
15/05/2024	Jarrah -Marri forest	Remote camera	-32.58101	116.21471	1
17/05/2024	Jarrah -Marri forest	Remote camera	-32.57687	116.22767	1
21/05/2024	Jarrah -Marri forest	Scats	-32.55393	116.24435	1
21/05/2024	Jarrah -Marri forest	Remote camera	-32.55891	116.24405	1
21/05/2024	Jarrah -Marri forest	Remote camera	-32.57687	116.22767	1
21/05/2024	Jarrah -Marri forest	Remote camera	-32.56315	116.15309	1
22/05/2024	Jarrah -Marri forest	Remote camera	-32.58690	116.20799	1
25/05/2024	Jarrah -Marri forest	Remote camera	-32.57685	116.22766	1
26/05/2024	Jarrah -Marri forest	Remote camera	-32.58977	116.19931	1
26/05/2024	Jarrah -Marri forest	Remote camera	-32.58393	116.21134	1
26/05/2024	Jarrah -Marri forest	Remote camera	-32.58395	116.21137	1
31/05/2024	Jarrah -Marri forest	Remote camera	-32.56307	116.15308	1
2/06/2024	Jarrah -Marri forest	Remote camera	-32.58933	116.20521	1
Total observations					54

Quenda (*Isoodon fusciventer*)

The Quenda is listed as Priority 4 under the BC Act.

The Quenda has patchy distribution through a range of forest, woodland, shrubland and heathland habitats from east of Two People Bay through the Jarrah/Karri forests of lower south-west, and north to Perth region where several local re-introduction programs has successfully re-instated this species to some of its former northern range on the Swan Coastal Plain. Its habitat is generally dense scrubby, often swampy, vegetation with dense cover up to one metre high, often feeds in adjacent forest and woodland that is burnt on a

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regular basis and in areas of pasture and cropland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses (Braithwaite, 1995). Unlike most other marsupials of similar size, this species appears to be quite resilient and able to survive in degraded and semi-developed lands, however it relies on suitable refugia to avoid predators.

The Quenda (Plate 7) was recorded at two locations within the Survey Area via remote camera, with a total of five camera events within the Jarrah-Marri forest. Quenda remote camera observation are presented in Table 15 and Figure 4, Appendix A.



Plate 7 Quenda observed via remote camera

Table 15 Quenda observations

Date	Habitat Type	Observation method	Latitude	Longitude	Number of individuals
8/03/2024	Jarrah -Marri forest	Remote camera	-32.5562	116.156	1
11/05/2024	Jarrah -Marri forest	Remote camera	-32.5631	116.1531	1
12/05/2024	Jarrah -Marri forest	Remote camera	-32.5631	116.1531	1
14/05/2024	Jarrah -Marri forest	Remote camera	-32.5631	116.1531	1
21/05/2024	Jarrah -Marri forest	Remote camera	-32.5631	116.1531	1
Total Observations					5

3.5 Black Cockatoo assessment summary

A summary of the Black Cockatoo breeding, foraging and roosting assessment as defined by Alcoa definitions is presented in Table 16 and Table 17.

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3.5.1 Breeding habitat

From this survey a total of nine trees were identified as potentially suitable nest hollow trees and were assessed by Principal Zoologist, Glen Gaikhorst during a follow up hollow assessment. From Glen's assessment, three trees were identified as Nest Trees and six were identified as Possible Nest Trees, Possible nest trees were classed on the basis of minimal chew marks (potential Black Cockatoo exploratory chews) and if they could not be accessed by drone or pole camera. Several other trees were assessed but were deemed Habitat Trees post assessment.

The Black Cockatoo Assessment is presented in Table 17 and all breeding trees are presented in Figure 4, Appendix A.

3.5.2 Foraging habitat

The Jarrah – Marri forest provides extensive foraging habitat for two Black Cockatoo species (Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo). With confirmed observations of foraging evidence from all three Black Cockatoo species across the Survey Area. Forest Red-tailed Black Cockatoos were the most extensive across the Survey Area with a total of 38 observations of Marri or Jarrah foraging residue (Table 7). Carnaby's Black Cockatoos and Baudin's Black Cockatoos had significantly less observations with only five observations of foraging residue by Carnaby's Black Cockatoos (Table 5) and two observations by Baudin's Black Cockatoos (Table 8).

3.5.3 Roosting habitat

Confirmed roosting habitat for Forest Red-tailed Black Cockatoo was recorded within the Survey Area, via observations of Forest Red-tailed Black Cockatoo tail feathers at roosting trees. Roosting trees were observed in close proximity to the McCoy mine centre, where some Jarrahs were observed to have large amounts of scats, trimmings and feathers, whilst other trees had minimal trimmings and scats. The Black Cockatoo species at other roost sites was unable to be confirmed, as no identifiable tail feathers were found.

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Table 16 Black Cockatoo habitat usage

Habitat usage (DAWE 2022)	Tree type (Alcoa/additional category)	Presence within the Survey Area	Evidence
Foraging habitat	-	Present Marri, Jarrah, Bull Banksia and Sheoak	Present with the Survey Area from Primarily Jarrah nuts and Marri nuts, small amounts of *Banksia grandis* and *Allocasurina fraseriana*
Known roosting Tree	-	Present Marri, Jarrah	21 Roosting trees were identified within the Survey Area via branch trimmings, scats and feathers at the base of large trees.
	Possible nest tree	Present	Six trees were identified within the Survey Area (refer Table 17)
	Nest tree	Present Marri and a Stag	Three known nesting trees were recorded within the Survey Area (refer Table 17)
	Habitat Tree	Present	2826 Habitat Trees were identified. 663 Marri trees, 2049 Jarrah Trees, 44 Blackbutt trees, 24 Bullich trees, 4 flooded gum and 42 Stags
-	Significant Trees	Present Jarrah and Marri	Nine significant trees were recorded. Five Marri and four Jarrah trees, An extra Jarrah tree which just falls out of the significant tree criteria was also recorded (refer Table 18)

Legend (DAWE 2022)

Foraging habitat: Plant species known to support foraging within the species' range.

Known roosting tree: A tree (usually tallest) or any species usually in close proximity to freshwater that is confirmed to be used for night roosting either via cockatoo presence or strong evidence of roosting.

Potential roost tree: Tall tree of any species, usually in close proximity to a freshwater water source.

Alcoa Black Cockatoo Tree usage terminology

Nest Tree: A tree (live or dead) containing one or more hollows suitable as Black Cockatoo breeding habitat (based on hollow size, shape, and entry angle), which shows evidence of use (chewing/scratching around entrance).

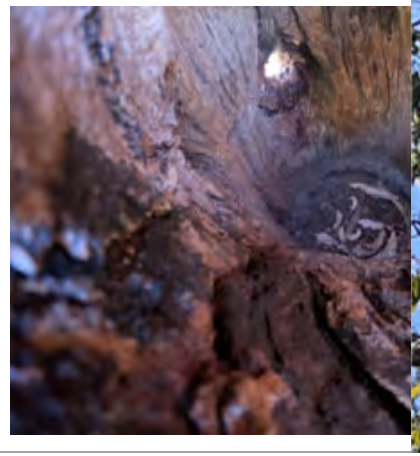
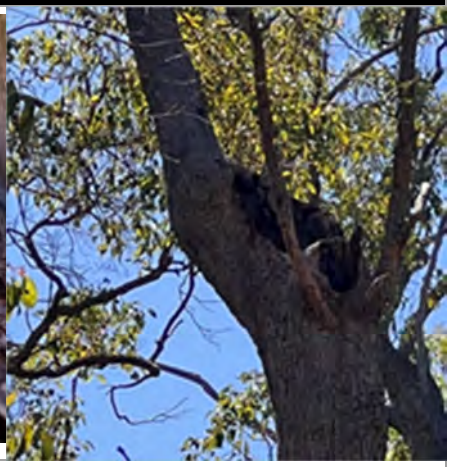
Possible Nest Tree: Trees with suitable nesting hollows present, that show no evidence.

Habitat Tree: Trees on a haul road alignment that have the potential to provide nest hollows in the future. These are primarily Marri trees with DBH ≥500mm. The tree should already be starting to develop a hollow or have a form that is conducive to hollow formation.

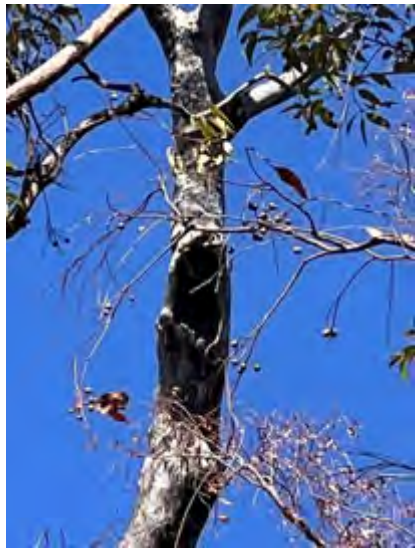
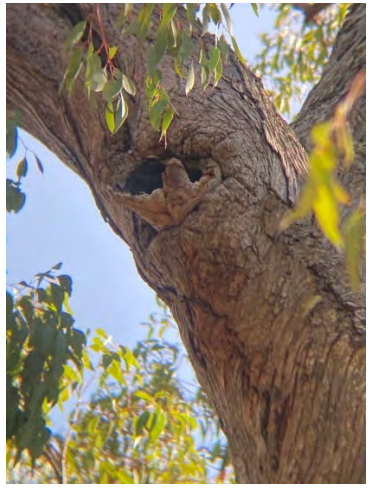
Significant Tree: Healthy Jarrah trees with DBH≥2000mm or healthy Marri trees with DBH≥1500mm

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Table 17 Black Cockatoo hollow assessment

Tree Species	Latitude	Longitude	Tree DBH (mm)	Alcoa Tree Definition	Glen Gaikhorst comments	Photo
Marri (*Corymbia calophylla*)	-32.5863	116.2043	700	Nest Tree	Well, used hollow, extensive chews on the hollow entrance with well defined nest chamber.	 
Marri (*Corymbia calophylla*)	-32.587	116.2075	930	Nest Tree	Extensive chews on outer hollow. Hollow too tall for pole camera.	

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Tree Species	Latitude	Longitude	Tree DBH (mm)	Alcoa Tree Definition	Glen Gaikhorst comments	Photo
Stag	-32.5852	116.2075	1600	Nest Tree	Extensive chews on outer hollow. Hollow too tall for pole camera.	
Jarrah (*Eucalyptus marginata*)	-32.592015	116.199922	910	Possible Nest Tree	Hollow too high for pole camera and branches in front for drone. Ground assessment via zoom lens. Appears to have minimal chews on the upper left and lower right rim. Assessment is a likely BC hollow.	 

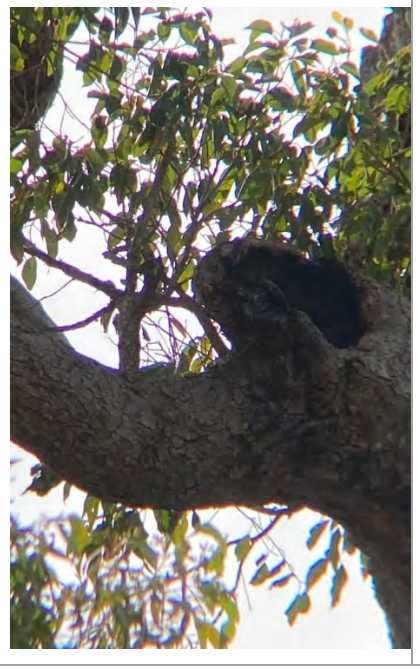
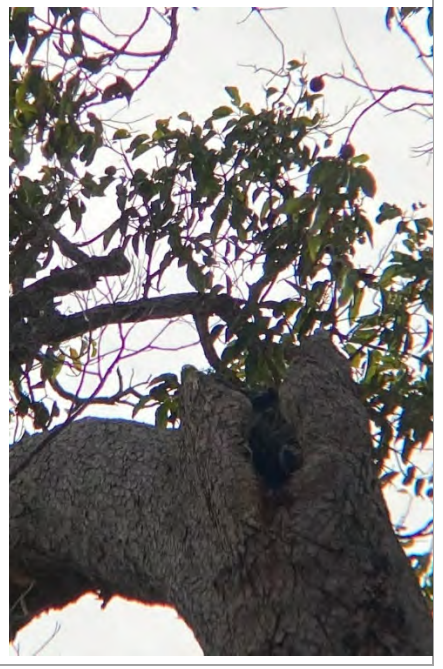
This Technical Memorandum is provided as an interim output under our agreement with Alcoa of Australia Limited. It is provided to foster discussion in relation to technical matters associated with the project and should not be relied upon in any way.

Tree Species	Latitude	Longitude	Tree DBH (mm)	Alcoa Tree Definition	Glen Gaikhorst comments	Photo
Marri (*Corymbia calophylla*)	-32.5661	116.2295	1350	Possible nest tree	Small number of chews, on lower right edge. Hollow too tall for pole camera	

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Tree Species	Latitude	Longitude	Tree DBH (mm)	Alcoa Tree Definition	Glen Gaikhorst comments	Photo
Marri (*Corymbia calophylla*)	-32.5839	116.208	1240	Possible nest tree	Minimal older chews present. Hollow too tall for pole camera	
Marri (*Corymbia calophylla*)	-32.5853	116.1906	1000	Possible nest tree	Fresh chews on top left of hollow entrance. Small number of chews Hollow too tall for pole camera.	

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Tree Species	Latitude	Longitude	Tree DBH (mm)	Alcoa Tree Definition	Glen Gaikhorst comments	Photo	
Marri (*Corymbia calophylla*)	-32.583677	116.211043	1410	Possible nest tree	2x Hollows too high for pole camera and branches in front of both hollows for drone. Ground assessment via zoom lens. Appears to have chews on the upper hollow particularly on the bottom rim which has fresh scarring. However this hollow has bees exiting and maybe taken over. Lower hollow is in a side limb top/side entry and also looks to have older chews present. But likely used by BC. Assessment is a likely BC hollow		

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Tree Species	Latitude	Longitude	Tree DBH (mm)	Alcoa Tree Definition	Glen Gaikhorst comments	Photo
Marri (*Corymbia calophylla*)	-32.573211	116.217328	1500	Possible nest tree	Possible Hollow. Ground Assessment only. Hollow too tall for Pole Camera and too windy and branch in front of hollow for drone. Also, Significant tree	

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3.5.4 Significant trees

Nine trees were identified as significant by the Alcoa guidelines stated in Section 2.2.3. These trees comprised of four Jarrah trees with a DBH of 2000mm or greater and five Marri trees with a DBH of 1500 mm or greater (Table 18 and presented in Figure 3, Appendix A).

An extra Jarrah tree was also recorded as it just falls under the 2000 mm DBH criteria to be considered a significant tree and is presented in Table 18.

Table 18 Significant trees

Tree species	DBH (mm)	Notes	Latitude	Longitude
Jarrah (*Eucalyptus marginata*)	2005	Huge tree but burnt out	-32.58011	116.21240
Jarrah (*Eucalyptus marginata*)	2060	Huge jarrah	-32.58261	116.20928
Marri (*Corymbia calophylla*)	1560		-32.59213	116.20174
Marri (*Corymbia calophylla*)	1900	Possible hollow. 2 hollows present, too shallow for BC, potential for future use. Forest Red-tailed Black Cockatoo foraging.	-32.58036	116.21419
Jarrah (*Eucalyptus marginata*)	2000		-32.56328	116.15597
Jarrah (*Eucalyptus marginata*)	2100	Very healthy jarrah, bit burnt.	-32.57220	116.21692
Marri (*Corymbia calophylla*)	1500	Significant tree, possible hollow. too windy and branch in front for drone. Too high for pole camera. (Refer Table 17)	-32.57321	116.21733
Jarrah (*Eucalyptus marginata*)	2600	Tree has 'H' spray painted on tree. Healthy but burnt	-32.57278	116.21809
Marri (*Corymbia calophylla*)	1600	Significant tree. Good tree for bird of prey	-32.55311	116.24168
Jarrah (*Eucalyptus marginata*)	1950	Falls just under significant tree criteria	-32.55996	116.24852

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4. Conclusion

The Survey Area consists of Jarrah-Marri forest as the dominant habitat type, with smaller areas of habitat types including Bullich woodlands, Flooded Gum woodlands and Rehabilitation Areas. The conservation value of the Jarrah-Marri forest is specific to the locally occurring significant fauna species and the type of usage by those species. For example, Jarrah-Marri forest provides extensive foraging habitat for Chuditch and all three Black Cockatoo species as well as roosting and breeding habitat for the three Black Cockatoo species.

All three Black Cockatoo species have been observed utilising the Survey Area. The Forest Red-tailed Black Cockatoo was recorded the most within the Survey Area with the highest number of individuals recorded (sightings) and the most foraging evidence located compared to Carnaby's Cockatoo and Baudin's Cockatoo. Both Baudin's Black Cockatoo and Carnaby's Black Cockatoo had minimal amounts of usage and observation within the Survey Area.

The Survey area contains habitat to support breeding, foraging and roosting for Black Cockatoos. From this survey three trees were identified as known nesting trees, three were identified as priority suitable nesting hollows (nest trees) and three were identified as suitable nesting trees (potential nesting trees). These were recorded and verified by Principal Zoologist, Glen Gaikhorst. Several other trees were identified as potential nesting trees/habitat trees. Nine Significant trees (Jarrah DBH ≥2000 mm, and Marri DBH ≥1500 mm) were recorded within the Survey Area.

In total, nine significant fauna species were recorded including the Carnaby's Black Cockatoo, Baudin's Black Cockatoo, Forest Red-tailed Black Cockatoo, Chuditch, Quokka, South-western Brush-tailed Phascogale, Peregrine Falcon, Western Brush Wallaby and Quenda. Building upon the 14 significant species recorded within the O'Neil and O'Neil East Survey Areas (occurring in the region) with the addition of the Peregrine Falcon, there has been a total of 15 significant fauna species recorded within the region during the surveys.

Chuditch were recorded readily by remote camera with 30 remote camera events with at least 7 individuals identified from physical features (spots and scars). Chuditch were observed in highly disturbed areas from around the mine area and recently burnt areas. These figures represent a variation from the Alcoa O'Neil site, which identified 61 remote camera events, with at least 15 individuals identified based on physical features. No Chuditch dens were identified within the Survey Area, however, a female Chuditch may have an estimated den usage of 110 burrows and 66 logs within her home range of up to 4 km^2 (DBCA, 2012). Therefore, a den could have been observed but not identified as it was not currently in use.

Quokkas had a single observation via Remote camera in the mixed Shrub dampland and two observations were scats. These observations are consistent with the Alcoa O'Neil sites as Quokkas were previously recorded in the same mixed shrubland and minor drainage line.

A single observation of the Peregrine Falcon within the McCoy Haul Road alignment was made. This species is rarely observed with the Jarrah Forest of Western Australia as they are in low densities.

A single observation of the Southwestern Brush-tail Phascogale was recorded via a remote camera. Low numbers of Southwestern Brush-tailed Phascogale is consistent within the region with only one other individual recorded recently within O'Neil East by GHD (2024).

Western Brush Wallaby were common within the Survey Area with individuals recorded within most of the habitat types. The high numbers of animals are likely attributed to the fox and cat control that is undertaken within the Northern Jarrah forest. Therefore, the population is dependent on management actions undertaken.

Quenda were only recorded at two locations, with a total of five camera events in the Survey Area despite extensive camera trapping effort within the Survey Area. From other projects, GHD has found Quenda

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numbers to be low within the region (GHD 2021a, GHD 2021b, GHD 2024a, GHD 2024b and GHD 2024c). Low number of the Quenda is likely due to extensive prescribed burning to key habitats within the region.

A Carter's Freshwater Mussel assessment was not conducted during this Survey as the two ephemeral streams within the Survey Area did not contain any water and were unable to support Carter's Freshwater Mussel. A Carter's Freshwater Mussel Assessment would need to be conducted post-significant rain and the streams need to contain sufficient water.

References

Braithwaite, RW 1995, *Southern Brown Bandicoot*. In R. Strahan (Ed.) The Mammals of Australia. Australian Museum and Reed Books. Chatswood, NSW.

Department of Agriculture Water and Energy (DAWE) 2022. Referral guidelines for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo. Department of Agriculture, Water and the Environment, Canberra.

Department of Biodiversity, Conservation and Attractions (DBCA) 2012, '*Fauna profiles – Chuditch Dasyurus geoffroii*, retrieved from http://www.dbca.wa.gov.au

Department of Biodiversity, Conservation and Attractions (DBCA) 2017a, '*Fauna profiles – Chuditch Dasyurus geoffroii',* retrieved from http://www.dbca.wa.gov.au

Department of Biodiversity, Conservation and Attractions (DBCA) 2017b, '*Fauna profiles – Brush-tailed Phascogale',* retrieved **http://www.dbca.wa.gov.au**

Department of Environment and Conservation (DEC) 2013, *'Quokka Setonix brachyurus Recovery Plan'*, Wildlife Management Program No. 56, Department of Environment and Conservation, Perth, WA.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2012, *'Referral guidelines for three species of Western Australian black cockatoos'*, retrieved from: **http://www.environment.gov.au/epbc/publications/wa-black-cockatoos.html**.

de Tores, P, Hayward, MW, Dillon, MJ & Brazell, RI 2007, 'Review of the distribution, causes for decline and recommendations for management of the quokka, Setonix brachyurus (Macropodidae: Marsupialia), an endemic macropodid marsupial from south-west Western Australia', Conservation Science Western Australia, vol 6(1), pp 13-73.

GHD 2021, Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine – Holyoake Pinjarra Alumina Refinery Revised Proposal. For Alcoa of Australia Limited. Unpublished Report

GHD 2024a, Terrestrial Fauna Survey Assessment, Holyoake Mine Development – O'Neil. For Alcoa of Australia Limited. Unpublished Report.

GHD 2024b, Terrestrial Fauna Survey Assessment, Holyoake Mine Development – O'Neil East. For Alcoa of Australia Limited. Unpublished Report.

GHD 2024c, O'Neil East Targeted Woylie Assessment. For Alcoa of Australia Limited. Unpublished report.

Groom, C 2011, *Plants Used by Carnaby's Black Cockatoo*, Perth, Department of Environment and Conservation.

Hohnen, R, Ashby, J, Tuft, K, & McGregor, H 2012, *'Individual identification of northern quolls (Dasyurus hallacatus) using remote cameras'*, Australian Mammalogy, CSIRO Publishing. http://dx.doi.org/10.1071/AM12015.

Johnstone, RE 1997, 'Current studies on three endemic Western Australian cockatoos', Eclectus, vol 3, pp 34--35.

Johnstone, RE, Kirkby, T & Sarti, K 2017, 'The distribution, status movements and diet of the Forest Red-tailed Black Cockatoo in the south-west with emphasis on the greater Perth regions', Western Australia, Western Australian Naturalist, vol 30 (4), pp 1-193.

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Johnstone, RE & Storr, GM 1998, Handbook of Western Australian Birds. Volume 1: Nonpasserines (Emu to Dollarbird), Western Australian Museum, Perth.

Johnstone, RE & Kirkby, T 1999, '*Food of the Forest Red-tailed Black Cockatoo Calyptorhynchus banksii naso in south-west Western Australia', Western Australian Naturalist*, vol 22, pp 167-177.

Johnstone, RE, Kirkby, T & Sarti, K 2017, 'The distribution, status movements and diet of the Forest Red-tailed Black Cockatoo in the south-west with emphasis on the greater Perth regions', Western Australia, Western Australian Naturalist, vol 30 (4), pp 1-193.

Kitchener, DJ 1995, '*Quokka*', In R. Strahan (Ed.) The Mammals of Australia, Australian

Klunzinger, MK, Beatty, SJ, Morgan, DL, & Lymbery, AJ 2012, 'Distribution of Westralunio carteri Iredale, 1934 (Bivalvia: Unionoida: Hyriidae) on the south coast of south-western Australia, including new records of the species', Journal of the Royal Society of Western Australia, vol 95, pp 77-81.

Nevill, SJ 2013, *Birds of Western Australia,* Simon Nevill Publications, Perth, Western Australia.

Main Roads Western Australia (Main Roads). 2023. *Environmental Factsheet: Technical Guidance Protecting Black Cockatoos – Baudin's Cockatoo, Carnaby's Cockatoo and Forest Red-tailed Cockatoo*.

Menkhorst, P & Knight, F 2011, *A Field Guide to Mammals of Australia*, third edition, South Melbourne, Australia, Oxford University Press.

Morcombe, M 2014, *Field Guide to Australian Birds,* Steve Parish Publishing, Archerfield, Queensland.

Pizzey, G & Knight, F 2012, *The Field Guide to the Birds of Australia,* Harper Collins Publishers, Sydney, Australia.

Saunders, DA 1979, '*Distribution and Taxonomy of the White-tailed and Yellow-tailed Black-Cockatoos Calyptorhynchus spp'*, Emu, vol 79, pp 215--227.

Saunders, DA 1982, 'The breeding behaviour of the short-billed form of the White-tailed Black Cockatoo Calyptorhynchus funereus', Ibis, vol 124, pp 422--455.

Saunders, DA and Ingram, JA 1987, '*Factors affecting survival of breeding populations of Carnaby's Cockatoo, Calyptorhynchus latirostris in remnants of native vegetation'*, IN: Saunders, DA, Arnold, GW, Burbidge, AA and Hopkins, AJM, Nature Conservation: the Role of Remnants of Native Vegetation, Surrey Beatty and Sons, Chipping Norton, pp 249-58.

Storr, GM 1991, *Birds of the South-west Division of Western Australia.* Records of the Western Australian Museum, Suppl. 35.

Van Dyck, S., Gynther., I & Baker, A 2013. Field companion to the mammals of Australia. New Holland Publishers, Australia.

Valentine LE and Stock W 2008, *Food Resources of Carnaby's Black-Cockatoo (Calyptorhynchus latirostris) in the Gnangara Sustainability Strategy study area*, unpublished report to the Forests Products Commission. Van Dyck, S., Gynther., I & Baker, A 2013. Field companion to the mammals of Australia. New Holland Publishers, Australia.

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Appendices

Appendix A

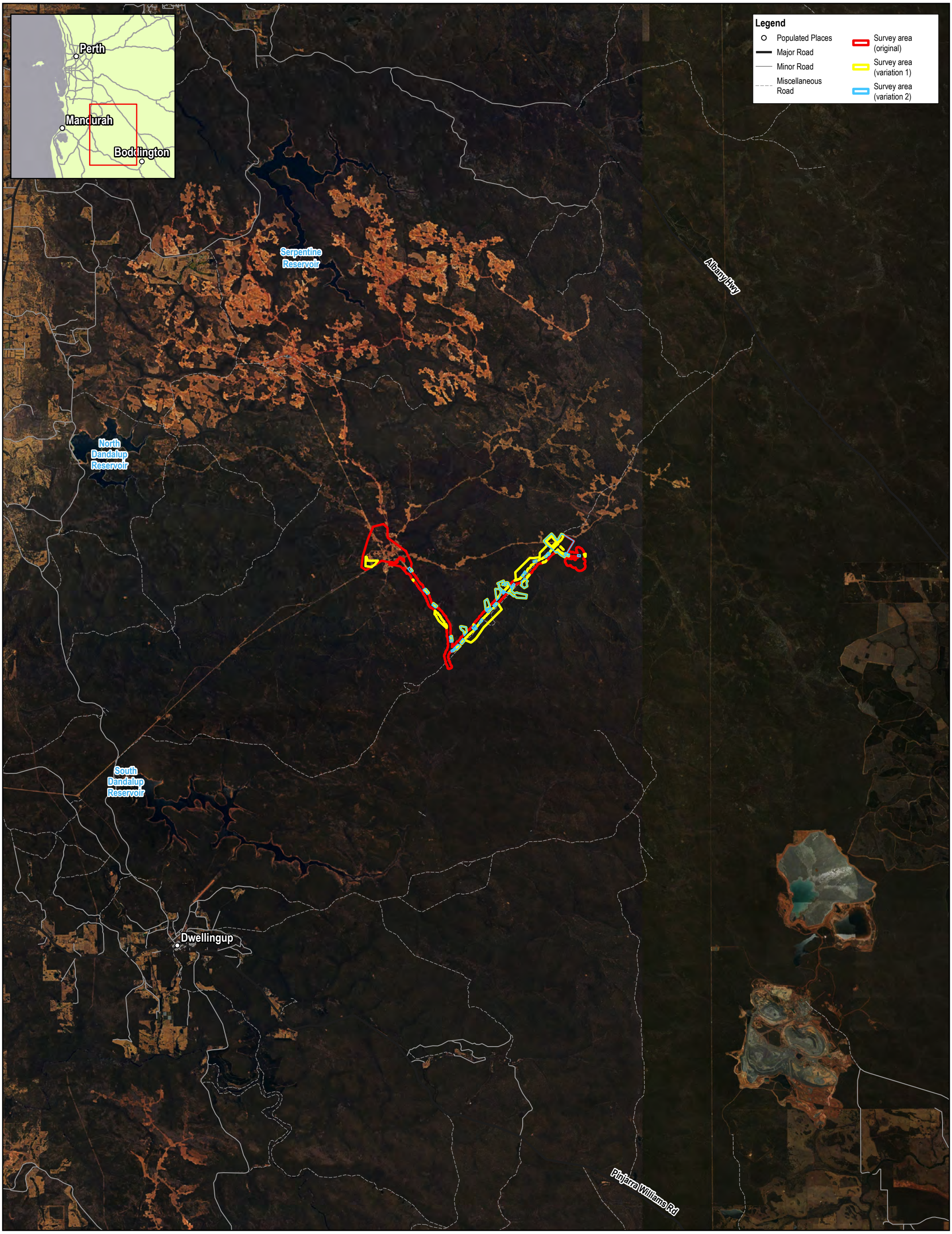
Figures

Figure 1 Survey Area

Figure 2 Survey Effort

Figure 3 Significant Fauna

Figure 4 Significant Trees and Black Cockatoo Nesting Trees



Paper Size ISO A3

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Kilometers

Map Projection: Transverse Mercator
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N

GHD

Alcoa
Holyoake Environmental Assessments

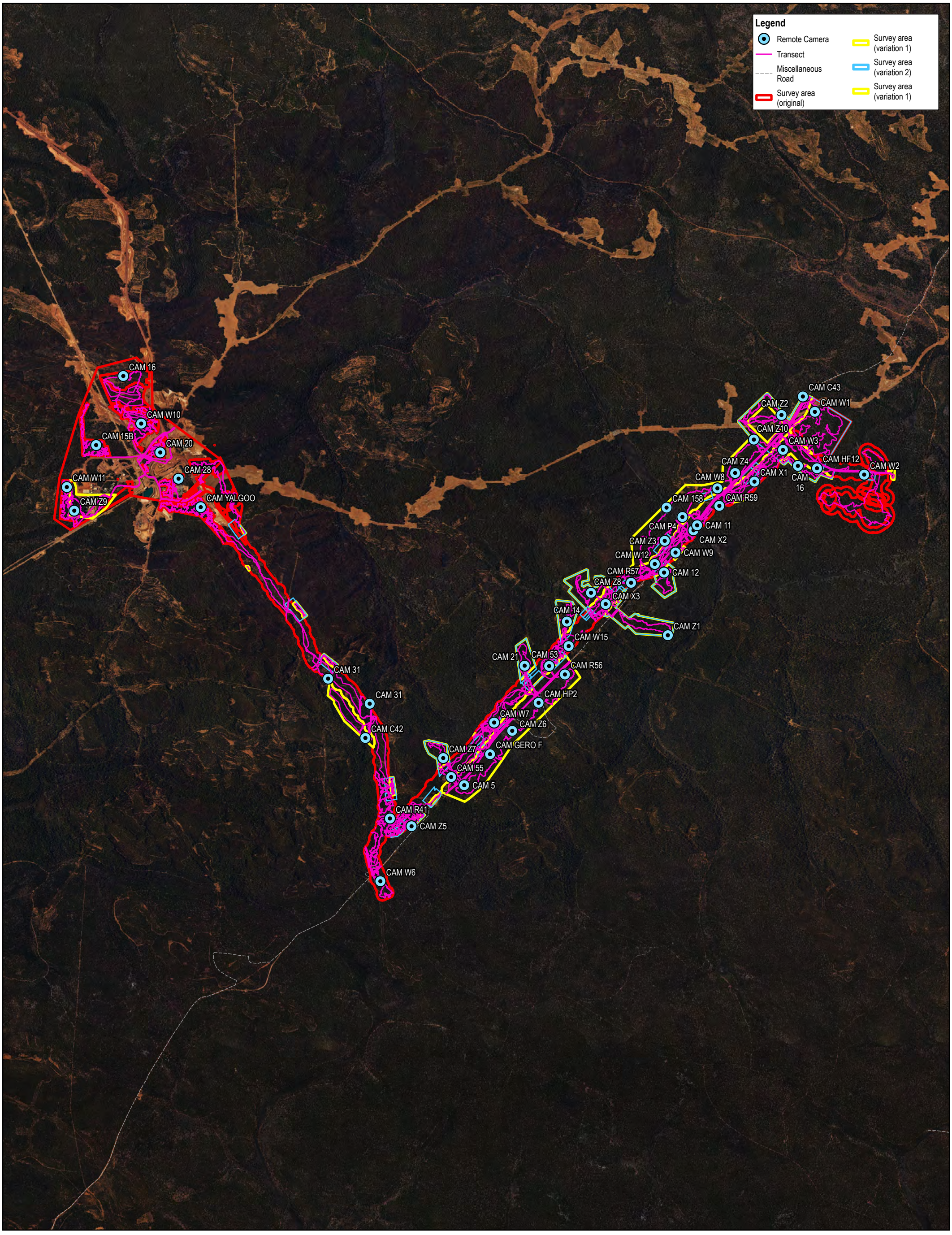
Project location

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Revision No. **D**
Date **02/07/2024**

FIGURE 1

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GHD

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Holyoake Environmental Assessments

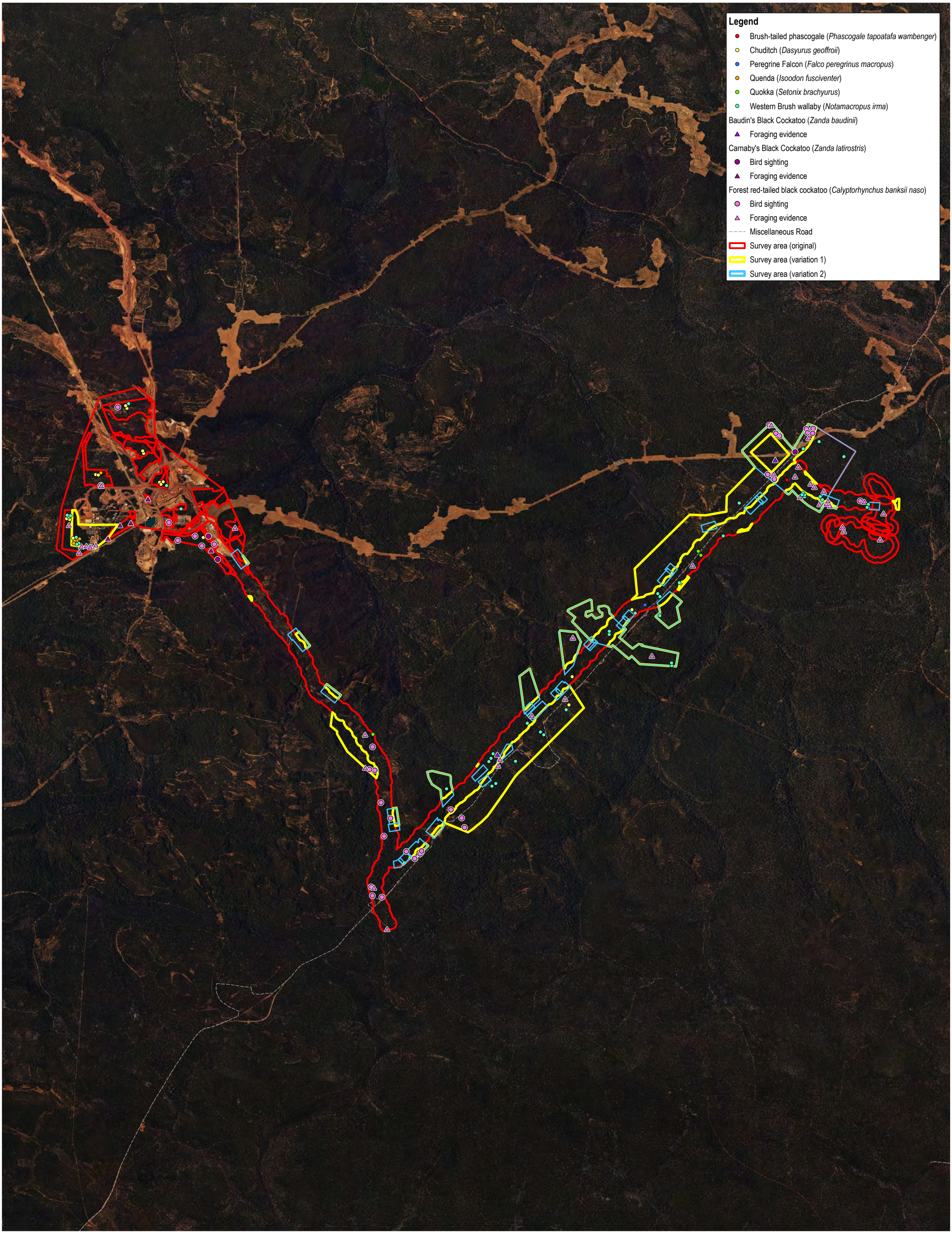
Survey effort

Project No. **12565572**
Revision No. **E**
Date **04/07/2024**

FIGURE 2

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GHD

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Holyoake Environmental Assessments

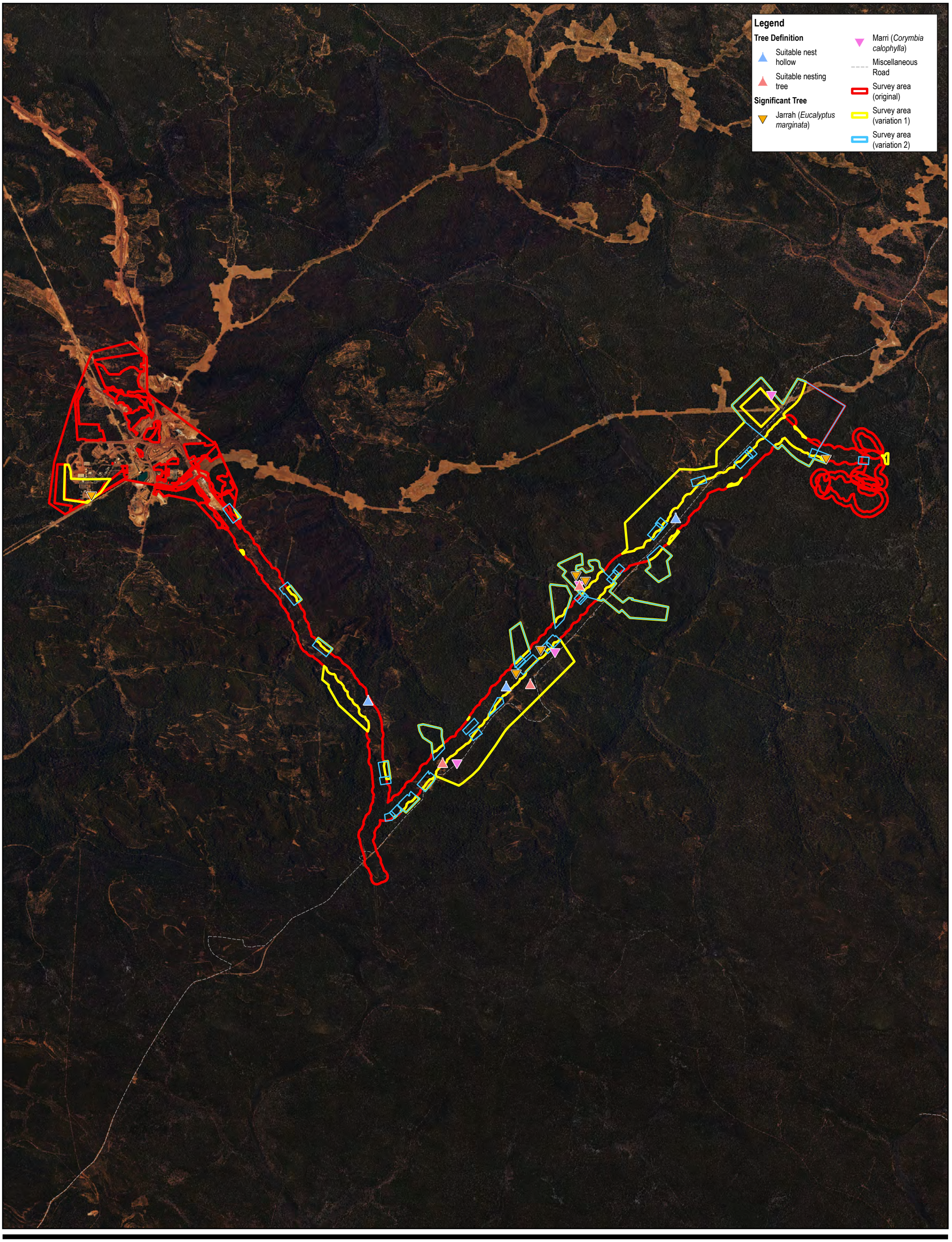
Threatened fauna

Project No. **12565572**
Revision No. **E**
Date **04/07/2024**

FIGURE 3

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Alcoa
Holyoake Environmental Assessments

Project No. **12565572**
Revision No. **E**
Date **02/07/2024**

Nesting trees and significant trees

FIGURE 4

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Appendix B

Field Data

Species List

Family	Scientific Name	Species	EPBC listing	BC Act/DBCA listing	Phase 1	Phase 2
Mammals						
Dasyuridae	*Antechinus flavipes*	Mardo			X	X
Dasyuridae	*Dasyurus geoffroii*	Chuditch	Vu	Vu	X	X
Dasyuridae	*Phascogale tapoatafa wambenger*	South Western Brush-tailed Phascogale		CD	X	
Felidae	*Felis catus*	Feral Cat	Int	Int		X
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo			X	X
Macropodidae	*Notamacropus irma*	Western Brush Wallaby		P4	X	X
Macropodidae	*Setonix brachyurus*	Quokka	Vu	Vu	X	X
Muridae	*Rattus fuscipes*	Bush rat				X
Peramelidae	*Isoodon fusciventer*	Quenda		P4	X	X
Suidae	*Sus scrofa*	Feral Pig	Int	Int	X	X
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna			X	X
Birds						
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill				X
Acanthizidae	*Gergoyne fusca*	Western Gerygone				X
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren			X	X
Acanthizidae	*Smicrornis brevirostris*	Weebill			X	X
Accipitridae	*Accipiter cirrocephals*	Collared Sparrowhawk				X
Accipitridae	*Lophoictinia isura*	Square-tailed Kite			X	
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar			X	
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra		Int	X	X
Artamidae	*Strepera versicolor*	Grey Currawong			X	X
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Vu	Vu	X	X
Cacatuidae	*Eolophus roseicapillus*	Galah			X	
Cacatuidae	*Zanda baudinii*	Baudin's Cockatoo	En	En	X	
Cacatuidae	*Zanda latirostris*	Carnaby's Black Cockatoo			X	X
Casuariidae	*Dromaius novaehollandiae*	Emu			X	
Climacteridae	*Climacteris rufus*	Rufous Tree Creeper				X
Columbidae	*Phaps chalcoptera*	Common Bronzewing			X	X
Corvidae	*Corvus coronoides*	Australian Raven				X
Cuculidae	*Chrysococcyx basalis*	Pallid Cuckoo				X
Falconidae	*Falco peregrinus macropus*	Peregrine Falcon		OS	X	
Maluridae	*Malurus elegans*	Red-winged Fairywren				X
Maluridae	*Malurus splendens*	Splendid Fairywren			X	X

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Family	Scientific Name	Species	EPBC listing	BC Act/DBCA listing	Phase 1	Phase 2
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill			X	
Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler			X	X
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote			X	X
Pardalotidae	*Pardalotus striatus*	Striated Pardalote			X	X
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin			X	X
Psittaculidae	*Barnardius zonarius*	Australian Ringneck Parrot			X	X
Psittaculidae	*Platycercus icterotis*	Western Rosella				X
Psittaculidae	*Purpureicephalus spurius*	Red-capped Parrot				X
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail			X	X
Strigidae	*Ninox boobook*	Southern Boobook			X	
Turnicidae	*Turnix varius*	Painted Button Quail			X	
Zosteropidae	*Zosterops lateralis*	Silverye				X
Reptiles						
Agamidae	*Pogona minor minor*	Western Bearded Dragon			X	
Elapidae	*Pseudonaja affinis*	Dugite			X	X
Scincidae	*Ctenotus labilladieri*	Red-legged Ctenotus				X
Scincidae	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink				X
Scincidae	*Egernia napoleonis*	Napoleon Skink			X	
Scincidae	*Lerista distinguenda*	South-western Orange-tailed Slider			X	
Scincidae	*Menetia greyii*	Common Dwarf Skink				X
Scincidae	*Morethia obscura*	Shrubland Skink				X
Varanidae	*Varanus rosenbergi*	Rosenburg's Monitor			X	X
Frogs						
Limnodynastidae	*Heleioporus eyrei*	Moaning Frog				X
Myobatrachidae	*Crinia pseudinsignifera*	Bleating Froglet				X

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Camera data Phase 1

Family	Scientific Name	Species	EPBC listing	DBCA listing/ BC Act	CAM 16	CAM W3	CAM HF12	CAM 55	CAM R59	CAM 31	CAM W1	CAM W9	CAM 53	CAM W6	CAM 20	CAM 28	CAM R41	CAM X2	CAM Yalgoo
Dasyuridae	*Antechinus flavipes*	Mardo				7	8	3	4	3	7	3	11	1	1	9			7
Dasyuridae	*Dasyurus geoffroii*	Chuditch	Vu	Vu	8										6				1
Dasyuridae	*phascogale tapoatafa wambenger*	South western Brush-tailed Phascogale		CD		1													
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo			1		1	2											
Macropodidae	*Notamacropus irma*	Western Brush Wallaby		P4	1		2		5		1	1				1			
Peramelidae	*Isoodon fusciventer*	Quenda		P4															
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna					2		1										
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren			1	1			1					1	1	4		1	
Acanthizidae	*Smicrornis brevirostris*	Weebill				1													
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar																	
Artamidae	*Strepera versicolor*	Grey Currawong																	
Casuariidae	*Dromaius novaehollandiae*	Emu				1													

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Family	Scientific Name	Species	EPBC listing	DBCA listing/ BC Act	CAM 16	CAM W3	CAM HF12	CAM 55	CAM R59	CAM 31	CAM W1	CAM W9	CAM 53	CAM W6	CAM 20	CAM 28	CAM R41	CAM X2	CAM Yalgoo
Climacteridae	*Climacteris rufus*	Rufous Tree Creeper																	
Maluridae	*Malurus elegans*	Red-winged Fairywren											1	1					
Maluridae	*Malurus splendens*	Splendid Fairywren			6					4								1	
Pardalotidae	*Pardalotus striatus*	Striated Pardalote							1										
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin				1													
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail											2						
Strigidae	*Ninox boobook*	Southern Boobook																	
Turnicidae	*Turnix varius*	Painted Button Quail																	
Agamidae	*Pogona minor minor*	Western Bearded Dragon												1					
Elapidae	*Pseudonaja affinis*	Dugite							1										
Scincidae	*Egernia napoleonis*	Napoleon Skink				1	3						4				1	1	
Scincidae	*Morethia obscura*	Shrubland Skink																	
Varanidae	*Varanus rosenbergi*	Rosenburg's Monitor					1		1		1								

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Family	Scientific Name	Species	EPBC listing	DBCA listing/ BC Act	CAM X3	CAM W7	CAM 15B	CAM X1	CAM 31	CAM W12	CAM W11	CAM R57	CAM W10	CAM W2	CAM 15
Dasyuridae	*Antechinus flavipes*	Mardo			5	1	1	7		7	4				
Dasyuridae	*Dasyurus geoffroii*	Chuditch	Vu	Vu			2				1	1	3		
Dasyuridae	*phascogale tapoatafa wambenger*	South western Brush-tailed Phascogale		CD											
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo					2		1		1			1	
Macropodidae	*Notamacropus irma*	Western Brush Wallaby		P4	3					3	3	1			
Peramelidae	*Isoodon fusciventer*	Quenda		P4			1								
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna				1				3		1			
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren					1							14	2
Acanthizidae	*Smicrornis brevirostris*	Weebill													1
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar								1				5	
Artamidae	*Strepera versicolor*	Grey Currawong				1	4					1		4	
Casuariidae	*Dromaius novaehollandiae*	Emu													
Climacteridae	*Climacteris rufus*	Rufous Tree Creeper					1	1							
Maluridae	*Malurus elegans*	Red-winged Fairywren					1								
Maluridae	*Malurus splendens*	Splendid Fairywren							1	3					
Pardalotidae	*Pardalotus striatus*	Striated Pardalote													3
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin												4	
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail				1					1				
Strigidae	*Ninox boobook*	Southern Boobook								1					
Turnicidae	*Turnix varius*	Painted Button Quail							2						
Agamidae	*Pogona minor minor*	Western Bearded Dragon												5	
Elapidae	*Pseudonaja affinis*	Dugite													1

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Family	Scientific Name	Species	EPBC listing	DBCA listing/ BC Act	CAM X3	CAM W7	CAM 15B	CAM X1	CAM 31	CAM W12	CAM W11	CAM R57	CAM W10	CAM W2	CAM 15
Scincidae	*Egernia napoleonis*	Napoleon Skink			1			4		2					
Scincidae	*Morethia obscura*	Shrubland Skink												2	
Varanidae	*Varanus rosenbergi*	Rosenburg's Monitor							1	1		5			

Camera data Phase 2

Family	Scientific Name	Species	EPBC listing	DBCA listing/ BC Act	CAM Z1	CAM Z10	CAM Z4	CAM Z8	CAM Z3	CAM 19	CAM 11	CAM W8	CAM P4	CAM Z2	CAM Z7	CAM 15b	CAM 12	CAM 21	CAM 17/Gero F
Dasyuridae	*Antechinus flavipes*	Mardo				10	4	1	3	6	1	7	7	2	1	1			3
Dasyuridae	*Dasyurus geoffroii*	Chuditch	Vu	Vu															
Felidae	*Felis catus*	Feral Cat	Int	Int			1							1					
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo						1	1	1				2	1				
Macropodidae	*Notamacropus irma*	Western Brush Wallaby		P4	3		1								1				2
Macropodidae	*Setonix brachyurus*	Quokka	Vu	Vu							1								
Muridae	*Rattus fuscipes*	Bush rat																	
Peramelidae	*Isoodon fusciventer*	Quenda		P4															
Suidae	*Sus scrofa*	Feral Pig	Int	Int							1								
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna			1			1	1	1		1	2			1			
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill																	

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Family	Scientific Name	Species	EPBC listing	DBCA listing/ BC Act	CAM Z1	CAM Z10	CAM Z4	CAM Z8	CAM Z3	CAM 19	CAM 11	CAM W8	CAM P4	CAM Z2	CAM Z7	CAM 15b	CAM 12	CAM 21	CAM 17/Gero F
Acanthizidae	*Gergoyne fusca*	Western Gerygone				1													
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren							1										
Artamidae	*Strepera versicolor*	Grey Currawong			1					1									
Climacteridae	*Climacteris rufus*	Rufous Tree Creeper																	
Columbidae	*Phaps chalcoptera*	Common Bronzewing						1					1						
Cuculidae	*Chrysococcyx basalis*	Pallid Cuckoo														1			
Maluridae	*Malurus elegans*	Red-winged Fairywren														1			
Maluridae	*Malurus splendens*	Splendid Fairywren									1		6			1			
Neosittidae	*Pachycephala pectoralis*	Golden Whistler				1			1										
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin						1											
Psittaculidae	*Platycercus icterotis*	Western Rosella											2						
Psittaculidae	*Purpureicephalus spurius*	Red-capped Parrot																	
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail																	
Scincidae	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink																	

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Family	Scientific Name	Species	EPBC listing	DBCA listing/ BC Act	CAM 16	CAM 5	CAM Z6	CAM14	CAM Z9	CAM C42	CAM Z5	CAM HP2	CAM R56
Dasyuridae	*Antechinus flavipes*	Mardo			4			1	2		12		4
Dasyuridae	*Dasyurus geoffroii*	Chuditch	Vu	Vu					1				1
Felidae	*Felis catus*	Feral Cat	Int	Int									
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo			1				1				
Macropodidae	*Notamacropus irma*	Western Brush Wallaby		P4	4		1		4			2	1
Macropodidae	*Setonix brachyurus*	Quokka	Vu	Vu									
Muridae	*Rattus fuscipes*	Bush rat											1
Peramelidae	*Isoodon fusciventer*	Quenda		P4					4				
Suidae	*Sus scrofa*	Feral Pig	Int	Int									
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna									1		1
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill									1		
Acanthizidae	*Gergoyne fusca*	Western Gerygone											
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren											
Artamidae	*Strepera versicolor*	Grey Currawong											1
Climacteridae	*Climacteris rufus*	Rufous Tree Creeper					1				6		1

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Family	Scientific Name	Species	EPBC listing	DBCA listing/ BC Act	CAM 16	CAM 5	CAM Z6	CAM14	CAM Z9	CAM C42	CAM Z5	CAM HP2	CAM R56
Columbidae	*Phaps chalcoptera*	Common Bronzewing								1			
Cuculidae	*Chrysococcyx basalis*	Pallid Cuckoo											
Maluridae	*Malurus elegans*	Red-winged Fairywren											
Maluridae	*Malurus splendens*	Splendid Fairywren											1
Neosittidae	*Pachycephala pectoralis*	Golden Whistler											
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin					1						1
Psittaculidae	*Platycercus icterotis*	Western Rosella											
Psittaculidae	*Purpureicephalus spurius*	Red-capped Parrot									1		
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail											1
Scincidae	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink									1		

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Black Cockatoo foraging assessment- Forest Red Tailed Black Cockatoos

Date	Evidence	Latitude	Longitude
5/03/2024	Foraging residue of Marri nuts	-32.60459	116.19172
5/03/2024	Foraging residue of Marri nuts	-32.60019	116.19010
6/03/2024	Foraging residue of Marri nuts	-32.56434	116.15346
8/03/2024	Foraging residue of Marri nuts	-32.58667	116.20605
21/03/2024	Foraging residue of Marri nuts	-32.56184	116.17304
22/03/2024	Foraging residue of Marri nuts	-32.58392	116.18915
22/03/2024	Foraging residue of Marri nuts	-32.55684	116.24330
25/03/2024	Foraging residue of Marri nuts	-32.55958	116.25197
25/03/2024	Foraging residue of Marri nuts	-32.55845	116.24688
25/03/2024	Foraging residue of Marri nuts	-32.55797	116.24573
25/03/2024	Foraging residue of Marri nuts	-32.56270	116.24936
25/03/2024	Foraging residue of Marri nuts	-32.56224	116.24921
4/04/2024	Foraging residue of Marri nuts	-32.55581	116.24373
4/04/2024	Foraging residue of Marri nuts	-32.56360	116.25391
4/04/2024	Foraging residue of Marri nuts	-32.56083	116.25436
6/05/2024	Foraging residue of Marri nuts	-32.58733	116.20578
8/05/2024	Foraging residue of Marri nuts	-32.58028	116.21426
9/05/2024	Foraging residue of Marri nuts	-32.56364	116.15438
9/05/2024	Foraging residue of Marri nuts	-32.56377	116.15507
9/05/2024	Foraging residue of Marri nuts	-32.56357	116.15557
9/05/2024	Foraging residue of Marri nuts	-32.58744	116.18914
9/05/2024	Foraging residue of Marri nuts	-32.57579	116.22519
21/05/2024	Foraging residue of Marri nuts	-32.55275	116.24504
21/05/2024	Foraging residue of Marri nuts	-32.55135	116.24037
21/05/2024	Foraging residue of Marri nuts	-32.56000	116.24766
21/05/2024	Foraging residue of Marri nuts	-32.55977	116.24719
21/05/2024	Foraging residue of Marri nuts	-32.55903	116.24390
22/05/2024	Foraging residue of Marri nuts	-32.57379	116.21529
4/06/2024	Foraging residue of Marri nuts	-32.56378	116.15484
5/06/2024	Foraging residue of Marri nuts	-32.55761	116.24525

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Black Cockatoo Direct Observation assessment- Forest Red Tailed Black Cockatoos

Date	Evidence	Latitude	Longitude	No. of Individuals
5/03/2024	Heard calling	-32.59285	116.19226	2

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Date	Evidence	Latitude	Longitude	No. of Individuals
5/03/2024	Heard calling	-32.59118	116.19107	1
6/03/2024	Observed flying	-32.54897	116.15845	3
8/03/2024	Tail feather	-32.56317	116.16585	1
8/03/2024	Individual loafing	-32.56377	116.16885	2
21/03/2024	Observed flying	-32.60013	116.18974	2
21/03/2024	Observed flying	-32.60106	116.18990	2
22/03/2024	Heard calling	-32.60122	116.19110	2
25/03/2024	Heard calling	-32.55955	116.25169	2
4/04/2024	Flying	-32.59640	116.19420	2
7/05/2024	Heard calling	-32.55178	116.24562	1
7/05/2024	Heard calling	-32.55181	116.24476	1
7/05/2024	Heard calling	-32.55667	116.24033	1
8/05/2024	Heard calling	-32.59389	116.20153	1
8/05/2024	Observed flying	-32.59200	116.19985	5
9/05/2024	Observed flying	-32.58775	116.19033	6
9/05/2024	Heard calling	-32.59475	116.19142	1
9/05/2024	Heard calling	-32.59715	116.19525	1
9/05/2024	Observed foraging	-32.59665	116.19593	4
21/05/2024	Heard calling	-32.55224	116.24489	1
21/05/2024	Heard calling	-32.55256	116.24140	1
21/05/2024	Observed flying	-32.55227	116.24093	4
21/05/2024	Observed foraging	-32.55140	116.24010	3
21/05/2024	Heard calling	-32.55715	116.24070	1
5/06/2024	Observed foraging	-32.58765	116.18967	1
5/06/2024	Heard calling	-32.59635	116.19612	1

Black Cockatoo Direct Observation Assessment- Forest Red Tailed Black Cockatoos

Date	Evidence	Latitude	Longitude	No. of Individuals
5/03/2024	Heard calling	-32.59285	116.19226	2
5/03/2024	Heard calling	-32.59118	116.19107	1
6/03/2024	Observed flying	-32.54897	116.15845	3
8/03/2024	Tail feather	-32.56317	116.16585	1
8/03/2024	Individual loafing	-32.56377	116.16885	2
21/03/2024	Observed flying	-32.60013	116.18974	2
21/03/2024	Observed flying	-32.60106	116.18990	2
22/03/2024	Heard calling	-32.60122	116.19110	2
25/03/2024	Heard calling	-32.55955	116.25169	2
4/04/2024	Flying	-32.59640	116.19420	2

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Date	Evidence	Latitude	Longitude	No. of Individuals
7/05/2024	Heard calling	-32.55178	116.24562	1
7/05/2024	Heard calling	-32.55181	116.24476	1
7/05/2024	Heard calling	-32.55667	116.24033	1
8/05/2024	Heard calling	-32.59389	116.20153	1
8/05/2024	Observed flying	-32.59200	116.19985	5
9/05/2024	Observed flying	-32.58775	116.19033	6
9/05/2024	Heard calling	-32.59475	116.19142	1
9/05/2024	Heard calling	-32.59715	116.19525	1
9/05/2024	Observed foraging	-32.59665	116.19593	4
21/05/2024	Heard calling	-32.55224	116.24489	1
21/05/2024	Heard calling	-32.55256	116.24140	1
21/05/2024	Observed flying	-32.55227	116.24093	4
21/05/2024	Observed foraging	-32.55140	116.24010	3
21/05/2024	Heard calling	-32.55715	116.24070	1
5/06/2024	Observed foraging	-32.58765	116.18967	1
5/06/2024	Heard calling	-32.59635	116.19612	1

Black Cockatoo Foraging Assessment- Baudin's Black Cockatoos

Date	Evidence	Latitude	Longitude
21/03/2024	Foraging residue of Marri nuts	-32.55508	116.24083
22/03/2024	Foraging residue of Marri nuts	-32.58615	116.20572

Black Cockatoo Foraging assessment- Carnaby's Black Cockatoos

Date	Evidence	Latitude	Longitude
6/03/2024	Foraging evidence of Sheoak	-32.56148	116.15862
6/03/2024	Foraging evidence of Sheoak	-32.56126	116.15997
6/03/2024	Foraging evidence of Sheoak	-32.56288	116.15709

Black Cockatoo Direct Observation assessment- Carnaby's Black Cockatoos

Date	Evidence	Latitude	Longitude	No. of Individuals
8/03/2024	Heard calling	-32.56522	116.17083	1
8/03/2024	Heard calling	-32.56275	116.16970	2
21/05/2024	Perched in tree	-32.5543	116.2433	3

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Black Cockatoo foraging assessment (DAWE 2022)

Starting score	Carnaby's Cockatoo	Baudin's Cockatoo	Forest Red-tailed Black Cockatoo
10	Start at a score of 10 if your site is native shrubland, Kwongan heathland or woodland, dominated by proteaceous plant species such as Banksia spp. (including Dryandra spp.), Hakea spp. and Grevillea spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas. This tool only applies to sites equal to or larger than 1 hectare in size.
Attribute/score subtraction	Context adjustor (attributes reducing functionality of foraging habitat)		
Foraging potential (-2)	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.
Connectivity (-2)	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.
Proximity to breeding (-2)	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.
Proximity to roosting (-1)	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.
Impact from significant plant disease (-1)	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.
Attribute/score subtraction	Carnaby's Black Cockatoo	Baudin's Black Cockatoo	Forest Red-tailed Black Cockatoo
Starting score	10	10	10
Foraging potential (-2)	0	0	0
Connectivity (-2)	0	0	0
Proximity to breeding (-2)	0	0	0

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Starting score	Carnaby's Cockatoo	Baudin's Cockatoo	Forest Red-tailed Black Cockatoo
Proximity to roosting (-1)	0	0	0
Impact from significant plant disease (-1)	0	0	0
Total score	10	10	10
Appraisal	The Jarrah-marri forest contains suitable foraging habitat for Carnaby's Black Cockatoo however, only limited signs of foraging evidence from Carnaby's Black Cockatoo were recorded within the Survey Area. The habitat has good connectivity with foraging habitat within 12kms of the Survey Area. Previously recorded breeding trees are recorded within the region and three known breeding trees, three suitable nesting hollows and three suitable nesting trees were recorded within the Survey Area. 21 Roosting sites were recorded with the Survey Area with more roosting being recorded within the region. No signs of Phytophthora or Marri canker was observed. Frequent fires have the potential to affect Carnaby's Black Cockatoo.	The Jarrah-marri forest contains suitable foraging habitat for Baudin's Black Cockatoo however, only limited signs of foraging evidence from Baudin's Black Cockatoo were recorded within the Survey Area. The habitat has good connectivity with foraging habitat within 12kms of the Survey Area. Previously recorded breeding trees are recorded within the region and three known breeding trees, three suitable nesting hollows and three suitable nesting trees were recorded within the Survey Area. 21 Roosting sites were recorded with the Survey Area with more roosting being recorded within the region. No signs of Phytophthora or Marri canker was observed. Frequent fires have the potential to affect Baudin's Black Cockatoo.	The Jarrah-marri forest contains suitable foraging habitat with numerous signs of Forest Red-tailed Black Cockatoo foraging evidence on Marri and Jarrah nuts were recorded within the Survey Area. The Survey Area has good connectivity with foraging habitat within 12kms and the greater Jarrah forest. Previously recorded breeding trees are recorded within the region and three known breeding trees, three suitable nesting hollows and three suitable nesting trees were recorded within the Survey Area. 21 Roosting sites were recorded within the Survey Area, however, from the number of Forest Red-tailed Black Cockatoos sighted it is likely there are roosting trees elsewhere in the region. No signs of Phytophthora or Marri canker was observed. Frequent fires have the potential to affect Forest Red-tail Black Cockatoo.

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Chuditch Camera Capture (Dasyurus geoffroii) Physical Assessment data

Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 1	CAM16	Phase 1: 07/03/2024 09/03/2024 10/03/2024 15/03/2024	Three distinct horizontal white spots along left hand front flank, with three distinct vertical white spots at front left leg. Distinct belt of three vertical white spots in the middle of right hand side flank		Chuditch Left Side:  Chuditch Right Side: 

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 2	CAM16	Phase 1: 13/03/2024 14/03/2024 25/03/2024	Definitive white “slash” type marking along front right flank with grouping of four white spots in “square” formation along back right hand side flank.		Chuditch Left Side:  Chuditch Right Side: 
Chuditch 3	CAM20 CAM Yalgoo	Phase 1: 09/03/2024 10/03/2024	Distinctive white scarring on underside of left ear with row of three horizontal spots along left flank. Large bare patch without spots along back right hand side with small row of three horizontal spots along middle of right hand side.		Chuditch Left Side:

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
					 Chuditch Right Side: 

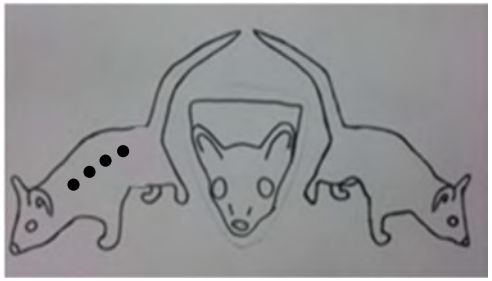
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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 4	CAM20	Phase 1: 09/03/2024	Distinct scarring along snout on right hand side. Blackened tail. Line of three vertical white spots in the middle of right hand side flank. Prominent, large white spot in the middle of left hand side flank.		Chuditch Left Side:  Chuditch Right Side: 

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 5	CAM15B	Phase 1: 09/03/2024	White spot marking on front left ear and distinctive single, large white spot on front left shoulder. Two distinct, large white spots located across right shoulder.		Chuditch Left Side:  Chuditch Right Side: 
Chuditch 6	CAM W11 Cam R57	Phase 1: 08/03/2024 18/03/2024	Distinct scarring behind right ear and distinct, large, single white spot directly behind right ear. Small distinct notch on left ear.		Chuditch Left Side: Chuditch Right Side:

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
					
Chuditch 7	CAM Z9 CAM R56	Phase 2: 27/05/2024	Distinct horizontal row of four spots along left flank		Chuditch Left Side:  Chuditch Right Side:

Reference

Hohnen, R, Ashby, J, Tuft, K, & McGregor, H 2012, *'Individual identification of northern quolls (Dasyurus hallacatus) using remote cameras'*, Australian Mammalogy, CSIRO Publishing. http://dx.doi.org/10.1071/AM12015.

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Document title		McCoy Haul Road Fauna Pre-clearance Survey					
Project number		12565572					
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Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
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S0	Rev A	D. Goldspink	J Collins, G Gaikhorst	On file	J Collins		14/06/24
S3	Rev B	D. Goldspink S. Flemington	S. Flemington	On file			3/07/24
S4	Rev C	D. Goldspink	S. Flemington	On file			4/07/24
S4	Rev 1 FINAL	D. Goldspink	S. Flemington		M Brook		5/07/24
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GHD Pty Ltd | ABN 39 008 488 373
Contact: GHD
999 Hay Street, Level 10
Perth, Western Australia 6000, Australia
T +61 8 6222 8222 | **F** +61 8 6222 8555 | **E** permail@ghd.com | **ghd.com**

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22 May 2024

To	Sarah Boys	**Contact No.**	0432 978 361
Copy to	[Enter text]	**Email**	[Enter text]
From	Dylan Goldspink	**Project No.**	12637107
Project Name	Alcoa Myara Terrestrial Fauna Assessments		
Subject	Myara pre-clearance targeted fauna assessment		

1. Introduction

Alcoa of Australia Limited's (Alcoa) Western Australian (WA) mining operations comprise the Huntly and Willowdale bauxite mines, which are located in Alcoa's Mining Lease 1SA (ML1SA) within the Northern Jarrah Forest (NJF) IBRA subregion.

Alcoa has approval to mine within ML1SA subject to submitting draft five-year mine plans and associated environmental management programmes known as the Mining and Management Program (MMP). The MMP is submitted to the State's Mining and Management Program Liaison Group (MMPLG) on an annual basis. Areas which are approved for clearing via this process are included in Forest Clearance Advice (FCA) which are approved as clearance envelopes.

1.1 Purpose of this Memorandum

The Purpose of the memorandum is to summarise the methodology and the survey results of the targeted pre-clearance assessment for Myara site.

1.2 Survey Areas

The Survey Areas (labelled 1 to 5 from East to West) are located in the Huntly Mine area within the Myara Region of the Southwest of Western Australia (WA), Appendix A, Figure 1. The area is approximately 30 kilometres (km) southeast from the township of Jarrahdale in the Peel Region of WA. The Survey Areas are split into two types: a Targeted Fauna Survey (Sites 1 -5) comprising of 185.7 hectares (ha) and a targeted Black Cockatoo Assessment covering 10.3 ha (bordering site 3), as shown on Figure 1, Appendix A.

1.3 Scope and limitations

The Scope of works was as follows:

- Undertake targeted assessment to identify significant fauna constraints focusing on Significant fauna: Chuditch, Woylies and Quokka.
- Targeted Black Cockatoo Assessment, to assess the quality and extent of breeding, roosting and foraging habitat and to identify Black Cockatoo breeding trees and trees of significance.
- Prepare a standalone memorandum which summarises findings (this document)
- Prepare a Technical Report with desktop assessment.
- Prepare a data package of the survey results for the Index of Biodiversity Surveys for Assessments (IBSA) submission. Submitted to Alcoa electronically as part of the reporting package.

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incorporation into other documents. The matters discussed in this memorandum are limited to those specifically detailed in the memorandum and are subject to any limitations or assumptions specially set out.

Accessibility of documents

If this Technical Memorandum is required to be accessible in any other format this can be provided by GHD upon request and at an additional cost if necessary.

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2. Method

2.1 Survey timing and personnel.

The Survey conducted during March – May 2024 and was led by GHD Zoologist Dylan Goldspink and accompanied by Zoologist Melissa Wood. The Hollow assessments was conducted by GHD Principal Zoologist Glen Gaikhorst and Dylan Goldspink. A breakdown of the field assessments is presented in Table 2.1.

Table 2.1 Survey Timing and Personnel

Date	Task	Personnel
Black Cockatoo habitat assessment and Remote camera deployment 08/04/2024 - 12/04/2024	Black Cockatoo Habitat Assessment identifying Black Cockatoo trees of a suitable Diameter at breast height (DBH). Deployment of remote cameras.	Dylan Goldspink Mellisa Wood
Black Cockatoo Hollow Assessment 17/04/2024	Hollow assessment of potential hollows recorded.	Glen Gaikhorst Dylan Goldspink
Camera Collection 13/05/2024 - 14/05/2024	Camera collection	Dylan Goldspink Melissa Wood

2.2 Field survey

2.2.1 Targeted Remote Camera

Targeted remote cameras were deployed within the Survey Areas. A total of 25 Reconyx remote cameras were deployed within all five Survey Areas, with a minimum 400 m apart (dependent on habitat availability). The remote cameras were baited with a combination of sardines, tuna and peanut butter and were deployed to target significant fauna; Chuditch (*Dasyurus geoffroii*), Quokka (*Setonix brachyurus*), Woylies, (*Bettongia penicillate ogilbyi*). For each remote camera deployed, the time and date deployed and collected, as well as the GPS coordinates were recorded and presented in Table 2.2.

Data (images/video) was collected to SD cards and downloaded in office to database. Images were then screened for fauna species present and identified to species level. Where species level could not be achieved then species group, or best determination to highest taxonomic level was made. Species recorded was classified as an event with one event occurring every 24 hours (dusk to dawn) unless individual specimens could be identified (i.e. Chuditch with unique spot arrangement or animal sizes or injury marks). By restricting data to one event every 24 hours assumes some level of independence over each observation event.

All significant and non-significant terrestrial fauna species were identified and added to the species list presented in Appendix B.

Chuditch Camera Capture (*Dasyurus geoffroii*) Physical Assessment data

Spot patterns of Chuditch were examined in detail and used to identify individuals from camera trap photographs. To use these patterns to identify individuals, accurate and proportionate sketches were made of the top of the head, back, left and right sides of individual Chuditch from the photographs taken by the remote cameras. Each sketch aimed to provide a useful summary that strongly aided subsequent recognition of individuals (Hohnen et al 2015). The spot patterns were examined to determine whether the Chuditch in question was new or a previously viewed individual. Often two or more key spot patterns were visible in a photograph of a single side (e.g. one group on the shoulder and one on the haunch). When these key collections of spots could be matched and no area of the coat had con-complementary patterns, it was deemed to be the same individual. Therefore, a clear view of a single side was sufficient to confirm the identify of the individual, if that individual had been previously identified. Only good quality images

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showing two or more clear spot patterns were used for identification and photographs with obscured or blurred patterns were not used (Hohnen et al 2015).

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Table 2.2 Targeted Camera deployment.

Survey Area	Camera	Habitat type	Latitude	Longitude	Date Deployed	Date Collected	Nights deployed
Survey Area 1	CAM Yalgoo	Jarrah -Marri forest	-32.5034	116.1023	8/04/2024	13/05/2024	35
	CAM 28	Jarrah -Marri forest	-32.503	116.1051	8/04/2024	13/05/2024	35
	CAM W1	Jarrah -Marri forest	-32.5003	116.1114	8/04/2024	13/05/2024	35
	CAM 31	Jarrah -Marri forest	-32.5038	116.0985	8/04/2024	13/05/2024	35
	CAM X2	Jarrah -Marri forest	-32.5023	116.1081	8/04/2024	13/05/2024	35
Survey Area 2	CAM W9	Jarrah -Marri forest	-32.4917	116.2054	9/04/2024	13/05/2024	34
	CAM X3	Jarrah -Marri forest	-32.4939	116.2112	9/04/2024	13/05/2024	34
	CAM HF12	Jarrah -Marri forest	-32.498	116.2069	9/04/2024	13/05/2024	34
	CAM R59	Jarrah -Marri forest	-32.4947	116.2071	9/04/2024	14/05/2024	35
	CAM R41	Jarrah -Marri forest	-32.4919	116.2023	9/04/2024	13/05/2024	34
Survey Area 3	CAM X1	Jarrah -Marri forest	-32.472	116.2224	11/04/2024	13/05/2024	32
	CAM W10	Jarrah -Marri forest	-32.4674	116.2231	11/04/2024	13/05/2024	32
	CAM W12	Jarrah -Marri forest	-32.472	116.232	11/04/2024	13/05/2024	32
	Cam W5	Jarrah -Marri forest	-32.4765	116.2294	11/04/2024	13/05/2024	32
	Cam 20	Jarrah -Marri forest	-32.4732	116.2279	11/04/2024	13/05/2024	32
Survey Area 4	CAM W2	Jarrah -Marri forest	-32.4731	116.2544	9/04/2024	14/05/2024	35
	CAM W11	Jarrah -Marri forest	-32.4702	116.2554	9/04/2024	14/05/2024	35
	CAM 16	Jarrah -Marri forest	-32.4742	116.2522	9/04/2024	14/05/2024	35
	CAM W3	Jarrah -Marri forest	-32.4768	116.2564	10/04/2024	14/05/2024	34
	CAM W15	Jarrah -Marri forest	-32.4793	116.2593	10/04/2024	14/05/2024	34
Survey Area 5	CAM 53	Jarrah -Marri forest	-32.4494	116.2532	10/04/2024	14/05/2024	34
	CAM W7	Jarrah -Marri forest	-32.4529	116.2533	10/04/2024	14/05/2024	34

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Survey Area	Camera	Habitat type	Latitude	Longitude	Date Deployed	Date Collected	Nights deployed
	CAM R57	Jarrah -Marri forest	-32.4548	116.2559	10/04/2024	14/05/2024	34
	Cam 55	Jarrah -Marri forest	-32.456	116.2605	10/04/2024	14/05/2024	34
	CAM W6	Jarrah -Marri forest	-32.4602	116.2597	10/04/2024	14/05/2024	34
Total nights							849

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2.2.2 Black Cockatoo assessment

A Black Cockatoo habitat assessment for Baudin's Black Cockatoo (*Zanda baudinii*), Carnaby's Black Cockatoo (*Z. latirostris*), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) was undertaken across the Survey Areas to assess the presence, quality, and extent of foraging and breeding habitat and assess roosting habitat. The assessment involved visual and aural assessment of the Survey Areas, identifying breeding habitat (presence/absence of actual and potential breeding trees), foraging habitat, roosting areas, current species activity and other signs of use by Black Cockatoos. This assessment approach was carried out based on Alcoa habitat definitions and DAWE (2022) Black Cockatoo referral guidelines and used to define breeding, foraging and night roosting habitat.

Breeding habitat

Breeding habitat: Defined by DAWE (2022) as 'habitat that contains known, suitable, or potential nesting trees' for most tree species such as Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), Blackbutt (*E.pilularis*) and Flooded Gum (*E.grandis*), suitable DBH is 500 mm. For Wandoo suitable DBH is 300 mm. On average Carnaby Black Cockatoos are known to nest in hollows with an entrance greater than 20 cm (Johnstone & Storr 1998, Groom 2011). While the Forest Red-tailed Black Cockatoo is known to nest in hollows with an entrance greater than 12 cm (Johnstone & Storr 1998). Therefore, hollow suitability was assessed in consideration of these hollow requirements.

Breeding habitat was assessed by surveying the entirety of the Myara Survey Areas. Breeding habitat was then analysed from the data collected from the field surveys. For each potential nesting tree, details of the tree location, species, DBH, size and numbers of hollows observed, evidence of use and any other significant observations were recorded. All identified potential nesting tree were further checked visually using binoculars for suitable nest hollows. Data collected was used to score tree hollows based on DAWE (2022) and Alcoa definitions (see Table 3.5).

Where trees were recorded to have suitable large hollows that could be used or had signs of being used (potential or likely), trees were revisited by Glen Gaikhorst (Principal Zoologist) where the hollows were checked for Black Cockatoo use by using a drone, pole camera and/or telephoto lens.

Foraging habitat

Foraging habitat: Defined by DAWE (2022) as 'Plant species known to support foraging within the range of cockatoo species. Foraging habitat was assessed to determine if the vegetation within the Survey Area constitutes foraging habitat, and to qualify its value for Black Cockatoos. Foraging scores were calculated using the forage score tool outlined within the DAWE (2022) referral guidelines.

As part of the foraging assessment, the ground below known food plants and trees present was searched for any evidence of Black Cockatoo foraging residue such as chewed seed pods, cones and foliage.

The DAWE foraging quality scoring tool is based on a set of site and context attributes:

– Foraging potential
– Connectivity
– Proximity to breeding and roosting.
– Habitat health/disease presence
– Appraisal comments to explain and justify score.

Giving consideration to the above DAWE (2022) referral guidelines, the scoring approach was applied, based on the scope of works requirements, and to account for the composition of regrowth vegetation and corresponding low density of foraging plant species within habitats present. To provide an accurate assessment of Black Cockatoo foraging habitat quality, the following criteria were applied to calculate the foraging quality score of the fauna habitat present:

– Starting score of 10 (native vegetation greater than 1 hectare

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– Foraging potential (-2 where no evidence of foraging)
– Connectivity (-2 where no other foraging habitat within 12km)
– Proximity to breeding (-2 where site is greater than 12 km form breeding habitat)
– Proximity to roosting (-1 where site is greater than 20 km form roosting habitat)
– Impacts from plant disease (-1 where dieback is present in site)
– Total score calculated, adjusted and justified by appraisal statement.

The location and extent of plant species suitable for Black Cockatoo Species foraging habitat was identified and mapped for the Survey Areas, based on the vegetation assemblages and fauna habitat types, and presence/absence of known foraging species. During the field survey any Black Cockatoo foraging activity (actual or evidence) was recorded via GPS. Vegetation and foraging data were used to calculate foraging Quality score for all fauna habitat types across the Survey Area as detailed in DAWE (2022).

The foraging score tool and field data collected and associated forage score calculations are summarised in Appendix B.

Roosting habitat

Night roosting habitat: Defined by DAWE (2022) as habitat that contains one, or a group of known or potential roosting trees. Potential night roosting habitat was assessed based on the presence of suitable tall trees within proximity to water. Roosting habitat was also assessed on evidence of roosting activity i.e. feathers, twig clips and proximity of known local or regional roosting sites available from the desktop assessment.

Opportunistic observations, both visual and aural observations of Black Cockatoos within the Survey Areas were noted during the Survey.

This data was used to calculate estimates of the amount of breeding habitat, amount and quality of foraging habitat, and extent of night roosting habitat within the Survey Areas. This information is presented in Appendix B.

Alcoa Black Cockatoo tree definitions

Trees were also identified by four tree types outlined by Alcoa.

Nest Tree: A tree (live or dead) contains one or more hollows suitable as, Black Cockatoo breeding habitat (based on hollow size, shape, and entry angle), which shows evidence of use (chewing/scratching around entrance).

Possible Nest Tree: Trees with suitable nesting hollows present, that show no evidence of use.

Habitat Tree: Trees that have the potential to provide nest hollows in the future. These are primarily marri trees with DBH ≥ 500mm. The tree should already be starting to develop a hollow or have a form that is conducive to hollow formation.

Significant Tree: Healthy Jarrah trees with DBH ≥2000mm or healthy Marri trees with DBH ≥1500mm.

2.2.3 Basic fauna assessment

A GHD Zoologist undertook a basic fauna assessment during the Survey. The Survey Areas was traversed by vehicle and by foot over the entirety and opportunistic fauna species were recorded within the Survey Area (Appendix B). All survey methods and effort are presented in Figure 2.

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3. Results

3.1 Fauna habitats

The most extensive habitat identified within all five Survey Areas was Jarrah-Marri forest. Habitat dominated by Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) forest with a mixed understory open to scattered to patchy Sheoak (*Allocasuarina fraseriana*), Bull Banksia (*Banksia grandis*) and Myrtaceous shrubs over *Persoonia, Xanthorrhoea, Macrozamia* and diverse low shrub layer. Soils are orange-brown lateritic sandy clay with pea gravel. The Survey Areas represent a large continuous tract of forest and woodland with good connectivity.

3.2 Fauna diversity

Through the Myara Pre-clearance assessment, 34 terrestrial fauna vertebrates were identified comprising nine mammals, 21 Birds and four Reptiles. Of the nine mammal species, two are introduced (for full species list refer to Appendix B).

3.3 Significant fauna

In total five significant fauna species were recorded. One of the targeted significant fauna species was recorded within the Survey Areas and an additional four significant fauna species were recorded:

Targeted fauna species recorded include:

– Chuditch (*Dasyurus geoffroii*) listed as Vulnerable under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) and *Biodiversity Conservation Act 2016* (BC Act).

Non-targeted significant fauna recorded include:

– Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under the BC Act and EPBC Act
– Western Brush Wallaby (*Notamacropus irma*) listed as Priority 4 by the DBCA
– Southwestern Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) listed as Conservation Dependent by the BC Act.
– Quenda (*Isoodon fusciventer*) listed as Priority 4 by the DBCA

3.4 Significant fauna recorded

Chuditch (*Dasyurus geoffroii*)

The Western Quoll or Chuditch is listed as Vulnerable under the BC Act and EPBC Act.

The Chuditch is WA's largest extant carnivorous marsupial and is endemic to the south-west. It has mostly brown fur with distinctive white spots (4 to 7 white spots on its body but not on its tail). The head body length is up to 40cm and tail to 35 cm long. The Chuditch feeds mostly on large invertebrates. It also easts small lizards, birds and mammals. They are also known to consume the red pulp on Zamia seeds, small fruits and part of flowers. They utilise hollow logs or burrows for a den during the day and hunt at night. It is an excellent climber and will hunt for prey arboreally. Historically, Chuditch inhabited a wide range of habitats, but today it survives mostly in Jarrah forests and heathlands of the south-west, and woodlands of the Great Southern (DBCA 2017).

Chuditch (Plate 3.1) were recorded on 16 remote cameras, in all five Survey Areas within the Jarrah-Marri woodlands (see Appendix A, Figure 3), Chuditch had a total of 66 camera events across all 16 cameras and two observations of Chuditch scats (Plate 3.2) were recorded in Survey Area 2 and Survey Area 3. Physical assessments were conducted on the Chuditch, where camera trap images were analysed as described in section 2.2.1 to identify individuals from there spots or other identifiable characteristics. From this assessment 17 different individuals were identified in the Survey Areas. There is a likelihood that more

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individuals reside in the Survey Areas as not all camera image show identifying features. The results of the spot pattern analysis can be seen in the table in Appendix B.



Plate 3.1 Chuditch recorded via remote camera.

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Plate 3.2 Chuditch Scat recorded in Survey Area 3

Table 3.1 Chuditch observations

Date	Survey Area	Habitat	Observation type	Latitude	Longitude	Number of individuals
8/04/2024	Survey Area 1	Jarrah -Marri forest	Remote Camera	-32.5004	116.1114	1
9/04/2024		Jarrah -Marri forest	Remote Camera	-32.5004	116.1115	1
9/04/2024		Jarrah -Marri forest	Remote Camera	-32.5004	116.1112	1
10/04/2024		Jarrah -Marri forest	Remote Camera	-32.5023	116.1082	1
10/04/2024		Jarrah -Marri forest	Remote Camera	-32.5024	116.1082	1
11/04/2024		Jarrah -Marri forest	Remote Camera	-32.5023	116.1081	1
11/04/2024		Jarrah -Marri forest	Remote Camera	-32.5002	116.1115	1
12/04/2024		Jarrah -Marri forest	Remote Camera	-32.5024	116.1082	1
12/04/2024		Jarrah -Marri forest	Remote Camera	-32.5002	116.1112	1
13/04/2024		Jarrah -Marri forest	Remote Camera	-32.5001	116.1114	1

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Date	Survey Area	Habitat	Observation type	Latitude	Longitude	Number of individuals
14/04/2024		Jarrah -Marri forest	Remote Camera	-32.5001	116.1115	1
15/04/2024		Jarrah -Marri forest	Remote Camera	-32.5001	116.1115	1
16/04/2024		Jarrah -Marri forest	Remote Camera	-32.5023	116.1082	1
16/04/2024		Jarrah -Marri forest	Remote Camera	-32.5002	116.1116	1
17/04/2024		Jarrah -Marri forest	Remote Camera	-32.5035	116.1023	1
18/04/2024		Jarrah -Marri forest	Remote Camera	-32.5003	116.1116	1
20/04/2024		Jarrah -Marri forest	Remote Camera	-32.5034	116.1024	1
22/04/2024		Jarrah -Marri forest	Remote Camera	-32.5034	116.1022	1
5/05/2024		Jarrah -Marri forest	Remote Camera	-32.5023	116.1082	1
9/04/2024	Survey Area 2	Jarrah -Marri forest	Fresh scats	-32.4981	116.2056	
9/04/2024		Jarrah -Marri forest	Remote Camera	-32.4942	116.2111	1
9/04/2024		Jarrah -Marri forest	Remote Camera	-32.4941	116.2113	1
9/04/2024		Jarrah -Marri forest	Remote Camera	-32.4919	116.2024	1
9/04/2024		Jarrah -Marri forest	Remote Camera	-32.4920	116.2024	1
10/04/2024		Jarrah -Marri forest	Remote Camera	-32.4939	116.2109	1
10/04/2024		Jarrah -Marri forest	Remote Camera	-32.4918	116.2024	1
12/04/2024		Jarrah -Marri forest	Remote Camera	-32.4948	116.2071	1
13/04/2024		Jarrah -Marri forest	Remote Camera	-32.4940	116.2110	1
13/04/2024		Jarrah -Marri forest	Remote Camera	-32.4947	116.2072	1
14/04/2024		Jarrah -Marri forest	Remote Camera	-32.4918	116.2025	1
14/04/2024		Jarrah -Marri forest	Remote Camera	-32.4916	116.2054	1
15/04/2024		Jarrah -Marri forest	Remote Camera	-32.4981	116.2069	1
15/04/2024		Jarrah -Marri forest	Remote Camera	-32.4939	116.2114	1
15/04/2024		Jarrah -Marri forest	Remote Camera	-32.4919	116.2025	1
15/04/2024		Jarrah -Marri forest	Remote Camera	-32.4948	116.2070	1
16/04/2024		Jarrah -Marri forest	Remote Camera	-32.4980	116.2070	1
16/04/2024		Jarrah -Marri forest	Remote Camera	-32.4946	116.2072	1
21/04/2024		Jarrah -Marri forest	Remote Camera	-32.4981	116.2067	1
21/04/2024		Jarrah -Marri forest	Remote Camera	-32.4937	116.2109	1
21/04/2024		Jarrah -Marri forest	Remote Camera	-32.4916	116.2053	1
22/04/2024		Jarrah -Marri forest	Remote Camera	-32.4979	116.2070	1
23/04/2024		Jarrah -Marri forest	Remote Camera	-32.4980	116.2067	1
23/04/2024		Jarrah -Marri forest	Remote Camera	-32.4917	116.2053	1
25/04/2024		Jarrah -Marri forest	Remote Camera	-32.4941	116.2109	1
3/05/2024		Jarrah -Marri forest	Remote Camera	-32.4979	116.2069	1
4/05/2024		Jarrah -Marri forest	Remote Camera	-32.4917	116.2053	1
14/04/2024	Survey Area 3	Jarrah -Marri forest	Remote Camera	-32.4675	116.2230	1
17/04/2024		Jarrah -Marri forest	Fresh scats	-32.4696	116.2271	
17/04/2024		Jarrah -Marri forest	Remote Camera	-32.4734	116.2280	1

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Date	Survey Area	Habitat	Observation type	Latitude	Longitude	Number of individuals
21/04/2024		Jarrah -Marri forest	Remote Camera	-32.4720	116.2320	1
22/04/2024		Jarrah -Marri forest	Remote Camera	-32.4719	116.2321	1
22/04/2024		Jarrah -Marri forest	Remote Camera	-32.4765	116.2294	1
30/04/2024		Jarrah -Marri forest	Remote Camera	-32.4675	116.2231	1
9/04/2024	Survey Area 4	Jarrah -Marri forest	Remote Camera	-32.4742	116.2523	1
9/04/2024		Jarrah -Marri forest	Remote Camera	-32.4741	116.2522	1
10/04/2024		Jarrah -Marri forest	Remote Camera	-32.4768	116.2564	1
11/04/2024		Jarrah -Marri forest	Remote Camera	-32.4702	116.2553	1
11/04/2024		Jarrah -Marri forest	Remote Camera	-32.4742	116.2521	1
11/04/2024		Jarrah -Marri forest	Remote Camera	-32.4768	116.2563	1
12/04/2024		Jarrah -Marri forest	Remote Camera	-32.4730	116.2545	1
12/04/2024		Jarrah -Marri forest	Remote Camera	-32.4741	116.2522	1
13/04/2024		Jarrah -Marri forest	Remote Camera	-32.4703	116.2553	1
14/04/2024		Jarrah -Marri forest	Remote Camera	-32.4730	116.2544	1
14/04/2024		Jarrah -Marri forest	Remote Camera	-32.4742	116.2523	1
16/04/2024		Jarrah -Marri forest	Remote Camera	-32.4731	116.2543	1
19/04/2024		Jarrah -Marri forest	Remote Camera	-32.4768	116.2565	1
21/04/2024		Jarrah -Marri forest	Remote Camera	-32.4731	116.2545	1
17/04/2024	Survey Area 5	Jarrah -Marri forest	Remote Camera	-32.4603	116.2597	1
Total Observations						66

** Please note that this is the number of camera events and not number of individuals.

3.5 Significant fauna likely to occur

Quokka (*Setonix brachyurus*)

The Quokka is listed as Vulnerable under the EPBC Act and BC Act

The current distribution of the mainland Quokka includes areas through the southwest forests from Jarrahdale to Walpole. The mainland Quokka lives in the Darling Range and south-west regions of WA, mostly inhabiting densely vegetated swamps and sometimes tea-tree thickets on sandy soils along creek systems and dense heath on slopes. Mainland Quokkas tend to hide in runs among vegetation during the day and forage along the swamp margins at night (Kitchener 1995)

In the southern forest Quokkas occupy a range of forest, woodland and wetland ecotypes. The most commonly occupied sites comprise of Jarrah, Marri, Red Tingle (*Eucalyptus jacksonii*) or Yellow Tingle (*E. guilfoylei*) forest and riparian habitats with a sedge dominated understory (DEC 2013). Habitat supporting a low density of near-surface fuel, a complex vegetation structure and burn patchiness are the factors favouring Quokka occupancy in the southern forest (DEC 2013). The habitat critical to survival for the south coast subpopulations includes a wider range of vegetation types (floristically and structurally) than in the northern Jarrah forest, including swamps, riparian areas, incised gullies and dense coastal heath (de Tores et al 2007).

Quokkas were recorded via remote cameras and scats in the adjacent Survey Areas of O'Neil, O'Neil East and the targeted Woylie Assessment within 10kms of the Survey Areas (GHD 2024a, GHD 204b & GHD 2024c). Within the region Quokkas have been mainly recorded in damplands and drainage lines. No

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preferred habitat for Quokkas was observed within the Survey Areas, however, within some Survey Areas drainage lines were just outside the Survey Area boundaries. This species has been assessed as likely to occur as they can venture out from their preferred habitat into the greater Jarrah forest areas and into the Survey Areas, without detection during the survey period.

Woylie (*Bettongia penicillate ogilbyi*)

The Woylie is listed as Critically Endangered under the BC Act and Endangered under the EPBC Act.

The Woylie is a small Potoroidae marsupial which is restricted to small remnant populations in the Southwest of Western Australia. Inhabiting dry sclerophyll forests with thick understories in the strongholds of Dryandra National Park, Tutanning Nature Reserve and Perup forest (Menkhorst & Knight, 2011). Identifiable by their grey brown with a distinctive brush like tail (Menkhorst & Knight, 2011).

Woylies were recorded via remote cameras in the nearby Survey Area of O'Neil East and the Monadnocks Conservation Park approximately 4.5km southeast to Survey Area 4 (GHD 2024b, GHD 2024c). The Survey Areas lack areas of suitable thick understories, however suitable areas lie just outside the Survey Area boundaries, where individuals have the potential to venture within the Survey Areas. This species as been assessed as likely to occur within the Survey Areas, as it is possible for Woylies to venture into the greater Jarrah forest areas and into the Survey Areas, without detection.

3.6 Black Cockatoo assessment

The Black Cockatoo habitat assessment focused on qualifying and quantifying Black Cockatoo habitat values throughout the Survey Areas. The whole survey area was traversed by foot to sample all trees with a suitable DBH to determine breeding habitat usage and assess foraging habitat potential value for Baudin's, Carnaby's and Forest Red-tailed Black Cockatoo as described in in sections 2.2.2. Table 3.4 presents a summary of Black Cockatoo habitat values and definitions as defined within the referral guidelines (DAWE 2022).

3.6.1 Black Cockatoo observations

Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)

The Forest Red tailed Black Cockatoo is listed as Vulnerable under the EPBC Act and BC Act.

The Forest Red-tailed Black Cockatoo is endemic to the south-west humid and sub-humid zones of WA (Mawson and Johnstone 1997). It inhabits the dense Jarrah (*Eucalyptus marginata*), Karri (*E.diversicolor*) and Marri (*Corymbia calophylla*) forests receiving more than 600 mm of annual average rainfall. The current distribution is north of Perth and east to Mount Helena, Christmas Tree Well, North Banister, Mt Saddleback, Rocky Gully and the upper King River (Johnstone 1997). More recently the species has been utilising and persisting on the northern portions of the Swan Coastal Plain and is now considered a regular sighting (Johnstone *et al* 2017). Habitats in which Forest Red-tailed Black Cockatoos occur are throughout the Northern Jarrah Forest and within Marri, Jarrah, Wandoo, Blackbutt, Bullich and Flooded Gum present. This region has a general understorey of Bull Banksia (*Banksia grandis*), Snottygobble (*Persoonia longifolia*), Sheoak (*Allocasuarina fraseriana*) and other *Banksia* species with scattered ephemeral areas of relevant species (Johnstone & Kirkby 1999). Forest Red-tailed Black Cockatoos roost in emergent Jarrah-Marri-Blackbutt habitat on roadsides, paddocks or forest blocks. While the Forest Red-tailed Black Cockatoo feeds on the seeds of other species, around 90 per cent of its diet is made up of the seeds from Marri and Jarrah fruits.

Forest Red-tailed Black Cockatoos were observed flying and calling at five locations, with 13 individual birds sighted visually and aurally within the Black Cockatoo Survey Area, Within Survey Area 3, (Table 3.2). All bird locations are located in Appendix A, Figure 4.

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Table 3.2 Forest Red-tailed Black Cockatoo observations within Black Cockatoo Survey Area

Date	Observation	Latitude	Longitude	Number of individuals
11/04/2024	Flying	-32.4691	116.2273	4
11/04/2024	Calling	-32.4706	116.2304	1
12/04/2024	Flying	-32.4719	116.2264	1
12/04/2024	Flying	-32.4717	116.2310	4
17/04/2024	Flying	-32.4692	116.2263	3
Total observations				13

3.6.2 Breeding habitat

From this survey three trees were identified as potentially suitable nest hollows breeding trees and were assessed by Glen Gaikhorst during a follow up assessment post field survey. Two of the trees were assessed, one tree defined as a Known nesting tree and the other tree defined as a suitable nest hollow (Table 3.4 and Table 3.5). One other tree was assessed as a potential nesting tree, and subsequently checked by Tony Kirkby using drone and the potential hollow was found to be blocked. Several other trees were identified as potential nesting trees/habitat tree but when assessed by Glen Gaikhorst they were found to be blocked.

3.6.3 Foraging habitat

The Jarrah – Marri forest provides extensive foraging habitat for all three Black Cockatoo species. With confirmed observations of foraging evidence from Forest Red-tailed Black Cockatoo across the Black Cockatoo Survey Area. A total of 39 foraging observations were made with a total of 19 being Marri nuts (Plate 3.3) and 20 Jarrah nuts (Table 3.3). However, the amount of foraging evidence is not an indication to the size of the population. All foraging locations are located in Figure 4, Appendix A.

Table 3.3 Forest Red-tailed Black Cockatoo foraging observations with Black Cockatoo Survey Area

Date	Latitude	Longitude	Foraging residue
12/04/2024	-32.4692	116.2263	Jarrah Foraging residue
12/04/2024	-32.4699	116.2261	Jarrah Foraging residue
12/04/2024	-32.4692	116.2254	Jarrah Foraging residue
12/04/2024	-32.4707	116.2274	Marri foraging residue
12/04/2024	-32.4705	116.2271	Marri foraging residue
12/04/2024	-32.4704	116.2269	Marri foraging residue
12/04/2024	-32.4700	116.2265	Marri foraging residue
12/04/2024	-32.4689	116.2265	Jarrah Foraging residue
12/04/2024	-32.4691	116.2265	Marri foraging residue
12/04/2024	-32.4693	116.2274	Marri foraging residue
12/04/2024	-32.4695	116.2269	Marri foraging residue
12/04/2024	-32.4695	116.2266	Marri foraging residue
12/04/2024	-32.4697	116.2269	Marri foraging residue
12/04/2024	-32.4702	116.2282	Marri foraging residue
12/04/2024	-32.4710	116.2295	Marri foraging residue
12/04/2024	-32.4712	116.2294	Jarrah Foraging residue

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Date	Latitude	Longitude	Foraging residue
12/04/2024	-32.4723	116.2307	Marri foraging residue
12/04/2024	-32.4720	116.2310	Jarrah Foraging residue
12/04/2024	-32.4720	116.2310	Marri foraging residue
12/04/2024	-32.4718	116.2308	Marri foraging residue
12/04/2024	-32.4714	116.2300	Marri foraging residue
12/04/2024	-32.4710	116.2296	Jarrah Foraging residue
12/04/2024	-32.4719	116.2304	Marri foraging residue
12/04/2024	-32.4699	116.2231	Jarrah Foraging residue
12/04/2024	-32.4696	116.2224	Jarrah Foraging residue
12/04/2024	-32.4694	116.2226	Jarrah Foraging residue
12/04/2024	-32.4694	116.2227	Jarrah Foraging residue
12/04/2024	-32.4696	116.2223	Jarrah Foraging residue
12/04/2024	-32.4693	116.2219	Jarrah Foraging residue
12/04/2024	-32.4704	116.2257	Marri foraging residue
12/04/2024	-32.4696	116.2232	Jarrah Foraging residue
12/04/2024	-32.4696	116.2224	Jarrah Foraging residue
12/04/2024	-32.4694	116.2227	Jarrah Foraging residue
12/04/2024	-32.4692	116.2221	Jarrah Foraging residue
12/04/2024	-32.4692	116.2221	Jarrah Foraging residue
12/04/2024	-32.4691	116.2218	Jarrah Foraging residue
12/04/2024	-32.4686	116.2219	Jarrah Foraging residue
12/04/2024	-32.4683	116.2216	Marri foraging residue
12/04/2024	-32.4678	116.2214	Marri foraging residue

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Plate 3.3 Forest Red-tailed Black Cockatoo Marri nut foraging residue

3.6.4 Roosting habitat

No roosting trees were recorded within the Survey Area. However, with the number of Forest Red-tailed Black Cockatoos recorded from within the area, it is likely there are roost trees in the vicinity.

3.6.5 Black Cockatoo assessment summary

A summary of the Black Cockatoo breeding, foraging and roosting assessment as defined by DAWE (2022), and Alcoa definitions is shown in Table 3.4 and Table 3.5.

Table 3.4 Black Cockatoo habitat usage

Habitat usage (DAWE 2022)	Tree type (Alcoa) / additional category	Presence within the Survey Area	Evidence
Foraging habitat	-	Present. Marri, Jarrah Chewed Marri and Jarrah pods	Extensive foraging found throughout the Survey Area for Forest Red-tailed Black Cockatoos.
Known roosting tree	-	No	None recorded
Potential roost tree	-	No	No areas or potential roost trees identified, but likely to occur within Black Cockatoo Survey Area
Suitable nesting tree	-	Yes	Recorded

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Habitat usage (DAWE 2022)	Tree type (Alcoa) / additional category	Presence within the Survey Area	Evidence
Known nesting tree	Nest tree	Yes	One previously recorded nesting tree was recorded within the Survey Area. With ID tag number 1761. Table 3.5.
Known nesting tree	Nest tree	Yes	One trees with define chew marks. Table 3.5. Assigned Tree No. 2126 by Tony Kirkby.
Suitable nesting hollow	Possible nest tree	Yes	None
Potential nest tree	Habitat Tree	Yes	Recorded
-	Significant Trees	No	None recorded

Legend (DAWE 2022)

Foraging habitat: a plant species known to support foraging within the species range.

Known roosting tree: a tree (usually tallest) or any species in close proximity to fresh water that is confirmed t be used for night roosting either via Cockatoo presence or strong evidence of roosting.

Potential roost tree: tall tree of any species, usually in close proximity to a freshwater source.

Suitable nesting tree: trees with suitable nesting hollows present, but no evidence of breeding use.

Known nesting tree: tree that has a hollow in which black cockatoo breeding has been recorded (past or present)

Potential nesting tree: trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows. Trees suitable to develop a nest hollow in the future are 300-500 mm DBH.

Suitable nest hollows: any hollow with dimensions suitable for use for nesting by black cockatoos. Characteristics of hollows used by each species is available in the SPRAT database. Suitable nest hollows are only found in live trees with a DBH of at least 500 mm.

Alcoa Black Cockatoo Tree usage terminology

Nest Tree: A tree (live or dead) containing one or more hollows suitable as Black Cockatoo breeding habitat (based on hollow size, shape, and entry angle), which shows evidence of use (chewing/scratching around entrance).

Possible Nest Tree: Trees with suitable nesting hollows present, that show no evidence.

Habitat Tree: Trees on a haul road alignment that have the potential to provide nest hollows in the future. These are primarily marri trees with DBH ≥500mm. The tree should already be starting to develop a hollow or have a form that is conducive to hollow formation.

Significant Tree: Healthy Jarrah trees with DBH≥2000mm or healthy Marri trees with DBH≥1500mm

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Table 3.5 Glen Gaikhorst Black Cockatoo assessment

Tree Species/Tree Definition	Latitude	Longitude	Glen Gaikhorst comments	Photo
dead tree Tree Definitions: Known nesting tree	-32.4713	116.2302	Hollow Assessed with drone. Lower hollow is blocked. Another hollow higher up on tree with potentially old chew marks by Black Cockatoos. Also, tree marked with tag 1761 with "H" and dot. Known breeding tree. **Breeding hollow**	
Marri *Corymbia calophylla* Tree Definitions: Known nesting tree	-32.4703	116.2289	Hollow assessed with drone. Definite fresh chew marks at hollow mouth. Too high for pole camera likely a breeding hollow. Assigned Tree No. 2126 by Tony Kirkby. **Breeding hollow**	

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Tree Species/Tree Definition	Latitude	Longitude	Glen Gaikhorst comments	Photo
Marri *Corymbia calophylla* Tree Definitions: Potential nest tree / Habitat tree	-32.4704	116.2282	Hollow assessed with drone and from the ground. Too high for pole camera and foliage in way of hollow making it difficult to assess with drone. Images too poor to make assessment. Rechecked by Tony Kirkby using drone and found to be blocked. **No hollow**	No Photo
Marri *Corymbia calophylla* Tree Definitions: Potential nest tree / Habitat tree	-32.4693	116.2260	Hollow assessed with pole cam. Hollow is Blocked. **No hollow**	
Marri *Corymbia calophylla* Tree Definitions: Potential nest tree / Habitat tree	-32.4691	116.2270	Hollow assessed from ground level appears blocked. **No hollow**	No photo

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Tree Species/Tree Definition	Latitude	Longitude	Glen Gaikhorst comments	Photo
Marri *Corymbia calophylla* Tree Definitions: Potential nest tree / Habitat tree	-32.4695	116.2270	Hollow assessed with drone. Hollow entrance very small approx. 5 cm and no visible signs of use by Black Cockatoos **No hollow**	
dead tree Tree Definitions: Potential nest tree / Habitat tree	-32.4706	116.2280	Hollow assessed from ground level appears blocked. **No hollow**	No photo
Jarrah *Eucalyptus marginata* Tree Definitions: Potential nest tree / Habitat tree	-32.4724	116.2304	Hollow ground assessment, Hollow blocked **No hollow**	

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Tree Species/Tree Definition	Latitude	Longitude	Glen Gaikhorst comments	Photo
Jarrah *Eucalyptus marginata* Tree Definitions: Potential nest tree / Habitat tree	-32.4714	116.2306	Hollow ground assessment. Hollow blocked. Sticks and other debris observed. **No hollow**	
Marri *Corymbia calophylla* Tree Definitions: Potential nest tree / Habitat tree	-32.4701	116.2285	Hollow assessed with drone. Hollow is blocked. Small hollow on side of blocked hollow but too small for Black Cockatoo. **No hollow**	

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Tree Species/Tree Definition	Latitude	Longitude	Glen Gaikhorst comments	Photo
Marri *Corymbia calophylla* Tree Definitions: Potential nest tree / Habitat tree	-32.4698	116.2286	Hollow assessed with drone. Hollow is blocked. Cavity had potential use for bird of prey. **No hollow**	

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Tree Species/Tree Definition	Latitude	Longitude	Glen Gaikhorst comments	Photo
Jarrah *Eucalyptus marginata* Tree Definitions: Potential nest tree / Habitat tree	-32.4699	116.2234	Hollow assessed with pole camera. Hollow too small for Black Cockatoo use. **No hollow**	

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4. Conclusion

The Survey Areas consist of the main habitat type of Jarrah-Marri forest, mature aged. The conservation value of the Jarrah-Marri forest is specific to locally occurring significant fauna species and the type of usage by those species. For example, Jarrah-Marri forest provides extensive foraging habitat for Chuditch and all three Black Cockatoo species.

Within the Black Cockatoo Survey Area, observed use was recorded of Forest Red-tailed Black Cockatoo, with sightings of individuals and of foraging residue. The Black Cockatoo Survey Area contained habitat that supports Breeding and Foraging of Black Cockatoo species; however, no signs of roosting were observed within the Survey area, however due to the presence of Forest Red-tailed Black Cockatoo observed, roosting trees are likely to be nearby. From this survey three trees were identified as potentially suitable nest hollows breeding trees and were assessed by Glen Gaikhorst during a follow up assessment post field survey. Two of these trees were subsequently checked, and both were assessed as known breeding trees, one of which was previously recorded by Tony Kirkby. A third tree was assessed by Tony Kirkby using drone and the potential hollow was found to be blocked. Several other trees were identified as potential nesting trees/habitat tree but when assessed by Glen Gaikhorst they were found to be blocked.

In total five significant species were recorded. The targeted significant species, Chuditch was readily recorded via remote camera within all five Survey Areas, with a total of 66 camera events with Chuditch present and two observations of Chuditch scats. Through physical analysis of the Chuditch recorded via remote camera, 17 were identified through spot pattern analysis. Four other significant (but not target) species were recorded within the Survey Areas including Forest Red-tailed Black Cockatoo, Southwestern Brush-tailed Phascogale, Western Brush Wallaby and Quenda.

Regards

Dylan Goldspink
Zoologist

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References

de Tores, P, Hayward, MW, Dillon, MJ & Brazell, RI 2007, *'Review of the distribution, causes for decline and recommendations for management of the quokka, Setonix bracyurus (Macropodidae: Marsupialia), an endemic macropodid marsupial from south-west Western Australia*', Conservation Science Western Australia, vol 6(1), pp 13-73.

Department of Agriculture Water and Energy (DAWE) 2022. Referral guidelines for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo. Department of Agriculture, Water and the Environment, Canberra.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017, '*Fauna profiles – Chuditch Dasyurus geoffroii',* retrieved from http://www.dbca.wa.gov.au

Department of Environment and Conservation (DEC) 2013, *'Quokka Setonix brachyurus Recovery Plan'*, Wildlife Management Program No. 56, Department of Environment and Conservation, Perth, WA.

GHD 2024a, Terrestrial Fauna Survey Assessment, Holyoake Mine Development – O'Neil. For Aloca of Australia Limited. Unpublished Report.

GHD 2024b, Terrestrial Fauna Survey Assessment, Holyoake Mine Development – O'Neil East. For Alcoa of Australia Limited. Unpublished Report.

GHD 2024c, O'Neil East Targeted Woylie Assessment. For Alcoa of Australia Limited. Unpublished report.

Hohnen, R, Ashby, J, Tuft, K, & McGregor, H 2012, *'Individual identification of northern quolls (Dasyurus hallacatus) using remote cameras'*, Australian Mammalogy, CSIRO Publishing. http://dx.doi.org/10.1071/AM12015.

Johnstone, RE 1997, 'Current studies on three endemic Western Australian cockatoos', Eclectus, vol 3, pp 34--35.

Johnstone, RE & Kirkby, T 1999, '*Food of the Forest Red-tailed Black Cockatoo Calyptorhynchus banksii naso in south-west Western Australia', Western Australian Naturalist*, vol 22, pp 167-177.

Johnstone, RE & Storr, GM 1998, Handbook of Western Australian Birds. Volume 1: Nonpasserines (Emu to Dollarbird), Western Australian Museum, Perth.

Johnstone, RE, Kirkby, T & Sarti, K 2017, 'The distribution, status movements and diet of the Forest Red-tailed Black Cockatoo in the south-west with emphasis on the greater Perth regions', Western Australia, Western Australian Naturalist, vol 30 (4), pp 1-193.

Kitchener, DJ 1995, '*Quokka*', In R. Strahan (Ed.) The Mammals of Australia, Australian

Mawson, PR & Johnstone, RE 1997, 'Conservation status of parrots and cockatoos in Western Australia', Eclectus, vol 2, pp 4-9.

Menkhorst, P & Knight, F 2011, *A Field Guide to Mammals of Australia*, third edition, South Melbourne, Australia, Oxford University Press.

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Appendices

Appendix A

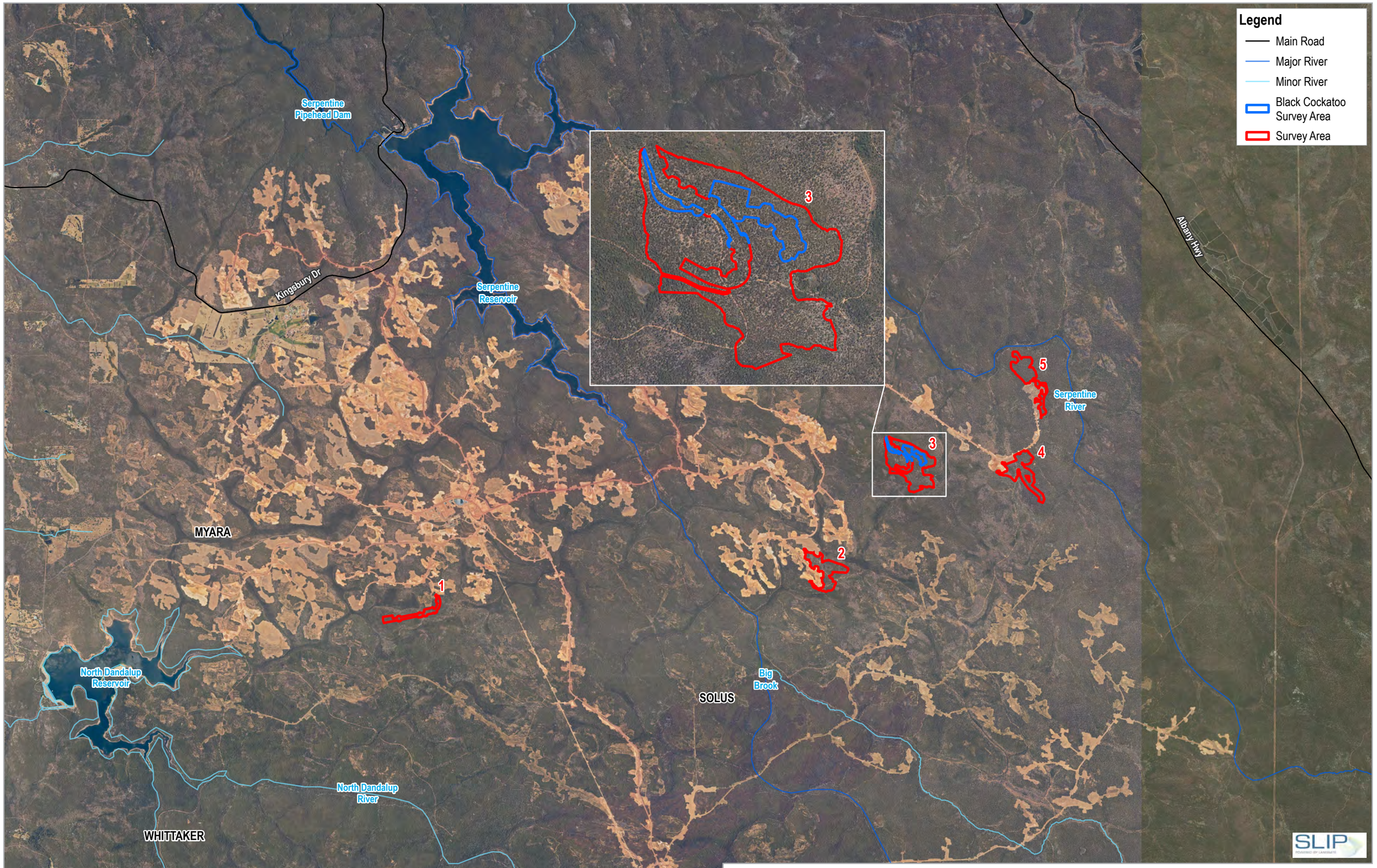
Figures

Figure 1 Survey Areas

Figure 2. Survey method – sites 1-5

Figure 3. Significant fauna – sites 1-5

Figure 4 Black Cockatoo survey results



Paper Size ISO A3

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Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

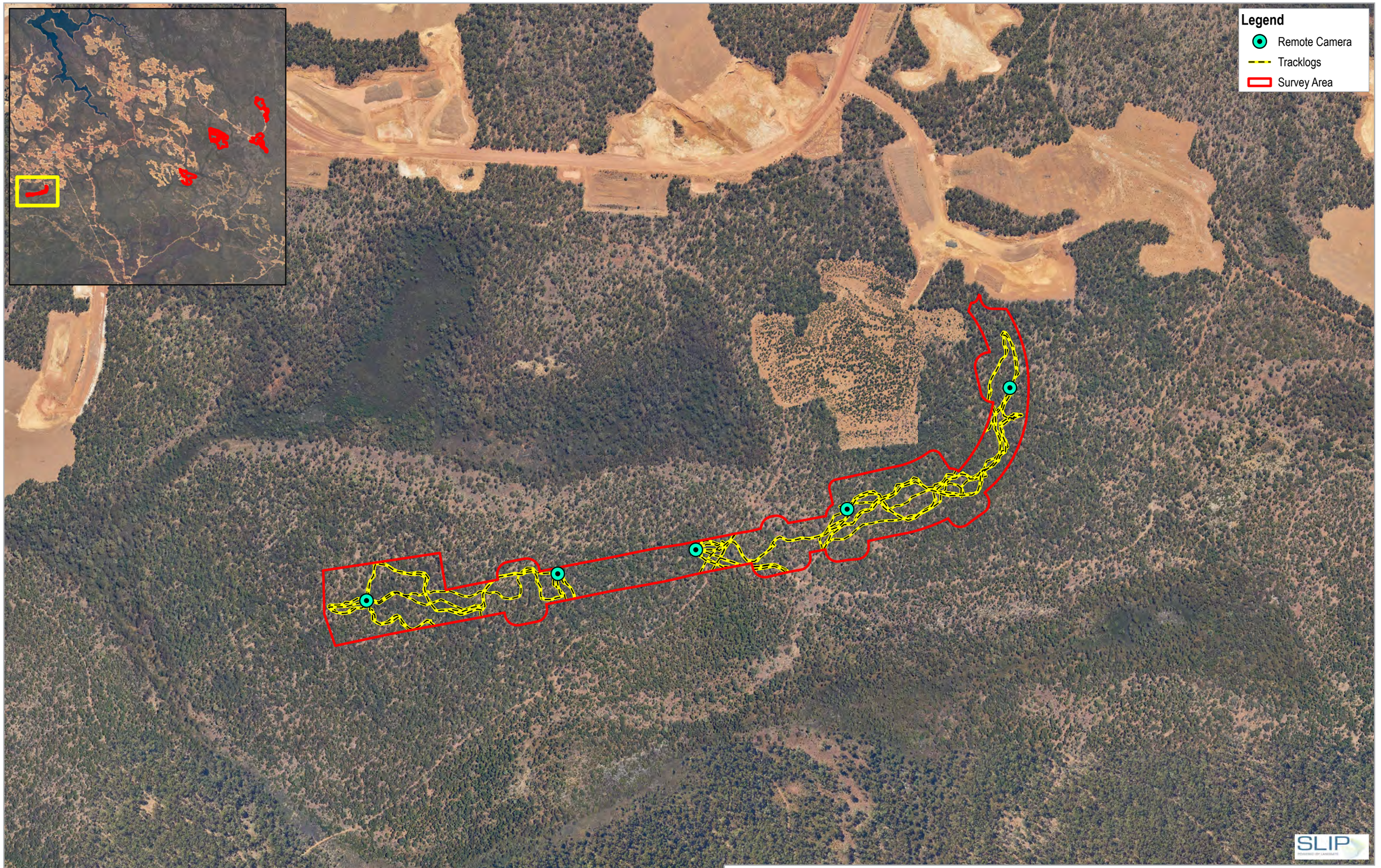
Survey Area

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 1

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Map Projection: Transverse Mercator
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Grid: GDA2020 MGA Zone 50

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Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

Survey Method

Project No. **12637107**
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Date **22/05/2024**

FIGURE 2

G:\61\12637107\GIS\Maps\Working\12637107_Figures\12637107_Figures.aprx\12637107_02_SurveyMethod_Rev0
Print date: 22 May 2024 - 15:34

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3



Legend
- Remote Camera
- Tracklogs
- Survey Area

SLIP

Paper Size ISO A3

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

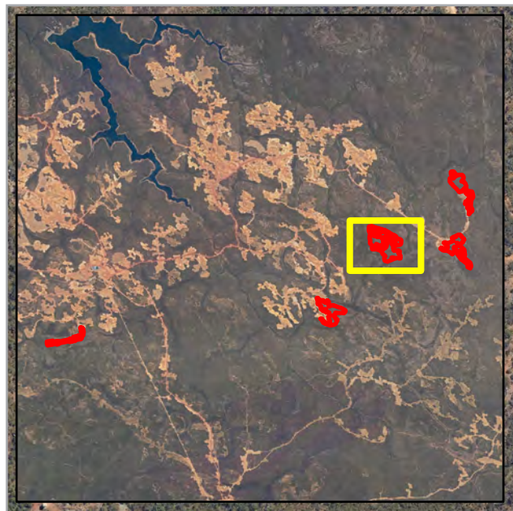
Survey Method

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 2

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Print date: 22 May 2024 - 15:34

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3



Legend
- Remote Camera
- Tracklogs
- Black Cockatoo Survey Area
- Survey Area

SLIP

Paper Size ISO A3

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

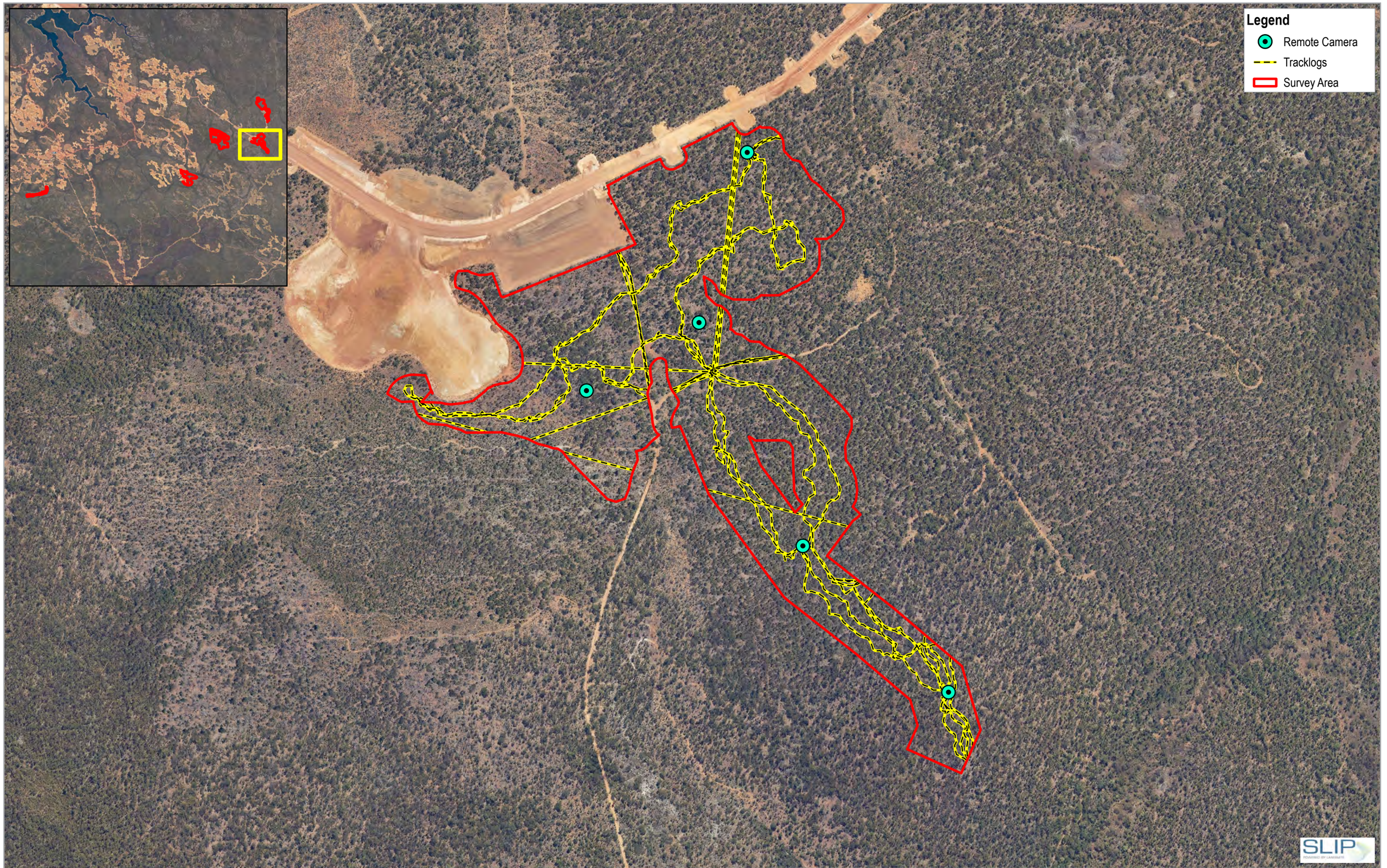
Survey Method

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 2

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Print date: 22 May 2024 - 15:34

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3



Paper Size ISO A3

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

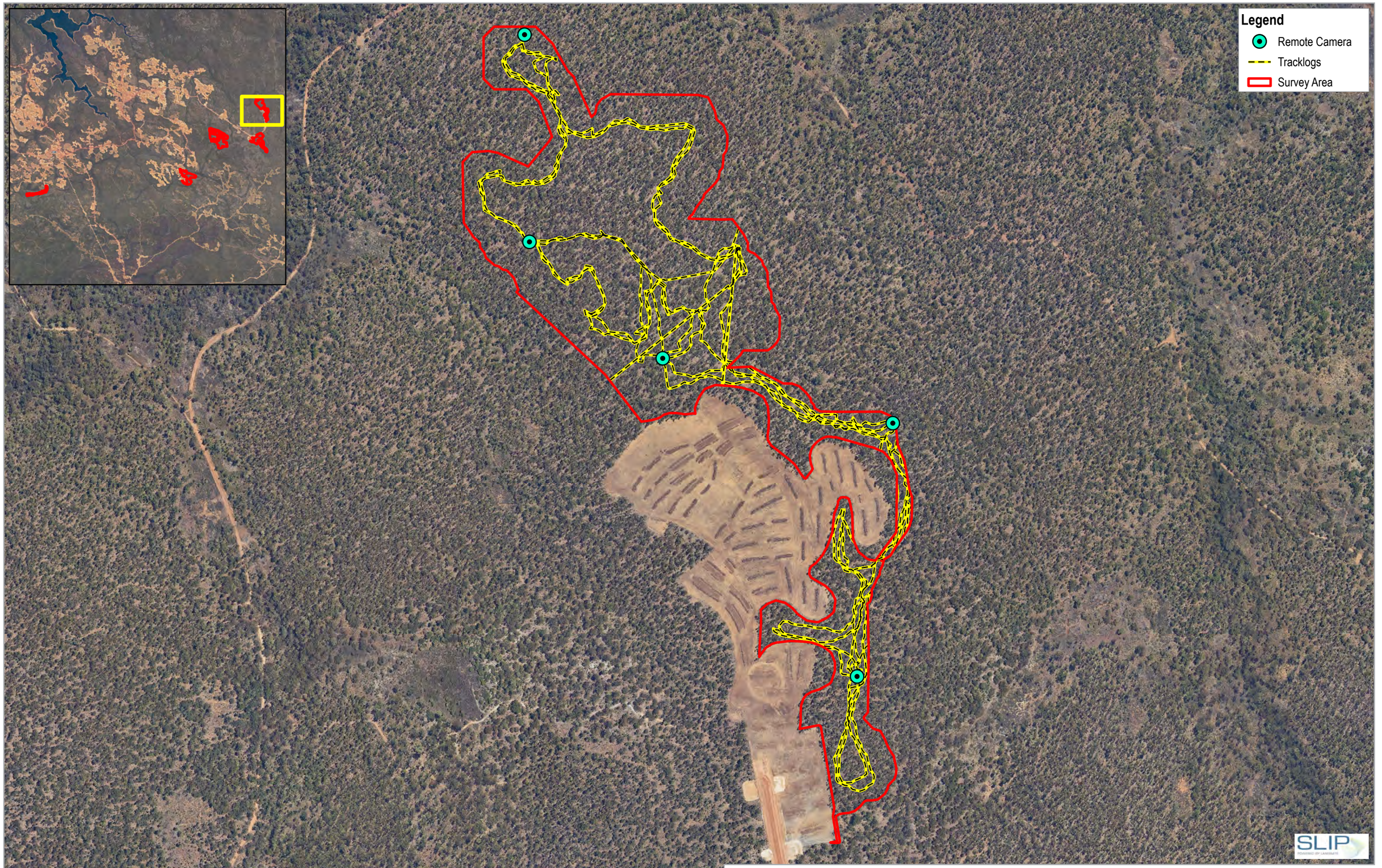
Survey Method

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 2

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Print date: 22 May 2024 - 15:35

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3



Paper Size ISO A3

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

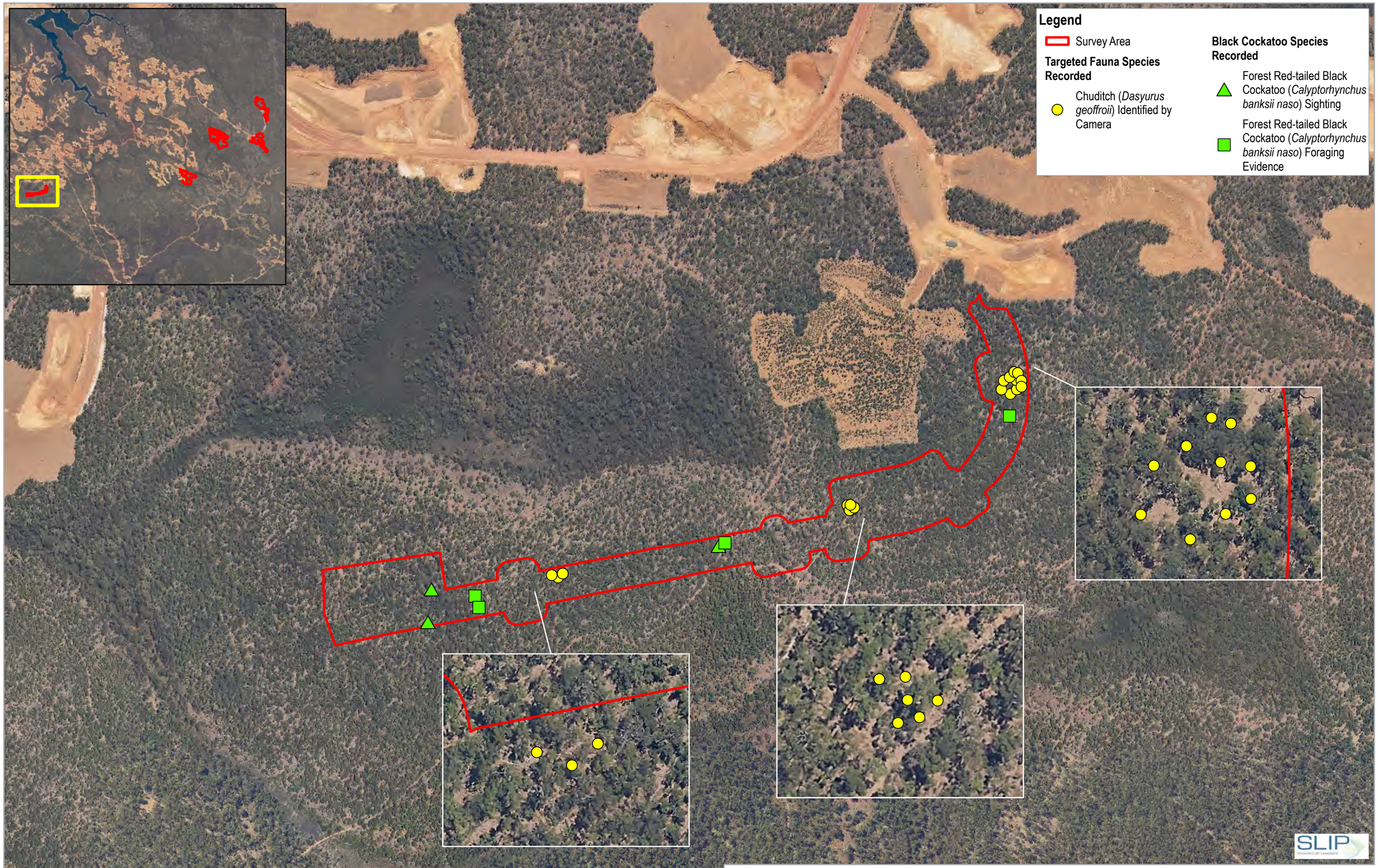
Survey Method

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 2

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Print date: 22 May 2024 - 15:35

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3



Paper Size ISO A3

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

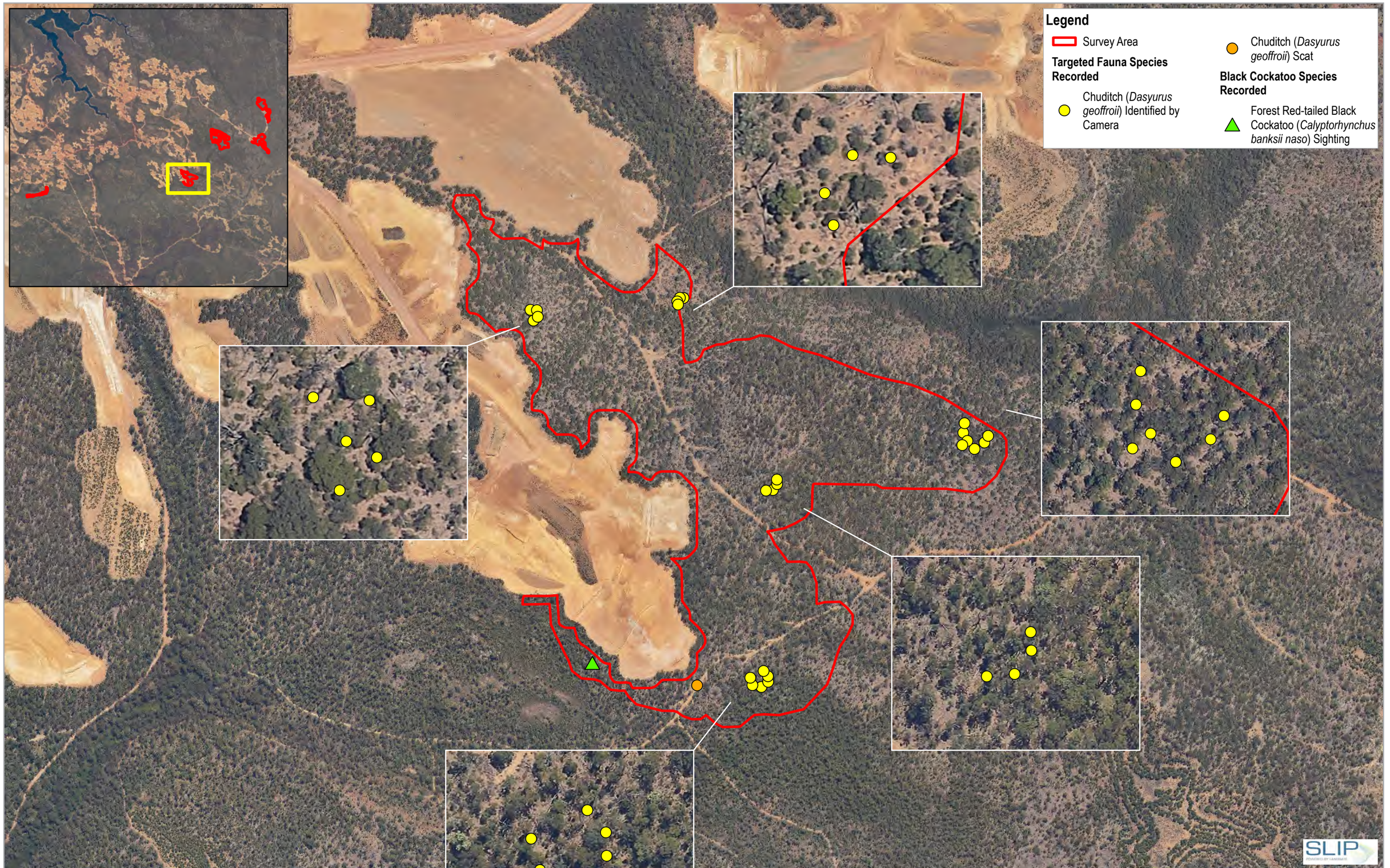
Significant Fauna

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

Page 1 of 5
FIGURE 3

G:\61\12637107\GIS\Maps\Working\12637107_Figures\12637107_Figures.aprx\12637107_03_SignificantFauna_Rev0
Print date: 22 May 2024 - 15:50

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3



Paper Size ISO A3

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

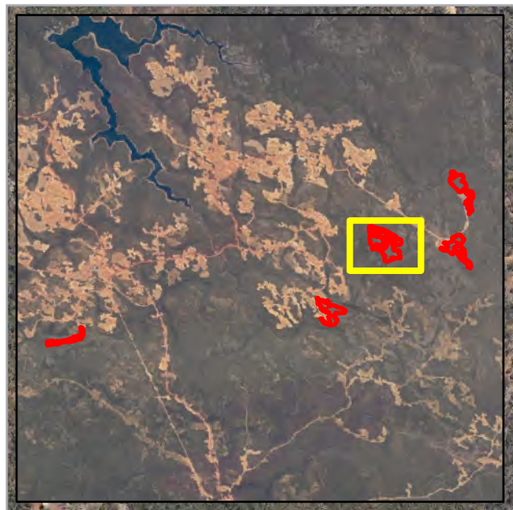
Significant Fauna

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 3

G:\61\12637107\GIS\Maps\Working\12637107_Figures\12637107_Figures.aprx\12637107_03_SignificantFauna_Rev0
Print date: 22 May 2024 - 15:48

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3



Legend

- Black Cockatoo Survey Area
- Survey Area

Targeted Fauna Species Recorded

- Chuditch (*Dasyurus geoffroii*) Identified by Camera
- Chuditch (*Dasyurus geoffroii*) Scat

Black Cockatoo Species Recorded

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) Sighting
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) Foraging Evidence

Paper Size ISO A3

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

Significant Fauna

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 3

G:\61\12637107\GIS\Maps\Working\12637107_Figures\12637107_Figures.aprx\12637107_03_SignificantFauna_Rev0
Print date: 22 May 2024 - 15:46

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3

Legend

Survey Area

Targeted Fauna Species Recorded

Chuditch (*Dasyurus geoffroii*) Identified by Camera

Black Cockatoo Species Recorded

Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) Sighting

Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) Foraging Evidence

Paper Size ISO A3

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

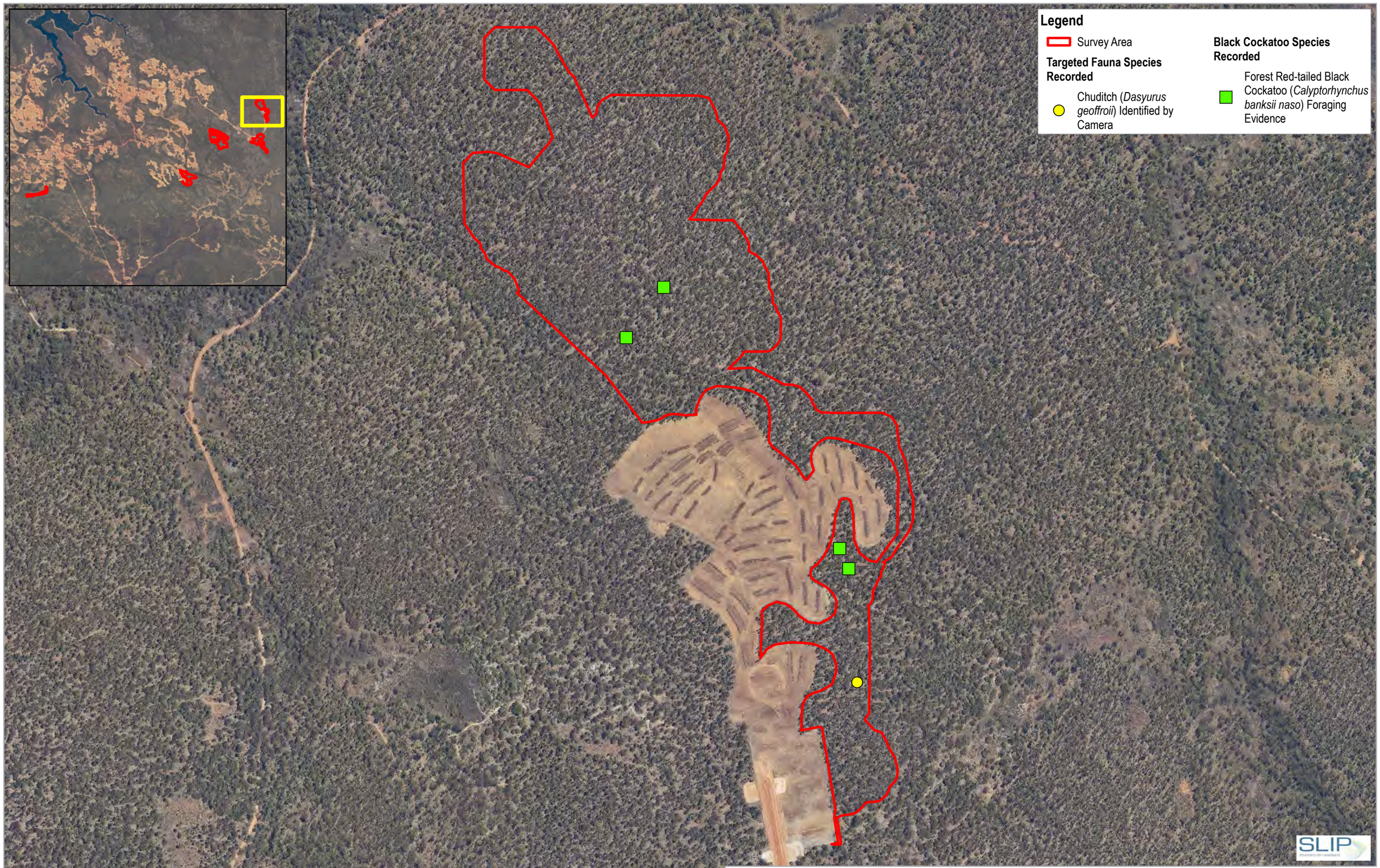
Significant Fauna

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 3

G:\61\12637107\GIS\Maps\Working\12637107_Figures\12637107_Figures.aprx\12637107_03_SignificantFauna_Rev0
Print date: 22 May 2024 - 15:44

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3



Paper Size ISO A3

0 50 100 150 200

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

Significant Fauna

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 3

G:\61\12637107\GIS\Maps\Working\12637107_Figures\12637107_Figures.aprx\12637107_03_SignificantFauna_Rev0
Print date: 22 May 2024 - 15:45

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3

Legend

- Black Cockatoo Survey Area
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) Sighting
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) Foraging Evidence

Black Cockatoo Hollows

- Known Nesting Tree / Nest Tree

SLIP

Paper Size ISO A3

0 30 60 90 120

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Alcoa of Australia Limited
Myara Pre-clearance Targeted Fauna

Black Cockatoo Results

Project No. **12637107**
Revision No. **0**
Date **22/05/2024**

FIGURE 4

G:\61\12637107\GIS\Maps\Working\12637107_Figures\12637107_Figures.aprx\12637107_04_BlackCockatoo_Rev0
Print date: 22 May 2024 - 15:31

Data source: Landgate_Subscription_Imagery\WANow: . Created by: rbrown3

Appendix B

Field Data

Species List

Family	Taxa	Species	EPBC listing	DBCA listing	
Mammals					
Dasyuridae	*Dasyurus geoffroii*	Chuditch	VU	VU	X
Dasyuridae	*phascogale tapoatafa wambenger*	Southwestern Brush-tailed Phascogale		CD	X
Felidae	*Felis catus*	Feral Cat	Int	Int	X
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo			X
Macropodidae	*Notamacropus irma*	Western Brush Wallaby		P4	X
Peramelidae	*Isoodon fusciventer*	Quenda		P4	X
Phalangeridae	*Trichosurus vulpecula*	Common Brushtail Possum			X
Suidae	*Sus scrofa*	Feral Pig	Int	Int	X
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna			X
Birds					
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill			X
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren			X
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar			X
Artamidae	*Strepera versicolor*	Grey Currawong			X
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	X
Casuariidae	*Dromaius novaehollandiae*	Emu			X
Climacteridae	*Climacteris rufus*	Rufous Tree Creeper			X
Columbidae	*Phaps chalcoptera*	Common Bronzewing			X
Corvidae	*Corvus coronoides*	Australian Raven			X
Maluridae	*Malurus elegans*	Red-winged Fairywren			X
Maluridae	*Malurus splendens*	Splendid Fairywren			X
Monarchidae	*Colluricincla harmonica*	Grey Strike Thrush			X
Neosittidae	*Pachycephala pectoralis*	Golden Whistler			X
Pachycephalidae	*Pardalotus punctatus*	Spotted Pardalote			X
Pachycephalidae	*Pardalotus striatus*	Striated Pardalote			X
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin			X
Petroicidae	*Petroica boodang*	Scarlet Robin			X
Phasianidae	*Coturnix pectoralis*	Stubble Quail			X
Psittaculidae	*Platycercus zonarius*	Australian Ringneck Parrot			X
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail			X
Turnicidae	*Turnix varius*	Painted Button Quail			X
Reptiles					
Scincidae	*Ctenotus labillardieri*	Common south-west Ctenotus			X
Scincidae	*Egernia napoleonis*	Napoleon Skink			X

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Family	Taxa	Species	EPBC listing	DBCA listing	
Scincidae	*Menetia greyii*	Common Dwarf Skink			X
Scincidae	*Morethia obscura*	Shrubland Skink			X

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Camera data

Species Name	Common Name	EPBC/BC Listing	Survey Area 1					Survey Area 2					Survey Area 3				
			CAM Yalgoo	CAM 28	CAM W1	CAM 31	CAM X2	CAM W9	CAM X3	CAM HF12	CAM R59	CAM R41	CAM X1	CAM W10	CAM W12	CAM W5	CAM 20
Antechinus flavipes	Mardo		25	6	1	12	7	2	12	13	9	1	8	10	20	9	10
Dasyurus geoffryii	Chuditch	Vu/VU	3		1		6	4	7	6	4	4		2	2	1	1
Phascogale tapoatafa wambenger	Southwestern Brush-tailed Phascogale	CD	4		1	5	1								1	2	
Felis catus	Feral Cat	Int						1					1				
Notamacropus irma	Western Brush Wallaby	P4	1	6	6	5	1	2	1	4			4	3		2	16
Macropus fuliginosis	Western Grey Kangaroo		1	3	2		1		1				5	2	2	5	1
Isoodon fusciventer	Quenda	P4	2			3	1							6			
Trichosurus vulpecula	Common Brushtail Possum				3	1	1										
Sus scrofa	Feral Pig	Int							1								
Tachyglossus aculeatus	Short-beaked Echidna			1	1			1						1			1
Sericornis frontalis	White-browed Scrubwren									2			1				
Acanthiza apicalis	Inland Thornbill								1	7			1				
Aegotheles cristatus	Australian Owlet-nightjar																
Strepera versicolor	Grey Currawong						2	1								2	6
Climacteris rufus	Rufous Tree Creeper																
Corvus coronoides	Australian Raven											1					
Malurus elegans	Red-winged Fairywren								1								
Colluricincla harmonica	Grey Strike Thrush																

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Eopsaltria griseogularis	Western Yellow Robin									2							
Coturnix pectoralis	Stubble Quail						1						1				1
Rhipidura albiscapa	Grey Fantail								1	2	2				2		

Species Name	Common Name	EPBC/BC Listing	Survey Area 4					Survey Area 5					Total
			CAM W2	CAM W11	CAM 16	CAM W3	CAM W15	CAM 53	CAM W7	CAM R57	CAM 55	CAM W6	
Antechinus flavipes	Mardo		13	4	13	2	7	2	15	4	16	12	233
Dasyurus geoffryii	Chuditch	Vu/Vu	3	2	5	3						1	55
Phascogale tapoatafa wambenger	Southwestern Brush-tailed Phascogale	CD											14
Felis catus	Feral Cat	Int											2
Notamacropus irma	Western Brush Wallaby	P4	16	7	2	13	8		2	3	2	9	113
Macropus fuliginosis	Western Grey Kangaroo			1		3	1		7	1	2	4	42
Isoodon fusciventer	Quenda	P4											12
Trichosurus vulpecula	Common Brushtail Possum												5
Sus scrofa	Feral Pig	Int											1
Tachyglossus aculeatus	Short-beaked Echidna		1							1			7
Sericornis frontalis	White-browed Scrubwren								8		1		12
Acanthiza apicalis	Inland Thornbill												9
Aegotheles cristatus	Australian Owlet-nightjar		2										2
Strepera versicolor	Grey Currawong		2					1					14
Climacteris rufus	Rufous Tree Creeper										2		2
Corvus coronoides	Australian Raven												1
Malurus elegans	Red-winged Fairywren		6		3								10
Colluricincla harmonica	Grey Strike Thrush				1								1
Eopsaltria griseogularis	Western Yellow Robin			2					13		2		19

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Coturnix pectoralis	Stubble Quail												3
Rhipidura albiscapa	Grey Fantail						1						8

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Black Cockatoo foraging assessment (DAWE 2022)

Starting score	Carnaby's Cockatoo	Baudin's Cockatoo	Forest Red-tailed Black Cockatoo
10	Start at a score of 10 if your site is native shrubland, Kwongan heathland or woodland, dominated by proteaceous plant species such as Banksia spp. (including Dryandra spp.), Hakea spp. and Grevillea spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas. This tool only applies to sites equal to or larger than 1 hectare in size.
Attribute/score subtraction	Context adjustor (attributes reducing functionality of foraging habitat)		
Foraging potential (-2)	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.
Connectivity (-2)	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.
Proximity to breeding (-2)	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.
Proximity to roosting (-1)	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.
Impact from significant plant disease (-1)	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g. Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.

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	Attribute/score subtraction	Carnaby's Black Cockatoo	Baudin's Black Cockatoo	Forest Red-tailed Black Cockatoo
Jarrah-Marri forest	Starting score	10	10	10
	Foraging potential (-2)	-2	-2	0
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0
	Total score	8	8	10
	Appraisal	The Jarrah-marri forest contains suitable foraging habitat for Carnaby's Black Cockatoo however, no signs of foraging evidence from Carnaby's Black Cockatoo were recorded within the Survey Area, resulting in a subtraction in the total score. The habitat has good connectivity with foraging habitat within 12kms of the Survey Area. Previously recorded breeding trees are recorded within the region and two breeding trees and one potential breeding tree was recorded within the Survey Area. No Roosting sites were recorded with the Survey Area, however, roosting has been recorded within the region. No signs of Phytophthora or Marri canker was observed. Frequent fires have the potential to affect Carnaby's Black Cockatoo.	The Jarrah-marri forest contains suitable foraging habitat for Baudin's Black Cockatoo however, no signs of foraging evidence from Baudin's Black Cockatoo were recorded within the Survey Area, resulting in a subtraction in the total score. The habitat has good connectivity with foraging habitat within 12kms of the Survey Area. Previously recorded breeding trees are recorded within the region and two breeding trees and one potential breeding tree was recorded within the Survey Area. No Roosting sites were recorded with the Survey Area, however, roosting has been recorded within the region. No signs of Phytophthora or Marri canker was observed. Frequent fires have the potential to affect Baudin's Black Cockatoo,	The Jarrah-marri forest contains suitable foraging habitat with numerous signs of Forest Red-tailed Black Cockatoo foraging evidence on Marri and Jarrah nuts were recorded within the Survey Area. The Survey Area has good connectivity with foraging habitat within 12kms and the greater Jarrah forest. Previously recorded breeding trees are recorded within the region and two breeding trees and one potential breeding tree was recorded within the Survey Area. No Roosting sites were recorded within the Survey Area, however, from the number of Forest Red-tailed Black Cockatoos sighted it is likely theyre are roosting trees near by. No signs of Phytophthora or Marri canker was observed. Frequent fires have the potential to affect Forest Red-tail Black Cockatoo

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Chuditch camera capture (*Dasyurus geoffroii*) physical assessment data

Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 1	CAM W11 CAM W3 (Survey area 4)	**11/04/2024** **11/04/2024** **12/04/2024**	Row of three defined dots with two combined dots above on left side		Chuditch Left Side:  Chuditch Right Side: 

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 2	CAM W11 (Survey Area 4)	**13/04/024**	Circle of dots on left flank		Chuditch Right Side:  Chuditch left Side: 

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 3	CAM W2 CAM16 (Survey area 4)	**12/04/2024** **14/04/2024** **16/04/2024**	Two rows of spots on right side. Bottom row has 6 spots top row has 4		Chuditch Left Side:  Chuditch Right Side:  

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 4	CAM W6 (Survey Area 5)	**17/04/2024**			Chuditch Left Side: Chuditch Right Side:  Left side

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 5	CAM 16 (Survey area 4)	**10/04/2024** **12/04/2024** **13/04/2024**	Notch in left ear Little spots on left side	 	 
Chuditch 6	CAM W3 (Survey area 4)	**20/04/2024**			

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 6	CAM HF12 (Survey Area 2)	**16/04/2024**			
Chuditch 7	CAM HF12 (Survey Area 2)	**22/04/2024**			

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 8	CAM HF12 (Survey Area 2)	**22/04/2024**			
Chuditch 9	CAM HF12 (Survey Area 2)	**24/04/2024**			
Chuditch 10	CAM X3 (Survey Area 2)	**10/04/2024**			

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 11	CAM 20	**18/04/2024**	Singificantly reduced tail/more than half missing, with line of three vertical spots down back right hand side flank and two small horizontal spots close to tail		
Chuditch 12	CAM W12	**22/04/2024** **23/04/2024**	Distinctly bare covering across front half of body. Horizontal line of four, equally-spaced dots across left flank.		

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 13	CAM Yalgoo	**18/04/2024** **21/04/2024**	Two distinct white spots along front of snout, circular ring of five spots along middle of body on left side flank.		
Chuditch 14	CAM W5 CAM R41 CAMW9	**23/04/2024** **16/04/2024** **15/04/2024** **16/04/2024**	Distinct loss of tail, approximately one-third missing, bare coverage across front half of body.		

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
					
Chuditch 15	CAM X2	**11/04/2024** **12/04/2024** **13/04/2024** **17/04/2024**	Distinct circular pattern of spots across front left shoulder.		
Chuditch 16	CAM R41 CAM W9	**10/04/2024** **11/04/2024** **22/04/2024** **24/04/2024**	Two vertical white spots down the front of snout, single, large white spot in the middle of left shoulder and white scarring directly behind left ear.		

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Chuditch ID	Camera ID	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 17	CAM W1	**09/04/2024** **10/04/2024** **12/04/2024** **13/04/2024** **14/04/2024** **15/04/2024** **17/04/2024**	Three vertical white spots in the middle of right flank with single horizintal white spot directly next to the same horizontal line. Small scar underneath left eye.		 

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Project name		Alcoa Myara Terrestrial Fauna Assessments					
Document title		Myara pre-clearance targeted fauna assessment | [Document subtitle]					
Project number		12637107					
File name		12637107-MEM-Myara Preclearance.docx					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S0	Rev A	D. Goldspink, M. Wood	J Collins, R. Browne-Cooper		J Collins		22/05/24
S4	Rev 0	D. Goldspink, M. Wood	J Collins, R. Browne-Cooper		J Collins		23/05/24
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[Status code]							

GHD Pty Ltd | ABN 39 008 488 373
Contact: GHD
999 Hay Street, Level 10
Perth, Western Australia 6000, Australia
T +61 8 6222 8222 | **F** +61 8 6222 8555 | **E** permail@ghd.com | **ghd.com**

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08 February 2024

To	Kristyna Gawith	**Contact No.**	0427232751
Copy to		**Email**	kristyna.gawith@alcoa.com
From	Glen Gaikhorst	**Project No.**	12565572
Project Name	Alcoa Holyoake Environmental Assessments		
Subject	O'Neil East Targeted Woylie Assessment		

1. Introduction and Survey Area

Alcoa of Australia Limited (Alcoa) is proposing to progressively transition the Huntly Mine into the Holyoake Stage 2 (East), Holyoake West and/or O'Neil mining regions in the future. As part of potential future expansions and environmental approvals, GHD has been undertaking fauna surveys in the O'Neil East blocks over the 2023 period. The O'Neil East survey project is located in the Peel region, Western Australia (WA), approximately 30 kilometres (km) southeast from the township of Jarrahdale. The O'Neil East Survey Area covers an area of approximately 2425.65 hectares (ha). The Survey Area has a 10 km buffer known as the Study Area Figure 1.

During the O'Neil East surveys GHD recorded a Woylie (*Bettongia penicillata ogilbyi*) on a remote camera in the north of the survey area. Alcoa then requested GHD to further investigate the population of Woylies within the O'Neil East Survey Area. The Woylie is listed as Critically Endangered under the *Biodiversity Conservation Act 2016* (BC Act) and Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Woylie is a small grey-brown bipedal marsupial, reaching a head body length 310-380 mm and a weight range of 1 – 1.6 kilograms (kg). The Woylie has a distinctive semi prehensile tail with brush like appearance, reaching a length of 290-350 mm (Menkhorst & Knight, 2011).

Woylie populations are restricted to four natural populations, Dryandra Woodland National Park, Tutanning Nature Reserve, Greater Kingston National Park and Perup forest along with 16 re-established populations across Western Australia (Yeatman & Groom, 2012). In 1995, 21 Individuals were reintroduced to the O'Neil area in plot 663. These animals were sourced from the population at Dryandra Woodland National Park. In 2007 the status of the reintroduced population was classified as undetermined (DEC, 2007). This location (according to broad GPS locations) is approximately 8.7 km southwest of the Woylies recorded in the O'Neil East Survey Area.

1.1 Purpose of this Memorandum

The purpose of the technical memorandum, is to identify the extent of the Woylie population within the O'Neil East Survey Area and Study Area.

1.2 Scope and limitations

This scope of work addresses the O'Neil East Survey Area. The scope of work includes:

– Undertake a targeted survey for Woylies via deployment of remote cameras.
– Identify the extent and range of the Woylie population.
– Provide a technical memorandum.
– Data management.

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This technical memorandum has been prepared by GHD for Alcoa of Australia Limited. It is not prepared as, and is not represented to be, a deliverable suitable for reliance by any person for any purpose. It is not intended for circulation or incorporation into other documents. The matters discussed in this memorandum are limited to those specifically detailed in the memorandum and are subject to any limitations or assumptions specially set out.

Accessibility of documents

If this Technical Memorandum is required to be accessible in any other format this can be provided by GHD upon request and at an additional cost if necessary.

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2. Methodology

Targeted remote cameras were deployed within a mixed shrub dampland where GHD identified a Woylie population in June 2023 via three images over two cameras. Based on this information cameras were scattered along the length of the dampland as well as two parallel rows of 10 remote cameras were deployed approximately 100 - 200 m from the edge on the dampland in Jarrah/Marri forest running from east and west. Each camera was deployed approximately 400 m apart. The next round of remote cameras was two rows of parallel cameras deployed approximately one kilometre from the edge of the dampland. Each camera was deployed approximately 400 m apart. For the duration of the survey a total of 71 remote cameras were deployed and remained in situ from 15 to 41 nights. Remote cameras were baited with liquified peanut butter and sardines placed in the field or view. For each remote camera deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded, Table, and displayed in Figure 2, Appendix A.

Data (images/video) was collected to SD card and downloaded in office to database. Images were then screened for fauna species present and identified to species level. Where species level could not be achieved then species group or best determination to highest taxonomic level was made. Species recorded was classified as an event with one event occurring every 24 hours unless individual specimens could be identified (i.e. Chuditch - *Dasyurus geoffroii* with spots or animal sizes or injury marks). By restricting data to one event every 24 hours assumes some level of independence over species.

The targeted field survey was conducted by a team of GHD Zoologists. Led by Senior Zoologist Glen Gaikhorst (20+ years of experience) and accompanied by Senior Zoologist Brad Maryan (20+ years of experience) and Zoologist Dylan Goldspink (2+ years of experience). Glen Gaikhorst and Dylan Goldspink conducted the data analysis.

The survey area for Woylies is in the Northwestern portion of the O'Neil East Survey Area and extends into the Study Area abutting with the Monadnocks Conservation Park, an area heavily baited with 1080 due to the Western Shield Program (DBCA, 2023). The Study Area is located approximately 70 km southeast of the City of Perth.

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Table 1 Targeted Woylie remote camera survey effort

Phase	Camera Number	Habitat type	Latitude	Longitude	Date deployed	Date collected	Nights deployed
Reccie	CAM P3	Mixed shrub dampland	-32.4967	116.3078	28/06/2023	24/07/2023	26
Reccie	CAM 21	Mixed shrub dampland	-32.4954	116.3066	28/06/2023	24/07/2023	26
Phase 1	CAM PRO 4	Mixed shrub dampland	-32.4917	116.3031	21/08/2023	5/09/2023	15
Phase 1	CAM 15	Mixed shrub dampland	-32.4999	116.3088	21/08/2023	5/09/2023	15
Phase 2	CAM HF10	Mixed shrub dampland	-32.4999	116.3088	8/09/2023	18/10/2023	40
Phase 2	CAM HP3	Mixed shrub dampland	-32.5009	116.3100	8/09/2023	18/10/2023	40
Phase 2	CAM PRO 4	Mixed shrub dampland	-32.5004	116.3120	8/09/2023	18/10/2023	40
Phase 2	CAM 5	Jarrah -Marri forest	-32.4952	116.3082	14/09/2023	18/10/2023	34
Phase 2	CAM 16	Jarrah -Marri forest	-32.4964	116.3053	14/09/2023	18/10/2023	34
Phase 2	CAM 28	Jarrah -Marri forest	-32.4994	116.3073	14/09/2023	18/10/2023	34
Phase 2	CAM PRO 4	Jarrah -Marri forest	-32.5029	116.3081	14/09/2023	18/10/2023	34
Phase 2	CAM R59	Jarrah -Marri forest	-32.5067	116.3089	14/09/2023	18/10/2023	34
Phase 2	CAM gero F 17	Jarrah -Marri forest	-32.5099	116.3107	14/09/2023	18/10/2023	34
Phase 2	CAM 53	Jarrah -Marri forest	-32.4977	116.3109	14/09/2023	18/10/2023	34
Phase 2	CAM 19	Jarrah -Marri forest	-32.4994	116.3149	14/09/2023	18/10/2023	34
Phase 2	CAM C42	Jarrah -Marri forest	-32.5023	116.3143	14/09/2023	18/10/2023	34
Phase 2	CAM 20	Jarrah -Marri forest	-32.5036	116.3186	14/09/2023	18/10/2023	34
Phase 3	CAM 19	Mixed shrub dampland	-32.4949	116.3061	19/10/2023	28/11/2023	40
Phase 3	CAM 53	Mixed shrub dampland	-32.4934	116.3055	19/10/2023	28/11/2023	40
Phase 3	CAM W1	Jarrah woodland	-32.4940	116.3032	19/10/2023	28/11/2023	40
Phase 3	CAM W2	Jarrah woodland	-32.4925	116.3012	19/10/2023	28/11/2023	40
Phase 3	CAM W3	Mixed shrub dampland	-32.4916	116.3031	19/10/2023	28/11/2023	40

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Phase	Camera Number	Habitat type	Latitude	Longitude	Date deployed	Date collected	Nights deployed
Phase 3	CAM W4	Mixed shrub dampland	-32.4911	116.3041	19/10/2023	28/11/2023	40
Phase 3	CAM W5	Jarrah woodland	-32.4895	116.3003	19/10/2023	28/11/2023	40
Phase 3	CAM W6	Mixed shrub dampland	-32.4893	116.3029	19/10/2023	28/11/2023	40
Phase 3	CAM W7	Mixed shrub dampland	-32.4891	116.3036	19/10/2023	28/11/2023	40
Phase 3	CAM W8	Jarrah woodland	-32.4869	116.2997	19/10/2023	28/11/2023	40
Phase 3	CAM W9	Mixed shrub dampland	-32.4862	116.3016	19/10/2023	28/11/2023	40
Phase 3	CAM W10	Jarrah woodland	-32.4842	116.2971	19/10/2023	28/11/2023	40
Phase 3	CAM 28	Mixed shrub dampland	-32.4949	116.3068	19/10/2023	28/11/2023	40
Phase 3	CAM 20	Jarrah -Marri forest	-32.4843	116.3019	19/10/2023	28/11/2023	40
Phase 3	CAM 17	Minor drainage line	-32.4802	116.3026	19/10/2023	29/11/2023	41
Phase 3	CAM P4	Minor drainage line	-32.4777	116.3003	19/10/2023	29/11/2023	41
Phase 3	CAM 16	Minor drainage line	-32.4823	116.3052	19/10/2023	29/11/2023	41
Phase 3	CAM 5	Minor drainage line	-32.4823	116.3089	19/10/2023	29/11/2023	41
Phase 3	CAM R59	Minor drainage line	-32.4797	116.3114	19/10/2023	29/11/2023	41
Phase 3	CAM C (42)	Minor drainage line	-32.4797	116.3165	19/10/2023	29/11/2023	41
Phase 3	CAM 15B	Mixed shrub dampland	-32.4924	116.3056	19/10/2023	28/11/2023	40
Phase 3	CAM P5	Mixed shrub dampland	-32.4892	116.3047	19/10/2023	28/11/2023	40
Phase 3	CAM HF10	Jarrah -Marri forest	-32.4931	116.3078	20/10/2023	28/11/2023	39
Phase 3	CAM R41	Mixed shrub dampland	-32.4909	116.3048	20/10/2023	28/11/2023	39
Phase 3	CAM W13	Jarrah -Marri forest	-32.4886	116.3069	20/10/2023	28/11/2023	39
Phase 3	CAM W12	Jarrah -Marri forest	-32.4864	116.3058	20/10/2023	29/11/2023	40
Phase 3	CAM W11	Sheoak and jarrah woodland	-32.4837	116.3053	20/10/2023	29/11/2023	40
Phase 3	CAM HP2	Jarrah -Marri forest	-32.4822	116.2943	20/10/2023	28/11/2023	39
Phase 3	CAM W15	Jarrah -Marri forest	-32.4776	116.2928	20/10/2023	28/11/2023	39
Phase 3	CAM SW2	Jarrah -Marri forest	-32.4740	116.2922	20/10/2023	28/11/2023	39

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Phase	Camera Number	Habitat type	Latitude	Longitude	Date deployed	Date collected	Nights deployed
Phase 3	CAM 12	Jarrah -Marri forest	-32.4735	116.2954	20/10/2023	28/11/2023	39
Phase 3	CAM R56	Wandoo woodland	-32.4763	116.2968	20/10/2023	28/11/2023	39
Phase 3	CAM YALGOO	Wandoo woodland	-32.4808	116.2962	20/10/2023	28/11/2023	39
Phase 3	CAM R57	Jarrah -Marri forest	-32.4805	116.2990	20/10/2023	28/11/2023	39
Single Target	CAM 19	Jarrah -Marri forest	-32.4785	116.3139	29/11/2023	18/12/2023	19
Single Target	CAM 28	Jarrah -Marri forest	-32.4749	116.3134	29/11/2023	18/12/2023	19
Single Target	CAM W6	Jarrah -Marri forest	-32.4821	116.3136	29/11/2023	18/12/2023	19
Single Target	CAM R57	Jarrah -Marri forest	-32.4854	116.3141	29/11/2023	18/12/2023	19
Single Target	CAM W3	Sheoak woodland	-32.4892	116.3133	29/11/2023	18/12/2023	19
Single Target	CAM C42	Jarrah -Marri forest	-32.4922	116.3160	30/11/2023	18/12/2023	18
Single Target	CAM W7	Jarrah -Marri forest	-32.5045	116.3260	30/11/2023	18/12/2023	18
Single Target	CAM W1	Jarrah -Marri forest	-32.5006	116.3254	30/11/2023	18/12/2023	18
Single Target	CAM W13	Jarrah -Marri forest	-32.4973	116.3239	30/11/2023	18/12/2023	18
Single Target	CAM HP2	Jarrah -Marri forest	-32.4945	116.3209	30/11/2023	18/12/2023	18
Single Target	CAM 16	Jarrah -Marri forest	-32.5005	116.2970	30/11/2023	19/12/2023	19
Single Target	CAM 5	Jarrah -Marri forest	-32.4979	116.2944	30/11/2023	19/12/2023	19
Single Target	CAM 12	Jarrah -Marri forest	-32.4944	116.2926	30/11/2023	19/12/2023	19
Single Target	CAM 20	Eucalyptus woodland	-32.4909	116.2917	30/11/2023	19/12/2023	19
Single Target	CAM W10	Jarrah -Marri forest	-32.4876	116.2901	30/11/2023	19/12/2023	19
Single Target	CAM R59	Jarrah -Marri forest	-32.5034	116.2995	30/11/2023	18/12/2023	18
Single Target	CAM 15B	Jarrah -Marri forest	-32.5068	116.3007	30/11/2023	18/12/2023	18
Single Target	CAM 17	Jarrah -Marri forest	-32.5104	116.3018	30/11/2023	18/12/2023	18
Single Target	CAM W4	Jarrah -Marri forest	-32.5138	116.3035	30/11/2023	18/12/2023	18
Single Target	CAM W9	Jarrah -Marri forest	-32.5173	116.3029	30/11/2023	18/12/2023	18
Total effort							2273

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3. Survey results

Woylies were recorded at abundance during the remote camera trapping period within the mixed shrub dampland and fringing Jarrah Marri Forest. The remote cameras recorded a total of 49 events where Woylies were present, Table 3. Woylies were mainly observed within the Mixed shrub dampland where they were recorded on nine cameras with a total of 35 camera events. Four cameras recording Woylies in the fringing Jarrah Marri forest, with 14 camera events, Table 2. Figure 3, Appendix A, shows the locations where Woylies were recorded.

Woylies were observed traveling up to approximately 200 m from the edge of the dampland into Jarrah Marri Forest. Camera PRO 4 recorded a single Woylie at 185 m from the edge of the dampland and Camera HF10 recorded four Woylie events at a distance of 160 m from the edge of the dampland, Table 2. One Woylie was recorded on Cam 16 carrying nest materials displaying the value of the Jarrah Marri forest for foraging for food and nest material, Plate 2 Woylie captured carrying nest material. Additional observations were made between the interactions between species. On numerous occasions Woylie/ Quokka interactions were recorded with Quokka appear to be grooming (in one event, Plate 3 but mostly trying to "monster" a Woylie. In response the Woylie is observed lying in a submissive or defensive type of response using its legs to defend itself, Plate 4.

Table 2 Woylie events within critical habitat and distance from critical habitat

Phase	Camera	Habitat	Latitude	Longitude	No. of events	Distance from dampland (m)
Reccie	CAM P3	Mixed shrub dampland	-32.4967	116.3078	4	0
Reccie	CAM 21	Mixed shrub dampland	-32.4954	116.3066	2	0
Phase 1	CAM 15	Mixed shrub dampland	-32.4999	116.3088	1	0
Phase 2	CAM 16	Jarrah -Marri forest	-32.4964	116.3053	7	113
Phase 2	CAM HF10	Mixed shrub dampland	-32.4999	116.3088	4	0
Phase 2	CAM 53	Jarrah -Marri forest	-32.4977	116.3109	2	128
Phase 2	CAM PRO 4	Jarrah -Marri forest	-32.5029	116.3081	1	185
Phase 3	CAM 19	Mixed shrub dampland	-32.4949	116.3061	13	0
Phase 3	CAM HF10*	Jarrah -Marri forest	-32.4931	116.3078	4	160
Phase 3	CAM W3	Mixed shrub dampland	-32.4916	116.3031	3	0
Phase 3	CAM W6	Mixed shrub dampland	-32.4893	116.3029	3	0
Phase 3	CAM W7	Mixed shrub dampland	-32.4891	116.3036	3	0
Phase 3	CAM 15B	Mixed shrub dampland	-32.4924	116.3056	2	0

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Plate 1 Woylie captured via remote camera



Plate 2 Woylie captured carrying nest material

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Plate 3 Quokka 'grooming' Woylie



Plate 4 Woylie displaying defensive type response towards Quokka

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Five non-targeted conservation significant species were identified during the survey: Chuditch (*Dasyurus geoffroii*, VU), Quokka (*Setonix brachyurus*, VU), Southwestern Brush-tailed Phascogale (*phascogale tapoatafa wambenger*, CD), Western Brush Wallaby (*Notamacropus irma*, P4) and Quenda (*Isoodon fusciventer*, P4).

Introduced predators, the Red Fox, *Vulpes vulpes*, and Feral Cat, *Felis catus*, were minimal within the Survey Area with no signs of the Red Fox and very few camera events which showed feral cats. Introduced herbivores, Feral Pig, *Sus scrofa*, had minimal camera events but extensive feral pig activity was observed when deploying the cameras.

Table 3 Woylie camera events

Phase	Date	Habitat	Latitude	Longitude	Number of individuals
Reccie	28/06/2023	Mixed shrub dampland	-32.4967	116.3078	1
Reccie	29/06/2023	Mixed shrub dampland	-32.4954	116.3066	1
Reccie	29/06/2023	Mixed shrub dampland	-32.4967	116.3078	1
Reccie	30/06/2023	Mixed shrub dampland	-32.4954	116.3066	1
Reccie	2/07/2023	Mixed shrub dampland	-32.4967	116.3078	1
Reccie	4/07/2023	Mixed shrub dampland	-32.4967	116.3078	1
Phase 1	20/08/2023	Mixed shrub dampland	-32.4999	116.3088	1
Phase 2	10/09/2023	Mixed shrub dampland	-32.4999	116.3088	1
Phase 2	10/09/2023	Jarrah -Marri forest	-32.5029	116.3081	1
Phase 2	11/09/2023	Mixed shrub dampland	-32.4999	116.3088	1
Phase 2	15/09/2023	Mixed shrub dampland	-32.4999	116.3088	1
Phase 2	19/09/2023	Jarrah -Marri forest	-32.4964	116.3053	1
Phase 2	19/09/2023	Jarrah -Marri forest	-32.4964	116.3053	1
Phase 2	19/09/2023	Jarrah -Marri forest	-32.4977	116.3109	1
Phase 2	20/09/2023	Mixed shrub dampland	-32.4999	116.3088	1
Phase 2	20/09/2023	Jarrah -Marri forest	-32.4976	116.3109	1
Phase 2	22/09/2023	Jarrah -Marri forest	-32.4964	116.3053	1
Phase 2	22/09/2023	Jarrah -Marri forest	-32.4964	116.3053	1
Phase 2	24/09/2023	Jarrah -Marri forest	-32.4964	116.3053	1
Phase 2	3/10/2023	Jarrah -Marri forest	-32.4964	116.3053	1
Phase 2	5/10/2023	Jarrah -Marri forest	-32.4964	116.3053	1
Phase 3	19/10/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	19/10/2023	Jarrah -Marri forest	-32.4931	116.3078	1
Phase 3	19/10/2023	Mixed shrub dampland	-32.4916	116.3031	1
Phase 3	20/10/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	20/10/2023	Mixed shrub dampland	-32.4924	116.3056	1
Phase 3	20/10/2023	Mixed shrub dampland	-32.4916	116.3031	1
Phase 3	21/10/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	21/10/2023	Mixed shrub dampland	-32.4891	116.3036	1
Phase 3	21/10/2023	Jarrah -Marri forest	-32.4931	116.3078	1
Phase 3	22/10/2023	Mixed shrub dampland	-32.4949	116.3061	1

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Phase	Date	Habitat	Latitude	Longitude	Number of individuals
Phase 3	22/10/2023	Mixed shrub dampland	-32.4893	116.3029	1
Phase 3	22/10/2023	Mixed shrub dampland	-32.4891	116.3036	1
Phase 3	22/10/2023	Mixed shrub dampland	-32.4924	116.3056	1
Phase 3	23/10/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	23/10/2023	Mixed shrub dampland	-32.4891	116.3036	1
Phase 3	23/10/2023	Jarrah -Marri forest	-32.4931	116.3078	1
Phase 3	24/10/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	26/10/2023	Mixed shrub dampland	-32.4893	116.3029	1
Phase 3	26/10/2023	Mixed shrub dampland	-32.4916	116.3031	1
Phase 3	28/10/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	29/10/2023	Mixed shrub dampland	-32.4893	116.3029	1
Phase 3	29/10/2023	Jarrah -Marri forest	-32.4931	116.3078	1
Phase 3	1/11/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	8/11/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	25/11/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	26/11/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	27/11/2023	Mixed shrub dampland	-32.4949	116.3061	1
Phase 3	29/11/2023	Mixed shrub dampland	-32.4949	116.3061	1
Total camera events					49

**This is the number of events recorded on camera and doesn't imply number of individuals

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4. Conclusion

Through the targeted camera trapping survey, a population of Woylies has been identified and appears concentrated in an area of the Mixed shrub dampland with 35 Woylie observations within the dampland and 14 events of the Woylie venturing into the skirting Jarrah Marri forest. No animals were recorded up to 1 km from the dampland. The core area of the dampland is approximately 75 ha with a further 20 ha of supportive Jarrah Marri forest habitat (within 200 m of adjoining forest) surrounding. The dampland (where the Woylie were recorded) is long unburnt surrounded by more recent burn scars in both the dampland and Jarrah Marri Forrest. The burn scar is particularly prominent north of the Woylie's current use area with little habitat and ground cover remaining in these areas.

It is recognised that remote camera data is extremely difficult to interpret population size within an area unless individuals can be isolated in data i.e. such as Chuditch with representative spot pattern. In this case Woylie cannot be distinguished individually therefore interpretation of data is based on presumption looking at location and timing of records. It has been previously observed that Woylies can travel distances of up to 1 km within an individuals home range (Yeatman and Wayne 2015). Based on this and the data we have collected we assume approximately 3 to 6 individuals were recorded.

Numerous studies have demonstrated a high variation of home range sizes for the Woylie with 8.1 ha (Chistensen 1977), 29 ha (Sampson 1971), 14.6 ha (Wayne et al 2013) and 65 ha (Yeatman and Wayne 2015) at a stocking rate of approximately 1 animal per hectare for low populations (Yeatman and Wayne 2015) and over 2 individual per hectare for higher populations (Wayne et al 2013) recorded. These numbers vary due to a number of environmental conditions and factors. In this instance, a high stocking rate is not expected. While the home range size is unknown, the area of habitation currently being utilised is approximately 75 ha.

The most evident threating process to this Woylie population is fire and feral species. A large fire could cause catastrophic habitat destruction to this restricted population of Woylies as they occupy an area of approximately 75 ha. Feral pigs and cats are active within the area, providing competition for food and predation to the Woylies whilst pigs also being destructive when they forage affecting the landscape.

A total of five other conservation species were recorded: Chuditch, Quokka, Southwestern Brush-tailed Phascogale, Western Brush Wallaby and Quenda.

Regards

Glen Gaikhorst
Technical Director - Zoology

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References

Christensen, P. E. S. (1977). The biology of Bettongia penicillata Gray, 1837 and Macropus eugenii Desmarest, 1804 in relation to fire. Ph.D. Thesis, The University of Western Australia, Perth.

Department of Biodiversity, Conservation and Attractions (DBCA) 2023. Western Shield fox and feral cat baiting locations. Retrieved 17/01/2024, from https://www.dbca.wa.gov.au/management/threat-management/invasive-animals/western-shield/western-shield-fox-and-feral-cat-baiting-locations

Department of Environment and Conservation (DEC), 2007. Nomination of a Western Australian species for listing as threated, changed of status or delisting Department of Environment and Conservation, Perth, WA.

Menkhorst, P & Knight, F 2011, *A Field Guide to Mammals of Australia*, third edition, South Melbourne, Australia, Oxford University Press.

Sampson, J. C. (1971). The Biology of Bettongia penicillata Gray, 1837. Ph. D. Thesis, The University of Western Australia, Perth.

Wayne, A. F., Maxwell, M., Ward, C. G., Vellios, C. V., Ward, B. G., Liddelow, G. L., Wilson, I., Wayne, J., and Williams, M. (2013a). Importance of getting the numbers right: quantifying the rapid and substantial decline of an abundant marsupial, Bettongia penicillata. Wildlife Research 40, 169–183. doi:10.1071/WR12115

Yeatman, G.J. and Groom, C.J. (2012*). National Recovery Plan for the woylie Bettongia penicillate ogilbyi.* Wildlife management Program No. 51. Department of Environment and Conservation, Perth.

Yeatman, G.J. and Wayne, A.F. 2015. Seasonal home range and habitat use of a critically endangered marsupial (Bettongia penicillata ogilbyi) inside and outside a predator-proof sanctuary. CSIRO Publishing Australian Mammalogy, 2015, 37, 157–163. http://dx.doi.org/10.1071/AM14022

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Appendices

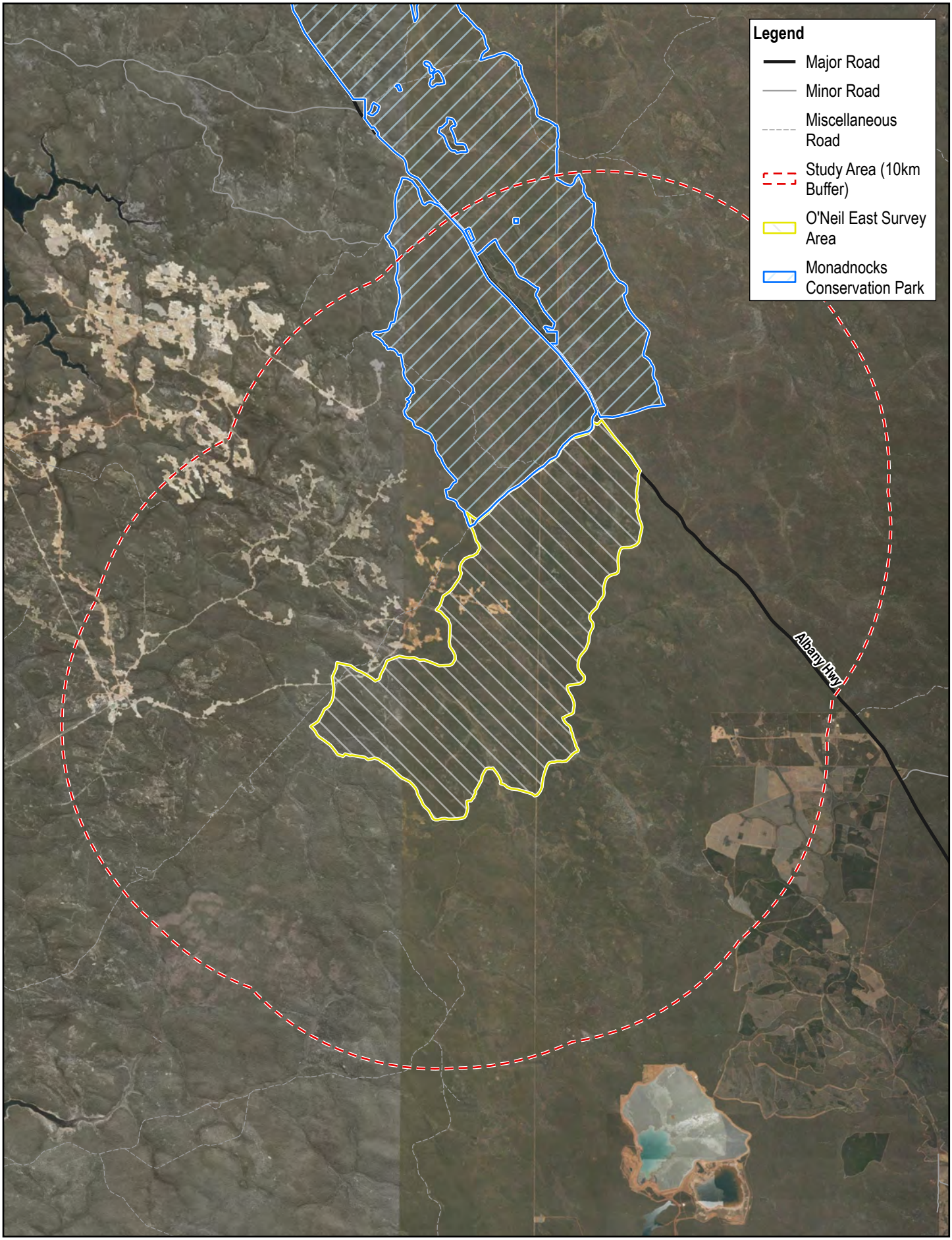
Appendix A

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Figure 1 Study Area

Figure 2 Remote Camera Locations

Figure 3 Woylie Observations Locations



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Kilometers

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

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Terrestrial Fauna Asessment Holyoake East

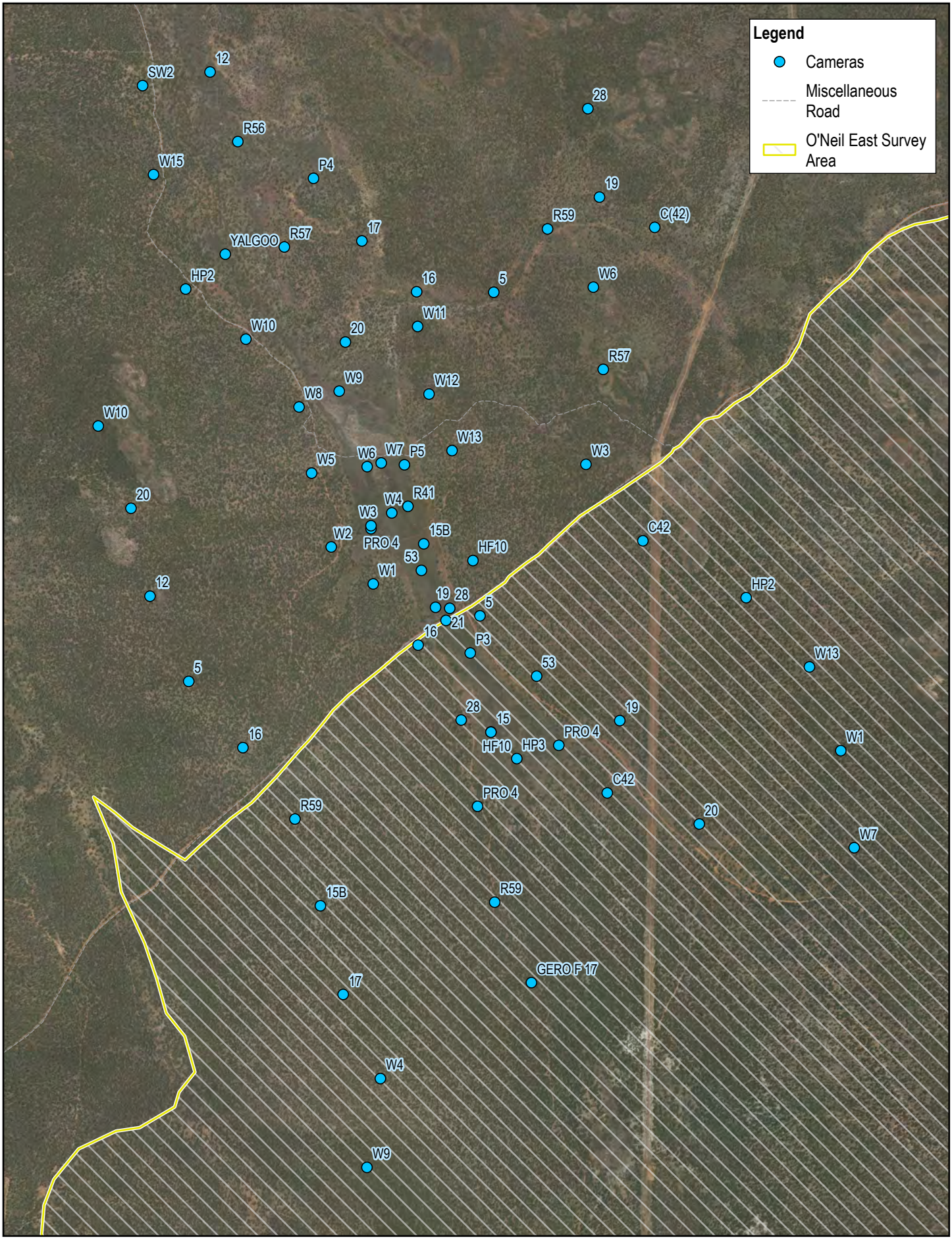
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Revision No. **A**
Date **21/02/2024**

O'Neil East Study Area

FIGURE 1

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Data source: World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
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World Imagery: Earthstar Geographics. Created by: rbrown3



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Map Projection: Mercator Auxiliary Sphere
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Grid: WGS 1984 Web Mercator Auxiliary Sphere

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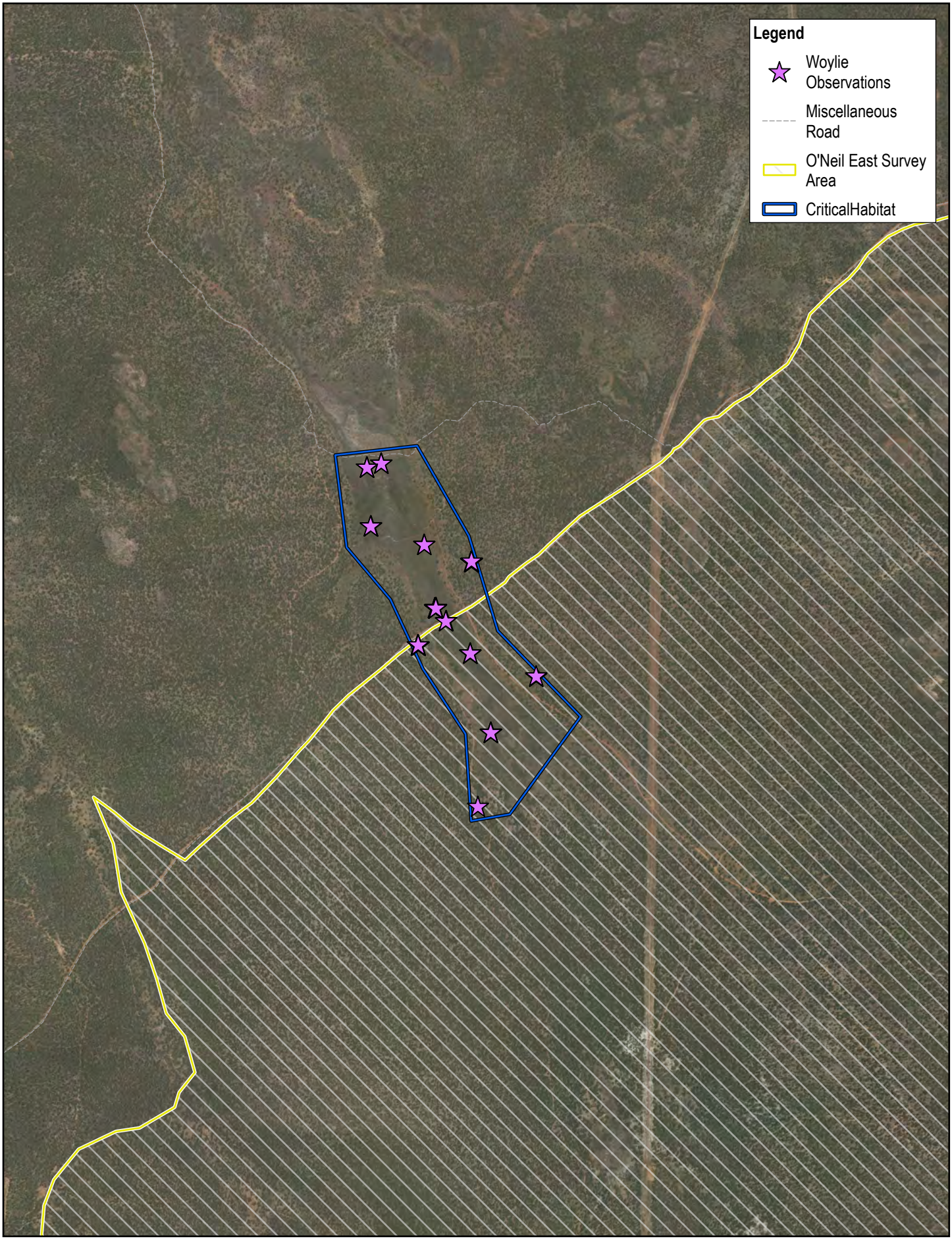
Project No. **12565572**
Revision No. **B**
Date **21/02/2024**

Remote Camera Locations

FIGURE 2

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Meters

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

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Terrestrial Fauna Assessment Holyoake East

Project No. **12565572**
Revision No. **A**
Date **21/02/2024**

Woylie Observation Locations

FIGURE 3

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Project name		Alcoa Holyoake Environmental Assessments					
Document title		O'Neil East Targeted Woylie Assessment |					
Project number		12565572					
File name		12565572-00000-CI-MEM-002_1					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S3	B	G. Gaikhorst, D. Goldspink	R. Browne-Cooper	On file	M. Brook	On file	
S3	A	G. Gaikhorst	R. Browne-Cooper	On file	M. Brook	On file	
S4	Rev 1	G. Gaikhorst	R. Browne-Cooper		M. Brook		15/03/24

GHD Pty Ltd | ABN 39 008 488 373
Contact: Glen Gaikhorst, Technical Director - Zoology | GHD
999 Hay Street, Level 10
Perth, WA 6000, Australia
T +61 42 1959529 | **F** +61 42 1959529

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Terrestrial Fauna Assessment

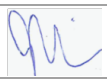
O’Neil Mine Development

Alcoa of Australia Limited

14 May 2024

→ **The Power of Commitment**



Project name		Alcoa Holyoake Environmental Assessments					
Document title		Terrestrial Fauna Assessment | O'Neil Mine Development					
Project number		12565572					
File name		12565572-00000-EN-RPT-015_1					
Status Code	Revision	Author	Reviewer		Approved for issue		
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[Status code]							
[Status code]							

GHD Pty Ltd | ABN 39 008 488 373
999 Hay Street, Level 10
Perth, Western Australia 6000, Australia
T +61 8 6222 8222 | **F** +61 8 6222 8555 | **E** permail@ghd.com | **ghd.com**

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Executive Summary

The O'Neil survey area is located within the Peel region, Western Australia (WA). Approximately 27 kilometres (km) south east of Jarrahdale town site in the south-west of Western Australia. The Survey Area lies in State Forest and covers an area of approximately 12719.25 hectares (ha), Shown in Figure 1 (Appendix A). This report also includes a 10 km area beyond the Survey Area which defines the Study Area.

The purpose of this report is to describe the terrestrial fauna attributes of the Survey Area via systematic and targeted methods with specific focus on significant fauna of local and regional occurrence occurring within the Survey Area.

Scope of works

This scope of work addresses the O'Neil mining region and O'Neil Infrastructure (including Lake Banksiadale).

The scope of work includes:

– Complete a desktop assessment and literature review of the Study Area.
– Undertake a basic fauna survey to determine the suite of fauna species that occur within the Survey Area including undertaking fauna habitat mapping
– Undertake a targeted fauna survey for all locally and regionally relevant significant vertebrate fauna species.
– Provide a fauna assessment report and data detailing the methods and findings.

Methods

Methodology involved an initial comprehensive desktop assessment to compile fauna database records and reports and understands all the local fauna occurrence for consideration. The desktop assessment informed on the field survey to target relevant significant fauna using specialised detection methods over several trapping phases. Seven survey events were undertaken by GHD Staff between June 2023 to January 2024.

Targeted survey methods included: Fauna habitat assessments; Pitfall and funnel traps; Elliot box traps; Remote cameras; Acoustic bat and bird call recorders; Diurnal and nocturnal searches; opportunistic observations; comprehensive assessment of Black Cockatoo habitat quality and quantity.

Finding

Nine broad fauna habitat types were identified during the field survey and via recent vegetation mapping: Jarrah – Marri forest, Wandoo woodland, Mixed shrub dampland, Bullich forest, Blackbutt forest, Granite Outcrop, Water bodies/reservoirs, Rehabilitation areas, and Cleared areas.

The combined fauna surveys (Reconnaissance to Camera collection) recorded a total of 121 vertebrate fauna species utilising the Survey Area, including 19 mammals (four introduced), 68 Birds, 27 reptiles and seven frogs.

Twelve significant fauna species were recorded within the survey area. This includes:

– Baudin's Black Cockatoo (*Zanda baudinii*) listed as Endangered under the BC Act and the EPBC Act.
– Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under the BC Act EPBC Act.
– Carnaby's Black Cockatoo (*Zanda latirostris*) listed as Endangered under the BC and EPBC Act.
– Chuditch (*Dasyurus geoffroii*) listed as Vulnerable under the BC Act and the EPBC Act.
– Quokka (*Setonix brachyurus*) listed as Vulnerable under the EPBC Act and BC Act
– Carter's Freshwater Mussel (*Westralunio carteri*) listed as Vulnerable under the EPBC Act and BC Act
– Rakali (*Hydromys chrysogaster*) Listed as Priority 4 by DBCA
– Western Bush Wallaby (*Notamacropus irma*) listed as Priority 4 by the DBCA.
– Dell's Skink (*Ctenotus delli*) listed as Priority 4 by the DBCA
– Quenda (*Isoodon fusciventer*) listed as Priority 4 by the DBCA.
– Masked Owls (*Tyto novaehollandiae novaehollandiae)* listed as Priority 3 by the DBCA

– The Western False Pipistrelle (*Falsistrellus mackenziei*) listed as Priority 4 by the DBCA

The Carter's Freshwater Mussel and Rakali were only recorded in the vicinity of Lake Banksiadale with the remainder of the survey area unsuitable for these species due to no habitat being present.

Five additional significant fauna species were not recorded but are considered likely to occur based on the desktop and field assessment. These include:

– Woylie (*Bettongia penicillata ogilbyi*) listed as Critically endangered under BC Act and Endangered under EPBC Act
– Numbat (*Myrmecobius fasciatus*) listed as Endangered under BC Act and EPBC Act
– Peregrine Falcon (*Falco peregrinus macropus*) listed as Specially protected fauna by DBCA
– Southwestern Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) Conservation Dependent under the BC Act
– Sothern Death Adder (*Acanthophis antarcticus*) listed as Priority 3 by the DBCA

The Black Cockatoo habitat assessment results concluded that:

– Breeding habitat is extensive across the Survey Area and three known nesting trees were confirmed within the Jarrah-Marri forest habitat.
– Foraging habitat is extensive and of high quality throughout the Jarrah-Marri forest, other forest and woodland habitats are considered moderate foraging quality with relatively low density of primary food plant species.

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Appendix B	Relevant legislation, background information and conservation codes
Appendix C	Desktop Searches

Appendix D Fauna Field Data
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Acronyms

DCCEEW	The Department of Climate Change, Energy the Environment and Water
DAWE	The Department of Agriculture Water and Energy
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter Breast Height
DE	Development Envelope
DEE	Department of the Environment and Energy
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EMRC	Environmental Management and Research Consultants
EPA	Environmental Protection Authority
EPBC	Environment Protection Biodiversity Conservation
EP	Environmental Protection
ERD	Environmental Review Document
ESD	Environmental Scoping Document
FRTBC	Forest Red-tail Black Cockatoo
GoWA	Government of Western Australia
IBSA	Index of Biodiversity Surveys for Assessments
LOO	Likelihood of Occurrence
LTFMP	Long Term Fauna Monitoring Program
MNES	Matters of National Environmental Significance
PMST	Protected Matters Search Tool
SM	Song Meter
SOP	Standard Operating Procedure
SRE	Short-Range Endemic

1. Introduction

1.1 Purpose of this report

The Purpose of this report is to describe the terrestrial fauna attributes of the O'Neil Survey area collected via systematic and targeted methods with focus on conservation significant species within the area.

1.2 Survey Area location

The O'Neil survey project is located in the Peel region, Western Australia, approximately 27 kilometres (km) east from the township of Jarrahdale, Western Australia (WA). The Survey Area covers approximately 12719.25 hectares (ha) of State Forest, Shown in Figure 1, Appendix A. This report also includes a 10 km area beyond the Survey Area which is defined as the desktop Study Area.

The O'Neil Survey Area is a collection of smaller areas. These areas are Contingency Area A, Contingency Area A – Haul Road Corridor (McCoy), Contingency Area B – Haul Road Corridor (McCoy) and Additional Haul Road. This collective of areas is known as the O'Neil Survey area. During the surveys O'Neil Infrastructure (including Lake Banksiadale) was also sampled however this is no longer part of the O'Neil mine area.

1.3 Scope and limitations

This scope of works addresses the O'Neil mining region, one of four mining regions part of the project. The scope of work includes:

- Complete a desktop assessment and literature review of the Study Area
- Undertake a reconnaissance survey to determine approach
- Undertake a basic fauna survey to determine the suite of fauna species that occur within the Survey Area including undertaking fauna habitat mapping
- Undertake a targeted fauna survey of significant fauna species focusing on the Chuditch, Quokka, South-west Brush-tailed Phascogale, Quenda, Western Brush Wallaby, Western Ringtail Possum, Numbat, Western False Pipistrelle, Carnaby's Black Cockatoo, Baudin's Black Cockatoo, Forest Red-tailed Black Cockatoo, Masked Owl (southern), Southern Death Adder and Dell's Skink.
- Provide a fauna assessment report (this document) detailing the methods and results of the assessment
- Provide a survey data package consistent with the Index of Biodiversity Surveys for Assessment (IBSA)

1.4 Limitations and assumptions

This report: has been prepared by GHD for Alcoa of Australia Limited and may only be used and relied on by Alcoa of Australia Limited for the purpose agreed between GHD and Alcoa of Australia Limited as set out in section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than Alcoa of Australia Limited arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section(s) 2.6.2 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

1.5 Terminology

Common terminologies are described below in Table 1.

Table 1 Terminology and definitions

Term (Abbreviation)	Definition/Use
Alcoa of Australia Limited	Proponent of the Proposal and Client of GHD for this Survey
GHD Pty Ltd (GHD)	Consultant engaged by Alcoa to prepare the environmental approvals documentation and supporting technical studies.
Survey Area	The area in which Alcoa propose for future mining development activities that will be assessed by regulators
Study Area	The Survey Area with a 10 km buffer used to define the limits of the desktop investigations.
Basic Fauna Survey	As per EPA 2020 describing the type of survey required, replaces wording from EPA 2016 for Level 1 assessment.
Targeted Fauna Survey	As per EPA 2020 describing the type of survey required, refers to undertaking targeted assessments for specific fauna species

1.6 Relevant legislation, conservation codes and background information

An overview of key legislation and guidelines, conservation codes and background information relevant to this fauna survey are provided in Appendix B.

2. Methods

2.1 Desktop assessment

Prior to the field survey a desktop assessment of the study area to identify environmental values and constraints was undertaken by viewing geographic information system (GIS) spatial files largely sourced from Government of Western Australia (GoWA) (2023a) and reviewing publicly available, government managed databases. The information sources utilised in this assessment are presented below in Table 2.

Table 2 Desktop Information Sources

Aspect	Information sources/Government Dataset
Climate	Bureau of Meteorology (BoM) Climate Data Online (2023)
Regional biogeography	Interim Biogeographic Regionalisation for Australia (IBRA) (DAWE 2012).
Geology, land systems and soils	1:500 000 State linear structures (DMIRS-015) (DMIRS 2018) Soil Landscape Mapping – Systems (DPIRD-064) (Geoscience 2019)
Environmentally Sensitive Areas (ESAs)	Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
Conservation reserves and areas	Department of Biodiversity, Conservation and Attractions (DBCA) – Legislated Lands and Waters (DBCA-011) DBCA – Lands of Interest (DBCA-012)
Hydrology	Public Drinking Water Source Areas (DWER- 033) *Rights in Water and Irrigation Act 1914* (RIWI Act), Surface Water Areas and Irrigation Districts (DWER-037) RIWI Act, Ground Water Areas (DWER-034) RIWI Act, Rivers (DWER – 036) Waterways Conservation Act Management Areas (DWER-072) Ramsar Sites (DBCA-010) Directory of important wetlands in Australia- Western Australia (DBCA-045)
Vegetation	Pre- European vegetation (DPIRD 2020) (DPIRD-006) Native Vegetation Extent (DPIRD 2020) (DPIRD-005) Vegetation Mapping (Mattiske 2024)
Significant fauna	Department of Agriculture, Water and the Environment (DCCEEW 2023) Protected Matters Search Tool (PMST) database to identify fauna species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) potentially occurring within the Study Area (Appendix C) DBCA *NatureMap* database (DBCA 2007–) (Appendix C) DBCA Threatened fauna database (DBCA 2021)
Literature review	31 fauna papers, reports, internal data of Alcoa as presented in Table 21.

The fauna desktop assessment included a review of:

– DCCEEW PMST database to identify fauna species listed under the EPBC Act potentially occurring within the desktop study area (refer Appendix C, Desktop Searches)

– The DBCA Threatened and Priority Fauna database for the Study Area
  - The DBCA *NatureMap* (DBCA 2007–) database for fauna species previously recorded within the study area

– *NatureMap* Species Report. This database comprises the following composite datasets:
  - Atlas of Australian birds
  - Bird data -Birdlife Australia
  - Fauna Survey Returns Database (New)
  - WA Museum (WAM) databases (mammals, birds, reptiles)

– Aerial photography, geology/soils, land systems and hydrology information to provide background information on the variability of the environment and likely habitat types present.
    - A fauna likelihood of occurrence assessment (Appendix D, Fauna Likelihood of occurrence assessment of significant species relevant to the Survey Area)

2.1.1 Previous studies

A literature review was performed on previous terrestrial fauna studies considered relevant to the current region, to inform the basis of the fauna surveys. The review focusses on all locally and regionally relevant significant species recorded during surveys on Alcoa mining lease and surrounding areas. A review of 31 reports that are considered relevant to the current study is provided in Table 21.

2.2 Field survey

2.2.1 Survey timing and personnel

The terrestrial fauna assessment comprised a multi-phase field program comprising a reconnaissance survey, a camera rotation, three targeted surveys with basic fauna assessment, single targeted survey for Additional Haul Road and a final site visit for remote camera collection. All phases are detailed below in Table 3. The field survey was led by Technical Director - Zoology Glen Gaikhorst and assisted by other GHD Zoologists. The experience of these staff members is presented in Table 4.

Table 3 Field Survey timing type and details

Phase/Survey Type	Date	Tasks	Personnel
Reconnaissance Survey	27/06/2023 – 30/06/2023	Preliminary habitat assessment, assessment of access tracks, target significant species remote camera deployment, selection of target trapping sites, opportunistic fauna observations	Glen Gaikhorst Lucas Hurst
Remote Camera Rotation	24/07/2023 – 28/07/2023	Remote camera rotation	Glen Gaikhorst Jack Eastwood
Phase 1 Targeted and Basic Survey	15/08/2023 – 25/08/2023	Install Trapping sites, targeted fauna remote equipment collection and redeployment (camera, bird acoustic, bat detector), significant fauna target searches and habitat mapping, black cockatoo assessment, basic fauna survey/opportunistic species inventory observations	Glen Gaikhorst Robert Browne-Cooper Brad Maryan Sarah Flemington Lucas Hurst Jack Eastwood Dylan Goldspink Kiara De Landgrafft
Phase 2 Targeted and Basic Survey	6/09/2023 – 15/09/2023	Run target trapping sites, targeted fauna remote equipment collection and redeployment (camera, bird acoustic, bat detector), significant fauna target searches and habitat mapping, black cockatoo assessment, basic fauna survey/opportunistic species inventory observations.	Glen Gaikhorst Jack Eastwood Dylan Goldspink Sam Patton
Phase 3 Targeted and Basic Survey	17/10/2023 – 26/10/2023	Run targeted trapping sites, remote camera collection and redeployment, significant fauna target searches and habitat mapping, black cockatoo assessment, basic fauna survey/opportunistic species inventory observations.	Glen Gaikhorst Brad Maryan Lucas Hurst Dylan Goldspink Kiara De Landgrafft Sam Patton
Single Target Additional Haul Road	14/12/2023 – 15/12/2023	Black Cockatoo assessment. Deployment of remote devise (cameras, bat and bird acoustic). Basic fauna assessment and basic flora assessment.	Brad Maryan Sarah Flemington

Phase/Survey Type	Date	Tasks	Personnel
			Dylan Goldspink Sam Patton
Remote Gear Collection	29/01/2024	Remote camera collection	Brad Maryan Dylan Goldspink

Table 4 Personnel experience

Name	Years of experience	Role	Phase
Glen Gaikhorst	25+	Technical Director - Zoology and field lead	Reconnaissance, Camera rotation, Phase 1, Phase 2 and Phase 3.
Robert Browne-Cooper	25+	Senior Zoologist	Phase 1
Brad Maryan	25+	Senior Zoologist	Phase 1, Phase 3, Single Target & Camera Collection
Sarah Flemington	5+	Ecologist	Phase 1 & Single Target
Lucas Hurst	5+	Zoologist	Reconnaissance survey, Phase 1 & Phase 3
Jack Eastwood	3+	Zoologist	Camera Rotation, Phase 1 & Phase 2
Dylan Goldspink	2+	Graduate Zoologist	Phase 1, Phase 2, Phase 3, Single Target & Camera Collection.
Kiara De Landgrafft	2+	Environmental Scientist	Phase 1 & Phase 3
Sam Patton	1+	Ecology Field Hand	Phase 2, Phase 3 and Single Target.

2.2.2 Guiding documents

The survey method and data collection that GHD employed was conducted in accordance with:

– EPA Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment (2020)
– DEHWA (2010a) Survey Guidelines for Australia's Threatened Bats
– DEWHA (2010b) Survey Guidelines for Australia's Threatened Mammals
– DEWHA (2010c) Survey Guidelines for Australia's Threatened Reptiles
– National Heritage Trust (NHT) National manual for the Malleefowl monitoring system standards (2007)
– Other published literature, including recent advances in species habitat and survey techniques.

2.2.3 Permits and animal ethics

A Regulation 27 Licence for Fauna Taking (Biological Assessment) was obtained from DBCA prior to undertaking the fauna survey (Licence Number: BA27000881). An Authorisation to take or disturb threatened species was also obtained (Authorisation number: TFA 2324-0025).

Fauna survey activities, specifically trapping, capture and animal handling, was undertaken in accordance with DBCA Standard Operating Procedures (SOPs) which were required to be followed under the conditions of GHD's fauna trapping permit. At the time of survey, compliance with these SOPs was accepted by DBCA as evidence of ethical treatment of animals.

This project was approved by GHD's ethics committee on the 23/5/2023 under ethics number 12565572-202305231713. This approval is covered under GHD's Standard Operating Procedures (SOP) which mostly aligns to DBCA's SOP's as part of our trapping permit. Where differentiation occurs GHD adopts the most relevant action according to the task.

2.2.4 Data collection

All field data methods and results including points locations, tracks and polygons were collected via the ArcGIS off-line platform (Field maps) This includes all systematic and targeted fauna sampling sites, significant fauna record locations, and all other spatial data required for delineation and mapping of major fauna habitat types throughout the Survey Area

2.2.5 Habitat assessment

Fauna habitat assessments were undertaken to document and map the type, ecological value and extent of habitat throughout the Survey Area.

Broad habitats within the Survey Area were identified, mapped and described based on the following:

- Location within study
- Landscape position
- Geomorphology, topography, and substrate
- Photos of representative habitat types
- Vegetation description and dominant structure
- Values to associated fauna including significant species (e.g., refuge, foraging, shelter)
- Ecological processes of importance
- Disturbances (weeds, fire, ground disturbance)
- Wider extent and connectivity of habitat type based on previous mapping
- Comparison between broad habitat types
- Evaluation of the likelihood of occurrence of significant fauna within the environments present (based on presence of suitable habitats and species recorded)
- Reconciliation with recently mapped vegetation community types Mattiske (2024)

2.2.6 Fauna identification and nomenclature

Fauna was identified in the field using reference books, field guides and electronic guides (Table 5). Where identification was not possible, specific publications were utilised or photographs of specimens were collected to be later identified. Nomenclature used in this report follows that used by Western Australian Museum (WAM) as reported on *NatureMap.* This nomenclature is deemed the most up-to-date species information for WA fauna.

Table 5 Fauna reference books

Fauna group	Field Guide
Mammals	Menkhorst and Knight (2011), Van Dyck and Strahan (2013)
Bats	Churchill (2008), Menkhorst and Knight (2010)
Birds	Morcombe (2014)
Reptiles	Wilson and Swan (2021), Storr *et. al.* (1999), Storr *et.al.* (2002)
Amphibians	Tyler and Doughty (2009)

2.3 Basic fauna assessment

A GHD Technical Director - Zoology undertook a basic fauna survey during both targeted survey phases (Table 3). The Survey Area was traversed by vehicle and by foot over the entirety of the survey to identify and describe the dominant fauna habitat types present and their condition, assess habitat connectivity, and identify and record opportunistic fauna species occurring within the Survey Area (Appendix D, Combined species list).

Opportunistic fauna searches

Opportunistic and active fauna searches were conducted while traversing the Survey Area which involved:

– Searching the Survey area for indirect signs of native and invasive fauna; tracks, scats, bone, diggings and feeding areas.
– Searching through microhabitats including turning over logs or rocks, turning over leaf litter and examining tree hollows and hollow logs
– Visual and aural detection of birds which accounted for many bird species utilising the Survey Area.
– Recording GPS locations for all significant fauna species.
– A fauna Inventory was compiled from species recorded during all phases of the survey from opportunistic fauna searches and targeted fauna assessment (Appendix D, Combined species list).

The targeted fauna survey comprised a comprehensive set of methods tailored for the locally relevant significant fauna species. Methods and survey effort and described in Table 6 and presented in Figure 3, Appendix A.

Table 6 Targeted fauna survey method

Trap Type	Description, habitat type and location	Target species
Pit-fall traps: Buckets with drift fence	Pit-fall traps were established as part of targeted sampling. These were 20 litre plastic buckets (25 cm diameter, 40 cm deep) set as a linear series of transects, each with seven pits spaced approximately 10 m apart and set with a continuous flywire drift fence (30 cm high) bisecting the pits to channel fauna into pits. Soil and egg crate is placed within each pit to provide shade and shelter. Trap sites were selected based on habitat type to maximise detection of the target species group. Suitable habitat characteristics included areas fringing granite outcrops, lateritic gravel or sandy substrates supporting low myrtaceous shrubs. In habitat types where soils are shallow or absent pitfall traps may be substituted with additional funnel traps where digging is not possible. Six trap transects were established, each with seven pit-fall traps.	Dell's Skink, Southern Death Adder
Funnel Traps	Twelve to fourteen funnel traps were installed between pit-fall traps along drift fences at each trap transect. Funnels were placed such that animals were channelled into pits along the drift fence. Funnel traps were covered with shade panels or vegetation to minimise heat exposure to animals. Trap sites were selected based on habitat type to maximise detection of the target species group, as per pit-fall traps.	Dell's Skink, Southern Death Adder
Elliot ® box traps	Elliot box traps (type A: 33 x 10 x 9 cm) were placed in selected locations with potential habitat for target significant fauna group. These were placed in linear series of 10 traps spaced 2 to 30 m apart. Traps are baited with universal bait: a mixture of peanut butter, rolled oats and sardines. Elliot traps are positioned within shady areas or covered with vegetation to minimise heat exposure to animals. Trap sites were selected based on habitat type to maximise detection of the target species group. Suitable Phascogale habitat characteristics included Jarrah – Marri open forest over Sheoak – Banksia with understory canopy connectivity. Box traps were positioned at least 1 m above ground on large fallen trees or attached to branches suitable for the arboreal target species.	South-west Brush-tailed Phascogale.
Remote Cameras	Remote cameras were deployed in selected locations in areas of suitable habitat for target significant species. Remote cameras have proved very effective at detecting target species groups and a range of bird, reptile, and mammal species also recorded opportunistically as bi-catch. Targeted habitat locations include rocky outcrops, riparian areas with dense low vegetation cover, well vegetated low-lying ephemeral damp areas, Jarrah-Marri forest, fringing areas of reservoirs. All cameras deployed during the survey (Table 7 & Table 8) have the potential to record multiple species groups. Data (images/video) was collected to SD card and downloaded in office to database. Images were then screened for fauna species present and identified to species level. Where species level could not be achieved then species group or best determination to highest level made. Species identification was classified as an event with one event occurring every 24	South-west Brush-tailed Phascogale, Chuditch, Quokka, Quenda, Brush Wallaby, Western Ringtail Possum.

Trap Type	Description, habitat type and location	Target species
	hours unless individual specimens can be identified (ie Chuditch with spots or animal sizes or injury marks). By restricting data to one event every 24 hours assumes independence over species.	
Full Spectrum SM4BAT ® or Anabat Swift ® (bat detectors)	Ultrasound bat detector/recorders deployed in selected locations in areas of suitable habitat (flyways, in proximity of water bodies, potential roost locations) to detect micro-chiropteran bats. Each detector set to record from 30 minutes pre-dusk to 30 minutes post-dawn.	Western False Pipistrelle
Song Meter SM4 (acoustic recorder)	SM4 units deployed in selected locations in areas of suitable habitat. Target areas included riparian habitat, and interface areas between forest and clearings that are favoured hunting sites for owls. Acoustic recorders were set to record from 30 minutes pre-dusk to 30 minutes post-dawn.	Masked Owl
Nocturnal Searches	Nocturnal surveys were conducted using handheld spotlights to target significant fauna via eyeshine during the survey. Spotlight is utilised to detect a range of nocturnal species that may not be trapped in the above techniques. Nocturnal searching can account for a significant proportion of the recorded fauna assemblage during favourable conditions. Nocturnal searches were subject to risk assessment based on fatigue management and in consultation with Alcoa site responsible personnel.	Western Ringtail Possum, South-west Brush-tailed Phascogale, Quenda, Masked Owl
Diurnal Active Searches	Transect searches on foot were undertaken is for significant fauna in selected potential habitat. This involved searching for presence of secondary evidence such as scats, tracks, diggings, nests, burrows, dens and remains, as well as scratch marks on tree trunks, and hollow-bearing trees for arboreal and avian species. All species observed during these searches will be recorded	Quokka, Malleefowl Western Ringtail Possum, Numbat, Black Cockatoo habitat assessment
Opportunistic observations	Opportunistic detection of fauna was recorded throughout the field survey activities. These include all confirmed sightings and calls heard. Whilst this method is non-systematic, it generally accounts for a large proportion of fauna recorded and contributes a large proportion of the total fauna recorded during survey.	Numbat, Black Cockatoos, Malleefowl

2.3.1 Chuditch assessment

Chuditch (*Dasyurus geoffroii*) are known to occur locally and are predominately associated with Jarrah (Eucalyptus marginata) forests and woodlands, mallee shrublands and heathlands (DBCA 2017). They are readily recorded via remote camera and also caught in cage traps in past surveys in the area surrounding the Survey Area (GHD 2021a, GHD 2021b).

Remote cameras were deployed at locations deemed suitable to support Chuditch. Suitability of camera location was determined by habitat characteristics and / or presence of or proximity to secondary evidence (scats, tracks). Both densely vegetated forest and open forest with adequate numbers of suitable den and refuge sites (horizontal hollow logs) were targeted as these habitats provide suitable shelter for Chuditch. Cameras targeting Chuditch were set as linear transects of 10 cameras set 400 m intervals and baited with chicken pieces and/or sardines. For each remote camera deployed, the time and date deployed and recovered, as well as the GPS coordinates and habitat summary were recorded. Table 7 details the locations of all cameras deployed those targeting Chuditch as well as other significant target mammal species. Cage traps were not used for this species, so as not to disturb female Chuditch with pouch or den young.

Table 7 Chuditch line camera deployment

Phase	Camera Number	Habitat type	Latitude	Longitude	Date deployed	Date collected	Nights deployed
Phase 1	CAM 19	Jarrah-Marri forest	-32.5840	116.3146	17/08/2023	25/08/2023	8
Phase 1	CAM 28	Jarrah-Marri forest	-32.5812	116.3142	17/08/2023	25/08/2023	8
Phase1	CAM 16	Jarrah-Marri forest	-32.5782	116.3140	17/08/2023	25/08/2023	8
Phase 1	CAM C(42)	Jarrah-Marri forest	-32.5757	116.3147	17/08/2023	25/08/2023	8
Phase 1	CAM 53	Jarrah-Marri forest	-32.5727	116.3149	17/08/2023	25/08/2023	8
Phase 1	CAM R59	Jarrah-Marri forest	-32.5695	116.3146	17/08/2023	25/08/2023	8
Phase 1	CAM 5	Jarrah-Marri forest	-32.5668	116.3147	17/08/2023	25/08/2023	8
Phase 1	CAM GHD GERO F (17)	Jarrah-Marri forest	-32.5613	116.3145	17/08/2023	25/08/2023	8
Phase 1	CAM 20	Jarrah-Marri forest	-32.4791	116.0864	17/08/2023	25/08/2023	8
Phase 1	CAM HP14	Jarrah-Marri forest	-32.4826	116.0862	17/08/2023	25/08/2023	8
Phase 1	CAM NO NAME	Jarrah-Marri forest	-32.4864	116.2723	17/08/2023	25/08/2023	8
Phase 1	CAM 55	Jarrah-Marri forest	-32.4909	116.2722	17/08/2023	25/08/2023	8
Phase 1	CAM P6	Jarrah woodland	-32.5985	116.1155	17/08/2023	25/08/2023	8
Phase 1	CAM P4	Jarrah woodland	-32.6023	116.1122	17/08/2023	25/08/2023	8
Phase 1	CAM P1	Jarrah woodland	-32.6063	116.1091	17/08/2023	25/08/2023	8
Phase 1	CAM 77	Jarrah woodland	-32.6112	116.1109	17/08/2023	25/08/2023	8
Phase 1	CAM P5	Jarrah woodland	-32.6163	116.1104	17/08/2023	25/08/2023	8
Phase 1	CAM 4	Jarrah woodland	-32.6188	116.1150	17/08/2023	25/08/2023	8
Phase 1	CAM 7	Bullich forest	-32.6225	116.1152	17/08/2023	25/08/2023	8
Phase 1	CAM 14B	Jarrah woodland	-32.6271	116.1160	17/08/2023	25/08/2023	8
Phase 1	CAM P2	Jarrah woodland	-32.6316	116.1140	17/08/2023	25/08/2023	8
Phase 1	CAM HF12	Jarrah woodland	-32.6335	116.1093	17/08/2023	25/08/2023	8
Phase 1	CAM 14	Jarrah-Marri forest	-32.4947	116.2712	18/08/2023	25/08/2023	7
Phase 1	CAM 21	Jarrah-Marri forest	-32.4978	116.2715	18/08/2023	25/08/2023	7
Phase 1	CAM R57	Jarrah-Marri Forest	-32.4995	116.2676	18/08/2023	25/08/2023	7

Phase	Camera Number	Habitat type	Latitude	Longitude	Date deployed	Date collected	Nights deployed
Phase 1	CAM 12	Jarrah-Marri Forest	-32.5023	116.2665	18/08/2023	25/08/2023	7
Phase 1	CAM HF10	Jarrah-Marri Forest	-32.5057	116.2654	18/08/2023	25/08/2023	7
Phase 1	CAM 31	Jarrah-Marri forest	-32.5093	116.2659	18/08/2023	25/08/2023	7
Phase 1	CAM HP3	Dampland	-32.5378	116.3167	21/08/2023	5/09/2023	15
Phase 2	CAM P6	Jarrah-Marri Forest	-32.5612	116.2342	5/09/2023	14/09/2023	9
Phase 2	CAM HP4	Jarrah -Marri forest	-32.5589	116.2374	5/09/2023	14/09/2023	9
Phase 2	CAM 14	Jarrah -Marri forest	-32.5562	116.2401	5/09/2023	14/09/2023	9
Phase 2	CAM HF12	Jarrah -Marri forest	-32.5521	116.2439	5/09/2023	14/09/2023	9
Phase 2	CAM 20	Jarrah -Marri forest	-32.5492	116.2481	5/09/2023	14/09/2023	9
Phase 2	CAM 31	Jarrah -Marri forest	-32.5483	116.2527	5/09/2023	14/09/2023	9
Phase 2	CAM NO NAME	Rehab area	-32.5453	116.2569	5/09/2023	14/09/2023	9
Phase 2	CAM 55	Jarrah -Marri forest	-32.5404	116.2592	5/09/2023	14/09/2023	9
Phase 2	CAM P2	Jarrah -Marri forest	-32.5364	116.2621	5/09/2023	14/09/2023	9
Phase 2	CAM 21	Jarrah -Marri forest	-32.5334	116.2649	5/09/2023	14/09/2023	9
Total recording nights							317

Table 8 Targeted camera deployment (Chuditch, Woylie, Western Brush Wallaby, Brush-tailed Phascogale, Western Ringtail Possum, Quenda, Quokka, Numbat and Mallefowl).

Phase	Camera Number	Habitat type	Latitude	Longitude	Date deployed	Date collected	Nights deployed
Reconnaissance	CAM G	Jarrah -Marri forest	-32.6080	116.1946	27/06/2023	24/07/2023	27
Reconnaissance	CAM 11	Jarrah -Marri forest	-32.6140	116.2007	27/06/2023	24/07/2023	27
Reconnaissance	CAM 14	Jarrah -Marri forest	-32.6186	116.2071	27/06/2023	24/07/2023	27
Reconnaissance	CAM R57	Jarrah -Marri forest	-32.6177	116.2209	27/06/2023	24/07/2023	27
Reconnaissance	CAM 4	Jarrah -Marri forest	-32.6012	116.1894	27/06/2023	24/07/2023	27
Reconnaissance	CAM HF12	Minor drainage line	-32.5885	116.1895	27/06/2023	24/07/2023	27
Reconnaissance	CAM 8	Minor drainage line	-32.5897	116.1895	27/06/2023	24/07/2023	27
Reconnaissance	P1	Jarrah -Marri forest	-32.5863	116.2065	27/06/2023	27/07/2023	30
Reconnaissance	CAM 7	Minor drainage line	-32.5807	116.1920	27/06/2023	27/07/2023	30
Reconnaissance	CAM 23	Jarrah -Marri forest	-32.5528	116.3274	29/06/2023	27/07/2023	28
Reconnaissance	CAM 7	Jarrah -Marri forest	-32.5710	116.3274	29/06/2023	27/07/2023	28
Reconnaissance	CAM 77	Jarrah -Marri forest	-32.5862	116.3128	29/06/2023	27/07/2023	28
Reconnaissance	CAM YALGOO	Jarrah -Marri forest	-32.5545	116.2861	29/06/2023	27/07/2023	28
Reconnaissance	CAM 1	Dampland	-32.5142	116.1927	29/06/2023	27/07/2023	28
Reconnaissance	CAM HP3	Dampland	-32.5276	116.2170	29/06/2023	27/07/2023	28
Single target	CAM 14	Jarrah -Marri forest	-32.6311	116.2243	24/07/2023	16/08/2023	23
Single target	CAM 11	Jarrah -Marri forest	-32.6265	116.2283	24/07/2023	16/08/2023	23
Single target	CAM R57	Jarrah -Marri forest	-32.6150	116.2194	24/07/2023	16/08/2023	23
Single target	CAM GERO	Jarrah -Marri forest	-32.6099	116.2003	24/07/2023	16/08/2023	23
Single target	CAM 4	Jarrah -Marri forest	-32.5838	116.1843	24/07/2023	16/08/2023	23
Single target	CAM HF12	Jarrah -Marri forest	-32.5758	116.1797	24/07/2023	16/08/2023	23
Single target	CAM 8	Minor drainage line	-32.5670	116.1712	24/07/2023	19/10/2023	87
Single target	CAM 77	Jarrah -Marri forest	-32.5560	116.2984	27/07/2023	16/08/2023	20
Single target	CAM YALGOO	Jarrah -Marri forest	-32.5572	116.3114	27/07/2023	16/08/2023	20
Single target	CAM P1	Dampland	-32.5663	116.2356	27/07/2023	16/08/2023	20
Single target	CAM PRO 4	Dampland	-32.5661	116.2338	27/07/2023	16/08/2023	20

Phase	Camera Number	Habitat type	Latitude	Longitude	Date deployed	Date collected	Nights deployed
Single target	CAM 1	Dampland	-32.5403	116.2296	27/07/2023	16/08/2023	20
Single target	CAM HP3	Dampland	-32.5471	116.2405	27/07/2023	18/08/2023	22
Phase 2	CAM 12	Bullich forest	-32.6334	116.0864	5/09/2023	18/10/2023	43
Phase 2	CAM P5	Melaleuca dampland	-32.5606	116.2883	7/09/2023	18/10/2023	41
Phase 2	CAM R57	Large water body	-32.6322	116.0862	8/09/2023	18/10/2023	40
Single target	CAM 53	Jarrah -Marri forest	-32.4788	116.2701	15/12/2023	29/01/2024	45
Single target	CAM P5	Jarrah -Marri forest	-32.4771	116.2673	15/12/2023	29/01/2024	45
Single target	CAM W5	Jarrah -Marri forest	-32.4753	116.2641	15/12/2023	29/01/2024	45
Single target	CAM W8	Jarrah -Marri forest	-32.4740	116.2606	15/12/2023	29/01/2024	45
Single target	CAM W12	Jarrah -Marri forest	-32.4724	116.2571	15/12/2023	29/01/2024	45
Single target	CAM P4	Jarrah -Marri forest	-32.4726	116.2537	15/12/2023	29/01/2024	45
Single target	CAM YALGOO	Jarrah -Marri forest	-32.4818	116.2717	15/12/2023	29/01/2024	45
Single target	CAM HF10	Jarrah -Marri forest	-32.4843	116.2722	15/12/2023	29/01/2024	45
Single target	CAM W2	Jarrah -Marri forest	-32.4878	116.2738	15/12/2023	29/01/2024	45
Total recording nights							1290

2.3.2 Western Brush Wallaby assessment

The Western Brush Wallaby (*Notamacropus irma*) is known from the area, predominantly associated with dry sclerophyll forest and woodlands in the southwest of WA (Menkhorst & Knight 2010). It is readily recorded via remote camera and has successfully been recorded in local Jarrah Marri Forest habitat during recent surveys (GHD 2021a, GHD 2021b).

Targeted remote cameras were deployed at locations deemed suitable to support Brush Wallaby to confirm their presence. Suitability of camera location were assessed by habitat characteristics and presence of / proximity to secondary evidence (scats, diggings, track). For each remote camera deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded (Table 7 and Table 8).

Opportunistic sightings and records of any evidence of Western Brush Wallaby presence was recorded. Secondary evidence of species was verified by Glen Gaikhorst in the form of scat.

2.3.3 Brush-tailed Phascogale assessment

South-west Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) have previously been recorded in the region in dry sclerophyll Jarrah-Marri forests and woodlands with canopy connectivity that contain hollow bearing trees and sparse ground cover. They have recently been recorded via remote cameras as demonstrated by recent surveys in the area surrounding the Survey Area (GHD 2021a, GHD 2021b).

South-west Brush-tailed Phascogales will be targeted utilising modified arboreal Elliot box traps. The trapping program was in accordance with the methodology and recommendations outlined by DSEWPC (2011b). South-west Brush-tailed Phascogale are predominantly an arboreal (tree dwelling) species however will traverse habitats on the ground. Therefore, Elliot box traps were set in transect lines of 10 traps at approximately 30 m intervals. Traps were adapted by being strapped into trees and onto elevated logs. The Elliot box traps were baited with universal bait and covered with bark, leaves or Sheoak needles. Trap site location trap effort and other details from Phases 1 and 3 are recorded in Table 10. Trapping was split over 3 phases due to weather events at the time.

Remote cameras were deployed at locations deemed suitable to support South-west Brush-tailed Phascogale to confirm their presence. Remote camera placement was focused on key habitat features important to Brush-tailed Phascogale including placement in trees and facing onto elevated logs. For each remote camera deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded (Table 7 and Table 8)

Nocturnal transects were undertaken targeting potential South-west Brush-tailed Phascogale habitat searching for eyeshine. Habitat including suitable hollow-bearing trees / hollow logs as possible nest sites and suitable foraging were targeted. Any evidence of Brush-tailed Phascogale presence including scratches on tree trunks or scats on the ground nearby potential nesting sites was recorded and verified by Glen Gaikhorst. The locations and survey effort for nocturnal transects are recorded in Table 9. All other species observed during nocturnal searches were noted.

Table 9 ***Nocturnal transect survey effort for South-west Brush-tailed Phascogale, Western Ringtail Possum, Quenda and Southern Death Adder.***

Phase	Date Conducted	Habitat type	Latitude	Longitude	Effort (minutes)
Phase 3	21/10/2023	Jarrah -Marri forest	-32.4998	116.2288	60
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5117	116.2428	60
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5261	116.2511	60
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5375	116.2617	60
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5156	116.1961	60
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5254	116.2139	60
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5334	116.2320	60
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5383	116.2480	60
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5464	116.2614	60

Phase	Date Conducted	Habitat type	Latitude	Longitude	Effort (minutes)
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5631	116.2604	60
Phase 3	21/10/2023	Jarrah -Marri forest	-32.5069	116.2913	60
Total effort					660

Table 10 Total fauna trapping effort

Trap site number	Coordinates		Habitat description	Trapping nights	Pit traps/Buckets		Elliot traps		Funnel traps	
	Easting	Northing			Per site	Trap nights	Per site	Trap nights	Per site	Trap nights
Phase 1										
Elliot Line 1	-32.5710	116.2597	Jarrah -Marri forest	3	0	0	10	30	0	0
Elliot Line 2	-32.5107	116.2876	Jarrah -Marri forest	3	0	0	10	30	0	0
Elliot Line 3	-32.5132	116.2682	Jarrah -Marri forest	3	0	0	10	30	0	0
Elliot Line 4	-32.5308	116.2547	Jarrah -Marri forest	3	0	0	10	30	0	0
Elliot Line 5	-32.5835	116.3154	Jarrah -Marri forest	3	0	0	10	30	0	0
Elliot Line 6	-32.5380	116.3161	Jarrah -Marri forest	3	0	0	10	30	0	0
Elliot Line 7	-32.6102	116.1967	Sheoak woodland	3	0	0	10	30	0	0
Elliot Line 8	-32.6160	116.2059	Sheoak woodland	3	0	0	10	30	0	0
Total for Phase 1				24	0	0	80	240	0	0
Phase 2										
Trap site 1	-32.5430	116.2584	mixed shrub over scattered jarrah	5	7	35	0	0	10	50
Trap site 2	-32.5009	116.2312	Jarrah -Marri forest	5	7	35	0	0	10	50
Trap site 3	-32.5671	116.2599	Mix shrub dampland	5	7	35	0	0	10	50
Trap site 4	-32.5742	116.3000	Dampland	5	7	35	0	0	10	50
Trap site 5	-32.5502	116.3149	Jarrah -Marri forest	5	7	35	0	0	10	50
Trap site 6	-32.5083	116.2884	Jarrah -Marri forest	5	7	35	0	0	10	50
Total for phase 2				30	42	210	0	0	60	300
Phase 3										
Trap site 1	-32.5430	116.2584	mixed shrub over scattered jarrah	7	7	49	10	70	10	70
Trap site 2	-32.5009	116.2312	Jarrah -Marri forest	7	7	49	10	70	10	70
Trap site 3	-32.5671	116.2599	Mix shrub dampland	7	7	49	10	70	10	70
Trap site 4	-32.5742	116.3000	Dampland	7	7	49	10	70	10	70
Trap site 5	-32.5502	116.3149	Jarrah -Marri forest	6	7	42	0	0	10	60
Trap Site 6	-32.5083	116.2884	Jarrah -Marri forest	7	7	49	10	70	10	70
Total for phase 3				41	42	238	50	280	60	340

2.3.4 Western Ringtail Possum assessment

The Western Ringtail Possum (*Pseudocheirus occidentalis*) has previously been recorded regionally in Lane Pool Reserve, a known past translocation site for the species. The Western Ringtail Possum is predominantly associated with coastal/near coastal Peppermint Tree (*Agonis flexuosa*) forest and Tuart (*Eucalyptus gomphocephala*) dominated forest with a Peppermint Tree understorey. The species also occurs in Jarrah (*E. marginata*) forest and Jarrah-Marri (*Corymbia calophylla*) forest associated with Peppermint Trees (Van Dyck & Strahan 2013).

Targeted remote cameras were deployed at locations deemed suitable to support Western Ringtail Possum to confirm their presence. Remote camera placement focused on key habitat features important to Western Ringtail Possum including placement in trees and facing onto logs according to methodology outlined by DSEWPC (2011b) known to be effective in locations where possum densities are low or the species' presence requires confirmation. For each remote camera deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded (refer Table 7 and Table 8).

Active searches were done in areas of potential Western Ringtail Possum habitat. Searching involved looking for possible den sites in hollow-bearing trees and nests (dreys) in trees. Any evidence of Western Ringtail Possum presence in the form of scratches on tree trunks or scats on the ground nearby potential nesting sites to be recorded and verified by Glen Gaikhorst. The locations and survey effort for targeted searches are recorded in Table 11.

Nocturnal transects were undertaken targeting potential Western Ringtail Possum habitat searching for eyeshine in accordance with methodology and recommendations outlined by DSEWPC (2011b). Habitat supporting suitable hollow-bearing trees, possible nest sites and suitable foraging will be targeted. All other opportunistic species observations during these searches were recorded. The locations and survey effort for nocturnal transects are recorded in Table 9.

2.3.5 Woylie assessment

Woylie (*Bettongia penicillata ogilbyi*) have previously been recorded regionally in the Dwellingup area and recorded in the adjacent O'Neil East Survey Area (GHD 2024b). It is associated with open forest and woodland with a tussock grass ground layer or understorey of woody scrub and the presence of thickets of the plant genus Gastrolobium (Van Dyck & Strahan 2013).

Targeted remote cameras were deployed at locations deemed suitable to support Woylie to confirm their presence. Suitability of camera location was determined by habitat characteristics and presence of /proximity to secondary evidence (scats, diggings, tracks and nests). Habitat consisting of dense undergrowth, logs and rock-cavities was targeted as these habitats provide suitable shelter and cover from predators for Woylie. For each remote camera deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded (refer Table 8).

During the field survey any evidence of Woylie presence detected via opportunistic sighting was recorded. Records determined via secondary evidence are verified by Glen Gaikhorst, in the form of scats, diggings and tracks. Cage trapping was not undertaken due to risks of trapping reproductive Chuditch. Consequently, remote cameras were utilised as a highly effective replacement.

2.3.6 Quokka assessment

Quokka (*Setonix brachyurus*) have previously been recorded in the region where they tend to be associated with riparian areas and damp lands supporting low dense vegetation favourable to Quokkas. They are readily recorded via remote cameras locally as demonstrated by recent surveys in the area surrounding the Survey Area (GHD 2021a, GHD 2021b).

Remote cameras were deployed at locations deemed suitable to support Quokkas to confirm their presence. Suitability of camera location were determined by habitat characteristics and presence of /proximity to secondary evidence (scats, runnels and tracks). Habitat with relatively high density of low shrubs associated with creek lines were targeted as these habitats provide suitable shelter and under cover movement corridors for Quokka. For

each remote camera deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded (Table 7 & Table 8).

Opportunistic detection of Quokka presence via evidence will be recorded. Records will be determined via secondary evidence and verified in the form of scats, tracks, runnels and remains by Glen Gaikhorst

2.3.7 Quenda assessment

Quenda (*Isoodon fusciventer*) have previously been recorded locally within Jarrah forest. The Quenda prefers low dense vegetation along drainage lines and damp lands and is readily recorded via remote cameras as demonstrated by recent surveys in the area surrounding the Survey Area (GHD 2021a, GHD 2021b).

Targeted remote cameras were deployed at locations deemed suitable to support Quenda to confirm their presence. Suitability of camera location was determined by habitat characteristics and presence of /proximity to secondary evidence (forage digs, runnels, scats). Habitat consisting of low dense vegetation along drainage lines and ephemeral damp lands was targeted as these habitats provide suitable shelter and cover from predators for Quenda. For each remote camera deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded (refer Table 7 & Table 8).

During the field survey opportunistic sighting of Quenda presence via secondary evidence was recorded and verified by Glen Gaikhorst (e.g. foraging digs, runnels. scats, tracks). All observations were and logged via GPS.

Nocturnal transects were undertaken targeting potential Quenda habitat searching for eyeshine. Habitat along drainage lines and damp lands with suitable vegetation were targeted. The locations and survey effort for nocturnal transects are recorded in Table 9.

The use of cage traps for Quenda was avoided during the survey due to risk of bi-catch capture of Chuditch, Quokka and Woylie.

2.3.8 Numbat assessment

The Numbat (*Myrmecobius fasciatus*) occupies several different habitat types including upland Jarrah Forest, open Eucalypt woodland, Banksia woodland, and tall closed shrubland, preferring habitats with an abundance of termites in the soil, hollow logs, burrows and branches for shelter (DAWE 2022; Van Dyck & Strahan 2013). The only remaining original subpopulation are at Dryandra Woodland and the Upper Warren area, with nine translocation sites across WA (DAWE 2022). The Numbat appears capable of dispersing away from sites where they have been released, particularly in areas not surrounded by farmland (Friend & Thomas 2003). An individual was recorded via monitoring camera in 2021 at Boddington, approximately 30 km southeast of the Survey Area.

Active targeted searches of potentially suitable Numbat habitat resources were conducted, particularly in mature Wandoo woodland (if present) and areas with hollow logs and termite mounds (if present). Searches were conducted in accordance with methodology and recommendations outlined by DSEWPC (2011b). Any evidence of Numbat presence in the form of tracks, scats and dens will be recorded and verified by Glen Gaikhorst. All other opportunistic species observed during these searches will be recorded. The locations and survey effort for targeted searches are recorded in Table 11.

Targeted remote cameras were deployed at locations potentially suitable for Numbat determined by habitat characteristics and presence of / proximity to secondary evidence (tracks, scats and dens). Habitat consisting of fallen hollow logs was targeted as these habitats provide suitable dens. For each remote camera deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded (refer Table 7 and Table 8).

Table 11 Targeted transects for Numbats, Western Brush Wallaby, Malleefowl and Black Cockatoo's

Phase	Habitat type	Latitude	Longitude	Date Conducted	Effort (minutes)
Phase 1	Jarrah -Marri forest	-32.5551	116.2425	9/08/2023	30
Phase 1	Jarrah -Marri forest	-32.5327	116.2828	21/08/2023	90
Phase 1	Jarrah -Marri forest	-32.5327	116.2828	21/08/2023	90
Phase 1	Wandoo Woodland	-32.5392	116.3330	21/08/2023	60
Phase 2	Jarrah -Marri forest	-32.5086	116.2885	6/09/2023	180
Phase 2	Jarrah -Marri forest	-32.5067	116.2915	6/09/2023	45
Phase 1	Jarrah -Marri forest	-32.5659	116.2607	6/09/2023	45
Phase 2	Jarrah -Marri forest	-32.5086	116.2885	7/09/2023	180
Phase 2	Jarrah -Marri forest	-32.5067	116.2915	7/09/2023	45
Phase 2	Jarrah -Marri forest	-32.5565	116.3146	7/09/2023	120
Phase 1	Jarrah -Marri forest	-32.5327	116.2828	7/09/2023	45
Phase 1	Jarrah -Marri forest	-32.5704	116.2892	7/09/2023	45
Phase 2	Mixed shrub dampland	-32.5582	116.2894	8/09/2023	30
Phase 2	Jarrah -Marri forest	-32.5086	116.2885	10/09/2023	180
Phase 2	Jarrah -Marri forest	-32.5565	116.3146	10/09/2023	120
Phase 2	Jarrah -Marri forest	-32.5564	116.3151	10/09/2023	180
Phase 2	Jarrah -Marri forest	-32.5086	116.2885	11/09/2023	180
Phase 2	Jarrah -Marri forest	-32.5067	116.2915	11/09/2023	45
Phase 2	Jarrah -Marri forest	-32.5428	116.3335	11/09/2023	30
Phase 2	Jarrah -Marri forest	-32.5502	116.3155	11/09/2023	60
Phase 2	Jarrah -Marri forest	-32.5327	116.2829	12/09/2023	45
Phase 2	Jarrah -Marri forest	-32.5605	116.2275	12/09/2023	45
Phase 2	Jarrah -Marri forest	-32.5086	116.2885	12/09/2023	180
Phase 2	Jarrah -Marri forest	-32.5086	116.2885	13/09/2023	180
Phase 2	Jarrah -Marri forest	-32.5067	116.2915	13/09/2023	45
Phase 3	Jarrah -Marri forest	-32.5086	116.2885	17/10/2023	180
Phase 3	Jarrah -Marri forest	-32.5086	116.2885	18/10/2023	180
Phase 3	Jarrah -Marri forest	-32.5288	116.2243	18/10/2023	120
Phase 3	Jarrah -Marri forest	-32.5086	116.2885	19/10/2023	180
Phase 3	Jarrah -Marri forest	-32.5086	116.2885	20/10/2023	180
Phase 3	Jarrah -Marri forest	-32.5086	116.2885	21/10/2023	180
Phase 3	Jarrah -Marri forest	-32.5086	116.2885	22/10/2023	180
Phase 3	Jarrah -Marri forest	-32.5429	116.2583	22/10/2023	180
Phase 3	Jarrah -Marri forest	-32.5086	116.2885	23/10/2023	180
Phase 3	Jarrah -Marri forest	-32.5334	116.2320	23/10/2023	45
Phase 3	Jarrah -Marri forest	-32.5334	116.2320	23/10/2023	60
Phase 3	Jarrah -Marri forest	-32.5086	116.2885	24/10/2023	180
Total effort					3675

2.3.9 Dell's Skink assessment

The Dell's Skink (*Ctenotus delli*) is known from the Darling Range, associated with Jarrah-Marri woodland that has a shrub dominated understorey on lateritic clay soils, as well as granite outcrops, stony hills and ranges (Wilson & Swan 2021)

The Dell's Skink assessment used a combination of targeted systematic trapping techniques, including pit-traps and funnel traps with drift fences, and active searches. There are no specific guidelines on the assessment of this species specifically in WA, however detection methods will be derived from DSEWPC (2011a). Trapping sites were selected on habitat likely suitable habitat characteristics of low shrubby vegetation strata and/or lateritic substrate. The trap site's location, trapping nights and trapping effort from phases 2 and 3 are recorded in Table 10. The targeted active search locations are recorded in Table 12.

Table 12 Targeted Dell's Skink and Southern Death Adder active search

Phase	Latitude	Longitude	Habitat	Date conducted	Effort (minutes)
Phase 1	-32.5369	116.3284	Rocky outcrop	21/08/2023	60
Phase 1	-32.5421	116.2966	Granite outcrop	24/08/2023	45
Phase 1	-32.5792	116.3090	Rocky outcrop	18/08/2023	45
Phase 1	-32.5753	116.3222	Rocky outcrop	21/08/2023	60
Phase 1	-32.5380	116.3115	Rocky outcrop	22/08/2023	60
Phase 1	-32.5792	116.3111	Rocky outcrop	18/08/2023	45
Phase 1	-32.5754	116.3219	Rocky outcrop	23/08/2023	60
Phase 2	-32.5635	116.2812	Granite outcrop	10/09/2023	15
Phase 2	-32.5483	116.3129	Granite outcrop	11/09/2023	45
Total					435

2.3.10 Southern Death Adder assessment

The Southern Death Adder (*Acanthophis antarcticus*) is known to be associated with a broad range of habitats including rainforest, shrubland and heath habitat (Wilson & Swan 2021). Within the southwest region, sub-population are known to occur in dry sclerophyll forests and woodlands to the north (Serpentine-Canning) and to the east (Dryandra-Narrogin) of the Survey Area. The Southern Death Adder is highly cryptic using thick litter to shelter sand concealment from prey and is generally only visible when active or during whilst thermoregulation. It has been previously recorded regionally during recent survey near Serpentine Reservoir to the north (GHD 2021b).

The Southern Death Adder assessment involved targeted trapping techniques including a combination of pit-traps and funnel traps with drift fences. There are no specific guidelines on the assessment of this species specifically in WA, however detection methods were derived from DSEWPC (2011a). The trap location, trapping nights, trap type and trapping effort from phases 2 and 3 are recorded in Table 10. In conjunction with trapping targeted diurnal and nocturnal searches were conducted, with targeted searches recorded in Table 9 & Table 12.

During the field survey any opportunistic sign of Southern Death Adder presence are recorded. This may include secondary evidence (slough) and verified by Glen Gaikhorst, Robert Browne-Cooper or Brad Maryan.

2.3.11 Malleefowl assessment

Malleefowl (*Leipoa ocellata*) have been historically recorded regionally from a past tentative recording in Dwellingup, approximately 25km southwest of the survey area. The Malleefowl is associated with long unburnt thick vegetation and occupies shrublands and low woodlands that are dominated by mallee vegetation, native pine Callitris woodlands, Acacia shrublands, Broombush vegetation and/or coastal heathlands. The breeding habitat is

characterised by light soil and an abundance of leaf litter, which is used in the construction of a large conspicuous nesting mound (Marchant & Higgins 1993).

Target searches for Malleefowl were conducted by undertaking targeted transects in areas of potential Malleefowl habitat, searching for and recording evidence of prints, scats, feathers, and mounds in accordance with the guidelines outlined by Benshemesh (2017). Transects were recorded via GPS and secondary evidence verified by Glen Gaikhorst. The locations and survey effort for targeted searches are recorded in Table 11.

2.3.12 Masked Owl assessment

Masked Owls (*Tyto novaehollandiae novaehollandiae*) have been recorded in the region in Jarrah Marri Forest and woodlands and nearby permanent water body. They are readily recorded via acoustic recorder as demonstrated by recent surveys in the area surrounding the Survey Area (GHD 2021b).

The Masked Owl were targeted using Song Meter SM4 ® acoustic recorders, deployed during both survey phases. Acoustic recorders were positioned in areas where the Masked Owl is likely to occur i.e. utilising water bodies and flyways and forest habitat adjacent potential hunting clearings such as paddocks and orchards. Acoustic recorders were set to record from 30 minutes pre-dusk to 30 minutes post-dawn. For each bird acoustic deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded (refer Table 13). All data collected was assessed by Dr Nicholas Leseberg a recognised Avian data analysis specialist.

Nocturnal search transects were undertaken targeting potential Masked Owl habitat searching for eyeshine and listening for the species' call. Habitat along drainage lines and nearby water bodies and clearings was targeted. Records were sightings and / or calls verified by Glen Gaikhorst. Opportunistic nocturnal species observed during these searches were also recorded. Table 9 shows the locations and survey effort for nocturnal transect.

2.3.13 Western False Pipistrelle assessment

The Western False Pipistrelle (*Falsistrellus macenziei*) has been recorded in the region in dry sclerophyll eucalypt forest and woodland habitat and are readily recorded via ultrasonic detector as demonstrated by recent regional surveys (GHD 2021a, GHD 2021b).

The Western False Pipistrelle survey approach was based on guidance from DEWHA (2010) and Burgar et al. (2017). Bat detectors (SM2 ® and SM4 SongMeters ®) were deployed during both survey phases. Bat detectors were positioned in areas where the Western False Pipistrelle is likely to occur, i.e. utilising water bodies, fly ways, such as clearings and along forest tracks, hill tops or open areas associated with damp lands or granite outcrops. Bat detectors were set to record from 30 minutes pre-dusk to 30 minutes post-dawn and left for two to four nights per location. For each bat detector deployed, the time and date deployed and recovered, as well as the GPS coordinates were recorded (refer Table 14). All data collected was stored and analysis by Dr Erin Westerhuis to extract species or call group results. Erin is a in-house GHD specialist on Bat data analysis.

Table 13 Bird detector deployment

Phase	Bird acoustic	Habitat type	Latitude	Longitude	Date deployed	Date collected	Nights deployed
Reconnaissance	SM4-AC4	Jarrah -Marri forest	-32.6083	116.1944	27/06/2023	30/06/2023	3
Reconnaissance	SM4-AC1	Jarrah -Marri forest	-32.6011	116.1895	27/06/2023	30/06/2023	3
Reconnaissance	SM4-AC3	Dampland	-32.5648	116.2314	27/06/2023	30/06/2023	3
Single target	SM4-AC4	Jarrah -Marri forest	-32.6206	116.2244	24/07/2023	27/07/2023	3
Single target	SM4-AC1	Jarrah -Marri forest	-32.5642	116.1674	24/07/2023	27/07/2023	3
Phase 1	SM4-AC3	Jarrah -Marri forest	-32.5082	116.2888	16/08/2023	21/08/2023	5
Phase 1	SM4-AC3	Jarrah -Marri forest	-32.4810	116.2695	21/08/2023	25/08/2023	4
Phase 1	SM4-AC2	Jarrah -Marri forest	-32.4983	116.2494	21/08/2023	25/08/2023	4
Phase 1	SM4-AC1	Jarrah -Marri forest	-32.5007	116.2311	21/08/2023	25/08/2023	4
Phase 2	SM4-AC3	Bullich Forrest next to dam	-32.6321	116.0862	5/09/2023	8/09/2023	3
Phase 2	SM4-AC3	Edge of eucalyptus and sheoak woodland	-32.5767	116.2852	8/09/2023	12/09/2023	4
Single target	SM4-AC3	Jarrah – Marri forest	-32.4869	116.2738	14/12/2023	19/12/2023	5
Toral recording nights							44

Table 14 Bat detector deployment

Phase	Bat detector	Habitat type	Latitude	Longitude	Date deployed	Date collected	Nights deployed
Reconnaissance	SM4-6	Jarrah -Marri forest	-32.6011	116.1898	27/06/2023	30/06/2023	3
Reconnaissance	SM2-1	Dampland	-32.5649	116.2316	27/06/2023	30/06/2023	3
Single target	SM4-6	Jarrah -Marri forest	-32.5641	116.1675	24/07/2023	27/07/2023	3
Single target	SM2 Unit 1	Jarrah – Marri forest	32.6205	116.2242	24/07/2023	27/07/2023	3
Phase 1	SM4-6	Jarrah -Marri forest	-32.5083	116.2881	16/08/2023	21/08/2023	5
Phase 1	SM4-6	Jarrah -Marri forest	-32.4807	116.2702	21/08/2023	25/08/2023	4
Phase 1	SM4-10	Jarrah -Marri forest	-32.4983	116.2492	21/08/2023	25/08/2023	4
Phase 1	SM4-4	Jarrah -Marri forest	-32.5007	116.2311	21/08/2023	25/08/2023	4
Phase 2	SM4-10	Edge of dam	-32.6321	116.0863	5/09/2023	8/09/2023	3
Phase 2	SM4-10	Edge of sheoak and eucalyptus woodland	-32.5767	116.2851	8/09/2023	12/09/2023	4
Reconnaissance	SM2 Unit 4	Jarrah -Marri forest	-32.6081	116.1944	27/06/2023	30/06/2023	3
Single target	SM4-10	Jarrah -Marri forest	-32.4870	116.2738	14/12/2023	19/12/2023	5
Total nights							44

2.3.14 Carter's Fresh Water Mussel assessment

The Carter's Freshwater Mussel (*Westralunio carteri*) survey approach was based on methods used by Kluzinger et al. (2012) to study Carter's Freshwater Mussel populations in the lower Vasse River. This method is aimed at detecting species presence. Due to the ephemeral nature of water bodies assessed in this study, this method assumed low density of individuals.

Targeted searching on foot was done within areas selected for assessment prior to field survey based available water bodies and stream zone areas. Potential survey locations focussed on streams likely to have year-round water present, to maximise detection to confirm presence / absence. At each survey location, ecologists / zoologists walked 100 m upstream and 200 m downstream assessing ten (1 m by 1 m) quadrats at regular 30 m intervals. While traversing the stream zone opportunistic searching for mussels was completed between each quadrat. In situations where stream zones become inaccessible due to dense riparian vegetation, the maximum number of quadrats was surveyed along the accessible stream zone. The locations and survey effort for targeted searches are recorded in Table 15.

The following data were recorded:

– Any evidence of Carter's Freshwater Mussel including live mussels and dead shell remains within the water, as well as any shell evidence on banks
– Presence of water and if so, still or flowing, size of water body and depth if determinable
– Riparian vegetation, bank/bed condition including evidence of bank erosion, bed sediment deposition and disturbance (i.e. tramping by pigs, dumped material etc.)
– Riparian vegetation condition
– Evidence of riparian terrestrial fauna including Rakali middens, Quokka tracks, runnels, scats etc.

For standing water the following will be recorded:

– Approximate depth, width and (for pools) length
– Substrate (rocky, sandy etc.)
– Water quality (clear, turbid, sheen etc.)
– Opportunistic observations for aquatic fauna (fish, crayfish, frogs etc.)

Table 15 Carter's Fresh Water Mussel transect effort

Phase	Date	Habitat Type	Latitude	Longitude	Survey effort (minutes)
Reconnaissance	27/06/2023	Large water body	-32.6547	116.0802	30
Phase 2	8/09/2023	Large water body	-32.6323	116.0879	30
Total Survey effort					60

2.3.15 Black Cockatoo assessment

A Black Cockatoo habitat assessment for Baudin's Black Cockatoo (*Zanda baudini*), Carnaby's Black Cockatoo (*Z. latirostris*), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) was undertaken across the Survey Area to assess the presence, quality, and extent of habitat foraging and breeding habitat and assess roosting habitat. The assessment involved visual and aural assessment of the Survey Area, identifying breeding habitat (presence/absence of actual and potential breeding trees), foraging habitat, roosting areas, current species' activity, and any other signs of use by Black Cockatoos. The assessment approach was carried out based on DAWE (2022) Black Cockatoo referral guidelines and used to define breeding, foraging and night roosting habitat.

Breeding habitat

Breeding habitat: Defined by DAWE (2022) as 'habitat that contains known, suitable, or potential nesting trees'. For most tree species such as Jarrah, Marri, Blackbutt, and Flooded Gum, suitable DBH is 500 mm. For and Wandoo suitable DBH is 300 mm. On average, Carnaby's Black Cockatoos are known to nest in hollows with an entrance diameter greater than 20 cm (Johnstone & Storr 1998; Groom 2011). While the Forrest Red-tailed Black Cockatoo is known to nest in hollows with an entrance of greater than 12 cm (Johnstone & Storr 1998). Therefore, hollow suitability was assessed in consideration of these hollow requirements.

Breeding habitat was assessed by surveying the three Haul Roads (Contingency Area A – Infrastructure, Contingency Area B – Haul Road Corridor (McCoy) and Additional Haul Road) and 26 plots, each measuring approximately 40 m by 500 m (2 ha) across the Contingency Area A Survey Area. The location of plots was selected to sample across all the broad-scale vegetation complexes occurring locally based on vegetation mapping by Mattiske and Havel (1998). The number of plots within each vegetation complex was roughly proportional to the relative area amount of each vegetation complex within the Survey Area. For example, the extensive Jarrah Marri forest habitat type was allocated proportionately more plots than Flooded Gum habitat type which comprised a smaller limited proportion of the Survey Area. Throughout all plots, all potential nest trees, suitable nest trees, and known nesting trees were assessed based on Diameter Breast Height (DBH) suitability within plots. Each plot was traversed on foot and all potential trees (DBH>500 mm) was recorded.

Breeding habitat was extrapolated using averaged results from these plot surveys per fauna habitat type throughout the Survey Area. This method was undertaken due to the large extent of the Survey Area and the commitment by Alcoa to undertaking detailed pre-clearing surveys of potential breeding trees in mining and haul road footprints once these footprint areas are confirmed. For each potential nesting tree, details of the tree location, species, DBH, size and number of hollows observed, evidence of use and any other significant observations were recorded. All identified potential nesting trees within plots were further checked visually using binoculars for suitable nest hollows. Where trees were recorded to have a suitable large hollow that could be used or had signs of being used (potential or likely), trees were revisited by Tony Kirkby (Black Cockatoo Specialist) where the hollows were checked for Black Cockatoo use by using a drone, pole camera and telephoto lens.

Foraging habitat

Foraging habitat: Defined by DAWE (2022) as 'Plant species known to support foraging within the range of the cockatoo species'. Foraging habitat was assessed to determine if the vegetation within the Survey Area constitutes foraging habitat, and to qualify its value for Black Cockatoos. Foraging scores were calculated using the forage score tool outlined within the DAWE (2022) referral guidelines.

The flora species identified within the Survey Area from on-site habitat assessment and recent vegetation mapping by Mattiske (Mattiske 2024) were compared with known foraging species (Valentine and Stock 2008). As part of the foraging assessment, the ground below known food plants and trees present was searched for any evidence of Black Cockatoo foraging residue such as chewed seed pods, cones and foliage.

The DAWE foraging quality scoring tool is based on a set of site attributes:

– Foraging potential.
– Connectivity.
– Proximity to breeding and roosting.
– Habitat health/disease presence.
– Appraisal comments to explain and justify score.

Giving consideration to the above DAWE guidance, the Main Roads (2020) Black Cockatoo environmental factsheet scoring approach was applied, based on the scope of works requirements, and to account for the composition of regrowth vegetation and corresponding low density of foraging plant species within habitats present. To provide an accurate assessment of Black Cockatoo foraging habitat quality, the following criteria were applied to calculate the foraging quality score of the fauna habitat present:

– Vegetation condition: quantity (density) and diversity of preferred foraging plant species (score out of 3)
– Local habitat context (importance): based on proportion of habitat be cleared, proximity to breeding and roosting locations, and local land tenure/security (score out of 3)

– Utilisation: known foraging or evidence (score out of 4).

The location and extent of plant species suitable for Black Cockatoo species foraging habitat was identified and mapped for the Survey Area, based on the vegetation assemblages and fauna habitat types, and presence/absence of known foraging species. During the field surveys any Black cockatoo foraging activity (actual or evidence) was recorded via GPS. Vegetation and foraging data was used to calculate foraging quality score for all fauna habitat types across the Survey Area as detailed in DAWE (2022).

The foraging score tool and field data collected and associated forage score calculations are summarised in Appendix D, Black Cockatoo foraging assessment.

Roosting habitat

Night roosting habitat: Defined by DAWE (2022) as habitat that contains one, or a group of, known or potential roosting trees. Potential night roosting habitat was assessed based on the presence of suitable tall trees within proximity to water. Roosting habitat was also assessed on evidence of roosting activity i.e., feathers, twig clips, and proximity of known local or regional roosting sites available from the desktop assessment.

Opportunistic observations - both visual and aural observations of Black Cockatoos within the Survey Area were noted during the survey.

This data was used to calculate estimates of the amount of breeding habitat, amount and quality of foraging habitat, and extent of night roosting habitat within the Survey Area. This information is presented in Appendix D, Black Cockatoo foraging assessment

2.4 Fauna survey limitations

2.4.1 Desktop limitations

The EPBC Act PMST is based on bioclimatic modelling for the potential presence of species. As such, this does not represent actual recorded locations of the species present within the Survey Area or wider Study Area. The records from Western Australian Government fauna data sources such as the DBCA searches of Threatened and Priority flora and fauna provide more accurate information for the general area and local occurrence. The accuracy of these publicly available datasets is dependent on up to date data management via state government, and recent significant fauna records may be absent due to delayed database management. Additionally, some collections, sighting or trapping records are from historical sources and cannot be dated and often misrepresent the current range of Threatened and Priority species. Not with standing, questionable fauna records relevant to desktop assessments are interrogated on a case by case basis.

2.4.2 Field survey limitations

The EPA (2016, 2020) Technical Guidance states that flora and fauna survey reports for environmental impact assessment in WA should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with this field survey are discussed in Table 16. Based on this assessment, the survey effort has not been subject to any major constraints, which affect the accuracy or thoroughness of the assessment or conclusions formed.

Table 16 Field Survey Limitations

Aspect	Constraint	Comment
Sources of information and availability of contextual information.	Nil	Adequate information is available for the Survey Area, this includes: Broadscale (1:1,000,000) mapping by Beard (1979) and digitised by Shepherd et al. (2002) Database searches (DBCA and *NatureMap*). Previous surveys (GHD 2021a and 2021b). Previous broadscale vegetation mapping (Mattiske and Havel 1998)
Scope (what life forms were sampled etc.)	Nil	Significant terrestrial vertebrates were sampled during the survey. Basic fauna assessment sampled significant and non-significant species opportunistically. Terrestrial invertebrate fauna were not surveyed.
Proportion of fauna collected and identified (based on sampling, timing and intensity)	Minor	The Targeted fauna survey included undertaking specific tasks to focus on desired species. In permit application GHD applied for the use of cage traps to undertake trapping transects throughout the Survey Area. DBCA at the time declined the use of cage traps requesting substitution of camera transects instead. Camera transects replicated cage trapping design i.e. 10 units spaced at 200 meter intervals and baited with a desirable lure. The advantage of cameras enabled continual data collection of a range of species over time rather than a one of per day. However the identification of individuals was more difficult despite using the spotted pelage marking identification method. The survey timing was considered appropriate for the purpose of the assessment with four survey periods undertaken from June to November. The fauna recorded is detailed in Section 4.2 and a full fauna species list is provided in Combined species list. A species inventory was compiled for this report as it assists in demonstrating effort when some species are not located. For example, during nocturnal surveys no possums were recorded despite Boobook owl and frogs listed demonstrating effort but species is not present. The portion of fauna collected and identified was considered representative for the Survey Area.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Nil	The Survey Area was accessed by vehicle and on foot. The Survey Area was adequately surveyed during the field survey in line with the scope. Additional opportunistic sampling was undertaken to develop a comprehensive species inventory although the primary goal of the survey was to target significant fauna. Habitats considered suitable for significant fauna were traversed by foot.
Mapping reliability	Nil	The fauna habitats were mapped using high-resolution aerial imagery obtained from Landgate, topographical features, previous broad scale mapping (Beard 1976) and field data from Mattiske 2023. Data was recorded in the field using hand-held GPS tools. Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The Garmin GPS units and GPS enabled tablets used for this survey are accurate to within 2 to 5 m on average.
Timing/weather/ season/cycle	Minor	The field survey was conducted in June to November. The fauna survey was planned for spring and summer to accommodate the activity of reptiles as well as mammals and birds. Phase 1 received a prolonged cold wet period in which the trapping effort was modified to over three phases rather than two.
Disturbances (e.g. fire, flood, accidental human intervention)	Moderate	Some of the Survey Area has been subjected to historical disturbance events (e.g. clearing – logging and fire – prescribed burning); in some areas these events are having a big impact to fauna diversity. Despite all the survey effort no Brushtail Possum were recorded and large hollow bearing trees retained by loggers burnt down due to prescribed burning. This is reducing the amount of large trees are present in the forest. It is likely that these two human impacts are modifying the presence of species within the Survey Area. A large prescribed burn did occur in the survey area in Autumn (directly before the surveys) and spring during the surveys. This did limit the access and amount of assessment that could be undertaken during this time due to human heath risks.
Intensity (in retrospect, was the intensity adequate)	Nil	The fauna of the Survey Area was sampled in accordance with EPA (2020). The Survey Area was sufficiently covered by the Senior and Principal zoologists during the survey.

Aspect	Constraint	Comment
Resources	Nil	Adequate resources were employed during the field survey which included nine staff over 170 person days were spent undertaking the survey using two senior and one Principal zoologist.
Access restrictions	Nil	The Survey Area was accessible by vehicle and on foot. There were no access restrictions.
Experience levels	Nil	The Senior zoologists and Technical Director - Zoology who executed the survey are practitioners suitably qualified and experienced in their respective fields: Senior zoologist, Brad Maryan, was a field team lead with more than 25 years' experience leading and conducting fauna surveys. Senior zoologist, Robert Browne-Cooper, was a field team lead with more than 25 years' experience leading and conducting fauna surveys. Zoologist Sarah Flemington has over 7 years' experience undertaking fauna surveys. Technical Director - Zoology Glen Gaikhorst was a field team lead with more than 25 years' experience leading and conducting fauna surveys.

3. Desktop assessment

3.1 Climate

The Study Area is located within the Dwellingup State Forest subregion of Western Australia. The regions climate is classified as Warm Mediterranean, with two distinct seasons: a warm and dry summer (December to February) and a cool wet winter (June to August) (Williams & Mitchell 2001).

The region is characterised spatially by rainfall, with rainfall being greatest on the scarp and decreasing to the east and north (Williams & Mitchell 2001). The majority of rainfall received during winter months and is a result of low-pressure system associated with the westerly wind systems. The closest operating weather station is Dwellingup (Station ID: 009538) located approximately 30km west of the O'Neil Survey Area. Climate data from this station indicate:

Climate data (Bureau of Meteorology 2023) at this station indicates:

– Mean maximum temperature in July reaches 15.8^{0}C to 32.1^{0}C in January.
– Mean minimum temperature in July reaches 6.8^{0}C and reaches 14.7^{0}C in January.
– Annual total rainfall to October 2023 is 948.4 mm.

The Site weather conditions was generally cool with low maximums and some rainfall during Phase 1, mild temperatures with little rainfall during Phase 2 and mild weather with no rainfall during Phase 3. The weather data over the survey Period is presented in Table 17. Temperature data was obtained from the Bureau of Meteorology website, closest weather station to the site, Dwellingup station (No. 009538) which is approximately 30 km west of the O'Neil Survey Area.

Table 17 Weather data for survey period (Phase 1-3)

Date	Minimum temp (^{0}C)	Maximum Temp (^{0}C)	Rainfall (mm)
Phase 1			
14/08/2023	3.9	17.7	0
15/08/2023	11.5	17	25.8
16/08/2023	7.7	13.9	17.2
17/08/2023	6.1	16.3	0.2
18/08/2023	4.9	17.1	0.2
19/08/2023	4	18.2	0.2
20/08/2023	4.1	16.1	0
21/08/2023	7.5	17	1.2
22/08/2023	1.4	14.6	0
23/08/2023	6.7	16.5	0
24/08/2023	6.7	19.7	0.2
25/08/2023	4.4	24.2	0
Phase 2			
5/09/2023	10.8	17.4	3
6/09/2023	8.9	15.3	6.6
7/09/2023	0.7	17	2.2
8/09/2023	3.7	21.8	0
9/09/2023	11.5	20.4	2

Date	Minimum temp (^{0}C)	Maximum Temp (^{0}C)	Rainfall (mm)
10/09/2023	9.5	19.1	1.4
11/09/2023	10.6	20.9	0.2
12/09/2023	11.2	21.2	0
13/09/2023	13.6	16	1
14/09/2023	8.1	17.4	0
15/09/2023	13.4	14.1	0.2
16/09/2023	11.1	18.3	0
Phase 3			
17/10/2023	11.2	31.2	0
18/10/2023	11.3	23.6	0
19/10/2023	9.7	24.2	0
20/10/2023	10.3	26.7	0
21/10/2023	14.3	28.7	0
22/10/2023	13.5	20.5	0
23/10/2023	8.2	20.3	0
24/10/2023	5.3	23.8	0
25/10/2023	9.6	31	0

3.2 Geology and land systems

3.2.1 Geology

3.2.1.1 Regional geology

The region lies within the Darling Plateau, an undulating lateritic regolith over Archaean granite with dolerite intrusions. The regional geology is described in the Pinjarra Refinery Revised Proposal as follows.

The regolith that covers the bedrock was formed through a long period of bedrock weathering, and averages about 30 m thick over the Darling Plateau. The upper layers of the regolith are lateritic, being rich in iron and aluminium derived from the bedrock, with a characteristic rusty-red colour. The regolith has a complex vertical sequence which is generalised as follows (from surface to bedrock):

– Overburden, comprising sandy gravels about 0.2 to 4 m thick (average 0.5 m)
– Lateritic bauxite about 4-6 m thick comprising two distinct layers:
– Duricrust or caprock, comprising iron or aluminium cemented rock about 1 to 2 m thick
– Friable fragmental layer about 2 m or more thick
– Mottled and pallid clays (saprolite) about 20 to 30 m thick
– Saprock, comprising rock fragments about 2 to 5 m thick that define a basal interface between saprolite and bedrock.

The regolith is partially or fully eroded in valleys that dissect the Darling Plateau, with the upper lateritic layers often absent and replaced by colluvial or alluvial deposits. In some areas the regolith is fully eroded to expose bedrock.

3.2.1.2 Local geology

The surficial geology of the region is based on 1:250,000 regional geological mapping (Pinjarra sheet GSWA 1980).

The superficial geology is consistent with the wider geology of the Huntly Mine and Darling Plateau, predominantly comprising lateritic regolith interspersed by quaternary deposits in streams and swamps and Archaean rock outcrops in hills and incised valleys.

There is limited data from bore logs to support the regionally mapped geology: The DWER Water Information Reporting (WIR) database only contains bore records without lithological records, and the only bore logs available from the Alcoa records are those for the Jayrup Catchment in the far southwest of the region.

The Jayrup Catchment data supports the generalised vertical profile of the regolith as present above. Based on the Jayrup catchment data (which includes bores outside the region), the depth of 4 to 59 m, likely dependent on locations within the slope profile (excluding one bore where granite was encountered at 0.9m – L4502-1A). It is noted that the majority of bores do not extend the basement depth and are completed within the saprolite profile. Possible shallower gravel and laterite mottled and pallid clays over saprolite.

3.2.2 Landforms

The region mostly lies over the Darling Plateau System and a small portion lies over the Murray Valleys System. The Darling Plateau System which comprises an undulating lateritic plateau. The Darling Plateau system is associated with the predominant lateritic surficial geology of the region.

The Murray Valleys System is found in the Northwestern portion of the survey area and comprises of deep incised valleys of loamy soil, shallow duplex, and rock outcrops.

3.3 Hydrology

The Darling Plateau is characterised by sharply incised drainage lines forming dense drainage networks in the western rainfall zone (HRZ), with these transitioning to open, flat-floored valleys in the eastern intermediate rainfall zone (IRZ) (Churchward and Dimmock 1989). The IRZ is noted to occur between the 900 –to 1,100 mm/year long term rainfall isohyets with the western

The region is located within the Serpentine River System and Dandalup River System. The majority of the region occurs in the Serpentine River System, a proclaimed surface water area under the RIWI Act, and the Southwestern portion falling under the Dandalup River System, also a proclaimed surface water is under the RIWI Act.

3.3.1 Local catchments

The region drains through several catchment areas. A summary of local catchments and the tributaries is provided in Table 18.

Table 18 Local Catchment Areas of the O'Neil Survey area,

Management area	Sub management area	Rivers	Sub catchment name	Sub catchment area (ha)	Proportion of catchment with region (%)
Contingency Mining Region A					
Serpentine River Catchment	Upper Serpentine	Serpentine River	River Rd	3085	30.8
Serpentine River Catchment	Upper Serpentine	Big Brook	O'Neil Rd	5310.7	53
Serpentine River Catchment	Upper Serpentine	Big Brook	Jayrup	923.7	9.2
Serpentine River Catchment	Upper Serpentine	Big Brook	075	701.6	7.0
Contingency Area A Haul Road					

Management area	Sub management area	Rivers	Sub catchment name	Sub catchment area (ha)	Proportion of catchment with region (%)
Serpentine River Catchment	Upper Serpentine	Big Brook	O'Neil Rd	1662	29
Serpentine River Catchment	Upper Serpentine	Big Brook	Jayrup	3347	11
Serpentine River Catchment	Upper Serpentine	Big Brook	Jayrup	1356	9.7
Dandalup River System	North Dandalup	North Dandalup River	North Rd	8722	2.73
Dandalup River System	South Dandalup	South Dandalup River	614	2418	1.0
Contingency Area B Haul Road					
Serpentine River Catchment	Upper Serpentine	Big Brook	Jayrup	1992	14
Dandalup River System	South Dandalup	South Dandalup River	Duncan Rd	975	9.0
Dandalup River System	South Dandalup	South Dandalup River	614	2418	3.5

3.3.2 Regional hydrology

3.3.3 Groundwater dependent ecosystems

Assessment of potential groundwater dependent ecosystems (GDE) is based on key indicator species that are generally accepted as indicators of moister soil, and therefore potential groundwater dependence.

Based on the vegetation complex mapping, potential GDEs within O'Neil region are likely to occur as an extension of the potential GDEs identified in the O'Neil DE, including parts of the valley floors of the Yg1 and Yg2 vegetation complex as well as the Swamp (S) vegetation complex within the valley floors of the upper South Dandalup River, central South Dandalup River tributary and upper 34 Mile Brook. The vegetation complexes are described as:

– **Swamp (S)**: Mosaic of low open woodland of *Melaleuca preissiana* – *Banksia littoralis*, closed scrub of *Myrtaceae spp*., closed heath of *Myrtaceae spp*. and sedgelands of *Baumea* and *Leptocarpus* spp. on seasonally wet or moist sand, peat and clay soils on valley floors in all climatic zones.
– **Yarragil 1 (Yg1):** Open forest of *Eucalyptus marginata* subsp. *marginata* - *Corymbia calophylla* on slopes with mixtures of *Eucalyptus patens* and *Eucalyptus megacarpa* on the valley floors in humid and subhumid zones.
– **Yarragil 2 (Yg2):** Open forest of *Eucalyptus marginata* subsp. *thalassica* – *Corymbia calophylla* on slopes, woodland of *Eucalyptus patens* – *Eucalyptus rudis* with *Hakea prostrata* and *Melaleuca viminea* on valley floors in subhumid and semiarid zones.

The Yarragil 2 vegetation complex is broadly mapped and the potential GDEs are likely to form a portion of the complex along the lower valley slopes and valley floors. Accordingly, the Yarragil 2 complex is not mapped as a potential GDE, with the potential GDEs of valleys mapped through a nominal 50 m buffer along mapped streams.

Topographic mapping and review of aerial imagery identifies two river pools as occurring with the region: Kennedy's Pool and Mundalup Pool which are located on the South Dandalup River. The pools may be permanent or semi-permanent and may potentially be refuges for aquatic fauna, including the threatened species Carters Freshwater Mussel.

No geomorphic wetlands are mapped within the region, due to that dataset being limited to within 5 km east of the Swan Coastal Plain. No wetlands of national or international importance are mapped within or in the vicinity of the region.

The region lies predominantly within the catchment of the Serpentine River system, a tributary of the Murray River which discharges into the Peel Inlet near Mandurah on the Swan Coastal Plain. The Peel Inlet forms part of the Peel-Yalgorup System Ramsar wetlands of international importance. However, the South Dandalup Dam downstream of the region diverts all flow from its catchment for drinking water supply. The southeast portion of the river discharges into Swamp Oak Brook and the Hotham River, which are tributaries to the unregulated Murray River downstream, which discharges into the Peel Inlet. Mining within the unregulated catchment of the Murray River is expected to pose a very low risk to the Peel-Yalgorup Ramsar wetlands, due to existing salinity of the river and the small area of catchment affected. Accordingly, the region is not considered constrained by the presence of the Ramsar wetlands downstream.

3.4 Land use and environmental constraints

Land use within the region and surrounding region buffer is primarily comprised of State Forest, reserved for conservation and recreational activities. The remaining areas within and surrounding region is comprised as Rural areas along with primary regional roads, local roads, railways, waterways, and regional open spaces.

3.5 Significant environmental constraints

Resulting from the desktop assessment undertaken, a number of potential significant environmental constraints have been identified within each of the three EPA themes. These constraints are based on known occurrences and the list does not include potential constraints for which additional studies are required to confirm presence.

3.5.1 Conservation reserves and estates

The Monadnocks Conservation Park (R 39826) is located to the North of the Survey boundary within the Study Area, only State Forest resides inside the Survey Area, Dwellingup State Forest (F14) and Jarrahdale State Forest (F22).

Table 19 Reserves within the Study Area

Reserve Number	Name	Class	Use	Approximate Location relative to survey Area	Within the Study Area?
R 39826	Monadnocks Conservation Park	Class C	Conservation Park	Adjacent to Survey Area on northwestern boundary.	Yes
F14	Dwellingup State Forest	Class C	State Forest	Majority of the Survey Area, extending into the Study Area.	Yes
F22	Jarrahdale State Forest	Class C	State Forest	Located with the northern portion of the Survey Area extending into the Study Area	Yes

3.5.2 Environmentally sensitive areas

No Environmentally Sensitive Areas (ESAs) lie within the Study Area.

3.5.3 Regional ecological linkages

Regional Ecological Linkages data doesn't exist for the O'Neil survey area However, Link ID 145 lies within the Study Area to the Northwest of the Survey Area.

3.5.4 Land

Significant constraints were identified from both Flora and Vegetation and Fauna values from the O'Neil region. They are presented in Table 20 and shown in Figure 2.

Table 20 Significant constraint identified within the Study Area

Constraint	Definition	Description	Occurrence in region
Granite outcrop communities	These communities are defined by the mapped granite outcrops (incorporating a 50m buffer as well as the potential to occur within the Cooke vegetation complex	These communities represent restricted vegetation and potential habitat for significant flora and fauna species. Clearing over these areas will be subject to survey of significant flora and may potentially not be approved. While mining does not occur over granite outcrops (due to lack of bauxite), infrastructure may be developed over outcrops. The Cooke complex also represents an area of potential shallow regolith that may result in a lower rehabilitation resilience to drought once mining removes the majority of the regolith. This may be regarded as significant by some stake holders.	Scattered occurrences within the region.
Potential GDEs	These communities are defined by the presence of the Swamp vegetation complex and a nominal 50m radius buffer zone around mapped streams.	These communities represent restricted vegetation and potential habitat for significant fauna and flora species. Clearing over these areas will be subject of survey of significant flora and fauna and if found, infrastructure may need to be realigned to avoid. While mining does not occur over swamps and streams (due to lack of bauxite), infrastructure may be developed over these areas.	Present in association with Serpentine River System
Old growth forest	These areas are formally mapped by DBCA based on their assessment criteria which are areas that have not been subject to timber harvesting, are not infested with *Phytophthora* dieback and where human disturbance is negligible.	These areas contain habitat for threatened fauna for which long periods without disturbance are required before they are able to form. This forest is regarded as significant by agencies and stakeholders. Alcoa has committed to not clear DBCA mapped old growth forest. These are represented as no go zones.	Not present
Mature age forest	These areas are mapped based on interpretation of DBCA harvesting data and are areas of forest that have not been harvested for more than 70 years.	These areas contain habitat for threatened fauna for which long periods without disturbance are required before they are able to form. This forest may be regarded as significant by some stakeholders.	Present in pockets along valleys and hills.
CAR and non-CAR reserves	These areas are mapped by DBCA and area areas of forest that have been set aside from timber harvesting for conservation purposes.	These areas have been protected from forest harvesting and represents high quality patches of forest. The informal reserves are regarded as conservation significant by DBCA.	Informal reserves are primarily mapped in association with GDEs.

3.6 Terrestrial fauna

3.6.1 Fauna diversity

The *NatureMap* database search identified 166 terrestrial vertebrate fauna species previously recorded within the region. This total included 31 mammals, 83 birds, 41 reptiles and 11 frogs. Of the 166 species three are Introduced species. The PMST search identified 10 addition species occurring within the region.

The Southern Death Adder is not recorded in the *NatureMap* or DBCA database searches. However, is known to occur in the region by GHD Zoologists. Therefore, has been included in the significant fauna list in Section 3.6.2.

Please note that *NatureMap* data contains some inaccuracies, with nomenclature and accuracy of records.

3.6.2 Significant fauna

Based on the *NatureMap* and PMST search, 26 significant terrestrial vertebrate taxa were identified to potentially occurring within the Survey Area and wider Study Area.

These species included:

- Carnaby's Black Cockatoo (*Zanda latirostris*) listed as Endangered under the EPBC Act and BC Act
- Baudin's Black Cockatoo (*Zanda baudinii*) listed as Endangered under the EPBC Act and BC Act.
- Numbat (*Myrmecobius fasciatus*) listed as Endangered under the EPBC Act and BC Act
- Western Ringtail Possum (*Pseudocheirus occidentalis*) listed as Vulnerable under the EPBC Act and Critically Endangered under the BC Act
- Australian Painted snipe (*Rostratula australis*) listed as Endangered under the EPBC Act and BC Act
- Curlew Sandpiper (*Calidris ferruginea*) listed as Critically Endangered under the EPBC Act and BC Act
- Far Eastern Curlew (*Numenius madagascariensis*) listed as Critically Endangered and as a Migratory Species under the EPBC Act and BC Act.
- Woylie (*Bettongia penicillata ogilbyi*) listed as Endangered under the EPBC Act and Critically Endangered under the BC Act
- Malleefowl (*Leipoa ocellata*) listed as Vulnerable under the EPBC Act and BC Act
- Carter's Freshwater Mussel (*Westralunio carteri*) listed as Vulnerable under the EPBC Act and BC Act
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the EPBC Act and BC Act
- Chuditch (*Dasyurus geoffroii*) listed as Vulnerable under the EPBC Act and BC Act
- Quokka (*Setonix brachyurus*) listed as Vulnerable under the EPBC Act and BC Act
- Peregrine Falcon (*Falco peregrinus macropus*) listed as 'Other specially protected' under the BC Act.
- Dell's skink (*Ctenotus Delli*) listed as Priority 4 by DBCA.
- Western Brush wallaby (*Notamacropus irma*) listed as Priority 4 by DBCA.
- Western False Pipistrelle (*Falsistrellus mackenziei*) listed as Priority 4 by DBCA.
- Quenda (*Isoodon fusciventer*) listed as Priority 4 by DBCA.
- Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) listed as 'Conservation Dependent' by DBCA.
- Fork-tailed Swift (*Apus pacificus*) listed as Migratory under the EPBC Act and BC Act
- Grey Wagtail (*Motacilla cinerea*) listed as Migratory under the EPBC Act and BC Act
- Common Sandpiper (*Actitis hypoleucos*) listed as Migratory under the EPBC Act and BC Act
- Sharp-tailed Sandpiper (*Calidris acuminata*) listed as Migratory under the EPBC Act and BC Act
- Pectoral Sandpiper (*Calidris melanotos*) listed as Migratory under the EPBC Act and BC Ac
- Jarrah Forest Freshwater Snail (*Glacidorbis occidentalis*) Listed as Priority 3 by DBCA (Assessed under the SRE program)
- Southern Death Adder (*Acanthophis antarcticus*) listed as Priority 3 by the DBCA.

The above list is compiled from broad database parameters and has been refined further based on the field survey assessment within the Likelihood of Occurrence (LOO) assessment in Appendix D (Fauna Likelihood of occurrence assessment of significant species relevant to the Survey Area). and in section to accurately reflect the potential and actual occurrence of all locally relevant significant fauna.

3.7 Previous studies

Table 21 outlines previous studies identified within the O'Neil Study Area.

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Table 21 Previous Studies

Study	Location and key findings	Location in relation to this region
GHD (2024) Unpublished, O'Neil East Targeted Woylie Assessment	Location: O'Neil East This report outlines the findings from the Targeted Woylie Assessment. The targeted area was in the northwest of the O'Neil East Survey Area, extending into the Study Area. Approximately 75 ha of critical habitat. In total 49 Woylie events were recorded, and five additional conservation significant species was recorded: Chuditch, Quokka, Southwestern Brush-tailed Phascogale, Western Brush Wallaby and Quenda.	Approximately 1.7 km form eastern boundary (within study area).
GHD (2023) Unpublished, O'Neil East targeted Terrestrial Fauna assessment.	Location: O'Neil East This Report outlines the results of terrestrial vertebrate fauna survey of the O'Neil development envelope. The O'Neil Survey area is approximately 25 km from the township of Dwellingup in the Southwest of Western Australia. The O'Neil Survey area covers an area of approximate 2425.65 ha. In total Eight Significant Fauna Species were recorded in the Survey Area including: Woylie, Chuditch, Quokka, Baudin's Black Cockatoo, Forest Red-tailed Black Cockatoo, Western Brush Wallaby, Quenda and Dell's Skink. This Region has extensive foraging habitat for Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoo.	Abuts to the eastern boundary of the O'Neil Survey Area (extending up to 5 km east)
GHD (2022) Terrestrial Fauna Assessment Holyoake Mine Development – Holyoake East	Location: Holyoake East This report outlies the results of a terrestrial vertebrate fauna survey of the Holyoake East Development Envelope. The Holyoake East Survey Area is approximately 20 kms east of the Town of Dwellingup in the Southwest of Western Australia. The Survey area covers an approximate area of 17,354 ha. In total nine significant fauna species were recorded in the Survey area including: Baudin's Black Cockatoo, Carnaby's Black Cockatoo, Forest Red-tailed Black Cockatoo, Chuditch, Quenda, Western Brush Wallaby, Dell's Skink, Masked Owl and Rakali. The region had extensive foraging habitat for all three cockatoos as well as confirmed breeding habitat for Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoos.	Abuts the southwestern boundary of the O'Neil Survey Area
GHD (2022) Terrestrial Fauna Assessment Holyoake Mine Development – Holyoake East	Location: Holyoake West This report outlines the results of a terrestrial vertebrate fauna survey of the Holyoake West Development Envelope. The Holyoake East Survey Area is within 10 km of the town of Dwellingup in the Southwest of Western Australia. In total seven conservation significant fauna were recorded within the survey area, including: Quokka, Chuditch, Western Brush Wallaby, Forest Red-tailed Black Cockatoo, Baudin's Black cockatoo, Carnaby's Black Cockatoo and Quenda. The survey area contained extensive foraging evidence from all three types of Black Cockatoo.	Approximately 10km southwest of the main survey body. Approximately 1 km southwest of the Contingency Area A – infrastructure portion of the greater O'Neil Survey Area
GHD (2021b) Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake	Location: Holyoake This report details the results of a terrestrial vertebrate fauna survey of the Holyoake Development Envelope and adjacent conveyor and haul road corridors. The region is located approximately five kilometres east of the Dwellingup town site in the south-west of WA. The region covers approximately 10,541 ha. In total ten significant species were recorded in the region including the Quokka, Chuditch, Brush-tailed Phascogale, Western Brush Wallaby, Forest Red-tailed Black Cockatoo, Baudin's Black Cockatoo, Carnaby's Black Cockatoo, Western False Pipistrelle, Quenda and Peregrine Falcon. All significant species identified are	Abuts the southern survey boundary.

Study	Location and key findings	Location in relation to this region
	likely to have resident populations and habitat present within the region. Although recorded nearby and outside of the region the presence of Carter's Freshwater Mussel is unlikely due to the lack of permanent surface waterbodies present. The region has extensive foraging habitat for the three Black Cockatoo species, and potential breeding habitat (limited in extent) for Carnaby's and Forest Red-tailed Black Cockatoo. Regarding migratory shorebirds, the region lacks open water such as shallow shorelines or tidal zones for foraging habitat. The creek lines and vegetated dampland areas within the region are not Suitable for migratory shorebirds.	
Environmental Management and Research Consultants (EMRC) (1992) Long term fauna monitoring program 1992 (draft)	Location: 20 plots between Jarrahdale, Huntly and Karnet (control) Alcoa conducted numerous surveys as part of a monitoring program which included trapping (five successive trap nights in July, August and September), avifauna (quantitative and inventory surveys in summer and winter), reptile survey (trapping over five consecutive nights in Summer with toenail clippings to indicate recapture) opportunistic survey, nocturnal surveys and active searches. A total of 16 mammals, 61 birds, 21 reptiles, 6 frog and 80 and species were recorded. Recorded threatened fauna comprise: – Quenda – trapped at Jarrahdale – Baudin's Black Cockatoo (recorded at all sites) – Red-eared Firetail (delisted) – Carpet Python (delisted)	8 survey plots established in Jarrahdale, 8 plots established in Huntly and four control plots at Karnet. Exact locations are not shown in report, but Jarrahdale plots are expected to be within 50 km north of the region. Huntly is within 20 km north and Karnet is within 50 km north of the region
EMRC (1995) Long term fauna monitoring program 1995	Location: 20 plots between Jarrahdale, Huntly and Karnet (control) Alcoa conducted numerous surveys as part of a monitoring program which included trapping (five successive trap nights in July, August and September), avifauna (quantitative and inventory surveys in summer and winter), reptile survey (trapping over five consecutive nights in Summer with toenail clippings to indicate recapture) opportunistic survey, nocturnal surveys and active searches. A total of 19 mammals (six introduced), 57 birds, 20 reptiles, 5 frog and 52 ant species were recorded. Recorded threatened fauna comprise: – Quenda – four individuals were trapped – Chuditch – all opportunistic sightings (one near Phillips Road/Nettleton Road and seven ay Huntly Mine in 1995).	8 survey plots established in Jarrahdale, 8 plots established in Huntly and four control plots at Karnet. Exact locations are not shown in report but Jarrahdale plots are expected to be within 50 km north of the region. Huntly is within 20 km north and Karnet is within 50 km north of the region
EMRC (2003). McCoy Long Term Fauna Monitoring Program 2003	Location: six plots established, two in the Cameron catchment, two in the Gordon control catchment and two between these and the current Huntly Mine McCoy region crusher site. The monitoring program surveyed all terrestrial vertebrate species and ants. Mammal trapping occurred over four successive trap nights in both summer and winter using 10 pit traps, 16 medium Elliot traps, four large Elliot traps and four cage traps. Reptiles were targeted using five PVC pot traps with drift fence during summer. Traps were open on 29th Jan (summer) and 13 Aug (winter). Birds were surveyed using quantitative methods (two permanent bird transects surveyed on three consecutive days in summer and winter) and inventory methods (opportunistic recordings at each plot during the trapping program).	Huntly Mine approximately 10 km west of the Survey Area.

Study	Location and key findings	Location in relation to this region
	A total of six mammals (one introduced), 39 birds, 7 reptiles, 9 frog and 37 ant species were recorded. Recorded threatened fauna comprise: – Chuditch – two trapped plus sightings or signs – Baudin's Black Cockatoo - sightings	
EMRC (2006) Long term fauna monitoring program 2006	Location: 20 plots between Jarrahdale, Huntly and Karnet (control) Alcoa conducted numerous surveys as part of a monitoring program which included trapping (five successive trap nights in July, August and September), avifauna (quantitative and inventory surveys in summer and winter), reptile survey (trapping over five consecutive nights in Summer with toenail clippings to indicate recapture) opportunistic survey, nocturnal surveys and active searches. A total of 18 mammals (six introduced), 49 birds, 21 reptiles, 5 frog and 70 ant species were recorded. Recorded threatened fauna comprise: – Chuditch – opportunistic sightings at Huntly – Quokka – opportunistic sighting at Huntly – Baudin's Cockatoo – sighted at Jarrahdale, Huntly and Karnet – Carpet Python (delisted) – Quenda - trapped at Jarrahdale and Karnet – Western Brush Wallaby - sighted at Jarrahdale and Huntly	8 survey plots established in Jarrahdale, 8 plots established in Huntly and four control plots at Karnet. Exact locations are not shown in report but Jarrahdale plots are expected to be within 50 km north of the region. Huntly is within 20 km north and Karnet is within 50 km north of the region
EMRC (2007). McCoy Long Term Fauna Monitoring Program – results of the 2007 survey	Location: six plots established, two in the Cameron catchment, two in the Gordon control catchment and two between these and the current Huntly McCoy crusher site. Methods used were identical to those used in the 2003 survey (above). A total of seven mammal (two introduced), 41 bird, seven reptile, five frog and 54 ant species were recorded. Recorded threatened fauna comprise: – Baudin's Cockatoo –sightings – Western Brush Wallaby – multiple sightings	Huntly Mine approximately 10 km west of the survey area.
ALCOA World Alumina Australia (2010) No 40. Threatened fauna species management plans for Alcoa's bauxite mining operations in the Jarrah forest	Location: Mining Lease ML1sa Management Plan for seven species of fauna known to occur within the mining lease: – Noisy Scrub-bird – Chuditch – Quokka – Baudin's Black Cockatoo – Forest Red-tailed Black Cockatoo – Peregrine Falcon – Carpet Python (delisted)	Huntly Mine approximately 10 km west of the survey area.

Study	Location and key findings	Location in relation to this region
Stokes (2011) Orion Long Term Fauna Monitoring Program	Location: six monitoring sites within Alcoa's Orion mine region comprising two typical upland forest areas, two associated with stream zones and two within rehabilitated forest (8 years old). Mammals, birds, reptiles and frogs were surveyed during both summer (March) and winter (July), and ground dwelling invertebrates were sampled in summer only. Survey methods were similar to those used in EMRC (2006) with the addition of a single large trapping transect designed to specifically target Chuditch and species of goanna. This transect covered approx. 880 ha and comprised 40 wire cage traps spaced 300 m apart and was trapped over four successive nights at the same time as the generic mammal survey. A total of 10 mammals (three introduced), 38 birds, 9 reptiles, two frogs, 22 ground invertebrates, 49 ant species was recorded. Recorded threatened fauna comprise: – Chuditch – five males trapped in summer – Quenda – one trapped – Western Brush Wallaby – multiple sightings – Baudin's Black Cockatoo – sightings – Forest Red-tailed Black Cockatoo - sightings	Within 20 km of the far southwestern boundary of the region
Stokes (2012) Vertebrate Fauna Survey of Planted Mining Areas at Alcoa's Keats Mining region 2011/2012	Location: Keats mining region. Fauna was surveyed using a range of techniques, including trapping, remote sensitive cameras, tracking tunnels, observational surveys and spotlighting. Pitfall traps were not used. Five areas were trapped for mammals comprising two dieback free Jarrah forest areas and three stream zones. One landscape trapping transect was deployed to target Chuditch and goanna and this encompasses upland Jarrah forest, stream zones, low lying open forest, dieback graveyards and Sheoak forest. Black Cockatoo habitat survey was also undertaken. Surveys were only undertaken in summer due to time constraints. Recorded threatened fauna comprise: – Forest Red-tailed Black Cockatoo – flock sighted (up to 11 individuals) – Baudin's Black Cockatoo – 2 individuals sighted. – Western Brush Wallaby – sightings and recorded on remote camera. – Chuditch – one male trapped. – Carpet Python (delisted)	Huntly Mine approximately 10 km west of the region.
Way *et al*. (2013), McCoy Long Term Fauna Monitoring Program Report of the 2013 Field Survey	Location: six plots established, two in the Cameron catchment, two in the Gordon control catchment and two between these and the current Huntly McCoy crusher site and an additional three sites established in two-year-old rehabilitation within the McCoy Intermediate Rainfall Zone. In 2013 the McCoy Long Term Fauna Monitoring Program involved survey of terrestrial vertebrates (including mammals, birds and reptiles) and ground invertebrates, using the same methods used in previous LTFMP at McCoy (EMRC 2003, 2007). Mammals, birds, reptiles, and frogs were surveyed in both winter (July-August 2013) and summer December 2013-January 2014). Additional survey methods were also implemented including	Huntly Mine approximately 10 km west of the region.

Study	Location and key findings	Location in relation to this region
	a single large trapping transect to sample highly mobile species, remote sensor cameras and all invertebrates collected in pitfall traps were identified to taxonomic order. A total of 13 mammal species (four introduced), 46 birds, five frog, 31 invertebrates, and 64 ant species was recorded. Recorded threatened fauna comprise: – Western Quoll – one adult male trapped. – Quenda – recorded on remote cameras. – Western Brush Wallaby – multiple sightings and on remote cameras – Baudin's Black Cockatoo – multiple sightings – Forest Red-tailed Black Cockatoo – multiple sightings	
Chuditch survey raw data Myara 2013	This is an excel data file along with short summary document with the location description as 'Myara west' and 'Myara east'. Shows details of eight quoll captures at 'Myara west' and one quoll captured at 'Myara east' between 18-22 March 2013. Myara West excel data provides 8 GPS capture locations (in cage traps). Myara East excel data provides 40 locations with coordinates however according to the report only 1 capture location was recorded at Cage 26. The coordinates of this location was unable to be identified. Total number of captures comprised of five males and four females.	Location described as Myara west and east and general area surrounding Karnet Prison which is approximately 15km northwest of the region. GPS coordinates provided: 410458 E, 6409663 N 410839 E, 6408964 N 411357 E, 6408290 N 411766 E, 6410671 N 411138 E. 6407725 N 412384 E, 6408752 N 414231 E. 6408816 N 414362 E, 6409006 N
McGregor *et al*. (2014). Does forest restoration in fragmented landscapes provide habitat for a wide-ranging carnivore?	Location: Huntly and Willowdale mines Fourteen Chuditch trapping sessions (13 at Huntly, one at Willowdale) across 9 trapping transects (8 at Huntly, one at Willowdale) were undertaken between June 2009 and Dec 2010. Radio collars with a two-stage transmitter and mortality mode were attached to 14 adult Chuditch (9 female, 5 males – all trapped at Huntly). Chuditch were tracked to their dens during the day. Spool and line tracking was also used. In total 29 individual Chuditch were captured on 60 occasions. Of the 14 individuals fitted with radio collars, three were found dead on the Huntly mine access road with evidence of road trauma. Another three Chuditch were also found dead from vehicle strikes along this road. The study identified 138 den sites from 11 tracked animals: 75 in unmined forest and 63 in restored forest ranging from 2-32 years old. In unmined forest, dens were mostly in hollow logs and ground burrows beneath	Huntly Mine approximately 10 km north of the region. Willowdale (within 20 km south of the far southern boundary of the region)

Study	Location and key findings	Location in relation to this region
	tree stumps, but these substrates were never used in restored forest where dens were mostly ground burrows, usually associated with rock piles at the surface.	
Burgar *et al*. (2015) The importance of mature forest as bat roosting habitat within the production landscape	Location: forest surrounding Huntly mine site, for both restored and unmined forest. *Nyctophilus gouldii* and *Vespadelus regulus* were trapped and tracked during maternity and mating seasons using harp traps and position-sensitive radio transmitters. Few bats were captured in restored forest, so traps were relocated to water sources. Study aimed at identifying roost habitat within restored forest vs unmined forest. Findings indicate that habitat restoration in production forest landscapes is unlikely to play a significant role in conserving species that rely on slow developing microhabitats such as tree hollows for decades or centuries and that retaining and managing forest remnants would be a more effective strategy to conserve populations of these species.	Huntly mine, approximately 10 km west of the current region.
Burgar *et a*l. (2017) Habitat features act as unidirectional and dynamic filters to bat use of production landscapes	Location: five forest types around the Huntly mine (four restored forest with different stages of vegetation succession, and one unmined forest) Ultrasonic detectors (Anabat Titley Electronics) were set at 64 sites four times per year between Oct and March 2010/2011 and 2011/2012 for a total of 512 survey nights. 31,347 bat call files were recorded over both years of which 22,520 were identified to species/species group. *Vespadelus regulus* was detected most frequently (15,833 call files) and *Falsistrellus mackenziei* least frequently (167 call files). Six species/groups were detected. Recorded threatened fauna comprise: Western False Pipistrelle	Huntly Mine approximately 10 km west of the region.
Craig *et al*. (2017) Can postmining revegetation create habitat for a threatened mammal?	Location: Jarrah Forest (Huntly mine site approximately 10 km north of Dwellingup) Most revegetation conducted for biodiversity conservation aims to mimic. reference ecosystems present pre-disturbance. However, revegetation can overshoot or undershoot targets, particularly in the early stages of a recovery process, resulting in conditions different from the reference model. Revegetation that has, yet, failed to fully meet revegetation targets may, nonetheless, provide habitat for threatened species not present in reference ecosystems. To investigate this possibility a survey of the Quokka (*Setonix brachyurus*), a threatened macropod, in a mining landscape in south-western Australia was conducted. Four sites in each of riparian forest (the preferred habitat of quokkas) but is not mined, mid-slope forest, which is the pre-mining reference ecosystem but is not suitable habitat for quokkas, and revegetated forest on mine pits 16–21 years postmining. Quokkas were recorded in all riparian forest sites and two revegetated forest sites but not in any mid-slope forest sites. Occupied revegetated sites had greater cover between 0 and 2 m and were spatially closer to riparian forest than unoccupied revegetated sites, suggesting predation pressure was likely influencing which mine pits were occupied. The study demonstrated postmining revegetation can provide new habitat for a threatened species and suggested that revegetating a small proportion of sites to provide new habitat for threatened species could be considered as a management option in some scenarios. This could improve landscape connectivity and increase both the area of available habitat and between-site heterogeneity, which could all potentially increase the ability of revegetation to conserve biodiversity.	Huntly Mine approximately 10 km west of the region.

Study	Location and key findings	Location in relation to this region
EMRC (2015) Long Term Fauna Monitoring Program Summary of Results at Orion Mining region.	Location: Numerous plots over the Willowdale Mine area Results of the 3rd survey of the LTFMP. Same methodology and plot locations as 2010 survey of the area. Additionally, a large trapping transects targeting Chuditch and remote sensing cameras also deployed. Trapping conducted over 4 nights in both winter and summer seasons. The study results: – Twelve mammal species were trapped. – Thirty-five bird species recorded. – Thirteen reptile species recorded. – Three frog species recorded. Results were indicative of some species being affected (not present afterwards or in lower numbers) by the January 2016 wildfire that burnt through the Willowdale Mine and surrounding areas including four of the six Orion sites.	Willowdale (within 60 km south of the far southern boundary of the region)
Doherty *et al*. (2016). Successional changes in feeding activity by threatened cockatoos in revegetated mine sites.	Location: Numerous plots over the Huntly Mine, Boddington Bauxite Mine and Newmont Boddington Gold Mine. 232 plots were surveyed in revegetated forest and 480 plots were surveyed in unmined forest to determine whether there were successional patterns in cockatoo feeding activity in revegetation aged between 4 to 23 years. The study concludes that black cockatoos feed in vegetation at all three mine sites, despite variations in vegetation age, structure and floristics. Black cockatoos begun feeding on proteaceous and myrtaceous food plants within 4 and 7 years following revegetation, indicating that some food sources are restored quickly after mining disturbance of the Jarrah forest. The results highlight the importance of monitoring fauna recolonization over appropriate time scales to understand how successional processes in revegetation influence fauna persistence in production landscapes.	Huntly Mine approximately 10 km west of the region. Boddington Bauxite Mine approximately 18 km south east of the current region, Newmont Boddington Gold Mine approximately 25 km south east of current region.
Mastrantonis *et al*. (2019) Climate change indirectly reduces breeding frequency of a mobile	Location: The Northern Jarrah Forest of South- Western Australia over both the Swan and Murray River Catchments. Using a dataset of annual breeding frequency spanning 19 years, in combination with hydrological, climatological, and remotely sensed data, the effects of environmental variation on the annual breeding frequency of Forest Red-tailed Black Cockatoo's (FRTBC) were modelled. In total, 143 unique trees were surveyed over the 19-year period. A total of 173 breeding events were observed during this time with 104 and 71 events observed in the Swan and Murray River catchments respectively. On average there were 5.83 breeding events recorded per year with events ranging from 0 to 21 annually. Results found several significant relationships between annual breeding frequency of FRTBCs and environmental variation. While the model, which included a proxy for the availability of the cockatoo's primary food source and the previous season's rain, explained 49% of annual breeding frequency, there were also direct and indirect effects of heatwaves and forest productivity. FRTBC breeding was found to appear be linked to the spatiotemporal availability of its primary food sources, the fruit from the tree species, Marri *Corymbia calophylla* and Jarrah *Eucalyptus marginata*. However, due to climate change experienced and predicted to be experienced in the future in WA it is expected that the food resources during the breeding season for cockatoos will become increasingly limited in time and space, thus threatening their persistence	Approximately 10 km west of the northern boundary of the Study Area

Study	Location and key findings	Location in relation to this region
Burn (2000) A survey of the impact of burning on mammals and birds in Alcoa's rehabilitated Bauxite mines at Jarrahdale	Location: Jarrahdale forest (two unmined and four rehabilitated bauxite mine pits) To ascertain the impact of burning on birds and mammals at the above location pre burning monitoring took place 1997, and post burn monitoring commenced in 1998 in both burnt and unburnt, rehabilitated and unmined forest sites. Low numbers of mammals were caught making it difficult to conclude with certainty whether burning influenced most species. New epicormic growth may have attracted possums into one rehabilitated area, while mice invaded the dense rehabilitated site after the burn. There was a large decline in the numbers of birds and bird species following the burn in the dense rehabilitation. Burning sparse rehabilitation only resulted in a small decline while fire had little effect on bird populations of unmined forest. It was concluded that more time was needed to define the longer-term effects of burning on mammals and birds. The present survey was therefore undertaken in 2000 to assess the situation three years after burning.	Approximately 10 km north of the northern boundary of the Study Area.
Huntly rehabilitation (2000), Alcoa internal data	As no long-term monitoring of fauna has been conducted at Huntly since 1998, it was decided a repeat of the 1994 survey using identical methods would occur to gain a better understanding of the extent to which vertebrate fauna colonise older rehabilitation. The sites ranged from 14 to 22 years. Sixteen mammal species are known to inhabit rehabilitation at Huntly including 10 native and 6 feral species. Thirty-four bird species were recorded in the rehabilitated areas surveyed (like the 36 recorded in the 1994 survey. Eight reptile species and one frog species were recorded in the rehabilitated areas surveyed. Fourteen recommendations came about which if implemented should encourage the return of fauna species in similar number to which they occur in surrounding unmined forest. Some recommendations are identical to the 1994 study; they have either not been implemented or they should continue. Key recommendations include: Where it is not yet known about species recolonisation follow up monitoring in rehabilitated areas will reveal whether they have recolonised. Surrounding forest if the source of all fauna recruitment. It is important that fauna habitat be protected so that species are available to recolonise.	Huntly mine, approximately 10 km west of the current region.
EMRC (2007a) A Vertebrate Fauna Survey of Rehabilitated Areas at Alcoa's Huntly Mine site. (Final report)	Provides an overview of the 1994, 2000 and 2007 vertebrate fauna surveys of Alcoa's rehabilitated bauxite mines at Huntly. Mammals, birds and reptiles were surveyed in six rehabilitated pits ranging in age from 8 to 16 years. In total 16 mammal species (11 indigenous and 5 introduced), 34 birds and 8 reptiles were recorded. Rare or specially protected species either recorded in the present survey or recently sighted or trapped in rehabilitation at Huntly include the Brush-tailed Phascogale, Chuditch, Quokka, Baudin's Black Cockatoo, Forest Red-tailed Black Cockatoo and Carpet Python. Other species recorded in rehabilitation during the survey included the Echidna, Brush-tailed Phascogale and Common Brushtail Possum, while Western Brush Wallaby, Chuditch and Quenda have also recently been either trapped or sighted in rehabilitation at Huntly. Total bird species numbers recorded have remained like those in 2000 and in 1994, however in individual rehabilitated sites, the numbers of bird species and bird diversity have both decreased. Numbers of reptile species remained like those of previous years, with the Specially Protected Carpet Python seen in rehabilitation on a number of occasions. Thirteen recommendations were given as a result including protection of adjacent fauna habitat, construction of fauna habitats and corridors, control of feral species, construction of suitable habitat specific to mammals and reptiles.	Huntly mine, approximately 10 km west of the current region.
EMRC (2001a) Alcoa World Alumina Australia Ltd. Long	The Alcoa Long Term Fauna Monitoring Program was designed in 1991. Monitoring events took place in 1992, 1995, 1998 and 2001 (Nichols 1992) using identical methods each time (except for the baseline). The program is designed to monitor fauna every three years at twenty plots located in rehabilitation and nearby forest at Jarrahdale, Huntly and Karnet (remote from mining). A total of 16 mammal (10 indigenous, six introduced), 50	Exact locations are not shown in report but Jarrahdale plots are expected to be within 40 km

Study	Location and key findings	Location in relation to this region
Term Fauna Monitoring Program. (V2)	bird, 17 reptiles, 7 frog and 73 ant species was recorded. In 1998, the corresponding figures were 18 mammals, 53 bird, 21 reptiles, 7 frog and 56 ant species. Mammals recorded included one officially gazetted rare species, the Chuditch. Two of the species recorded in 1998 were not detected in 2001. These were the Brush-tailed Phascogale and an unidentified bat species. Numbers of several species appear to have changed significantly with some mammal and bird species declining, possibly due to very dry summer followed by very low winter rainfall. . Common brushtail possum and frog species increased. Baudin's Black Cockatoo was recorded at both Jarrahdale and Huntly. The reptile fauna included one 'Specially Protected' species, viz. the Carpet Python. Quantitative data showed that the composition of all rehabilitated sites was becoming more like that of the unmined sites. However, they remain linked to each other, particularly JR1 and JR2, which have become even more like each other.	north of the region. Huntly is within 10 km west and Karnet is within 40 km north of the region.
EMRC (1998) Alcoa of Australis Ltd. Long Term Fauna Monitoring Program (1998)	Location: Plots located in rehabilitation and nearby forest at Jarrahdale, Huntly and Karnet. This report provides the results of the 1998 fauna monitoring program. Methods used were identical to the 1995 monitoring program. Results are then compared to previous monitoring programs (1992 and 1995) in detail and the influence of mining and successional processes on fauna can be assessed. A total of 18 mammal (12 indigenous, six introduced), 53 bird, 20 reptiles, 5 frog and 56 ant species were recorded. Mammals recorded included two officially gazetted rare species, viz. the Chuditch and the Quokka. Two of the species recorded (Dunnart *Sminthopsis gilberti* and the Honey Possum) in 1995 were not detected in 1998. Several species have increased since the previous monitoring event (Mardo and Quenda). There wasn't any evidence of any mammal species declining due to proximity of mining. All bird species recorded in 1992 and 1995 were recorded in 1998. Only one rare bird species, Baudin's Black Cockatoo was recorded, and this was present at all sites. One new skink species was collected - *Glaphyromorphus gracilipes* was trapped at stream site HS1 (Banya Road) during the summer trapping program. Insufficient reptile numbers were collected to determine trends over time.	Exact locations are not shown in report but Jarrahdale plots are expected to be within 40 km north of the region. Huntly is within 10 km west and Karnet is within 40 km north of the region.
EMRC (2004) Orion LTFMP report 2004 Final	Location: Willowdale -northeast portion of Orion region (two healthy forest and two dieback forest plots, two steam zone plots and two plots in rehabilitation) The LTMFP was reviewed in 2003 (Majer, 2003) which included a recommendation for a similar program to be established at Orion so that any differences in faunal successional processes taking place at Willowdale could be detected. Similar techniques to those used at Jarrahdale, Huntly and McCoy. Mammals recorded during the survey included the Chuditch, Quokka, Mardo, Dunnart, Common Brushtail Possum, Western Brush Wallaby. Only one mammal species was recorded in the young rehabilitation (Feral Mouse). Forty-one bird species was recorded including the Baudin's Black Cockatoo. Bird numbers were highest at steam sites and lowest at rehabilitated sites. Six reptile species were recorded compared with 15 species recorded in the 1999 pre-mining survey. Three frog species were recorded. Fifty ant species were recorded. Further monitoring was recommended to determine successional patterns.	Willowdale (within 40 km south of the far southern boundary of the region)
EMRC (1999) A fauna survey of planned mining areas at Alcoa's Orion Mining region	Location: Orion mining region at Willowdale This report provides the results of the fauna survey conducted between February and November 1999. The habitats monitored were poorly surveyed in current mining areas, extensive dieback affected areas, small dieback free areas and on sites where mining operations are planned. A total of 46 bird species, nine mammals (6 native, 3 introduced), 13 reptiles and five frogs were recorded. These included three rare species (the Chuditch, Baudin's Black Cockatoo and possibly the Quokka) and one Specially Protected species (the Carpet Python). As well as these, the Noisy Scrub-bird has been reintroduced into the area and the uncommon Brush-tailed Phascogale is present albeit in low densities. The fauna of the Orion area was largely comparable to that of existing Willowdale mining areas. Results emphasise the need for ongoing fox control. Rehabilitation using	Willowdale (within 40 km south of the far southern boundary of the region)

Study	Location and key findings	Location in relation to this region
	Jarrah and other indigenous species offers the best prospects of successfully recreating suitable habitat for the species. Eleven recommendations were given for managing the area's faunal diversity including: protection of adjacent fauna habitat, construction of fauna habitats and corridors, control of feral species, construction of suitable habitat specific to mammals and reptiles.	
EMRC (2007b) A Vertebrate Fauna Survey of Rehabilitated Areas at Alcoa's Willowdale Minesite	Location: Willowdale (rehabilitated bauxite mine sites) This report details the 2007 results of the long-term fauna monitoring. Previous monitoring events occurred in 1994, 2000 (following fox control) and again in 2007. In the 2007 survey a total of 25 bird species, 10 mammals (seven indigenous, three introduced) and five reptiles was recorded in rehabilitation. They included three rare species, viz. the Chuditch, Brush-tailed Phascogale and Forest Red-tailed Black Cockatoo. Numbers of native mammals trapped in rehabilitation were higher than in previous years, with Yellow-footed Antechinus increasing from 0 in 1994 to 6 in 2007; Brush-tailed Phascogales increased from 0 to 1 and Chuditch increased from 0 to 3. Bird species had declined since the 2000 survey. Total numbers of both insectivores and honeyeaters both showed large declines between 1994 and 2000. There was a gradual decline in numbers of the skink *Acritoscincus trilineatus* as the rehabilitated sites become more like upland forest habitat and less suitable for this species. Fifteen recommendations were given for managing the area's faunal diversity including protection of adjacent fauna habitat, construction of fauna habitats and corridors, control of feral species, construction of suitable habitat specific to mammals and reptiles	Willowdale (within 40 km south of the far southern boundary of the region)
EMRC (2001b) A Vertebrate Fauna Survey of rehabilitated areas at Alcoa's Willowdale Mine site	Location: Willowdale (rehabilitated bauxite mine sites) This report details the 2000 fauna monitoring event results after the introduction of fox control following the 1994 monitoring event. A total of 31 bird species, nine mammals (five introduced, four indigenous) and five reptiles was recorded. Although not trapped or recorded in the present survey, both the rare Chuditch and the specially protected Carpet Python have been recently recorded in rehabilitation at Willowdale. Numbers of native mammals trapped in rehabilitation were low, as in 1994. Some evidence suggests that Fox predation may still be a problem near farmland. The 31 bird species recorded in the 2000 survey is less than the 45 recorded in 1994. The five reptile species recorded indicate that the rehabilitation has not yet become more suitable for this fauna group. Fifteen recommendations were given for managing the area's faunal diversity including protection of adjacent fauna habitat, construction of fauna habitats and corridors, control of feral species, construction of suitable habitat specific to mammals and reptiles.	Willowdale (within 40 km south of the far southern boundary of the region)

4. Survey results

4.1 Fauna habitats

There were nine broad fauna habitats found within the Survey Area during the field surveys and included cleared areas. The habitat varies from extensive habitats (Jarrah-Marri forest) to very limited habitat. Water bodies occurred in limited areas with the O'Neil Survey Area, with small seasonal not permanent streams occurring. Two large bodies of water occurred within the Survey Area (Lake Banksiadale and South Dandalup Dam), which is included as relevant to significant fauna. The habitat types are categorised based on flora species, hydrology, landform, soil and topography. The have also been outlined to aligned broadly with vegetation types identified by Mattiske by grouping similar vegetation community types to form Broad fauna types. The habitat types recorded in the Survey Area are described below in Table 22 and mapped in Figure 6, Appendix A. The Broad fauna habitat types are:

– Jarrah – Marri forest
– Wandoo woodland
– Mixed shrub damplands
– Bullich woodlands
– Blackbutt forest
– Granite outcrop
– Water bodies
– Rehabilitation areas
– Cleared areas.

Cleared areas are highly disturbed areas, often with minimal to no remnant native vegetation, limited habitat value and comprising a portion of the Survey Area. Cleared areas include rehabilitation areas, roads, tracks, firebreaks, powerline easements, infrastructure, and the Solus mine. These areas are included in Figure 6, Cleared areas lack, or have very limited habitat values, however some species forage on the Juvenile/small rehabilitation plants, for example Western Brush Wallabies will browse on the *Eucalyptus* and *Acacia* saplings planted in the rehabilitation areas.

4.1.1 Fauna habitat linkages

The Survey Area represents a large continuous tract of forest and woodland with good connectivity to all habitats directly adjacent.

Impacts to all habitat types in the Survey Area include damage from fire, historical logging, mining (mineral/soil extraction), trampling of vegetation (public wood collection and camping), soil compaction along trails (recreational users), off road public use, small amounts of clearing for tracks and artificial water sources as well as grazing from feral animals (pigs) and native kangaroos.

4.1.2 Quality of Habitat

Whilst the vegetation is mostly intact the impact by logging, mine clearing, frequent and extensive fire in some areas were evident. Despite this the habitat presents a large contiguous forest with multiple habitat types suitable for highly mobile species such as Chuditch and Western Brush Wallaby. The lack of many species (such as Brushtail Possums and various small reptiles) demonstrates the impact of existing human activities mainly logging and prescribed fires.

Jarrah-Marri forest is by far the most extensive habitat type making up most of the Survey Area. Aside from some areas being affected by clearing and logging the habitat type was found to be relatively intact. The forest habitat provides an array of microhabitats such as logs, hollows, leaf litter, soft sand and dense foliage with a broad range of floristic species providing a range of foraging, roosting, denning and sheltering habitat.

Large bodies of water and small ephemeral drainage lines reside within the survey area. These habitats provide accessible drinking water to fauna with ephemeral water only portions of the year. Low dense vegetation which is often associated with drainage lines was identified as suitable habitat for Quokkas and where frogs were heard calling across all phases.

The granite outcrop habitat comprises to small portions of the Survey Area. The outcrops provide habitat for granite specialists species such as Ornate Crevice Dragon and Barking Gecko. Signs of disturbance included rock damage and frequent fires. Fauna habitats are described below is Table 22.

Table 22 Major habitat types within the Survey Area

Description	Corresponding Vegetation Type Code (Mattiske 2024)	Area (ha)	Percentage of Survey Area (%)	Representative images
Jarrah-Marri Forest The most extensive fauna habitat within the Survey Area. Habitat dominated by Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) forest. With mixed understory of open to scattered to patchy Sheoak*, Banksia grandis* and Woody Pear and myrtaceous shrubs over Persoonia, Xanthorrhoea, Macrozamia and diverse low shrub layer, Soils are orange-brown lateritic sandy clay with pea gravel. There are very few well defined surface flow drainage lines as the soils tend to be porous and well-draining. Provides foraging, shelter and breeding habitat for a range of common locally occurring, mammals and reptiles such as Mardo, Grey kangaroo, and Rosenberg monitor, also habitat for a wide range of forest birds such as seasonal nectar feeding Purple-crowned Lorikeet, and Western Spinebill. Disturbance signs include intensive historical and current logging, dumped rubbish, frequent fire, localised dieback, and ground disturbance from pigs. **Significant species recorded:** Chuditch, Forest Red-tailed Black Cockatoo, Baudin's Black Cockatoo, Carnaby's Black Cockatoo, Quenda, Carnaby's Black Cockatoo, Masked Owl, Western Brush Wallaby, Western False Pipistrelle and Dell's skink. **Habitat for significant species:** Chuditch (foraging, denning, breeding), Forest Red-tailed Black Cockatoo (foraging, breeding, roosting), Baudin's Black Cockatoo (foraging, breeding, roosting), Carnaby's Black Cockatoo (foraging, breeding, roosting), Westen Brush Wallaby (foraging, breeding - residing), Dell's Skink (foraging, breeding, residing), Southern Death Adder (foraging, breeding, residing),	D, P, PS, S, SW, PT, SP, DA, DG, ST, PW, E, TS, T	9487.93	74.6	

Description	Corresponding Vegetation Type Code (Mattiske 2024)	Area (ha)	Percentage of Survey Area (%)	Representative images
Masked Owl (foraging, roosting, breeding, residing) and Western False Pipistrelle (foraging, roosting, residing). **Foraging Value** Forest Red-tailed Black Cockatoo – 9 Carnaby's Black Cockatoo – 9 Baudin's Black Cockatoo - 9				
Wandoo Woodland Tall wandoo woodlands with occasional Jarrah and Marri trees. There is extensive recruitment of young Wandoo dominating the understory due to low level of historical logging. Shrub layers dominated by Grass trees (*Xanthorrhoea preissii*), *Macrozamia riedlei* over mixed low shrubs including Grevillea, *Banksia dallanneyi*, and Hibbertia. Extensive habitat within easter portion of the Survey Area. Substrates consist of heavy pea-gravel sandy clay loam. Provides foraging and nesting habitat for many small insectivorous woodland birds including Thornbills, Robins, and Fairy-wrens. Disturbance factors include firewood removal, pigs, and trail bike activity. **Significant species recorded:** Baudin's Black Cockatoo and Western Brush Wallaby **Habitat for significant fauna:** Numbat (foraging, breeding, denning, residing), Baudin's Black Cockatoo (foraging, breeding, roosting), Carnaby's Black Cockatoo (foraging, breeding, roosting), Western Brush Wallaby (foraging, breeding - residing), **Foraging value** Forest Red-tailed Black Cockatoo – 7 Carnaby's Black Cockatoo – 7 Baudin's Black Cockatoo – 7	AY, Y, YG, YS	67.39	0.52	

Description	Corresponding Vegetation Type Code (Mattiske 2024)	Area (ha)	Percentage of Survey Area (%)	Representative images
Mixed Shrub Dampland Mixed shrub dampland has occasional Flooded Gum, Blackbutt and/or Jarrah over open to sparse *Melaleuca persiana*, *Xanthorrhoea preissii* and *Banksia littoralis* over low mixed dense myrtaceous shrubs, and sedges. Associated with and restricted to poor drainage areas of ephemeral dampland associated with dark grey sandy clay and humus soils. Some areas appear head waters of small ephemeral creeks within the survey area. Disturbances include pig activity and frequent prescribed burning. **Significant Species recorded:** Baudin's Black Cockatoo, Quokka, Western Brush Wallaby, Dell's Skink **Habitat for significant species:** Black Cockatoos (foraging). Quokka (foraging, breeding, residing), Quenda (foraging, breeding, residing), and Western Brush Wallaby (foraging, breeding, residing). **Foraging value scores** Forest Red-tailed Black Cockatoo - 7 Carnaby's Black Cockatoo -7 Baudin's Black Cockatoo - 7	AD, AX, AC, A	579.1	4.69	

Description	Corresponding Vegetation Type Code (Mattiske 2024)	Area (ha)	Percentage of Survey Area (%)	Representative images
Bullich Forest Bullich Forest is dominated by Bulich (*Eucalyptus megacarpa*) with an understory of Swamp peppermint (*Taxandria lineaifolia)*, Angle Sword Sedge (*Lepidosperma tetraquetrum).* Substrate is dark clay loam soil. Associated with seasonal creeks and drainage lines. Bullich Forest are restricted to localised areas within the O'Neil Survey Area. Disturbance factors include frequent fires and feral pigs. **Significant species recorded:** Nil **Habitat for significant fauna:** Provides habitat for a range birds and frogs. Thick undergrowth provides suitable habitat for Black Cockatoos (foraging, roosting), Quokka (foraging, breeding, residing), Quenda (foraging, breeding, residing), and Western Brush Wallaby (foraging, breeding, residing). **Foraging value:** Forest Red-tailed Black Cockatoo – 6 Carnaby's Black Cockatoo – 6 Baudin's Black Cockatoo – 6	W	216.15	1.7	

Description	Corresponding Vegetation Type Code (Mattiske 2024)	Area (ha)	Percentage of Survey Area (%)	Representative images
Blackbutt Forest Blackbutt forests are dominated by Blackbutt (*Eucalyptus pilularis*) and interspersed with scattered or occasional Jarrah- Marri and Flooded Gum over Melaleuca. Shrub layer comprised of *Xanthorrhoea preissii* , *Persoonia longifolia*, *Macrozamia riedlei* over mixed low shrubs (*Trymalium ledifolium*, *Grevillea wilsonii*, *Banksia dallanneyi*). and mixed, sedges, bracken fern and herbs. This habitat occupies a small proportion of the Survey Area and tends to be associated with seasonal creeks (drainage lines) and poor draining clay soils areas of low elevation. The vegetation of understory stratum varies from dense in long-unburnt areas, to sparse in areas subject to frequent prescribed burning. Where sufficient density of low shrub layer occurs, the habitat provides suitable movement corridor for Quokka and Quenda and a range of forest birds, mammals and reptiles. Disturbance includes frequent prescribed burning fires, pig disturbance and historical logging. **Significant Species recorded:** Quokka, All three Black Cockatoo **Habitat for significant species:** Carnaby's, Baudin's and Forest Red-tailed Black Cockatoo (Foraging, roosting, breeding) but lower density of forage plants than Jarrah-marri forest. Provides refugia and movement corridors for Quokka (foraging, breeding, residing), Quenda (foraging, breeding, residing), and Western Brush Wallaby (foraging, breeding, residing). **Foraging value scores** Forest Red-tailed Black Cockatoo – 8 Carnaby's Black Cockatoo – 8 Baudin's Black Cockatoo - 8	AW, C, CW	241.95	1.9	

Description	Corresponding Vegetation Type Code (Mattiske 2024)	Area (ha)	Percentage of Survey Area (%)	Representative images
Granite Outcrop Granite outcrop consisting of exfoliated slabs, boulders on exposed rock surfaces supporting scattered low herbaceous and myrtaceous shrubs, mosses, lichens, *Borya nitida* (Pyramid Plant) and other granite specialist flora. Outcrops are surrounded by Jarrah Marri forest. Granite also associated with seasonal watercourse due to seasonal rainfall run-off and associated shallow water table in some areas. Granite habitat represents a small proportion of the O'Neil Survey Area. But provides shelter and foraging habitat for a range of terrestrial vertebrates including granite-specialist species such as Ornate Crevice Dragon, and a diverse range of generalist species including Southern Carpet Python, Black-headed monitor, Southwestern cool-skink, Gould's hooded snake and Barking Gecko. The water courses associated with Granite outcrops provide breeding habitat for a range of common local frog species such as Quacking Frog, Lea's Frog, Moaning Frog, Signs of disturbance include rock damage, frequent fire and trail bike damage to vegetation. This habitat comprises a very small proportion of the Survey Area **Significant species recorded**: Nil **Habitat for significant species**: Chuditch (foraging, denning, breeding), Forest Red-tailed Cockatoo, Carnaby's Cockatoo (foraging only around the vegetated margins of rock areas) **Foraging value:** Forest Red-tail Black Cockatoo – 5 Carnaby's Black Cockatoo – 7 Baudin's Black Cockatoo – 5	G, G1, R, R/G	237.64	1.87	

Description	Corresponding Vegetation Type Code (Mattiske 2024)	Area (ha)	Percentage of Survey Area (%)	Representative images
Water bodies/reservoirs Water bodies within O'Neil Survey Area are limited to two large and localised areas of water. Water bodies are associated with dampland and broad drainage areas within flooded gum woodland habitat and comprise either natural shallow swamp or areas where swamp has historically been partially excavated to provide water supply for the former timber industry. They are relatively shallow and seasonal to semi-permanent ponds of standing water or very slow drainage. They are fringed by myrtaceous shrubs and sedges and form part of the habitat connectivity of the flooded gum dampland. They provide seasonal habitat for several common wetland bird species, and breeding habitat for a range of frog genera including *Heleioporus, Litoria,* and *Crinia*. **Significant species recorded.** Rakali, Carter's Freshwater Mussel, Forest Red-tailed Black Cockatoo **Habitat for significant fauna** Habitat for Carter's Freshwater Mussel and Rakali (foraging, breeding, residing), migratory birds (temporary foraging, loafing) and drinking water for Black Cockatoos, Western Brush Wallaby and Chuditch and all other fauna **Foraging value:** Forest Red-tail Black Cockatoo – 3 Carnaby's Black Cockatoo – 2 Baudin's Black Cockatoo – 2	-	15.23	0.12	

Description	Corresponding Vegetation Type Code (Mattiske 2024)	Area (ha)	Percentage of Survey Area (%)	Representative images
Cleared Area Cleared areas are highly disturbed areas, often with minimal to no remnant native vegetation and comprising a small proportion of the Survey Area. Cleared areas include roads, tracks, fire breaks, powerline easements and infrastructure, farm clearings on private property, and a portion of the Solus Mine Area. **Significant species recorded:** Western Brush Wallaby, Black Cockatoo (fly over) (opportunistic foraging) **Foraging value:** Forest Red-tailed Black Cockatoo – 2 Carnaby's Black Cockatoo - 2 Baudin's Black Cockatoo – 2	CL	300.54	2.36	

Description	Corresponding Vegetation Type Code (Mattiske 2024)	Area (ha)	Percentage of Survey Area (%)	Representative images
Rehabilitation Areas Rehabilitation areas were cleared areas (used for mining purposes) which have undergone rehabilitation in the form of log pile placements and native flora planting. Use is dependant on age with some areas rehabilitated recently (within 2 years) and others much older. **Significant species recorded**: Western Brush Wallaby (foraging), Black Cockatoo (fly over) or potential use of older rehabilitation, opportunistic use) **Foraging Value:** Forest Red-tailed Black Cockatoo – 0 Carnaby's Black Cockatoo – 0 Baudin's Black Cockatoo – 0	Rehab	1573.31	12.37	

4.2 Fauna diversity

The combined fauna survey (Phase 1, Camera Rotation, Phase 2, Phase 3 and Single Target) recorded a total of 121 vertebrate fauna species utilising the Survey Area. Of the 121 species, 19 were mammals, 68 birds, 27 reptiles, seven frogs. One invertebrate species was recorded during the survey.

4.3 Significant fauna

Twelve significant fauna species were recorded within the survey area during the survey period;

- Baudin's Black Cockatoo (*Zanda baudinii*) listed as Endangered under the BC Act and the EPBC Act.
- Carnaby's Black Cockatoo (*Zanda latirostris*) listed as Endangered under the BC Act and EPBC Act.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under the BC Act and the EPBC Act.
- Chuditch (*Dasyurus geoffroii*) listed as Vulnerable under the BC Act and the EPBC Act.
- Quokka (*Setonix brachyurus*) listed as Vulnerable under the EPBC Act and BC Act
- Rakali (*Hydromys chrysogaster*) Listed as Priority 4 by DBCA
- Western Bush Wallaby (*Notamacropus irma*) – listed as Priority 4 by the DBCA.
- Dell's Skink (*Ctenotus delli*) listed as Priority 4 by the DBCA
- Quenda (*Isoodon fusciventer*) listed as Priority 4 by the DBCA.
- Carter's Freshwater Mussel (*Westralunio carteri*) listed as Vulnerable under the EPBC Act and BC Act
- Masked Owls (*Tyto novaehollandiae novaehollandiae)* listed as Priority 3 by the DBCA
- The Western False Pipistrelle (*Falsistrellus mackenziei*) listed as Priority 4 by the DBCA

Likelihood of occurrence assessment

In addition to the field survey results, an assessment of the likelihood of significant species occurring in the Survey Area was undertaken. This assessment is based on species' biology, habitat requirements, the quality and availability of suitable habitat as determined during the field survey and records of the species in the Survey Area and locality. The database searches (*NatureMap*, PMST and DBCA) identified 166 terrestrial vertebrate fauna species previously recorded or likely to occur within the Study Area. Based on the above database searches and GHD observations, six significant terrestrial vertebrate taxa were identified as likely to occur or present within the Survey Area.

With regard to migratory shorebirds and marine species, the Survey Area lacks suitable foraging habitat, namely shorelines or extensive shallow open water. The creek lines and vegetated seasonal dampland areas within the Survey Area are not considered suitable foraging habitat and in most cases are dry during the period of migratory bird use in the south west of WA. Therefore, they are unlikely to occur within the Survey Area, and any occurrence would be as rare vagrant. A number of Marine listed species were recorded in the database searches however these species are marine use and typically common in the environment. These species are not discussed within the LOO assessment.

In addition to the 12 recorded significant species, a further five significant fauna species are considered likely to occur within the Survey Area even though extensive and targeted surveys did not detect them. Table 23 summarises the summarises all species of significance that are either known or considered highly likely or likely to occur in the Survey Area. The parameters of assessment for this likelihood of occurrence assessment and the full likelihood of occurrence assessment are provided in Appendix D, Fauna Likelihood of occurrence assessment.

Table 23 Likelihood of occurrence assessment

Species	EPBC Act	BC Act/ DBCA	Assessment Outcome
Mammals			
Chuditch (*Dasyurus geoffroii*)	VU	VU	**Known.** This species was recorded numerous times via remote cameras in the Survey Area. Suitable habitat is found within the survey area.
Quenda (*Isoodon fusciventer*)		P4	**Known.** This species was recorded numerous times via remote cameras and suitable habitat is found within the Survey Area.
Quokka (*Setonix brachyurus*)	VU	VU	**Known.** This species was recorded numerous times via remote cameras and suitable habitat is found within the Survey Area.
Western Brush Wallaby (*Notamacropus irma*)		P4	**Known.** This species was recorded numerous times via remote cameras and suitable habitat is found within the Survey Area.
Rakali (*Hydromys chrysogaster*)		P4	**Known.** This species was recorded numerous times via remote cameras and suitable habitat is found within southwestern portion of the Survey Area.
Woylie (*Bettongia penicillata ogilbyi*)	EN	CR	**Likely.** Known from Study Area. Restricted to Mixed shrub dampland and observed via remote cameras only 1.6 km from this survey areas boundary. Due the close proximity and patches of suitable habitat it is likely that Woylies will be present within the survey area but at very low population density, below the level of detectability based on current survey effort
Western False Pipistrelle (*Falsistrellus mackenziei*)		P4	**Known**. This species had a single recording via SM4 ultrasonic song meter. Suitable habitat found within the Survey Area.
Numbat (*Myrmecobius fasciatus*)	EN	EN	**Likely.** Historical records include the region. A resident population occurs in Dryandra and re-introduced population at Boyagin Rock. Eastern portions of the Holyoake Survey Area have excellent open wandoo woodland representing suitable Numbat habitat within the species' former range. This species potentially occurs within this suitable habitat, but at very low population density, below the level of detectability based on current survey effort
Brush tailed Phascogale (*Phascogale tapoatafa wambenger*)		CD	**Likely.** One individual was sighted in O'Neil East (GHD unpublished, 2024) and recorded on cameras at Holyoake East (GHD 2023) and Holyoake Central area by GHD in 2021. Suitable habitat occurs within Survey Area.
Birds			
Baudin's Black Cockatoo (*Zanda baudinii*)	EN	EN	**Known.** This species was recorded numerous times during the Survey period and suitable foraging and roosting habitat is found within the Survey Area.
Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)	VU	VU	**Known.** This species was recorded during the Survey period and suitable foraging and roosting habitat is found within the Survey Area.
Carnaby's Black Cockatoo (*Zanda latirostris*)	EN	EN	**Known.** This species was recorded via recent foraging evidence within the Survey Area. Suitable Black Cockatoo habitat resides within the Survey Area.
Masked Owl (southwest) (*Tyto novaehollandiae novaehollandiae*)		P3	**Known.** This species was recorded via SM4 Bird acoustic. Suitable habitat is found within the Survey Area.
Peregrine Falcon (*Falco peregrinus macropus*)		SP	**Likely.** Species has been recorded within the Holyoake region which is near the O'Neil Survey Area. The survey area contains suitable habitat for the Peregrine falcon.
Reptiles			
Dell's Skink (*Ctenotus delli*)		P4	**Known**. Three individuals of this species were trapped using targeted methods over all phases of the survey. Suitable habitat such as granite and lateritic clay supporting forest occur within the survey.

Species	EPBC Act	BC Act/ DBCA	Assessment Outcome
This Common Death Adder (*Acanthophis antarcticus*)		P3	**Likely.** Common Death Adders are found within the region with sightings <20kms away from the survey area. Suitable habitat with thick leaf litter is found within the Survey Area.
Invertebrates			
Carter's Freshwater Mussel (*Westralunio carteri*)	VU	VU	**Known.** Old shells were found at Lake Banksiadale within the Survey Area. Lake Banksiadale and South Dandalup Dam is the only habitat suitable for this species in the survey area.

4.3.1 Significant fauna recorded.

Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)

The Forest Red tailed Black Cockatoo is listed as Vulnerable under the EPBC Act and BC Act.

The Forest Red-tailed Black Cockatoo is endemic to the south-west humid and sub-humid zones of WA (Mawson and Johnstone 1997). It inhabits the dense Jarrah (*Eucalyptus marginata*), Karri (*E.diversicolor*) and Marri (*Corymbia calophylla*) forests receiving more than 600 mm of annual average rainfall. The current distribution is north of Perth and east to Mount Helena, Christmas Tree Well, North Banister, Mt Saddleback, Rocky Gully and the upper King River (Johnstone 1997). More recently the species has been utilising and persisting on the northern portions of the Swan Coastal Plain and is now considered a regular sighting (Johnstone *et al* 2017). Habitats in which Forest Red-tailed Black Cockatoos occur are throughout the Northern Jarrah Forest and within Marri, Jarrah, Wandoo, Blackbutt, Bullich and Flooded Gum present. This region has a general understorey of Bull Banksia (*Banksia grandis*), Snottygobble (*Persoonia longifolia*), Sheoak (*Allocasuarina fraseriana*) and other *Banksia* species with scattered ephemeral areas of relevant species (Johnstone & Kirkby 1999). Forest Red-tailed Black Cockatoos roost in emergent Jarrah-Marri-Blackbutt habitat on roadsides, paddocks or forest blocks. While the Forest Red-tailed Black Cockatoo feeds on the seeds of other species, around 90 per cent of its diet is made up of the seeds from Marri and Jarrah fruits.

Forest Red-tailed Black Cockatoos were observed flying, calling, loafing and foraging at 27 locations observing 82 individuals. One form of secondary evidence, Forest Red-tail Black Cockatoo tail feather, was found at another location, Table 24. A total of 235 Forest Red-tailed Black Cockatoo foraging observations were made, with a total of 148 being marri nuts, 86 of the observations were jarrah nuts and one observation of Blackbutt foraging Table 25. However, foraging evidence is not an indication to the size of the population. All foraging locations and bird sightings are located in Appendix A, Figure 5.

Table 24 Forest Red Tailed Black Cockatoo records.

Phase	Date	Observation type	Latitude	Longitude	Number of Individuals
Reconnaissance	29/06/2023	Flying	-32.5217	116.2056	3
Recc.	29/06/2023	Feeding on jarrah nuts	-32.4958	116.2211	6
Recc.	29/06/2023	Calling	-32.4961	116.2178	2
Recc.	29/06/2023	Flying	-32.4973	116.2070	6
Phase 1	17/08/2023	Flying	-32.5697	116.2558	2
Phase 1	18/08/2023	Flying	-32.4948	116.2688	6
Phase 1	18/08/2023	Flying	-32.5846	116.1180	2
Phase 1	18/08/2023	Loafing	-32.5013	116.2690	4
Phase 1	19/08/2023	Calling	-32.5001	116.2821	2
Phase 1	21/08/2023	Flying	-32.5356	116.3158	1
Phase 1	24/08/2023	Calling	-32.5113	116.2875	2
Phase 1	24/08/2023	Feeding on jarrah nuts	-32.5294	116.2822	2
Phase 1	25/08/2023	Feeding on jarrah nuts	-32.4992	116.2702	4
Phase 1	25/08/2023	Feeding on jarrah nuts	-32.4974	116.2698	2
Phase 1	25/08/2023	Feeding on marri nuts	-32.4807	116.2674	2
Phase 2	8/09/2023	Flying	-32.5262	116.2752	8
Phase 2	8/09/2023	Calling	-32.5086	116.2881	2
Phase 2	8/09/2023	Tail feather	-32.6323	116.0880	1
Phase 2	8/09/2023	Calling	-32.6324	116.0880	1

Phase	Date	Observation type	Latitude	Longitude	Number of Individuals
Phase 2	10/09/2023	Calling	-32.5622	116.2819	1
Phase 2	10/09/2023	Flying	-32.5841	116.2729	4
Phase 2	10/09/2023	Flying	-32.5829	116.2731	5
Phase 2	12/09/2023	Juvenile calling	-32.5251	116.2759	1
Phase 3	18/10/2023	Flying	-32.568	116.2623	5
Phase 3	18/10/2023	Flying	-32.5398	116.2589	2
Phase 3	21/10/2023	Flying	-32.5038	116.2334	3
Phase 3	22/10/2023	Flying	-32.5448	116.2517	3
Total observations					82

Table 25 Forest Red tailed Black Cockatoo foraging evidence.

Phase	Date	Latitude	Longitude	Foraging evidence type
Reconnaissance	27/06/2023	-32.6539	116.0795	Chewed marri nuts
Reconnaissance	27/06/2023	-32.6534	116.0794	Chewed jarrah nuts
Reconnaissance	27/06/2023	-32.6327	116.1124	Chewed jarrah nuts
Reconnaissance	27/06/2023	-32.6200	116.1160	Chewed marri nuts
Reconnaissance	27/06/2023	-32.6139	116.1106	Chewed jarrah nuts
Reconnaissance	27/06/2023	-32.6071	116.1096	Chewed jarrah nuts
Reconnaissance	27/06/2023	-32.5912	116.1172	Chewed jarrah nuts
Reconnaissance	29/06/2023	-32.4950	116.2146	Chewed marri nuts
Reconnaissance	29/06/2023	-32.5024	116.2358	Chewed jarrah nuts
Reconnaissance	29/06/2023	-32.5030	116.2374	Chewed jarrah nuts
Reconnaissance	29/06/2023	-32.5033	116.2380	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.5569	116.2403	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.5658	116.2331	Chewed marri nuts
Reconnaissance	30/06/2023	-32.5647	116.2315	Chewed marri nuts
Reconnaissance	30/06/2023	-32.5967	116.1963	Chewed marri nuts
Reconnaissance	30/06/2023	-32.5926	116.2009	Chewed marri nuts
Reconnaissance	30/06/2023	-32.5432	116.2373	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.5408	116.2339	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.5310	116.2279	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.5272	116.2744	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.5260	116.2753	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.5885	116.2044	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.5885	116.2044	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.6053	116.1923	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.6056	116.1925	Chewed marri nuts
Reconnaissance	30/06/2023	-32.6146	116.2024	Chewed jarrah nuts
Reconnaissance	30/06/2023	-32.6126	116.1987	Chewed jarrah nuts
Reconnaissance	24/07/2023	-32.6255	116.2110	Chewed marri nuts
Reconnaissance	24/07/2023	-32.6280	116.2152	Chewed marri nuts

Phase	Date	Latitude	Longitude	Foraging evidence type
Reconnaissance	24/07/2023	-32.6268	116.2121	Chewed jarrah nuts
Reconnaissance	24/07/2023	-32.6266	116.2171	Chewed marri nuts
Reconnaissance	24/07/2023	-32.5980	116.1891	Chewed marri nuts
Reconnaissance	24/07/2023	-32.5661	116.2300	Chewed marri nuts
Reconnaissance	24/07/2023	-32.5646	116.2314	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5630	116.2911	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5608	116.2898	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5552	116.2861	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5551	116.2923	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5564	116.2984	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5586	116.3091	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5980	116.1891	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5396	116.2302	Chewed jarrah nuts
Reconnaissance	27/07/2023	-32.5395	116.2301	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5469	116.2408	Chewed marri nuts
Phase 1	14/08/2023	-32.5006	116.2311	Chewed marri nuts
Phase 1	14/08/2023	-32.5007	116.2313	Chewed jarrah nuts
Phase 1	17/08/2023	-32.4768	116.2726	Chewed marri nuts
Phase 1	17/08/2023	-32.4753	116.2673	Chewed marri nuts
Phase 1	17/08/2023	-32.4802	116.2695	Chewed marri nuts
Phase 1	17/08/2023	-32.4856	116.2728	Chewed jarrah nuts
Phase 1	17/08/2023	-32.4887	116.2728	Chewed jarrah nuts
Phase 1	17/08/2023	-32.4901	116.2723	Chewed marri nuts
Phase 1	17/08/2023	-32.4932	116.2721	Chewed jarrah nuts
Phase 1	17/08/2023	-32.4978	116.2713	Chewed marri nuts
Phase 1	17/08/2023	-32.4988	116.2719	Chewed marri nuts
Phase 1	17/08/2023	-32.4977	116.2712	Chewed marri nuts
Phase 1	18/08/2023	-32.5840	116.3067	Chewed jarrah nuts
Phase 1	18/08/2023	-32.5844	116.3066	Chewed jarrah nuts
Phase 1	18/08/2023	-32.5844	116.3066	Chewed jarrah nuts
Phase 1	18/08/2023	-32.5826	116.3070	Chewed marri nuts
Phase 1	18/08/2023	-32.5825	116.3067	Chewed marri nuts
Phase 1	18/08/2023	-32.5838	116.1177	Chewed jarrah nuts
Phase 1	18/08/2023	-32.5849	116.1184	Chewed jarrah nuts
Phase 1	18/08/2023	-32.5850	116.1185	Chewed jarrah nuts
Phase 1	18/08/2023	-32.4989	116.2674	Chewed jarrah nuts
Phase 1	18/08/2023	-32.5868	116.1178	Chewed jarrah nuts
Phase 1	18/08/2023	-32.5869	116.1179	Chewed jarrah nuts
Phase 1	18/08/2023	-32.5858	116.1176	Chewed marri nuts
Phase 1	19/08/2023	-32.5313	116.2548	Chewed marri nuts
Phase 1	19/08/2023	-32.4984	116.2845	Chewed marri nuts

Phase	Date	Latitude	Longitude	Foraging evidence type
Phase 1	19/08/2023	-32.4981	116.2848	Chewed marri nuts
Phase 1	19/08/2023	-32.5240	116.3015	Chewed marri nuts
Phase 1	19/08/2023	-32.5240	116.3015	Chewed jarrah nuts
Phase 1	19/08/2023	-32.5246	116.3011	Chewed jarrah nuts
Phase 1	21/08/2023	-32.4983	116.2817	Chewed marri nuts
Phase 1	21/08/2023	-32.4986	116.2808	Chewed marri nuts
Phase 1	21/08/2023	-32.4780	116.2675	Chewed jarrah nuts
Phase 1	21/08/2023	-32.4772	116.2685	Chewed jarrah nuts
Phase 1	21/08/2023	-32.4769	116.2686	Chewed marri nuts
Phase 1	21/08/2023	-32.4759	116.2695	Chewed jarrah nuts
Phase 1	21/08/2023	-32.4755	116.2694	Chewed jarrah nuts
Phase 1	21/08/2023	-32.4754	116.2699	Chewed jarrah nuts
Phase 1	21/08/2023	-32.4751	116.2700	Chewed jarrah nuts
Phase 1	21/08/2023	-32.4749	116.2702	Chewed jarrah nuts
Phase 1	22/08/2023	-32.5955	116.2793	Chewed marri nuts
Phase 1	22/08/2023	-32.5765	116.2198	Chewed jarrah nuts
Phase 1	22/08/2023	-32.5772	116.2230	Chewed jarrah nuts
Phase 1	22/08/2023	-32.5772	116.2229	Chewed marri nuts
Phase 1	23/08/2023	-32.5028	116.2376	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5029	116.2376	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5030	116.2376	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5030	116.2375	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5031	116.2375	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5032	116.2375	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5032	116.2375	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5033	116.2374	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5287	116.1909	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5292	116.1913	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5296	116.1917	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5296	116.1918	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5298	116.1918	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5299	116.1917	Chewed marri nuts
Phase 1	23/08/2023	-32.5300	116.1920	Chewed marri nuts
Phase 1	23/08/2023	-32.5301	116.1919	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5307	116.1923	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5314	116.1930	Chewed marri nuts
Phase 1	23/08/2023	-32.5316	116.1929	Chewed jarrah nuts
Phase 1	23/08/2023	-32.5326	116.1937	Chewed marri nuts
Phase 1	23/08/2023	-32.5404	116.2098	Chewed Blackbutt nuts
Phase 1	23/08/2023	-32.5384	116.2116	Chewed jarrah nuts
Phase 1	24/08/2023	-32.5289	116.2831	Chewed marri nuts

Phase	Date	Latitude	Longitude	Foraging evidence type
Phase 1	24/08/2023	-32.5281	116.2838	Chewed marri nuts
Phase 1	24/08/2023	-32.5277	116.2838	Chewed jarrah nuts
Phase 1	24/08/2023	-32.5949	116.1174	Chewed jarrah nuts
Phase 1	24/08/2023	-32.5948	116.1175	Chewed marri nuts
Phase 1	24/08/2023	-32.5274	116.2840	Chewed jarrah nuts
Phase 1	24/08/2023	-32.5315	116.2832	Chewed marri nuts
Phase 1	24/08/2023	-32.6171	116.1112	Chewed jarrah nuts
Phase 1	24/08/2023	-32.6185	116.1135	Chewed marri nuts
Phase 1	24/08/2023	-32.6184	116.1131	Chewed marri nuts
Phase 1	24/08/2023	-32.6183	116.1124	Chewed marri nuts
Phase 1	24/08/2023	-32.5626	116.3039	Chewed marri nuts
Phase 1	24/08/2023	-32.5628	116.3040	Chewed marri nuts
Phase 1	24/08/2023	-32.5627	116.3051	Chewed marri nuts
Phase 1	24/08/2023	-32.5491	116.2929	chewed marri nuts
Phase 1	24/08/2023	-32.5434	116.2969	chewed marri nuts
Phase 1	25/08/2023	-32.5239	116.2766	Chewed marri nuts
Phase 1	25/08/2023	-32.5234	116.2762	Chewed marri nuts
Phase 1	25/08/2023	-32.5198	116.2749	Chewed marri nuts
Phase 1	25/08/2023	-32.5175	116.2752	Chewed marri nuts
Phase 1	25/08/2023	-32.5128	116.2676	Chewed marri nuts
Phase 1	25/08/2023	-32.5046	116.2659	Chewed marri nuts
Phase 1	25/08/2023	-32.6317	116.1138	Chewed marri nuts
Phase 1	25/08/2023	-32.6189	116.1147	Chewed marri nuts
Phase 1	25/08/2023	-32.6163	116.1106	Chewed jarrah nuts
Phase 1	25/08/2023	-32.6112	116.1107	Chewed marri nuts
Phase 1	25/08/2023	-32.6024	116.1123	Chewed jarrah nuts
Phase 1	25/08/2023	-32.4984	116.2623	Chewed jarrah nuts
Phase 1	25/08/2023	-32.4982	116.2589	Chewed jarrah nuts
Phase 1	25/08/2023	-32.4983	116.2550	Chewed jarrah nuts
Phase 1	25/08/2023	-32.5094	116.2411	Chewed marri nuts
Phase 1	25/08/2023	-32.5198	116.2487	Chewed marri nuts
Phase 1	25/08/2023	-32.5984	116.1154	Chewed jarrah nuts
Phase 1	25/08/2023	-32.4982	116.2514	Chewed marri nuts
Phase 2	5/09/2023	-32.5263	116.2750	Chewed marri nuts
Phase 2	5/09/2023	-32.5279	116.2740	Chewed marri nuts
Phase 2	7/09/2023	-32.5587	116.3090	Chewed marri nuts
Phase 2	7/09/2023	-32.5603	116.2893	Chewed jarrah nuts
Phase 2	7/09/2023	-32.5605	116.2856	Chewed marri nuts
Phase 2	7/09/2023	-32.5782	116.2825	Chewed marri nuts
Phase 2	7/09/2023	-32.5875	116.2906	Chewed jarrah nuts
Phase 2	7/09/2023	-32.5862	116.2909	Chewed marri nuts

Phase	Date	Latitude	Longitude	Foraging evidence type
Phase 2	7/09/2023	-32.5844	116.2920	Chewed jarrah nuts
Phase 2	7/09/2023	-32.5728	116.2865	Chewed marri nuts
Phase 2	7/09/2023	-32.5732	116.2820	Chewed jarrah nuts
Phase 2	7/09/2023	-32.5722	116.2799	Chewed marri nuts
Phase 2	7/09/2023	-32.5717	116.2785	Chewed jarrah nuts
Phase 2	8/09/2023	-32.6320	116.0859	Chewed marri nuts
Phase 2	8/09/2023	-32.6326	116.0880	Chewed marri nuts
Phase 2	8/09/2023	-32.5597	116.2547	Chewed marri nuts
Phase 2	10/09/2023	-32.5606	116.2831	Chewed marri nuts
Phase 2	10/09/2023	-32.5641	116.3077	Chewed jarrah nuts
Phase 2	10/09/2023	-32.5647	116.3083	Chewed marri nuts
Phase 2	10/09/2023	-32.5650	116.3085	Chewed marri nuts
Phase 2	10/09/2023	-32.5529	116.2851	Chewed marri nuts
Phase 2	10/09/2023	-32.5488	116.2827	Chewed marri nuts
Phase 2	10/09/2023	-32.5488	116.2820	Chewed marri nuts
Phase 2	10/09/2023	-32.5488	116.2815	Chewed marri nuts
Phase 2	10/09/2023	-32.5488	116.2799	Chewed marri nuts
Phase 2	10/09/2023	-32.5460	116.2742	Chewed marri nuts
Phase 2	10/09/2023	-32.5435	116.2743	Chewed marri nuts
Phase 2	10/09/2023	-32.5430	116.2742	Chewed marri nuts
Phase 2	10/09/2023	-32.5466	116.2720	Chewed marri nuts
Phase 2	10/09/2023	-32.5457	116.2676	Chewed marri nuts
Phase 2	10/09/2023	-32.5456	116.2668	Chewed marri nuts
Phase 2	10/09/2023	-32.5820	116.2654	Chewed marri nuts
Phase 2	10/09/2023	-32.5841	116.2702	Chewed marri nuts
Phase 2	10/09/2023	-32.5841	116.2706	Chewed marri nuts
Phase 2	10/09/2023	-32.5814	116.2746	Chewed marri nuts
Phase 2	10/09/2023	-32.5802	116.2785	Chewed marri nuts
Phase 2	10/09/2023	-32.5586	116.2833	Chewed marri nuts
Phase 2	10/09/2023	-32.5570	116.2811	Chewed jarrah nuts
Phase 2	10/09/2023	-32.5537	116.2784	Chewed marri nuts
Phase 2	10/09/2023	-32.5502	116.2755	Chewed marri nuts
Phase 2	10/09/2023	-32.5494	116.2751	Chewed marri nuts
Phase 2	10/09/2023	-32.5481	116.2754	Chewed marri nuts
Phase 2	11/09/2023	-32.5439	116.2585	Chewed marri nuts
Phase 2	11/09/2023	-32.5455	116.3089	Chewed jarrah nuts
Phase 2	11/09/2023	-32.5461	116.3098	Chewed marri nuts
Phase 2	11/09/2023	-32.5486	116.3121	Chewed marri nuts
Phase 2	11/09/2023	-32.5564	116.3126	Chewed marri nuts
Phase 2	11/09/2023	-32.5390	116.2832	Chewed marri nuts
Phase 2	11/09/2023	-32.5322	116.2830	Chewed marri nuts

Phase	Date	Latitude	Longitude	Foraging evidence type
Phase 2	11/09/2023	-32.5300	116.2832	Chewed marri nuts
Phase 2	11/09/2023	-32.5257	116.2849	Chewed marri nuts
Phase 2	11/09/2023	-32.5154	116.2891	Chewed marri nuts
Phase 2	12/09/2023	-32.5601	116.2894	Chewed marri nuts
Phase 2	12/09/2023	-32.5383	116.2838	Chewed marri nuts
Phase 2	12/09/2023	-32.5312	116.2791	Chewed marri nuts
Phase 2	12/09/2023	-32.5310	116.2778	Chewed marri nuts
Phase 2	12/09/2023	-32.5283	116.2758	Chewed marri nuts
Phase 2	12/09/2023	-32.5332	116.2852	Chewed marri nuts
Phase 2	12/09/2023	-32.5380	116.2852	Chewed marri nuts
Phase 2	14/09/2023	-32.5572	116.2398	Chewed marri nuts
Phase 3	17/10/2023	-32.5005	116.2313	Chewed jarrah nuts
Phase 3	17/10/2023	-32.5004	116.2312	Chewed jarrah nuts
Phase 3	21/10/2023	-32.5010	116.2307	Chewed jarrah nuts
Phase 3	22/10/2023	-32.5045	116.2873	Chewed marri nuts
Phase 3	22/10/2023	-32.5042	116.2307	Chewed marri nuts
Phase 3	22/10/2023	-32.5074	116.2292	Chewed marri nuts
Phase 3	22/10/2023	-32.5078	116.2292	Chewed marri nuts
Phase 3	22/10/2023	-32.5249	116.2412	Chewed marri nuts
Phase 3	22/10/2023	-32.5182	116.2355	Chewed marri nuts
Phase 3	22/10/2023	-32.5229	116.2162	Chewed jarrah nuts
Phase 3	22/10/2023	-32.5166	116.2295	Chewed marri nuts
Phase 3	22/10/2023	-32.5163	116.2232	Chewed marri nuts
Phase 3	22/10/2023	-32.5184	116.2193	Chewed marri nuts
Phase 3	22/10/2023	-32.5216	116.2168	Chewed marri nuts
Phase 3	22/10/2023	-32.5148	116.1999	Chewed marri nuts
Phase 3	22/10/2023	-32.5145	116.2029	Chewed marri nuts
Phase 3	22/10/2023	-32.5140	116.2120	Chewed marri nuts
Phase 3	22/10/2023	-32.5153	116.2128	Chewed marri nuts
Phase 3	22/10/2023	-32.5135	116.2149	Chewed marri nuts
Phase 3	22/10/2023	-32.5255	116.2709	Chewed marri nuts
Phase 3	22/10/2023	-32.5251	116.2708	Chewed marri nuts
Phase 3	22/10/2023	-32.5239	116.2701	Chewed marri nuts
Phase 3	22/10/2023	-32.5236	116.2699	Chewed marri nuts
Phase 3	22/10/2023	-32.5169	116.2603	Chewed marri nuts
Phase 3	22/10/2023	-32.5162	116.2596	Chewed marri nuts
Phase 3	22/10/2023	-32.5159	116.2590	Chewed marri nuts
Phase 3	22/10/2023	-32.4982	116.2589	Chewed jarrah nuts
Phase 3	23/10/2023	-32.5423	116.2238	Chewed marri nuts
Phase 3	23/10/2023	-32.5453	116.2209	Chewed jarrah nuts
Phase 3	23/10/2023	-32.5421	116.2360	Chewed marri nuts

Phase	Date	Latitude	Longitude	Foraging evidence type
Phase 3	23/10/2023	-32.5436	116.2382	Chewed marri nuts
Single target	15/12/2023	-32.4755	116.2648	Chewed jarrah nuts
Single target	15/12/2023	-32.4757	116.2643	Chewed jarrah nuts
Single target	15/12/2023	-32.4753	116.2639	Chewed jarrah nuts
Single target	15/12/2023	-32.4749	116.2631	Chewed jarrah nuts
Single target	15/12/2023	-32.4748	116.2625	Chewed jarrah nuts
Single target	15/12/2023	-32.4744	116.2617	Chewed jarrah nuts
Single target	15/12/2023	-32.4741	116.2607	Chewed jarrah nuts
Single target	15/12/2023	-32.4735	116.2585	Chewed jarrah nuts
Single target	15/12/2023	-32.4728	116.2581	Chewed jarrah nuts
Single target	15/12/2023	-32.4722	116.2567	Chewed jarrah nuts
Single target	15/12/2023	-32.4723	116.2561	Chewed jarrah nuts
Single target	15/12/2023	-32.4724	116.2549	Chewed marri nuts
Single target	15/12/2023	-32.4724	116.2543	Chewed marri nuts
Single target	15/12/2023	-32.4721	116.2537	Chewed jarrah nuts
Single target	15/12/2023	-32.4721	116.2534	Chewed jarrah nuts
Single target	15/12/2023	-32.4725	116.2536	Chewed jarrah nuts
Single target	15/12/2023	-32.4728	116.2537	Chewed jarrah nuts
Single target	15/12/2023	-32.4731	116.2538	Chewed jarrah nuts
Single target	15/12/2023	-32.4732	116.2542	Chewed jarrah nuts
Single target	15/12/2023	-32.4731	116.2559	Chewed jarrah nuts
Single target	15/12/2023	-32.4730	116.2573	Chewed jarrah nuts
Single target	15/12/2023	-32.4733	116.2576	Chewed jarrah nuts
Single target	15/12/2023	-32.4734	116.2578	Chewed jarrah nuts
Single target	15/12/2023	-32.4737	116.2584	Chewed jarrah nuts
Single target	15/12/2023	-32.4741	116.2587	Chewed marri nuts
Single target	15/12/2023	-32.4740	116.2600	Chewed jarrah nuts
Single target	15/12/2023	-32.4746	116.2610	Chewed jarrah nuts
Single target	15/12/2023	-32.4748	116.2614	Chewed jarrah nuts
Single target	15/12/2023	-32.4753	116.2629	Chewed jarrah nuts
Single target	15/12/2023	-32.4760	116.2650	Chewed jarrah nuts
Single target	15/12/2023	-32.4775	116.2675	Chewed marri nuts
Single target	15/12/2023	-32.4781	116.2684	Chewed jarrah nuts
Single target	15/12/2023	-32.4818	116.2712	Chewed jarrah nuts
Single target	15/12/2023	-32.4818	116.2715	Chewed jarrah nuts
Single target	15/12/2023	-32.4817	116.2717	Chewed jarrah nuts
Single target	15/12/2023	-32.4816	116.2714	Chewed marri nuts
Single target	15/12/2023	-32.4840	116.2727	Chewed jarrah nuts
Single target	15/12/2023	-32.4878	116.2741	Chewed jarrah nuts
Single target	15/12/2023	-32.4878	116.2733	Chewed marri nuts
Single target	15/12/2023	-32.4737	116.2588	Chewed jarrah nuts

Phase	Date	Latitude	Longitude	Foraging evidence type
Single target	15/12/2023	-32.4734	116.2577	Chewed jarrah nuts
Single target	15/12/2023	-32.4729	116.2528	Chewed jarrah nuts
Single target	15/12/2023	-32.4723	116.2544	Chewed jarrah nuts
Single target	15/12/2023	-32.4723	116.2562	Chewed jarrah nuts
Single target	15/12/2023	-32.4736	116.2598	Chewed jarrah nuts

Baudin's Black Cockatoo (*Zanda baudinii*)

The Baudin's Black Cockatoo is listed as Endangered under the EPBC Act and BC Act.

Baudin's Black Cockatoo is endemic to the south-west of WA. The range of Baudin's Black Cockatoo varies considerably between the breeding and non-breeding seasons. During the breeding season (from October to January), the species nests in isolated pockets of the far south-west of WA within Jarrah, Marri and Karri forests which receive an average of 750 mm of rainfall annually. In addition to the south-west there is an isolated patch of known breeding recorded at Perth Hills, east of Armadale (Johnstone & Storr 1998, Johnstone & Kirkby 2008). Breeding generally occurs in woodland or forest but may also occur in former woodland or forest now present as isolated trees withing partially cleared parkland or farmland. Nesting occurs in hollows of live or dead karri, marri, wandoo and tuart (*Eucalyptus gomphocephala*) trees (DSEWPaC 2012). During the breeding season feeding primarily occurs in native vegetation, particularly Marri (DSEWPaC 2012). The range then expands during the non-breeding season (from February) as flocks disperse to forage more widely, congregating on the central and northern parts of the Darling plateau, as far as Mundaring and Gidgegannup (DSEWPaC 2012; Saunders 1974 & 1979).

Baudin's Black Cockatoo were recorded in flight, foraging (Plate 1), loafing and perching at several locations within the Survey Area as shown in Table 26. In total Baudin's Black Cockatoo were recorded at 10 different locations with a total of 35 individuals observed. Baudin's Black Cockatoo foraging evidence was recorded at 21 different locations, with Marri nuts as the primary foraging evidence, Table 27 and Appendix A, Figure 5.



Plate 1 ***Baudin's Black Cockatoo taken within the survey area.***

Table 26 Baudin's Black Cockatoo observations

Phase	Date	Observation type	Latitude	Longitude	Number of Individuals
Reconnaissance	29/06/2023	Perched with juvenile	-32.5422	116.2843	6
Phase 1	17/08/2023	Flying	-32.5377	116.3326	2
Phase 2	11/09/2023	Flying	-32.5739	116.3037	2
Phase 2	11/09/2023	Foraging	-32.5414	116.2834	11
Phase 2	11/09/2023	Flying	-32.5405	116.2833	2
Phase 2	11/09/2023	Flying	-32.5390	116.2833	1
Phase 2	12/09/2023	Flying	-32.5349	116.2826	6
Phase 2	12/09/2023	Flying	-32.5483	116.2178	2
Phase 3	22/10/2023	Flying	-32.5397	116.2566	2
Phase 3	18/10/2023	Flying	-32.5642	116.3153	1
Total observations					35

Table 27 Baudin's Black Cockatoo foraging evidence recorded.

Phase	Date	Latitude	Longitude	Foraging evidence type
Reconnaissance	30/06/2023	-32.5784	116.2166	Chewed marri nuts
Reconnaissance	30/06/2023	-32.6161	116.2107	Chewed marri nuts
Reconnaissance	30/06/2023	-32.6180	116.2202	Chewed marri nuts
Reconnaissance	30/06/2023	-32.6208	116.2243	Chewed marri nuts
Reconnaissance	30/06/2023	-32.6265	116.2284	Snotty gobble residue
Reconnaissance	24/07/2023	-32.5669	116.1714	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5854	116.3052	Chewed marri nuts
Reconnaissance	27/07/2023	-32.5556	116.2866	Chewed marri nuts
Phase 1	18/08/2023	-32.5595	116.2860	Chewed marri nuts
Phase 1	25/08/2023	-32.5330	116.2561	Chewed marri nuts
Phase 2	7/09/2023	-32.5594	116.2861	Chewed marri nuts
Phase 2	7/09/2023	-32.5838	116.2939	Chewed marri nuts
Phase 2	7/09/2023	-32.5796	116.2973	Chewed marri nuts
Phase 2	11/09/2023	-32.5395	116.2835	Chewed marri nuts
Phase 2	12/09/2023	-32.5383	116.2838	Chewed marri nuts
Phase 2	12/09/2023	-32.5311	116.2791	Chewed marri nuts
Phase 3	22/10/2023	-32.5113	116.2334	Chewed marri nuts
Phase 3	22/10/2023	-32.5223	116.2163	Chewed marri nuts
Phase 3	22/10/2023	-32.5172	116.2213	Chewed marri nuts
Phase 3	22/10/2023	-32.5140	116.2145	Chewed marri nuts
Phase 3	23/10/2023	-32.5423	116.2238	Chewed marri nuts

Carnaby's Black Cockatoo (*Zanda latirostris*)

The Carnaby's Black Cockatoo is listed as Endangered under the EPBC Act and BC Act.

Carnaby's Black Cockatoo is endemic to the south-west of WA from near Cape Arid on the south coast through the eastern Wheat Belt and north to about Kalbarri. Carnaby's Black Cockatoo nest in hollows of live or dead eucalypts, primarily smooth-barked Salmon Gum and Wandoo (Saunders 1979, 1982) though breeding has been reported in other Wheatbelt tree species and some tree species on the Swan Coastal Plain and Jarrah forest (Saunders 1979, 1982; Storr 1991; Johnstone & Storr 1998). Success in breeding is dependent on sufficient high quality foraging habitat located in proximity of nesting and is nominally a radius of up to12 km of nesting sites (Saunders 1979, 1982; Saunders and Ingram 1987). Along with the trees that provide nest hollows, the protection and increase of this feeding habitat that supports the breeding of Carnaby's Black Cockatoo is a critical requirement for the conservation management of the species.

Carnaby's Black Cockatoos were rarely recorded within the Survey Area with only two observations during Phase 1 (Table 28). Foraging evidence was recorded within the Survey Area. Chewed marri nuts were recorded at two locations, Table 29 and Appendix A, Figure 5.

Table 28 Carnaby's Black Cockatoo observations

Phase	Date	Observation type	Latitude	Longitude	Number of individuals
Phase 1	22/08/2023	Flying	-32.5434	116.2484	1
Phase 1	22/08/2023	Perched	-32.5678	116.2377	2

Table 29 Carnaby's Black Cockatoo foraging evidence

Phase	Date	Latitude	Longitude	Foraging evidence type
Single target	15/12/2023	-32.4737	116.2589	Chewed marri nuts
Single target	15/12/2023	-32.4724	116.2558	Chewed marri nuts

Western Brush Wallaby (*Notamacropus irma*)

The Western Brush Wallaby is listed as Priority 4 by the DBCA.

The Western Brush Wallaby occurs widely through south-west WA although its former distribution was more extensive, having contracted due to habitat loss from historical and ongoing land clearing. It is a medium size macropod with a head body of 900mm and has distinctive pale stripes on its face with black and white ears and black feet and hands (Van Dyck et al., 2013). Western Brush Wallaby is locally common in dry sclerophyll forest and woodlands in the southwest of WA (Menkhorst & Knight 2010). They are predominantly diurnal, grazing on grasses and forbs.

During the Survey the Western Brush Wallaby had a total of 143 observations (161 individuals) with throughout the Survey Area. Observations mainly consisted opportunistic sightings and remote camera within Jarrah-marri forest Table 30. Opportunistic observations of Western Brush Wallaby accounted for 57 of the observations Remote cameras accounted for 11 Western Brush Wallaby observations (Plate 2). Locations of Western Brush Wallaby observations during the survey are presented In Table 30 and Appendix A, Figure 4.



Plate 2 *Western Brush Wallaby recorded via remote camera.*

Table 30 *Western Brush Wallaby Records from the survey area*

Phase	Date	Record type	Latitude	Longitude	Number of individuals
Reconnaissance	29/06/2023	Individual	-32.5508	116.3301	1
Reconnaissance	29/06/2023	Individual	-32.5724	116.3276	1
Reconnaissance	29/06/2023	Individual	-32.5350	116.2844	1
Reconnaissance	30/06/2023	Individual	-32.5629	116.3154	1
Reconnaissance	30/06/2023	Individual	-32.5861	116.3150	1
Reconnaissance	30/06/2023	Fresh scat	-32.5666	116.2338	1
Reconnaissance	30/06/2023	Fresh scat	-32.5679	116.2345	1
Camera Rotation	27/07/2023	Individual	-32.5474	116.3300	1
Camera Rotation	27/07/2023	Fresh scat	-32.5575	116.3128	1
Phase 1	14/08/2023	Fresh scat	-32.5685	116.2594	1
Phase 1	14/08/2023	Individual	-32.5501	116.3156	1
Phase 1	16/08/2023	Remote camera	-32.5545	116.2861	2
Phase 1	18/08/2023	Individual	-32.5280	116.2740	1
Phase 1	18/08/2023	Individual	-32.5077	116.2663	1
Phase 1	20/08/2023	Remote camera	-32.5985	116.1155	1
Phase 1	20/08/2023	Remote camera	-32.5710	116.3274	1
Phase 1	20/08/2023	Individual	-32.5525	116.3155	1
Phase 1	20/08/2023	Individual	-32.5747	116.3151	1
Phase 1	20/08/2023	Individual	-32.5815	116.3151	1
Phase 1	21/08/2023	Individual	-32.5635	116.3154	1
Phase 1	22/08/2023	Individual	-32.4993	116.2281	2
Phase 1	22/08/2023	Individual	-32.5565	116.3155	1
Phase 1	22/08/2023	Individual	-32.5535	116.3155	1
Phase 1	22/08/2023	Individual	-32.5247	116.2502	1

Phase	Date	Record type	Latitude	Longitude	Number of individuals
Phase 1	23/08/2023	Remote camera	-32.6316	116.1140	1
Phase 1	23/08/2023	Individual	-32.5289	116.2452	1
Phase 1	24/08/2023	Individual	-32.5120	116.2866	1
Phase 1	24/08/2023	Individual	-32.6308	116.0798	1
Phase 1	24/08/2023	Individual	-32.6328	116.1077	1
Phase 1	24/08/2023	Old scat	-32.5358	116.3336	1
Phase 1	25/08/2023	Individual	-32.4799	116.2715	1
Phase 1	25/08/2023	Individual	-32.5152	116.2451	1
Phase 2	5/09/2023	Fresh scat	-32.5407	116.2595	1
Phase 2	6/09/2023	Individual	-32.5783	116.3152	1
Phase 2	6/09/2023	Individual	-32.5387	116.3268	1
Phase 2	7/09/2023	Remote camera	-32.5364	116.2621	1
Phase 2	7/09/2023	Remote camera	-32.5453	116.2569	1
Phase 2	9/09/2023	Remote camera	-32.4978	116.2715	1
Phase 2	9/09/2023	Remote camera	-32.5589	116.2374	1
Phase 2	9/09/2023	Remote camera	-32.5589	116.2374	1
Phase 2	10/09/2023	Remote camera	-32.5483	116.2527	1
Phase 2	10/09/2023	Individual	-32.5117	116.2871	1
Phase 2	10/09/2023	Individual	-32.5241	116.2767	1
Phase 2	10/09/2023	Individual	-32.5690	116.2954	1
Phase 2	10/09/2023	Individual	-32.5695	116.2958	1
Phase 2	10/09/2023	Individual	-32.5731	116.3280	1
Phase 2	11/09/2023	Individual	-32.5144	116.2449	1
Phase 2	11/09/2023	Individual	-32.5192	116.2486	1
Phase 2	11/09/2023	Fresh scat	-32.5417	116.2837	1
Phase 2	12/09/2023	Remote camera	-32.5334	116.2649	1
Phase 2	12/09/2023	Deceased individual	-32.5584	116.2891	1
Phase 2	12/09/2023	Individual	-32.5310	116.2780	1
Phase 2	12/09/2023	Individual	-32.5026	116.2363	1
Phase 2	14/09/2023	Individual	-32.5455	116.2570	2
Phase 2	14/09/2023	Individual	-32.5362	116.2630	1
Phase 3	17/10/2023	Deceased individual	-32.5404	116.2604	1
Phase 3	18/10/2023	Individual	-32.5097	116.2882	1
Phase 3	18/10/2023	Individual	-32.5718	116.2984	2
Phase 3	18/10/2023	Individual	-32.5587	116.3041	1
Phase 3	18/10/2023	Individual	-32.5698	116.3153	1
Phase 3	18/10/2023	Individual	-32.5589	116.3155	1
Phase 3	18/10/2023	Individual	-32.5505	116.2601	1
Phase 3	19/10/2023	Individual	-32.5127	116.2854	1
Phase 3	19/10/2023	Fresh scat	-32.5082	116.2882	1

Phase	Date	Record type	Latitude	Longitude	Number of individuals
Phase 3	19/10/2023	Individual	-32.5634	116.2913	1
Phase 3	20/10/2023	Individual	-32.5127	116.2853	1
Phase 3	20/10/2023	Fresh scat	-32.5529	116.3156	1
Phase 3	20/10/2023	Individual	-32.5239	116.2508	1
Phase 3	20/10/2023	Individual	-32.5263	116.2514	1
Phase 3	20/10/2023	Individual	-32.4980	116.2319	1
Phase 3	20/10/2023	Individual	-32.5323	116.2568	1
Phase 3	21/10/2023	Individual	-32.5653	116.2924	1
Phase 3	21/10/2023	Individual	-32.5727	116.3025	1
Phase 3	21/10/2023	Individual	-32.5440	116.2615	2
Phase 3	21/10/2023	Individual	-32.5035	116.2309	1
Phase 3	22/10/2023	Individual	-32.5273	116.2531	1
Phase 3	22/10/2023	Individual	-32.5183	116.2195	1
Phase 3	22/10/2023	Fresh scat	-32.5173	116.2348	1
Phase 3	23/10/2023	Individual	-32.5175	116.2477	1
Phase 3	23/10/2023	Individual	-32.5481	116.3157	1
Single target	14/12/2023	Individual	-32.4857	116.2731	1
Single target	14/12/2023	Individual	-32.4879	116.2735	1
Single target	16/12/2023	Remote camera	-32.4740	116.2606	1
Single target	17/12/2023	Remote camera	-32.4740	116.2606	2
Single target	18/12/2023	Remote camera	-32.4740	116.2606	1
Single target	19/12/2023	Remote camera	-32.4740	116.2606	2
Single target	20/12/2023	Remote camera	-32.4740	116.2606	2
Single target	21/01/2024	Remote camera	-32.4740	116.2606	1
Single target	24/12/2023	Remote camera	-32.4740	116.2606	1
Single target	26/12/2023	Remote camera	-32.4740	116.2606	1
Single target	27/12/2023	Remote camera	-32.4740	116.2606	1
Single target	1/01/2024	Remote camera	-32.4740	116.2606	1
Single target	10/01/2024	Remote camera	-32.4740	116.2606	1
Single target	13/01/2024	Remote camera	-32.4740	116.2606	1
Single target	18/01/2024	Remote camera	-32.4740	116.2606	2
Single target	21/01/2024	Remote camera	-32.4739	116.2606	1
Single target	22/01/2024	Remote camera	-32.4740	116.2607	1
Single target	17/12/2023	Remote camera	-32.4724	116.2571	1
Single target	18/12/2023	Remote camera	-32.4724	116.2571	1
Single target	19/12/2023	Remote camera	-32.4724	116.2571	1
Single target	22/12/2023	Remote camera	-32.4724	116.2571	1
Single target	26/12/2023	Remote camera	-32.4724	116.2571	1
Single target	27/12/2023	Remote camera	-32.4724	116.2571	1
Single target	30/12/2023	Remote camera	-32.4724	116.2571	1

Phase	Date	Record type	Latitude	Longitude	Number of individuals
Single target	5/01/2024	Remote camera	-32.4724	116.2571	2
Single target	8/01/2024	Remote camera	-32.4724	116.2571	1
Single target	11/01/2024	Remote camera	-32.4724	116.2571	1
Single target	12/01/2024	Remote camera	-32.4724	116.2571	1
Single target	18/01/2024	Remote camera	-32.4724	116.2571	1
Single target	24/01/2024	Remote camera	-32.4724	116.2571	1
Single target	25/01/2024	Remote camera	-32.4724	116.2571	1
Single target	16/12/2023	Remote camera	-32.4753	116.2641	1
Single target	20/12/2023	Remote camera	-32.4753	116.2641	1
Single target	21/12/2023	Remote camera	-32.4753	116.2641	1
Single target	22/12/2023	Remote camera	-32.4753	116.2641	1
Single target	23/12/2023	Remote camera	-32.4753	116.2641	1
Single target	24/12/2023	Remote camera	-32.4753	116.2641	1
Single target	25/12/2023	Remote camera	-32.4753	116.2641	1
Single target	18/12/2023	Remote camera	-32.4843	116.2722	1
Single target	19/12/2023	Remote camera	-32.4843	116.2722	2
Single target	20/12/2023	Remote camera	-32.4843	116.2722	2
Single target	21/12/2023	Remote camera	-32.4843	116.2722	2
Single target	23/12/2023	Remote camera	-32.4843	116.2722	2
Single target	24/12/2023	Remote camera	-32.4843	116.2722	1
Single target	28/12/2023	Remote camera	-32.4843	116.2722	1
Single target	30/12/2023	Remote camera	-32.4843	116.2722	1
Single target	2/01/2024	Remote camera	-32.4843	116.2722	2
Single target	16/12/2023	Remote camera	-32.4771	116.2673	1
Single target	18/12/2023	Remote camera	-32.4771	116.2673	1
Single target	20/12/2023	Remote camera	-32.4771	116.2673	2
Single target	27/12/2023	Remote camera	-32.4771	116.2673	1
Single target	31/12/2023	Remote camera	-32.4771	116.2673	1
Single target	2/01/2024	Remote camera	-32.4771	116.2673	1
Single target	8/01/2024	Remote camera	-32.4771	116.2673	3
Single target	17/01/2024	Remote camera	-32.4771	116.2673	1
Single target	18/01/2024	Remote camera	-32.4771	116.2673	1
Single target	20/12/2023	Remote camera	-32.4818	116.2717	1
Single target	21/12/2023	Remote camera	-32.4818	116.2717	1
Single target	23/12/2023	Remote camera	-32.4818	116.2717	1
Single target	24/12/2023	Remote camera	-32.4818	116.2717	1
Single target	29/12/2023	Remote camera	-32.4818	116.2717	1
Single target	2/01/2024	Remote camera	-32.4818	116.2717	1
Total individuals sighted					161

**This number is events recorded on camera and does not imply to number of individuals.

Chuditch (*Dasyurus geoffroii*)

The Western Quoll or Chuditch is listed as Vulnerable under the BC Act and EPBC Act.

The Chuditch is WA's largest extant carnivorous marsupial and is endemic to the south-west. It has mostly brown fur with distinctive white spots (4 to 7 white spots on its body but not on its tail). The head body length is up to 40 cm and tail to 35 cm long. The Chuditch feeds mostly on large invertebrates. It also easts small lizards, birds and mammals. They are also known to consume the red pulp on Zamia seeds, small fruits and part of flowers. They utilise hollow logs or burrows for a den during the day and hunt at night. It is an excellent climber and will hunt for prey arboreally. Historically, Chuditch inhabited a wide range of habitats, but today it survives mostly in Jarrah (*E.marginata*) forests and heathlands of the south-west, and woodlands of the Great Southern (DBCA 2017a).

Chuditch were recorded on 16 remote cameras at several locations in Jarrah-Marri woodlands, Table 31. (see Appendix A, Figure 4). Physical assessments were conducted on the Chuditch, where camera trap images were analysed in detail to identify individuals from there spot patterns. From this assessment four different individuals were identified in the Survey Area (for analysis, Chuditch camera capture (*Dasyurus geoffroii*) physical assessment data). There is a likelihood that more individuals reside in the Survey Area as not all camera images show identifying features.



Plate3 *Chuditch recorded via remote camera*

Table 31 *Chuditch observations*

Phase	Date	Record type	Latitude	Longitude	Number of individuals
Reconnaissance	2/07/2023	Remote camera	-32.5862	116.3128	1
Reconnaissance	2/07/2023	Remote camera	-32.5862	116.3128	1
Reconnaissance	6/07/2023	Remote camera	-32.5862	116.3128	1
Reconnaissance	10/07/2023	Remote camera	-32.5862	116.3128	1
Reconnaissance	3/07/2023	Remote camera	-32.5545	116.2861	1
Phase 1	19/08/2023	Remote camera	-32.5695	116.3146	1
Phase 1	21/08/2023	Remote camera	-32.5695	116.3146	1

Phase	Date	Record type	Latitude	Longitude	Number of individuals
Phase 1	24/08/2023	Remote camera	-32.5695	116.3146	1
Phase 1	24/08/2023	Remote camera	-32.5840	116.3146	1
Phase 1	25/08/2023	Remote camera	-32.5840	116.3146	1
Phase 1	17/08/2023	Remote camera	-32.5812	116.3142	1
Phase 1	18/08/2023	Remote camera	-32.5812	116.3142	1
Phase 1	25/08/2023	Remote camera	-32.5727	116.3149	1
Phase 1	25/08/2023	Remote camera	-32.5727	116.3149	1
Phase 1	17/08/2023	Remote camera	-32.5757	116.3147	1
Single Target	3/01/2024	Remote camera	-32.4878	116.2738	1
Total observations					16

**This number is events recorded on camera and does not imply to number of individuals.

Quokka (*Setonix brachyurus*)

The Quokka is listed as Vulnerable under the EPBC Act and BC Act.

The current distribution of the mainland quokka includes areas through the south-west forests from Jarrahdale to Walpole. The mainland quokka lives in the Darling Range and south-west regions of WA, mostly inhabiting densely vegetated swamps and sometimes tea-tree thickets on sandy soils along creek systems and dense heath on slopes. Mainland quokkas tend to hide in runs among vegetation during the day and forage along the swamp margins at night (Kitchener 1995).

In the southern forest, quokkas occupy a range of forest, woodland and wetland ecotypes. The most commonly occupied sites comprise Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), Karri *(E. diversicolor*) or Tingle (*E. jacksonii* or *E. guilfoylei*) forest and riparian habitats with a sedge dominated understorey (DEC 2013). Habitat supporting a low density of near-surface fuel, a complex vegetation structure and burn patchiness are the factors favouring quokka occupancy in the southern forest (DEC 2013). The habitat critical to survival for the south coast subpopulation includes a wider range of vegetation types (floristically and structurally) than in the northern Jarrah forest, including swamps, riparian areas, incised gullies and dense coastal heath (de Tores et al. 2007).

Quokkas were observed via remote cameras on 16 different occasions and locations with some camera events having three individuals in one image (Plate4). Secondary signs of Quokkas, Runnels and Scats, were found within the survey and recorded. Locations of Quokka observations are presented in Table 32 and Appendix A, Figure 4.



Plate4 *Quokkas recorded via remote cameras.*

Table 32 *Quokka observations*

Phase	Date	Record type	Latitude	Longitude	Number of individuals
Reconnaissance	29/06/2023	Runnels	-32.5145	116.1925	
Reconnaissance	30/06/2023	Fresh tracks	-32.5677	116.2346	
Reconnaissance	1/07/2023	Remote camera	-32.5142	116.1927	1
Reconnaissance	2/07/2023	Remote camera	-32.5142	116.1927	1
Reconnaissance	2/07/2023	Remote camera	-32.5142	116.1927	2
Reconnaissance	3/07/2023	Remote camera	-32.5142	116.1927	3
Reconnaissance	3/07/2023	Remote camera	-32.5142	116.1927	2
Reconnaissance	3/07/2023	Remote camera	-32.5142	116.1927	2
Reconnaissance	5/07/2023	Remote camera	-32.5142	116.1927	1
Reconnaissance	6/07/2023	Remote camera	-32.5142	116.1927	1
Reconnaissance	7/07/2023	Remote camera	-32.5142	116.1927	1
Camera Rotation	11/07/2023	Remote camera	-32.5142	116.1927	1
Camera Rotation	11/07/2023	Remote camera	-32.5142	116.1927	1
Camera Rotation	11/07/2023	Remote camera	-32.5142	116.1927	1
Camera Rotation	12/07/2023	Remote camera	-32.5142	116.1927	2
Camera Rotation	19/07/2023	Remote camera	-32.5142	116.1927	1
Camera Rotation	21/07/2023	Remote camera	-32.5142	116.1927	2
Camera Rotation	27/07/2023	Fresh scat	-32.5807	116.1920	1
Camera Rotation	30/07/2023	Remote camera	-32.5663	116.2356	1
Phase 3	22/10/2023	Runnels	-32.5076	116.2316	
Phase 3	22/10/2023	Fresh scat	-32.5129	116.2340	1
Total observations					25

**This number is events recorded on camera and does not imply to number of individuals.

Dell’s Skink (*Ctenotus delli*)

The Dell’s Skink is listed as Priority 4 by the DBCA.

The Dell's Skink has a uniform dark olive to coppery body with a pattern less back with a pale/white dorsal and mid lateral stripe broken into a series of dashes with brown limbs with specks of black. It has a snout-vent length of 63mm (Wilson & Swan 2021). Associated with Jarrah-Marri woodland that has a shrub-dominated understorey, on laterite, sandy or clay soils. It is found in the north Darling Range and inhabits dry sclerophyll forest on granite outcrops, stony hills, and ranges. It is absent from the Swan Coastal Plain (Cogger 2014; Wilson & Swan 2021).

During the trapping phases (Phase 2 and Phase 3) a total of three Dell’s skinks were captured in Funnel and Bucket traps. During Phase 2 Dell’s skink was only recorded at Quadrat 3, however during Phase 3 the single capture was at Quadrat 5. Observing the three captured Dell’s Skinks (Plate5) there were no recaptures. Locations of these captures are presented below in Table 33 and Appendix A, Figure 4.

Table 33 Dell’s Skink recorded in Survey Area

Phase	Date	Trap Site	Latitude	Longitude	Number of individuals
Phase 2	12/09/2023	Q3	-32.5671	116.2599	1
Phase 2	12/09/2023	Q3	-32.5671	116.2599	1
Phase 3	20/10/2023	Q5	-32.5502	116.3149	1
Total captures					3



Plate5 Dell’s skink captured at trap site 3.

Quenda (*Isoodon fusciventer)*

The Quenda is listed as Priority 4 under the BC Act.

The Quenda has patchy distribution through a range of forest, woodland, shrubland and heathland habitats from east of Two People Bay through the Jarrah/Karri forests of lower south-west, and north to Perth region where several local re-introduction programs has successfully re-instated this species to some of its former northern range on the Swan Coastal Plain. Its habitat is generally dense scrubby, often swampy, vegetation with dense cover up to one metre high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses (Braithwaite, 1995). Unlike most other marsupials of similar size, this species appears to be quite resilient and able to survive in degraded and semi-developed lands, however it relies on suitable refuge habitat to avoid predators.

Quenda were observed via remote cameras once over the survey, with one quenda digging was also observed within the survey area. Quenda observations are recorded below in Table 34 and Appendix A, Figure 4.

Table 34 Quenda observations

Phase	Date	Record type	Latitude	Longitude	Number of individuals
Camera Rotation	24/07/2023	Diggings	-32.5669	116.1713	
Camera Rotation	30/07/2023	Remote camera	-32.5403	116.2296	1
Total observations					1



Plate6 Quenda recorded via remote camera

Rakali (*Hydromys chrysogaster*)

The Rakali is listed as Priority 4 by DBCA

The Rakali, also known as the Water Rat, is identifiable by its large size, blunt nose and white tail-tip. It has thick otter-like fur and a thick tail. The Rakali's fur varies in colour depending on its locality from black to slate grey or white to orange (Van Dyck et al. 2013). The Rakali lives in the vicinity of permanent bodies of fresh, brackish estuarine, or marine water, lakes and farm dams, and on sheltered coastal beaches, mangroves and offshore islands. In the south-west of WA, they have been shown to prefer areas with riparian vegetation, better water quality and a degree of habitat complexity. Known to occur along major river systems of the south-west. Woody debris, rock ledges and wetland islands are likely to be important areas for feeding and refuge (DEC 2012). It is an

occasional vagrant to temporary waters. Rakali dens are made at the end of tunnels in banks and occasionally in logs (Van Dyck and Strahan 2013).

One Rakali was observed via remote camera (Plate7) on the banks of the large body of water along the N E Road. Camera location is recorded in Table 35 and Appendix A, Figure 4.

Table 35 Rakali observation during survey period

Phase	Date	Record type	Latitude	Longitude	Number of individuals
Phase 2	8/09/2023	Remote camera	-32.6322	116.0862	1



Plate7 Rakali observed via remote camera.

Carter's Fresh Water Mussel

Carter's Fresh Water Mussel (*Westralunio carteri*) listed as Vulnerable under the EPBC Act and BC Act

Carter's Freshwater Mussel is the only freshwater mussel species in the south-west of WA. Its range has contracted by 49% in less than 50 years, principally as a result of secondary salinsation (Klunzinger *et al*. 2011). The species is now confined to non-salinised rivers and streams, principally in forested catchments along the west and south coasts.

Two targeted transects along water bodies were conducted during the survey, with only a single observation of Carter's freshwater mussel being recorded. This included old remnant shells of Carter's Fresh Water Mussel observed on the banks of Lake Banksiadale, refer to Table 36 and Appendix A, Figure 4. No other observation of the species were made and no water bodies were present within the remainder of the survey area that could support the species. Lake Banksiadale and neighbouring Dandalup Dam are the only location this species is known to occur in the area, this is because the species requires permanent water present to persist and support the species lifecycle.

Table 36 Carter's Fresh Water Mussel survey effort

Phase	Date	Record type	Latitude	Longitude
Reconnaissance.	27/06/2023	Remnant shell	-32.65469	116.080259

Masked Owl (*Tyto novaehollandiae novaehollandiae*)

The Masked Owl listed as Priority 3 by the DBCA.

The Masked Owl is the largest owl in the South-west region of Western Australia. It is identified by its white circular facial disk, darker flecking, robust legs and hunched shoulders when perched (Nevill, 2013)

The Masked Owl is found in forests (wet and dry sclerophyll, non-eucalypt dominated), open woodlands, farmlands or scrub with large trees (12-20 m) and adjacent cleared country, timbered watercourses, paperbark woodlands, and caves (Pizzey & Knight 2012). It requires large hollows in old growth eucalypts or bare sand or the earth of a cave for nesting, and often favours areas with dense understorey or ecotones comprising dense and sparse ground cover. It is often recorded foraging within 100-300 m of the boundary of two vegetation types (Bell & Mooney 2002). The bird is restricted to the thicker humid forests of the southwest region, particularly in the Pemberton and Manjimup area and along the Murray River in the Lane Poole area. It nests in hollows in large Karri (*Eucalyptus diversicolor*), Marri (*Corymbia calophylla*) and Jarrah (*E. marginata*) trees (Nevill 2013).

Masked Owls were recorded on three different SM4 Bird acoustic devices within the Survey Area, SM4-AC1 in the southwestern portion, SM4-AC3 in the Northeastern portion and SM4-A04 in the southeastern portion of the Survey Area, Table 37 and Appendix A, Figure 4. No sightings of masked owls were observed during nocturnal work.

Table 37 Masked Owl call recording s

Phase	Date	Acoustic device	Latitude	Longitude	No. of calls
Reconnaissance	28/06/2023	SM4-AC1	-32.6011	116.1895	6
Reconnaissance	29/06/2023	SM4-AC1	-32.6011	116.1895	1
Single target	24/07/2023	SM4-AC4	-32.6206	116.2244	3
Phase 1	16/08/2023	SM4-AC3	-32.5082	116.2888	5

Western False Pipistrelle (*Falsistrellus mackenziei*)

The Western False Pipistrelle is listed as Priority 4 under the BC Act.

The Western False Pipistrelle is a vespertilionid bat that occurs in Southwest Australia. It is an insectivore associated with old large trees that provides the species with its preferred foraging opportunities. Namely, flying insects are hunted around tall forest canopy in the valley between trees tops or the open areas above the mid-storey (Kitchener, Caputi and Jones, 1986). Their range is dominated by wet sclerophyll eucalypt forest and semi woodland of the southwest. Roosting sites are usually associated with old growth eucalypts containing hollows as well as within branches or tree stumps. The Western False Pipistrelle has been recorded on the Swan Coastal Plain in Banksia woodland (Kitchener, Caputi and Jones 1986).

A single recording of the Western False Pipistrelle was recorded on a SM4 Ultrasonic recording device in the Northeastern portion of the survey area Table 38 and Appendix A, Figure 4.

Table 38 Western False Pipistrelle call recordings

Phase	Date	Acoustic	Latitude	Longitude	No. of calls
Phase 1	20/08/2023	SM4-6	-32.5083	116.2881	1

4.3.2 Significant fauna likely to occur

Woylie (*Bettongia penicillate ogilbyi*)

The Woylie is listed as Critically Endangered under the BC Act and Endangered under the EPBC Act.

The Woylie is a small Potoroidae marsupial which is restricted to small remnant populations in the Southwest of Western Australia. Inhabiting dry sclerophyll forests with thick understories in the strongholds of Dryandra National Park, Tutanning Nature Reserve and Perup forest (Menkhorst & Knight, 2011). Identifiable by their grey brown with a distinctive brush like tail (Menkhorst & Knight, 2011).

Woylies were recorded via remote cameras in the adjacent survey area, O'Neil East, within the O'Neil Study Area (GHD 2024b). Areas with thick understories reside within the Survey Area in various locations. This species has been assessed as likely to occur within this suitable habitat, but at low densities, and potential below the level of detectability on current survey effort.

Numbat (*Myrmecobius fasciatus*)

The Numbat is listed as endangered under the BC Act, and EPBC Act.

Current Numbat populations, including source populations and re-introduced animals occupy eucalypt forest, woodland, and tall shrubland. Habitats generally require an abundance of termites (food) in the soil, and hollow logs, tree hollows, burrows and branches for shelter (DAWE 2021e; Van Dyck & Strahan 2008).

Sections of the southeastern portion of the O'Neil contains patches of open wandoo woodland representing suitable habitat within the species former range. This species has been assessed as likely to occur within this suitable habitat, but at low population density, and potentially below the level of detectability on current survey effort.

South-west Brush tailed Phascogale (*Phascogale tapoatafa wambenger*)

The South-west Brush-tailed Phascogale is listed as Conservation Dependant under the BC Act.

It occurs at low densities in the northern Jarrah forest with highest densities occurring in the Perup/Kingston area, Collie River valley and near Margaret River and Busselton. This species has been observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover. Records are less common from wetter forests. They are most active between dusk and dawn (though emerging later in mid-winter) and forage almost exclusively among the tree canopies. Nest sites include hollow tree limbs, rotten stumps and even bird's nests. Lactating females show a preference for large tree cavities with small entrances. They are opportunistic feeders including invertebrates, nectar, small birds and small mammals (DBCA 2017b).

A South-west Brush tailed Phascogale was recorded via remote camera in the adjacent survey area, O'Neil East, approximately 1km from the O'Neil survey boundary. Suitable habitat is scattered throughout the Survey Area. This species has been assessed as likely to occur within this suitable habitat, but at low population density, and potentially below the level of detectability on current survey effort.

Peregrine Falcon (*Falco peregrinus macropus*)

The Peregrine Falcon is listed as specially protected under the BC Act.

The Peregrine Falcon is found on and near cliffs, gorges, timbered watercourses, riverine environments, wetlands, plains, open woodlands, and pylons and spires of buildings, though less frequently in desert regions (Morcombe 2004; Pizzey & Knight 2012). They are not common but can be found almost anywhere throughout WA and in the southwest, including particularly at Fitzgerald River, Stirling Range, Porongurup National Parks, Kondinin, and Peak Charles, with many more locations north of Perth (Nevill 2013).

This species has previously been recorded in the region, within the Holyoake block. Suitable habitat occurs within the Survey area. This species has been assessed as likely to occur within the survey area and possibly missed due to their efficient hunting skills, regardless of survey effort.

Southern Death Adder (*Acanthophis antarctius*)

The Southern Death Adder is listed as Priority 3 by the DBCA

The Southern Death Adder lives in forests, woodlands, grasslands and heaths. This species is highly cryptic as it sits in ambush in thick leaf litter and is often only visible when basking or active (Wilson and Swan, 2021). Altered fire regimes and habitat destruction are a cause of decline (Wilson and Swan, 2021)

This species is known from the region and was recorded in the Jarrahdale area West of the Survey Area in 2021 (GHD 2021a). Records of this species from Jarrahdale, Serpentine (hills) and East of Boddington. Habitat of Jarrah-Marri forest with patchy microhabitats of dense leaf litter and granitic areas are present within the survey area.

4.4 Black Cockatoo Use Assessment

The Black cockatoo habitat assessment focussed on qualifying and quantifying Black Cockatoo habitat values throughout the Survey Area. Due to the scale of the Survey Area habitat assessment plots were placed on aerial imagery across the Survey Area. With the sections of the Survey Area made up of haul roads (Contingency Area A – Infrastructure and Additional Haul Road).. The locations of plots were selected to sample all major broad vegetation associations previously mapped by Mattiske and Havel (1997). The twenty-six rectangular plots and two haul roads, each of the required two-hectare area and greater were sampled to determine quantify foraging and breeding habitat usage and potential value for Baudin's, Carnaby's, and Forest Red-tailed Black Cockatoo as described in section Black Cockatoo assessment. Table 39 presents a summary of black cockatoo habitat values and definitions as defined within the referral guidelines (DAWE 2022).

4.4.1 Breeding Habitat

The Survey Area contains several broad habitat types considered to be breeding habitats for all three locally occurring threatened Black cockatoo species. The broad fauna habitat types considered as breeding habitat include Jarrah-Marri forest and Wandoo woodland as shown in Table 22 and are extensive across the Survey Area. The Jarrah-Marri forest in particular also provides extensive high quality foraging habitat relevant to local cockatoo breeding.

4.4.2 Foraging Habitat

Foraging habitat for Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoo is extensive across the mapped habitat types and ranges from high for Jarrah-marri forest and low for Wandoo woodland. Whilst Foraging habitat was high for Carnaby's Black Cockatoo, only a handful of foraging residue was observed within the Survey Area. A total of 303 signs of foraging evidence was recorded within the Survey Area, with 280 from Forest Red-tail Black Cockatoo, 21 from Baudin's Black Cockatoo and two from Carnaby's Black Cockatoo.

4.4.3 Roosting Habitat

No roosting trees were recorded within the Survey Area. However, potential roost trees are present within tall trees such as Jarrah-Marri and Blackbutt forests, and trees in proximity to water bodies. It is likely that roost locations are present particularly for the Forest Red-tailed Black Cockatoo in the Survey Area due to the large numbers of bird records. It is likely that location of any possible roosting site is dependent on habitat quality in relation to fire history, timber harvesting, dieback or other anthropomorphic behaviour.

Table 39 Black Cockatoo habitat usage

Habitat usage	Presence within the Survey Area	Evidence
Foraging habitat	Yes. Marri, Jarrah, Blackbutt, Grevillia and Snottygoble recorded	Extensive foraging evidence was found throughout the survey area for all three Black Cockatoo species. Forest Red-tailed Black Cockatoo had 280 observations of foraging evidence across the survey area, mainly in Jarrah-marri habitat. Baudin's Black Cockatoo 21 observations of foraging evidence and Carnaby's Black Cockatoo with two observations of foraging evidence observations.
Known nesting trees	Yes. Marri, Blackbutt	Three breeding trees were recorded during the survey period. Two hollows with signs of Black Cockatoo use were observed within the Survey Area. Refer Table 40
Suitable nesting trees	Yes, based off transect surveys only.	43 suitable nest trees recorded within the survey.
Suitable and priority nesting hollows	Yes	One suitable nesting hollow was recorded within the Survey Area which was checked by Tony Kirkby. However Tony was unable to access hollow to confirm Black Cockatoo usage, no external use by Black Cockatoo's were confirmed. Refer Table 40.

Legend:

Foraging habitat: Plant species known to support foraging within the species' range.

Known nesting trees: a tree that has a hollow in which black cockatoo breeding has been recorded.

Suitable nesting hollows: tree with suitable DBH range and with suitable nest hollow present but no evidence of nesting

Potential nesting tree: Trees with suitable DBH to develop a nest hollow, but currently lack hollows.

Breeding habitat: habitat that contains known, suitable or potential nest trees.

Priority nesting hollows: suitable nest hollows that have clear or possible signs of nesting activity such as chew marks at hollow entrance. Or cockatoo presence indicating possible breeding activity. During this survey priority hollows were labelled as requiring follow-up inspection Tony Kirkby via hollow camera or drone. Priority nest hollow is a hollow classification used in this report, but not defined within the guidelines (DAWE 2022).

Potential roost tree: Tall tree of any species, usually in close proximity to a freshwater water source

Known roosting tree: a tree (usually tallest) or any species usually in close proximity to fresh water that is confirmed to be used for night roosting either via cockatoo presence or strong evidence of roosting.

Table 40 Tony Kirkby Black Cockatoo hollow assessment

Tree specie	Latitude	Longitude	TK comments	Photo
Marri (*Corymbia calophylla*)	-32.6186	116.1135	No signs of use. No access to hollow. Possible black cockatoo hollow	
Marri (*Corymbia calophylla*)	-32.6185	116.1131	Well used black cockatoo hollow	

Tree specie	Latitude	Longitude	TK comments	Photo
Marri (*Corymbia calophylla*)	-32.5112	116.2806	Black cockatoo nest	
Marri (*Corymbia calophylla*)	-35.5862	116.3123	Blocked and not an actual hollow	No photo attached due to hollows not being present and or blocked.
Wandoo (*Eucalyptus wandoo*)	-32.5391	116.3335	Blocked and not an actual hollow	
Wandoo (*Eucalyptus wandoo*)	-32.5394	116.3335	Blocked and not an actual hollow	
Jarrah (*Eucalyptus marginata*)	-32.5307	116.1925	Not an actual hollow	
Jarrah (*Eucalyptus marginata*)	-32.5309	116.1926	Not an actual hollow	
Jarrah (*Eucalyptus marginata*)	-32.5833	116.3068	Blocked and not an actual hollow	
Jarrah (*Eucalyptus marginata*)	-32.5586	116.3263	Blocked and not an actual hollow	
Jarrah (*Eucalyptus marginata*)	-32.5472	116.3273	Blocked and not an actual hollow	
Jarrah (*Eucalyptus marginata*)	-32.5825	116.2946	Blocked and not an actual hollow	
Marri (*Corymbia calophylla*)	-32.5955	116.2793	Blocked and not an actual hollow	
Marri (*Corymbia calophylla*)	-32.5390	116.2832	Blocked and not an actual hollow	

Table 41 Black Cockatoo nesting breeding trees from transect data

	Area of habitat within Survey Area (ha)	Area of habitat within cockatoo assessment transects (ha)	Number of trees >50cm DBH within transects	Mean density trees >50cm DBH (trees/ha) within transects	Number of trees identified with potential hollows within transects	Number of trees identified with suitable breeding hollows within transects	Range of density potential breeding trees (DBH>50cm)/ha
Habitats							
Jarrah Marri Forest	9487.93	30	1596	53	29	3	8 - 166
Wandoo	67.39	4	40	10	3	0	8 - 32
Mixed Shrub Dampland	579.10	0	0	0	0	0	0
Bullich	216.15	0	0	0	0	0	0
Blackbutt	241.95	20	76	4	0	0	1-18
Granite Outcrop	237.64	0	0	0	0	0	0
Water body/reservoir	15.23	0	0	0	0	0	0
Rehabilitation	1573.31	0	0	0	0	0	0
Cleared areas	300.54	0	0	0	0	0	0
Total	12719.24	**54**	**1712**				

Table 42 Black Cockatoo tree type numbers across surveyed plots – O'Neill Contingency A

Tree Type – O'Neill Cont A	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8	Plot 9	Plot 10	Plot 11	Plot 12	Plot 13	Plot 14	Plot 15	Plot 16	Plot 17	Plot 18	Plot 19	Plot 20	Plot 21	Plot 22	Plot 23	Plot 24	Plot 25	Plot 26
Jarrah	81	39	61	74	11	33	14	48	63	53	57	40	47	66	33	68	38	86	8	32	39	46	91	47	44	166
Marri	40	11	9	3	3	4	5	9	3	14	12	7	4	17	4	2	3	34	11	12	2	2	0	0	0	0
Blackbutt	4	0	5	0	6	0	7	12	5	0	18	6	1	0	0	0	6	0	5	0	0	0	0	0	0	0
Wandoo	0	0	0	0	32	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
Flooded Gum	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	1	2	1	0	0	4	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	125	50	75	77	52	38	28	70	71	67	91	61	53	83	37	70	55	120	24	44	41	48	91	47	44	166

Table 43 Black Cockatoo foraging quality habitat scores

Habitat types - Holyoake East Survey Area	Vegetation type (Mattiske)	Foraging quality score values and foraging habitat present		
		Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black Cockatoo
Jarrah Marri Forest	D, P, PS, S, SW, PT, SP, DA, DG, ST, PW, E, TS, T	Foraging quality Score: 9 Jarrah, Marri nuts and blossom, sparse Banksia grandis and other banksia Grevilia species. Adjusted score due to fire in area	Foraging quality Score: 9 Wandoo blossom, very sparse banksia and Marri. Adjusted score due to fire in area	Foraging quality Score: 9 Wandoo blossom, sparse Allocasuarina and Marri. Adjusted score due to fire in area
Wandoo	AY, Y, YG, YS	Foraging quality Score: 7 Gum blossom, Grevillia. Sparse fringing Jarrah, Marri and Banksia	Foraging quality Score: 7 Gum blossom, Grevillia. Sparse fringing Jarrah, Marri and Banksia	Foraging quality Score: 7 Gum blossom, Grevillia. Sparse fringing Jarrah, Marri, Allocasuarina and Banksia
Mixed Shrubs Dampland	AD, AX, AC, A	Foraging quality Score: 7 Gum blossom, sparse Marri	Foraging quality Score: 7 Gum blossom, sparse Banksia, Jarrah and Marri	Foraging quality Score: 7 Gum blossom, sparse Banksia, Jarrah and Marri
Bullich	W	Foraging quality Score: 6 Bullich seed, Gum blossom, sparse Banksia, Jarrah and Marri	Foraging quality Score: 6 Bullich seed, gum blossom, sparse Banksia, Jarrah and Marri	Foraging quality Score: 6 Bullich seed, gum blossom, sparse Jarrah, Marri and Allocasuarina
Blackbutt	AW, C, CW	Foraging quality Score: 5 Limited foraging potential but has scattered Jarrah, Marri	Foraging quality Score: 5 Limited foraging potential but has scattered Jarrah, Marri	Foraging quality Score: 5 Limited foraging potential but has scattered Jarrah, Marri
Granite Outcrop Association	G, G1, R, R/G	Foraging quality Score: 7 Good supportive vegetation around outskirts of the granite including Grevillia, Callistemon and Banksia	Foraging quality Score: 7 Good supportive vegetation around outskirts of the granite including Grevillia, Callistemon and Banksia	Foraging quality Score: 5 Good supportive vegetation around outskirts of the granite including Grevillia and Allocasuarina.
Water body/reservoir	-	Foraging quality Score: 2. Some supportive vegetation for foraging also a water source	Foraging quality Score: 2. Some supportive vegetation for foraging also a water source	Foraging quality Score: 3. Some supportive vegetation for foraging also a water source
Rehabilitation	Rehab	Foraging quality Score: 4. Patches Jarrah and Marri just starting to fruit	Foraging quality Score: 4. Patches Jarrah and Marri just starting to fruit	Foraging quality Score: 4. Patches Jarrah and Marri just starting to fruit
Cleared areas	Cl	Foraging quality Score: 0.	Foraging quality Score: 0.	Foraging quality Score: 0.

5. Conclusion

Nine broad fauna habitat types were recorded within the Survey Area during the field survey based on flora species, hydrology, soil, and topography. They include, Jarrah-marri woodlands, Wandoo woodland, Mixed Shrub dampland, Bullich woodland, Blackbutt woodland, Granite formation associations, Water bodies, Rehabilitation areas and Cleared areas. Jarrah-Marri forest is the most extensive habitat covering an approximate 74.6% of the Survey Area. The remaining habitat types have relatively limited extent in the survey area, particularly Wandoo, Bullich, Blackbutt, Granite outcrop, Mixed Shrub damplands and Water body. The remaining cleared and rehabilitation areas make up 14.73% of the Survey Area.

The conservation value of each fauna habitat type is specific to the locally occurring significant fauna species and the type of usage by those species. For example, Jarrah-Marri forest provides extensive foraging habitat for Chuditch and all three Black Cockatoo species. Another example is Jarrah-Marri forest, Bullich, Blackbutt and Wandoo woodland provides foraging, roosting, and breeding habitat for the three locally occurring Black Cockatoos.

In total twelve significant fauna species was recorded within the Study Area during the field survey period including Baudin's Black Cockatoo, Carnaby's Black Cockatoo, Forest Red-tailed Black Cockatoo, Chuditch, Quokka, Quenda, Western Brush Wallaby, Dell's Skink, Rakali, Masked Owl, Western False Pipistrelle and Carters Freshwater Mussels.

Baudin's Black Cockatoo, Carnaby's Black Cockatoo and Forest Red-tailed Black Cockatoo are species that are resource dependant able to move through the environment targeting areas as required. At the time of the surveys good numbers of birds were recorded active and foraging particularly on Marri nuts. These species are able to breed within the survey area with two breeding hollows recorded during the survey. As the entire survey area was not traversed there is likely more breeding hollows scattered throughout the area.

Chuditch were recorded from 16 remote camera events with four individuals physically identify via spot pattern analysis. However, several events could not be attributed to an individual and not all animals would have been recorded, therefore it is likely that more than four individuals are present in the survey area.

Quokka were only recorded in damplands and ephemeral sections of Blackbutt forest where vegetation is most dense. These areas demonstrated runnels and scats and presented areas for remote camera placement. In total four locations recorded the presence of Quokkas and were all recorded on different drainage systems. Numbers in each population ranged from one to four animals but this is likely an underestimate due to the territorial nature of the species and linear habitat present. The population recorded on a tributary of Big Creek appeared to have the highest numbers with one remote camera image have three individuals recorded.

Only one Quenda was recorded in the survey area despite extensive remote cameras trapping effort within the survey area. The one recorded was within Jarrah Marri forest. We have found from other projects in the region (GHD 2021a, GHD 2021b, GHD 2024a, GHD 2024b) the Quenda are low in numbers and is likely due to extensive prescribed burning to key habitat within the region.

Western Brush Wallaby were common in the survey area with individuals recorded in most habitat areas. The high numbers of animals is likely attributed to the fox and cat control that is undertaken throughout the Jarrah forest. Therefore, the population is dependent on management actions undertaken.

Dell's Skink were recorded in two locations within Jarrah Forest and dampland habitat. Dell Skinks are a cryptic species and appear to be patchily distributed throughout the survey area. Population is likely to be localised in low numbers.

Rakali and Carters Freshwater Mussels were only recorded in Lake Banksiadale from single events. Both species require permanent water bodies to persist with Lake Banksiadale and South Dandalup Dam being the only permanent water body's in the region. Small isolated forest water dams are present however most dry up in the peak of summer or are not connected by any permanent or semi-permanent systems. The population of Rakali and Carters Freshwater Mussels in this area are sympatric and restricted with low/small populations present in the Lake Banksiadale system.

Masked Owl were recorded at three locations however two of these were relatively close together and be amalgamated as one location. The two remaining areas are separated by 13 km therefore are likely representing two family unit of which normally comprise a pair of birds. Therefore, based on our assessment two pairs are likely present within the survey area.

Western False Pipistrelle were recorded from one location within the survey area. This species was identified by calls, but no hollow/roost tree was identified. It is likely a population of the species is present in the survey area in a large hollow bearing tree.

A further five significant species were not confirmed present within the Study Area but are assessed likely to occur based on distribution patterns and habitat assessment including: Woylie, Numbat, Southwestern Brush-tailed Phascogale, Peregrine Falcon, and Southern Death Adder.

The most evident major threatening process to fauna habitat identified during the survey was the frequency, size and intensity of fire. Large areas of the Survey Area appeared to be burnt within the past three years impacting a large portion of the area in particular large mature hollow bearing habitat trees. Other threatening process include logging practices and feral pig activity.

6. References

Allen, G.R., Midgley, S.H. and Allen, M. (2002). Field guide to the Freshwater Fishes of Australia. Western Australian Museum, Perth, Western Australia.

ALCOA World Alumina Australia 2010, 'No 40. *Threatened fauna species management plans for Alcoa's bauxite mining operations in the Jarrah forest'*.

Beard, JS 1979, Vegetation Survey of Western Australia: the Vegetation of the Pinjarra Area Western Australia, map and explanatory memoir 1:250,000 series, Applecross, Vegmap Publications.

Bell, PJ & Mooney, N 2002, *Distribution, Habitat and Abundance of Masked Owls (Tyto novaehollandiae) in Tasmania, In; Ecology and Conservation of Owls*, Eds. Newton I, Kavanagh R, Olsen J, and Taylor I. CSIRO Publishing, Australia.

Benshemesh, J. (2007). National Recovery Plan for Malleefowl. Department for Environment and Heritage, South Australia.

Braithwaite, RW 1995, *Southern Brown Bandicoot*. In R. Strahan (Ed.) The Mammals of Australia. Australian Museum and Reed Books. Chatswood, NSW.

Burbidge, AA 2004, '*Threatened Animals of Western Australia'*. Department of Conservation and Land Management, Perth.

Bureau of Meteorology 2022, *Climate statistics for Australian locations*, retrieved June 2022, from http://www.bom.gov.au/climate

Burgar, JM, Craig, MD & Stokes, VL 2015, '*The importance of mature forest as bat roosting habitat within a production landscape'*, Forest Ecology and Management, vol 356, pp 112-123.

Burgar, JM, Stokes, VL & Craig, MD 2017, '*Habitat features act as unidirectional and dynamic filers to bat use of production landscapes'*, Biological conversations, vol 209, pp 280-288.

Burn 2000, *A Survey of the impact of burning on mammals and birds in Alcoa's rehabilitated Bauxite mines at Jarrahdale*.

Churchill, S 2008, *Australian Bats*, second edition, Milton, Australia, Allen & Unwin.

Cogger, H 2014, *Reptiles and Amphibians of Australia*, Collingwood, Victoria, CSIRO Publishing.

Craig, MD, White, DA, Stokes, VL & Prince, J 2017, *'Can postmining revegetation create habitat for a threatened mammal?*' Ecological Management & Restoration, vol 18 no. 2. Ecological Society of Australia and John Willey & Sons Australia. Ltd.

de Tores, P, Hayward, MW, Dillon, MJ & Brazell, RI 2007, *'Review of the distribution, causes for decline and recommendations for management of the quokka, Setonix bracyurus (Macropodidae: Marsupialia), an endemic macropodid marsupial from south-west Western Australia*', Conservation Science Western Australia, vol 6(1), pp 13-73.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023, *Environmental Protection and Biodiversity Conservation Act* 1999 Protected Matters Search Tool Results, retrieved May 2022, from http://www.environment.gov.au/epbc/pmst/index.html.

Department of Agriculture, Water and the Environment (DAWE) 2021a, '*Atrichornis clamosus in Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Agriculture, Water and the Environment (DAWE) 2021b, '*Calidris acuminata in Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Agriculture, Water and the Environment (DAWE) 2021c, *'Calyptorhynchus banksii naso in Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Agriculture, Water and the Environment (DAWE) 2021d, '*Calyptorhynchus baudinii in Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Agriculture, Water and the Environment (DAWE) 2021e, *'Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Biodiversity, Conservation and Attractions (DBCA) 2007, *'NatureMap: Mapping Western Australia's Biodiversity'*, retrieved May 2020, from http://naturemap.dpaw.wa.gov.au/default.aspx/.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017a, '*Fauna profiles – Chuditch Dasyurus geoffroii',* retrieved from http://www.dbca.wa.gov.au

Department of Biodiversity, Conservation and Attractions (DBCA) 2017b, '*Fauna profiles – Brush-tailed Phascogale',* retrieved **http://www.dbca.wa.gov.au**

Department of Biodiversity, Conservation and Attractions (DBCA) 2021, Priority ecological communities for Western Australia, version 32, 05 2021, retrieved Month Year, from https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Priority%20Ecological%20Communities%20list.pdf

Department of Environment and Conservation (DEC) 2012a, *'Fauna Profiles. Water Rat (Rakali) Hydromys chrysogaster (Geoffrey, 1804)'*, Department of Environment and Conservation, Perth, WA.

Department of Environment and Conservation (DEC) (2012b). Chuditch (Dasyurus geoffroii) Recovery Plan. Wildlife Management Program No. 54. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment and Conservation (DEC) 2013, *'Quokka Setonix brachyurus Recovery Plan'*, Wildlife Management Program No. 56, Department of Environment and Conservation, Perth, WA.

Department of Mines, industry Regulation and Safety (DMIRS) 18, GeoVIEW.WA, retrieved 05 2020, from **http://www.dmp.wa.gov.au/7113.aspx**.

Department of the Environment (DotE) (2015). Referral guideline for 14 birds listed as migratory species under the EPBC Act. Commonwealth of Australia.

Department of Primary Industries and Regional Development (DPIRD) 2020, Natural Resource Management Shared Land Information Portal (SLIP) Mapping, retrieved 05 2020, from http://maps.agric.wa.gov.au/nrminfo/framesetup.asp.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2011a, *'Survey guidelines for Australia's threatened reptiles'*, Guidelines for detecting reptiles listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2011b, *'Survey guidelines for Australia's threatened mammals'*, Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2012, *'Referral guidelines for three species of Western Australian black cockatoos'*, retrieved from: **http://www.environment.gov.au/epbc/publications/wa-black-cockatoos.html**.

Department of Agriculture Water and Energy (DAWE) 2022. Referral guidelines for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo. Department of Agriculture, Water and the Environment, Canberra.

Department of Water and Environmental Regulation (DWER) 2017, *Water Information Reporting,* retrieved 05 2020, from http://www.water.wa.gov.au/maps-and-data/monitoring/water-information-reporting

Doherty, TS, Wingfield, BN, Stokes, VL, Craig, MD, Lee, JGH, Finn, HC & Calver, MC 2016, '*Successional changes in feeding activity by threatened cockatoos in revegetated mine sites'*, Wildlife Research, vol 43, pp 93-104. CSIRO Publishing.

Environmental Management and Research Consultants (EMRC) 1992, *'Long Term Fauna Monitoring Program 1992'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 1995, *'Long term fauna monitoring program 1995'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 1998, *Long Term Fauna Monitoring Program (1998)*, a report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 1999, *'A fauna survey of planned mining areas at Alcoa's Orion Mining Region'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2004, *'A Vertebrate Survey of Rehabilitated Areas at Alcoa's Huntly Mine site – year 2000 results'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2001a, '*Alcoa World Alumina Australia Ltd. Long Term Fauna Monitoring Program - 2001 results'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2001b, *'A Vertebrate Fauna Survey of rehabilitated areas at Alcoa's Willowdale Mine site – Year 2000 results'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2003, *'McCoy Long Term Fauna Monitoring Program 2003'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2006, '*Long term fauna monitoring program 2006'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2007a, '*McCoy Long Term Fauna Monitoring Program –results of the 2007 survey'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2007b, 'A Vertebrate Fauna Survey of Rehabilitated Area's at Alcoa's Huntly Minesite -year 2007 results Final Report', report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2007, *'A Vertebrate Survey of Rehabilitated areas at Alcoa's Willowdale Minesite – Year 2007 results'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2015, '*Long Term Fauna Monitoring Program Summary of Results at Alcoa's Orion Mining Region'*, report prepared for Alcoa of Australia.

Environmental Protection Authority (EPA) 2016a, '*EPA Technical Guidance –Terrestrial Fauna Surveys'*, Perth.

Environmental Protection Authority (EPA) 2016b, 'EPA Technical Guidance – Sampling methods for terrestrial vertebrate fauna', Perth.

Environmental Protection Authority (EPA) 2020, 'EPA Technical Guidance – Sampling methods for terrestrial vertebrate fauna', Perth.

Freegard C (2007). Nomination of a Western Australian species for listing as threatened change of Status or delisting: Woylie. Report. Department of Environment and Conservation, Kensington, WA.

Garnett, ST & Crowley, GM 2000, *The Action Plan for Australian Birds,* Environment Australia, Canberra.

GHD 2021a, Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine – Myara North Pinjarra Alumina Refinery Revised Proposal. For Alcoa of Australia Limited. Unpublished Report

GHD 2021b, Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine – Holyoake Pinjarra Alumina Refinery Revised Proposal. For Alcoa of Australia Limited. Unpublished Report

GHD 2024a, Terrestrial Fauna Survey Assessment, Holyoake Mine Development – O'Neil East. For Alcoa of Australia Limited. Unpublished Report.

GHD 2024b, O'Neil East Targeted Woylie Assessment. For Alcoa of Australia Limited. Unpublished report.

Government of Western Australia (GoWA) 2023, Data WA, retrieved 05 2023, from https://data.wa.gov.au/.

Higgins, PJ (ed.) 1999, *Handbook of Australian, New Zealand & Antarctic Birds, Volume 4: Parrots to Dollarbird*, South Melbourne, Australia, Oxford University Press.

Hohnen, R, Ashby, J, Tuft, K, & McGregor, H 2012, *'Individual identification of northern quolls (Dasyurus hallacatus) using remote cameras'*, Australian Mammalogy, CSIRO Publishing. http://dx.doi.org/10.1071/AM12015.

Johnstone, RE & Kirkby, T 1999, '*Food of the Forest Red-tailed Black Cockatoo Calyptorhynchus banksii naso in south-west Western Australia', Western Australian Naturalist*, vol 22, pp 167-177.

Johnstone, RE & Kirkby, T 2008, 'Distribution, status, social organisation, movements and conservation of Baudin's Cockatoo (Calyptorhynchus baudinii) in South-west Western Australia', Records of the Western Australian Museum, vol 25, pp 107-118.

Johnstone, RE & Storr, GM 1998, Handbook of Western Australian Birds. Volume 1: Nonpasserines (Emu to Dollarbird), Western Australian Museum, Perth.

Johnstone, RE and Storr, GM 2004, Handbook of Western Australian Birds, Volume 2: Passerines (Blue-winged Pitta to Goldfinch), Perth, Australia, Western Australian Museum.

Johnstone, RE 1997, 'Current studies on three endemic Western Australian cockatoos', Eclectus, vol 3, pp 34--35.

Johnstone, RE, Kirkby, T & Sarti, K 2017, 'The distribution, status movements and diet of the Forest Red-tailed Black Cockatoo in the south-west with emphasis on the greater Perth regions', Western Australia, Western Australian Naturalist, vol 30 (4), pp 1-193.

Jones, D & Goth, A (2008). Mound-builders. CSIRO Publishing. Victoria.

Kavanagh, RP & Murray, M 1996, *'Home Range, Habitat and Behaviour of the Masked Owl Tyto novaehollandiae Near Newcastle, New South Wales*', Emu Austral Ornithology, Journal of Birdlife Australia, vol 96, pp 250-257, CSIRO publishing.

Kitchener, DJ 1995, '*Quokka*', In R. Strahan (Ed.) The Mammals of Australia, Australian

Kitchener, DJ, Caputi, N, Jones, B 1986, *'Revision of Australo-Papuan Pipistrellus and Falsistrellus (Microchiroptera: Vespertilionidae)'*, Records of the Western Australian Museum, vol 12, pp 435–495, ISSN 0312-3162.

Klunzinger MW 2012, 'Ecology, life history and conservation status of Westralunio carteri Iredale 1934, an endemic freshwater mussel of south-western Australia', PHD Thesis, Murdoch University, Perth Western Australia.

Klunzinger, MK, Beatty, SJ, Morgan, DL, & Lymbery, AJ 2012, '*Distribution of Westralunio carteri Iredale, 1934 (Bivalvia: Unionoida: Hyriidae) on the south coast of south-western Australia, including new records of the species'*, Journal of the Royal Society of Western Australia, vol 95, pp 77-81.

Marchant, S & Higgins, PJ, (eds.) 1993, Handbook of Australian, New Zealand and Antarctic Birds, Volume 2 - Raptors to Lapwings, Melbourne, Victoria: Oxford University Press.

Mastrantonis, S, Craig, MD, Renton, M, Kirkby, T & Hobbs, RJ 2019, *'Climate change indirectly reduces breeding frequency of a mobile species through changes in food availability'*, Ecosphere, vol 10 (4), e02656. 10.1002/ecs2.2656.

Mattiske Consulting 2023, 'Holyoake east Flora and Vegetation Survey Report', in prep.

Mattiske, EM & Havel JJ 1998, Vegetation Mapping in the South West of Western Australia and Regional Forest Agreement vegetation complexes. Map sheets for Pemberton, Collie, Pinjarra, Busselton- Margaret River, Mt Barker, and Perth, Western Australia. Scale 1:250,000. Department of Conservation and Land Management, Perth.

Mawson, PR & Johnstone, RE 1997, 'Conservation status of parrots and cockatoos in Western Australia', Eclectus, vol 2, pp 4-9.

McGregor, RA, Stokes, VL & Craig, MD 2014, '*Does forest restoration in fragmented landscapes provide habitat for a wide-ranging carnivore?'*, Animal Conservation, vol 17, pp 467–475.

McKenzie, N & Start, T (1999). The Action Plan for Australian Bats 2000. Environment Australia, Canberra, Australia.

Menkhorst, P & Knight, F 2011, *A Field Guide to Mammals of Australia*, third edition, South Melbourne, Australia, Oxford University Press.

Morcombe, M 2014, *Field Guide to Australian Birds,* Steve Parish Publishing, Archerfield, Queensland.

Nevill, SJ 2013, *Birds of Western Australia,* Simon Nevill Publications, Perth, Western Australia.

Pizzey, G & Knight, F 2012, *The Field Guide to the Birds of Australia,* Harper Collins Publishers, Sydney, Australia.

Saunders, DA 1974, *'Subspeciation in the White-tailed Black Cockatoo, Calyptorhynchus baudinii, in Western Australia'*, Australian Wildlife Research, vol 1, pp 55-69.

Saunders, DA 1979, '*Distribution and Taxonomy of the White-tailed and Yellow-tailed Black-Cockatoos Calyptorhynchus spp'*, Emu, vol 79, pp 215--227.

Saunders, DA 1982, 'The breeding behaviour of the short-billed form of the White-tailed Black Cockatoo Calyptorhynchus funereus', Ibis, vol 124, pp 422--455.

Saunders, DA and Ingram, JA 1987, '*Factors affecting survival of breeding populations of Carnaby's Cockatoo, Calyptorhynchus latirostris in remnants of native vegetation'*, IN: Saunders, DA, Arnold, GW, Burbidge, AA and Hopkins, AJM, Nature Conservation: the Role of Remnants of Native Vegetation, Surrey Beatty and Sons, Chipping Norton, pp 249-58.

Shepherd, DP, Beeston, GR, and Hopkins, AJM 2002, Native Vegetation in Western Australia – Extent, Type and Status, Resource Management Technical Report 249, Department of Agriculture, Western Australia.

Scida, M and Gration, R 2017, 'Monitoring the threatened brush-tailed phascogale (Phascogale tapoatafa tapoatafa) at Sugarloaf Reservoir, Victoria', Australian Mammalogy, vol 40(2), pp 307-311.

Stokes, V 2011, '*Orion Long Term Fauna Monitoring Program 2010'*, Internal report for Alcoa of Australia.

Stokes, V 2012, 'Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Keats Mining Region 2011/12', Internal report for Alcoa of Australia.

Storr, GM 1991, *Birds of the South-west Division of Western Australia.* Records of the Western Australian Museum, Suppl. 35.

Storr, GM, Smith, LA & Johnstone, RE 1999, *Lizards of Western Australia, Volume 1: Skinks*, revised edition, Perth, Western Australian Museum.

Storr, GM, Smith, LA & Johnstone, RE 2002, *Snakes of Western Australia*, Western Australian Museum, Perth, W.A.

Threatened Species Scientific Committee (TSSC) 2016a, *'Commonwealth Listing Advice on Cacatua pastinator pastinator (Muir's corella)'*, Department of the Environment, Canberra.

Threatened Species Scientific Committee (TSSC) 2016b, 'Commonwealth Listing Advice on Limosa lapponica (Bar-tailed Godwit)', Department of the Environment, Canberra.

Tyler, MJ & Doughty, P 2009, *Field Guide to Frogs of Western Australia,* Fourth Edition, Western Australian Museum.

Van Dyck, S & Strahan, R 2008, *The Mammals of Australia*, fourth edition, Sydney, Australia, New Holland Publishers.

Van Dyck, S., Gynther., I & Baker, A 2013. Field companion to the mammals of Australia. New Holland Publishers, Australia.

Way, S, Stokes, V & Majer, J 2013, *'McCoy Long Term Fauna Monitoring Program Report of the 2013 Field Survey'*, report prepared for Alcoa of Australia by Environmental Research Department.

Williams, K & Mitchell, D 2001, Jarrah Forest (JF1 – Northern Jarrah Forest subregion), A biodiversity audit of Western Australia's 53 biogeographical subregions in 2002.

Wilson, S & Swan, G 2021, *A Complete Guide to Reptiles of Australia*, Sixth edition, Sydney, Australia, New Holland Press.

Appendices

Appendix A

Figures

Figure 1 Location of Survey Area

Figure 2 Environmental constraints

Figure 3 Fauna survey methods

Figure 4 Threatened fauna (other than Black Cockatoo)

Figure 5 Black Cockatoo

Figure 6 Fauna Habitat

Legend

Survey Boundary

Robinswood Folw
Nettleton Rd
Lyster Rd
Chandler Rd
Jarrahdale Rd
Stirlingia Rd
Blue Rock Rd
37 Mile Rd
Frollett Rd
Bulldozer Rd
Watershed Rd
McCallum Rd
Metro Rd
Feast Rd
Selkirk Rd
Summerfield Rd
Richardson St
Falls Rd
Leroy St
Hall Rd
Walker Rd
Hardey Rd
Utley Rd
Scrivener Rd
Firns Rd
SERPENTINE
JARRAHDALE
Day Rd
Kingsbury Dr
Ronan Rd
Roma Rd
Herold Rd
Millars Log Rd
Buckley Rd
Banksia Gully Rd
Appian Rd
MOUNT COOKE
Balmoral Rd
Solus Rd
Cooke Rd
Albany Hwy
Dirk Rd
Baden Rd
South Western Hwy
Elliott Rd
Gobby Rd
KEYSBROOK
Boyd Rd
Atkins Rd
Reides Rd
Hines Rd
MYARA
SOLUS
CMR-A Alternative Haul Road
Contingency Area A
Whittakers Rd
WHITTAKER
Contingency Area A Haul Road (McCoy)
Torrens Rd
North Rd
Del Park Rd
Ireland Gr
Contingency Area B Haul Road (McCoy)
MOUNT WELLS
Edgar Rd
Kesners Rd
Teddy Rd
Contingency Area A - Infrastructure
BANKSIADALE
Plantation Rd
Scarp Rd
Deer Rd
North Spur Rd
Hatch Rd
MARRINUP
Marrinup Rd
Grey Rd
Freeman Rd
Wilde Rd
Bandicoot Rd
HOLYOAKE
Duncans Rd
Dillon Rd
Hello Rd
TEESDALE
Kings Rd
Oro Rd
Linto Rd
Nanga Rd
INGLEHOPE
Farley Rd
ETMILYN
Gold Mine Rd
Siding Rd
Old Soldiers Rd
Murray Valley Rd
River Rd
Murray Rd
Pinjarra-Williams Rd
Access Rd
Morts Rd
Robinns Rd
Camarri Rd
Waroona Rd
Nanga Brook Rd
Yarragil Form
Murray River Fireline
WURAMING
Invarell Rd
Dawn Creek Rd
NANGA BROOK
Summer Trk
Ashcroft Rd

Paper Size ISO A1

0 0.8 1.6 2.4 3.2

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Alcoa of Australia Ltd
Terrestrial Fauna Assessment O'Neil

Project Location

Project No. **12565572**
Revision No. **0**
Date **10/05/2024**

FIGURE 1

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Print date: 10 May 2024 - 08:56

Data source: World Imagery: Earthstar Geographics. Created by: klabez

Legend

- Survey Boundary
- Registered Aboriginal Heritage Site
- Other Aboriginal Heritage Place
- Baudin's cockatoo
- Carnaby's cockatoo
- Carter's freshwater mussel
- Chuditch, western quoll
- Dell's skink, Darling Range Southwest Ctenotus
- Forest red-tailed black cockatoo
- Malleefowl
- Numbat, walpurti
- Quenda, southwestern brown bandicoot
- Quokka
- Red-tailed phascogale, kenngoor
- Western brush wallaby
- White-tailed black cockatoo
- Woylie, brush-tailed bettong
- Western false pipistrelle, western falsistrelle

Paper Size ISO A1

0 0.5 1 1.5 2

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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GHD

Alcoa of Australia Ltd
Terrestrial Fauna Assessment O'Neil

Ecological Constraints

Project No. **12565572**
Revision No. **1**
Date **10/05/2024**

FIGURE 2

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Print date: 10 May 2024 - 14:27

Data source: World Imagery: Maxar. Created by: klabez

Legend

- Survey Boundary
- Black Cockatoo Plot
- Trap Site
- Remote Camera
- Bat Detector
- Bird Acoustic
- Active Search
- Transect Line

Paper Size ISO A1

0 0.5 1 1.5 2

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Alcoa of Australia Ltd
Terrestrial Fauna Assessment O'Neil

Fauna Survey Methods

Project No. **12565572**
Revision No. **0**
Date **10/05/2024**

FIGURE 3

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Print date: 10 May 2024 - 09:23

Data source: World Imagery: Maxar. Created by: klabez

Legend

- Survey Boundary

Threatened Fauna (other than Black Cockatoo)

- Carter's Freshwater Mussel (*Westralunio carteri*)
- Chuditch (*Dasyurus geoffroii*)
- Dell's Skink (*Ctenotus delli*)
- Masked Owl (*Tyto novaehollandiae novaehollandiae*)
- Quenda (*Isoodon fusciventer*)
- Quokka (*Setonix brachyurus*)
- Rakali (*Hydromys chrysogaster*)
- Western Brush Wallaby (*Notamacropus irma*)

Paper Size ISO A1

0 0.5 1 1.5 2

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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GHD

Alcoa of Australia Ltd
Terrestrial Fauna Assessment O'Neil

Threatened Fauna (other than Black Cockatoos)

Project No. **12565572**
Revision No. **0**
Date **10/05/2024**

FIGURE 4

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Print date: 10 May 2024 - 09:13

Data source: World Imagery: Maxar. Created by: klabez

Legend

- Survey Boundary
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) Sighting
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) Foraging Evidence
- Baudin's Cockatoo (*Zanda baudinii*) Sighting
- Baudin's Cockatoo (*Zanda baudinii*) Foraging Evidence
- Carnaby's Black Cockatoo (*Zanda latirostris*) Sighting
- Carnaby's Black Cockatoo (*Zanda latirostris*) Foraging Evidence
- Black Cockatoo Tree

Black Cockatoo Hollows

- Marri (*Corymbia calophylla*) 1 Hollow

Paper Size ISO A1

0 0.5 1 1.5 2

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Alcoa of Australia Ltd
Terrestrial Fauna Assessment O'Neil

Black Cockatoo Results

Project No. **12565572**
Revision No. **0**
Date **10/05/2024**

FIGURE 5

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Print date: 10 May 2024 - 09:18

Data source: World Imagery: Maxar. Created by: klabez

Legend

Survey Boundary

Fauna Habitat

- Blackbutt Forest
- Bullich Forest
- Granite Outcrop
- Jarrah-Marri Forest
- Mine Rehabilitation
- Mixed Shrub Dampland
- Wandoo Woodland
- Cleared Area

Paper Size ISO A1

0 0.5 1 1.5 2

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Alcoa of Australia Ltd
Terrestrial Fauna Assessment O'Neil

Fauna Habitat

Project No. **12565572**
Revision No. **0**
Date **10/05/2024**

FIGURE 6

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Print date: 10 May 2024 - 09:03

Data source: World Imagery: Maxar. Created by: klabez

Appendix B

Relevant legislation, background information and conservation codes

Relevant legislation

Federal *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Federal Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (MNES).

The biological aspects listed as MNES include:

– Nationally threatened flora and fauna species and ecological communities
– Migratory species

A person must not undertake an action that has, will have, or is likely to have a significant impact (direct or indirect) on MNES, without approval from the Federal Minister for the Environment.

The EPBC Act is administered by the Department of the Environment and Energy (DEE).

State *Environment Protection Act 1986*

The *Environmental Protection Act 1986* (EP Act) is the primary legislative Act dealing with the protection of the environment in Western Australia. The Act allows the Environmental Protection Authority (EPA), to prevent, control and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing. Part IV of the EP Act is administered by the EPA and makes provisions for the EPA to undertake environmental impact assessment of significant proposals, strategic proposals and land use planning schemes.

The Department of Water and Environment Regulation (DWER) is responsible for administering the clearing provisions of the EP Act (Part V). Clearing of native vegetation in Western Australia requires a permit from the DWER, unless exemptions apply. Applications for clearing permits are assessed by the Department and decisions are made to grant or refuse the application in accordance with the Act. When making a decision the assessment considers clearing against the ten clearing principles as specified in Schedule 5 of the EP Act:

1. Native vegetation should not be cleared if it comprises a high level of biodiversity.
2. Native vegetation should not be cleared if it comprises the whole or a part of or is necessary for the maintenance of a significance habitat for fauna indigenous to Western Australia.
3. Native vegetation should not be cleared if it includes, or is necessary, for the continued existence of rare flora.
4. Native vegetation should not be cleared if it comprises the whole or part of native vegetation in an area that has been extensively cleared.
5. Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
6. Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
7. Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.
8. Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
9. Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.
10. Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

Exemptions for clearing include clearing that is a requirement of a written law or authorised under certain statutory processes (listed in Schedule 6 of the EP Act) and exemptions for prescribed low impact day-to-day activities (prescribed in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004); these exemptions do not apply in environmentally sensitive areas (ESAs).

State *Biodiversity and Conservation Act 2016*

The *Biodiversity Conservation Act 2016* (BC Act) provides for the conservation and protection of biodiversity and biodiversity components, as well as the promotion of the ecologically sustainable use of biodiversity components in Western Australia. The BC Act replaces both the repealed *Wildlife Conservation Act 1950* (WC Act) and the *Sandalwood Act 1929* (Sandalwood Act), as well as their associated regulations. To attain the objectives of the BC Act, principles of ecological sustainable development have been established:

– Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.
– If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
– The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
– The conservation of biodiversity and ecological integrity should be a fundamental consideration indecision-making.
– Improved valuation, pricing and incentive mechanisms should be promoted.

The BC Act is administered by the Department of Biodiversity Conservation and Attractions (DBCA).

State *Biosecurity and Agriculture Management Act 2007*

The *Biosecurity and Agriculture Management Act 2007* (BAM Act) and associated regulations are administered by the Department of Primary Industries and Regional Development (DPIRD) and replace the repealed *Agriculture and Related Resources Protection Act 1976.* The main purposes of the BAM Act and its regulations are to:

– Prevent new animal and plant pests (vermin and weeds) and diseases from entering WA.
– Manage the impact and spread of those pests already present in the state.
– Safely manage the use of agricultural and veterinary chemicals
– Increased control over the sale of agricultural products that contain violative chemical residues.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act. A Declared Pest is a prohibited organism or an organism for which a declaration under Section 22(2) of the Act is in force. Declared Pests may be assigned a control category including: C1 (exclusion), C2 (eradication) and C3 (management). The category may apply to the whole of the State, LGAs, districts, individual properties or even paddocks, and all landholders are obliged to comply with the specific category of control. Categories of control are defined below.

DPIRD Categories for Declared Pests under the BAM Act

Control class code	Description
C1 (Exclusion)	Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2 (Eradication)	Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.
C3 (Management)	Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which is currently is free of that pest.

Fauna Conservation codes

The Federal conservation level of fauna species and their significance status is assessed under the EPBC Act. The significance levels for fauna used in the EPBC Act align with the International Union for Conservation of Nature (IUCN) Red List criteria, which are internationally recognised as providing best practice for assigning the conservation status of species. The EPBC Act also protects land and migratory species that are listed under International Agreements. The list of migratory species established under section 209 of the EPBC Act comprises:

– Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II)
– Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China–Australia Migratory Bird Agreement (CAMBA)
– Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)

The State conservation level of fauna species and their significance status also follows the IUCN Red List criteria. Under the BC Act fauna can be listed as Threatened, Extinct and as Specially Protected species.

Threatened species are those are species which have been adequately searched for and are deemed to be, in the wild, either rare, under identifiable threat of extinction, or otherwise in need of special protection, and have been gazetted as such. The assessment of the conservation status of Threatened species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria. Specially protected species meet one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as Threatened or Extinct species under the BC Act cannot also be listed as Specially Protected species.

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna List under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

For the purposes of this assessment, all species listed under the EPBC Act, BC Act and DBCA Priority species are considered significant.

Conservation categories and definitions for EPBC Act and BC Act listed fauna species

Conservation category	Definition
Threatened species	
Critically Endangered (CR)	Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with criteria set out in section 20 and the ministerial guidelines.
Endangered (EN)	Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.
Vulnerable (VU)	Threatened species considered to be "facing a high risk of extinction in the wild in the medium term future as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.
Extinct species	
Extinct (EX)	Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).
Extinct in the Wild (EW)	Species that "is known only to survive in cultivation, in captivity or as a naturalized population well outside its past range, and it has not been recorded in its known habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its lifecycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).
Specially protected species	
Migratory (MI)	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.
Species of special conservation interest (conservation dependent fauna) (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Other specially protected fauna (OS)	Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Conservation codes for DBCA listed Priority fauna

Priority category	Definition
Priority 1	Poorly-known taxa Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2	Poorly-known taxa Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3	Poorly-known taxa Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4	Rare, Near Threatened and other taxa in need of monitoring Rare: Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands. Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. Taxa that have been removed from the list of threatened taxa during the past five years for reasons other than taxonomy.

Other significant fauna

Fauna species may be significant for a range of reasons other than those protected by international agreement or treaty, Specially Protected or Priority Fauna. Significant fauna may include short-range endemic species, species that have declining populations or declining distributions, species at the extremes of their range, or isolated outlying populations, or species which may be undescribed (EPA 2010).

References

ANZECC 2000, Core Environmental Indicators for Reporting on the State of Environment, ANZECC State of the Environment Reporting Task Force.

Commonwealth of Australia 2001, National Targets and Objectives for Biodiversity Conservation 2001–2005, Canberra, AGPS.

EPA 2010, Technical Guide – Terrestrial Fauna Surveys, EPA, Perth, WA

Appendix C

Desktop Searches

***NatureMap* Species Report**

EPBC Act Protected Maters Search Tool Report

***NatureMap* Species Report**

TAXON	CLASS	CONS
Crinia georgiana	AMPHI	
Crinia glauerti	AMPHI	
Crinia pseudinsignifera	AMPHI	
Geocrinia leai	AMPHI	
Heleioporus barycragus	AMPHI	
Heleioporus eyrei	AMPHI	
Heleioporus inornatus	AMPHI	
Heleioporus psammophilus	AMPHI	
Heleioporus sp.	AMPHI	
Litoria adelaidensis	AMPHI	
Litoria moorei	AMPHI	
Pseudophryne guentheri	AMPHI	
Acanthiza apicalis	BIRD	
Acanthiza chrysorrhoa	BIRD	
Acanthiza inornata	BIRD	
Acanthorhynchus superciliosus	BIRD	
Accipiter cirrocephalus	BIRD	
Aegotheles cristatus	BIRD	
Anthochaera carunculata	BIRD	
Anthochaera lunulata	BIRD	
Aquila audax	BIRD	
Artamus cyanopterus	BIRD	
Barnardius zonarius	BIRD	
Cacatua roseicapilla	BIRD	
Cacomantis flabelliformis	BIRD	
Cacomantis pallidus	BIRD	
Calyptorhynchus banksii	BIRD	
Calyptorhynchus banksii subsp. *naso*	BIRD	VU
Calyptorhynchus baudinii	BIRD	EN
Calyptorhynchus latirostris	BIRD	EN
Calyptorhynchus sp.	BIRD	
Chenonetta jubata	BIRD	
Chrysococcyx basalis	BIRD	
Climacteris rufa	BIRD	
Colluricincla harmonica	BIRD	
Coracina novaehollandiae	BIRD	
Corvus coronoides	BIRD	
Cracticus tibicen	BIRD	
Dacelo novaeguineae	BIRD	

TAXON	CLASS	CONS
Daphoenositta chrysoptera	BIRD	
Dromaius novaehollandiae	BIRD	
Eopsaltria australis subsp. *griseogularis*	BIRD	
Eopsaltria georgiana	BIRD	
Eopsaltria griseogularis	BIRD	
Falco berigora	BIRD	
Falco cenchroides	BIRD	
Falco peregrinus	BIRD	OS
Falcunculus frontatus subsp. *leucogaster*	BIRD	
Gerygone fusca	BIRD	
Glyciphila melanops	BIRD	
Hamirostra isura	BIRD	
Hirundo neoxena	BIRD	
Hirundo nigricans	BIRD	
Leipoa ocellata	BIRD	VU
Lichenostomus leucotis	BIRD	
Lichenostomus ornatus	BIRD	
Lichenostomus virescens	BIRD	
Lichmera indistincta	BIRD	
Malurus elegans	BIRD	
Malurus splendens	BIRD	
Malurus splendens subsp. *splendens*	BIRD	
Melithreptus brevirostris	BIRD	
Melithreptus chloropsis	BIRD	
Melithreptus lunatus	BIRD	
Merops ornatus	BIRD	
Neophema elegans	BIRD	
Ninox novaeseelandiae	BIRD	
Nycticorax caledonicus	BIRD	
Ocyphaps lophotes	BIRD	
Pachycephala pectoralis	BIRD	
Pachycephala pectoralis subsp. *fuliginosa*	BIRD	
Pachycephala rufiventris	BIRD	
Pardalotus punctatus	BIRD	
Pardalotus striatus	BIRD	
Pardalotus striatus subsp. *westraliensis*	BIRD	
Petrochelidon nigricans	BIRD	
Petroica boodang	BIRD	
Petroica multicolor	BIRD	
Petroica multicolor subsp. *campbelli*	BIRD	
Phaps chalcoptera	BIRD	

TAXON	CLASS	CONS
Phylidonyris novaehollandiae	BIRD	
Platycercus icterotis	BIRD	
Platycercus spurius	BIRD	
Platycercus zonarius	BIRD	
Polytelis anthopeplus	BIRD	
Purpureicephalus spurius	BIRD	
Rhipidura albiscapa	BIRD	
Rhipidura fuliginosa	BIRD	
Rhipidura leucophrys	BIRD	
Sericornis frontalis	BIRD	
Smicrornis brevirostris	BIRD	
Stagonopleura oculata	BIRD	
Strepera versicolor	BIRD	
Tadorna tadornoides	BIRD	
Todiramphus sanctus	BIRD	
Turnix varius	BIRD	
Zosterops lateralis	BIRD	
Mammals		
Antechinus flavipes subsp. *leucogaster*	MAMMAL	
Bettongia penicillata subsp. *ogilbyi*	MAMMAL	CR
Canis lupus subsp. *dingo*	MAMMAL	
Cercartetus concinnus	MAMMAL	
Chalinolobus gouldii	MAMMAL	
Chalinolobus morio	MAMMAL	
Dasyurus geoffroii	MAMMAL	VU
Falsistrellus mackenziei	MAMMAL	P4
Isoodon fusciventer	MAMMAL	P4
Isoodon obesulus	MAMMAL	
Isoodon obesulus subsp. *fusciventer*	MAMMAL	
Macropus fuliginosus	MAMMAL	
Macropus irma	MAMMAL	
Mormopterus planiceps	MAMMAL	
Mus musculus	MAMMAL	
Myrmecobius fasciatus	MAMMAL	EN
Notamacropus irma	MAMMAL	P4
Nyctophilus geoffroyi	MAMMAL	
Nyctophilus gouldi	MAMMAL	
Nyctophilus major	MAMMAL	
Nyctophilus sp.	MAMMAL	
Nyctophilus timoriensis subsp. *timoriensis*	MAMMAL	
Ozimops australis	MAMMAL	

TAXON	CLASS	CONS
Rattus rattus	MAMMAL	
Setonix brachyurus	MAMMAL	VU
Sminthopsis gilberti	MAMMAL	
Sminthopsis griseoventer	MAMMAL	
Sminthopsis griseoventer subsp. *griseoventer*	MAMMAL	
Tachyglossus aculeatus	MAMMAL	
Tadarida australis	MAMMAL	
Trichosurus vulpecula	MAMMAL	
Trichosurus vulpecula subsp. *vulpecula*	MAMMAL	
Vespadelus regulus	MAMMAL	
Reptiles		
Acritoscincus trilineatum	REPTILE	
Acritoscincus trilineatus	REPTILE	
Aprasia pulchella	REPTILE	
Aprasia repens	REPTILE	
Christinus marmoratus	REPTILE	
Cryptoblepharus buchananii	REPTILE	
Cryptoblepharus plagiocephalus	REPTILE	
Ctenophorus ornatus	REPTILE	
Ctenotus delli	REPTILE	P4
Ctenotus impar	REPTILE	
Ctenotus labillardieri	REPTILE	
Diplodactylus granariensis subsp. *granariensis*	REPTILE	
Diplodactylus polyophthalmus	REPTILE	
Diporiphora pindan	REPTILE	
Egernia kingii	REPTILE	
Egernia napoleonis	REPTILE	
Hemiergis initialis	REPTILE	
Hemiergis initialis subsp. *initialis*	REPTILE	
Lerista distinguenda	REPTILE	
Lerista microtis subsp. *microtis*	REPTILE	
Lialis burtonis	REPTILE	
Menetia greyii	REPTILE	
Morethia obscura	REPTILE	
Nephrurus milii	REPTILE	
Notechis scutatus	REPTILE	
Oedura reticulata	REPTILE	
Parasuta gouldii	REPTILE	
Parasuta nigriceps	REPTILE	
Pogona minor	REPTILE	
Pogona minor subsp. *minor*	REPTILE	

TAXON	CLASS	CONS
Pseudechis australis	REPTILE	
Pseudonaja affinis subsp. *affinis*	REPTILE	
Ramphotyphlops australis	REPTILE	
Ramphotyphlops pinguis	REPTILE	
Simoselaps bertholdi	REPTILE	
Tiliqua rugosa	REPTILE	
Tiliqua rugosa subsp. *palarra*	REPTILE	
Tiliqua rugosa subsp. *rugosa*	REPTILE	
Underwoodisaurus milii	REPTILE	
Varanus gouldii	REPTILE	
Varanus rosenbergi	REPTILE	

Please note that *NatureMap* data contains some inaccuracies.

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 14-Jan-2022

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	15
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	1
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	8
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)	[Resource Information]
Ramsar Site Name	Proximity
Peel-yalgorup system	30 - 40km upstream from Ramsar site

Listed Threatened Species		[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.		
Scientific Name	Threatened Category	Presence Text
BIRD		
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus banksii naso		
Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Zanda baudinii listed as Calyptorhynchus baudinii		
Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Roosting likely to occur within area
Zanda latirostris listed as Calyptorhynchus latirostris		
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area
MAMMAL		

Scientific Name	Threatened Category	Presence Text
Bettongia penicillata ogilbyi		
Woylie [66844]	Endangered	Species or species habitat known to occur within area
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area
Pseudocheirus occidentalis		
Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat may occur within area
Setonix brachyurus		
Quokka [229]	Vulnerable	Species or species habitat likely to occur within area
OTHER		
Westralunio carteri		
Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area
PLANT		
Diuris micrantha		
Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei		
Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
Verticordia fimbrilepis subsp. fimbrilepis		
Shy Featherflower [24631]	Endangered	Species or species habitat likely to occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		

Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State
Monadnocks	5(1)(g) Reserve	WA

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State
South West WA RFA	Western Australia

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Alcoa Pinjarra Refinery Production Increase and Bauxite Export	2020/8743	Controlled Action	Assessment Approach
Efficiency and Growth Increase of Alumina Production	2004/1566	Controlled Action	Post-Approval
Newmont Boddington Gold Mine Extension Project	2012/6370	Controlled Action	Post-Approval
Not controlled action			
Albany Highway extension of existing passing lanes	2013/6727	Not Controlled Action	Completed
Construction and operation of a putrescible landfill	2011/5998	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Appendix D

Fauna Field Data

Fauna likelihood of occurrence assessment guideline and definitions

Fauna Likelihood of occurrence assessment

Combined Species List

Phase 2 targeted survey data

Phase 3 targeted survey data

Phase 1 camera data

Phase 2 camera data

Single target camera data

Chuditch remote capture spot assessment

Black Cockatoo foraging assessment

Species recorded from studies and database searches

The table presents all vertebrate fauna species recorded in previous studies within or in proximity to the Survey Area, and database searches within a 20 kilometre radius of the Survey Area.

Fauna likelihood of occurrence assessment guidelines

Assessment outcome	Description
Known	Species recorded during the field survey or from recent, reliable records from within or close proximity to the Survey Area.
Likely	Species are **likely** to occur in the Survey Area where there is suitable habitat within the Survey Area and there are recent records of occurrence of the species in close proximity to the Survey Area. OR Species known distribution overlaps with the Survey Area and there is suitable habitat within the Survey Area.
Unlikely	Species assessed as **unlikely** include those species previously recorded within 40 km of the Survey Area however: There is limited (i.e. the type, quality and quantity of the habitat is generally poor or restricted) habitat in the Survey Area. The suitable habitat within the Survey Area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the Survey Area. OR Those species that have a known distribution overlapping with the Survey Area however: There is limited habitat in the Survey Area (i.e. the type, quality and quantity of the habitat is generally poor or restricted). The suitable habitat within the Survey Area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the Survey Area.
Highly unlikely	Species that are considered highly unlikely to occur in the Survey Area include: Those species that have no suitable habitat within the Survey Area. Those species that have become locally extinct, or are not known to have ever been present in the region of the Survey Area.

Source information - desktop searches

NM – *DBCA NatureMap* (accessed May 2022)

PMST – DAWE Protected Matters Search Tool (PMST) to identify fauna listed under the EPBC Act potentially occurring within the Survey Area (accessed June 2020)

Definitions

Term	Description
Database search area	a 10 km buffer around the Survey Area
Survey Area	the area subject to the current survey
CR	Critically endangered under the EPBC Act or BC Act
EN	Endangered under the EPBC Act or BC Act
VU	Vulnerable under the EPBC Act or BC Act
IA	Migratory birds protected under an international agreement
MI, MA	Migratory, Marine
CD	Conservation dependent fauna
OS	Other specially protected fauna under the BC Act
P1	Priority 1: Poorly known fauna. Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2	Priority 2: Poorly known species. Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3	Priority 3: Poorly known species. Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	Priority 4: Rare, Near Threatened and other species in need of monitoring. (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Fauna Likelihood of occurrence assessment of significant species relevant to the Survey Area

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
Calidris ferruginea	Curlew Sandpiper	CR	CR	Curlew Sandpipers mainly occur in areas with soft mud conditions, including intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are found inland less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. In WA, they are widespread around coastal and subcoastal plains from Cape Arid to south-west Kimberley Division but are more sparsely distributed between Carnarvon and Dampier Archipelago (DAWE 2021e). They are common on the Swan Coastal Plain, particularly near large drying lakes like Thompson and Forrestdale, and Peel Inlet. They are less common along the southern coast to Esperance (Nevill 2013).	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	PMST
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	The Forest Red-tailed Black Cockatoo inhabits the dense Jarrah, karri, and Marri forests receiving more than 600 mm annual average rainfall but also occurs in a range of other forest and woodland types, including Blackbutt (*E. patens*), Wandoo (*E. wandoo*), Tuart (*E. gomphocephala*), Albany Blackbutt (*E. staeri*), Yate (*E. cornuta*), and Flooded Gum (*E. rudis*) (DAWE 2021b). Habitats tend to have an understorey of balga (*Xanthorrhoea* spp.), kingia (*Kingia australis*), snottygobble (*Persoonia* spp.), parrot bush (*Banksia sessillis*), holly-leaved mirbelia (*Mirbelia dilatata*), bull banksia (*B. grandis*), bullich (*Taxandria* spp.) and sheoak (*Allocasuraina fraseriana*). They are most common in the Jarrah forest region of the northern Darling Range from Collie north to Mundaring and are very local throughout the lower south-west. They can be found on the Swan Coastal Plain, mainly in search of food the exotic white cedar (*Melia azedarach*). There are also several small isolated populations in the eastern parts of its range (DAWE 2021b).	**Known** This species is known from the region.	**Known** Known to occur within Survey Area. Recorded sightings and foraging within the Survey Area.	NatureMap, PMST, DBCA & GHD
Zanda baudinii	Baudin's Black Cockatoo	EN	EN	Baudin's Black Cockatoo mainly occurs in eucalypt forests, especially Jarrah, Marri and karri forest that receives 750 mm of annual rainfall. The species is less frequently in woodlands of wandoo (*Eucalyptus wandoo*), blackbutt (*E. patens*), flooded gum (*E. rudis*), yate (*E. cornuta*), partly cleared farmlands and urban areas. The range of the species extends from Albany northward to Gidgegannup and Mundaring (east of Perth), and inland to the Stirling Ranges and near Kojonup. Preferred roosts are in areas with a dense canopy close to permanent sources of water (DAWE 2021c).	**Known** This species is known from the region.	**Known** Known to occur within Survey Area. Recorded sighting and foraging within the Survey Area.	NatureMap, PMST, DBCA & GHD

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
Zanda latirostris	Carnaby's Black Cockatoo	EN	EN	Carnaby's Cockatoo occurs in uncleared or remnant native eucalypt woodlands, especially those that contain Salmon gum, Wandoo, Marri, Jarrah and Karri, and in shrubland or kwongan heathland dominated by Hakea, Dryandra, Banksia and Grevillea species. Breeding activity is restricted to eucalypt woodlands mainly in the semiarid and subhumid interior, from Kalbarri in the north, Three Springs District south to the Stirling Range, west to Cockleshell Gully and east to Manmanning. The species has expanded its breeding range westward and south into the Jarrah-Marri forests of the Darling Scarp and into the tuart forests of the Swan Coastal Plain, including the Yanchep area, Lake Clifton and near Bunbury. It nests in trees older than 120-150 years (DAWE 2021d).	**Known** This species is known from the region.	**Known** Known to occur within Survey Area. Foraging evidence was recorded within Survey Area.	NatureMap, PMST, DBCA & GHD
Falco peregrinus macropus	Peregrine Falcon	OS		The Peregrine Falcon is found on and near cliffs, gorges, timbered watercourses, riverine environments, wetlands, plains, open woodlands, and pylons and spires of buildings, though less frequently in desert regions (Morcombe 2004; Pizzey & Knight 2012). They are not common but can be found almost anywhere throughout WA and in the southwest, including particularly at Fitzgerald River, Stirling Range, Porongurup National Parks, Kondinin, and Peak Charles, with many more locations north of Perth (Nevill 2013).	**Likely** Specimen have been recorded in the region the closest in Holyoake block	**Likely** The species wasn't recorded during the surveys however the species is known to persist in the region. Suitable habitat and prey items are found within the survey area.	NatureMap & DBCA
Leipoa ocellata	Malleefowl	VU	VU & MI	The Malleefowl generally occurs in semi-arid areas of WA, in shrublands and low woodlands that are dominated by mallee vegetation, as well as native pine Callitris woodlands, Acacia shrublands, paperbark, sheoak, Broombush *Melaleuca uncinata* vegetation, eucalypt woodlands, or coastal heathlands. Mostly they are found where there are sandy or gravel soils. The nest is a large mound of sand or soil and organic matter (Jones & Goth 2008; Morcombe 2014; Nevill 2013). In WA they are found from the southwest Nullarbor to Albany, north, and then west from Moore River up to Shark Bay, past Cue, across to Wiluna and east to the northern Victoria Desert south of the Blackstone Ranges (Nevill 2013; Pizzey & Knight 2012).	**Unlikely** The Survey Area does not contain suitable undisturbed habitat to support this species.	**Unlikely** Regional records are historical. The Survey Area does not contain suitable undisturbed habitat to support this species. The area is to readily logged and burnt to persist in the area. Over 35 transects were undertaken across the Survey	NatureMap, PMST & DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
						Area with no evidence of use recorded.	
Numenius madagascariensis	Eastern Curlew	CR	CR & MI	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, sometimes within the mangroves, and in coastal saltworks and sewage farms. In the south west, Eastern Curlews are recorded from Eyre, and there are scattered records from Stokes Inlet to Peel Inlet (Marchant & Higgins 1993). They are uncommon further south of Geraldton, but can be spotted in Alfred Cove, Peel Inlet and the Albany region (Nevill 2013).	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	NatureMap & PMST
Tringa brevipes	Grey-tailed Tattler	Mi & P4	IA	Within Australia, the Grey-tailed Tattler has a primarily northern coastal distribution and is found in most coastal regions. It is found in the south-west between Augusta and Cervantes (DAWE 2021d).	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	NatureMap
Tyto novaehollandiae subsp. novaehollandiae	Masked Owl (southern subsp)	P3		The Masked Owl is found in forests (wet and dry sclerophyll, non-eucalypt dominated), open woodlands, farmlands or scrub with large trees (12-20 m) and adjacent cleared country, timbered watercourses, paperbark woodlands, and caves (Pizzey & Knight 2012). It requires large hollows in old growth eucalypts or bare sand or the earth of a cave for nesting, and often favours areas with dense understorey or ecotones comprising dense and sparse ground cover. It is often recorded foraging within 100-300 m of the boundary of two vegetation types (Bell & Mooney 2002). The bird is restricted to the thicker humid forests of the southwest region, particularly in the Pemberton and Manjimup area and along the Murray River in the Lane Poole area (Kavanagh & Murray 1996). It nests in hollows in large Karri (*Eucalyptus diversicolor*), Marri (*Corymbia calophylla*) and Jarrah (*E. marginata*) trees (Nevill 2013).	**Likely** The Survey area contains suitable habitat. Masked owls have been previously recorded near the survey area.	**Known** A hand fall of Masked Owl calls were record via SM4 Song Meters. The survey area contains suitable habitat.	NatureMap, DBCA & GHD
Apus pacificus	Fork-tailed Swift	Mi	Mi	The Fork-tailed Swift is common in coastal and sub coastal areas between Carnarvon and Augusta including near and offshore islands. There are scattered records along south coast from Denmark east to Cocklebiddy on the Great Australian Bight, and sparsely scattered records inland. They are found across a range of habitats, from inland open plains to wooded areas. They are most often observed over inland plains in Australia, but sometimes recorded over coastal cliffs and	**Unlikely** The species is rarely observed inland use is rare and opportunistic	**Unlikely** The species is occasionally observed in the south-west of WA but roosting	PMST

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
				beaches as well as urban areas. They have been recorded well out to sea as well as from offshore islands especially when on passage from Indonesia. This species is almost exclusively aerial (DotE 2015).		infrequently. May occasionally fly over Survey Area.	
Rostratula australis	Australian Painted Snipe	En	En	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire. It sometimes use areas that are lined with trees, or that have some scattered fallen or washed-up timber (DAWE 2021e). In the south west it can be found around Carnarvon and wetlands north of Perth, particularly those west of Moora and Gin Gin (Nevill 2013).	**Highly Unlikely** The Survey Area lacks suitable wetlands, and the species is not typically known from this region.	**Highly Unlikely** The Survey Area lacks suitable wetlands, and the species is not typically known from this region.	PMST
Motacilla cinerea	Grey Wagtail	Mi	Mi	The Grey Wagtail is an opportunistic migrant to Australia. The species typically migrates to Indonesia occasionally landing in Australia. Most records for the species are from Northern Australia and South Australia (Morcombe 2004). The non-breeding habitat only of the Grey Wagtail has a strong association with water, particularly rocky substrates along water courses but also lakes and marshes (DAWE 2021e). It can be found mainly in banks and rocks in fast-running freshwater habitats: rivers, creeks, streams, and around waterfalls, both in forest and open country; but occurs almost anywhere during migration (Johnstone & Storr 2004).	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	**Highly Unlikely** Survey Area is beyond the range of this species	PMST
Actitis hypoleucos	Common Sandpiper	Mi	Mi	The Common Sandpiper is found along all coastlines of Australia and uses a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around often narrow and steep muddy margins or rocky shores. The species has been recorded in estuaries and deltas of streams, as well as on banks further upstream; around lakes, pools, mangroves, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. It is often found near mangroves, and sometimes in areas of mud littered with rocks or snags (DAWE 2021e). They are somewhat uncommon in the south west, but can be found on Rottnest and Penguin Islands, and along the south coast all the way to the Esperance region, including the inland lakes like Lake Warden (Nevill 2013).	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	PMST
Calidris auminata	Sharp-tailed Sandpiper	Mi	Mi	In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh, or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans, and hypersaline salt lakes	**Highly Unlikely** The Survey Area lacks suitable	**Highly Unlikely** The Survey Area lacks suitable	PMST

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
				inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries, or seashores, and also swamps and creeks lined with mangroves. Sometimes they occur on rocky shores (DAWE 2021e). They are found throughout many wetlands on the Swan Coastal Plain, in Perth lakes with wet grassed margins and receding waters, Vasse and Harvey Estuaries, and the Busselton wetlands, but are less common on the south coast until the Esperance region (Nevill 2013).	wetland or shoreline habitat.	wetland or shoreline habitat.	
Calidris melanotos	Pectoral Sandpiper	Mi	Mi	In Australia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The bird can be seen on the Swan Coastal Plain but is rare to scarce on Lake Thompson, and as well on any freshwater wetland in the southwest with shallow, well-grassed margins. They are seen at Lake Warden, Esperance, and at Lake McLarty (Nevill 2013).	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	**Highly Unlikely** The Survey Area lacks suitable wetland or shoreline habitat.	PMST
Mammals							
Bettongia penicillata ogilbyi	Woylie	CR	EN	Preferred habitat for the Woylie includes dense undergrowth, logs and rock-cavities and occasionally in burrows (Burbidge 2004). Scattered Woylie populations may be found throughout the Jarrah forest in the south-west corner of WA. Extant naturally occurring populations of the species are restricted to three small wheatbelt reserves – Dryandra Woodland, Tutanning Nature Reserve and Perup Forest. All are characterised by the presence of thickets of the plant *Gastrolobium* (Van Dyck and Strahan 2008). The species is now restricted to forests and areas where predation has been controlled (or excluded). It rests during the day in a well-concealed nest, built over a shallow depression. The nest is most commonly built using long strands, of grasses, but other material such as strips of bark are also used (in the forest) or dried seagrass and/or *triodia* (in arid coastal areas) (Freegard 2007).	**Unlikely** Suitable habitat is present within the Survey Area. The Woylie is known to be previously recorded in Dwellingup area (many years ago) but there are no current local records in Holyoake and Jarrahdale forests. Due to fire frequency and presence of feral predators (such	**Likely** There is suitable habitat within the Survey Area Woylies were recorded in the adjacent O'Neil East Survey Area.	NatureMap, PMST, DBCA & GHD

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
					as foxes and cats) they are unlikely to be currently present. There is a possibility of vagrant occurrence but unlikely a current population in the Survey Area.		
Dasyurus geoffroii	Chuditch	VU	VU	The Chuditch inhabits eucalypt forest (especially Jarrah, *Eucalyptus marginata*), dry woodland, mallee shrublands, heaths, and desert, particularly in the south coast of WA. They also occur at lower densities in drier woodland and mallee shrubland in the goldfields and wheatbelt, as well as in Kalbarri National Park (translocated). Chuditch require adequate numbers of suitable den and refuge sites (horizontal hollow logs or earth burrows) to survive (DEC 2012b). In Jarrah forest, Chuditch populations occur in both moist, densely vegetated, steeply sloping forest and drier, open, gently sloping forest (Van Dyck & Strahan 2008). The species can travel large distances, and for this reason requires habitats that are of a suitable size and not excessively fragmented.	**Known** This species is known from the region. The Survey Area provides suitable denning and foraging/hunting habitat to support this species.	**Known** This species was recorded during the survey via remote cameras and several locations. The Survey Area provides suitable denning and foraging/hunting habitat to support this species.	NatureMap, PMST, DBCA & GHD
Hydromys chrysogaster	Rakali, Water-rat	P4		The Water Rat lives in the vicinity of permanent bodies of fresh, brackish, or marine water, lakes, and farm dams, and on sheltered coastal beaches, mangroves and offshore islands. In the south-west of WA, they have been shown to prefer areas with riparian vegetation, better water quality and a degree of habitat complexity. Woody debris, rock ledges and wetland islands are likely to be important areas for feeding and refuge (DEC 2012a). It is an occasional vagrant to temporary waters. Water Rat's dens are made at the end of tunnels in banks and occasionally in logs (Van Dyck & Strahan 2008).	**Likely** This species is known from the region in creeks, brooks and rivers that provide suitable aquatic and riparian habitats.	**Known** One individual was recorded via remote camera in the southwestern portion of the Survey Area.	NatureMap, DBCA & GHD
Falsistrellus mackenziei	Western False Pipistrelle	P4		The Western False Pipistrelle occurs in wet sclerophyll forest dominated by Karri, and in the high rainfall zones of the Jarrah and Tuart dry sclerophyll forests. The species is restricted to areas in or adjacent to stands of old growth forest. Marri, Sheoak and Peppermint are often codominant at its collection localities (Churchill 2008; McKenzie and Start 1999).	**Likely** This species is known from the region and was recorded in	**Known** This species had a singular recording via a SM4 Bat Acoustic	NatureMap, DBCA & GHD

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
					Holyoake area in 2021	during Phase 1 of the survey.	
Isoodon fusciventer	Quenda (Southern Brown Bandicoot)	P4		The Quenda prefers dense scrubby, often swampy, vegetation with dense cover up to one metre high. However, it also occurs in woodlands, and may use less ideal habitat where this habitat occurs adjacent to the thicker, more desirable vegetation. The species often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (Van Dyck & Strahan 2008).	**Known** This species is known from the region	**Known** This species was recorded during the survey via both remote cameras and diggings. The Survey Area provides suitable breeding and foraging habitat to support this species.	NatureMap, DBCA & GHD
Myrmecobius fasciatus	Numbat	EN	EN	Current Numbat populations occupy several different habitat types: upland Jarrah forest, open eucalypt woodland, banksia woodland and tall closed shrubland. The only remaining original subpopulations are at Dryandra Woodland and the Upper Warren area (including Tone Perup Nature Reserve, Greater Kingston National Park, and adjoining State Forest). In WA there are nine translocation sites, including Boyagin Nature Reserve, Tutanning Nature Reserve, Batalling block and Karroun Hill Nature Reserve (see DPaW 2015 for complete list and details). At Dryandra, numbats inhabit brown mallet (*Eucalyptus astringens*) plantations. Habitats usually have an abundance of termites in the soil, and hollow logs, tree hollows, burrows and branches for shelter (DAWE 2021e; Van Dyck & Strahan 2008).	**Likely** Historical records include the Jarrah forest and wandoo areas in the southwest. A resident population occurs in the Narrogin area and re-introduced population at Boyagin rock. Anedotal recocords exist in the Boddington area however this is unconfirmed.	**Likely** Historical records include the region. A resident population occurs in the Narrogin area and re-introduced population at Boyagin rock. Eastern portions of the O'Neil Survey Area have excellent open wandoo woodland representing suitable Numbat habitat within the species' former range. This species potentially occurs within this suitable habitat, but at	NatureMap &, DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
						very low population density, and potentially below the level of detectability based on current survey effort.	
Notamacropus irma	Western Brush Wallaby	P4		The Western Brush Wallaby is found primarily in open forest or woodland, particularly favouring open, seasonally- wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland and is uncommon in karri forest (DEC 2011; Van Dyck & Strahan 2008).	**Known** This species is known from the region.	**Known** This species was recorded numerously during the survey. The Survey Area provides suitable breeding and foraging habitat to support this species.	NatureMap, DBCA & GHD
Phascogale tapoatafa wambenger	South-west Brush Tailed Phascogale	CD		The Brush-tailed Phascogale is sparsely distributed outside the semi-arid zone in dry sclerophyll forest and monsoonal forest and woodland. The species is generally rare and threatened by habitat fragmentation in the south west of WA. (Scida et al 2017). Habitat varies but forest or woodlands is required with large trees to provide hollows and cover. Canopy connection provides excellent cover and connectivity for the species to mover through their environment (Scida et al 2017).	**Known** This species is known from the region	**Likely** This species is known from this area. Suitable habitat is found within the Survey Area.	NatureMap, DBCA, GHD
Pseudocheirus occidentalis	Western Ringtail Possum	CR	CR	The Western Ringtail Possum occurs in coastal and near coastal and Peppermint Tree (*Agonis flexuosa*) forest and Tuart (*Eucalyptus gomphocephala*) dominated forest with a Peppermint Tree understorey from Bunbury to Albany. Also occurs in Jarrah (*E. marginata*) forest and Jarrah-Marri *(Corymbia calophylla*) forest associated with Peppermint Tree (Van Dyck & Strahan 2008).	**Unlikely** Suitable habitat (Tuart over peppermint understory) is not present to support this species and the Study Area is beyond the current local range of the species.	**Unlikely** Suitable habitat (Tuart over peppermint understory) is not present to support this species and the Study Area is beyond the current range of the species.	NatureMap & DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
Setonix brachyurus	Quokka	Vu	Vu	The current distribution of the Quokka includes Rottnest and Bald Islands, and at least 25 sites on the mainland, including Two Peoples Bay Nature Reserve and Torndirrup, Mt Manypeaks and Walpole-Nornalup National Parks, and swamp areas through the south-west forests from Jarrahdale to Walpole. The last known population on the Swan Coastal Plain occurs in Muddy Lakes near Bunbury. Quokkas have also been reintroduced to Karakamia Sanctuary (DEC 2013). They occupy dense forests and thickets, streamside vegetation, heaths, shrublands, *Agonis linearifolia*-dominated swamps in the Jarrah (*Eucalyptus marginata*) forest, and sometimes tea-tree thickets on sandy soils along creek systems. The northern extent on the mainland is in the Jarrah forest immediately south-east of the Perth metropolitan area, from where it extends southward through the southern Jarrah, Marri and Karri forests to the south coast, but largely confined throughout to areas receiving an annual rainfall of 1,000 mm or more (DEC 2013; Van Dyck & Strahan 2008).	**Likely** This species was recorded during the Holyoake main survey on remote cameras. The Survey Area looks to provided suitable breeding and foraging habitat to support this species within the low lying and riparian areas.	**Known** This species was recorded via remote cameras during the Survey period.	NatureMap, PMST, DBCA & GHD
Reptiles							
Acanthophis antarcticus	Southern Death Adder	P3		The Southern Death Adder habitat ranges from rainforest to shrublands and heaths. This species is declining in many areas, probably due to habitat destruction and altered fire regimes (Wilson & Swan 2021).	**Likely.** Habitat is present for this species	**Likely.** Known to occur locally albeit patchily within northern Jarrah forests. Habitat is present for this species, even though was not recorded during the surveys.	GHD
Ctenotus delli	Dell's Skink	P4		Dell's Skink is associated with Jarrah-Marri woodland that has a shrub-dominated understorey, on laterite, sandy or clay soils. It is found in the north Darling Range and inhabits dry sclerophyll forest on granite outcrops, stony hills and ranges. It is absent from the Swan Coastal Plain (Cogger 2014; Wilson & Swan 2021).	**Likely** The Survey Area contains suitable habitat such as granite and lateritic clay to support this species and historical records surround the	**Known** This species was recorded at two different Quadrats via pit traps and funnel traps.	NatureMap, DBCA & GHD

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence pre field assessment	Likelihood of occurrence post field assessment	Source
		BC Act	EPBC Act				
Birds							
					Holyoake east location.		
Fish							
G*eotria australis*	Pouched Lamprey	P3		This species utilises freshwater streams in the south west (Perth to Albany) to breed and grow before migrating to the ocean to mature (Allen *et al*. 2002). Dams and weirs are the main obstacles for the species. Sporadic records exist throughout the South West Coast Drainage Division between Perth and Albany including the Swan, Canning, Serpentine, Margaret, Donnelly, Warren and Goodga rivers.	**Highly Unlikely** The Survey Area lacks suitable water ways and presumed locally extinct upstream of South Dandalup Dam.	**Highly Unlikely** The Survey Area lacks suitable water ways and presumed locally extinct upstream of South Dandalup Dam.	NatureMap & DBCA
Invertebrates							
Westralunio carteri	Carter's Freshwater Mussel	Vu	Vu	Carter's Freshwater Mussel is usually found in freshwater river pools. They are most common in areas with muddy, silty and sandy bottoms and flowing permanent water. Environmental tolerances of *W. carteri* are not precisely known but they can be found where water temperatures range from 4° C to over 30° C. Formerly this species occurred widely through the southwest including interior rivers of southwest such as Avon, Murray and Blackwood, however Salination of many waterways has severely reduced this species distribution (Klunzinger 2012; Klunzinger, et al. 2012).	**Likely** The Survey Area has some suitable habitat.	**Known** Remnants shells were found at Lake Banksiadale.	PMST
Glacidorbis occidentalis	Jarrah Forest Freshwater snail	P3		The Jarrah Forest Freshwater snail inhabits freshwater streams in the Darling Range, Western Australia. The minute shell reaches a maximum diameter of 1.2mm varying from a cream colour to light grey. The streams they inhibit are found within the Jarrah forest.	**Unlikely.** The survey Area doesn't contain suitable habitat.	**Unlikely.** The survey Area doesn't contain suitable habitat.	NatureMap

Combined species list

Family	Scientific Name	Species	EPBC listing	DBCA listing	Recc.	Camera Rotation	Phase 1	Phase 2	Phase 3	Single Target
Mammals										
Dasyuridae	*Antechinus flavipes*	Mardo					X	X	X	X
Dasyuridae	*Dasyurus geoffroii*	Chuditch	Vu	Vu	X		X			X
Leporidae	*Oryctolagus cuniculus*	European Rabbit	Int	Int				X		
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo			X		X	X	X	X
Macropodidae	*Notamacropus irma*	Western Brush Wallaby		P4	X	X	X	X	X	X
Macropodidae	*Setonix brachyurus*	Quokka	Vu	Vu	X	X			X	
Molossidae	*Ozimops kitcheneri*	South-western Free-tailed Bat				X	X			
Muridae	*Hydromys chrysogaster*	Rakali		P4				X		
Muridae	*Mus musculus*	House Mouse	Int	Int				X		
Muridae	*Rattus fuscipes*	Bush Rat			X		X			
Muridae	*Rattus rattus*	Black Rat	Int	Int	X		X	X		
Peramelidae	*Isoodon fusciventer*	Quenda		P4		X				
Suidae	*Sus scrofa*	Feral Pig	Int	Int	X		X	X		X
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna			X		X			X
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat				X	X			
Vespertilionidae	*Chalinolobus morio*	Chocolate Wattled Bat				X	X			
Vespertilionidae	*Falsistrellus mackenziei*	Western false pipistrelle		P4			X			
Vespertilionidae	*Nyctophilus species*	Australian long-ear bats				X	X			
Vespertilionidae	*Vespadelus regulus*	Southern Forest Bat				X	X			
Birds										
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill			X		X		X	
Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill			X					
Acanthizidae	*Acanthiza inornata*	Western Thornbill						X		
Acanthizidae	*Gergoyne fusca*	Western Gerygone			X		X	X	X	
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren			X		X	X	X	

Family	Scientific Name	Species	EPBC listing	DBCA listing	Recc.	Camera Rotation	Phase 1	Phase 2	Phase 3	Single Target
Acanthizidae	*Smicrornis brevirostris*	Weebill			X		X	X	X	
Accipitridae	*Accipiter fasciatus*	Brown Goshawk						X		
Accipitridae	*Aquila audax*	Wedge-tailed Eagle			X		X	X		
Accipitridae	*Haliastur sphenurus*	Whistling Kite							X	
Accipitridae	*Lophoictinia isura*	Square-tailed Kite						X	X	
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar					X			
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra		Int	X	X	X		X	
Anatidae	*Anas gracilis*	Grey Teal						X		
Anatidae	*Anas superciliosa*	Pacific Black Duck			X					
Anatidae	*Biziura lobata*	Musk Duck					X	X		
Anatidae	*Chenonetta jubata*	Australian Wood Duck						X		
Artamidae	*Artamus cinereus*	Black-faced Woodswallow							X	
Artamidae	*Artamus cyanopterus*	Dusky Woodswallow							X	
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird			X		X			
Artamidae	*Cracticus tibicen*	Australian Magpie			X					
Artamidae	*Strepera versicolor*	Grey Currawong			X			X	X	X
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	Vu	Vu	X	X	X	X	X	
Cacatuidae	*Eolophus roseicapillus*	Galah			X					
Cacatuidae	*Zanda baudinii*	Baudin's Cockatoo	En	En	X	X		X	X	
Cacatuidae	*Zanda latirostris*	Carnaby's Black Cockatoo	EN	EN						X
Campephagidae	*Chalcites lucidus*	Shining Bronze Cuckoo			X		X			
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike			X			X	X	
Campephagidae	*Lalage tricolor*	White-winged Triller							X	
Casuariidae	*Dromaius novaehollandiae*	Emu			X		X	X		
Climacteridae	*Climacteris rufus*	Rufous Tree Creeper						X		
Columbidae	*Phaps chalcoptera*	Common Bronzewing			X				X	
Columbidae	*Phaps elegans*	Brush Bronzewing			X			X	X	

Family	Scientific Name	Species	EPBC listing	DBCA listing	Recc.	Camera Rotation	Phase 1	Phase 2	Phase 3	Single Target
Corvidae	*Corvus coronoides*	Australian Raven			X		X	X	X	X
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo			X	X			X	
Cuculidae	*Cacomantis pallidus*	Pallid Cuckoo			X	X			X	
Cuculidae	*Chrysococcyx basalis*	Horsfield's Bronze Cuckoo							X	
Falconidae	*Falco berigora*	Brown Falcon						X		
Hirundinidae	*Petrochelidon nigricans*	Tree Martin					X		X	
Maluridae	*Malurus elegans*	Red-winged Fairywren			X		X	X		
Maluridae	*Malurus splendens*	Splendid Fairywren			X		X	X	X	X
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill					X		X	
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird			X				X	
Meliphagidae	*Anthochaera lunulata*	Western Wattlebird							X	
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater			X		X		X	
Meliphagidae	*Melithreptus brevirostris*	Brown-headed Honeyeater							X	
Meliphagidae	*Melithreptus lunatus*	White-napped Honeyeater			X			X		
Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater			X		X		X	
Meropidae	*Merops ornatus*	Rainbow Bee-eater							X	
Monarchidae	*Myiagra inquieta*	Restless Flycatcher							X	
Neosittidae	*Daphoenositta chrysoptera*	Varied Sitella							X	
Pachycephalidae	*Colluricincla harmonica*	Grey Strike Thrush			X		X	X	X	
Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler			X			X	X	
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler			X		X			
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote			X		X		X	
Pardalotidae	*Pardalotus striatus*	Striated Pardalote			X		X		X	
Petroicidae	*Eopsaltria georgiana*	White-breasted Robin			X					
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin			X		X		X	X
Petroicidae	*Melanodryas cucullata*	Hooded Robin						X		

Family	Scientific Name	Species	EPBC listing	DBCA listing	Recc.	Camera Rotation	Phase 1	Phase 2	Phase 3	Single Target
Petroicidae	*Petroica boodang*	Scarlet Robin			X		X		X	
Phalacrocoracidae	*Phalacrocorax sulcirostris*	Little Black Cormorant						X		
Psittaculidae	*Barnardius zonarius*	Australian Ringneck Parrot			X		X	X	X	
Psittaculidae	*Neophema elegans*	Elegant Parrot			X		X			
Psittaculidae	*Platycercus icterotis*	Western Rosella			X		X	X	X	
Psittaculidae	*Purpureicephalus spurius*	Red-capped Parrot			X				X	
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail			X		X		X	
Strigidae	*Ninox boobook*	Southern Boobook			X		X			
Turnicidae	*Turnix varius*	Painted Button Quail								X
Tytonidae	*Tyto novaehollandiae novaehollandiae*	Masked Owl		P3			X			
Zosteropidae	*Zosterops lateralis*	Silvereye			X		X			
Reptiles										
Agamidae	*Ctenophorus ornatus*	Ornate Crevice-dragon					X			
Agamidae	*Pogona minor*	Western Bearded Dragon			X					
Carphodactylidae	*Underwoodisaurus milii*	Barking Gecko			X		X			
Elapidae	*Suta gouldii*	Gould's Hooded Snake					X		X	
Elapidae	*Suta nigriceps*	Mallee Black-backed Snake					X			
Gekkonidae	*Christinus marmoratus*	Marbled Gecko						X		
Gekkonidae	*Diplodactylus lateroides*	Speckled stone gecko			X		X	X	X	
Pygopodidae	*Aprasia pulchella*	Pretty Worm-lizard					X			
Pygopodidae	*Delma fraseri*	Fraser's Delma						X		
Pygopodidae	*Lialis burtonis*	Burton's legless lizard							X	
Pygopodidae	*Pygopus lepidopodus*	Common Scaly-foot						X		
Scincidae	*Acritoscincus trilineatus*	South-western cool-skink						X		
Scincidae	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink						X		
Scincidae	*Ctenotus delli*	Dell's Skink		P4				X	X	

Family	Scientific Name	Species	EPBC listing	DBCA listing	Recc.	Camera Rotation	Phase 1	Phase 2	Phase 3	Single Target
Scincidae	*Ctenotus impar*	South-western Odd-striped Ctenotus						X		
Scincidae	*Ctenotus labillardieri*	Common south-west Ctenotus			X		X	X	X	
Scincidae	*Egernia kingii*	King Skink						X		
Scincidae	*Egernia napoleonis*	Napoleon Skink						X		X
Scincidae	*Hemiergis initialis*	South-western earless skink					X	X	X	
Scincidae	*Hemiergis quadrilineata*	Two-toed Earless Skink						X		
Scincidae	*Lerista distinguenda*	South-western Orange-tailed Slider							X	
Scincidae	*Menetia greyii*	Common Dwarf Skink						X	X	
Scincidae	*Morethia obscura*	Shrubland Skink					X	X	X	X
Scincidae	*Tiliqua rugosa rugosa*	Shingleback					X	X		
Typhlopidae	*Anilios australis*	Southern Blind Snake							X	
Varanidae	*Varanus gouldii*	Gould's Monitor								X
Varanidae	*Varanus rosenbergi*	Rosenberg's Monitor						X	X	X
Amphibians										
Hylidae	*Litoria adelaidensis*	Slender Tree Frog			X			X	X	
Limnodynastidae	*Heleioporus eyrei*	Moaning Frog						X	X	
Limnodynastidae	*Heleioporus psammophilus*	Sand Frog						X	X	
Myobatrachidae	*Crinia georgiana*	Quacking Frog					X	X		
Myobatrachidae	*Crinia glauerti*	Rattling Froglet					X			
Myobatrachidae	*Crinia pseudinsignifera*	Bleating Froglet			X		X	X	X	
Myobatrachidae	*Pseudophryne guentheri*	Gunther's toadlet/Crawling toadlet						X	X	
Other										
Hyriidae	*Westralunio carteri*	Carter's freshwater mussel	Vu		X					

Phase 2 Trapping data

Family	Taxa	Common Name	Q1	Q2	Q3	Q4	Q5	Q6	Total
Mammals									
Muridae	*Mus musculus*	House Mouse				1			1
Birds									
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren			1				1
Acanthizidae	*Smicrornis brevirostris*	Weebill						1	1
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo						2	2
Falconidae	*Falco berigora*	Brown Falcon			1				1
Pachycephalidae	*Colluricincla harmonica*	Grey Strike Thrush						1	1
Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler						1	1
Psittaculidae	*Platycercus zonarius*	Australian Ringneck parrot						1	1
Reptiles									
Gekkonidae	*Diplodactylus lateroides*	Laterite stone gecko						2	2
Pygopodidae	*Delma fraseri*	Fraser's Delma	1						1
Pygopodidae	*Pygopus lepidopodus*	Common Scaly foot					2		2
Scincidae	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink						1	1
Scincidae	*Ctenotus dell*	Dell's Skink			2				2
Scincidae	*Ctenotus impar*	South-western striped Ctenotus				2			2
Scincidae	*Ctenotus labillardieri*	Common south-west Ctenotus						1	1
Scincidae	*Hemiergis initialis*	Southwestern earless skink	1	4	3			3	11
Scincidae	*Menetia greyii*	Common Dwarf skink	1			1	5		7
Scincidae	*Morethia obscura*	Shrubland Skink				2	6	6	14
Frogs									
Limnodynastidae	*Heleioporus eyrei*	Moaning Frog	1						1
Limnodynastidae	*Heleioporus inornatus*	Plain Frog			2				2
Limnodynastidae	*Heleioporus psammophilus*	Sand Frog			6	1	1		8
Myobatrachidae	*Crinia georgiana*	Quacking Frog	1						1
Myobatrachidae	*Pseudophryne guentheri*	Gunther's toadlet			7	1	2		10

Phase 3 Trapping data

Family	Taxa	Common Name	Q1	Q2	Q3	Q4	Q5	Q6	Total
Mammals									
Dasyuridae	*Antechinus flavipes*	Mardo			2	1		2	5
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo	2					2	4
Macropodidae	*Notamacropus Irma*	Western Bush Wallaby		1				1	2
Birds									
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill	1						1
Acanthizidae	*Gergoyne fusca*	Western Gerygone		2		1		3	6
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren	1		2	2		3	8
Acanthizidae	*Smicrornis brevirostris*	Weebill	2	7	4			4	17
Accipitridae	*Haliastur sphenurus*	Whistling Kite				1			1
Accipitridae	*Lophoictinia isura*	Square-tailed Kite			2				2
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra		1		1			2
Artamidae	*Artamus cinereus*	Black-faced Woodswallow				4			4
Artamidae	*Artamus cyanopterus*	Dusky Woodswallow					4		4
Artamidae	*Strepera versicolor*	Grey Currawong		2	3	1			6
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	2		2			2	6
Cacatuidae	*Zanda baudinii*	Baudin’s Cockatoo			1	2		2	5
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike				1			1
Campephagidae	*Lalage tricolor*	White-winged Triller	1						1
Casuariidae	*Dromaius novaehollandiae*	Emu					2		2
Columbidae	*Phaps chalcoptera*	Common Bronzewing					1		1
Columbidae	*Phaps elegans*	Brush Bronzewing				1			1
Corvidae	*Corvus coronoides*	Australian Raven				1	1		2
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo					1		1
Cuculidae	*Cacomantis pallidus*	Pallid Cuckoo	1						1
Cuculidae	*Chrysococcyx basalis*	Horsfield's Bronze Cuckoo	1			4		1	6
Cuculidae	*Chrysococcyx lucidus*	Shining Bronze-cuckoo		1					1
Hirundinidae	*Petrochelidon nigricans*	Tree Martin	16			5	1		22

Family	Taxa	Common Name	Q1	Q2	Q3	Q4	Q5	Q6	Total
Maluridae	*Malurus splendens*	Splendid Fairywren	2		4		1		7
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill		1	1	6	1		9
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	2	2	1				5
Meliphagidae	*Anthochaera lunulata*	Western Wattlebird		5					5
Meliphagidae	*Lichmera indistincta*	Brown Honeyeater	22	3			2		27
Meliphagidae	*Melithreptus brevirostris*	Brown-headed Honeyeater		1				1	2
Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater	1			4			5
Meropidae	*Merops ornatus*	Rainbow Bee-eater	1						1
Monarchidae	*Myiagra inquieta*	Restless Flycatcher	1						1
Neosittidae	*Daphoenositta chrysoptera*	Varied Sitella		8				4	12
Pachycephalidae	*Colluricincla harmonica*	Grey Strike Thrush		1		3			4
Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler	2	1	2	1	1	2	9
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote		4				4	8
Pardalotidae	*Pardalotus striatus*	Striated Pardalote	2	2	6	4	1	15	30
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin		2					2
Petroicidae	*Petroica boodang*	Scarlet Robin			1				1
Psittaculidae	*Platycercus icterotis*	Western Rosella					1		1
Psittaculidae	*Platycercus zonarius*	Australian Ringneck parrot	2						2
Psittaculidae	*Purpureicephalus spurius*	Red Capped Parrot	1			2			3
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail		1	1		1	1	4
Reptiles									
Elapidae	*Suta gouldii*	Gould's Hooded Snake	1						1
Gekkonidae	*Diplodactylus lateroides*	Laterite stone gecko				1		4	5
Pygopodidae	*Lialis burtonis*	Burton's legless lizard	2				1	1	4
Scincidae	*Ctenotus dell*	Dell's Skink					1		1
Scincidae	*Ctenotus impar*	South-western striped Ctenotus				17			17
Scincidae	*Ctenotus labillardieri*	Common south-west Ctenotus			1			1	2
Scincidae	*Hemiergis initialis*	Southwestern earless skink		1				2	3

Family	Taxa	Common Name	Q1	Q2	Q3	Q4	Q5	Q6	Total
Scincidae	*Lerista distinguenda*	South-western Orange-tailed Slider		7	1		3	3	14
Scincidae	*Menetia greyii*	Common Dwarf skink	3	2	2	1	4	4	16
Scincidae	*Morethia obscura*	Shrubland Skink	1		3	3	2	6	15
Typhlopidae	*Anilios australis*	Southern Blind Snake	2				1	1	4
Varanidae	*Varanus rosenbergi*	Rosenberg's Monitor	1						1
Frogs									
Limnodynastidae	*Heleioporus eyrei*	Moaning Frog				1			1
Limnodynastidae	*Heleioporus psammophilus*	Sand Frog			3	2			5
Myobatrachidae	*Crinia georgiana*	Quacking Frog	1	2					3
Myobatrachidae	*Crinia pseudinsignifera*	Bleating Froglet			1				1
Myobatrachidae	*Pseudophryne guentheri*	Gunther's toadlet			1	1			2
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog		1					1

Reconnaissance camera data

Species	Cam 1	Cam 7	Cam HP3	CAM 77	CAM 4	CAM Yalgoo	CAM P1	CAM HF12	Cam 8
Black Rat (Int)	6		12					21	7
Bush Rat								5	
Chuditch (VU)				4		1			
Echidna									
Mardo	18		19	6	4	13	1	9	4
Quokka (VU)	22								
Western Brush Wallaby (P4)		1							
Western Grey Kangaroo		1							
Red-winged Fairy Wren	3	1	13					6	
Tree Creeper						11			
White-breasted Robin								1	
White-browed Scrubwren								3	
Western Bearded Dragon	1								

Camera rotation camera data

Species	CAM NO NAME	CAM 12	CAM 14	CAM 20	CAM 21	CAM 31	CAM 55	CAM R59
Chuditch (VU)								3
Echidna	1	1			1			
Mardo		1	5		2	5	1	1
Western Brush Wallaby (P4)					2			
Grey Fantail						1		
Inland Thornbill							1	
Red-winged Fairy Wren	1					1		
White-breasted Robin								
White-browed Scrubwren							1	

Phase 1 Camera data

Species	CAM NO NAME	CAM 12	CAM 14	CAM 21	CAM 31	CAM 55	CAM R59	CAM 5	CAM 16	CAM 17F	CAM 19	CAM 28	CAM 53	CAM C42	CAM HP4	CAM P6	CAM P1	CAM 77	CAM P5	CAM P4	CAM P2	CAM 1	CAM HF12
Black Rat (Int)																						2	
Bush Rat																						6	
Chuditch (VU)							3				2	2	2	1									
Echidna	1	1		1								1					1	2					1
Mardo		1	5	2	5	1	1	1	6	4	2		6	1			8	31		20	2	11	
Western Brush Wallaby (P4)				2											1	1					1		
Western Grey Kangaroo										1		1			2			1					
Grey Currowong																							1
Grey Fantail					1																		
Inland Thornbill						1							1										
Owlet Nightjar								1															
Red-winged Fairy Wren	1				1								1		1								
Spotted Pardalote													1										
Weebill																				1			
Western Yellow Robin																				1			
White-browed Scrubwren						1							1										

Phase 2 Camera data

Species	CAM14	CAM21	CAM31	CAM55	CAM Forgot	CAM HF12	CAM HP4	CAM P2	CAM P6	CAM No Name	Cam 12	Cam 57
Black Rat (Int)											6	
Echidna	1					1	1				1	
Mardo		2		6	2	6	7	2	9	1	9	
Rakali (P4)												1
Western Brush Wallaby (P4)			1				1	1		1		
Western Grey Kangaroo		2								1		
Australian Raven												4
Grey Currawong									1			
Grey Teal												1
Red-winged Fairy Wren											2	2
Splendid Fairywren												8
White-browed Scrubwren										1		10
King Skink											1	2
Napoleon Skink				1								
Rosenberg's Monitor												4
Shingleback				1							1	

Single Target camera data

Common Name	Cam W5	Cam HF10	Cam P5	Cam Yalgoo	Cam W2	Cam W8	Cam 53	CAM P4	Cam W12
Mardo		1	2	2			2	16	3
Chuditch (Vu)					1				
Western Grey Kangaroo		3	1		5	2			2
Western Brush Wallaby (P4)	7		12	6		17			14
Feral Pig (int)								1	2
Short-beaked Echidna		3	2	6		1			
Australian Raven	1								
Western Yellow Robin					1			1	
Splendid Fairy Wren				1	1				
Grey Currawong		2		1		1			1
Southwest Crevice Skink			1	4				5	
Shrubland Skink						2			2
Painted Button Quail			1	3		2			
Rosenberg's Monitor		1		3					
Gould's Monitor			4						

Chuditch camera capture (*Dasyurus geoffroii*) physical assessment data

Spot patterns of Chuditch were examined in detail and used to identify individuals from camera trap photographs. In order to use these patterns to identify individuals, accurate and proportionate sketches were made of the top of the head, back, left and right sides of individual Chuditch from the photographs taken by the remote cameras. Each sketch aimed to provide a useful summary that strongly aided subsequent recognition of individuals (Hohnen *et a*l 2015). The spot patterns were examined to determine whether the Chuditch in question was new or a previously viewed individual. Often two or more key spot patterns were visible in a photograph of a single side (e.g. one group on the shoulder and one on the haunch). When these key collections of spots could be matched and no area of the coat had con-complementary patterns, it was deemed to be the same individual. Therefore a clear view of a single side was sufficient to confirm the identify of the individual, if that individual had been previously identified. Only good quality images showing two or more clear spot patterns were used for identification and photographs with obscured or blurred patterns were not used (Hohnen *et al* 2015).

Chuditch ID	Camera ID	Easting	Northing	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 1	CAM 77			Phase Reccy deployment: 02/07/2023 Phase Reccy Deployment: 06/07/2023 Phase Reccy Deployment: 10/07/2023 Phase Reccy Deployment: 16/07/2023	Distinct row of three spots directly behind left ear. Distinct row of three spots in semi-circle pattern directly behind right ear.	 	Chuditch Left Side:  Chuditch Right Side: 

Chuditch ID	Camera ID	Easting	Northing	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 2	CAM Yalgoo CAM R59 CAM53			Phase Reccy deployment:03/07/2023 Phase North East Powerlines: 19/08/2023 Phase North East Powerlines: 20/08/2023 Phase Powerlines: 25/08/2023	Visible notch on left ear, mating scar across neck. Circle of five spots along middle of right hand side flank. Square formation of four spots along front left shoulder.		Chuditch Left Side:  Chuditch Right Side: 

Chuditch ID	Camera ID	Easting	Northing	Date	ID marks	Spot pattern diagram	Remote camera Image
Chuditch 3	Cam 19			Phase Powerlines: 24/08/2023 Phase Powerlines: 25/08/2023	Two distinct, large spots directly underneath right ear. Star-shaped pattern of six spots along back left flank.		Chuditch Left Side:  Chuditch Right Side: 
Chuditch 4	CAM 28 CAM C42			Phase Powerlines: 17/08/2023 Phase Powerlines: 18/08/2023 Phase Powerlines:	Circular pattern of eight spots in middle of left hand flank. Straight horizontal band of four spots along right hand flank.		Chuditch Left Side: 

Chuditch ID	Camera ID	Easting	Northing	Date	ID marks	Spot pattern diagram	Remote camera Image
				17/08/2023			Chuditch Right Side: 

Reference

Hohnen, R, Ashby, J, Tuft, K, & McGregor, H 2012, *'Individual identification of northern quolls (Dasyurus hallacatus) using remote cameras'*, Australian Mammalogy, CSIRO Publishing. http://dx.doi.org/10.1071/AM12015.

Black Cockatoo foraging assessment

	Starting score	Carnaby's Cockatoo	Baudin's Cockatoo	Forest Red-tailed Black Cockatoo
Foraging tool template	10	Start at a score of 10 if your site is native shrubland, Kwongan heathland or woodland, dominated by proteaceous plant species such as Banksia spp. (including Dryandra spp.), Hakea spp. and Grevillea spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation. This tool only applies to sites equal to or larger than 1 hectare in size.	Start at a score of 10 if your site is Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas. This tool only applies to sites equal to or larger than 1 hectare in size.
	Attribute/score subtraction	Context adjustor (attributes reducing functionality of foraging habitat)		
	Foraging potential (-2)	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.	Subtract 2 from your score if there is no evidence of feeding debris on your site.
	Connectivity (-2)	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.
	Proximity to breeding (-2)	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.
	Proximity to roosting (-1)	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.
	Impact from significant plant disease (-1)	Subtract 1 if your site has disease present (e.g., Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g., Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	Subtract 1 if your site has disease present (e.g., Phytophthora spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.
	Attribute/score subtraction	**Carnaby's Cockatoo**	**Baudin's Cockatoo**	**Forest Red-tailed Black Cockatoo**

Jarrah-Marri forest	Starting score	10	10	10
	Foraging potential (-2)	0	0	0
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0
	Total score	10	10	10
	Appraisal and adjusted score	The Jarrah-marri forest contains suitable foraging habitat. The habitat has good connectivity with foraging habitat within 12kms of the Survey Area. Previously recorded breeding trees are recorded within the Survey Area. Roosting sites were recorded with 20kms from Survey Area. Some signs of Phytophthora or Marri canker was observed and frequent fires and logging have the potential to affect habitat usage (-1). **Score: 9**	The Jarrah-marri forest contains suitable foraging habitat with many signs of foraging evidence scattered throughout the Survey Area. The habitat has good connectivity with foraging habitat within 12kms of the Survey Area. Previously recorded breeding trees are recorded within the Survey Area. Roosting sites were recorded with 20kms from Survey Area. Some signs of Phytophthora or Marri canker was observed and frequent fires and logging have the potential to affect habitat usage (-1). **Score 9**	The Jarrah-marri forest contains suitable foraging habitat with many signs of foraging evidence scattered throughout the Survey Area. The habitat has good connectivity with foraging habitat within 12kms of the Survey Area. Previously recorded breeding trees are recorded within the Survey Area. Roosting sites were recorded with 20kms from Survey Area. Some signs of Phytophthora or Marri canker was observed and frequent fires and logging have the potential to affect Forest Red-tail Black Cockatoo (-1). **Score 9**
Wandoo Woodland	Starting score	10	10	10
	Foraging potential (-2)	-2	-2	-2
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0
	Total score	8	8	8

	Appraisal and adjusted score	Foraging evidence was not observed within the Wandoo woodlands, Wandoo doesn't provide much foraging potential for Black Cockatoos. Breeding hollows within 12kms and roosting trees within 20kms. No signs of disease within the woodland. Good connectivity with the greater forested area. Frequent fires and logging can also affect the habitat usage (-1). **Score 7**	Foraging evidence was not observed within the Wandoo woodlands, Wandoo doesn't provide much foraging potential for Black Cockatoos. Breeding hollows within 12kms and roosting trees within 20kms. No signs of disease within the woodland. Good connectivity with the greater forested area. Frequent fires and logging can also affect the habitat usage (-1). **Score 7**	Foraging evidence was not observed within the Wandoo woodlands, Wandoo doesn't provide much foraging potential for Black Cockatoos. Breeding hollows within 12kms and roosting trees within 20kms. No signs of disease within the woodland. Good connectivity with the greater forested area. Frequent fires and logging can also affect the habitat usage (-1). **Score 7**
Blackbutt	Starting score	10	10	10
	Foraging potential (-2)	-2	-2	-2
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0
	Total score	8	8	8
	Appraisal and adjusted score	No foraging evidenced recorded within Blackbutt Forest or a favoured foraging item for Black Cockatoos. However, Blackbutt has the potential to provide suitable hollows. Great connectivity to the larger forested area, within 12km of known breeding trees and within 20kms of roosting sites. No signs of diseases affecting vegetation. **Score 5**	No foraging evidenced recorded within Blackbutt Forest or a favoured foraging item for Black Cockatoos. However, Blackbutt has the potential to provide suitable hollows. Great connectivity to the larger forested area, within 12km of known breeding trees and within 20kms of roosting sites. No signs of diseases affecting vegetation. **Score 5**	No foraging evidenced recorded within Blackbutt Forest or a favoured foraging item for Black Cockatoos. However, Blackbutt has the potential to provide suitable hollows. Great connectivity to the larger forested area, within 12km of known breeding trees and within 20kms of roosting sites. No signs of diseases affecting vegetation. **Score 5**
Bullich Forest	Starting score	10	10	10
	Foraging potential (-2)	-2	-2	-2
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0
	Total score	8	8	8

	Appraisal and adjusted score	No foraging evidenced recorded within Bullich Forest or a favoured foraging item for Black Cockatoos. However, Bullich has the potential to provide suitable hollows. Great connectivity to the larger forested area, within 12km of known breeding trees and within 20kms of roosting sites. No signs of diseases affecting vegetation. **Score 6**	No foraging evidenced recorded within Bullich Forest or a favoured foraging item for Black Cockatoos. However, Bullich has the potential to provide suitable hollows. Great connectivity to the larger forested area, within 12km of known breeding trees and within 20kms of roosting sites. No signs of diseases affecting vegetation. **Score 6**	No foraging evidenced recorded within Bullich Forest or a favoured foraging item for Black Cockatoos. However, Bullich has the potential to provide suitable hollows. Great connectivity to the larger forested area, within 12km of known breeding trees and within 20kms of roosting sites. No signs of diseases affecting vegetation. **Score 6**
Granite Outcrop	Starting score	10	0	0
	Foraging potential (-2)	-2	-2	-2
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0
	Total score	8	-2	-2
	Appraisal and adjusted score	No foraging evidence recorded within granite outcrop habitat however proteaceous species are present. Great connection to larger forested area. Within 12km to confirmed breeding trees and within 20kms from roosting trees. No diseases affecting vegetation present in area. Rain could cause seasonal pools providing drinking sources for Black Cockatoos. Frequent fires and logging can also affect the habitat usage (-1). **Score 7**	No foraging evidence recorded within granite outcrop habitat. Great connection to larger forested area. Within 12km to confirmed breeding trees and within 20kms from roosting trees. No diseases affecting vegetation present in area. Rain could cause seasonal pools providing drinking sources for Black Cockatoos. Frequent fires and logging can also affect the habitat usage (-1). **Score 7**	No foraging evidence recorded within granite outcrop habitat. Great connection to larger forested area. Within 12km to confirmed breeding trees and within 20kms from roosting trees. No diseases affecting vegetation present in area. Rain could cause seasonal pools providing drinking sources for Black Cockatoos. Frequent fires and logging can also affect the habitat usage (-1). **Score 5**
Damplands	Starting score	10	10	10
	Foraging potential (-2)	-2	-2	-2
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0

	Total score	-2	-2	-2
	Appraisal and adjusted score	Foraging evidence was not observed within the melaleuca woodlands. Potential Breeding hollows within 12kms and roosting trees within 20kms. No signs of disease within the woodland. Good connectivity with the greater forested area. Frequent fires and logging can also affect the habitat usage (-1). **Score: 7**	Foraging evidence was not observed within the melaleuca woodlands. Potential Breeding hollows within 12kms and roosting trees within 20kms. No signs of disease within the woodland. Good connectivity with the greater forested area. Frequent fires and logging can also affect the habitat usage (-1). **Score: 7**	Foraging evidence was not observed within the melaleuca woodlands. Potential Breeding hollows within 12kms and roosting trees within 20kms. No signs of disease within the woodland. Good connectivity with the greater forested area. Frequent fires and logging can also affect the habitat usage (-1). **Score: 7**
Rehab Areas	Starting score	0	0	0
	Foraging potential (-2)	-2	-2	-2
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0
	Total score	-2	-2	-2
	Appraisal and adjusted score	No foraging evidence was recorded within rehab areas. More established rehab areas can provide foraging potential or foraging potential from established Jarrah or Marri trees. Rehab areas have good connectivity to the great forest area and are located with 20kms from roosting sites and 12kms from Known breeding trees. However, Seasonal bodies of water providing drinking sources for Black Cockatoos. **Score: 4**	No foraging evidence was recorded within rehab areas. More established rehab areas can provide foraging potential or foraging potential from established Jarrah or Marri trees. Rehab areas have good connectivity to the great forest area and are located with 20kms from roosting sites and 12kms from Known breeding trees. However, Seasonal bodies of water providing drinking sources for Black Cockatoos. **Score: 4**	No foraging evidence was recorded within rehab areas. More established rehab areas can provide foraging potential or foraging potential from established Jarrah or Marri trees. Rehab areas have good connectivity to the great forest area and are located with 20kms from roosting sites and 12kms from Known breeding trees. However, Seasonal bodies of water providing drinking sources for Black Cockatoos. **Score: 4**
Cleared Land	Starting score	0	0	0
	Foraging potential (-2)	-2	0	0
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0

	Total score	-2	0	0
	Appraisal and adjusted score	Potential for foraging on Parrot Bush and Marri trees fringing roads and powerlines. Good connectivity to greater forested area. Previously confirmed breeding trees within 12kms of area and roosting sites with 20kms of cleared areas. **Score:2**	Baudin's Cockatoo were observed foraging on Parrot Bush fringing roads and powerlines and Marri nuts were often found on tracks. Good connectivity to greater forested area. Previously confirmed breeding trees within 12kms of area and roosting sites with 20kms of cleared areas. **Score: 2**	Foraging evidence of Jarrah and Marri nuts were often observed on roads and tracks. However, Previously confirmed breeding trees within 12kms of area and within 20kms of roosting sites. **Score: 2**
Water Body	Starting score	10	10	10
	Foraging potential (-2)	-2	-2	-2
	Connectivity (-2)	0	0	0
	Proximity to breeding (-2)	0	0	0
	Proximity to roosting (-1)	0	0	0
	Impact from significant plant disease (-1)	0	0	0
	Total score	-2	-2	-2
	Appraisal and adjusted score	No foraging evidence recorded on the banks of water bodies, potential foraging habitat in woodlands surrounding water body. Great connectivity with greater forested area. Within 12kms from known breeding trees. Within 20kms from known roosting trees. No signs of disease affecting vegetation. Water body provides a consistent drinking source year-round for Black Cockatoos. **Score: 2**	No foraging evidence recorded on the banks of water bodies, potential foraging habitat in woodlands surrounding water body. Great connectivity with greater forested area. Within 12kms from known breeding trees. Within 20kms from known roosting trees. No signs of disease affecting vegetation. Water body provides a consistent drinking source year-round for Black Cockatoos. **Score: 2**	Foraging evidence recorded 20 meters away from water's edge. Great connectivity with greater forested area. Within 12kms from known breeding trees. Within 20kms from known roosting trees. No signs of disease affecting vegetation. Water body provides a consistent drinking source year-round for Black Cockatoos. **Score: 3**

Appendix E

External data assessments

Results from Bird acoustic analysis

Results from Bat acoustic analysis

Results of acoustic surveys conducted for Masked Owl (*Tyto novaehollandiae)*

Alcoa Project – Contingency Area A

Jun – Sep 2023

Report to:

GHD

Prepared by:

Nick Leseberg

Adaptive NRM

10th February 2024

1. Summary

During the period June – September 2023, autonomous recording units (ARUs) were deployed at nine sites within the Alcoa Contingency Area A project area in southwest Western Australia to survey for Masked Owls (*Tyto novaehollandiae*). Resulting acoustic data was analysed using signal parameters optimised for detecting Masked Owl screech calls. Masked Owl calls were detected at three sites.

2. Survey effort

Research has demonstrated Masked Owls occupy long-term home ranges for periods of up to several years (Kavanagh and Murray 1996). The owls have predictable year-round calling periods at dusk and dawn (N. Jackett unpubl. data), with calling detected at these times usually indicating proximity to a roost site (Todd et al. 2018; Young et al. 2021). Therefore, ARUs have the potential to localise roost sites through strategic deployment. It is likely that multiple recordings nights, during calm weather with minimal background noise, are required for greatest confidence pertaining to Masked Owl presence, but further research is warranted.

Masked Owls are also known to call during the night when away from their roost or breeding sites and can similarly be detected using ARUs (N. Jackett unpubl. data). However, it is likely that the probability of detecting a Masked Owl away from its roost site diminishes with distance, and therefore additional nights may be required to detect a Masked Owl in foraging only areas.

The likelihood of detection may also be influenced by the type of ARU being used. In calm conditions, Song Meter 4s may be capable of reliably detecting Masked Owl screech calls at distances greater than 200m (N. Jackett unpubl. data).

GHD conducted sampling for the Masked Owl between June and September 2023. Four Song Meter 4 (Wildlife Acoustics, MA, USA) autonomous recording units were deployed across nine sites. At eight sites the ARUs recorded 3-5 nights of data, while at one site only one night of data was recorded. The units were programmed to record approximately from sunset to sunrise. A combined total of 30 nights of data were recorded (Table 1).

Table 1. Bioacoustic recordings analysed from the Jun – Sep surveys.

Machine	Recording start date (PM)	Recording end date (AM)	Total recording nights
SM4-AC1	27-Jun-23	30-Jun-23	3
SM4-AC3	27-Jun-23	30-Jun-23	3
SM4-AC4	24-Jul-23	27-Jul-23	3
SM4-AC3	16-Aug-23	21-Aug-23	5
SM4-AC1	21-Aug-23	25-Aug-23	4
SM4-AC3	21-Aug-23	25-Aug-23	4
SM4-AC2	24-Aug-23	25-Aug-23	1
SM4-AC3	5-Sep-23	8-Sep-23	3
SM4-AC3	8-Sep-23	12-Sep-23	4
		Total	30

3. Data analysis

ANRM received the raw acoustic data in '.wav' format, as 60-minute files. These were scanned using the acoustic analysis software Kaleidoscope (Wildlife Acoustics, MA, USA), targeting the frequency range of 1600 – 2400 Hz, within which Masked Owl screech calls are distributed. Based on data from previous surveys in this region, this method will detect approximately 87% of screech calls within a dataset. Calls not detected are typically faint (i.e. likely distant from the acoustic recorder), or occurred during light rain, or wind gusts. Within the test dataset, the probability of non-detection of a true-positive screech call was 13.3%; two consecutive true-positive screech calls was 1.8%; etc. Of the data tested, the median number of consecutive (spaced at <10 minutes apart) calls in a screech sequence when Masked Owls were recorded was 5 (1–21, n = 18). Based on previous analyses of datasets containing Masked Owl vocalisations, the probability of at least one screech call being detected within a sequence of median length is >99.9%.

4. Survey results

A total of 3136 Kaleidoscope detections were manually assessed for Masked Owl screech calls. 15 Masked Owl screech calls were detected from four calling sequences across three sites (Table 2). Except for the call sequence detected on SM4-AC3, call sequences were outside the period when owls are departing or arriving at their roost sites (i.e. < 1 hour post-sunset or < 1 hour pre-sunrise). The calls detected on SM4-AC3 were approximately 50 minutes after sunset,

and while possibly a bird near its roost site, are more likely a bird in transit given no calls were detected in this period on other nights.

19 non-target species were detected during the analysis. A list of these species is provided at Appendix 1.

Table 2. Masked Owl calls detected during Jun – Aug surveys. Shading indicates call sequences.

Machine	Lat	Long	Date	Time
SM4-AC1	-32.6011	116.1895	28-Jun-23	19:46:55
SM4-AC1	-32.6011	116.1895	28-Jun-23	19:46:30
SM4-AC1	-32.6011	116.1895	28-Jun-23	19:46:38
SM4-AC1	-32.6011	116.1895	28-Jun-23	19:47:11
SM4-AC1	-32.6011	116.1895	28-Jun-23	19:47:27
SM4-AC1	-32.6011	116.1895	28-Jun-23	19:47:37
SM4-AC1	-32.6011	116.1895	29-Jun-23	01:41:46
SM4-AC3	-32.5082	116.2888	16-Aug-23	18:32:45
SM4-AC3	-32.5082	116.2888	16-Aug-23	18:33:08
SM4-AC3	-32.5082	116.2888	16-Aug-23	18:40:36
SM4-AC3	-32.5082	116.2888	16-Aug-23	18:41:44
SM4-AC3	-32.5082	116.2888	16-Aug-23	18:42:07
SM4-AC4	-32.6207	116.2245	24-Jul-24	18:45:14
SM4-AC4	-32.6207	116.2245	24-Jul-24	18:53:37
SM4-AC4	-32.6207	116.2245	24-Jul-24	18:55:55

5. Conclusion

Based on these results, it is considered unlikely Masked Owls roosted in proximity to the ARU sites during the survey. However, based on a home range size of ~1000 – 2000 ha, a roost and/or nest site may have been present within several kilometres of those sites where calls were detected. A denser acoustic sampling array within several kilometres of these sites may provide further indication of roost presence.

It is important to note that these results pertain specifically to that area immediately surrounding the survey points, and do not necessarily support conclusions about the presence or absence of Masked Owls in the wider landscape.

6. References

Kavanagh, R. P., & Murray, M. (1996). Home range, habitat and behaviour of the Masked Owl Tyto novaehollandiae near Newcastle, New South Wales. Emu - Austral Ornithology, 96(4), 250–257.

Todd, M. K., Kavanagh, R. P., Bell, P., & Munks, S. A. (2018). Calling behaviour of the Tasmanian Masked Owl Tyto novaehollandiae castanops. Australian Zoologist, 39(3), 449–463.

Young, D., Bell, P., & Mooney, N. (2021). Roosting behaviour of radio-tracked Tasmanian Masked Owls Tyto novaehollandiae castanops. Australian Field Ornithology, 38, 13–18.

Appendix 1 – Non-target species detected during analysis

Appendix 1. Non-target species detected during analysis. Note that this list is not exhaustive, and includes only species that were incidentally detected across all survey sites while manually checking detections made by the signal scanning algorithm. Taxonomy follows the Checklist of the Terrestrial Vertebrate Fauna of Western Australia (November 2022).

Australian Owlet-Nightjar	*Aegotheles cristatus*
Pallid Cuckoo	*Heteroscenes pallidus*
Fan-tailed Cuckoo	*Cacomantis flabelliformis*
Shining Bronze Cuckoo	*Chalcites lucidus*
Southern Boobook	*Ninox boobook*
Laughing Kookaburra	*Dacelo novaeguineae*
Twenty-eight Parrot	*Barnardius zonarius semitorquatus*
Forest Red-tailed Black-Cockatoo	*Calyptorhynchus banksii naso*
Brown Honeyeater	*Lichmera indistincta*
Striated Pardalote	*Pardalotus striatus*
Spotted Pardalote	*Pardalotus punctatus*
Grey Butcherbird	*Cracticus torquatus*
Pied Butcherbird	*Craccticus nigrogularis*
Grey Currawong	*Strepera versicolor*
Grey Shrikethrush	*Colluricincla harmonica*
Grey Fantail	*Rhipidura albiscapa Corvus*
Australian Raven	*coronoides Eopsaltria*
Western Yellow Robin	*griseogularis Petroica*
Scarlet Robin	*boodang*

Technical Memorandum

January 24, 2023

Bat call analysis for Project 12565572

Dr Erin Westerhuis, Senior Terrestrial Ecologist, GHD

1. Summary

Bat identifications from acoustic recordings are provided from the Holyoake East area in southwest Western Australia. Five detectors were deployed in June, August and September 2023. There was a total effort of 58 detector nights (the sum of all nights from all detectors). Recorded data was analysed using a combination of manual and automated identification with specific analysis to identify bat fauna recorded. Overall, 19084 bat calls were recorded. Of these, 33547 calls could be identified to a species or species group. A single file with calls matching the characteristics of the priority 4 species *Falsistrellus mackenziei* was observed on the 20th August 2023 at 20:11 hrs. A large number of calls recorded were fragments or social calls and could not be positively identified to a species or group. Of the species recorded, *Nyctophilus* species and *Vespadelus regulus* was recorded on most detector nights. *Chalinolobus gouldii*, *Ozimops kitcheneri* and *Chalinolobus morio* were recorded less commonly. All species are bats which roost and breed in tree hollows. Activity was highest at dusk and dawn which suggests tree roosts may be in the study area.

2. Methods

2.1 Bat call analysis method

Data was processed and analysed using a combination of manual review and automated techniques using Kaleidoscope Pro (Wildlife Acoustic, version 5.4.6) and Anabat Insight (Titley Scientific, version 2.0.1). The following process was used:

1. Calls were initially processed in Kaleidoscope Pro using a 4 – 150 kHz frequency range, 1 – 5000 ms minimum and maximum length of detected pulses, a maximum inter-syllable gap of 500 ms and with a minimum of 3 pulses detected. Files were split to standard 1 second intervals and noise files were moved to a subfolder.
2. For each night, the first hour of data passing the Kaleidoscope pro filter was manually reviewed for bat calls using Anabat Insight by visually comparing the time-frequency graph (spectrogram) and call characteristics (e.g. peak frequency, characteristic frequency and call shape) with species call descriptions from published guidelines (Armstrong and Cole 2007; McKenzie and Bullen 2009; Guppy et al. 1985; Hanrahan et al. 2021; Hourigan 2011). Species were manually labelled according to species
3. Manually labelled species identifications were used to build a custom species-specific filter and a decision tree in Anabat Insight. This was achieved by extracting the call metadata for all identified calls,

then calculating the interquartile ranges of values per pulse. These values then informed the ranges used to build filters for automatic species identification using a decision tree.

4. To identify *Falsistrellus mackenziei* calls, a separate filter was built using parameters reported for the species in Strahans Mammals of Australia; that is a peak frequency between 32- 34 kHz and a call duration of 12 milliseconds. Every file identified as positive for *F. mackenziei* was manually vetted.
5. Call identification was assisted by consulting distribution information for potential species (Armstrong 2011 and McKenzie et al various dates; Churchill 2008; Van Dyck et al. 2013) and records from Australasian Bat Society BatMap (November 2022). No reference calls were collected during the survey.

3. Summary of results

During all nights of recording 54541 bat calls were recorded. Of these, 33547 could be identified to species or species group level. Unidentified calls consisted of irregular vocalisations rather than search phase echolocation. These are likely a form of social calls or fragments of calls that were not “search phase”.

3.1 Species recorded in study area

Desktop assessments of bat species distributions overlapping the study area indicated that 9 species had the potential to occur (BatMap ausbats.org.au accessed online 30th November 2023). Eight are least concern under state and federal legislation and the Western false pipistrelle is currently listed as Priority 4 under Western Australian legislation.

The species identified as having the potential to occur were:

- *Austronomus australis* – White-striped free-tailed bat
- *Chalinolobus gouldii* – Gould’s wattled bat
- *Chalinolobus morio* – Chocolate wattled bat
- *Falsistrellus mackenziei* – Western false pipistrelle
- *Nyctophilus geoffroyi* – Lesser long-eared bat
- *Nyctophilus holtorum* - Holt's long-eared bat
- *Nyctophilus major* – Western long-eared bat
- *Ozimops kitcheneri* – Southwestern free tailed bat
- *Vespadelus regulus* – Southern forest bat

3.2 Bat species identified and activity patterns

Overall, bat activity detected at the detector sites during the survey varied greatly with between 1 and 7432 bat passes recorded each night (Table 1). A single file with calls matching the characteristics of *F. mackenziei* was identified on the 20th August 2023 on detector S4U14898 at 20:11 hrs. Previously the range of the species was thought to have contracted south of Collie (Armstrong et al. 2021b) however it has more recently been reported North of Collie but only along the Hotham River and south of the Harvey River estuary (Bullen et al. 2023). The species is readily identified in flight by its large size and flight behaviour and spotlighting in suitable habitat may assist with a more defined identification.

Vespadelus regulus and *Nyctophilus* sp. was recorded at most sites and was the most frequently recorded. For *Nyctophilus* species, it is not possible to reliably differentiate between calls of the three species and so any bat calls matching the characteristics of *Nyctophilus* like calls (low amplitude and steep, near vertical pulses) were grouped. *Chalinolobus gouldii, C. morio* and *Ozimops kitcheneri* were recorded less commonly.

All species identified are tree roosting microbat species and bat activity was highest around dusk and dawn when bats are emerging and re-entering roosts, which suggests that suitable tree roosts may be within the survey area.

Table 1 Number of calls recorded per species per detector night. FAMA = Falsistrellus mackenziei, CHGO = Chalinolobus gouldii, CHMO = Chalinolobus morio, OZKI = Ozimops kitcheneri, NYCT= Nyctophilus species, VERE= Vespadelus regulus.

FOLDER	DATE	FAMA	CHGO	CHGO/ OZKI	CHMO	NYCT	OZKI	VERE	Grand Total
S4U04382	8/16/2023					12		6	18
S4U04382	8/17/2023				3	103		112	218
S4U04382	8/18/2023					185		265	450
S4U04382	8/19/2023				1	156		272	429
S4U04382	8/20/2023				1	281		435	717
S4U04382	8/21/2023					33		55	88
S4U04382	8/22/2023					34		52	86
S4U04382	8/23/2023					17		31	48
S4U04382	8/24/2023			4	4	96		439	543
S4U04382	8/25/2023		1	2	1	75		175	254
S4U04382	9/5/2023					1			1
S4U04382	9/6/2023					17		8	25
S4U04382	9/7/2023					18		2	20
S4U04382	9/8/2023				4	773		890	1667
S4U04382	9/9/2023		3	1	55	1964		5025	7048
S4U04382	9/10/2023		7		11	1607		3286	4911
S4U04382	9/11/2023		5	2	40	2131		5254	7432
S4U04382	9/12/2023		3		55	1559		4558	6175
S4U14895	8/17/2023				3	71		52	126
S4U14895	8/18/2023		3			130		98	231
S4U14895	8/19/2023		5	5	2	128		107	247
S4U14895	8/20/2023		89	13	4	179		155	440
S4U14895	8/21/2023		1			37		38	76
S4U14895	8/22/2023					10		34	44
S4U14895	8/23/2023					5		13	18
S4U14895	8/24/2023		5			12		11	28
S4U14895	8/25/2023				1	4		4	9
S4U14895	9/5/2023					2		6	8
S4U14895	9/6/2023				8	6		14	28
S4U14895	9/7/2023		1	1	8	17		59	86
S4U14895	9/8/2023				3	25		15	43
S4U14895	9/9/2023		1	1		5		12	19
S4U14895	9/10/2023					5		4	9
S4U14895	9/11/2023					4		7	11
S4U14895	9/12/2023		1			9		6	16
S4U14898	8/17/2023					1		17	18
S4U14898	8/18/2023				1	28		18	47
S4U14898	8/19/2023		1	1	1	30		42	75
S4U14898	8/20/2023	1	17		4	147		217	385
S4U14898	8/21/2023					5		23	28
S4U14898	8/22/2023					4		2	6
S4U14898	8/23/2023					19		8	27
S4U14898	8/24/2023					12	1	45	58
SM2-A	6/28/2023							7	7
SM4-6	6/27/2023				1	3		10	14
SM4-6	6/28/2023				14	115		180	309

SM4-6	6/29/2023					14		31	45
SM4-6	7/24/2023					2		14	16
SM4-6	7/25/2023					18		75	93
SM4-6	8/17/2023					23		4	27
SM4-6	8/18/2023		1		15	236		35	287
SM4-6	8/19/2023				8	17		5	30
SM4-6	8/20/2023				9	155		68	232
SM4-6	8/21/2023				8	11		54	73
SM4-6	8/22/2023					17		61	78
SM4-6	8/23/2023					7		24	31
SM4-6	8/24/2023					25		66	91
SM4-6	8/25/2023							1	1
Grand Total		**1**	**144**	**30**	**265**	**10600**	**1**	**22507**	**33547**

4. References

Armstrong K. N., Broken-Brow J., Hoye G., Ford G., Thomas M., Corben C. (2021a) Effective detection and identification of sheath-tailed bats of Australian forests and woodlands. Australian Journal of Zoology 68, 346-363.

Armstrong, K.N., Woinarski, J.C.Z. & Burbidge, A.A. (2021b). Falsistrellus mackenziei (amended version of 2017 assessment). The IUCN Red List of Threatened Species 2021: e.T17348A209540109. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T17348A209540109.en

Armstrong, K. N., and Coles, R. B. (2007). Echolocation call frequency differences between geographic isolates of Rhinonicteris aurantia (Chiroptera: Hipposideridae): implications of nasal chamber size. Journal of Mammalogy 88, 94-104.

Armstrong, K. N. (2011). The current status of bats in Western Australia. In: 'The biology and conservation of Australasian bats.' (Eds B. Law, P. Eby, D. Lunney and L. Lumsden.) pp. 257–269. (Royal Zoological Society of New South Wales: Mosman.)

Bullen, R. D. and McKenzie, N. L. (2011). Recent developments in studies of the community structure, foraging ecology and conservation of Western Australian bats. In 'The biology and conservation of Australasian bats.' (Eds B. Law, P. Eby, D. Lunney and L. Lumsden.) pp. 31-43. (Royal Zoological Society of New South Wales: Mosman.)

Bullen, R., Mackenzie, N. & Start, A., (2023) *Falsistrelllus mackenziei,* Western Falsistrelle, In Baker, Andrew & Gynther, Ian (Eds.) (2023) Strahan's Mammals of Australia.[4th ed.]. New Holland Publishers, Sydney, NSW.

Churchill, S (2008). Australian Bats, Allen and Unwin, Australia.

Denzinger, A. and Schnitzler, H.U., 2013. Bat guilds, a concept to classify the highly diverse foraging and echolocation behaviors of microchiropteran bats. *Frontiers in physiology*, *4*, p.164.

Duffy, AM, Lumsden, LF, Caddle, CR, Chick, RR & Newell, GR (2000). The efficacy of Anabat ultrasonic detectors and harp traps for surveying microchiropterans in southeastern Australia, Acta Chiropterologica 2: 127-144.

Guppy, A., Coles, R.B and Pettigrew, J.D (1985) Echolocation and acoustic communication in the Australian Ghost Bat, Macroderma gigas (Microchiroptera: Megadermatidae). Australian Mammology 8, 299-308.

Hanrahan Nicola, Turbill Christopher, Armstrong Kyle N., Dalziell Anastasia H., Welbergen Justin A. (2021) Ghost bats exhibit informative daily and seasonal temporal patterns in the production of social vocalisations. Australian Journal of Zoology 67, 305-315.

Hourigan, C. (2011). Ghost Bat, Macroderma gigas. Targeted species survey guidelines. Queensland Herbarium, Department of Science, Information Technology and Innovation, Brisbane.

McKenzie, N. L., and Bullen, R. D. (2009). The echolocation calls, habitat relationships, foraging niches and communities of Pilbara microbats. Records of the Western Australian Museum Supplement 78: 123–155.

McKenzie, N. L., and Bullen, R. D. (2012). An acoustic survey of zoophagic bats on islands in the Kimberley, Western Australia, including data on the echolocation ecology, organisation and habitat relationships of regional communities. Records of the Western Australian Museum Supplement 81: 67–108.

Mills, DJ, Norton, TW, Parnaby, HE, Cunningham, RB & Nix, HA (1996), Designing surveys for microchiropteran bats in complex forest landscapes – a pilot study from south-east Australia. Forest Ecology and management 85 (1-3):149-161.

Parnaby, H.E., King, A.G. and Eldridge, M.D.B. 2021. A new bat species from Western Australia, previously assigned to Gould's Long-eared Bat Nyctophilus gouldi Tomes, 1858. Records of the Australian Museum 73(1): 53-66.

Richardson, S.M. Lintott, S.R. Hosken, D.J. Economou, T. and Mathews, F. Peaks in bat activity at turbines and the implications for mitigating the impact of wind energy developments on bats. Scientific Reports, 2021; 11 (1) DOI: 10.1038/s41598-021-82014-9

Reardon, T. B., McKenzie, N. L., Cooper, S. J. B., Appleton., B., Carthew, S. and Adams, M (2014) A molecular and morphological investigation of species boundaries and phylogenetic relationships in Australian free-tailed bats Mormopterus (Chiroptera : Molossidae). Australian Journal of Zoology 62: 109-136.

Van Dyke. S, Gynther. I, and Baker. A. (2013). Field Companion To The Mammals of Australia. New Holland Publishers.

5. Example spectrograms for each species or species group identified

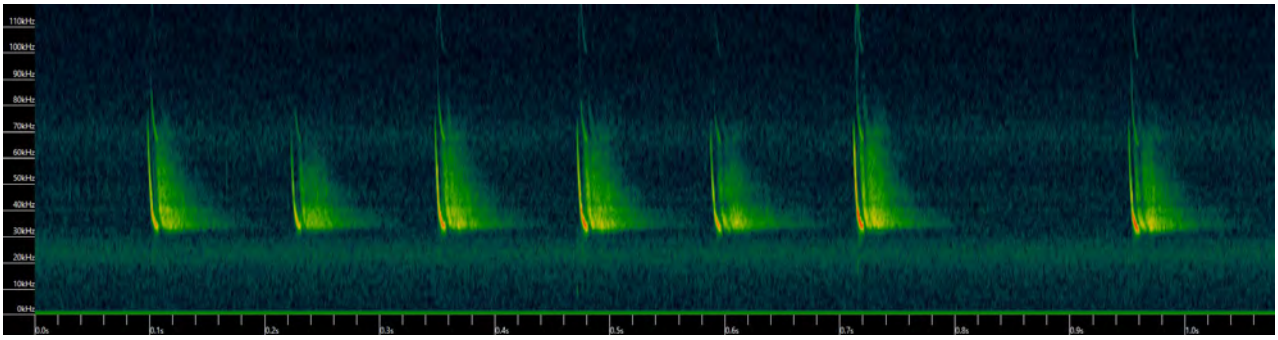


Figure 1 ***Falsistrellus mackenziei,* Western Falsistrelle**

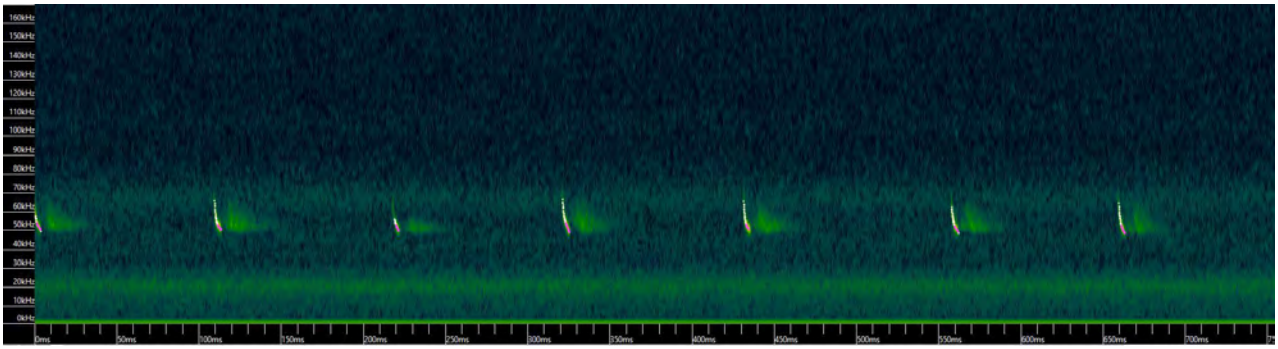


Figure 2 ***Chalinolobus morio* Chocolate wattled bat**

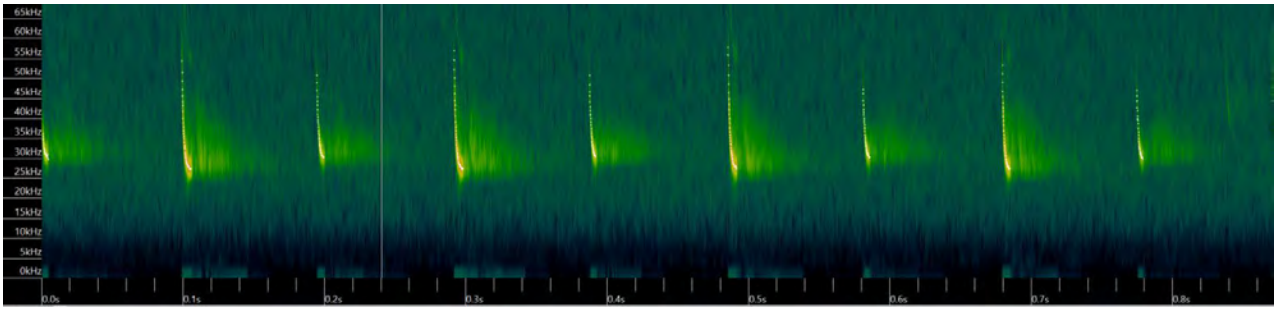


Figure 3 ***Chalinolobus gouldii* Gould's wattled bat**

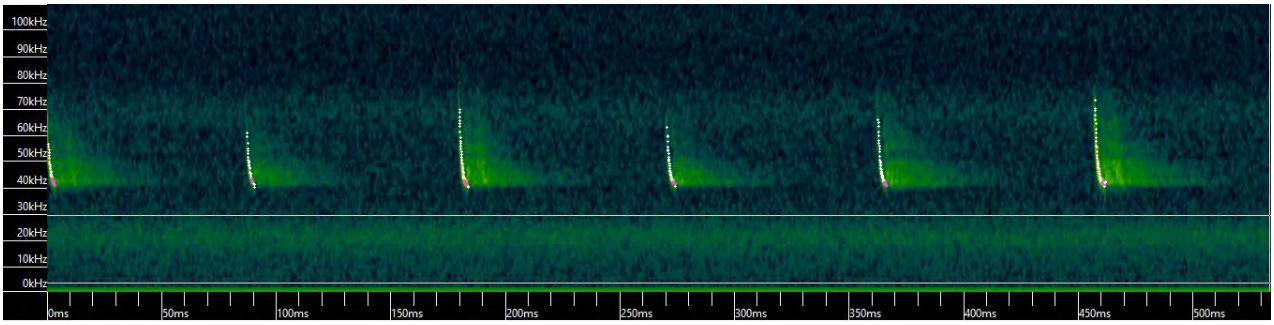


Figure 4 ***Vespadelus regulus*** **Southern forest bat**

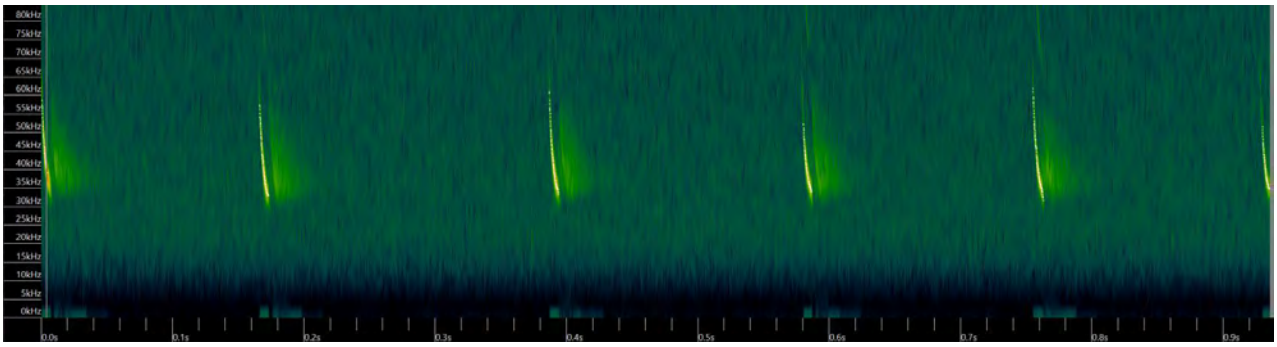


Figure 5 ***Nyctophilus sp.***

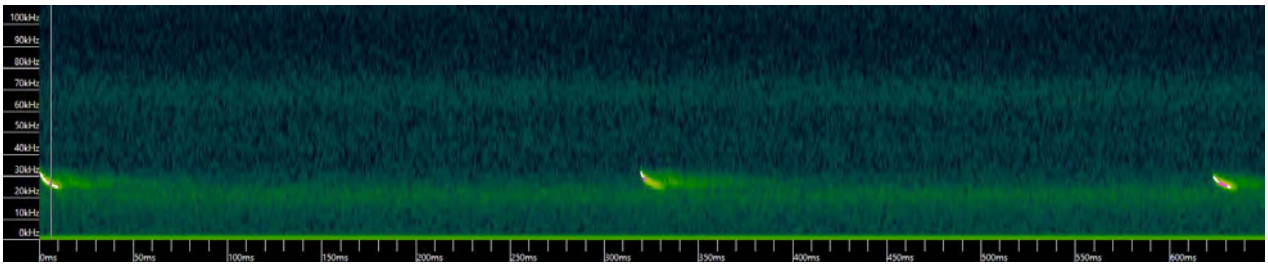


Figure 6 ***Ozimops kitcheneri*** **Southwestern freetailed bat**

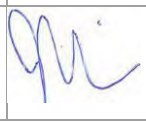
Terrestrial Fauna Desktop Assessment

Huntly and Willowdale MMP – EPA Fauna Assessment

Alcoa of Australia

6 March 2025



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GHD Pty Ltd | ABN 39 008 488 373
999 Hay Street, Level 10
Perth, Western Australia 6000, Australia
T +61 8 6222 8222 | **F** +61 8 6222 8555 | **E** permail@ghd.com | **ghd.com**

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→ The Power of Commitment

Executive summary

Alcoa of Australia Limited's (Alcoa) Western Australian (WA) mining operations comprise the Huntly and Willowdale bauxite mines, which are located in Alcoa's Mining Lease 1SA (ML1SA) within the Northern Jarrah Forest (NJF) IBRA subregion.

The purpose of this report is to establish a background desktop study of all terrestrial fauna attributes of the Huntly and Willowdale Study Areas via systematic searches and review of existing state and federal databases, previous survey literature assessments, reviews and existing survey recordings and identified fauna habitat types, with a specific focus on conservation significant species, including EPBC listed within the Study Areas.

Scope of works

This scope of work addresses the Huntly and Willowdale mine footprints.

The scope of work includes:

– Complete a desktop assessment
– Provide a fauna assessment conclusions of potential, likely or confirmed presence of conservation significant species and related habitat suitability based on historical surveys, database records, literature reviews and known confirmed species recordings either directly within the Study Areas or in close proximity to the Study Areas.
– Discussion of fauna habitats and alignment with vegetation mapping.

Methods

Methodology involved initial comprehensive desktop assessment to compile fauna database records and previous reports and understands the local fauna occurrence and fauna habitats in the Study Areas. These fauna habitats were assessed against known vegetation mapping and specific VT codes from the Mattiske vegetation assessment criteria tools to provide a more thorough understanding of the recorded presence of species and the identified habitats and vegetation types that comprise these habitats and therefore provide additional justification for likelihood of occurrence assessments provided for each species of conservation significance within the two mine footprint Study Areas.

Findings

Jarrah – Marri forest is by far the most extensive habitat type making up most of both Study Areas. This is based on the literature and previous studies of sites within the surrounding areas and within sites of the Huntly and Willowdale Study Areas.

With regards to the Huntly Study Area, a total of 16 species of conservation significance were assessed as being either likely to occur, or known to occur within the Study Area. Specifically, 15 species were assessed as being known to occur within the Study Area, and a further one species considered likely to occur. The 15 species of conservation significant species known to occur, based on literature reviews, recent GHD and SLR consultancy surveys and recent and historical database records at state and federal level, consist of all three species of black cockatoos (Baudin's, Carnaby's and Forest Red-tailed), Quenda, Chuditch, South-West Brush-tailed Phascogale Western Brush Wallaby, Quokka, Western False Pipistrelle, Carter's Freshwater Mussel, Peregrine Falcon, Dell's Skink, Rakali, Woylie and Southern Death Adder. This conclusion is based on numerous confirmed recordings of these species within the Study Area various consultancies, including those conducted by GHD, and the strong correlation of these species utilising Jarrah-Marri forest and other identified fauna habitats within the Huntly Study Area. The remaining one species considered like to occur consisted of the Masked Owl (South-Western).

With regards to the Willowdale Study Area, a total of 17 species of conservation significance were assessed as being either likely to occur or known to occur within the Study Area. Specifically, 5 species were assessed as being known to occur within the Study Area, and a further 12 species considered likely to occur. The 5 species of conservation significant species known to occur, based on literature reviews, recent GHD and SLR consultancy surveys and recent and historical database records at state and federal level, consist of all three species of black cockatoos (Baudin's, Carnaby's and Forest Red-tailed), Rakali, and Western Brush Wallaby. The remaining 12

species determined as being likely to occur consist of the Western False Pipistrelle, Woylie, Southern Death Adder, Dell's Skink, Peregrine Falcon, Masked Owl (South-Western), Quenda, South-West Brush- tailed Phascogale, Western Ringtail Possum, Quokka, and Chudich. As with the Huntly Area, this conclusion is based on confirmed recordings of these species within the Study Area various consultancies, including those conducted by GHD, and the strong correlation of these species utilising Jarrah-Marri forest and other identified fauna habitats within the Willowdale Area, with comparatively reduced Jarrah-Marri fauna habitat presence when compared with the Huntly Study Area, and the sections of the Willowdale Study Area still yet to be fully surveyed.

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Appendix A Relevant legislation, background information and conservation codes

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1. Introduction

Alcoa of Australia Limited's (Alcoa) Western Australian (WA) mining operations comprise the Huntly and Willowdale bauxite mines, which are located in Alcoa's Mining Lease 1SA (ML1SA) within the Northern Jarrah Forest (NJF) Interim Biogeographic Regionalisation of Australia (IBRA) subregion. Alcoa is currently putting together an Environmental Scoping Document (ESD) for the Section 6 areas at Huntly and Willowdale Mine sites. As part of this, an investigation into the occurrence, and gaps in knowledge of fauna habitat and likelihood of occurrence of fauna species of conservation significance is required.

1.1 Purpose of this report

The purpose of this Technical Report is to summarise the desktop assessment for fauna species presence and fauna habitat results for the Study Areas.

1.2 Scope and limitations

The Scope of works was as follows:

- Database searches both Naturemap (Dandjoo), Department of Biodiversity, Conservation, and Attractions (DBCA) and Protected Matters Search Tool (PMST) for each of the Study Areas (20 km radius of a central point).
- Identify various desktop-based environmental characteristics of both Study Areas including the alignment of fauna habitat types with vegetation types,
- A summary of surveys completed so far (presented as a table for each area), and
- An updated likelihood of occurrence assessment (for each area- based on desktop results and literature reviews).
- A final set of comments and conclusions for species of conservation significance that are likely to occur and justification based on habitats, historical databases and known literature of surveys conducted in the area.

This report: has been prepared by GHD for Alcoa of Australia Limited and may only be used and relied on by Alcoa of Australia Limited for the purpose agreed between GHD and Alcoa of Australia Limited.

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The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

GHD disclaims liability arising from any of the assumptions being incorrect.

1.3 Study Areas

The Study Areas are located in the Huntly and Willowdale Mines, located in the Southwest of Western Australia (WA). The Huntly Mine footprint (Huntly Study Area) includes parts of the Huntly, O'Neil, McCoy Huntly, Del Park, White, and Holyoake regions. The Willowdale Mine footprint (Willowdale Study Area) includes parts of the Larego and Orion regions.

The Huntly Mine is predominantly located within the Shire of Serpentine Jarrahdale and Shire of Murray, and extends from Dwellingup in the south to Jarrahdale in the north. The Huntly Mine lies within Dwellingup and Jarrahdale State Forest and is broadly bordered by Serpentine National Park and the Darling Scarp to the west, the Monadnocks Conservation Park and Albany Highway to the east, Dwellingup and Pinjarra-Williams Road to the south and the former Jarrahdale Mine to the north. The Huntly Mine Footprint comprises of two areas to the east and north-east of Pinjarra and occupies an area of 39,046 hectares (ha). The northern portion is approximately 29,323 ha and encompasses currently active mining areas, and the southern portion is approximately 9,724 ha and encompasses a previously mined area.

The Willowdale Mine is located within the Shire of Waroona and Shire of Harvey and is broadly bordered by Lane Poole Reserve in the east and north-east, the Darling Scarp to the west, and Harvey Dam and surrounding rural land to the south-east. The Willowdale Mine lies predominantly within Dwellingup State Forest and Lane Poole Reserve. The Willowdale Mine Footprint comprises of 3 areas to the east of Wagerup and occupies an area of 2,136 ha.

These specified Study Areas are highlighted in Figure 1 in Appendices.

1.4 Terminology

Common terminologies are described below in Table 1.

Table 1 Terminology and definitions

Term (Abbreviation)	Definition/Use
BoM	Bureau of Meteorology
Alcoa of Australia Limited	Proponent of the Proposal and Client of GHD for this Survey
DBCA	Department of Biodiversity, Conservation, and Attractions
ESA	Environmentally Sensitive Areas
GoWA	Government of Western Australia
GHD Pty Ltd (GHD)	Consultant engaged by Alcoa to prepare the environmental approvals documentation and supporting technical studies.
GIS	Geographic Information System
LOO	Likelihood of Occurrence
Study Area	The area in which Alcoa propose for future mining development activities that will be assessed by regulators
Study Area	The Study Area with a 20 km buffer used to define the limits of the desktop investigations.
TEC	Threatened Ecological Community

2. Methods

2.1 Relevant legislation, conservation codes and background information

An overview of key legislation and guidelines, conservation codes and background information relevant to this fauna survey are provided in Appendix B.

2.2 Desktop assessment

The desktop assessment of the Study Areas to identify environmental values and constraints was undertaken by viewing geographic information system (GIS) spatial files largely sourced from Government of Western Australia (GoWA) (2021a) and reviewing publicly available, government managed databases. The information sources utilised in this assessment are presented below in Table 2.

Table 2 Desktop Information Sources

Aspect	Information sources/Government Dataset
Significant fauna and Fauna Diversity	DCCEEW (Department of Climate Change, Energy, the Environment and Water) PMST database to identify fauna species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) potentially occurring within the Study Area (Appendix C) DBCA *Naturemap (Dandjoo)* database (DBCA 2007–) (Appendix C) DBCA Threatened fauna database (DBCA 2021)
Literature review	Fauna papers, reports, internal data of Alcoa.

The fauna desktop assessment included a review of:

– DCCEEW PMST database to identify fauna species listed under the EPBC Act potentially occurring within the desktop Study Area
  - The DBCA Threatened and Priority Fauna database for the Study Area.
  - The DBCA *Naturemap (Dandjoo)* (DBCA 2007-) database for fauna species previously recorded within the Study Area.
– This database comprised of the following sources:
  - Atlas of Australian birds
  - Bird data -Birdlife Australia
  - Fauna Survey Returns Database (New)
  - WA Museum (WAM) databases (mammals, birds, reptiles).

2.2.1 Previous studies

A literature review was performed on previous terrestrial fauna studies in or adjacent to the Study Areas. The review focusses on all locally and regionally relevant significant species recorded during surveys on Alcoa mining lease and surrounding areas.

2.2.2 Guiding documents

The survey method and data collection that GHD employed was conducted in accordance with:

– EPA Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment (2020)
– EPA Technical Guidance - Sampling methods for terrestrial vertebrate fauna (2020)
– DEHWA (2010a) Survey Guidelines for Australia's Threatened Bats
– DEWHA (2010b) Survey Guidelines for Australia's Threatened Mammals

- DEWHA (2010c) Survey Guidelines for Australia's Threatened Reptiles
- National Heritage Trust (NHT) National manual for the Malleefowl monitoring system standards (2007)
- Other published literature, including recent advances in species habitat and survey techniques.

3. Desktop assessment - Huntly Study Area

3.1 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) classifies Australia's landscapes into large 'bioregions' and 'subregions' based on climate, geology, landform, native vegetation and species information (DoEE 2016). The study area is located in the Northen Jarrah Forest subregion (JF1) of the Jarrah Forest bioregion which is characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by woodlands of Wandoo - Marri on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands. The climate is Warm Mediterranean ((Williams & Mitchell 2001).

3.2 Conservation reserves and environmentally sensitive areas

The Huntly Study Area occurs primarily within state forest (Jarrahdale, Dwellingup and Marrinup State Forest). Serpentine National Park intersects the northern portion of the Huntly Area.

3.3 Identified Fauna Habitats

Fauna habitat has been mapped in accordance with EPA guidance for terrestrial fauna surveys (EPA 2020) within the Myara North and Holyoake mine regions, and Preliminary fauna habitat mapping has been undertaken in areas of the Huntly mine where baseline fauna surveys have not been undertaken, and extrapolation of habitats was made using available historical site vegetation type mapping, undertaken by Mattiske Consulting. A mapping overview of all surveyed regions within the Huntly Study Area is highlighted in Figure 3 in Appendix C.

These fauna habitats were assessed against known vegetation mapping and specific VT codes from the Mattiske vegetation assessment criteria tools to provide a more thorough understanding of the recorded presence of species and the identified habitats and vegetation types that comprise these habitats and therefore provide additional justification for likelihood of occurrence assessments provided for each species of conservation significance within the two mine footprint Study Areas.

A total of eight broad fauna habitat types have been recorded and mapped across portions of the Huntly Mine area. Jarrah – Marri forest is by far the most extensive habitat type making up most of the Study Area. This is followed to a lesser extent by a mix of Blackbutt Forest, Bullich Forest, Flooded Gum Woodland, Granite Outcrop, Melaleuca Dampland, Pine Plantation, Mine Rehabilitation, and Cleared Area. These habitats provide an array of microhabitats such as logs, hollows, leaflitter, soft sand and dense foliage with a broad range of floristic species providing a range of foraging, roosting, denning and sheltering. The identified fauna habitats of Blackbutt, Bullich and Flooded Gum were distinguished from additional terrestrial fauna assessments by consultants with SLR, who utilised a similar overall methodology for habitat assessment, but whose technique for assessment was varied enough to warrant an overall description of these habitats as Drainage Line as opposed to the three distinct habitat types identified by GHD. This is likely due to slight variation in methodology criteria for what is considered the dominant vegetation types in those surveyed areas as opposed to whether species such as blackbutt and flooded are present at all. Therefore, even though previous SLR assessments classified certain areas as Drainage Lines, the presence of blackbutt and flooded gum species there is also highly likely to at least a reasonable degree.

Given the dominance of Jarrah-Marri forest habitat types across the majority of the Huntly site, the Study Area is considered to provide core habitat for Chuditch, Brush-tailed Phascogale, Western Brush Wallaby, Peregrine Falcon, Masked Owl, Western False Pipistrelle, Dell's Skink and Southern Death Adder. Foraging and potential roosting habitat for all three locally occurring Black Cockatoo (Calyptorhynchus) species, as well as breeding habitat for all three Black Cockatoo species. Quokka may also use dense areas of Jarrah Marri Forest for foraging and dispersal. The additional smaller sections of other habitat types are considered to provide additional sources of foraging and dispersal for these same species of conservation significance, including Quendas with regards to Blackbutt, Bullich and Flooded Gum habitats. The smaller habitat types such as Flooded Gum and Melaleuca

Dampland may also provide the potential for Western Ringtail Possum foraging and sheltering.

The details of the identified fauna habitats across the Study Area are outlined in Table 1 below and in the detailed fauna habitat mapping outlined in Figure 6 in Appendix C.

Table 1 Fauna Habitat Profile of Huntly Mine

Description
Blackbutt Forest (Mapped at Drainage Line in SLR 2024b) The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data and review of surveyed areas across the Huntly mine are AW, AX, CW, C, and CQ. The habitat vegetation consists of Blackbutt open forest with occasional Bullich, and Marri over sparse *Banksia littoralis* over *Trymalium, Macrozamia, Xanthorrhoea preissii*, over *Lepidosperma tetraquetrum*, *Astartea scoparia* and areas of dense Swamp peppermint (*Taxandria linearifolia*). This habitat is limited to localised patches often associated with creeks and drainage lines. Disturbance factors include frequent fire, feral pigs, dieback, trail bike and 4WD. **Habitat for conservation significant species:** Core habitat for Western Brush Wallaby, Quenda, Quokka, Chuditch and Western False Pipistrelle. Breeding and roosting habitat for all three Black Cockatoo species with moderate foraging to Forest Red-tailed Black Cockatoo. Feeding, foraging and refuge habitat is also a feature for Western Ringtail Possum and Woylie.
Bullich forest (Mapped at Drainage Line in SLR 2024b) The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data and review of surveyed areas across the Huntly mine are W, and WA. The habitat vegetation of this area consists of valleys and drainage areas dominated by Bullich (*Eucalyptus megacarpa*) and with some Blackbutt (*E. patens*), occasional Marri (*Corymbia calophylla*), over Sheoak (*Allocasuarina fraseriana*), *Banksia littoralis* over Grass trees (*Xanthorrhoea preissii*), Bracken fern, patches of dense *Gahnia trifida* shrubland over *Lasiopetalum floribundum*, sedges and herbs. Substrate is dark clayloam soil. These areas are associated with seasonal creeks and drainage areas. Disturbance factors include frequent fire, feral pigs, dieback. **Habitat for conservation significant species:** Core habitat for Black Cockatoos (all three, breeding and roosting with limited foraging), Chuditch, Quokka, Quenda, Western Brush Wallaby, Masked Owl, Brush-tailed Phascogale and Western False Pipistrelle. Feeding, foraging and refuge habitat is also a feature for Western Ringtail Possum and Woylie.
Flooded Gum woodland (Mapped at Drainage Line in SLR 2024b) The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data tools and review of surveyed areas across the Huntly mine are AC, and AX. The habitat vegetation associated with this area consists of Flooded Gum (*E. rudis*) open woodland with occasional Blackbutt, over open to open to sparse *Banksia littoralis* over Prickly Moses (*Acacia pulchella*), myrtaceous species such as Swamp peppermint (*Taxandria linearifolia*), *Astartea scoparia Trymalium odoratissimum*, low shrub/sedgeland. Substrate varies from dark grey to grey, brown sandy clays. Associated with poorly drained broad valleys forming seasonal swamps and occasionally tall open forest along drainage lines. Disturbance factors include frequent fire, feral pigs. **Habitat for conservation significant species:** Core habitat for Chuditch, Western Brush Wallaby, Quokka and Quenda for which it will also provide refuge and movement corridors. Foraging and roosting habitat for all Black Cockatoos. Foraging and feeding and refuge habitat potential is also present for Western Ringtail Possum, Woylie and Numbat. Breeding habitat for Carnaby's Cockatoo limited for others.
Granite outcrop The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data and review of surveyed areas across the Huntly mine are R, RG, G, G1, and G2. The vegetation associated with this habitat type consists of Granite outcrops with associated lithic vegetation complexes and adjacent associated fringing open Jarrah and Marri areas with scattered Sheoak, Melaleuca, *Banksia ilicifolia* over occasional Grass trees over mixed open heath communities of Myrtaceous and Proteaceous low shrubs. Soils are pale grey to yellowish fine sand or sandy clay. Granite outcrops often associated with seasonal watercourse and seasonally damp areas. This habitat found as localised patches throughout the Study Area. Disturbance factors include frequent fire, feral pigs, dieback, damage caused by rock removal, trail bike and 4WD on granite. The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data tools and review of surveyed areas across the Huntly mine are R, RG, G, G1, and G2. **Habitat for conservation significant species:** Foraging and denning habitat for Chuditch. Habitat for Western Brush Wallaby, Southern Death Adder, and Dell's Ctenotus. Fringing open forest provides foraging and potential breeding habitat for Black Cockatoo species.

Jarrah – Marri forest

The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data and review of surveyed areas across the Huntly mine are B, D, DG, E, J, M, P, PG, PS, PT, PW, Q, R/S, S, SP, SP-D, S-SP, ST, SW, SW-D, T, TP, TS, WD, and Z. The vegetation types forming this habitat type comprises of *E. marginata* and *C. calophylla* open forest over Grass trees (*Xanthorrhoea preissi*), *Lasiopetalum floribundum*, and Macrozamia mid shrubland. Patches have dominance of understory *Allocasuarina fraseriana* and *Banksia grandis*. Often with complex mosaic of low shrubs such as Fabaceae, *Hibbertia*, *Leucopogon*, *Adenanthos*, and *Pteridium*. This is the most extensive habitat identified and comprises a number of vegetation types dominated by Jarrah on upper, mid and low slopes and broad valleys. Soils range from well drained gravely sand to sandy clay loam. Historical logging is a significant disturbance factor: extensive areas of forest are at varying ages of regeneration. Other disturbances include frequent fire (significant), feral pigs, dieback, trail bike, 4WD and dumped rubbish including weed plants.

Habitat for conservation significant species:

Core habitat for Chuditch, Brush-tailed Phascogale, Western Brush Wallaby, Peregrine Falcon, Masked Owl, Western False Pipistrelle, Dell's Skink, Southern Death Adder. Foraging and potential roosting habitat for all three locally occurring Black Cockatoo (Calyptorhynchus) species. Breeding habitat for all three Black Cockatoo species. Quokka may use dense area of Jarrah Marri Forest for foraging and dispersal, which is also the case for Western Ringtail Possum, Woylie and Numbat.

Melaleuca dampland

The matching VT code types and values corresponding to this fauna habitat type based on Mattiske tools and review of surveyed areas across the Huntly mine are A, CA, and DA. The vegetation types forming this habitat type consist of Paperbark (*Melaleuca preissiana*) over sparse isolated *Banksia littoralis* over open *Hakea*, occasional Woody Pear (*Xylomelum*), Grass trees and over mixed shrub layer of Cyperaceae, Restionaceae, *Babingtonia*, *Jacksonia* and *Acacia*, over low shrubs, sedges and herbs. There are areas of sparse to occasional stunted Jarrah and Marri however these are limited to lowland transitional zones adjacent to slightly higher elevation and drainage open forest areas. Generally limited to areas of poor drainage and subject to winter inundation such as broad valleys and swamps. Substrate is grey gravely clay and clay loam. Disturbance factors include frequent fire and feral pigs.

Habitat for conservation significant species:

Western Brush Wallaby, Western False Pipistrelle. Foraging habitat for all three locally occurring Black Cockatoo (*Calyptorhynchus*) species although Jarrah and Marri are generally stunted and sub-optimal for potential breeding habitat. Where creek lines or dense vegetation is present Quokka and Quenda reside.

Mine rehabilitation

Mine rehabilitation of the Huntly and Willowdale Mines of varying ages. Areas of age greater than 8 years provide foraging habitat for Black Cockatoo species but lack trees of suitable age (trunk diameter) to have developed hollows of sufficient diameter and depth to be considered potentially suitable breeding trees for Black Cockatoos. These areas also provide continuity of forest or woodland connectivity allowing fauna movement and foraging habitat for a range of species ground such as terrestrial reptiles, birds, small mammals.

Habitat for conservation significant species

Research indicates use of mine rehabilitation within 2 years of establishment for Chuditch and Quenda, 4-5 years for Western Brush Wallaby, by Quokka (varying ages) and within 4-7 years for foraging by Black Cockatoos.

Pine plantation

These are monocultures of Pine timber tree species (*Pinus*). They represent very high quality foraging habit for Carnaby's and Baudin's Cockatoos. They tend to be devoid of understory and ground layer vegetation and lack habitat values for most other native vertebrates. The single matching VT code type and values corresponding to this fauna habitat type based on Mattiske data tools and review of surveyed areas across the Huntly mine is PL.

3.4 Terrestrial fauna

3.4.1 Fauna diversity

The *Naturemap (Dandjoo) (Dandjoo)* database search utilising a 20 km buffer zone around the Study Area, including additional literature searches and provided Alcoa data, identified 440 terrestrial vertebrate fauna species previously recorded within the Huntly Study Area. This total included 55 mammal species, 281 bird species, 70 reptile species and 16 amphibian species, with an additional 18 terrestrial freshwater system fish species.

It should be noted that *Naturemap (Dandjoo)* data contains some inaccuracies with nomenclature and accuracy of records. An extensive review and removal of clear irregularities and duplications has allowed for a more accurate summary and overview of species presence and abundance, yet absolute accuracy within the database is not guaranteed.

3.4.2 Significant fauna

Based on the *Naturemap* and PMST search and DBCA databases, Alcoa records, and confirmed survey recordings, 53 significant terrestrial vertebrate taxa were identified to potentially occur within the Study Area and wider Study Area.

These species Included:

- 5 (Five) species listed as Critically Endangered (CR) under the Federal EPBC Act and WA Biodiversity Conservation Act.
- 7 (Seven) species listed as Endangered (EN) under the Federal EPBC Act and WA Biodiversity Conservation Act.
- 6 (Six) species listed as Vulnerable (VU) under the Federal EPBC Act and WA Biodiversity Conservation Act.
- 22 (Twenty-two) species listed as Migratory (MI) under the Federal EPBC Act and WA Biodiversity Conservation Act.
- 1 (One) species listed as under Special Conservation Protection (OS) under the WA Biodiversity Conservation Act.
- 1 (One) species listed as Conservation Dependent (CD) under the WA Biodiversity Conservation Act.
- 6 (Six) species listed at Priority 4 (P4) category under the WA Biodiversity Conservation Act.
- And 5 (five) species listed at Priority 3 (P3) category under the WA Biodiversity Conservation Act.

The above list is compiled from broad database parameters and has been refined further based on the overall desktop assessment within the Likelihood of Occurrence (LOO) assessment and in the final conclusions section to accurately reflect the potential and actual occurrence of all locally relevant significant fauna.

Of these, 16 species have been recorded or are likely to exist in the Huntly Study Area:

- Forest Red-tailed Black Cockatoo (*Calytorhynchus banksii naso*) - Known
- Baudin's Black Cockatoo (*Zanda baudinii*) - Known
- Carnaby's Black Cockatoo (*Zanda latirostris*) – Known

- Chuditch (*Dasyurus geoffryi*) - Known
- Western Brush Wallaby (*Notamacropus irma*) – Known
- Western False Pipestrelle (*Falsistrellus mackenziei*) – Known
- Quenda (*Isoodon fusciventor*) – Known
- Quokka (*Setonix brachyurus*) – Known
- South-West Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Known
- Carter's Freshwater Mussel (*Westralunio carteri*) – Known
- Peregrine Falcon *(Falco peregrinus*) –Known
- Dell's Skink (*Ctenotus delli*) – Known.
- Carter's Freshwater Mussel *(Westralunia carteri*) – Known.
- Southern Death Adder (Acanthophis antarcticus) – Known.
- Woylie (*Bettongia penicilatta ogilbyi*) – Known.
- Masked Owl (*Tyto novaehollandiae novaehollandiae*) – Likely

Threatened species that were assessed as potentially occurring were the Numbat (*Myrmecobius fasciatus*) and the Western Ringtail Possum (*Pseudocheirus occidentalis),* while species assessed as unlikely to occur include the Noisy Scrub Bird (*Atrichornis clamosus*) and the Malleefowl (*Leipoa ocellata*). The mine areas may include suitable habitat for these species and Numbat and Malleefowl have previously been recorded in the Huntly and Willowdale mines and the Noisy Scrub Bird previously recorded south of Dwellingup. The Noisy Scrub bird was translocated into sites in the Northern Jarrah Forest from 1997-2003 however monitoring indicates that establishment of permanent populations was unsuccessful. The three species were not recorded during surveys in the Huntly mines. While individuals may occur as vagrants, the three species are unlikely to occur as significant populations, given the absence of evidence collected during extensive fauna survey within the Huntly regions.

No migratory bird species have been recorded in the Huntly mines nor are they considered likely to occur due to the lack of wetland habitats favoured by the species. The Flooded Gum Woodland and Melaleuca Dampland habitats are seasonally waterlogged and may have areas that are seasonally inundated, however they do not contain large areas of wading habitat with mudflat, grasses, sedges, rushes or reeds. Similarly, the Huntly Areas are unlikely to support populations of threatened birds that use such wetland habitats, such as the Australasian Bittern (*Botaurus poiciloptilus*) and Australian Painted Snipe (*Rostratula australis*).

The conservation significant fauna records and results across DBCA and all previous surveys have been provided for the Huntly Study Area in Figure 4, Appendix C.

3.5 Previous Studies and Literature Review

Table 4 outlines the previous studies conducted within the region relating to the Huntly Study Area. With those outlined previous studies for the Huntly Study Area, those identified studies that were conducted to EPA guidelines, standards and procedures are mentioned within the key findings of each study.

Table 4 Previous Studies Huntly Mine Site Study Area

Study	Location and key findings	Location in relation to this region
SLR (2024a) Huntly – Carter's Freshwater Mussel Targeted Survey, Unpublished	**Location: Huntly region, Huntly Mine** This report highlighted findings from the targeted species search for the state and federally listed Vulnerable Carter's Freshwater Mussel (CFM) within the Huntly survey region. Six highlighted sites were surveyed across a period of several weeks in October and November of 2023 approximately 12km upstream from known locations within Serpentine Dam. The survey was conducted according to current EPA guidelines. No confirmed sightings or evidence was found of CFM in any of the six surveyed areas, and Ph and oxygen levels analysed suggested that the existing areas with water bodies were outside normal range for suitable long-term habitat for the species.	Within Huntly Study Area
SLR (2024b) Huntly Region – Targeted Fauna Survey for Chuditch, Quokka and Woylie, Unpublished	**Location: Huntly region, Huntly Mine** This report highlighted findings from the targeted species survey for Quokka, Chuditch and Woylie across the Huntly area of 928.6ha within the Pinjarra and Jarrah Forest bioregion. Two main habitat types were identified throughout the Study Area, that being Jarrah-Marri forest, and drainage lines, both of which provide core habitat for the three targeted species. The survey was conducted according to current EPA guidelines. The targeted surveys recorded 52 instances of Chuditch with 14 specific individuals reliably recorded, along with 18 recordings of quokkas. In addition to the two targeted fauna taxa, six significant taxa were recorded during the fauna survey in Jarrah-Marri Forest and Drainage Line habitats: – Baudin's Cockatoo (*Zanda baudinii).* – Carnaby's Cockatoo (*Zanda latirostris).* – Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*). – Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger).* – Quenda (*Isoodon fusciventer).* – Western Brush Wallaby (*Notamacropus irma).*	Within Huntly Study Area
SLR (2024c) Huntly Region – Black Cockatoo Habitat Assessment, Unpublished	**Location: Huntly region, Huntly Mine** This report highlighted findings from a targeted species assessment for all three EPBC listed Black Cockatoo species in terms of direct observation and recorded feeding, foraging behaviour, as well as identification of suitable roosting, feeding and breeding hollow habitat within the Huntly Study Area covering 501.7 ha of Jarrah-Marri Forest bioregion. Ground-based, drone and camera searches were conducted, using specific government referral guidelines for all three black cockatoo species. The survey was conducted according to current EPA guidelines. The surveys recorded significant direct observations of all three EPBC listed black cockatoo species, as well as recorded feeding, roosting and numerous suitable breeding hollows for all three species, with six confirmed nesting hollows and 11 confirmed mass roosting sites within the Study Area itself.	Within Huntly Study Area

GHD (2024e). Myara pre-clearance targeted fauna assessment	**Location: Huntly Region, Alcoa Huntly Mine** The Purpose of the memorandum is to summarise the methodology and the survey results of the targeted pre-clearance assessment for Myara site. The Survey Areas for identified for assessment were split into two types: a Targeted Fauna Survey (Sites 1 -5) comprising of 185.7 hectares (ha) and a targeted Black Cockatoo Assessment covering 10.3 ha (bordering site 3. Targeted fauna assessment were performed with a specific focus to identify significant fauna constraints focusing on significant fauna species of Chuditch, Woylies and Quokka. The most extensive habitat identified within all five Survey Areas was Jarrah-Marri forest. Habitat dominated by Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) forest with a mixed understory open to scattered to patchy Sheoak (*Allocasuarina fraseriana*), Bull Banksia (*Banksia grandis*) and Myrtaceous shrubs over *Persoonia, Xanthorrhoea, Macrozamia* and diverse low shrub layer The Survey Areas represented a large continuous tract of forest and woodland with good connectivity. 34 terrestrial fauna vertebrates were identified comprising nine mammals, 21 Birds and four Reptiles. Of the nine mammal species, two are introduced. Furthermore, five significant fauna species were recorded, these included: • Chuditch • Forest Red-tailed Black Cockatoo • Western Brush Wallaby • Southwestern Brush-tailed Phascogale • Quenda	Within Huntly Study Area
GHD (2024d) McCoy Haul Road Fauna Pre-clearance Survey, Unpublished	**Location: McCoy and O'Neil regions, Huntly Mine** This memo outlines the results of a targeted preclearance assessment for the McCoy Haul road within the O'Neil region covering approximately 563.4 ha. In total nine significant fauna species were recorded including Carnaby's Black Cockatoo, Baudin's Black Cockatoo, Forest Red-tailed Black Cockatoo, Chuditch, Quokka,	Partly within Huntly Study Area

Study	Location and key findings	Location in relation to this region
	South-western Brush-tailed Phascogale, Peregrine Falcon, Western Brush Wallaby and Quenda. The survey was conducted according to current EPA guidelines. Foraging for all three Black Cockatoo species was recorded within the area along with roosting sites and three known nesting trees were recorded.	
GHD (2024c) O'Neil East Targeted Woylie Assessment. Unpublished,	**Location: O'Neil East region, Huntly Mine** This memo outlines the results of a targeted Woylie assessment within the O'Neil East Study Area and Study Area. Covering an area approximately 1,402 ha. In total approximately 3 – 6 Woylies were observed within the Area. Five other conservation significant species were also recorded within the area, Chuditch, Quokka, Southwestern Brush-tailed Phascogale, Western Brush Wallaby and Quenda. The survey was conducted according to current EPA guidelines.	Within boundary of the Huntly Study Area.
GHD (2024b) Terrestrial Fauna Assessment O'Neil East. Unpublished	**Location: O'Neil East region, Huntly Mine** This report outlines the results of the terrestrial vertebrate fauna survey of the Alcoa O'Neil development envelope. The O'Neil East Study Area covers an approximate 2,425.65 ha and is located approximately 30km east of the township of Jarrahdale, WA. The survey was conducted according to current EPA guidelines. In total nine significant species were recorded in the Study Area including: Woylie, Baudin's Black Cockatoo, Forest Red-tailed Black Cockatoo, Chuditch, Quokka, Southwestern Brush-tailed Phascogale, Western Brush Wallaby, Dell's Skink and Quenda. Extensive foraging habitat for the two recorded Black Cockatoos (Baudin's and Forest Red-tailed Black Cockatoo) was found within the Study Area.	Approximately 5km southeast of the Huntly Study Area
GHD (2024a) Terrestrial Fauna Assessment O'Neil. Unpublished	**Location: O'Neil region, Huntly Mine** This report outlines the results of a terrestrial vertebrate fauna survey of the Alcoa O'Neil development envelope. The O'Neil Study Area is approximately 30kms east of the town of Dwellingup in the Southwest of Western Australia. The Study Area covered an approximate of 12,687.48 ha. The survey was conducted according to current EPA guidelines. In total nine significant fauna species was recorded in the Study Area including: Chuditch, Baudin's Black Cockatoo, Forest Red-tailed Black Cockatoo, Quokka, Rakali, Western Brush Wallaby, Dell's Skink, Quenda and Carter's Fresh Water Mussel. Extensive foraging habitat for two of the Black Cockatoos (Baudin's and Forest Red-tailed Black Cockatoo)	Within Huntly Study Area

GHD (2023). Myara North Terrestrial Fauna Pre-Clearance Survey	**Location: Myara North Region, Huntly Mine** The Huntly Mine transition into the Myara North mine region is a component of the Pinjarra Alumina Refinery Revised Proposal (the Alcoa Proposal). GHD was commissioned, on behalf of Alcoa, to prepare a comprehensive Environmental Review Document for the Alcoa Proposal, which includes commitments for environmental management, including pre-clearance surveys. From a terrestrial fauna perspective. The purpose of the survey was to identify the presence of significant fauna and significant fauna habitat features in the survey area. The outcome of the survey and information supplied in this biological survey report will be used to inform the environmental assessment and approvals process, and the results will be used to assist in the preparation of Environmental Impact Assessment documentation. Six significant fauna species were recorded within the survey area during the surveys. These are: • Baudin's Cockatoo (*Zanda baudinii*) – listed as Endangered under the BC Act and Endangered under the EPBC Act. • Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) listed as Vulnerable under the BC Act and Vulnerable under the EPBC Act. • Chuditch (*Dasyurus geoffroii*) listed as Vulnerable under the BC Act and Vulnerable under the EPBC Act. • Quenda (*Isoodon fusciventer*) – listed as Priority 4 by the DBCA. • Western Bush Wallaby (*Notamacropus irma*) – listed as Priority 4 by the DBCA. • South-Western brush-tailed phascogale (*Phascogale tapoatafa wambenger*) – listed as Conservation Dependent by the DBCA.	Within Huntly Study Area
	In line with GHD's (2021) assessment, no evidence of Woylie (*Bettongia penicillata ogilbyi*) or Numbat (*Myrmecobius fasciatus*) were observed during the survey. These species have the potential to occur, although unlikely. Potential breeding habitat trees were identified in the survey area for Black Cockatoos. A total of 62suitable trees were identified in the survey area, containing a total of 82 hollows. A total of 9 hollows with evidence of use by Black Cockatoos (chew marks around hollow) were recorded in the survey area. Three of these hollows were in Marri, and the remaining 6 were in Jarrah. No evidence of Quokka was recorded during the 2023 survey at Myara North, however, previous records from GHD (2021) are close to the area and Quokka is likely to occur.	
GHD (2021) Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake	**Location: Holyoake region, Huntly Mine** This report details the results of a terrestrial vertebrate fauna survey of the Holyoake Development Envelope and adjacent conveyor and haul road corridors. The region is located approximately five kilometres east of the Dwellingup town site in the south-west of WA. The region covers approximately 10,541 hectares (ha). The survey was conducted according to current EPA guidelines. In total ten significant species were recorded in the region including the Quokka, Chuditch, Brush-tailed Phascogale, Western Brush Wallaby, Forest Red-tailed Black Cockatoo, Baudin's Black Cockatoo, Carnaby's Black Cockatoo, Western False Pipistrelle, Quenda and Peregrine Falcon. All significant species identified are likely to have resident populations and habitat present within the region. Although recorded nearby and outside	Abuts the western boundary of the Huntly Study Area (extending up to 10 km west)

Study	Location and key findings	Location in relation to this region
	of the region the presence of Carter's Freshwater Mussel is unlikely due to the lack of permanent surface waterbodies present. The region has extensive foraging habitat for the three Black Cockatoo species, and potential breeding habitat (limited in extent) for Carnaby's and Forest Red-tailed Black Cockatoo. Regarding migratory shorebirds, the region lacks open water such as shallow shorelines or tidal zones for foraging habitat. The creek lines and vegetated dampland areas within the region are not suitable for migratory shorebirds.	
McGregor *et al*. (2014). Does forest restoration in fragmented landscapes provide habitat for a wide-ranging carnivore?	**Location: Huntly and Willowdale mines** Fourteen Chuditch trapping sessions (13 at Huntly, one at Willowdale) across 9 trapping transects (8 at Huntly, one at Willowdale) were undertaken between June 2009 and Dec 2010. Radio collars with a two-stage transmitter and mortality mode were attached to 14 adult Chuditch (9 female, 5 males – all trapped at Huntly). Chuditch were tracked to their dens during the day. Spool and line tracking was also used. In total 29 individual Chuditch were captured on 60 occasions. Of the 14 individuals fitted with radio collars, three were found dead on the Huntly mine access road with evidence of road trauma. Another three Chuditch were also found dead from vehicle strikes along this road. The study identified 138 den sites from 11 tracked animals: 75 in unmined forest and 63 in restored forest ranging from 2-32 years old. In unmined forest, dens were mostly in hollow logs and ground burrows beneath tree stumps, but these substrates were never used in restored forest where dens were mostly ground burrows, usually associated with rock piles at the surface.	Huntly Mine. Willowdale mine, South of the current Study Area.
Burn (2000) A survey of the impact of burning on mammals and birds in Alcoa's rehabilitated Bauxite mines at Jarrahdale	**Location: Jarrahdale forest (two unmined and four rehabilitated bauxite mine pits)** To ascertain the impact of burning on birds and mammals at the above location pre burning monitoring took place 1997, and post burn monitoring commenced in 1998 in both burnt and unburnt, rehabilitated and unmined forest sites. Low numbers of mammals were caught making it difficult to conclude with certainty whether burning influenced most species. New epicormic growth may have attracted possums into one rehabilitated area, while mice invaded the dense rehabilitated site after the burn. There was a large decline in the numbers of birds and bird species following the burn in the dense rehabilitation. Burning sparse rehabilitation only resulted in a small decline while fire had little effect on bird populations of unmined forest. It was concluded that more time was needed to define the longer-term effects of burning on mammals and birds. The present survey was therefore undertaken in 2000 to assess the situation three years after burning.	North of the Huntly Study Area.

4. Desktop assessment – Willowdale Study Area

4.1 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) classifies Australia's landscapes into large 'bioregions' and 'subregions' based on climate, geology, landform, native vegetation and species information (DoEE 2016). The study area is located in the Northen Jarrah Forest subregion (JF1) of the Jarrah Forest bioregion which is characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by woodlands of Wandoo - Marri on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands. The climate is Warm Mediterranean ((Williams & Mitchell 2001).

4.2 Conservation reserves and environmentally sensitive areas

The Willowdale Footprint and Study Area occurs primarily within state forest (Jarrahdale, Dwellingup and Marrinup State Forest). Lane Poole Reserve intersects the eastern and western perimeter of the Willowdale Footprint and Study Area.

4.3 Identified Fauna Habitats

Fauna habitat has been mapped in accordance with EPA guidance for terrestrial fauna surveys (EPA 2020), and Preliminary fauna habitat mapping has been undertaken in areas of the Willowdale mine where baseline fauna surveys have not been undertaken, and extrapolation of habitats was made using available historical site vegetation type mapping, undertaken by Mattiske Consulting. The findings are also based on an additional fauna habitat assessment conducted by SLR.

These fauna habitats were assessed against known vegetation mapping and specific VT codes from the Mattiske vegetation assessment criteria tools to provide a more thorough understanding of the recorded presence of species and the identified habitats and vegetation types that comprise these habitats and therefore provide additional justification for likelihood of occurrence assessments provided for each species of conservation significance within the two mine footprint Study Areas. A mapping overview of all surveyed regions within the Willowdale Study Area is highlighted in Figure 3 in Appendix C.

A total of eight broad fauna habitat types have been recorded and mapped across portions of the Willowdale Mine area, with a similar overall variety and type to that found for the Huntly Study Area. Jarrah – Marri forest is by far the most extensive habitat type making up most of the Study Area (28.5%). This is followed to a lesser extent by a mix of Blackbutt Forest Bullich Forest (2.8%), Flooded Gum Woodland (0.8%), Granite Outcrop (0.2%), Melaleuca Dampland (0.1%), Mine Rehabilitation (8.9%), and Cleared Area (3.2%). These habitats provide an array of microhabitats such as logs, hollows, leaflitter, soft sand and dense foliage with a broad range of floristic species providing a range of foraging, roosting, denning and sheltering habitat.

Given the dominance of Jarrah-Marri forest habitat types across the majority of the Willowdale site, the Study Area is considered to provide core habitat for Chuditch, Brush-tailed Phascogale, Western Brush Wallaby, Peregrine Falcon, Masked Owl, Western False Pipistrelle, Dell's Skink and Southern Death Adder. Foraging and potential roosting habitat for all three locally occurring Black Cockatoo (Calyptorhynchus) species, as well as breeding habitat for all three Black Cockatoo species. Quokka may also use dense areas of Jarrah Marri Forest for foraging and dispersal. The additional smaller sections of other habitat types are considered to provide additional sources of foraging and dispersal for these same species of conservation significance, including Quendas with regards to Blackbutt, Bullich and Flooded Gum habitats. The smaller habitat types such as Flooded Gum and Melaleuca Dampland may also provide the potential for Western Ringtail Possum foraging and sheltering.

The details of the identified fauna habitats across the Study Area are outlined in Table 5 below and in Appendix C.

Table 5 Fauna habitat profile of Willowdale Mine Study Area

Description
Blackbutt Forest (Mapped as Drainage Line by SLR 2024). The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data and review of surveyed areas across the Willowdale mine are AW, AX, CW, C, and CQ. These vegetation types associated with this habitat type consist of Blackbutt open forest with occasional Bullich, and Marri over sparse *Banksia littoralis* over *Trymalium, Macrozamia, Xanthorrhoea preissii*, over *Lepidosperma tetraquetrum*, *Astartea scoparia* and areas of dense Swamp peppermint (*Taxandria linearifolia*). This habitat is limited to localised patches often associated with creeks and drainage lines. Disturbance factors include frequent fire, feral pigs, dieback, trail bike and 4WD. **Habitat for conservation significant species:** Core habitat for Western Brush Wallaby, Quenda, Quokka, Chuditch and Western False Pipistrelle. Breeding and roosting habitat for all three Black Cockatoo species with moderate foraging to Forest Red-tailed Black Cockatoo. Feeding, foraging and refuge habitat is also a feature for Western Ringtail Possum and Woylie.
Bullich Forest (Mapped as Drainage Line by SLR 2024). The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data and review of surveyed areas across the Willowdale mine are W, and WA. These vegetation types corresponding to this habitat type consist of Valleys and drainage areas dominated by Bullich (*Eucalyptus megacarpa*) and with some Blackbutt (*E. patens*), occasional Marri (*Corymbia calophylla*), over Sheoak (*Allocasuarina fraseriana*), *Banksia littoralis* over Grass trees (*Xanthorrhoea preissii*), Bracken fern, patches of dense *Gahnia trifida* shrubland over *Lasiopetalum floribundum,* sedges and herbs. Substrate is dark clayloam soil. These areas are associated with seasonal creeks and drainage areas. Disturbance factors include frequent fire, feral pigs, dieback. **Habitat for conservation significant species:** Core habitat for Black Cockatoos (all three, breeding and roosting with limited foraging), Chuditch, Quokka, Quenda, Western Brush Wallaby, Masked Owl, Brush-tailed Phascogale and Western False Pipistrelle. Feeding, foraging and refuge habitat is also a feature for Western Ringtail Possum and Woylie.
Flooded Gum woodland (Mapped as Drainage Line by SLR 2024). The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data and review of surveyed areas across the Willowdale mine are W, and WA. The vegetation types associated with this habitat type comprise of Flooded Gum (*E. rudis*) open woodland with occasional Blackbutt, over open to open to sparse *Banksia littoralis* over Prickly Moses (*Acacia pulchella*), myrtaceous species such as Swamp peppermint (*Taxandria linearifolia*), *Astartea scoparia Trymalium odoratissimum*, low shrub/sedgeland. Substrate varies from dark grey to grey, brown sandy clays. Associated with poorly drained broad valleys forming seasonal swamps and occasionally tall open forest along drainage lines. Disturbance factors include frequent fire, feral pigs. **Habitat for conservation significant species:** Core habitat for Chuditch, Western Brush Wallaby, Quokka and Quenda for which it will also provide refuge and movement corridors. Foraging and roosting habitat for all Black Cockatoos. Foraging and feeding and refuge habitat potential is also present for Western Ringtail Possum, Woylie and Numbat. Breeding habitat for Carnaby's Cockatoo limited for others.
Granite outcrop The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data and review of surveyed areas across the Willowdale mine area are R, RG, G, G1, and G2. These vegetation types associated with this fauna habitat type consist of Granite outcrops with associated lithic vegetation complexes and adjacent associated fringing open Jarrah and Marri areas with scattered Sheoak, Melaleuca, *Banksia ilicifolia* over occasional Grass trees over mixed open heath communities of Myrtaceous and Proteaceous low shrubs. Soils are pale grey to yellowish fine sand or sandy clay. Granite outcrops often associated with seasonal watercourse and seasonally damp areas. This habitat found as localised patches throughout the Study Area. Disturbance factors include frequent fire, feral pigs, dieback, damage caused by rock removal, trail bike and 4WD on granite. **Habitat for conservation significant species:** Foraging and denning habitat for Chuditch. Habitat for Western Brush Wallaby, Southern Death Adder, and Dell's Ctenotus. Fringing open forest provides foraging and potential breeding habitat for Black Cockatoo species.

Jarrah – Marri forest The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data and review of surveyed areas across the Willowdale mine are B, D, DG, E, J, M, P, PG, PS, PT, PW, Q, R/S, S, SP, SP-D, S-SP, ST, SW, SW-D, T, TP, TS, WD, and Z. The vegetation types associated with this habitat type consist of *E. marginata* and *C. calophylla* open forest over Grass trees (*Xanthorrhoea preissi*), *Lasiopetalum floribundum*, Macrozamia mid shrubland. Patches have dominance of understory *Allocasuarina fraseriana* and *Banksia grandis*. Often with complex mosaic of low shrubs such as Fabaceae, *Hibbertia*, *Leucopogon*, *Adenanthos*, and *Pteridium*. This is the most extensive habitat identified and comprises a number of vegetation types dominated by Jarrah on upper, mid and low slopes and broad valleys. Soils range from well drained gravely sand to sandy clay loam. Historical logging is a significant disturbance factor: extensive areas of forest are at varying ages of regeneration. Other disturbances include frequent fire (significant), feral pigs, dieback, trail bike, 4WD and dumped rubbish including weed plants. **Habitat for conservation significant species:** Core habitat for Chuditch, Brush-tailed Phascogale, Western Brush Wallaby, Peregrine Falcon, Masked Owl, Western False Pipistrelle, Dell's Skink, Southern Death Adder. Foraging and potential roosting habitat for all three locally occurring Black Cockatoo (Calyptorhynchus) species. Breeding habitat for all three Black Cockatoo species. Quokka may use dense area of Jarrah Marri Forest for foraging and dispersal, which is also the case for Western Ringtail Possum, Woylie and Numbat.
Melaleuca dampland The matching VT code types and values corresponding to this fauna habitat type based on Mattiske data tools and review of surveyed areas across the Willowdale mine area are A, CA, and DA. The vegetation types associated with this fauna habitat types consist of Paperbark (*Melaleuca preissiana*) over sparse isolated *Banksia littoralis* over open *Hakea*, occasional Woody Pear (*Xylomelum*), Grass trees and over mixed shrub layer of Cyperaceae, Restionaceae, *Babingtonia*, *Jacksonia* and *Acacia*, over low shrubs, sedges and herbs. There are areas of sparse to occasional stunted Jarrah and Marri however these are limited to lowland transitional zones adjacent to slightly higher elevation and drainage open forest areas. Generally limited to areas of poor drainage and subject to winter inundation such as broad valleys and swamps. Substrate is grey gravely clay and clay loam. Disturbance factors include frequent fire and feral pigs. **Habitat for conservation significant species:** Western Brush Wallaby, Western False Pipistrelle. Foraging habitat for all three locally occurring Black Cockatoo (*Calyptorhynchus*) species although Jarrah and Marri are generally stunted and sub-optimal for potential breeding habitat. Where creek lines or dense vegetation is present Quokka and Quenda reside.
Mine rehabilitation Mine rehabilitation of the Willowdale Mine of varying ages. Areas of age greater than 8 years provide foraging habitat for Black Cockatoo species but lack trees of suitable age (trunk diameter) to have developed hollows of sufficient diameter and depth to be considered potentially suitable breeding trees for Black Cockatoos. These areas also provide continuity of forest or woodland connectivity allowing fauna movement and foraging habitat for a range of species ground such as terrestrial reptiles, birds, small mammals. **Habitat for conservation significant species** Research indicates use of mine rehabilitation within 2 years of establishment for Chuditch and Quenda, 4-5 years for Western Brush Wallaby, by Quokka (varying ages) and within 4-7 years for foraging by Black Cockatoos.
Cleared areas

4.4 Terrestrial fauna

4.4.1 Fauna diversity

The *Naturemap (Dandjoo)* database search utilising a 20 km buffer zone in the request, and including the survey literature from surveys of the Alcoa sites, identified 261 terrestrial vertebrate fauna species previously recorded within the region. This total included 39 mammal species, 156 bird species, 46 reptile species and 14 amphibian species, with an additional 6 terrestrial freshwater fish species. Of the species three are introduced species.

Please note that *Naturemap (Dandjoo)* data contains some inaccuracies, with nomenclature and accuracy of records. An extensive review and removal of clear irregularities and duplications has allowed for a more accurate summary and overview of species presence and abundance, yet absolute accuracy within the database is not guaranteed.

4.4.2 Significant fauna

Based on the *Naturemap/Dandjoo*, DBCA, and PMST search, along with recent 2024 SLR Fauna Survey assessments and previous fauna surveys within the Willowdale Mine region by Western Environmental and Biologic, along with the review of the existing literature from surveys within and surrounding the Alcoa sites, 38

significant terrestrial vertebrate taxa were identified to potentially occurring within the Study Area.

These Species Included:

- 4 (Four) species listed as Critically Endangered (CR) under the Federal EPBC Act and WA Biodiversity Conservation Act.
- 7 (Seven) species listed as Endangered (EN) under the Federal EPBC Act and WA Biodiversity Conservation Act.
- 7 (Seven) species listed as Vulnerable (VU) under the Federal EPBC Act and WA Biodiversity Conservation Act.
- 9 (Nine) species listed as Migratory (MI) under the Federal EPBC Act and WA Biodiversity Conservation Act.
- 1 (One) species listed as under Special Conservation Protection (OS) under the WA Biodiversity Conservation Act.
- 1 (One) species listed as Conservation Dependent (CD) under the WA Biodiversity Conservation Act.
- 5 (Five) species listed at Priority 4 (P4) category under the WA Biodiversity Conservation Act.
- And 4(Four) species listed as Priority 3 (P3) under the WA Biodiversity Conservation Act.

Of these, 17 have been recorded or are likely to exist in the Willowdale Study Area:

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) - Known
- Baudin's Black Cockatoo (*Zanda baudinii*) – Known
- Carnaby's Black Cockatoo (*Zanda latirostris*) - Known
- Rakali (*Hydromys chrysogaster*) – Known.
- Western Brush Wallaby (*Notamacropus irma*) – Known.
- South-West Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Likely.
- Quenda (*Isoodon fusciventor*) – Likely.
- Quokka (*Setonix brachyurus*) – Likely
- Chuditch (*Dasyurus geoffroyii*) – Likely.
- Western Ringtail Possum (*Pseudocheirus occidentalis)* – Likely.
- Woylie (*Bettongia penicillata ogilbyi*) – Likely.
- Peregrine Falcon (*Falco peregrinus*) – Likely.
- Western False Pipestrelle (*Falsistrellus mackenziei)* – Likely.
- Masked Owl (*Tyto novaehollandiae novaehollandiae)* – Likely.
- Southern Death-adder (*Acanthophis antarcticus*) – Likely.
- Dell's Skink (*Ctenotus delli*) – Likely
- Carter's Freshwater Mussel (*Westralunia carteri*) – Likely.

Threatened species that were assessed as potentially or possibly occurring in the Willowdale Areas include the Numbat (*Myrmecobius fasciatus*), while other threatened species assessed as being unlikely to occur include Noisy Scrub Bird (*Atrichornis clamosus) and Malleefowl (Leipoa ocellata).* The mine areas may include suitable habitat for these species and Numbat and Malleefowl have previously been recorded in the mines and the Noisy Scrub Bird previously recorded south of Dwellingup. The Noisy Scrub bird was translocated into sites in the Northern Jarrah Forest from 1997-2003 however monitoring indicates that establishment of permanent populations was unsuccessful. The three species were not recorded during surveys in the Huntly mines. While individuals may occur as vagrants, the three species are unlikely to occur as significant populations, given the absence of evidence collected during extensive fauna surveys within the Willowdale regions. Historically, the Western Ringtail Possum was considered as unlikely to occur based on fewer recent DBCA records and comparatively small areas of potentially suitable foraging and sheltering habitat within the area, and no recorded findings having been made by previous survey efforts. However, recent SLR surveys of the Larego section of the Willowdale mine area in July 2024 (Pers. Comm) have confirmed sightings of a single individual (observed twice) utilising Blackbutt saplings as part of dense section of BlackButt forest habitat approximately five metres from the edge of the vegetation. This species has now been classified as Known to Occur within the Willowdale mine.

No migratory bird species have been recorded in the Willowdale mines nor are they considered likely to occur due to the lack of wetland habitats favoured by the species. The Flooded Gum Woodland and Melaleuca Dampland habitats are seasonally waterlogged and may have areas that are seasonally inundated, however they do not contain large areas of wading habitat with mudflat, grasses, sedges, rushes or reeds. Similarly, the Willowdale Areas are unlikely to support populations of threatened birds that use such wetland habitats, such as the Australasian Bittern (*Botaurus poiciloptilus*) and Australian Painted Snipe (*Rostratula australis*).

The conservation significant fauna results and recordings across both DBCA records and surveyed areas have been provided for the Willowdale Study Area in Figure 7, Appendix C.

4.5 Previous studies and Literature Review

Table 6 outlines the previous studies conducted within the region. As with those previous studies for the Huntly Study Area, those identified studies that were conducted to EPA guidelines, standards and procedures are mentioned within the key findings of each study.

Table 6 Previous studies Willowdale Minesite

Study	Location and key findings	Location in relation to this region
SLR (2024) Larego Region – Chuditch, Quokka and Woylie Targeted Survey, Unpublished	This report highlighted findings from the targeted species survey for Quokka, Chuditch and Woylie across the Larego mine area of 4518 ha within the Pinjarra and Jarrah Forest bioregion. Two main habitat types were identified throughout the Study Area, that being Jarrah-Marri forest, and drainage lines, both of which provide core habitat for the three targeted species. One targeted species was identified throughout the study, that being secondary scat-based evidence for Chuditch presence. No direct evidence for either Woylies or Quokka were recorded within the Study Area, however historical records from previous studies and databases revealed recordings of both such species within 200metres of the Study Area. The survey was conducted according to current EPA guidelines. In addition to the targeted fauna, a further four conservation significant species were identified within the Study Area; – Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*). – Baudin's Cockatoo (*Zanda baudinii)* – Rakali (*Hydromys chrysogaster)* – Western Brush Wallaby (*Notamacropus irma).*	Within Willowdale Study Area
Western Environmental (2023) Willowdale Mine Black Cockatoo Targeted Assessment, Unpublished	Location: Willowdale Mine, Larego Site This report highlighted findings from a targeted species assessment for all three EPBC listed Black Cockatoo species in terms of direct observation and recorded feeding, foraging behaviour, as well as identification of suitable roosting, feeding and breeding hollow habitat within the Willowdale Mine and Larego Study Area covering 477.7 ha of Jarrah-Marri Forest bioregion. Ground-based, drone and camera searches were conducted, using specific government referral guidelines for all three black cockatoo species. The survey was conducted according to current EPA guidelines. A combined total of 13,267 potential, suitable or known nesting trees were recorded. The vast majority (97%) of these trees were Bamford Class 4 or 5 trees, defined by DAWE, 2022 as potential nesting trees, however these do not currently contain suitable nesting hollows. Analysis of regional habitat extent indicates there is 63,554.92 ha of remnant native vegetation mapped within a 12 km buffer of the Study Area. It is expected that the majority of this vegetation would contain suitable foraging species at the same or greater rate than that present within the Study Area. Therefore, the approximately 470ha of foraging habitat represents 0.74 % of the estimated regional habitat extent. Six locations were recorded that displayed evidence of having been used as a roost site, and based on additional mapping and direct evidence of cockatoo species presence, it is considered highly likely that more roosting sites exist within the Study Area than the six confirmed locations.	Within Willowdale Study Area
Stokes (2011) Orion Long Term Fauna Monitoring Program	Location: six monitoring sites within Alcoa's Orion mine region comprising two typical upland forest areas, two associated with stream zones and two within rehabilitated forest (8 years old). Mammals, birds, reptiles and frogs were surveyed during both summer (March) and winter (July), and ground dwelling invertebrates were sampled in summer only. Survey methods were similar to those used in EMRC (2006) with the addition of a single large trapping transect designed to specifically target Chuditch and species of goanna. This transect covered approx. 880 ha and comprised 40 wire cage traps spaced 300 m apart and was trapped over four successive nights at the same time as the generic mammal survey. A total of 10 mammals (three introduced), 38 birds, 9 reptiles, two frogs, 22 ground invertebrates, 49 ant species was recorded. Recorded threatened fauna comprise: – Chuditch – five males trapped in summer – Quenda – one trapped – Western Brush Wallaby – multiple sightings – Baudin's Black Cockatoo – sightings	Within 10 km of the far western boundary of the Willowdale Study Area

Study	Location and key findings	Location in relation to this region
	– Forest Red-tailed Black Cockatoo - sightings	
McGregor *et al*. (2014). Does forest restoration in fragmented landscapes provide habitat for a wide-ranging carnivore?	Location: Huntly and Willowdale mines Fourteen Chuditch trapping sessions (13 at Huntly, one at Willowdale) across 9 trapping transects (8 at Huntly, one at Willowdale) were undertaken between June 2009 and Dec 2010. Radio collars with a two-stage transmitter and mortality mode were attached to 14 adult Chuditch (9 female, 5 males – all trapped at Huntly). Chuditch were tracked to their dens during the day. Spool and line tracking was also used. In total 29 individual Chuditch were captured on 60 occasions. Of the 14 individuals fitted with radio collars, three were found dead on the Huntly mine access road with evidence of road trauma. Another three Chuditch were also found dead from vehicle strikes along this road. The study identified 138 den sites from 11 tracked animals: 75 in unmined forest and 63 in restored forest ranging from 2-32 years old. In unmined forest, dens were mostly in hollow logs and ground burrows beneath tree stumps, but these substrates were never used in restored forest where dens were mostly ground burrows, usually associated with rock piles at the surface.	Willowdale region.
EMRC (2015) Long Term Fauna Monitoring Program Summary of Results at Orion Mining region.	Location: Numerous plots over the Willowdale Mine area Results of the 3rd survey of the LTFMP. Same methodology and plot locations as 2010 survey of the area. Additionally a large trapping transect targeting Chuditch and remote sensing cameras also deployed. Trapping conducted over 4 nights in both winter and summer seasons. The study results: – Twelve mammal species were trapped – Thirty-five bird species recorded – Thirteen reptile species recorded – Three frog species recorded Results were indicative of some species being affected (not present afterwards or in lower numbers) by the January 2016 wildfire that burnt through the Willowdale Mine and surrounding areas including four of the six Orion sites.	Within Willowdale Study Area
EMRC (2004) Orion LTFMP report 2004 Final	Location: Willowdale -north east portion of Orion region (two healthy forest and two dieback forest plots, two steam zone plots and two plots in rehabilitation) The LTMFP was reviewed in 2003 (Majer, 2003) which included a recommendation for a similar program to be established at Orion so that any differences in faunal successional processes taking place at Willowdale could be detected. Similar techniques to those used at Jarrahdale, Huntly and McCoy. Mammals recorded during the survey included the Chuditch, Quokka, Mardo, Dunnart, Common Brushtail Possum, Western Brush Wallaby. Only one mammal species was recorded in the young rehabilitation (Feral Mouse). Forty-one bird species was recorded including the Baudin's Cockatoo. Bird numbers were highest at steam sites and lowest at rehabilitated sites. Six reptile species were recorded compared with 15 species recorded in the 1999 pre-mining survey. Three frog species were recorded. Fifty ant species were recorded. Further monitoring was recommended to determine successional patterns.	Within Willowdale Study Area
EMRC (1999) A fauna survey of planned mining areas at Alcoa's Orion Mining region	Location: Orion mining region at Willowdale This report provides the results of the fauna survey conducted between February and November 1999. The habitats monitored were poorly surveyed in current mining areas, extensive dieback affected areas, small dieback free areas and on sites where mining operations are planned. A total of 46 bird species, nine mammals (6 native, 3 introduced), 13 reptiles and five frogs were recorded. These included three rare species (the Chuditch, Baudin's Cockatoo and possibly the Quokka) and one Specially Protected species (the Carpet Python). As well as these, the Noisy Scrub-bird has been reintroduced into the area and the uncommon Brush-tailed Phascogale is present albeit in low densities. The fauna of the Orion area was largely comparable to that of existing Willowdale mining areas. Results emphasise the need for ongoing fox control. Rehabilitation using Jarrah and other indigenous species offers the	Within Willowdale Study Area

Study	Location and key findings	Location in relation to this region
	best prospects of successfully recreating suitable habitat for the species. Eleven recommendations were given for managing the area's faunal diversity including: protection of adjacent fauna habitat, construction of fauna habitats and corridors, control of feral species, construction of suitable habitat specific to mammals and reptiles.	
EMRC (2007b) A Vertebrate Fauna Survey of Rehabilitated Areas at Alcoa's Willowdale Minesite	Location: Willowdale (rehabilitated bauxite mine sites) This report details the 2007 results of the long term fauna monitoring. Previous monitoring events occurred in 1994, 2000 (following fox control) and again in 2007. In the 2007 survey a total of 25 bird species, 10 mammals (seven indigenous, three introduced) and five reptiles was recorded in rehabilitation. They included three rare species, viz. the Chuditch, Brush-tailed Phascogale and Forest Red-tailed Black Cockatoo. Numbers of native mammals trapped in rehabilitation were higher than in previous years, with Yellow-footed Antechinus increasing from 0 in 1994 to 6 in 2007; Brush-tailed Phascogales increased from 0 to 1 and Chuditch increased from 0 to 3. Bird species had declined since the 2000 survey. Total numbers of both insectivores and honeyeaters both showed large declines between 1994 and 2000. There was a gradual decline in numbers of the skink *Acritoscincus trilineatus* as the rehabilitated sites become more like upland forest habitat and less suitable for this species. Fifteen recommendations were given for managing the area's faunal diversity including; protection of adjacent fauna habitat, construction of fauna habitats and corridors, control of feral species, construction of suitable habitat specific to mammals and reptiles	Within Willowdale Study Area
EMRC (2001b) A Vertebrate Fauna Survey of rehabilitated areas at Alcoa's Willowdale Mine site	Location: Willowdale (rehabilitated bauxite mine sites) This report details the 2000 fauna monitoring event results after the introduction of fox control following the 1994 monitoring event. A total of 31 bird species, nine mammals (five introduced, four indigenous) and five reptiles was recorded. Although not trapped or recorded in the present survey, both the rare Chuditch and the specially protected Carpet Python have been recently recorded in rehabilitation at Willowdale. Numbers of native mammals trapped in rehabilitation were low, as in 1994. Some evidence suggests that Fox predation may still be a problem near farmland. The 31 bird species recorded in the 2000 survey is less than the 45 recorded in 1994. The five reptile species recorded indicate that the rehabilitation has not yet become more suitable for this fauna group. Fifteen recommendations were given for managing the area's faunal diversity including; protection of adjacent fauna habitat, construction of fauna habitats and corridors, control of feral species, construction of suitable habitat specific to mammals and reptiles.	Within Willowdale Study Area

5. Conclusion

With regards to the Huntly Study Area, a total of eight broad fauna habitat types have been recorded and mapped across portions of the area. Jarrah – Marri forest is by far the most extensive habitat type making up most of the Study Area, with a total percentage of over 55%. This is followed to a lesser extent by a mix of Blackbutt Forest Bullich Forest, Flooded Gum Woodland, Granite Outcrop, Melaleuca Dampland, Mine Rehabilitation, and Cleared Area. A total of 16 species of conservation significance were assessed as being either likely to occur or known to occur within the Huntly Area. Specifically, 15 species were assessed as being known to occur within the Study Area, and one species considered likely to occur. The 15 species of conservation significant species known to occur, based on literature reviews, recent GHD and SLR consultancy surveys and recent and historical database records at state and federal level, consist of all three species of black cockatoos (Baudin's, Carnaby's and Forest Red-tailed), Quenda, Chuditch, South-West Brush-tailed Phascogale and Western Brush Wallaby, Rakali, Quokka, Western False Pipistrelle, Peregrine falcon, Dell's Skink, Carter's Freshwater Mussel, Woylie, and Southern Death Adder. This conclusion is based on numerous confirmed recordings of these species within the Study Area various consultancies, including those conducted by GHD, and the strong correlation of these species utilising Jarrah- Marri forest and other identified fauna habitats within the Huntly Study Area. The remaining one species considered likely to occur consisted of the Masked Owl (South-Western).

With regards to the Willowdale Study Area, a total of eight broad fauna habitat types have been recorded and mapped across portions of the Willowdale Mine area, with a similar overall variety and type to that found for the Huntly Study Area. Jarrah – Marri forest is by far the most extensive habitat type making up most of the Study Area, with a total percentage of over 28%. This is followed to a lesser extent by a mix of Blackbutt Forest, Bullich Forest, Flooded Gum Woodland Granite Outcrop, Melaleuca Dampland, Mine Rehabilitation, and Cleared Areas. These habitats provide an array of microhabitats such as logs, hollows, leaflitter, soft sand and dense foliage with a broad range of floristic species providing a range of foraging, roosting, denning and sheltering habitat.

A total of 17 species of conservation significance were assessed as being either likely to occur or known to occur within the Study Area. Specifically, 5 species were assessed as being known to occur within the Study Area, and a further seven species considered likely to occur. The 5 species of conservation significant species known to occur, based on literature reviews, recent GHD and SLR consultancy surveys and recent and historical database records at state and federal level, consist of all three species of black cockatoos (Baudin's, Carnaby's and Forest Red-tailed), Western Brush Wallaby and Rakali. The remaining 12 species determined as being likely to occur consist of the Western False Pipistrelle, Woylie, Southern Death Adder, Dell's Skink, Peregrine Falcon, Masked Owl (South- Western), Carter's Freshwater Mussel, Quenda, Chuditch, South-West Brush-tailed Phascogale, Western Ringtail Possum and Quokka.

6. References

Allen, G.R., Midgley, S.H. and Allen, M. 2002. Field guide to the Freshwater Fishes of Australia. Western Australian Museum, Perth, Western Australia.

ALCOA World Alumina Australia 2010, 'No 40. *Threatened fauna species management plans for Alcoa's bauxite mining operations in the Jarrah forest'*

Bureau of Meteorology 2024, *Climate statistics for Australian locations*, retrieved June 2024, from **http://www.bom.gov.au/climate**

Burgar, JM, Craig, MD & Stokes, VL 2015, '*The importance of mature forest as bat roosting habitat within a production landscape'*, Forest Ecology and Management, vol 356, pp 112-123.

Burgar, JM, Stokes, VL & Craig, MD 2017, '*Habitat features act as unidirectional and dynamic filers to bat use of production landscapes'*, Biological conversations, vol 209, pp 280-288.

Burn 2000, *A Survey of the impact of burning on mammals and birds in Alcoa's rehabilitated Bauxite mines at Jarrahdale*.

Churchill, S 2008, *Australian Bats*, second edition, Milton, Australia, Allen & Unwin.

Cogger, H 2014, *Reptiles and Amphibians of Australia*, Collingwood, Victoria, CSIRO Publishing

Department of Biodiversity, Conservation and Attractions (DBCA) 2017a, '*Fauna profiles – Chuditch Dasyurus geoffroii',* retrieved from **http://www.dbca.wa.gov.au**

de Tores, P, Hayward, MW, Dillon, MJ & Brazell, RI 2007, *'Review of the distribution, causes for decline and recommendations for management of the quokka, Setonix bracyurus (Macropodidae: Marsupialia), an endemic macropodid marsupial from south-west Western Australia*', Conservation Science Western Australia, vol 6(1), pp 13-73.

Department of Agriculture, Water and the Environment (DAWE) 2021a, '*Atrichornis clamosus in Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Agriculture, Water and the Environment (DAWE) 2021b, '*Calidris acuminata in Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Agriculture, Water and the Environment (DAWE) 2021c, *'Calyptorhynchus banksii naso in Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Agriculture Water and Energy (DAWE) 2022. Referral guidelines for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo. Department of Agriculture, Water and the Environment, Canberra.

Department of Biodiversity, Conservation and Attractions (DBCA) 2017, '*Fauna profiles – Chuditch Dasyurus geoffroii',* retrieved from **http://www.dbca.wa.gov.au**

Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2023, *Environmental Protection and Biodiversity Conservation Act* 1999 Protected Matters Search Tool Results, retrieved May 2022, from http://www.environment.gov.au/epbc/pmst/index.html

Department of Environment and Conservation (DEC) 2013, *'Quokka Setonix brachyurus Recovery Plan'*, Wildlife Management Program No. 56, Department of Environment and Conservation, Perth, WA.

Department of Agriculture, Water and the Environment (DAWE) 2021d, '*Calyptorhynchus baudinii in Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Agriculture, Water and the Environment (DAWE) 2021e, *'Species Profile and Threats Database'*, Department of the Environment, Canberra.

Department of Biodiversity, Conservation and Attractions (DBCA) 2007, *'Naturemap (Dandjoo): Mapping Western Australia's Biodiversity'*, retrieved May 2020, from **http://Naturemap (Dandjoo).dpaw.wa.gov.au/default.aspx/**.

Department of the Environment (DotE) 2015. Referral guideline for 14 birds listed as migratory species under the EPBC Act. Commonwealth of Australia.

Department of Environment and Conservation (DEC) 2012. Chuditch (*Dasyurus geoffroii*) Recovery Plan. Wildlife Management Program No. 54. Department of Environment and Conservation, Perth, Western Australia.

Department of Environment and Conservation DEC 2013, *'Quokka Setonix brachyurus Recovery Plan'*, Wildlife Management Program No. 56, Department of Environment and Conservation, Perth, WA.

de Tores, P, Hayward, MW, Dillon, MJ & Brazell, RI 2007, *'Review of the distribution, causes for decline and recommendations for management of the quokka, Setonix bracyurus (Macropodidae: Marsupialia), an endemic macropodid marsupial from south-west Western Australia*', Conservation Science Western Australia, vol 6(1), pp 13-73.

Doherty, TS, Wingfield, BN, Stokes, VL, Craig, MD, Lee, JGH, Finn, HC & Calver, MC 2016, '*Successional changes in feeding activity by threatened cockatoos in revegetated mine sites'*, Wildlife Research, vol 43, pp 93-104. CSIRO Publishing.

EMRC, 1999. A fauna survey of planned mining areas at Alcoa's Orion Mining region

EMRC, 2001b. A Vertebrate Fauna Survey of rehabilitated areas at Alcoa's Willowdale Mine site

EMRC, 2004. Orion LTFMP report 2004 Final.

EMRC, 2007b. A Vertebrate Fauna Survey of Rehabilitated Areas at Alcoa's Willowdale Minesite

Environmental Management and Research Consultants (EMRC) 1992, *'Long Term Fauna Monitoring Program 1992'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 1995, *'Long term fauna monitoring program 1995'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 1998, *Long Term Fauna Monitoring Program (1998)*, a report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 1999, *'A fauna survey of planned mining areas at Alcoa's Orion Mining Region'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2004, *'A Vertebrate Survey of Rehabilitated Areas at Alcoa's Huntly Mine site – year 2000 results'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2001a, '*Alcoa World Alumina Australia Ltd. Long Term Fauna Monitoring Program - 2001 results'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2001b, *'A Vertebrate Fauna Survey of rehabilitated areas at Alcoa's Willowdale Mine site – Year 2000 results'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2003, *'McCoy Long Term Fauna Monitoring Program 2003'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2006, '*Long term fauna monitoring program 2006'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2007a, '*McCoy Long Term Fauna Monitoring Program –results of the 2007 survey*', report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2007b, 'A Vertebrate Fauna Survey of Rehabilitated Area's at Alcoa's Huntly Minesite -year 2007 results Final Report', report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2007, *'A Vertebrate Survey of Rehabilitated areas at Alcoa's Willowdale Minesite – Year 2007 results'*, report prepared for Alcoa of Australia.

Environmental Management and Research Consultants (EMRC) 2015, '*Long Term Fauna Monitoring Program Summary of Results at Alcoa's Orion Mining Region'*, report prepared for Alcoa of Australia.

Environmental Protection Authority (EPA) 2016a, '*EPA Technical Guidance –Terrestrial Fauna Surveys'*, Perth.

Environmental Protection Authority (EPA) 2016b, 'EPA Technical Guidance – Sampling methods for terrestrial vertebrate fauna', Perth.

Environmental Protection Authority (EPA) 2020, 'EPA Technical Guidance – Sampling methods for terrestrial vertebrate fauna', Perth.

EMRC 2015 Long Term Fauna Monitoring Program Summary of Results at Orion Mining region.

Freegard C 2007. Nomination of a Western Australian species for listing as threatened change of Status or delisting: Woylie. Report. Department of Environment and Conservation, Kensington, WA.

GHD 2024a, Terrestrial Fauna Survey Assessment, Holyoake Mine Development – O'Neil. For Alcoa of Australia Limited. Unpublished Report.

GHD 2024b, Terrestrial Fauna Survey Assessment, Holyoake Mine Development – O'Neil East. For Alcoa of Australia Limited. Unpublished Report.

GHD 2024c, O'Neil East Targeted Woylie Assessment. For Alcoa of Australia Limited. Unpublished report.

GHD 2024d, McCoy Haul Road Fauna Pre-clearance Survey. For Alcoa of Australia. Unpublished report

GHD 2024e. Myara pre-clearance targeted fauna assessment. Prepared for Alcoa of Australia. Unpublished Report.

GHD 2023. Fauna Management Plan, Huntly and Willowdale Mines. For Alcoa of Australia Limited. Unpublished Report.

GHD 2023b. Myara North Terrestrial Fauna Pre-Clearance Survey. For Alcoa of Australia Limited. Unpublished Report.

GHD 2022a, Holyoake East Terrestrial Fauna Survey Assessment, Holyoake Mine Development, For Alcoa of Australia. Unpublished report.

GHD 2022b, Holyoake West Terrestrial Fauna Survey Assessment, Holyoake Mine Development, For Alcoa of Australia. Unpublished report.

GHD 2021, Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine – Holyoake Pinjarra Alumina Refinery Revised Proposal. For Alcoa of Australia Limited. Unpublished Report

Hohnen, R, Ashby, J, Tuft, K, & McGregor, H 2012, *'Individual identification of northern quolls (Dasyurus hallacatus) using remote cameras'*, Australian Mammalogy, CSIRO Publishing. http://dx.doi.org/10.1071/AM12015.

Johnstone, RE 1997, 'Current studies on three endemic Western Australian cockatoos', Eclectus, vol 3, pp 34--35.

Johnstone, RE & Kirkby, T 1999, '*Food of the Forest Red-tailed Black Cockatoo Calyptorhynchus banksii naso in south-west Western Australia', Western Australian Naturalist*, vol 22, pp 167-177.

Johnstone, RE & Storr, GM 1998, Handbook of Western Australian Birds. Volume 1: Nonpasserines (Emu to Dollarbird), Western Australian Museum, Perth.

Johnstone, RE, Kirkby, T & Sarti, K 2017, 'The distribution, status movements and diet of the Forest Red-tailed Black Cockatoo in the south-west with emphasis on the greater Perth regions', Western Australia, Western Australian Naturalist, vol 30 (4), pp 1-193.

Kitchener, DJ 1995, '*Quokka*', In R. Strahan (Ed.) The Mammals of Australia, Australian

Klunzinger MW 2012, 'Ecology, life history and conservation status of Westralunio carteri Iredale 1934, an endemic freshwater mussel of south-western Australia', PHD Thesis, Murdoch University, Perth Western Australia.

Klunzinger, MK, Beatty, SJ, Morgan, DL, & Lymbery, AJ 2012, '*Distribution of Westralunio carteri Iredale, 1934 (Bivalvia: Unionoida: Hyriidae) on the south coast of south-western Australia, including new records of the species'*, Journal of the Royal Society of Western Australia, vol 95, pp 77-81.

Mawson, PR & Johnstone, RE 1997, 'Conservation status of parrots and cockatoos in Western Australia', Eclectus, vol 2, pp 4-9.

Mastrantonis, S, Craig, MD, Renton, M, Kirkby, T & Hobbs, RJ. 2019. *'Climate change indirectly reduces breeding*

McKenzie, N & Start, T. 1999. The Action Plan for Australian Bats 2000. Environment Australia, Canberra, Australia

Menkhorst, P & Knight, F, 2011, *A Field Guide to Mammals of Australia*, third edition, South Melbourne, Australia, Oxford University Press.

Morcombe, M 2014, *Field Guide to Australian Birds,* Steve Parish Publishing, Archerfield, Queensland.

Nevill, SJ 2013, *Birds of Western Australia,* Simon Nevill Publications, Perth, Western Australia.

Pizzey, G & Knight, F 2012, *The Field Guide to the Birds of Australia,* Harper Collins Publishers, Sydney, Australia.

Scida, M and Gration, R 2017, 'Monitoring the threatened brush-tailed phascogale (Phascogale tapoatafa tapoatafa) at Sugarloaf Reservoir, Victoria', Australian Mammalogy, vol 40(2), pp 307-311.

SLR 2024a Huntly – Carter's Freshwater Mussel Targeted Survey, Unpublished

SLR 2024b Huntly Region – Targeted Fauna Survey for Chuditch, Quokka and Woylie, Unpublished

SLR 2024c Huntly Region – Black Cockatoo Habitat Assessment, Unpublished

SLR 2024d Larego Region – Chuditch, Quokka and Woylie Targeted Survey, Unpublished

Stokes, V 2011 Orion Long Term Fauna Monitoring Program

Stokes, V 2012, 'Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Keats Mining Region 2011/12', Internal report for Alcoa of Australia.

Van Dyck, S & Strahan, R 2008, *The Mammals of Australia*, fourth edition, Sydney, Australia, New Holland Publishers.

Way, S, Stokes, V & Majer, J 2013, *'McCoy Long Term Fauna Monitoring Program Report of the 2013 Field Survey'*, report prepared for Alcoa of Australia by Environmental Research Department

Western Environmental 2023. Willowdale Mine Black Cockatoo Targeted Assessment, Unpublished

Wilson, S & Swan, G 2021, *A Complete Guide to Reptiles of Australia*, Sixth edition, Sydney, Australia, New Holland Press.

Appendices

Appendix A

Relevant legislation, background information and conservation codes

Relevant legislation

Federal *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Federal Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (MNES).

The biological aspects listed as MNES include:

– Nationally threatened flora and fauna species and ecological communities
– Migratory species

A person must not undertake an action that has, will have, or is likely to have a significant impact (direct or indirect) on MNES, without approval from the Federal Minister for the Environment.

The EPBC Act is administered by the Department of the Environment and Energy (DEE).

State *Environment Protection Act 1986*

The *Environmental Protection Act 1986* (EP Act) is the primary legislative Act dealing with the protection of the environment in Western Australia. The Act allows the Environmental Protection Authority (EPA), to prevent, control and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing. Part IV of the EP Act is administered by the EPA and makes provisions for the EPA to undertake environmental impact assessment of significant proposals, strategic proposals and land use planning schemes.

The Department of Water and Environment Regulation (DWER) is responsible for administering the clearing provisions of the EP Act (Part V). Clearing of native vegetation in Western Australia requires a permit from the DWER, unless exemptions apply. Applications for clearing permits are assessed by the Department and decisions are made to grant or refuse the application in accordance with the Act. When making a decision the assessment considers clearing against the ten clearing principles as specified in Schedule 5 of the EP Act:

1. Native vegetation should not be cleared if it comprises a high level of biodiversity.
2. Native vegetation should not be cleared if it comprises the whole or a part of or is necessary for the maintenance of a significance habitat for fauna indigenous to Western Australia.
3. Native vegetation should not be cleared if it includes, or is necessary, for the continued existence of rare flora.
4. Native vegetation should not be cleared if it comprises the whole or part of native vegetation in an area that has been extensively cleared.
5. Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
6. Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
7. Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.
8. Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
9. Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.
10. Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

Exemptions for clearing include clearing that is a requirement of a written law or authorised under certain statutory processes (listed in Schedule 6 of the EP Act) and exemptions for prescribed low impact day-to-day activities (prescribed in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004); these exemptions do not apply in environmentally sensitive areas (ESAs).

State *Biodiversity and Conservation Act 2016*

The *Biodiversity Conservation Act 2016* (BC Act) provides for the conservation and protection of biodiversity and biodiversity components, as well as the promotion of the ecologically sustainable use of biodiversity components in Western Australia. The BC Act replaces both the repealed *Wildlife Conservation Act 1950* (WC Act) and the *Sandalwood Act 1929* (Sandalwood Act), as well as their associated regulations. To attain the objectives of the BC Act, principles of ecological sustainable development have been established:

– Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.
– If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
– The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
– The conservation of biodiversity and ecological integrity should be a fundamental consideration indecision-making.
– Improved valuation, pricing and incentive mechanisms should be promoted.

The BC Act is administered by the Department of Biodiversity Conservation and Attractions (DBCA).

State *Biosecurity and Agriculture Management Act 2007*

The *Biosecurity and Agriculture Management Act 2007* (BAM Act) and associated regulations are administered by the Department of Primary Industries and Regional Development (DPIRD) and replace the repealed *Agriculture and Related Resources Protection Act 1976.* The main purposes of the BAM Act and its regulations are to:

– Prevent new animal and plant pests (vermin and weeds) and diseases from entering WA.
– Manage the impact and spread of those pests already present in the state.
– Safely manage the use of agricultural and veterinary chemicals
– Increased control over the sale of agricultural products that contain violative chemical residues.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act. A Declared Pest is a prohibited organism or an organism for which a declaration under Section 22(2) of the Act is in force. Declared Pests may be assigned a control category including: C1 (exclusion), C2 (eradication) and C3 (management). The category may apply to the whole of the State, LGAs, districts, individual properties or even paddocks, and all landholders are obliged to comply with the specific category of control. Categories of control are defined below.

Fauna Conservation codes

The Federal conservation level of fauna species and their significance status is assessed under the EPBC Act. The significance levels for fauna used in the EPBC Act align with the International Union for Conservation of Nature (IUCN) Red List criteria, which are internationally recognised as providing best practice for assigning the conservation status of species. The EPBC Act also protects land and migratory species that are listed under International Agreements. The list of migratory species established under section 209 of the EPBC Act comprises:

– Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II)
– Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China–Australia Migratory Bird Agreement (CAMBA)
– Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)

The State conservation level of fauna species and their significance status also follows the IUCN Red List criteria. Under the BC Act fauna can be listed as Threatened, Extinct and as Specially Protected species.

Threatened species are those are species which have been adequately searched for and are deemed to be, in the wild, either rare, under identifiable threat of extinction, or otherwise in need of special protection, and have been gazetted as such. The assessment of the conservation status of Threatened species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria. Specially protected species meet one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as Threatened or Extinct species under the BC Act cannot also be listed as Specially Protected species.

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna List under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

For the purposes of this assessment, all species listed under the EPBC Act, BC Act and DBCA Priority species are considered significant.

Conservation categories and definitions for EPBC Act and BC Act listed fauna species

Conservation category	Definition
Threatened species	
Critically Endangered (CR)	Threatened species considered to be “facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with criteria set out in section 20 and the ministerial guidelines.
Endangered (EN)	Threatened species considered to be “facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.

Conservation category	Definition
Vulnerable (VU)	Threatened species considered to be "facing a high risk of extinction in the wild in the medium term future as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.
Extinct species	
Extinct (EX)	Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).
Extinct in the Wild (EW)	Species that "is known only to survive in cultivation, in captivity or as a naturalized population well outside its past range, and it has not been recorded in its known habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its lifecycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).
Specially protected species	
Migratory (MI)	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, which are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.
Species of special conservation interest (conservation dependent fauna) (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Other specially protected fauna (OS)	Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Conservation codes for DBCA listed Priority fauna

Priority category	Definition
Priority 1	Poorly-known taxa Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2	Poorly-known taxa Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3	Poorly-known taxa Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Priority category	Definition
Priority 4	Rare, Near Threatened and other taxa in need of monitoring Rare: Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands. Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. Taxa that have been removed from the list of threatened taxa during the past five years for reasons other than taxonomy.

Other significant fauna

Fauna species may be significant for a range of reasons other than those protected by international agreement or treaty, Specially Protected or Priority Fauna. Significant fauna may include short-range endemic species, species that have declining populations or declining distributions, species at the extremes of their range, or isolated outlying populations, or species which may be undescribed (EPA 2010).

References

ANZECC 2000, Core Environmental Indicators for Reporting on the State of Environment, ANZECC State of the Environment Reporting Task Force.

Commonwealth of Australia 2001, National Targets and Objectives for Biodiversity Conservation 2001–2005, Canberra, AGPS.

EPA 2010, Technical Guide – Terrestrial Fauna Surveys, EPA, Perth.

Appendix B

Desktop Based EPBC and BC Act Guidelines and Fauna Species Classifications and Likelihood of Occurrence

Fauna likelihood of occurrence assessment guideline and definitions

Fauna Likelihood of occurrence assessments

Species recorded from studies and database searches

The table presents all vertebrate fauna species recorded in previous studies within or in proximity to the Study Area, and database searches within a 20 kilometre radius of the Study Area.

Fauna Likelihood of Occurrence assessment guidelines

Assessment outcome	Description
Known	Species recorded during the field survey or from recent, reliable records from within or close proximity to the Study Area.
Likely	Species are **likely** to occur in the Study Area where there is suitable habitat within the Study Area and there are recent records of occurrence of the species in close proximity to the Study Area. OR Species known distribution overlaps with the Study Area and there is suitable habitat within the Study Area.
Possible/ Potential	Species are **possible or potentially** occurring in the Study Area where there are small sections of suitable habitat within the Study Area and there are recent records of occurrence of the species that are not in close proximity to the Study Area. OR Species known distribution overlaps with the Study Area.
Unlikely	Species assessed as **unlikely** include those species previously recorded within 40 km of the Study Area however: There is limited (i.e. the type, quality and quantity of the habitat is generally poor or restricted) habitat in the Study Area. The suitable habitat within the Study Area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the Study Area. OR Those species that have a known distribution overlapping with the Study Area however: There is limited habitat in the Study Area (i.e. the type, quality and quantity of the habitat is generally poor or restricted). The suitable habitat within the Study Area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the Study Area.
Highly unlikely	Species that are considered highly unlikely to occur in the Study Area include: Those species that have no suitable habitat within the Study Area. Those species that have become locally extinct, or are not known to have ever been present in the region of the Study Area.

Source information - desktop searches

NM – *DBCA Naturemap (Dandjoo)/Dandjoo* (accessed August 2024)

PMST – DAWE Protected Matters Search Tool (PMST) to identify fauna listed under the EPBC Act potentially occurring within the Study Area (accessed August 2024).

Definitions

Term	Description
Database search area	A 20 km buffer around the Study Area
Study Area	the area subject to the current survey
CR	Critically endangered under the EPBC Act or BC Act
EN	Endangered under the EPBC Act or BC Act
VU	Vulnerable under the EPBC Act or BC Act
IA	Migratory birds protected under an international agreement
MI, MA	Migratory, Marine
CD	Conservation dependent fauna
OS	Other specially protected fauna under the BC Act

P1	Priority 1: Poorly known fauna. Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Term	**Description**
P2	Priority 2: Poorly known species. Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3	Priority 3: Poorly known species. Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	Priority 4: Rare, Near Threatened and other species in need of monitoring. (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Fauna Likelihood of Occurrence assessment of significant species relevant to the Huntly Study Area

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
Atrichornis clamosus	Noisy Scrub-bird	EN	EN	The Noisy Scrub-bird inhabits areas with dense understorey or lower stratum of sedges and shrubs, dense leaf litter and abundant litter-dwelling invertebrates. It mainly occurs in low closed forests 5–15 m in height that are dominated by Eucalyptus or Agonis and *Banksia littoralis*, and occur in the steep and wetter gullies, and drainage lines of hills and granite mountains (Eucalyptus), and on the margins of freshwater lakes (Agonis and *B. littoralis*). It is also common in low closed forests up to 5 m in height that are dominated by *Hakea elliptica*, Eucalyptus or Agonis and *B. littoralis* and occur around granite outcrops, in shallower and drier gullies and on the margins of freshwater lakes. It mostly occurs at sites that have not been burnt for 10 or more years. It occurs at two locations in the south west; on the mainland in coastal areas from Two Peoples Bay Nature Reserve to Cheyne Beach, and on Bald Island (DAWE 2022b).	**Unlikely.** Some historical relocation attempts within the wider region have occurred, but no reliable recordings for the species have been made within the Huntly Study Area	PMST, Naturemap (Dandjoo), DBCA, EMRC
Botaurus poiciloptilus	Australasian Bittern	EN	EN	The Australasian Bittern's preferred habitat is wetlands with tall dense vegetation. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds (e.g. *Phragmites*, *Cyperus*, *Eleocharis*, *Juncus*, *Typha*, *Baumea*, *Bolboschoenus*) or cutting grass (*Gahnia*) growing over a muddy or peaty substrate. In the South-West, the Bittern is largely confined to coastal areas, especially along the south coast. It also occurs around swamps, lakes, pools, rivers and channels fringed with lignum *Muehlenbeckia*, cane grass *Eragrostis* or other dense vegetation (Marchant 1990). They can be found in reed beds near Two Peoples Bay, in lakes near Mt Manypeaks, and the Lake Muir area (Nevill 2013).	**Highly Unlikely.** Suitable habitat for the species does not occur within the Huntly Study Area.	Naturemap(Dandjoo), DBCA,
Calidris ferruginea	Curlew Sandpiper	CR	CR	Curlew Sandpipers mainly occur in areas with soft mud conditions, including intertidal mudflats in	**Highly Unlikely**	PMST, Naturemap(Dandjoo), DBCA

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Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are found inland less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. In WA, they are widespread around coastal and subcoastal plains from Cape Arid to south-west Kimberley Division but are more sparsely distributed between Carnarvon and Dampier Archipelago (DAWE 2021e). They are common on the Swan Coastal Plain, particularly near large drying lakes like Thompson and Forrestdale, and Peel Inlet. They are less common along the southern coast to Esperance (Nevill 2013).	The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Huntly Study Area are very rare.	
Calidris ruficollis	Red-necked Stint	MI	MI	The Red-necked Stint breeds in north-eastern Siberia and northern and western Alaska. It follows the East Asian-Australasian Flyway to spend the southern summer months in Australia. It is found widely in Australia, except in the arid inland. In Australia, Rednecked Stints are found on the coast, in sheltered inlets, bays, lagoons, estuaries, intertidal mudflats and protected sandy or coralline shores (Pizzey and Knight 2012).	**Highly Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	PMST, Naturemap(Dandjoo), DBCA
Calidris subminuta	Long-toed Stint	MI	MI	In WA the species is found mainly along the coast, with a few scattered inland records. On the south coast the Long-toed Stint is found from Esperance to Albany and inland to Lake Cassencarry and Dumbleyung. On the south-west coast the species is known from the Vasse River estuary, Guraga Lake and the Namming Nature Reserve. The species has occasionally been recorded in the Gascoyne Region, around Lake Wooleen, Meeberrie Station and McNeill Claypan. It is widespread around the Pilbara region and the Kimberley Division between Karratha and Wyndham-Kununurra (DEE 2019b). It occurs in a variety of terrestrial wetlands. They prefer shallow freshwater or brackish wetlands including lakes,	**Highly Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	PMST, Naturemap(Dandjoo), DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				swamps, river floodplains, streams, lagoons and sewage ponds.		
Calidris tenuirostris	Great Knot	CR	CR	The Great Knot has been recorded around the entirety of the Australian coast, with a few scattered records inland. It is now absent from some sites along the south coast where it used to be a regular visitor (Garnett and Crowley 2000). The greatest numbers are found in northern Australia; where the species is common on the coasts of the Pilbara and Kimberley, from the Dampier Archipelago to the Northern Territory border, and in the Northern Territory from Darwin and Melville Island, through Arnhem Land to the south-east Gulf of Carpentaria. In Australasia, the species typically prefers sheltered coastal habitats, with large intertidal mudflats or sandflats. This includes inlets, bays, harbors, estuaries, and lagoons (DEE 2019b).	**Highly Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	PMST, Naturemap(Dandjoo), DBCA
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	The Forest Red-tailed Black Cockatoo inhabits the dense Jarrah, karri, and Marri forests receiving more than 600 mm annual average rainfall but also occurs in a range of other forest and woodland types, including Blackbutt (*E. patens*), Wandoo (*E. wandoo*), Tuart (*E. gomphocephala*), Albany Blackbutt (*E. staeri*), Yate (*E. cornuta*), and Flooded Gum (*E. rudis*) (DAWE 2021b). Habitats tend to have an understorey of balga (*Xanthorrhoea* spp.), kingia (*Kingia australis*), snottygobble (*Persoonia* spp.), parrot bush (*Banksia sessillis*), holly-leaved mirbelia (*Mirbelia dilatata*), bull banksia (*B. grandis*), bullich (*Taxandria* spp.) and sheoak (*Allocasuraina fraseriana*). They are most common in the Jarrah forest region of the northern Darling Range from Collie north to Mundaring and are very local throughout the lower south-west. They can be found on the Swan Coastal Plain, mainly in search of food the exotic white cedar (*Melia azedarach*). There are also several small, isolated populations in the eastern parts of its range (DAWE 2021b).	**Known.** This species has been recorded during surveys from several consultants via remote cameras and several locations. The Huntly Study Area provides suitable roosting, foraging and potential breeding habitat to support this species, notably Jarrah-Marri forest and additional habitats such as BlackButt Forest.	NatureMap(Dandjoo), PMST, DBCA GHD, SLR Western Environmental, Stokes, EMRC

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
Charadrius leschenaultii	Greater Sand Plover	VU	VU	In Australia, the Greater Sand Plover occurs in coastal areas in all states, though the greatest numbers occur in northern Australia, especially the north-west (Marchant & Higgins 1993). In northern Australia, the species is especially widespread between North West Cape and Roebuck Bay in WA; there are sparsely scattered records from the largely inaccessible area between Roebuck Bay and Darwin, but it often occurs in the Top End of the Northern Territory, including on Groote Eylandt (DCCEEW 2022).	**Highly Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	PMST, Naturemap/Dandjoo, DBCA
Chlidonias leucopterus	White-winged Tern	MI	MI	White-winged Black Terns are non-breeding migrants to Australia from the North. They arrive anywhere along the tropical coast of Australia and disperse around basically the entire Australian seaboard, including the East coast of Tasmania and many small offshore islands. They can be found farther inland, in parts of the Great Dividing Range and in particular in the central part of the Murray-Darling Basin near the NSW/VIC border. There are also White-winged Black Terns in an area around Perth, WA. Elsewhere on the continent White-winged Black Terns are found only rarely, and never in the great deserts of WA/SA/NT or the Nullarbor. White-winged Black Terns live around lakes including ephemeral lakes, in estuaries and in coastal waters.	**Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	PMST, Naturemap/Dandjoo, DBCA
Zanda baudinii	Baudin's Black Cockatoo	EN	EN	Baudin's Black Cockatoo mainly occurs in eucalypt forests, especially Jarrah, Marri and karri forest that receives 750 mm of annual rainfall. The species is less frequently in woodlands of wandoo (*Eucalyptus wandoo*), blackbutt (*E. patens*), flooded gum (*E. rudis*), yate (*E. cornuta*), partly cleared farmlands and urban areas. The range of the species extends from Albany northward to Gidgegannup and Mundaring (east of Perth), and inland to the Stirling Ranges and near Kojonup. Preferred roosts are in areas with a dense canopy close to permanent sources of water (DAWE 2021c).	**Known.** This species has been recorded during surveys from several consultants opportunistically and via remote cameras at several locations. The Huntly Study Area provides suitable roosting and foraging habitat to support this species.	Naturemap (Dandjoo), PMST, DBCA , GHD, SLR, Western Environmental, Stokes

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
Zanda latirostris	Carnaby's Black Cockatoo	EN	EN	Carnaby's Cockatoo occurs in uncleared or remnant native eucalypt woodlands, especially those that contain Salmon gum, Wandoo, Marri, Jarrah and Karri, and in shrubland or kwongan heathland dominated by Hakea, Dryandra, Banksia and Grevillea species. Breeding activity is restricted to eucalypt woodlands mainly in the semiarid and subhumid interior, from Kalbarri in the north, Three Springs District south to the Stirling Range, west to Cockleshell Gully and east to Manmanning. The species has expanded its breeding range westward and south into the Jarrah-Marri forests of the Darling Scarp and into the tuart forests of the Swan Coastal Plain, including the Yanchep area, Lake Clifton and near Bunbury. It nests in trees older than 120-150 years (DAWE 2021d).	**Known.** This species has been recorded during surveys from several consultants via remote cameras and several locations. The Huntly Study Area provides suitable roosting, foraging, and potential breeding habitat to support this species.	Naturemap (Dandjoo), PMST, DBCA , GHD, SLR, Western Environmental
Falco peregrinus macropus	Peregrine Falcon	OS	-	The Peregrine Falcon is found on and near cliffs, gorges, timbered watercourses, riverine environments, wetlands, plains, open woodlands, and pylons and spires of buildings, though less frequently in desert regions (Morcombe 2004; Pizzey & Knight 2012). They are not common but can be found almost anywhere throughout WA and in the southwest, including particularly at Fitzgerald River, Stirling Range, Porongurup National Parks, Kondinin, and Peak Charles, with many more locations north of Perth (Nevill 2013).	**Known** Recent records from 2024 from within the region, including GHD, recorded within the Huntly Study Area, and suitable foraging habitat and prey species are known within the area, along with DBCA recordings within the Study Area.	Naturemap/Dandjoo, DBCA, GHD,
Glareola muldivarum	Oriental Pratincole	MI	MI	Non-breeding habitat only: monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodlands. Frequently at edges or ecotones between habitat types. Riparian forest is favoured habitat in the Kimberley region. Typically in denser vegetation with more closed canopy (DCCEEW 2023).	**Unlikely.** No significant suitable foraging habitat and prey species are known within the area.	PMST, Naturemap/Dandjoo, DBCA
Hydropogne caspia	Caspian Tern	MI	MI	The Caspian Tern is mostly found in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred. They also occur on near-coastal or inland terrestrial wetlands	**Highly Unlikely**. The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species	PMST, NatureMap/Dandjoo, DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. They also use artificial wetlands, including reservoirs, sewage ponds and saltworks. In offshore areas the species prefers sheltered situations, particularly near islands, and is rarely seen beyond reefs (DEE 2019b).	within the Huntly Study Area are very rare	
Leipoa ocellata	Malleefowl	VU	VU	The Malleefowl generally occurs in semi-arid areas of WA, in shrublands and low woodlands that are dominated by mallee vegetation, as well as native pine Callitris woodlands, Acacia shrublands, paperbark, sheoak, Broombush *Melaleuca uncinata* vegetation, eucalypt woodlands, or coastal heathlands. Mostly they are found where there are sandy or gravel soils. The nest is a large mound of sand or soil and organic matter (Jones & Goth 2008; Morcombe 2014; Nevill 2013). In WA they are found from the southwest Nullarbor to Albany, north, and then west from Moore River up to Shark Bay, past Cue, across to Wiluna and east to the northern Victoria Desert south of the Blackstone Ranges (Nevill 2013; Pizzey & Knight 2012).	**Unlikely** Regional records are historical. The Study Area does not contain suitable undisturbed habitat to support this species. The area is too readily logged and burnt to persist in the area.	Naturemap (Dandjoo), Dandjoo,PMST & DBCA
Limosa lapponica	Bar-tailed Godwit	MI	MI	Bar-tailed Godwits arrive in Australia each year in August from breeding grounds in the northern hemisphere. Birds are more numerous in northern Australia Bar-tailed Godwits inhabit estuarine mudflats, beaches and mangroves. They are common in coastal areas around Australia. They are social birds and are often seen in large flocks and in the company of other waders (Birdlife Australia 2019).	**Highly Unlikely.** The Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Huntly Study Area are very rare.	PMST, Naturemap/Dandjoo, DBCA
Limosa limosa	Black-tailed Godwit	MI	MI	In Australia the Black-tailed Godwit has a primarily coastal habitat environment. The species is commonly found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; occasionally recorded on rocky coasts or coral islets. The use of habitat often	**Highly Unlikely.** The Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	Naturemap/Dandjoo, DBCA, PMST

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				depends on the stage of the tide. It is also found in shallow and sparsely vegetated, near coastal, wetlands; such as saltmarsh, salt flats, river pools, swamps, lagoons and floodplains. There are a few inland records, around shallow, freshwater and saline lakes, swamps, dams and bore-overflows. They also use lagoons in sewage farms and saltworks (Higgins & Davies 1996).		
Numenius madagascariensis	Eastern Curlew	CR	CR	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, sometimes within the mangroves, and in coastal saltworks and sewage farms. In the south west, Eastern Curlews are recorded from Eyre, and there are scattered records from Stokes Inlet to Peel Inlet (Marchant & Higgins 1993). They are uncommon further south of Geraldton, but can be spotted in Alfred Cove, Peel Inlet and the Albany region (Nevill 2013).	**Highly Unlikely** The Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Huntly Study Area are very rare.	DBCA, Naturemap/Dandjoo & PMST
Oxyura australis	Blue-billed duck	P4	-	The blue-billed Duck is a small Australian almost entirely aquatic duck, with both the male and female growing to a length of 40 cm. The male has a slate-blue bill which changes to bright blue during the breeding season. The Blue-billed Duck is endemic to Australia's temperate regions, ranging from the South-West of WA, extending to southern Queensland, through New South Wales and Victoria, to Tasmania. The species is readily seen on freshwater lakes and billabongs where deep fresh water is present (Morcombe 2004).	**Unlikely.** While database records for the species do exist in the wider areas surrounding the Huntly Study Area, suitable freshwater sources and lakes and wetlands are not present for persistent species presence.	DBCA, Naturemap/Dandjoo
Pandion cristatus	Osprey	MI	MI	The breeding range of the Osprey extends around the northern coast of Australia (including many offshore islands) from Albany in WA to Lake Macquarie in NSW; with a second isolated breeding population on the coast of South	**Unlikely.** While database records for the species do exist in the wider areas surrounding the Huntly Study Area, suitable coastal environments and	DBCA, Naturemap/Dandjoo

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				Australia, extending from Head of Bight east to Cape Spencer and Kangaroo Island. Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands (DCCEEW 2022).	feeding and nesting habitats are not present for persistent species presence.	
Philomachus pugnax	Ruff	MI	MI	In Australia the Ruff is found on generally fresh, brackish of saline wetlands with exposed mudflats at the edges. It is found in terrestrial wetlands including lakes, swamps, pools, lagoons, tidal rivers, swampy fields and flood-lands. They are occasionally seen on sheltered coasts, in harbours, estuaries, seashores and are known to visit sewage farms and saltworks. They are sometimes found on wetlands surrounded by dense vegetation including grass, sedges, saltmarsh and reeds. They have been observed on sand spits and other sandy habitats including shingles. The Ruff forages on exposed mudflats, in shallow water and occasionally on dry mud. They have been observed foraging in dry waterside plants and in swampy areas next to aeration tanks in sewage farms. They prefer to roost amongst shorter vegetation (Higgins & Davies 1996).	**Highly Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	DBCA, Naturemap/Dandjoo
Plegadis falcinellus	Glossy Ibis	MI	MI	The Glossy Ibis' preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes, and coastal lagoons. Within Australia, the largest contiguous areas of prime habitat are in inland and northern floodplain areas (Marchant and Higgins 1990).	**Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species have been on the outskirts of the current Huntly Study Area buffer zone.	DCBA, Naturemap/Dandjoo
Pluvialis fulva	Pacific Golden Plover	MI	MI	The Pacific Golden Plover breeds on the Arctic tundra in western Alaska. It winters in South America and islands of the Pacific Ocean to India, Indonesia and Australia. In Australia it is widespread along the coastline. Pacific Golden Plovers usually occur on beaches, mudflats and sandflats (sometimes in vegetation such as	**Highly Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	DBCA, Naturemap/Dandjoo

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				mangroves, low saltmarsh such as Sarcocornia, or beds of seagrass) in sheltered areas including harbours, estuaries and lagoons, and also in evaporation ponds in saltworks. The species is also sometimes recorded on islands, sand and coral cays and exposed reefs and rocks (DEE 2019b).		
Pluvialis squatarola	Grey Plover	MI	MI	The Grey Plover breeds around the Arctic regions and migrates to the southern hemisphere, being a regular summer migrant to Australia, mostly to the west and south coasts. It is generally sparse but not uncommon in some areas. It is occasionally found inland. It is almost entirely coastal, being found mainly on marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats for feeding, sandy beaches for roosting, and also on rocky coasts (Birdlife Australia 2019).	**Highly Unlikely.** the Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Huntly Study Area are very rare.	DBCA, Naturemap/Dandjoo
Thalasseus bergii	Greater Crested Tern	MI	MI	Crested Terns occur singularly or in flocks in coastal areas, estuaries, inlets, islands and occasionally on large inland lakes or rivers. They are often seen perching with gulls on beaches, sand spits or jetties. Crested Terns are widespread from the south coast of Africa north to Asia, south to Australia and east to Polynesia. They also occur on many islands in the Indian and Pacific Oceans (DEE 2018).	**Highly Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Huntly Study Area are very rare.	DBCA, Naturemap/Dandjoo
Tringa brevipes	Grey-tailed Tattler	MI	MI	Within Australia, the Grey-tailed Tattler has a primarily northern coastal distribution and is found in most coastal regions. It is found in the south-west between Augusta and Cervantes (DAWE 2021d).	**Highly Unlikely** The Huntly Study Area lacks suitable wetland or shoreline habitat.	Naturemap (Dandjoo), DBCA
Tringa glareola	Wood Sandpiper	MI	MI	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. Wood Sandpipers are more numerous in the north than the south of Australia and are also found in New Guinea, Africa, the Indian subcontinent and South-east Asia. They breed widely across the north of Europe and Asia, mostly in Scandinavia, Baltic countries and Russia.	**Highly Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	Naturemap (Dandjoo), DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				They are the most abundant migratory wader in non-coastal areas of Asia (DEE 2019b).		
Tringa nebularia	Common Greenshank	MI	MI	The Common Greenshank is a heavily built, elegant wader, 30–35 cm in length, with a wingspan of 55–65 cm and weight up to 190 g for both males and females. The bill is long and slightly upturned and the legs are long and yellowish-green. In flight, all plumages show uniformly dark upper-wing and contrasting white rump extending in a white wedge up the back, whitish tail and tips of toes projecting slightly beyond the tip of the tail. The sexes are alike (Higgins & Davies 1996). The species is seen singly or in small to large flocks (sometimes hundreds) in a variety of coastal and inland wetlands. The Common Greenshank does not breed in Australia, however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia (Higgins & Davies 1996). It occurs around most of the coast from Cape Arid in the south to Carnarvon in the north-west. In the Kimberleys it is recorded in the south-west and the north-east, with isolated records from the Bonaparte Archipelago (Higgins & Davies 1996).	**Highly Unlikely.** The Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	Naturemap (Dandjoo), DBCA
Tringa stagnatilis	Marsh Sandpiper	MI	MI	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In north Australia they prefer intertidal mudflats (Higgins & Davies 1996), although surveys in Kakadu National Park recorded more birds around shallow freshwater lakes than in areas influenced by tide. At the Top End they often use ephemeral pools on inundated freshwater and tidal floodplains	**Highly Unlikely.** The Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	Naturemap (Dandjoo), Dandjoo, DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				(Higgins & Davies 1996). They are found infrequently around mangroves (Higgins & Davies 1996).		
Tyto novaehollandiae novaehollandiae	Masked Owl (southern sub species)	P3	-	The Masked Owl is found in forests (wet and dry sclerophyll, non-eucalypt dominated), open woodlands, farmlands or scrub with large trees (12-20 m) and adjacent cleared country, timbered watercourses, paperbark woodlands, and caves (Pizzey & Knight 2012). It requires large hollows in old growth eucalypts or bare sand or the earth of a cave for nesting, and often favours areas with dense understorey or ecotones comprising dense and sparse ground cover. It is often recorded foraging within 100-300 m of the boundary of two vegetation types (Bell & Mooney 2002). The bird is restricted to the thicker humid forests of the southwest region, particularly in the Pemberton and Manjimup area and along the Murray River in the Lane Poole area (Kavanagh & Murray 1996). It nests in hollows in large Karri (*Eucalyptus diversicolor*), Marri (*Corymbia calophylla*) and Jarrah (*E. marginata*) trees (Nevill 2013).	**Known** This species is known to occur in the region. Suitable habitat occurs within the Huntly Study Area. This species was recorded in the O'Neil section of the overall Alcoa region.	Naturemap (Dandjoo), DBCA &GHD
Apus pacificus	Fork-tailed Swift	Mi	Mi	The Fork-tailed Swift is common in coastal and sub coastal areas between Carnarvon and Augusta including near and offshore islands. There are scattered records along south coast from Denmark east to Cocklebiddy on the Great Australian Bight, and sparsely scattered records inland. They are found across a range of habitats, from inland open plains to wooded areas. They are most often observed over inland plains in Australia, but sometimes recorded over coastal cliffs and beaches as well as urban areas. They have been recorded well out to sea as well as from offshore islands especially when on passage from Indonesia. This species is almost exclusively aerial (DotE 2015).	**Unlikely** The species is occasionally observed in the south-west of WA but roosting infrequently. May occasionally fly over Huntly Study Area.	PMST
Rostratula australis	Australian Painted Snipe	En	En	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and	**Highly Unlikely** The Huntly Study Area lacks suitable wetlands, and the	PMST

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire. It sometimes use areas that are lined with trees, or that have some scattered fallen or washed-up timber (DAWE 2021e). In the south west it can be found around Carnarvon and wetlands north of Perth, particularly those west of Moora and Gingin (Nevill 2013).	species is not typically known from this region.	
Motacilla cinerea	Grey Wagtail	Mi	Mi	The Grey Wagtail is an opportunistic migrant to Australia. The species typically migrates to Indonesia occasionally landing in Australia. Most records for the species are from Northern Australia and South Australia (Morcombe 2004). The non-breeding habitat only of the Grey Wagtail has a strong association with water, particularly rocky substrates along water courses but also lakes and marshes (DAWE 2021e). It can be found mainly in banks and rocks in fast-running freshwater habitats: rivers, creeks, streams, and around waterfalls, both in forest and open country; but occurs almost anywhere during migration (Johnstone & Storr 2004).	**Highly Unlikely** The Huntly Study Area lacks suitable habitat, and the species is not typically known from this area.	PMST
Actitis hypoleucos	Common Sandpiper	Mi	Mi	The Common Sandpiper is found along all coastlines of Australia and uses a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around often narrow and steep muddy margins or rocky shores. The species has been recorded in estuaries and deltas of streams, as well as on banks further upstream; around lakes, pools, mangroves, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. It is often found near mangroves, and sometimes in areas of mud littered with rocks or snags (DAWE 2021e). They are somewhat uncommon in the south west, but can be found on Rottnest and Penguin Islands, and along the south coast all the	**Highly Unlikely** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Study Area are very rare.	PMST, Naturemap/Dandjoo, DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				way to the Esperance region, including the inland lakes like Lake Warden (Nevill 2013).		
Calidris acuminata	Sharp-tailed Sandpiper	Mi	Mi	In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. Sometimes they occur on rocky shores (DAWE 2021e). They are found throughout many wetlands on the Swan Coastal Plain, in Perth lakes with wet grassed margins and receding waters, Vasse and Harvey Estuaries, and the Busselton wetlands, but are less common on the south coast until the Esperance region (Nevill 2013).	**Highly Unlikely** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Huntly Study Area are very rare.	PMST, DBCA, Naturemap/Dandjoo,
Calidris canutus	Red Knot	EN	EN	In Australasia, the Red Knot mainly inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps (DCCEEW 2022).They are found near mudflats and estuaries from Murchison to Bunbury but are then uncommon from Wilson Inlet to Esperance. In the Perth region they are mainly found in Alfred Cove and Peel Inlet (Nevill 2013).	**Highly Unlikely.** The Huntly Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Huntly Study Area are very rare.	PMST, Naturemap/Dandjoo, DBCA
Calidris melanotos	Pectoral Sandpiper	Mi	Mi	In Australia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at	**Highly Unlikely**	PMST, Naturemap/Dandjoo,DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The bird can be seen on the Swan Coastal Plain but is rare to scarce on Lake Thompson, and as well on any freshwater wetland in the southwest with shallow, well-grassed margins. They are seen at Lake Warden, Esperance, and at Lake McLarty (Nevill 2013).	The Study Area lacks suitable wetland or shoreline habitat, and recordings of the species within the Huntly Study Area are very rare.	
MAMMALS						
Bettongia penicillata ogilbyi	Woylie	CR	CR	Preferred habitat for the Woylie includes dense undergrowth, logs and rock-cavities and occasionally in burrows (Burbidge 2004). Scattered Woylie populations may be found throughout the Jarrah forest in the south-west corner of WA. Extant naturally occurring populations of the species are restricted to three small wheatbelt reserves – Dryandra Woodland, Tutanning Nature Reserve and Perup Forest. All are characterised by the presence of thickets of the plant *Gastrolobium* (Van Dyck and Strahan 2008). The species is now restricted to forests and areas where predation has been controlled (or excluded). It rests during the day in a well-concealed nest, built over a shallow depression. The nest is most commonly built using long strands, of grasses, but other material such as strips of bark are also used (in the forest) or dried seagrass and/or triodia (in arid coastal areas) (Freegard 2007).	**Known** Woylies were recorded in the Alcoa operations area of the O'Neil region in 2023, and additional confirmed recordings of the species were made in the O'Neil region by Spectrum in 2024. Additional DBCA records have also been made within the Huntly Study Area.	Naturemap/Dandjoo, PMST, & DBCA, GHD and Spectrum
Dasyurus geoffroii	Chuditch	VU	VU	The Chuditch inhabits eucalypt forest (especially Jarrah, *Eucalyptus marginata*), dry woodland, mallee shrublands, heaths, and desert, particularly in the south coast of WA. They also occur at lower densities in drier woodland and mallee shrubland in the goldfields and wheatbelt, as well as in Kalbarri National Park (translocated). Chuditch require	**Known** This species has been recorded during surveys from several consultants via remote cameras and several locations. The Huntly Study Area provides suitable denning and	Naturemap/Dandjoo, PMST, DBCA, GHD, SLR, Stokes, EMRC,

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				adequate numbers of suitable den and refuge sites (horizontal hollow logs or earth burrows) to survive (DEC 2012b). In Jarrah forest, Chuditch populations occur in both moist, densely vegetated, steeply sloping forest and drier, open, gently sloping forest (Van Dyck & Strahan 2008). The species can travel large distances, and for this reason requires habitats that are of a suitable size and not excessively fragmented.	foraging/hunting habitat to support this species.	
Hydromys chrysogaster	Rakali, Water-rat	P4	-	The Water Rat lives in the vicinity of permanent bodies of fresh, brackish, or marine water, lakes and farm dams, and on sheltered coastal beaches, mangroves and offshore islands. In the south-west of WA they have been shown to prefer areas with riparian vegetation, better water quality and a degree of habitat complexity. Woody debris, rock ledges and wetland islands are likely to be important areas for feeding and refuge (DEC 2012a). It is an occasional vagrant to temporary waters. Water Rat's dens are made at the end of tunnels in banks and occasionally in logs (Van Dyck & Strahan 2008).	**Known** DBCA records of the species within the Study Area and confirmed recordings made from previous surveys within the Huntly Study Area, particularly through Dandalup Dam.	Naturemap/Dandjoo, DBCA, SLR, GHD.
Falsistrellus mackenziei	Western False Pipistrelle	P4	-	The Western False Pipistrelle occurs in wet sclerophyll forest dominated by Karri, and in the high rainfall zones of the Jarrah and Tuart dry sclerophyll forests. The species is restricted to areas in or adjacent to stands of old growth forest. Marri, Sheoak and Peppermint are often codominant at its collection localities (Churchill 2008; McKenzie and Start 1999).	**Known** This species is known from this region. Suitable habitat of Jarrah – Marri woodland is found within the Huntly Study Area. Furthermore, the species has also been recorded in the O'Neil site of the overall Alcoa project region.	Naturemap, Dandjoo, DBCA & GHD
Isoodon fusciventer	Quenda (Southern Brown Bandicoot)	P4	-	The Quenda prefers dense scrubby, often swampy, vegetation with dense cover up to one metre high. However, it also occurs in woodlands, and may use less ideal habitat where this habitat occurs adjacent to the thicker, more desirable vegetation. The species often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (Van Dyck & Strahan 2008).	**Known** This species has been recorded during surveys from several consultants via remote cameras at several locations. The Huntly Study Area provides suitable denning and foraging/hunting habitat to support this species.	Naturemap/Dandjoo, DBCA &GHD, SLR,, Stokes

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
Myrmecobius fasciatus	Numbat	EN	EN	Current Numbat populations occupy several different habitat types: upland Jarrah forest, open eucalypt woodland, banksia woodland and tall closed shrubland. The only remaining original subpopulations are at Dryandra Woodland and the Upper Warren area (including Tone Perup Nature Reserve, Greater Kingston National Park and adjoining State Forest). In WA there are nine translocation sites, including Boyagin Nature Reserve, Tutanning Nature Reserve, Batalling block and Karroun Hill Nature Reserve (see DPaW 2015 for complete list and details). At Dryandra, numbats inhabit brown mallet (*Eucalyptus astringens*) plantations. Habitats usually have an abundance of termites in the soil, and hollow logs, tree hollows, burrows and branches for shelter (DAWE 2021e; Van Dyck & Strahan 2008).	**Potential** Historical records include the region. A resident population occurs in the Narrogin area and re-introduced population at Boyagin rock. However, no records of the species have been made from studies within the Study Area.	Naturemap/Dandjoo & DBCA,.
Notamacropus eugenii	Tammar Wallaby	P4	-	This Tammar wallaby is a smaller species of true macropod reaching a maximum of 7kg and a grey-brown coat with a distinctive dark mid-line on the forehead. The species has a preference for dense, coastal heath and scrub, with some dry sclerophyll forests with significant cover. Their current distribution across Western Australia is limited to Dryandra, Tutanning and Perup forests, and offshore islands of Garden, Middle and Recherche Archipelago (Menkhorst & Knight, 2004).	**Unlikely.** Some suitable habitat for the species does occur within the Huntly Study Area but records of the species and it's known and current distributions are outside of the current Huntly Study Area and no records have been made from surveys conducted.	DBCA, Naturemap/Dandjoo
Notamacropus irma	Western Brush Wallaby	P4	-	The Western Brush Wallaby is found primarily in open forest or woodland, particularly favouring open, seasonally- wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland and is uncommon in karri forest (DEC 2011; Van Dyck & Strahan 2008).	**Known** This species has been recorded during surveys from several consultants via remote cameras at several locations. The Huntly Study Area provides suitable denning and foraging/hunting habitat to support this species, especially Jarrah-Marri forest.	Dandjoo, DBCA & GHD, SLR, EMRC, Stokes
Phascogale tapoatafa wambenger	South-west Brush Tailed Phascogale	CD	-	The Brush-tailed Phascogale is sparsely distributed outside the semi-arid zone in dry sclerophyll forest and monsoonal forest and woodland. The species is generally rare and threatened by habitat	**Known** This species has been recorded during surveys from several	Dandjoo, DBCA & GHD, SLR

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				fragmentation in the south west of WA. (Scida et al 2017). Habitat varies but forest or woodlands is required with large trees to provide hollows and cover. Canopy connection provides excellent cover and connectivity for the species to mover through their environment (Scida et al 2017).	consultants via remote cameras and several locations. The Huntly Study Area provides suitable denning and foraging/hunting habitat to support this species, especially Jarrah-Marri forest.	
Pseudocheirus occidentalis	Western Ringtail Possum	CR	CR	The Western Ringtail Possum occurs in coastal and near coastal and Peppermint Tree (*Agonis flexuosa*) forest and Tuart (*Eucalyptus gomphocephala*) dominated forest with a Peppermint Tree understorey from Bunbury to Albany. Also occurs in Jarrah (*E. marginata*) forest and Jarrah-Marri *(Corymbia calophylla*) forest associated with Peppermint Tree (Van Dyck & Strahan 2008).	**Potential** This species has been recorded recently within neighbouring Alcoa sites at Larego, and DBCA records are also present historically. However, previous surveys within the Huntly Study Area have not recorded the species and previous surveys of areas such as Myara North have indicated that suitable habitat does not occur for a significant population.	Naturemap/Dandjoo & DBCA, SLR (Pers Comm.)

Setonix brachyurus	Quokka	VU	VU	The current distribution of the Quokka includes Rottnest and Bald Islands, and at least 25 sites on the mainland, including Two Peoples Bay Nature Reserve and Torndirrup, Mt Manypeaks and Walpole-Nornalup National Parks, and swamp areas through the south-west forests from Jarrahdale to Walpole. The last known population on the Swan Coastal Plain occurs in Muddy Lakes near Bunbury. Quokkas have also been reintroduced to Karakamia Sanctuary (DEC 2013). They occupy dense forests and thickets, streamside vegetation, heaths, shrublands, *Agonis linearifolia*-dominated swamps in the Jarrah (*Eucalyptus marginata*) forest, and sometimes tea-tree thickets on sandy soils along creek systems. The northern extent on the mainland is in the Jarrah forest immediately south-east of the Perth metropolitan area, from where it extends southward through the southern Jarrah, Marri and Karri forests to the south coast, but largely confined throughout	**Known** This species was recorded during surveys across the Alcoa O'Neil areas. The Study Area looks to provided suitable breeding and foraging habitat to support this species within the low lying and riparian areas which lies adjacent to the Study Areas, especially Jarrah-Marri forest.	Naturemap (Dandjoo), PMST, DBCA, SLR, GHD
				to areas receiving an annual rainfall of 1,000 mm or more (DEC 2013; Van Dyck & Strahan 2008).		
REPTILES						
Acanthophis antarcticus	Southern Death Adder	P3	-	The Southern Death Adder habitat ranges from rainforest to shrublands and heaths. This species is declining in many areas, probably due to habitat destruction and altered fire regimes (Wilson & Swan 2021).	**Likely** Known to occur locally albeit patchily within northern Jarrah forests. Habitat is present for this species, even though was not recorded during the surveys.	GHD, Naturemap/Dandjoo, DBCA
Aspidites ramsayi	Woma Python	P1	-	The Woma is one of 13 native species of python in Australia and one of two members of the Aspidites genus. The species reaches a maximum of 2m in length, and has a distinctive brown striped markings across a sandy-coloured body and marked yellow head. It's habitat preference ranges from sub-humid and arid interior sandy dune systems to spinifex-based woodlands and shrublands with distributions across the North West of WA to the interior, and a small, increasingly rare distribution to in the Wheatbelt region of the South-West (Wilson & Swan, 2013).	**Highly Unlikely.** Suitable habitat for the species such as dry, sandy burrowing systems and dune-type habitat types are not present, and species records in the area are very rare and not considered part of the species typical distribution and range.	DBCA

Ctenotus delli	Dell's Skink	P4		Dell's Skink is associated with Jarrah-Marri woodland that has a shrub-dominated understorey, on laterite, sandy or clay soils. It is found in the north Darling Range and inhabits dry sclerophyll forest on granite outcrops, stony hills and ranges. It is absent from the Swan Coastal Plain (Cogger 2014; Wilson & Swan 2021).	**Known.** The Study Area contains suitable habitat such as granite and lateritic clay to support this species and recent records from the O'Neil Region of the Alcoa operations area by GHD. Furthermore, DBCA and Dandjoo records of the species have been confirmed within the Study Area.	Naturemap/Dandjoo, DBCA, GHD
FISH						
G*eotria australis*	Pouched Lamprey	P3	-	This species utilises freshwater streams in the south west (Perth to Albany) to breed and grow before migrating to the ocean to mature (Allen *et al*. 2002). Dams and weirs are the main obstacles for the species. Sporadic records exist throughout the	**Highly Unlikely** The Huntly Study Area lacks suitable water ways and presumed locally extinct	Natureamap/Dandjoo & DBCA
				South West Coast Drainage Division between Perth and Albany including the Swan, Canning, Serpentine, Margaret, Donnelly, Warren and Goodga rivers.	upstream of South Dandalup Dam.	
INVERT						
Westralunio carteri	Carter's Freshwater Mussel	VU	VU	Carter's Freshwater Mussel is usually found in freshwater river pools. They are most common in areas with muddy, silty and sandy bottoms and flowing permanent water. Environmental tolerances of *W. carteri* are not precisely known but they can be found where water temperatures range from 4° C to over 30° C. Formerly this species occurred widely through the southwest including interior rivers of southwest such as Avon, Murray and Blackwood, however Salination of many waterways has severely reduced this species distribution (Klunzinger 2012; Klunzinger, et al. 2012).	**Known** Confirmed records of the species in the O'Neil region of the Alcoa operations, and additional recent recordings from DBCA within the Study Area.	PMST, Naturemap/ (Dandjoo), DBCA, GHD

Fauna Likelihood of Occurrence assessment of significant species relevant to the Willowdale Study Area

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
Anous stolidus	Common Noddy	MI	MI	The Common Noddy is found in tropical and sub-tropical seas off the west, north and east coasts of Australia, from the Abrolhos Islands in WA to the islands of the Great Barrier Reef in Qld, as well as Norfolk and Lord Howe Islands. Some are seen almost annually in NSW as far south as Sydney. It also ranges across tropical parts of the Pacific, Indian and Atlantic Oceans (DCCEEW 2022).	**Highly Unlikely.** Suitable habitat for the species does not occur within the Willowdale Study Area on a meaningful scale.	PMST
Atrichornis clamosus	Noisy Scrub-bird	EN	EN	The Noisy Scrub-bird inhabits areas with dense understorey or lower stratum of sedges and shrubs, dense leaf litter and abundant litter-dwelling invertebrates. It mainly occurs in low closed forests 5–15 m in height that are dominated by Eucalyptus or Agonis and *Banksia littoralis*, and occur in the steep and wetter gullies, and drainage lines of hills and granite mountains (Eucalyptus), and on the margins of freshwater lakes (Agonis and *B. littoralis*). It is also common in low closed forests up to 5 m in height that are dominated by *Hakea elliptica*, Eucalyptus or Agonis and *B. littoralis* and occur around granite outcrops, in shallower and drier gullies and on the margins of freshwater lakes. It mostly occurs at sites that have not been burnt for 10 or more years. It occurs at two locations in the south west; on the mainland in coastal areas from Two Peoples Bay Nature Reserve to Cheyne Beach, and on Bald Island (DAWE 2022b).	**Unlikely.** Some elements of suitable habitat are present for the species and historical relocation attempts within the wider region have occurred, but no reliable recordings for the species have been made within the Study Area, and the known distribution for the species is highly localised and away from the Willowdale Study Area.	PMST, EMRC, Naturemap/Dandjoo, DBCA
Botaurus poiciloptilus	Australasian Bittern	EN	EN	The Australasian Bittern's preferred habitat is wetlands with tall dense vegetation. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds (e.g. *Phragmites*, *Cyperus*, *Eleocharis*, *Juncus*, *Typha*, *Baumea*, *Bolboschoenus*) or cutting grass (*Gahnia*)	**Unlikely.** Suitable habitat for the species does not occur within the Willowdale Study Area, and recordings of the species within the Study Area and Mine Footprint are very rare.	Naturemap/Dandjoo, DBCA,

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				growing over a muddy or peaty substrate. In the South-West, the Bittern is largely confined to coastal areas, especially along the south coast. It also occurs around swamps, lakes, pools, rivers and channels fringed with lignum *Muehlenbeckia*, cane grass *Eragrostis* or other dense vegetation (Marchant 1990). They can be found in reed beds near Two Peoples Bay, in lakes near Mt Manypeaks, and the Lake Muir area (Nevill 2013).		
Calidris ferruginea	Curlew Sandpiper	CR	CR	Curlew Sandpipers mainly occur in areas with soft mud conditions, including intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are found inland less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. In WA, they are widespread around coastal and subcoastal plains from Cape Arid to south-west Kimberley Division but are more sparsely distributed between Carnarvon and Dampier Archipelago (DAWE 2021e). They are common on the Swan Coastal Plain, particularly near large drying lakes like Thompson and Forrestdale, and Peel Inlet. They are less common along the southern coast to Esperance (Nevill 2013).	**Highly Unlikely** The Willowdale Study Area lacks suitable wetland or shoreline habitat and recordings surrounding the Study Area are rare.	PMST, DBCA
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	The Forest Red-tailed Black Cockatoo inhabits the dense Jarrah, karri, and Marri forests receiving more than 600 mm annual average rainfall but also occurs in a range of other forest and woodland types, including Blackbutt (*E. patens*), Wandoo (*E. wandoo*), Tuart (*E. gomphocephala*), Albany Blackbutt (*E. staeri*), Yate (*E. cornuta*), and Flooded Gum (*E. rudis*) (DAWE 2021b). Habitats tend to have an understorey of balga	**Known** Known to occur within the Willowdale Study Area. Recorded sightings, foraging, and breeds within the Willowdale Study Area, especially Jarrah-Marri forest habitat.	Naturemap/Dandjoo, PMST, DBCA, ,GHD, SLR, Western Environmental, Stokes, EMRC

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				(*Xanthorrhoea* spp.), kingia (*Kingia australis*), snottygobble (*Persoonia* spp.), parrot bush (*Banksia sessilis*), holly-leaved mirbelia (*Mirbelia dilatata*), bull banksia (*B. grandis*), bullich (*E.megacarpa*), Myrtle (*Taxandria spp*.) and sheoak (*Allocasuarina fraseriana*). They are most common in the Jarrah forest region of the northern Darling Range from Collie north to Mundaring and are very local throughout the lower south-west. They can be found on the Swan Coastal Plain, mainly in search of food the exotic white cedar (*Melia azedarach*). There are also several small, isolated populations in the eastern parts of its range (DAWE 2021b).		
Charadrius leschenaultii	Greater Sand Plover	VU	VU	In Australia, the Greater Sand Plover occurs in coastal areas in all states, though the greatest numbers occur in northern Australia, especially the north-west (Marchant & Higgins 1993). In northern Australia, the species is especially widespread between North West Cape and Roebuck Bay in WA; there are sparsely scattered records from the largely inaccessible area between Roebuck Bay and Darwin, but it often occurs in the Top End of the Northern Territory, including on Groote Eylandt (DCCEEW 2022).	**Highly Unlikely.** The Study Area lacks suitable wetland or shoreline habitat.	PMST
Zanda baudinii	Baudin's Black Cockatoo	EN	EN	Baudin's Black Cockatoo mainly occurs in eucalypt forests, especially Jarrah, Marri and karri forest that receives 750 mm of annual rainfall. The species is less frequently in woodlands of wandoo (*Eucalyptus wandoo*), blackbutt (*E. patens*), flooded gum (*E. rudis*), yate (*E. cornuta*), partly cleared farmlands and urban areas. The range of the species extends from Albany northward to Gidgegannup and Mundaring (east of Perth), and inland to the Stirling Ranges and near Kojonup. Preferred roosts are in areas with a dense canopy close to permanent sources of water (DAWE 2021c).	**Known.** This species has been recorded during surveys from several consultants via remote cameras at several locations. The Willowdale Study Area provides suitable nesting, roosting and foraging habitat to support this species, especially Jarrah-Marri habitat.	Naturemap(Dandjoo), PMST, DBCA , GHD, SLR, Western Environmental, Stokes

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
Zanda latirostris	Carnaby's Black Cockatoo	EN	EN	Carnaby's Cockatoo occurs in uncleared or remnant native eucalypt woodlands, especially those that contain Salmon gum, Wandoo, Marri, Jarrah and Karri, and in shrubland or kwongan heathland dominated by Hakea, Dryandra, Banksia and Grevillea species. Breeding activity is restricted to eucalypt woodlands mainly in the semiarid and subhumid interior, from Kalbarri in the north, Three Springs District south to the Stirling Range, west to Cockleshell Gully and east to Manmanning. The species has expanded its breeding range westward and south into the Jarrah-Marri forests of the Darling Scarp and into the tuart forests of the Swan Coastal Plain, including the Yanchep area, Lake Clifton and near Bunbury. It nests in trees older than 120-150 years (DAWE 2021d).	**Known.** This species has been recorded during surveys from several consultants via opportunistic sightings and from confirmed historical DBCA records within the Study Area. The Willowdale Study Area provides suitable nesting, roosting and foraging habitat to support this species, especially Jarrah-Marri habitat.	Naturemap (Dandjoo), PMST, DBCA , GHD, SLR, Western Environmental
Falco peregrinus	Peregrine Falcon	OS	-	The Peregrine Falcon is found on and near cliffs, gorges, timbered watercourses, riverine environments, wetlands, plains, open woodlands, and pylons and spires of buildings, though less frequently in desert regions (Morcombe 2004; Pizzey & Knight 2012). They are not common but can be found almost anywhere throughout WA and in the southwest, including particularly at Fitzgerald River, Stirling Range, Porongurup National Parks, Kondinin, and Peak Charles, with many more locations north of Perth (Nevill 2013).	**Likely** Recent DBCA records have been made in close proximity to the Study Area, and suitable foraging habitat and prey species are known within the area.	Dandjoo, DBCA,
Leipoa ocellata	Malleefowl	VU	VU	The Malleefowl generally occurs in semi-arid areas of WA, in shrublands and low woodlands that are dominated by mallee vegetation, as well as native pine Callitris woodlands, Acacia shrublands, paperbark, sheoak, Broombush *Melaleuca uncinata* vegetation, eucalypt woodlands, or coastal heathlands. Mostly they are found where there are sandy or gravel soils. The nest is a	**Unlikely** Regional records are historical. The Willowdale Study Area does not contain suitable undisturbed habitat to support this species. The area is too readily logged and burnt to persist in the area.	Naturemap/Dandjoo, PMST & DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				large mound of sand or soil and organic matter (Jones & Goth 2008; Morcombe 2014; Nevill 2013). In WA they are found from the southwest Nullarbor to Albany, north, and then west from Moore River up to Shark Bay, past Cue, across to Wiluna and east to the northern Victoria Desert south of the Blackstone Ranges (Nevill 2013; Pizzey & Knight 2012).		
Limosa lapponica	Bar-tailed Godwit	MI	MI	Bar-tailed Godwits arrive in Australia each year in August from breeding grounds in the northern hemisphere. Birds are more numerous in northern Australia Bar-tailed Godwits inhabit estuarine mudflats, beaches and mangroves. They are common in coastal areas around Australia. They are social birds and are often seen in large flocks and in the company of other waders (Birdlife Australia 2019).	**Highly Unlikely.** The Study Area lacks suitable wetland or shoreline habitat.	PMST
Numenius madagascariensis	Eastern Curlew	CR	CR	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, sometimes within the mangroves, and in coastal saltworks and sewage farms. In the south west, Eastern Curlews are recorded from Eyre, and there are scattered records from Stokes Inlet to Peel Inlet (Marchant & Higgins 1993). They are uncommon further south of Geraldton, but can be spotted in Alfred Cove, Peel Inlet and the Albany region (Nevill 2013).	**Highly Unlikely** The Study Area lacks suitable wetland or shoreline habitat.	PMST
Pandion haliaetus	Osprey	MI	MI	The breeding range of the Osprey extends around the northern coast of Australia	**Unlikely.** Previous DBCA records have been made from within the region,	PMST, DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				(including many offshore islands) from Albany in WA to Lake Macquarie in NSW; with a second isolated breeding population on the coast of South Australia, extending from Head of Bight east to Cape Spencer and Kangaroo Island. Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands (DCCEEW 2022).	including fly-over records within the Study Area, although suitable habitat is not likely for consistent feeding and nesting.	
Sternula nereis nereis	Australian Fairy Tern	VU	VU	The Fairy Tern is approximately 22–27 cm in length, 70 g in weight and has a wingspan of 44–53 cm (Higgins & Davies 1996). The Fairy Tern is bulky and round bodied (Simpson & Day 2004). The breeding plumage of both sexes is pale grey-white, with a black crown, nape, ear coverts and patch in front of the eyes (square to round in shape). The forehead is white and the bill is orange-yellow (Higgins & Davies 1996). Legs are dull yellow and the iris is dark brown (Lindsey 1986a). The species is gregarious and often found in flocks of 50–150 birds. However the bird is also seen singularly or in pairs (Higgins & Davies 1996). The Fairy Tern (Australian) nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline (Higgins & Davies 1996; Lindsey 1986a). The bird roosts on beaches at night (Higgins & Davies 1996). Within Australia, the Fairy Tern occurs along the coasts of Victoria, Tasmania, South Australia and Western Australia; occurring as far north as the Dampier Archipelago near Karratha.	**Highly Unlikely.** The Study Area lacks suitable wetland or shoreline habitat.	PMST
Tringa nebularia	Common Greenshank	EN	EN	The Common Greenshank is a heavily built, elegant wader, 30–35 cm in length, with a wingspan of 55–65 cm and weight up to 190 g for both males and females. The bill is long	**Highly Unlikely.** The Study Area lacks suitable wetland or shoreline habitat.	PMST

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				and slightly upturned and the legs are long and yellowish-green. In flight, all plumages show uniformly dark upperwing and contrasting white rump extending in a white wedge up the back, whitish tail and tips of toes projecting slightly beyond the tip of the tail. The sexes are alike (Higgins & Davies 1996). The species is seen singly or in small to large flocks (sometimes hundreds) in a variety of coastal and inland wetlands. The Common Greenshank does not breed in Australia; however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia (Higgins & Davies 1996). It occurs around most of the coast from Cape Arid in the south to Carnarvon in the north-west. In the Kimberleys it is recorded in the south-west and the north-east, with isolated records from the Bonaparte Archipelago (Higgins & Davies 1996).		
Tyto novaehollandiae novaehollandiae	Masked Owl (southern sub species)	P3	-	The Masked Owl is found in forests (wet and dry sclerophyll, non-eucalypt dominated), open woodlands, farmlands or scrub with large trees (12-20 m) and adjacent cleared country, timbered watercourses, paperbark woodlands, and caves (Pizzey & Knight 2012). It requires large hollows in old growth eucalypts or bare sand or the earth of a cave for nesting, and often favours areas with dense understorey or ecotones comprising dense and sparse ground cover. It is often recorded foraging within 100-300 m of the boundary of two vegetation types (Bell & Mooney 2002). The bird is restricted to the thicker humid forests of the southwest region, particularly in the Pemberton and Manjimup area and along the Murray River in the Lane Poole area (Kavanagh & Murray 1996). It nests in hollows in large Karri (*Eucalyptus*	**Likely.** This species is known to occur in the region from previous DBCA recordings. Suitable habitat occurs within the Willowdale Study Area.	Dandjoo, DBCA, SLR,

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				diversicolor), Marri (*Corymbia calophylla*) and Jarrah (*E. marginata*) trees (Nevill 2013).		
Apus pacificus	Fork-tailed Swift	MI	MI	The Fork-tailed Swift is common in coastal and sub coastal areas between Carnarvon and Augusta including near and offshore islands. There are scattered records along south coast from Denmark east to Cocklebiddy on the Great Australian Bight, and sparsely scattered records inland. They are found across a range of habitats, from inland open plains to wooded areas. They are most often observed over inland plains in Australia, but sometimes recorded over coastal cliffs and beaches as well as urban areas. They have been recorded well out to sea as well as from offshore islands especially when on passage from Indonesia. This species is almost exclusively aerial (DotE 2015).	**Unlikely** The species is occasionally observed in the south-west of WA but roosting infrequently. May occasionally fly over Willowdale Study Area.	PMST
Rostratula australis	Australian Painted Snipe	EN	EN	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire. It sometimes use areas that are lined with trees, or that have some scattered fallen or washed-up timber (DAWE 2021e). In the south west it can be found around Carnarvon and wetlands north of Perth, particularly those west of Moora and Gin Gin (Nevill 2013).	**Highly Unlikely** The Willowdale Study Area lacks suitable wetlands, and the species is not typically known from this region.	PMST
Motacilla cinerea	Grey Wagtail	MI	MI	The Grey Wagtail is an opportunistic migrant to Australia. The species typically migrates to Indonesia occasionally landing in Australia. Most records for the species are from Northern Australia and South Australia	**Highly Unlikely** The Willowdale Study Area lacks suitable habitat and there are no DBCA or survey-based recordings surrounding the Willowdale Study Area.	PMST

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				(Morcombe 2004). The non-breeding habitat only of the Grey Wagtail has a strong association with water, particularly rocky substrates along water courses but also lakes and marshes (DAWE 2021e). It can be found mainly in banks and rocks in fast-running freshwater habitats: rivers, creeks, streams, and around waterfalls, both in forest and open country; but occurs almost anywhere during migration (Johnstone & Storr 2004).		
Actitis hypoleucos	Common Sandpiper	MI	MI	The Common Sandpiper is found along all coastlines of Australia and uses a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around often narrow and steep muddy margins or rocky shores. The species has been recorded in estuaries and deltas of streams, as well as on banks further upstream; around lakes, pools, mangroves, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. It is often found near mangroves, and sometimes in areas of mud littered with rocks or snags (DAWE 2021e). They are somewhat uncommon in the south west, but can be found on Rottnest and Penguin Islands, and along the south coast all the way to the Esperance region, including the inland lakes like Lake Warden (Nevill 2013).	**Highly Unlikely** The Willowdale Study Area lacks suitable habitat and there are no DBCA recordings or survey-based results from the surrounding Willowdale Study Area.	PMST
Calidris acuminata	Sharp-tailed Sandpiper	MI	MI	In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal	**Highly Unlikely** The Willowdale Study Area lacks suitable habitat and there are no DBCA recordings or survey-based records in the surrounding the Willowdale Study Area.	PMST

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. Sometimes they occur on rocky shores (DAWE 2021e). They are found throughout many wetlands on the Swan Coastal Plain, in Perth lakes with wet grassed margins and receding waters, Vasse and Harvey Estuaries, and the Busselton wetlands, but are less common on the south coast until the Esperance region (Nevill 2013).		
Calidris canutus	Red Knot	MI	MI	In Australasia, the Red Knot mainly inhabits intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps (DCCEEW 2022).They are found near mudflats and estuaries from Murchison to Bunbury but are then uncommon from Wilson Inlet to Esperance. In the Perth region they are mainly found in Alfred Cove and Peel Inlet (Nevill 2013).	**Highly Unlikely.** The Willowdale Study Area lacks suitable habitat and there are no DBCA recordings surrounding the Willowdale Study Area.	PMST
Calidris melanotos	Pectoral Sandpiper	MI	MI	In Australia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The bird can be seen on the Swan Coastal Plain but is rare to scarce	**Highly Unlikely** The Willowdale Study Area lacks suitable habitat and there are no DBCA or survey-based recordings surrounding the Willowdale Study Area or within the Study Area.	PMST

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				on Lake Thompson, and as well on any freshwater wetland in the southwest with shallow, well-grassed margins. They are seen at Lake Warden, Esperance, and at Lake McLarty (Nevill 2013).		
MAMMAL						
Bettongia penicillata ogilbyi	Woylie	CR	EN	Preferred habitat for the Woylie includes dense undergrowth, logs and rock-cavities and occasionally in burrows (Burbidge 2004). Scattered Woylie populations may be found throughout the Jarrah forest in the south-west corner of WA. Extant naturally occurring populations of the species are restricted to three small wheatbelt reserves – Dryandra Woodland, Tutanning Nature Reserve and Perup Forest. All are characterised by the presence of thickets of the plant *Gastrolobium* (Van Dyck and Strahan 2008). The species is now restricted to forests and areas where predation has been controlled (or excluded). It rests during the day in a well-concealed nest, built over a shallow depression. The nest is most commonly built using long strands, of grasses, but other material such as strips of bark are also used (in the forest) or dried seagrass and/or triodia (in arid coastal areas) (Freegard 2007).	**Likely** Woylies were recorded in the O'Neil region in 2024 (GHD 2024b and GHD 2024c) to the North of the Willowdale Study Area, and DBCA recordings have also been made in close proximity to the current Willowdale Study Area. Furthermore, suitable habitat for the species does occur within the Study Area.	Naturemap/Dandjoo, PMST, & DBCA, GHD.
Dasyurus geoffroii	Chuditch	VU	VU	The Chuditch inhabits eucalypt forest (especially Jarrah, *Eucalyptus marginata*), dry woodland, mallee shrublands, heaths, and desert, particularly in the south coast of WA. They also occur at lower densities in drier woodland and mallee shrubland in the goldfields and wheatbelt, as well as in Kalbarri National Park (translocated). Chuditch require adequate numbers of suitable den and refuge sites (horizontal hollow logs or earth burrows) to survive (DEC 2012b). In Jarrah forest, Chuditch populations occur in both moist, densely vegetated,	**Likely.** This species has had scat recordings during surveys in the current study Area, and numerous DCBA and older historical surveys within the region have confirmed sightings. The Study Area provides suitable denning and foraging/hunting habitat to support this species.	Naturemap/Dandjoo, PMST, DBCA, SLR, EMRC

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				steeply sloping forest and drier, open, gently sloping forest (Van Dyck & Strahan 2008). The species can travel large distances, and for this reason requires habitats that are of a suitable size and not excessively fragmented.		
Hydromys chrysogaster	Rakali, Water-Rat	P4	-	The Water Rat lives in the vicinity of permanent bodies of fresh, brackish, or marine water, lakes and farm dams, and on sheltered coastal beaches, mangroves and offshore islands. In the south-west of WA they have been shown to prefer areas with riparian vegetation, better water quality and a degree of habitat complexity. Woody debris, rock ledges and wetland islands are likely to be important areas for feeding and refuge (DEC 2012a). It is an occasional vagrant to temporary waters. Water Rat's dens are made at the end of tunnels in banks and occasionally in logs (Van Dyck & Strahan 2008).	**Known** The species has been recorded previously by SLR in the Study Area and DBCA has confirmed historical DBCA recordings within and around the Study Area.	Naturemap/Dandjoo, DBCA, SLR.
Falsistrellus mackenziei	Western False Pipistrelle	P4	-	The Western False Pipistrelle occurs in wet sclerophyll forest dominated by Karri, and in the high rainfall zones of the Jarrah and Tuart dry sclerophyll forests. The species is restricted to areas in or adjacent to stands of old growth forest. Marri, Sheoak and Peppermint are often codominant at its collection localities (Churchill 2008; McKenzie and Start 1999).	**Likely** This species is known from this region. Suitable habitat of Jarrah – Marri woodland is found within the Study Area, and DBCA recordings have also confirmed recent sightings in close proximity to the area.	Naturemap/Dandjoo, DBCA
Isoodon fusciventer	Quenda (Southern Brown Bandicoot)	P4	-	The Quenda prefers dense scrubby, often swampy, vegetation with dense cover up to one metre high. However, it also occurs in woodlands, and may use less ideal habitat where this habitat occurs adjacent to the thicker, more desirable vegetation. The species often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (Van Dyck & Strahan 2008).	**Likely.** This species has been recorded during surveys from several consultants via remote cameras and several locations, and suitable habitat for the species occurs in the Study Area, especially Jarrah-Marri forest.	Naturemap(Dandjoo), SLR, DBCA, EMRC, Stokes

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
Myrmecobius fasciatus	Numbat	EN	EN	Current Numbat populations occupy several different habitat types: upland Jarrah forest, open eucalypt woodland, banksia woodland and tall closed shrubland. The only remaining original subpopulations are at Dryandra Woodland and the Upper Warren area (including Tone Perup Nature Reserve, Greater Kingston National Park and adjoining State Forest). In WA there are nine translocation sites, including Boyagin Nature Reserve, Tutanning Nature Reserve, Batalling block and Karroun Hill Nature Reserve (see DPaW 2015 for complete list and details). At Dryandra, numbats inhabit brown mallet (*Eucalyptus astringens*) plantations. Habitats usually have an abundance of termites in the soil, and hollow logs, tree hollows, burrows and branches for shelter (DAWE 2021e; Van Dyck & Strahan 2008).	**Unlikely.** Historical records include the region. A resident population occurs in the Narrogin area and re-introduced population at Boyagin rock, but no recording of the species have been made in recent surveys within the Study Area.	Naturemap (Dandjoo) & DBCA
Notamacropus eugenii	Tammar Wallaby	P4	-	This Tammar wallaby is a smaller species of true macropod reaching a maximum of 7kg and a grey-brown coat with a distinctive dark mid-line on the forehead. The species has a preference for dense, coastal heath and scrub, with some dry sclerophyll forests with significant cover. Their current distribution across Western Australia is limited to Dryandra, Tutanning and Perup forests, and offshore islands of Garden, Middle and Recherche Archipelago (Menkhorst & Knight, 2004).	**Unlikely.** Some suitable habitat for the species does occur within the Willowdale Study Area but records of the species and it's known and current distributions are outside of the current Willowdale Study Area buffer zones. No records from previous surveys within and/or surrounding the Study Area.	DBCA, Naturemap/Dandjoo
Notamacropus irma	Western Brush Wallaby	P4	-	The Western Brush Wallaby is found primarily in open forest or woodland, particularly favouring open, seasonally- wet flats with low grasses and open scrubby thickets. It is also found in some areas of mallee and heathland and is uncommon in karri forest (DEC 2011; Van Dyck & Strahan 2008).	**Known** This species has been recorded during surveys from several consultants via remote cameras and several locations, with suitable habitat being found throughout the Study Area, especially Jarrah-Marri forest.	Naturemap/Dandjoo, DBCA, SLR

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
Phascogale tapoatafa wambenger	South-west Brush Tailed Phascogale	CD	-	The Brush-tailed Phascogale is sparsely distributed outside the semi-arid zone in dry sclerophyll forest and monsoonal forest and woodland. The species is generally rare and threatened by habitat fragmentation in the south west of WA. (Scida et al 2017). Habitat varies but forest or woodlands is required with large trees to provide hollows and cover. Canopy connection provides excellent cover and connectivity for the species to mover through their environment (Scida et al 2017).	**Likely** This species has been recorded during surveys from several consultants via remote cameras and several locations, with suitable habitat being found throughout the Study Area, especially Jarrah-Marri forest.	Naturemap/Dandjoo, DBCA, EMRC, SLR
Pseudocheirus occidentalis	Western Ringtail Possum	CR	CR	The Western Ringtail Possum occurs in coastal and near coastal and Peppermint Tree (*Agonis flexuosa*) forest and Tuart (*Eucalyptus gomphocephala*) dominated forest with a Peppermint Tree understorey from Bunbury to Albany. Also occurs in Jarrah (*E. marginata*) forest and Jarrah-Marri *(Corymbia calophylla*) forest associated with Peppermint Tree (Van Dyck & Strahan 2008).	**Likely** Some suitable habitat is present to support this species (Blackbutt forest), although in lower density than other known sub-populations, and one recent confirmed sighting been made within the (SLR,pers. Comm.), along with historical recordings of the species within the Willowdale Study Area.	Dandjoo, DBCA, SLR
Setonix brachyurus	Quokka	VU	VU	The current distribution of the Quokka includes Rottnest and Bald Islands, and at least 25 sites on the mainland, including Two Peoples Bay Nature Reserve and Torndirrup, Mt Manypeaks and Walpole-Nornalup National Parks, and swamp areas through the south-west forests from Jarrahdale to Walpole. The last known population on the Swan Coastal Plain occurs in Muddy Lakes near Bunbury. Quokkas have also been reintroduced to Karakamia Sanctuary (DEC 2013). They occupy dense forests and thickets, streamside vegetation, heaths, shrublands, *Agonis linearifolia*-dominated swamps in the Jarrah (*Eucalyptus marginata*) forest, and sometimes tea-tree thickets on sandy soils along creek systems. The northern extent on the mainland is in the Jarrah forest immediately south-east of the Perth metropolitan area, from where it	**Likely.** This species was recorded during surveys of the Alcoa O'Neil site operations nearby to the Willowdale Study Area, with confirmed recordings by EMRC at the Willowdale Study Area. Furthermore, DBCA records have been made within the Study Area itself.	Naturemap/Dandjoo, PMST, DBCA, EMRC

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				extends southward through the southern Jarrah, Marri and Karri forests to the south coast, but largely confined throughout to areas receiving an annual rainfall of 1,000 mm or more (DEC 2013; Van Dyck & Strahan 2008).		
REPTILE						
Acanthophis antarcticus	Southern Death Adder	P3	-	The Southern Death Adder habitat ranges from rainforest to shrublands and heaths. This species is declining in many areas, probably due to habitat destruction and altered fire regimes (Wilson & Swan 2021).	**Likely** Known to occur locally albeit patchily within northern Jarrah forests. Habitat is present for this species.	GHD, DBCA
Aspidites ramsayi	Woma Python	P1	-	The Woma is one of 13 native species of python in Australia and one of two members of the Aspidites genus. The species reaches a maximum of 2m in length, and has a distinctive brown striped markings across a sandy-coloured body and marked yellow head. It's habitat preference ranges from sub-humid and arid interior sandy dune systems to spinifex-based woodlands and shrublands with distributions across the North West of WA to the interior, and a small, increasingly rare distribution to in the Wheatbelt region of the South-West (Wilson & Swan, 2013).	**Highly Unlikely.** Suitable habitat for the species such as dry, sandy burrowing systems and dune-type habitat types are not present, and species records in the area are very rare and not considered part of the species typical distribution and range.	DBCA
Ctenotus delli	Dell's Skink	P4	-	Dell's Skink is associated with Jarrah-Marri woodland that has a shrub-dominated understorey, on laterite, sandy or clay soils. It is found in the north Darling Range and inhabits dry sclerophyll forest on granite outcrops, stony hills and ranges. It is absent from the Swan Coastal Plain (Cogger 2014; Wilson & Swan 2021).	**Likely** There is suitable habitat support this species, as well as DBCA recordings within the Study Area.	Naturemap/Dandjoo, DBCA, GHD.
FISH						
G*eotria australis*	Pouched Lamprey	P3	-	This species utilises freshwater streams in the south west (Perth to Albany) to breed and grow before migrating to the ocean to mature (Allen *et al*. 2002). Dams and weirs are the	**Highly Unlikely** The Study Area lacks suitable water ways and habitat in general and DBCA	Naturemap/Dandjoo & DBCA

Species name	Common name	Status		Habitat requirements	Likelihood of occurrence assessment	Source
		BC Act	EPBC Act			
				main obstacles for the species. Sporadic records exist throughout the South West Coast Drainage Division between Perth and Albany including the Swan, Canning, Serpentine, Margaret, Donnelly, Warren and Goodga rivers.	records within the Study Area and around the Study Area are rare.	
INVERT						
Westralunio carteri	Carter's Freshwater Mussel	VU	VU	Carter's Freshwater Mussel is usually found in freshwater river pools. They are most common in areas with muddy, silty and sandy bottoms and flowing permanent water. Environmental tolerances of *W. carteri* are not precisely known but they can be found where water temperatures range from 4° C to over 30° C. Formerly this species occurred widely through the southwest including interior rivers of southwest such as Avon, Murray and Blackwood, however Salination of many waterways has severely reduced this species distribution (Klunzinger 2012; Klunzinger, et al. 2012).	**Likely.** Confirmed recordings have been made by Biologic in nearby areas to the Willowdale Study Area, and DBCA records have been made within the Study Area. ,	Naturemap/Dandjoo, DBCA, Biologic

Appendix C

Figures

Figure 1 *Huntly and Willowdale Study Areas*

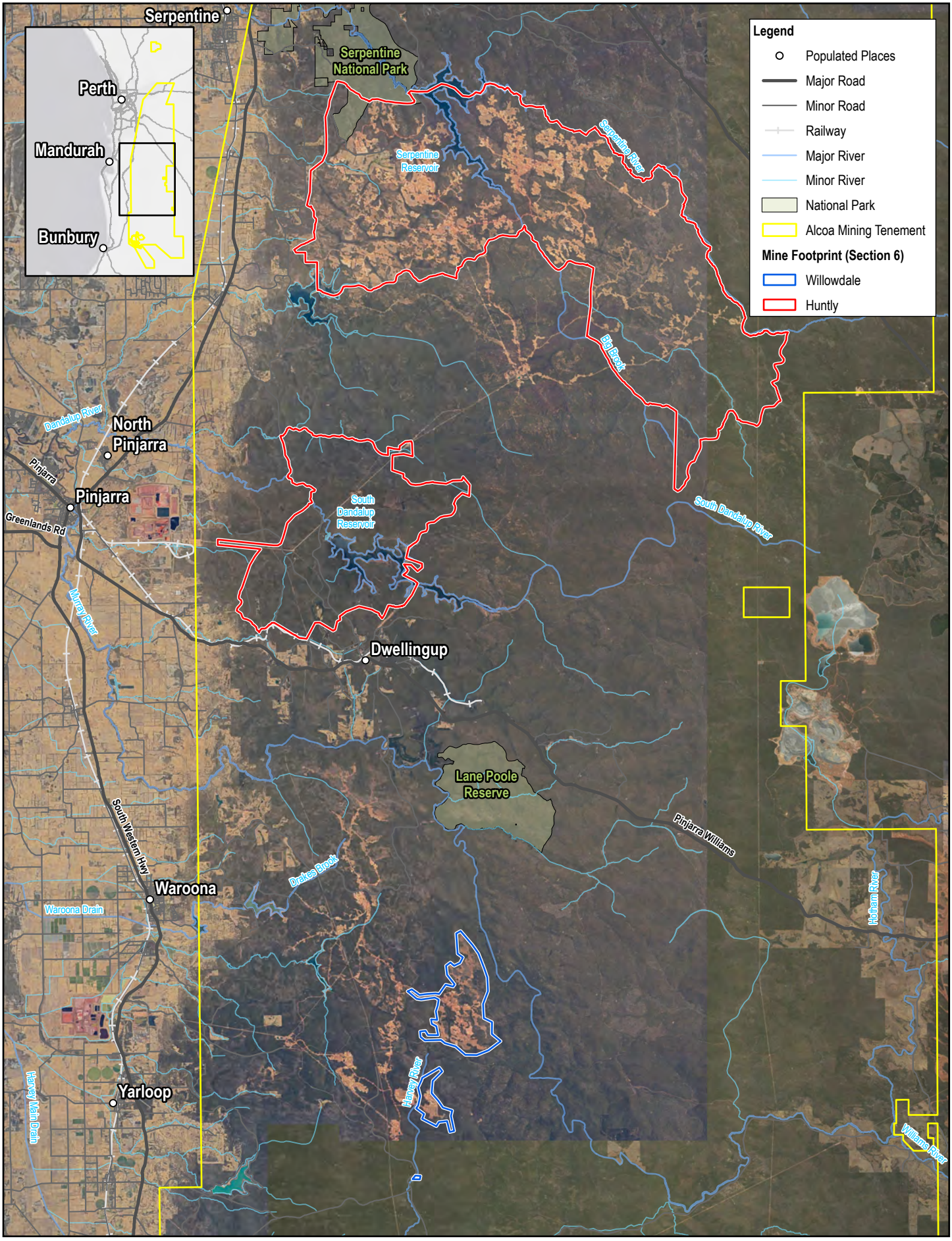
Figure 2 *Mapping Overview of Previous Survey Areas of Huntly and Willowdale Mines*

Figure 3 *Fauna Habitat Profile for Huntly Study Aea*

Figure 4 *Fauna Habitat Profile for Willowdale Study Area*

Figures 5 ***Significant*** *Fauna Records at Huntly Study Area*

Figure 6 *Significant Fauna Records at Willowdale Study Area*



Paper Size ISO A4

0 2.5 5 7.5 10

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Alcoa
Fauna Desktop Assessment

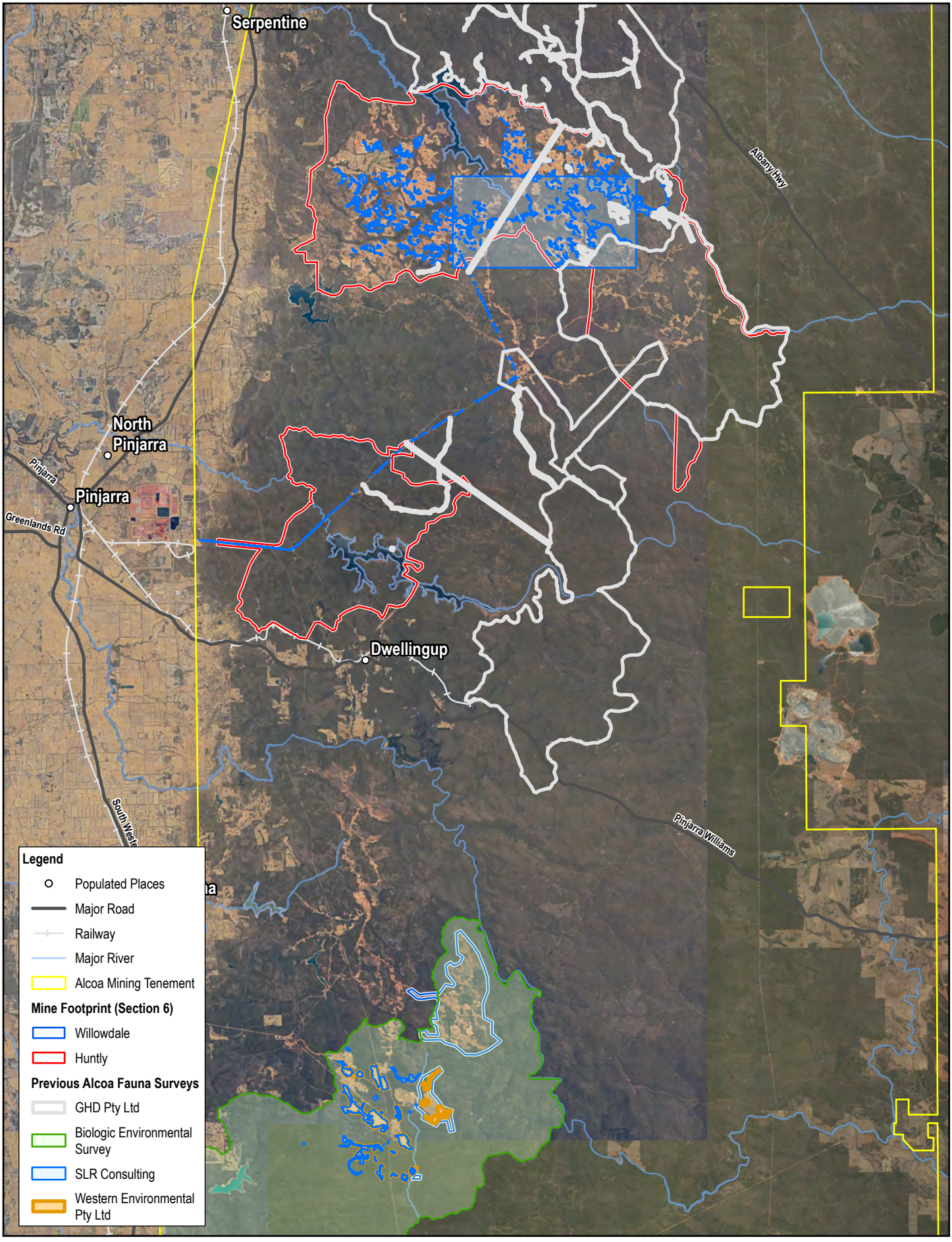
Study Area

Project No. **12565572**
Revision No. **0**
Date **04/11/2024**

FIGURE 1

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World Light Gray Canvas Base: Esri, HERE, Garmin, USGS. Created by: rbrown3



Paper Size ISO A4

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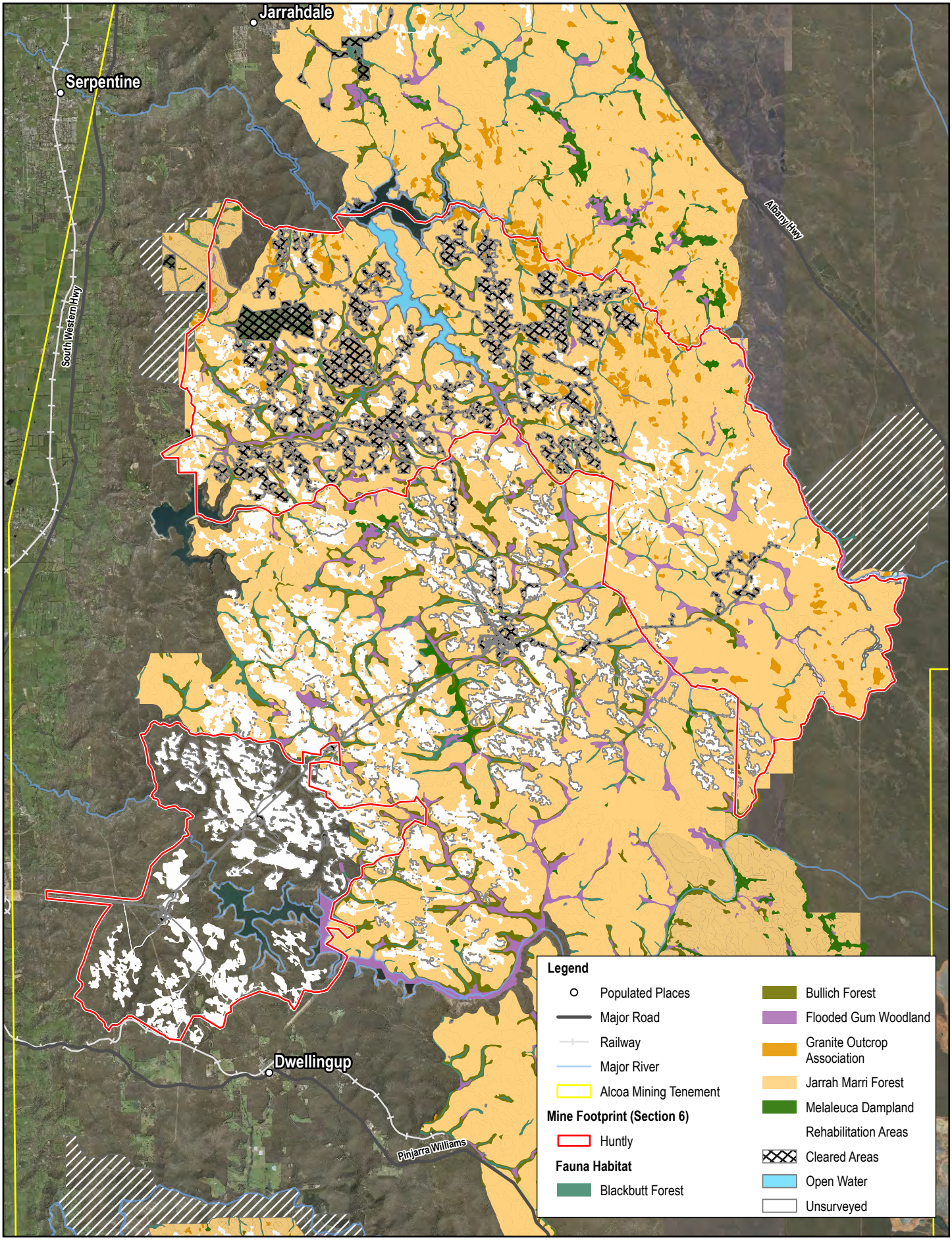
Project No. **12565572**
Revision No. **0**
Date **04/11/2024**

Previous GHD Survey Areas

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Paper Size ISO A4

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Kilometers

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N

GHD

Alcoa
Fauna Desktop Assessment

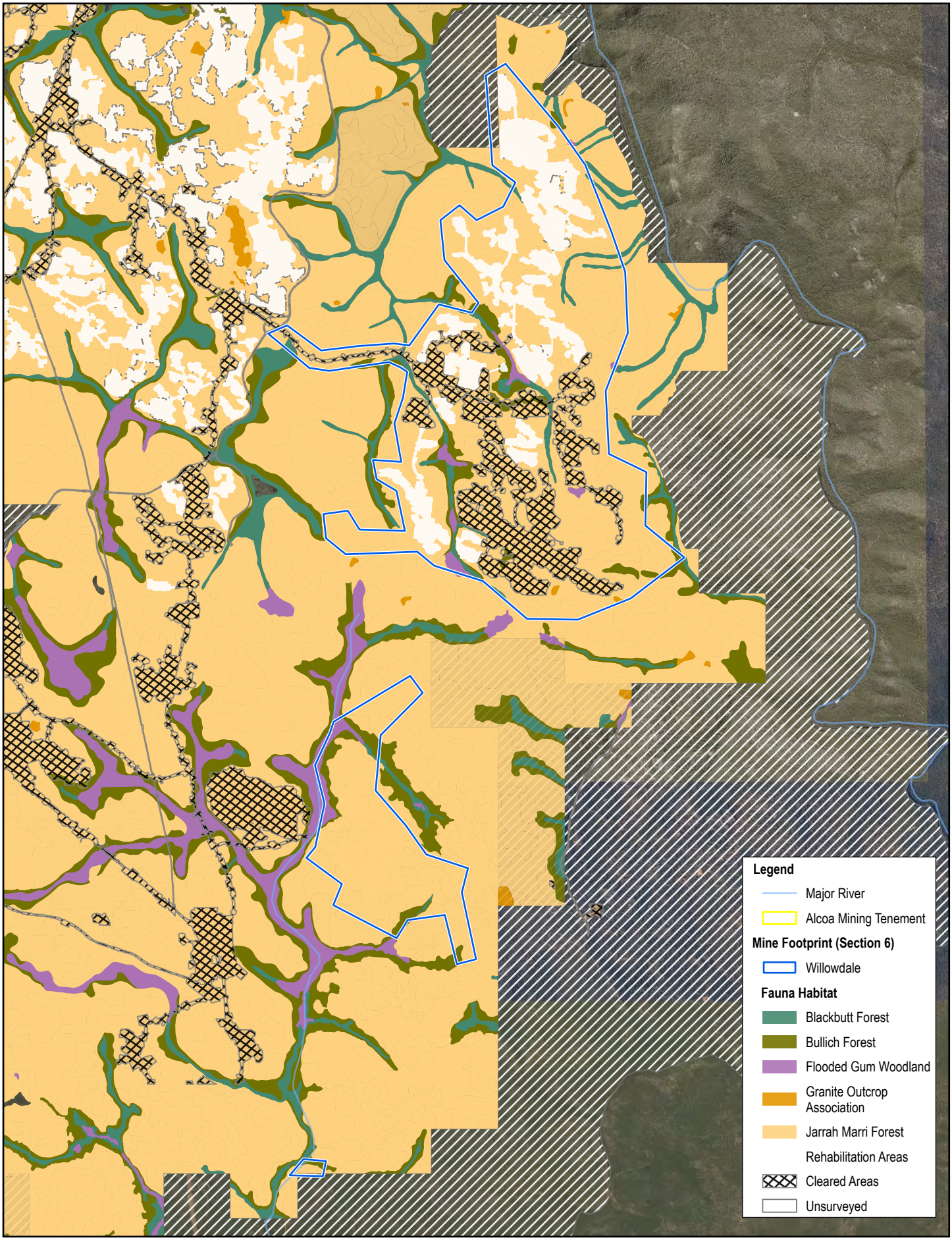
Fauna Habitat Mapping Huntly

Project No. **12565572**
Revision No. **1**
Date **20/02/2025**

FIGURE 3

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Data source: WANow: . Created by: mmikkonen



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Kilometers

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Grid: GDA 1994 MGA Zone 50

N

GHD

Alcoa
Fauna Desktop Assessment

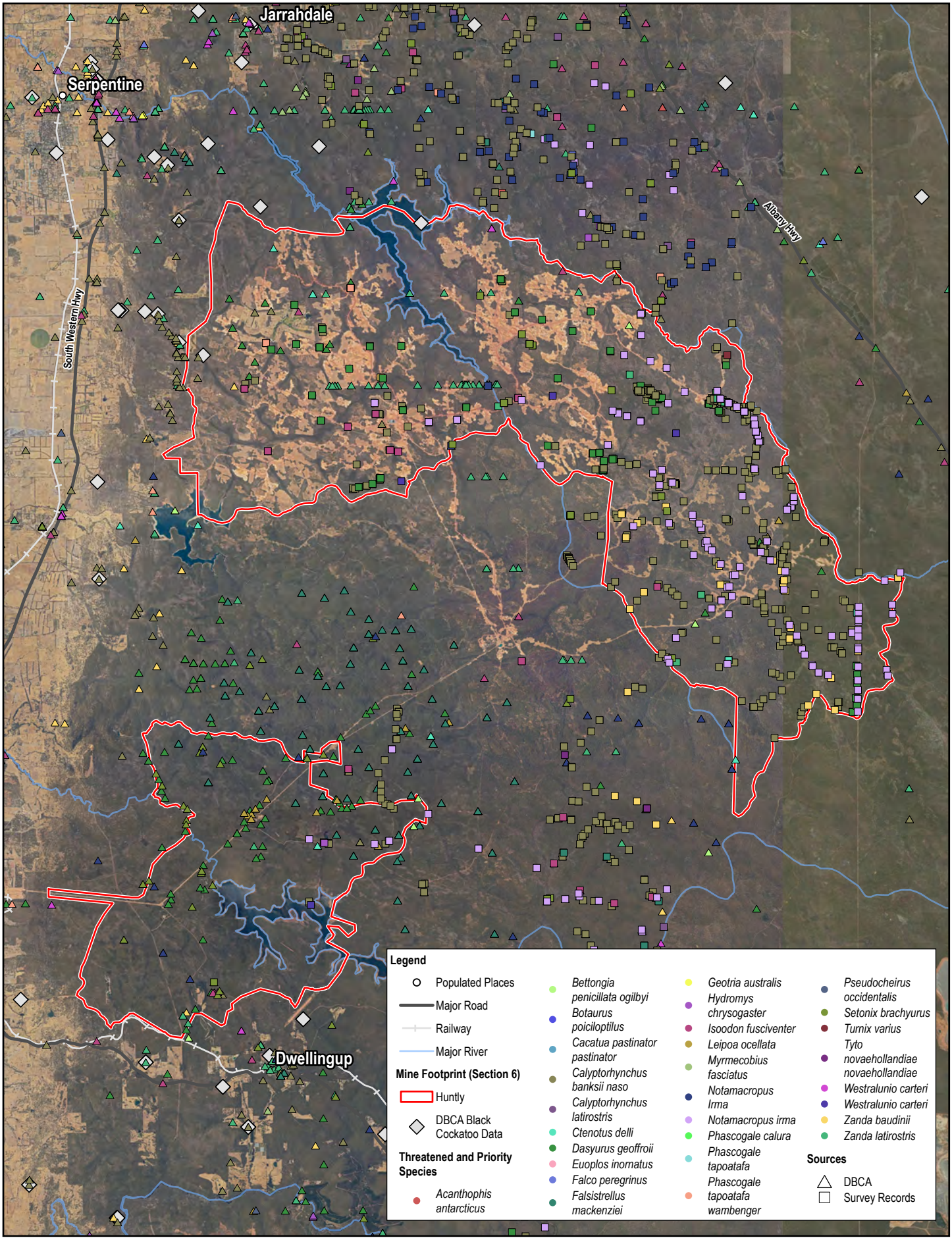
Fauna Habitat Mapping Willowdale

Project No. **12565572**
Revision No. **1**
Date **20/02/2025**

FIGURE 4

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Paper Size ISO A4

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Kilometers

Map Projection: Transverse Mercator
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Grid: GDA 1994 MGA Zone 50

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GHD

Alcoa
Fauna Desktop Assessment

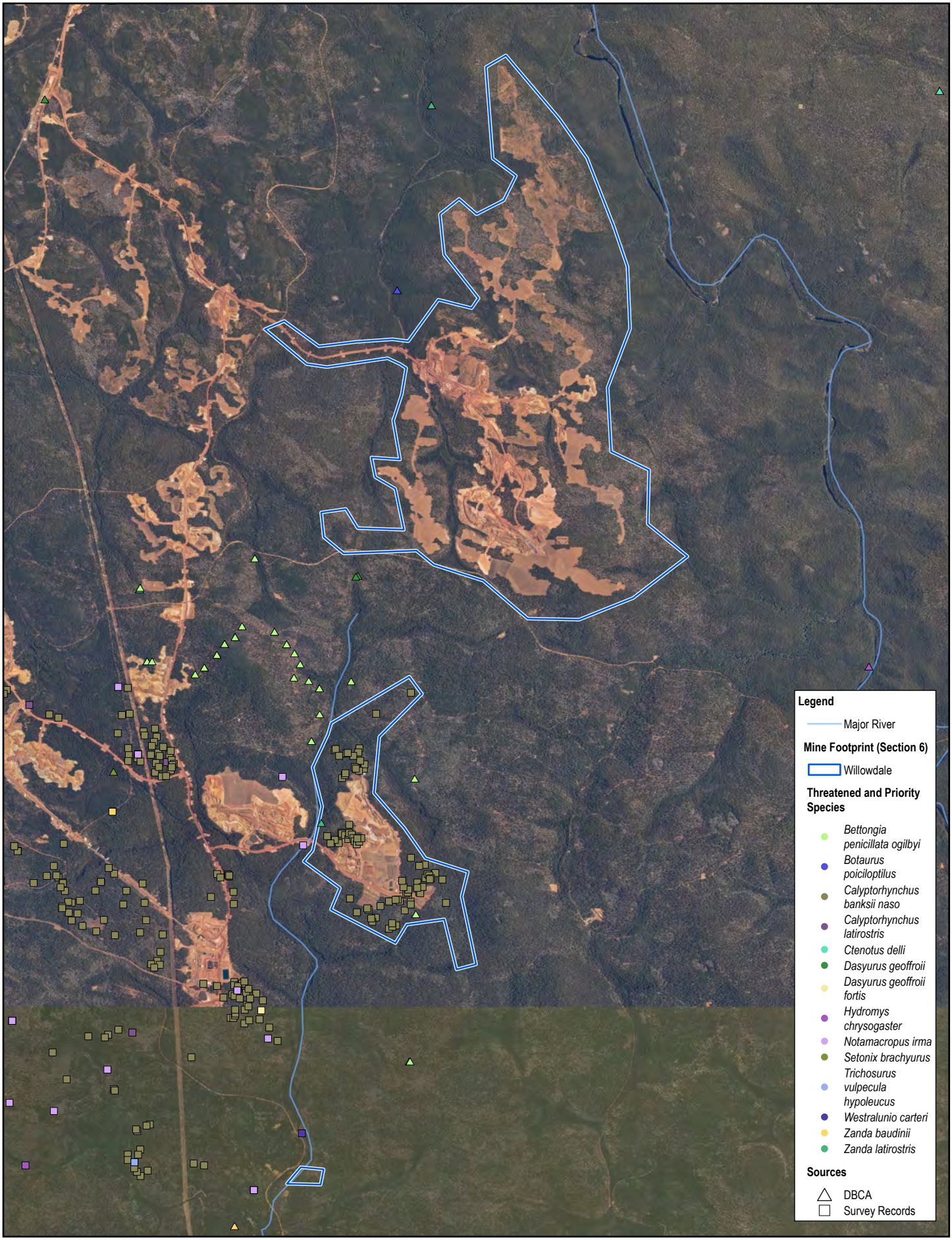
Survey Recorded Fauna – Huntly

Project No. **12565572**
Revision No. **1**
Date **04/11/2024**

FIGURE 5

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Paper Size ISO A4

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Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Alcoa
Fauna Desktop Assessment

Survey Recorded Fauna – Willowdale

Project No. **12565572**
Revision No. **1**
Date **04/11/2024**

FIGURE 6

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Print date: 04 Nov 2024 - 13:07

Data source: WANow:
World Imagery: Earthstar Geographics. Created by: rbrown3

PHOENIX
ENVIRONMENTAL SCIENCES

Short-range endemic invertebrate risk assessment for the Huntly and Willowdale Mine

Prepared for Alcoa of Australia Ltd.

September 2024

Final



Short-range endemic invertebrate risk assessment for the Huntly and Willowdale Mine Project
Prepared for Alcoa of Australia Ltd.

Version history

Author	Version	Version number	Date submitted	Submitted to
A. Jacks	Draft for client comments	0.1	19-Sep-24	S. Boys
A. Jacks	Final, client comments addressed	1.0	30-Sep-24	S. Boys

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Phoenix Environmental Sciences Pty Ltd
2/3 King Edward Road OSBORNE PARK WA 6017
P: 08 6323 5410
E: admin@phoenixenv.com.au
Job code: 1673

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1 INTRODUCTION

Alcoa of Australia Ltd. (Alcoa) operates the Huntly and Willowdale Mine (the Project), in the Northern Jarrah Forest, Western Australia (WA; Figure 1-1). Alcoa is currently putting together an Environmental Review Document (ERD) for the Section 6 areas at Huntly and Willowdale (Figure 1). As part of this, an investigation into the occurrence, and gaps in knowledge of SREs is required.

1.1 SCOPE OF WORK

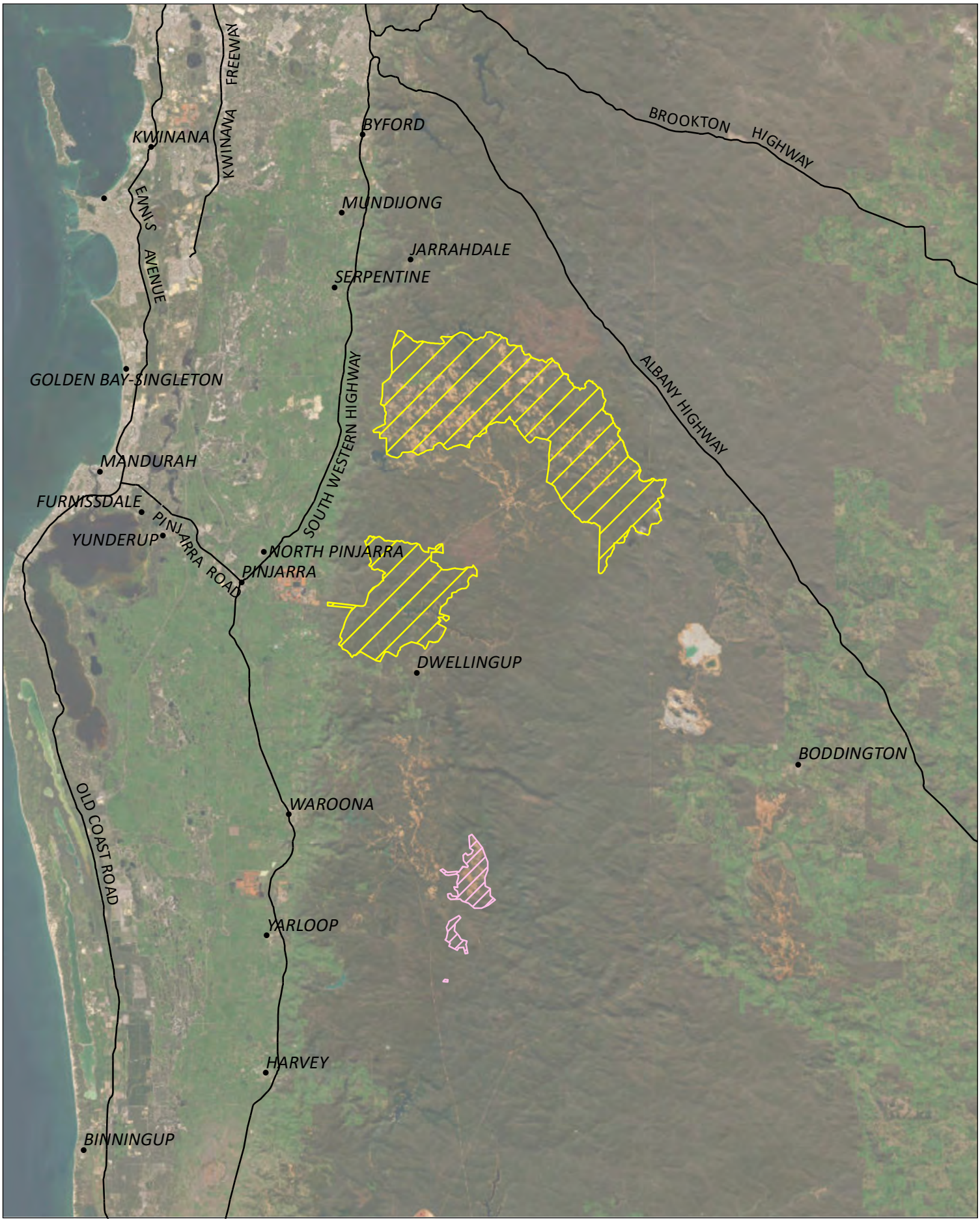
The scope of work is to undertake a desktop review of the SRE values by identifying:

- areas where previous surveys have/have not been undertaken, and survey effort
- species recorded
- areas where there is likely to be SRE values present.

1.2 STUDY AREA

The Huntly Mine Footprint (Section 6) (HMF) comprises of 2 areas to the east and north-east of Pinjarra and occupies an area of 39,046 ha (Figure 1-1). The northern portion is approximately 29,323 ha and encompasses currently active mining areas, and the southern portion is approximately 9,724 ha and encompasses a previously mined area.

The Willowdale Mine Footprint (Section 6) comprises of areas to the east of Wagerup and occupies an area of 2,136 ha (Figure 1-1).





Alcoa of Australia Ltd.
Huntly and Willowdale Mines

Project No	1673
Date	18/09/2024
Drawn by	AJ
Map author	AJ

0 8.5 17
Kilometers

1:500,000 (at A4) GDA 1994 MGA Zone 50

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P:\Data\Projects\HuntlyMine\1673-HM-ALC-TIN\GIS\Mapping\Outputs\Section 6 ERD\Fig 1- Project location.mxd

Huntly Mine Footprint (Section 6)
Willowdale Mine Footprint (Section 6)

Figure 1

Project location and study area

PHOENIX ENVIRONMENTAL SCIENCES

2 LEGISLATIVE CONTEXT

The protection of fauna in WA is principally governed by three acts:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- State *Biodiversity Conservation Act 2016* (BC Act)
- State *Environmental Protection Act 1986* (EP Act).

2.1 COMMONWEALTH

The EPBC Act is administered by the Federal Department of Climate Change, Energy, the Environment and Water (DCCEEW). The EPBC Act provides for the listing of Threatened fauna as matters of National Environmental Significance (NES). Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of NES, require approval from the Australian Government Minister for the Environment through a formal referral process. Key threats and habitat critical to the survival of EPBC Act Threatened species are usually defined in the conservation advice and/or recovery plan for the species.

Conservation categories applicable to Threatened fauna species under the EPBC Act are as follows:

- Extinct (EX)[1] – there is no reasonable doubt that the last individual has died
- Extinct in the Wild (EW) – taxa known to survive only in captivity
- Critically Endangered (CR) – taxa facing an extremely high risk of extinction in the wild in the immediate future
- Endangered (EN) – taxa facing a very high risk of extinction in the wild in the near future
- Vulnerable (VU) – taxa facing a high risk of extinction in the wild in the medium-term
- Conservation Dependent (CD)[1] – taxa whose survival depends upon ongoing conservation measures; without these measures, a conservation dependent taxon would be classified as Vulnerable, Endangered or Critically Endangered.

2.2 STATE

2.2.1 Threatened and Priority species

In WA, the BC Act provides for the listing of Threatened fauna species (Government of Western Australia 2018a, b) in the following categories:

- Critically Endangered (CR) – species facing an extremely high risk of extinction in the wild in the immediate future[2]
- Endangered (EN) – species facing a very high risk of extinction in the wild in the near future[2]
- Vulnerable (VU) – species facing a high risk of extinction in the wild in the medium-term future[2].

Species may also be listed as specially protected (SP) under the BC Act in one or more of the following categories:

[1] Species listed as Extinct and Conservation Dependent are not matters of NES and therefore do not trigger the EPBC Act.

[2] As determined in accordance with criteria set out in the ministerial guidelines.

- species of special conservation interest (conservation dependent fauna, CD) – species with a naturally low population, restricted natural range, of special interest to science, or subject to or recovering from a significant population decline or reduction in natural range
- migratory species (Mig.), including birds subject to international agreement
- species otherwise in need of special protection (OS).

The Department of Biodiversity, Conservation and Attractions (DBCA) administers the BC Act and also maintains a non-statutory list of Priority fauna. Priority species are still considered to be of conservation significance – that is they may be Threatened – but cannot be considered for listing under the BC Act until there is adequate understanding of threat levels imposed on them. Species on the Priority fauna list are assigned to one of four Priority (P) categories, P1 (highest) – P4 (lowest), based on level of knowledge/concern.

2.2.2 Other significant fauna

Under the EPA's environmental factor guideline (EPA 2016a), fauna may be considered significant for reasons other than listing as a Threatened or Priority species, including:

- species with restricted distribution, such as short-range endemic invertebrates (see also section 2.2.3)
- species subject to a degree of historical impact from threatening processes
- providing an important function required to maintain the ecological integrity of a significant ecosystem.

2.2.3 Short-range endemic invertebrates

Short-range endemic (SRE) fauna are defined as animals that display restricted geographic distributions, nominally less than 10,000 km^2, that may also be disjunct and highly localised (Harvey 2002). EPA (2016a) identifies species with restricted distributions as being significant fauna in the context of environmental impact assessments (EIA). SRE fauna need to be considered in EIA as localised, small populations of species that are generally at greater risk of changes in conservation status due to environmental change than other, more widely distributed taxa.

Short-range endemism in terrestrial invertebrates is believed to have evolved through two primary processes (Harvey 2002):

- Relictual – where the drying climate reduced the area of suitable habitat available to a species, forcing a range contraction. Such habitats typically maintain historic mesic conditions (e.g. south-facing rock faces or slopes of mountains or gullies).
- Habitat speciality – where species settled in particular isolated habitat types (e.g. rocky outcrops) by means of dispersal and evolved in isolation into distinct species.

SRE invertebrates have however also been reported in more widespread habitats such as spinifex plains or woodlands, mainly in groups with low dispersal capabilities, for example mygalomorph spiders and millipedes (see for example Car & Harvey 2014; Rix et al. 2018).

There can be uncertainty in categorising a specimen as an SRE due to several factors including poor regional survey density, lack of taxonomic research and problems of identification, i.e. specimens that may represent SREs cannot be identified to species level based on the life stage. For example, in contrast to mature males, juvenile and female millipedes, mygalomorph spiders and scorpions cannot be identified to species level. Molecular techniques such as 'barcoding' (Hebert *et al.* 2003a; Hebert *et al.* 2003b) are routinely employed to overcome taxonomic or identification problems.

3 EXISTING ENVIRONMENT

3.1 INTERIM BIOGEOGRAPHIC REGIONALISATION OF AUSTRALIA

The Interim Biogeographic Regionalisation of Australia (IBRA) classifies Australia's landscapes into large 'bioregions' and 'subregions' based on climate, geology, landform, native vegetation and species information (DoEE 2016). The study area is located in the Northen Jarrah Forest subregion (JF1) of the Jarrah Forest bioregion which is characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by woodlands of Wandoo - Marri on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands. The climate is Warm Mediterranean (Williams & Mitchell 2001).

3.2 CONSERVATION RESERVES AND ENVIRONMENTALLY SENSITIVE AREAS

The HMF and WMF both occur primarily within state forest (Jarrahdale, Dwellingup and Marrinup State Forest). Serpentine National Park intersects the northern portion of the HMF and Lane Poole Reserve intersects the eastern and western perimeter of the WMF.

4 SURVEY GUIDELINES

The EPA Technical Guidance: Sampling of short-range endemic invertebrate fauna (EPA 2016b) stipulates survey effort that is expected for projects requiring environmental impact assessment in WA, these include:

- Timing: Winter to early spring (May-Oct) for surveys in the south-west
- Sampling methods:
    - **Wet pitfall trapping** is listed in the EPA survey guidelines but is not considered a standard component due to ethical concerns, however this technique is very effective for detecting SREs and properly installed wet pit fall traps have a very low vertebrate fauna by-catch rate and very low sequencing failure rate (Phoenix 2024a).
    - **Dry pitfall traps** is listed in the EPA survey guidelines but it is acknowledged that these are only practical when undertaking survey work concurrently with vertebrate fauna pitfall trapping and that this is method highly constrained by weather.
    - **Hand foraging**, including leaf litter and soil sieving, leaf litter and soil raking or blowing, and active searches in micro-habitats such as under rocks, tree bark etc.

The EPA guidelines do not state number of sites to be sampled, however has general guidance on where to sample:

- "proponents should ensure that surveys aim to sample proposed ground disturbance areas, and any other areas where the Project influence could indirectly affect SRE taxa… proponents are strongly encouraged to also carry out sampling in equivalent habitats outside of their proposal footprint".
- sheltered habitats and micro-habitats such as "relatively mesic environments such as slopes with south-west facing aspects, vine thickets, rock piles, drainage systems, deep gorges, mound springs/natural springs, fire refuge areas such as cliffs/isolated rock piles, and other similar habitats".
- habitat isolates such as islands and rock outcrops.

5 PREVIOUS SURVEYS

Searches of several biological databases were undertaken to identify previous surveys that have been undertaken within the study area:

- WA Museum Arachnid and Myriapod Database, Mollusca Database, Crustacea Database (WAM 2024)
- Index of Biodiversity Surveys for Assessment (IBSA) database (IBSA 2024)
- Phoenix biological database (Phoenix 2024a).

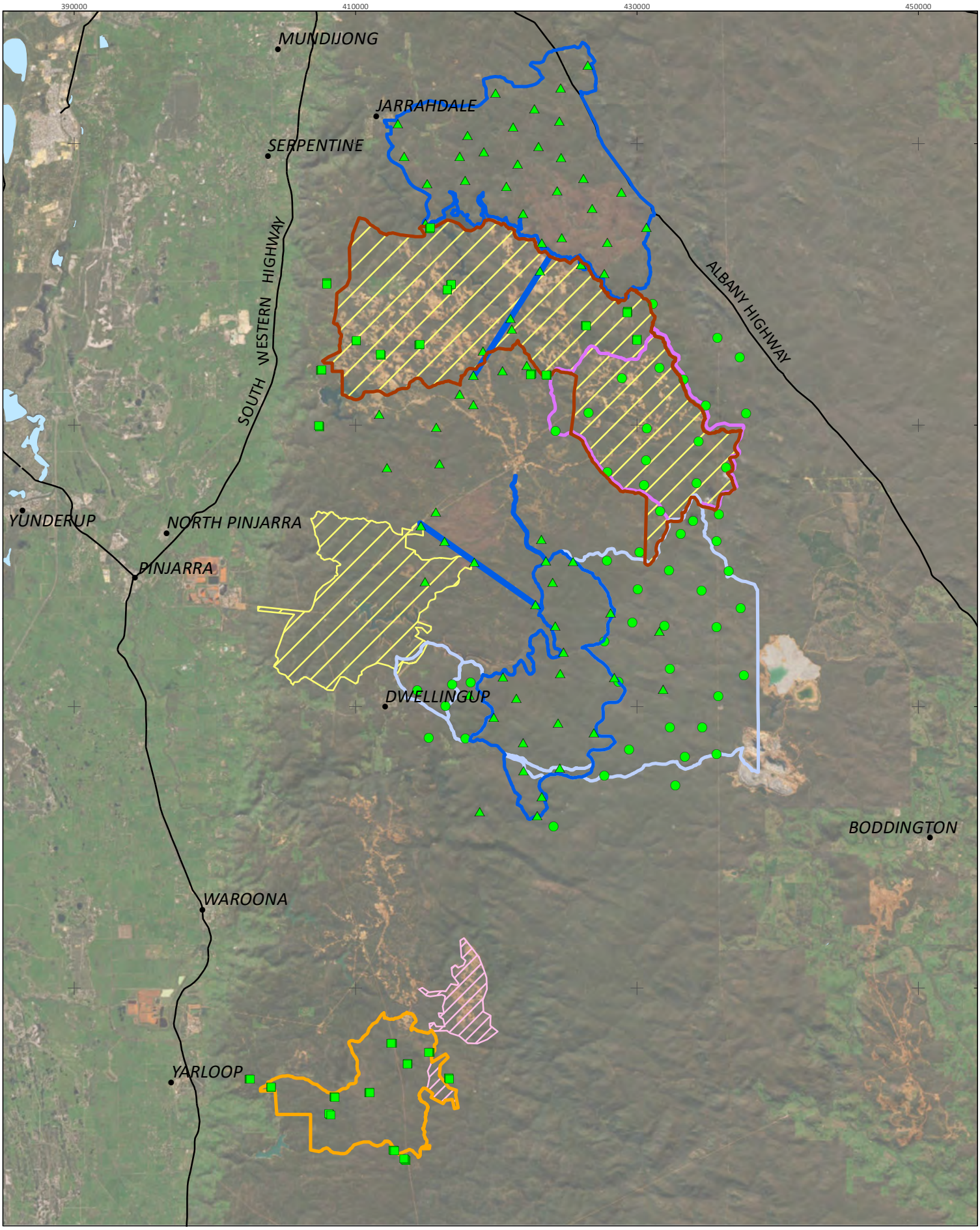
Reports obtained from the above sources (where available) were interrogated to determine survey effort and general outcomes.

Several SRE surveys have been undertaken or are currently being undertaken in parts of the HMF and WMF area (Table 5-1). The SRE surveys which meet current EPA survey guidelines cover the northern portion of the HMF, however the southern portion of the HMF and the WMF are lacking appropriate survey effort. Several other surveys not overlapping the HMF and the WMF occur to the east and south of HMF and WMF and provide some regional data in which to compare results. The main findings of these surveys indicate a high diversity of taxa throughout the region, with some overlap in species assemblages. All systematic SRE surveys are associated with mining projects. Some data from research projects, opportunistic collections, and smaller projects is also available near the HMF and WMF, however, most of these are not comprehensive or only focus on one group of SRE invertebrates.

Table 5-1 Surveys in or near the study area

Survey name	Survey timing	Sampling methods	Intersects study area	Main findings
Myara (currently being surveyed)	Winter and spring 2024	2 phase wet pit traps Foraging, incl. litter sieves **Meets EPA survey guidelines**	**Yes, encompasses entire northern portion of the HMF**	No results yet
Larego (currently being surveyed)	Winter and spring 2024	2 phase wet pit traps Foraging, incl. litter sieves **Meets EPA survey guidelines**	**Yes, part of the WMF**, however no sites were installed in this area	No results yet
Holyoake East and Holyoake West (Phoenix in prep.)	Winter and spring 2022 (Holyoake East) and spring 2022 and winter 2023 (Holyoake West) **Meets EPA survey guidelines**	2 phase wet pit traps Foraging, incl. litter sieves **Meets EPA survey guidelines**	**Yes, Minor overlap at boundary of HMF**	2 study areas 101 taxa
O'Neil Mine Development (Phoenix 2024b)	Winter and spring 2023 **Meets EPA survey guidelines**	2 phase wet pit traps Foraging, incl. litter sieves **Meets EPA survey guidelines**	**Yes, overlaps south-eastern third of the HMF**	1 study area 64 taxa

Survey name	Survey timing	Sampling methods	Intersects study area	Main findings
Myara North and Holyoake (Phoenix 2021)	Winter and spring 2020 **Meets EPA survey guidelines**	Wet pitfall traps Foraging, incl. Litter sieves **Meets EPA survey guidelines**	No – shares boundary with HMF	2 study areas, plus infrastructure corridors, plus rehabilitation survey 113 taxa
Worsley Mine Expansion Project (Phoenix 2019, 2020, 2023)	Spring 2019 (WMDE), autumn, winter spring 2020 (regional) **Meets EPA survey guidelines**	2 phase wet pit traps Foraging, incl. Litter sieves **Meets EPA survey guidelines**	No	3 study areas plus rehabilitation survey Large comparable survey located east and south of the study area 132 taxa
Worsley Alumina Primary Bauxite Area Expansion Project (Phoenix 2012)	Spring 2011, autumn 2012 **Meets EPA survey guidelines, though results may be outdated**	2 phase wet pit traps Foraging, incl. Litter sieves **Meets EPA survey guidelines**	No	Comparable survey located east and south of the study area 60 taxa
Boddington Gold Mine (Outback Ecology 2012)	**Meets EPA survey guidelines, though results may be outdated**	Wet pitfall traps Foraging, incl. Litter sieves **Meets EPA survey guidelines**	No	Comparable survey located east and south of the study area 69 taxa
Research projects (WA Museum, University research thesis etc.)	WAM records indicate records were collected in throughout the year	various	Some records	Research projects aimed at increasing and understanding biodiversity (WA Museum), or targeted species (e.g. D. Harms PhD on pseudoscorpion, S. Zuiddam PhD on harvestmen, and S. Judd PhD on isopods)
Alcoa staff opportunistic collections	WAM records indicate records were collected in throughout the year	Dry pitfall traps Small wet pitfall traps from ant monitoring	Some records	Opportunistic collections made recently (since 2020) revealed 15 species and 8 indeterminate species of Mygalomorph spiders, 1 species of harvestmen spider, Various SREs from historic (circa 2005-2001) ant monitoring wet pit trap samples
Other collections/ surveys	WAM records indicate records were collected in throughout the year	various	Some records	Some small EIA projects – using dry pit traps and foraging Many records in the WAM database are over 25 years old, with several records dating back to early and mid-1900's. While these records are valuable, taxonomy and locality accuracy are less reliable





Alcoa of Australia Ltd.
Huntly and Willowdale Mines

Project No	1673
Date	18/09/2024
Drawn by	AJ
Map author	AJ

0 6 12
Kilometers

1:350,000 (at A4) GDA 1994 MGA Zone 50

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- Huntly Mine Footprint (Section 6)
- Willowdale Mine Footprint (Section 6)
- Larego (surveyed 2024, Phoenix)
- Myara (surveyed 2024, Phoenix)
- Holyoake and Myara North (surveyed 2020, Phoenix)
- Holyoak East and West (surveyed 2022 and 2023, Phoenix)
- O'Neil (surveyed 2023, Phoenix)
- Myara North and Holyoake 2-phase wet pit and forage sites
- Myara and Larego 2-phase wet pit and forage sites
- Holyoake East & West and O'Neil 2-phase wet pit and forage sites

Figure 5-1

Previous surveys within or adjacent to the study area

PHOENIX ENVIRONMENTAL SCIENCES

6 SPECIES ASSEMBLAGE

Searches of several biological databases were undertaken to identify and prepare lists of SREs that may occur within the study areas:

- WA Museum Arachnid and Myriapod Database, Mollusca Database (WAM 2024)
- Index of Biodiversity Surveys for Assessment (IBSA) database (IBSA 2024)
- Phoenix biological database (Phoenix 2024a).

Previous surveys have indicated that a diverse array of SRE invertebrates occupy the Jarrah Forest, with 365 taxa being recorded from the desktop review (Table 6-1, Appendix 1), noting that a small proportion of taxa are higher level taxa (e.g. 'sp. indet') that may represent taxon identified to species level. Mygalomorph spiders, millipedes, and pseudoscorpions, slaters are the most speciose SRE groups. The previous surveys in the region have all recorded a high diversity of SRE taxa from all recognised SRE groups (e.g. land snails, trapdoor spiders, scorpions, isopod slaters, velvet worms etc.). Each survey has continued to collect new species, but has also re-collected species that are either Widespread, known from a few records/surveys, or previously only known from a previous recent survey, indicating that the cumulative sampling effort is providing us with a better understanding of species ecology and distribution.

6.1.1 Huntly Mine Footprint

A total of 102 taxa have previously been recorded in the HMF, most of which have been collected from recent baseline surveys in the south-eastern part of the study area (Figure 6-1; Table 6-1). Further taxa are expected as a result of current surveys being undertaken in the western part of the Myara study area/northern portion of the HMF. Some SREs have been collected by Alcoa staff within the HMF and immediate vicinity, which mostly consists of mygalomorph spiders and a smaller number of harvestmen spiders from dry pitfall traps and opportunistic burrow excavations.

Of the 102 taxa recorded in the HMF, 6 are Confirmed SREs, comprising of 5 millipedes and one scorpion, 66 are Potential SREs owing data deficiency (indeterminate taxa or species with only a few records), and 28 are Widespread species.

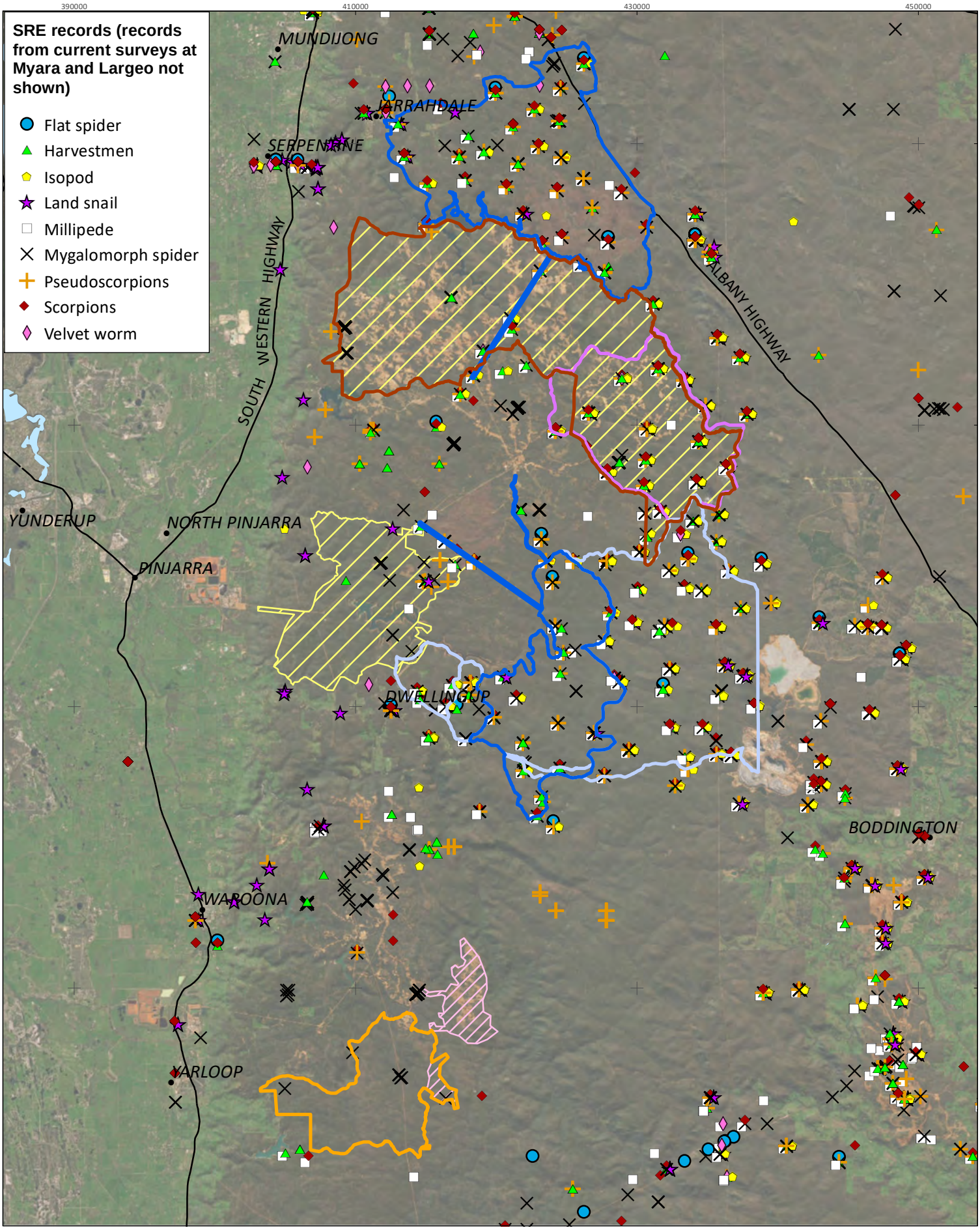
6.1.2 Willowdale Mine Footprint

One SRE has been recorded within the WMF study area, a mygalomorph spider (*Idiosoma* sp. indet.; Potential SRE) collected by Alcoa staff in 2022 (Figure 6-1). While there is a small overlap in study area from a current survey, no sites were located in this part of the WMF, however it is certain that SREs occur within native remnant vegetation within this study area.

Records located between the HMF and WMF that are not part of baseline surveys mostly comprise opportunistic or dry pitfall trap collections by Alcoa staff or academic research projects.

Table 6-1 Summary of SREs within the desktop review. (Number of taxa recorded within the study area is in parentheses).

Group/ SRE status	Confirmed	Likely	Potential	Potential/P3	Widespread	Widespread/P3	Total
Flat spider					3		3
Harvestmen			24 (15)		4		28
Isopod		1	29 (8)		12 (6)		42
Land snail			12 (4)		8 (2)		20
Millipede	45 (5)	4 (2)	18 (5)		5 (4)		72
Mygalomorph spider			121 (28)	1	10 (3)	1	133
Pseudoscorpion			30 (6)		16 (9)		46
Scorpion	1 (1)		7		10 (3)		18
Velvet worm			1		2 (1)		3
Total	**46 (6)**	**5 (2)**	**243 (66)**	**1**	**70 (28)**	**1**	**365 (102)**





Alcoa of Australia Ltd.
Huntly and Willowdale Mines

Project No	1673
Date	18/09/2024
Drawn by	AJ
Map author	AJ

0 6 12
Kilometers

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- Huntly Mine Footprint (Section 6)
- Willowdale Mine Footprint (Section 6)
- Laregó (surveyed 2024, Phoenix)
- Myara (surveyed 2024, Phoenix)
- Holyoake and Myara North (surveyed 2020, Phoenix)
- Holyoak East and West (surveyed 2022 and 2023, Phoenix)
- O'Neil (surveyed 2023, Phoenix)

Figure 5-2

SRE records from the desktop review

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P:\Data\Projects\HuntlyMine\1673-HM-ALC-TIN\GIS\Mapping\Outputs\Section 6 ERD\Fig 5-2- SRE records desktop.mxd

7 HABITATS

SRE habitats were re-interpreted from existing vegetation mapping undertaken by (Mattiske 2024). This data includes areas that have been previously cleared and areas of rehabilitation.

Habitats are assessed for their potential to support endemic SRE species and communities. Potential SRE habitat is rated as follows:

- High – defined/known areas of habitat that contain elements that often give rise to specialisation or dependency in invertebrate fauna, such as aspect (e.g. south-facing slopes, geological features (e.g. granite), soil types that retain water (e.g. clay, loam). These habitats may also include habitat isolates which have the capacity to restrict dispersal.
- Low – areas of largely in-tact native vegetation that occur broadly across the landscape, are less incised and typically link more restricted habitats. This may include land that was cleared but has since been rehabilitated or is in the process of being rehabilitated.
- None – land that has been previously cleared for other uses that no longer contains native vegetation.

The HMF and WMF mostly comprise of Low Potential SRE habitat 4 (Table 7-1, Figure 7-1, Figure 7-2) which is characterised by “Open forest to woodland of Jarrah/Marri on sandy-loam gravelly soils on mid-slopes and ridges”.

The southern portion of the HMF is only mapped for rehabilitation, which occupies approximately one-quarter of the southern portion of the HMF; the remainder of this is remnant vegetation is likely to be SRE habitat 4 with minor occurrences of other habitat types. South Dandalup Dam (approx. 450 ha) also occurs in the southern portion of the HMF and does not have any SRE value.

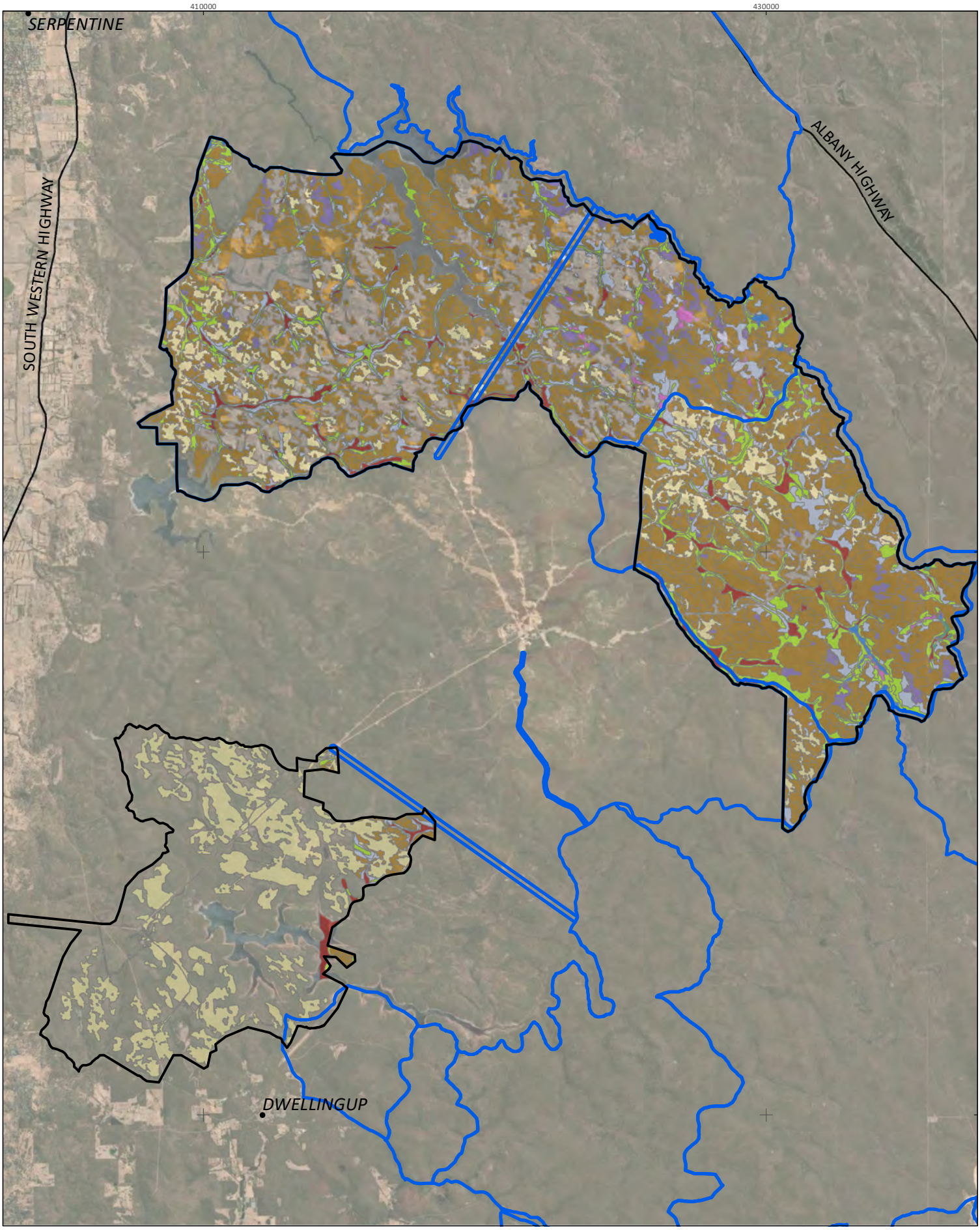
At least 19.2% of the HMF is comprised of High Potential SRE habitats, which are habitats which may support a high degree of refugia such as restricted micro-habitats or that have the tendency to retain more moisture, such as valley floors.

Although not shown in the mapping, approximately one-third of the WMF is cleared, mostly affecting what is likely habitat 4. At least 17.2 ha of the WMF supports High Potential SRE habitat.

Previous survey data in the region indicates both Low and High Potential SRE habitat supports SREs, however the Low Potential SRE habitats may have less restriction to dispersal and support species with wider habitat tolerances. Overall, the HMF and WMF comprise of approximately 29,094 ha (75%), and 1,410 ha (66%) remnant native vegetation and these areas are certain to support various SRE taxa.

Table 7-1 Habitats within the Huntly Mine Footprint

SRE habitat (code: description)	Habitat Potential	HMF Area (ha), (%)	WMF Area (ha), (%)
1. Melaleuca woodlands/shrublands on seasonally wet or waterlogged clays and clay-loams on valley floors	H	106 (0.3%)	-
2. Open Jarrah/Marri or Blackbutt on lower slopes and valley floors	H	2,692 (6.9%)	107 (5.0%)
3. Heath/shrubland/woodland on shallow soils on granite or outcrops	H	982 (2.5%)	3 (0.1%)
4. Open forest to woodland of Jarrah/Marri on sandy-loam gravelly soils on mid-slopes and ridges	L	14,827 (38%)	1,719 (80.5%)
5. Open forest of Jarrah/Marri, seasonally moist, sandy gravels on slopes	H	2,774 (7.1%)	207 (9.7%)
6. Cleared land, including plantations and dams	n/a	4,400 (11.3%)	-
7. Open forest to woodland of Jarrah/Marri on slopes and less undulating hills	L	145 (0.4%)	17 (0.8%)
10. Open woodlands of Wandoo and/or Flooded Gum on seasonally wet or waterlogged clays and clay-loams in valley floors	H	937 (2.4%)	52 (2.4%)
11. Open woodlands of Wandoo with clay-loams and some gravel on slopes	L	17 <0.1%)	-
12. Rehabilitation	L	5,102 (13.1%)	-
Un-mapped native vegetation		6,615 (16.9%)	30 (1.4%)
Un-mapped - dam	n/a	450 (1.1%)	-
Total		**39,046**	**2,136**



PERTH

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Huntly and Willowdale Mines

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Map author	AJ

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Willowdale Mine Footprint (Section 6)
Previous survey areas (Phoenix 2020 to 2024)

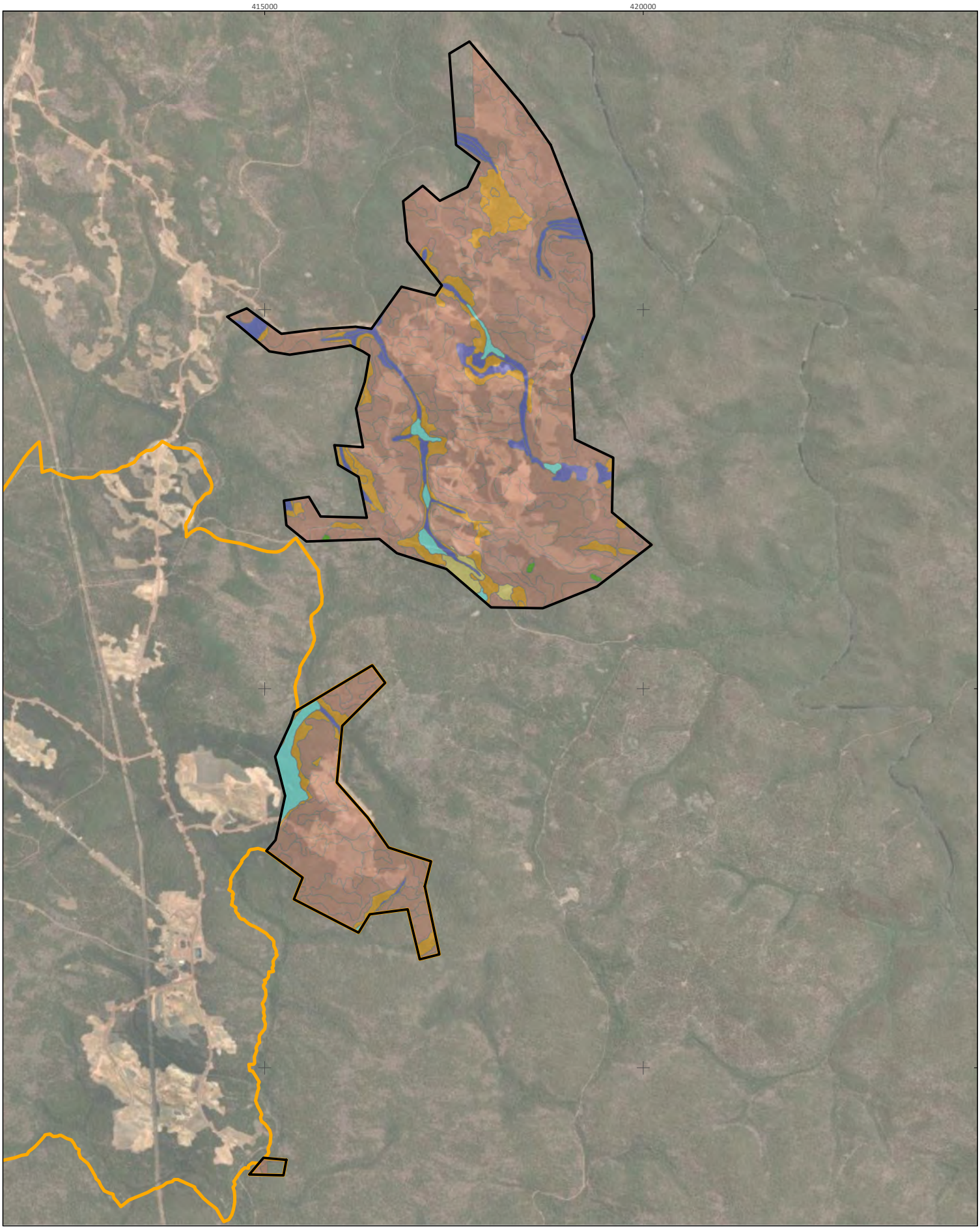
SRE habitat code
1
2
3
4
5
6
7
10
11
12

Figure 7-1

SRE Habitats within the Huntly Mine Footprint

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P:\Data\Projects\HuntlyMine\1673-HM-ALC-TIN\GIS\Mapping\Outputs\Section 6 ERD\Fig 5-3- SRE habitats HMF.mxd





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Date	18/09/2024
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Map author	AJ

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Willowdale Mine Footprint (Section 6)
Larego (surveyed 2024, Phoenix)

SRE habitat code

- 10
- 2
- 3
- 4
- 5
- 7

Figure 7-2

SRE Habitats within the Willowdale Mine Footprint

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8 CONCLUSION

The results SRE surveys undertaken in and around the HMF and WMF and further afield in the Northern Jarrah Forest bioregion all indicate that SRE invertebrates are certain to occur within areas of native vegetation. Studies and opportunistic records from rehabilitation indicate these areas also provide habitat, however these areas are generally of lower value due to lower levels of habitat complexity.

The desktop review revealed abundant SRE data was available in some areas, mostly related to mining approvals in the region. A low abundance of regional records outside of these study areas hinders comparisons and assumptions on species distributions that can be made.

8.1 HUNTLY MINE FOOTPRINT

SRE surveys have been undertaken within the HMF include intensive sampling throughout the northern portion. These surveys have been undertaken recently (2023 and 2024) using approved sampling techniques and were undertaken within optimal survey period according to the EPA (2016b). These have focussed on areas of remnant vegetation which are considered the highest values habitats for SREs, including a range of SRE habitats available (e.g. granite outcrops, riparian/valley, upper slopes and mid-slopes) with some sampling also undertaken in rehabilitation. The southern portion of the HMF has not been adequately sampled for SREs.

8.2 WILLOWDALE MINE FOOTPRINT

SREs have not been adequately sampled within the WMF, with no systematic sampling sites occurring within the WMF. Approximately one-third of the WFM has been previously cleared, however the remaining native vegetation is certain to support SRE invertebrate taxa.

REFERENCES

Car, C. A. & Harvey, M. S. 2014. The millipede genus *Antichiropus* (Diplopoda: Polydesmida: Paradoxosomatidae), part 2: species of the Great Western Woodlands region of Western Australia. *Records of the Western Australian Museum* **29**: 20–77.

DoEE. 2016. *Maps: Australia's bioregions (IBRA)*. Department of the Environment and Energy, Canberra, ACT. Available at: http://www.environment.gov.au/topics/land/national-reserve-system/science-maps-and-data/australias-bioregions-ibra

EPA. 2016a. *Environmental Factor Guideline: Terrestrial fauna*. Environmental Protection Authority, Perth, WA. Available at: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Guideline-Terrestrial-Fauna-131216_3.pdf

EPA. 2016b. *Technical Guidance: Sampling of short range endemic invertebrate fauna*. Environmental Protection Authority, Perth, WA. Available at: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Sampling-SREs-Dec-2016.pdf

Government of Western Australia. 2018a. *Wildlife Conservation Act 1950 Wildlife Conservation (Rare Flora) Notice 2018*. Government Gazette, WA. Government of Western Australia, Perth, WA.

Government of Western Australia. 2018b. *Wildlife Conservation Act 1950, Wildlife Conservation (Specially Protected Fauna) Notice 2018*. Government Gazette, WA, Perth, WA.

Harvey, M. S. 2002. Short-range endemism among the Australian fauna: some examples from non-marine environments. *Invertebrate Systematics* **16**: 555–570.

Hebert, P. D. N., A., C., Ball, S. L. & de Waard, J. R. 2003a. Biological identifications through DNA barcodes. *Proceedings of the Royal Society London B* **270**: 313–321.

Hebert, P. D. N., Ratnasingham, S. & de Waard, J. R. 2003b. Barcoding animal life: Cytochrome c oxidase subunit 1 divergences among closely related species. *Proceedings of the Royal Society London B, Supplement* **270**: 96–99.

IBSA. 2024. *Index of Biological Surveys for Assessment*. Department of Water and Environmental Regulation, Perth, WA.

Mattiske. 2024. *Alcoa Composite Vegetation_Descr_2024*. Mattiske Consulting, Kalamunda, WA. Available at: P:\Data\Projects\HuntlyMine\Client_Communications\DataReceived\20240424_Vegetation Mapping_CMRA-Holyoake\Alcoa Composite Vegetation_Descr_2024

Outback Ecology. 2012. *Terrestrial Short-ranged Endemic Invertebrate Fauna Baseline Survey for the Boddington Gold Mine*. Outback Ecology Services, Jolimont, WA.

Phoenix. 2012. *Two-season short-range endemic invertebrate survey for the BHP Billiton Worsley Alumina Primary Bauxite Area Expansion Project*. Phoenix Environmental Sciences Pty Ltd, Balcatta, WA. Unpublished report prepared for Strategen Environmental Consultants (on behalf of BHP Worsley Alumina Pty Ltd).

Phoenix. 2019. *Terrestrial short-range endemic fauna assessment conducted for the proposed Worsley Mine Expansion*. Phoenix Environmental Sciences Pty Ltd, Balcatta, W.A. Unpublished report prepared for S32 Ltd. Available at: https://phoenixenvironment.sharepoint.com/:b:/r/Projects/Worsley%20Primary%20Bauxite%20Area%20Extension%20Project/1240_BoddingtonWorselyMiningExpansionProject_SRE_Assessment_20190510.pdf?csf=1&e=vIiayG

Phoenix. 2020. *Short-range endemic invertebrate fauna survey for the Worsley Mine Expansion Project*. Phoenix Environmental Sciences Pty Ltd, Osborne Park, W.A. Unpublished report prepared for South32 Ltd.

Phoenix. 2021. *Short-range Endemic invertebrate survey for the Alcoa Huntly Mine – Myara North and Holyoake*. Phoenix Environmental Sciences, Osborne Park, WA. Report prepared for GHD Ltd.

Phoenix. 2023. *Four-phase short-range endemic invertebrate fauna survey for the Worsley Mine Expansion Project (March 2023 udpate)*. Phoenix Environmental Sciences Pty Ltd, Osborne Park, WA. Report prepared for South32 Ltd.

Phoenix. 2024a. *Phoenix Biological Database*. Phoenix Environmental Sciences Pty Ltd, Osborne Park, WA.

Phoenix. 2024b. *Short-range endemic invertebrate fauna survey for the Holyoake Stage 2 Project – O'Neil Mine Development*. Phoenix Environmental Sciences, Osborne Park, WA. Report prepared for GHD Ltd on behalf of Alcoa of Australia.

Phoenix. in prep. *Short-range Endemic invertebrate survey for the Holyoake Stage 2 Project – Holyoake East and Holyoake West*. Phoenix Environmental Sciences, Osborne Park, WA. Report prepared for GHD Ltd.

Rix, M. G., Huey, J. A., Cooper, S. J. B., Austin, A. D. & Harvey, M. S. 2018. Conservation systematics of the shield-backed trapdoor spiders of the *nigrum*-group (Mygalomorphae, Idiopidae, *Idiosoma*): integrative taxonomy reveals a diverse and threatened fauna from south-western Australia. *Zookeys* **756**: 1–121 http://dx.doi.org/10.3897/zookeys.756.24397.

WAM. 2024. *WA Museum Arachnology/Myriapodology, Crustacea, Mollusca and Entomology database*, Welshpool, WA.

Williams, K. & Mitchell, D. 2001. Jarrah Forest 1 (JF1—Northern Jarrah Forest subregion). *In:* May, J. E. & McKenzie, N. L. (eds) *A biodiversity audit of Western Australia's biogeographical subregions in 2002.* Department of Conservation and Land Management, Perth, WA, pp. 369–381.

Appendix 1 Short-range endemic invertebrate desktop results

Taxon	SRE status	in HMF or WMF
Class: Araneae, Infraorder: Araneomorphae (Flat spiders)		
Karaops `sp. indet.`	Widespread	
Karaops ellenae	Widespread	
Karaops jarrit	Widespread	
Class: Araneae, Order: Opiliones (Harvestmen spiders)		
Abaddon despoliator	Potential	HMF
Ballarra `sp. indet.`	Potential	HMF
Ballarra longipalpus	Potential	HMF
Calliuncus `genus 4`	Potential	
Calliuncus `sp. indet.`	Potential	HMF
Hesperopilio mainae	Potential	
Megalopsalis `sp. indet.`	Potential	HMF
Megalopsalis `worsley1`	Potential	
Megalopsalis `WorsleyDNA23`	Potential	HMF
Megalopsalis leptekes	Widespread	
Megalopsalis tanisphyros	Widespread	
Neopilionidae sp. indet.	Potential	HMF
Nunciella `sp. 6?`	Potential	
Nunciella `sp. indet.`	Potential	HMF
Nunciella `sp. nov.`	Potential	
Nunciella `WorsleyDNA25`	Potential	HMF
Nunciella aspera	Widespread	
Nunciella karriensis	Widespread	
Nunciella` `sp. 6`	Potential	
Perthacantha `sp. indet.`	Potential	
Triaenonychidae `Genus 002` `sp. indet.`	Potential	
Triaenonychidae `Genus 003` `sp. indet.`	Potential	
Triaenonychidae `Genus 004` `sp. indet.`	Potential	HMF
Triaenonychidae `Genus 008/Nunciella?` `sp. indet.`	Potential	HMF
Triaenonychidae `genus 008` `Phoenix0269`	Potential	HMF
Triaenonychidae `Genus 008` `sp. indet.`	Potential	HMF
Triaenonychidae `sp. indet.`	Potential	HMF
Triaenonychidae `genus 004` `Phoenix0270`	Potential	HMF
Class: Diplopoda (Millipedes)		
Akamptogonus novarae	Widespread	
Antichiropus `cf DIP097, marradong`	Confirmed	
Antichiropus `DIP046, boddington`	Confirmed	
Antichiropus `DIP056, arfa`	Confirmed	
Antichiropus `DIP056`	Confirmed	
Antichiropus `DIP062, darling`	Confirmed	
Antichiropus `DIP066, boyagin`	Confirmed	
Antichiropus `DIP078?`	Confirmed	
Antichiropus `DIP078`	Confirmed	

Antichiropus `DIP094, goldmine`	Confirmed	
Antichiropus `DIP097, marradong`	Confirmed	
Antichiropus `DIP105, bancroft`	Confirmed	
Antichiropus `DIP108, mt saddleback`	Confirmed	
Antichiropus `DIP112, Norman Road 1`	Confirmed	
Antichiropus `DIP125, tutanning`	Confirmed	
Antichiropus `DIP126`	Confirmed	
Antichiropus `DIP135, minnivale 2`	Confirmed	
Antichiropus `DIP137, saddleback 2`	Confirmed	
Antichiropus `DIP143, serpentine`	Confirmed	
Antichiropus `DIP166 whistlepipe`	Confirmed	
Antichiropus `DIP168`	Confirmed	
Antichiropus `DIP171, ellisbrook`	Confirmed	
Antichiropus `DIP178, bannister`	Confirmed	
Antichiropus `DIP180`	Confirmed	
Antichiropus `DIP181, lane poole`	Confirmed	
Antichiropus `DIP182, saddleback 3`	Confirmed	
Antichiropus `DIP183`	Confirmed	
Antichiropus `DIP183` `Phoenix0216`	Confirmed	
Antichiropus `DIP183` `Phoenix0217`	Confirmed	HMF
Antichiropus `DIP183` `Phoenix0218`	Confirmed	HMF
Antichiropus `DIP186, kirsten`	Confirmed	
Antichiropus `DIP202`	Confirmed	
Antichiropus `DIP220, mini`	Confirmed	
Antichiropus `DIP221, Myara`	Confirmed	HMF
Antichiropus `DIP222 forest`	Confirmed	
Antichiropus `DIP223 southern`	Confirmed	
Antichiropus `DIP224 dwellingup`	Confirmed	HMF
Antichiropus `DIP246`	Confirmed	
Antichiropus `sp. indet.`	Potential	
Antichiropus `worsley`	Potential	
Antichiropus minimus	Confirmed	
Antichiropus nanus	Confirmed	
Antichiropus variabilis	Widespread	HMF
Atelomastix `sp. indet.`	Widespread	HMF
Atelomastix nigrescens	Widespread	HMF
Dalodesmidae `Phoenix0038`	Potential	HMF
Dalodesmidae `sp. indet.`	Potential	HMF
Dinocambala ingens	Confirmed	
Paradoxosomatidae `Genus nov.` `sp. indet.`	Potential	
Podykipus `DIP241`	Potential	HMF
Podykipus collinus	Potential	HMF
Podykipus leptoiuloides	Widespread	HMF
Siphonotidae `DIPAAF` `DIP188`	Potential	
Siphonotidae `DIPAAF` `DIP188`	Confirmed	
Siphonotidae `DIPAAF` `Phoenix0043 / cf michaelseni`	Likely	HMF

Siphonotidae `DIPAAF` `sp. indet.`	Potential	
Siphonotidae `DIPAAF` michaelseni	Likely	HMF
Siphonotidae `DIPAAG/ `DIP219, Phoenix0044`	Potential	
Siphonotidae `DIPAAG` `DIP189, /Phoenix0039` `collie`	Confirmed	
Siphonotidae `DIPAAG` `DIP192`	Confirmed	HMF
Siphonotidae `DIPAAG` `DIP192` `mt saddleback`	Confirmed	
Siphonotidae `DIPAAG` `DIP194, cocaoi`	Potential	
Siphonotidae `DIPAAG` `sp. indet.`	Potential	
Siphonotidae `DIPAAH` `DIP190`	Confirmed	
Siphonotidae `DIPAAL` `DIP240`	Likely	
Siphonotidae `Megalosiphon `WorsleyDNA14`	Potential	
Siphonotidae `Megalosiphon `WorsleyDNA15`	Potential	
Siphonotidae `Rhinotus/DIPAAF` michaelseni	Likely	
Siphonotidae `sp. indet.`	Potential	
Sphaerotrichopus `sp. indet.`	Potential	HMF
Sphaerotrichopus `S-W forests`	Potential	
Sphaerotrichopus ramosus	Potential	
Class: Araneae, Infraorder: Mygalomorphae (Trapdoor spiders)		
Aname `Brennan sp. 1`	Potential	
Aname `Brennan sp. 2`	Potential	
Aname `cf. mainae`	Potential	
Aname `Dwellingup`	Potential	
Aname `false black wish-bone`	Potential	
Aname `mainae grp`	Potential	
Aname `MYG010`	Potential	HMF
Aname `MYG119`	Potential	
Aname `MYG120`	Potential	
Aname `MYG121`	Potential	
Aname `MYG242`	Potential	
Aname `MYG383`	Potential	
Aname `MYG850`	Potential	HMF
Aname `Phoenix0004`	Potential	
Aname `Phoenix0006`	Potential	
Aname `Phoenix0010`	Potential	
Aname `Phoenix0020`	Potential	
Aname `Phoenix0036`	Potential	HMF
Aname `Phoenix0037`	Potential	HMF
Aname `sp. indet.`	Potential	
Aname `sp. nov.`	Potential	
Anamidae `Phoenix0009`	Potential	
Anamidae `sp. indet.`	Potential	HMF
Aurecocrypta `Phoenix0014`	Potential	
Bertmainius opimus	Potential	
Bungulla disrupta	Potential	
Bungulla harrisonae	Potential	HMF
Bungulla parva	Potential	

Cethegus `sp. indet.`	Potential	
Cethegus fugax	Potential	
Chenistonia `sp. indet.`	Potential	
Conothele `sp. indet.`	Potential	
Eucanippe nemestrina	Potential	
Eucyrtops `cf T118362`	Potential	
Eucyrtops `cf. T118377?, male`	Potential	HMF
Eucyrtops `collie`	Potential	
Eucyrtops `everted fovea sp.`	Potential	
Eucyrtops `MYG142`	Potential	
Eucyrtops `MYG645`	Potential	HMF
Eucyrtops `MYG731`	Potential	
Eucyrtops `Phoenix0018`	Potential	
Eucyrtops `Phoenix0029`	Potential	
Eucyrtops `Phoenix0030`	Potential	
Eucyrtops `Phoenix0032`	Potential	HMF
Eucyrtops `Phoenix0033`	Potential	HMF
Eucyrtops `Phoenix0044`	Potential	
Eucyrtops `sp. indet.`	Potential	
Eucyrtops `WorsleyDNA06`	Potential	
Eucyrtops latior	Potential	
Euoplos `minimus`	Potential	
Euoplos `Phoenix0011`	Potential	
Euoplos `Phoenix0012`	Potential	
Euoplos `sp. indet.`	Potential	HMF
Euoplos inornatus	Potential	
Gaius `sp. indet.`	Potential	
Gaius cooperi	Potential	
Idiommata `flare tip`	Potential	
Idiommata `FP-11150 (Dryandra)`	Potential	
Idiommata `sp. indet.`	Potential	
Idiommata blackwalli	Widespread	HMF
Idiosoma `MYG075`	Potential	
Idiosoma `MYG187`	Potential	HMF
Idiosoma `MYG790`	Potential	HMF
Idiosoma `MYG803`	Potential	
Idiosoma `MYG806`	Potential	
Idiosoma `MYG831`	Potential	
Idiosoma `Phoenix0002`	Potential	
Idiosoma `rhaphiduca group`	Potential	
Idiosoma `sp. indet.`	Potential	HMF and WMF
Idiosoma jarrah	Widespread	HMF
Idiosoma schoknechtorum	Potential/P3	
Idiosoma sigillatum	Widespread/P3	
Kwonkan `MYG060`	Potential	
Kwonkan `MYG339 (FP-10068)`	Potential	

Kwonkan `MYG852`	Potential	HMF
Kwonkan `Phoenix0005`	Potential	
Kwonkan `Phoenix0008`	Potential	
Kwonkan `Phoenix0210`	Potential	
Kwonkan `sp. indet.`	Potential	
Kwonkan `sp. nov.`	Potential	
Mandjelia humphreysi	Widespread	
Missulena `black chelicerae`	Potential	
Missulena `cf. T132965? male`	Potential	HMF
Missulena `MYG198`	Potential	
Missulena `MYG639`	Potential	
Missulena `sp 5`	Potential	
Missulena `sp. indet.`	Potential	
Missulena `T132965`	Potential	HMF
Missulena granulosa	Widespread	
Missulena hoggi	Potential	
Missulena insignis	Widespread	
Missulena occatoria	Widespread	
Proshermacha `MYG449`	Potential	
Proshermacha `MYG471`	Potential	
Proshermacha `MYG485`	Potential	HMF
Proshermacha `MYG495`	Potential	HMF
Proshermacha `MYG596`	Potential	
Proshermacha `MYG646`	Potential	
Proshermacha `MYG658`	Potential	
Proshermacha `Phoenix0024`	Potential	
Proshermacha `Phoenix0027`	Potential	HMF
Proshermacha `Phoenix0028`	Potential	
Proshermacha `Phoenix0213`	Potential	
Proshermacha `sp. indet.`	Potential	HMF
Proshermacha `villosa`	Potential	
Proshermacha subarmata	Potential	
Synothele `MYG640`	Potential	
Synothele `sp. indet.`	Potential	
Synothele durokoppin	Widespread	
Synothele harveyi	Potential	
Synothele longbottomi	Widespread	
Synothele michaelseni	Widespread	HMF
Synothele mullaloo	Potential	HMF
Synothele rubripes	Potential	HMF
Teyl `Brennan sp. 2`	Potential	
Teyl `FP-12522 (Hovea)`	Potential	
Teyl `luculentus?`	Potential	
Teyl `mandgedal sp. group`	Potential	
Teyl `MYG241`	Potential	HMF
Teyl `MYG245`	Potential	HMF

Teyl `MYG249`	Potential	
Teyl `MYG355`	Potential	HMF
Teyl `MYG693`	Potential	
Teyl `MYG851`	Potential	
Teyl `Phoenix0007`	Potential	HMF
Teyl `Phoenix0019`	Potential	
Teyl `Phoenix0021`	Potential	
Teyl `Phoenix0212`	Potential	
Teyl `sp. indet.`	Potential	HMF
Teyl beaufortia	Potential	
Teyl luculentus	Potential	
Teyl nadineae	Widespread	
Teyl sampeyae	Potential	
Class: Araneae, Order: Pseudoscorpiones (Pseudoscorpions)		
Atemnidae `sp. indet.`	Potential	
Austrochthonius `grandis`	Widespread	
Austrochthonius `medium 2`	Potential	
Austrochthonius `PSE188, similis`	Widespread	HMF
Austrochthonius `PSE189, austini`	Potential	
Austrochthonius `PSE191, grandis`	Widespread	HMF
Austrochthonius `PSE192, lesueuri`	Potential	
Austrochthonius `sp. indet.`	Potential	HMF
Austrochthonius australis	Widespread	
Austrochthonius muchmorei	Widespread	HMF
Austrohorus `sp. indet.`	Potential	
Balgachernes occultus	Potential	HMF
Beierolpium `sp. 8/4 lge`	Potential	
Beierolpium `sp. 8/4`	Potential	HMF
Beierolpium `sp. indet.`	Potential	
Beierolpium `sp. nov.`	Potential	HMF
Beierolpium bornemisszai	Widespread	HMF
Cheliferidae `sp. indet.`	Potential	
Chernetidae `boddington`	Widespread	
Chernetidae `sp. indet.`	Potential	HMF
Chernetinae `tarsus IV without tactile seta`	Potential	
Chthoniidae `sp. indet.`	Potential	HMF
Euryolpium `sp. indet.`	Potential	
Geogarypus `sp. indet.`	Potential	
Geogarypus taylori	Widespread	HMF
Haplochernes ramosus	Potential	
Indolpium `sp. indet.`	Potential	
Lagynochthonius `sp. indet.`	Potential	
Lagynochthonius australicus	Widespread	HMF
Oratemnus `sp. indet.`	Potential	
Oratemnus curtus	Widespread	HMF
Protochelifer `boddington`	Widespread	HMF

Protochelifer `sp. indet.`	Potential	
Protogarypinus `sp. indet.`	Potential	
Protogarypinus giganteus	Widespread	
Pseudotyrannochthonius `Darling Range 1`	Potential	
Pseudotyrannochthonius `Darling Range 2`	Widespread	HMF
Pseudotyrannochthonius `Darling Range 3`	Potential	
Pseudotyrannochthonius `sp. indet.`	Potential	
Solinus `sp. indet.`	Potential	
Solinus pingrup	Potential	
Synsphyronus `sp. indet.`	Widespread	
Synsphyronus magnus	Widespread	
Synsphyronus mimulus	Widespread	
Tyrannochthonius `sp. indet.`	Potential	
Tyrannochthonius australicus	Potential	
Class: Araneae, Order: Scorpiones (Scorpions)		
Cercophonius `sp. indet.`	Potential	
Cercophonius granulosus	Widespread	
Cercophonius squama	Widespread	
Cercophonius sulcatus	Widespread	HMF
Isometroides `jarrah`	Potential	
Isometroides `vescus`	Widespread	
Lychas `austroccidentalis`	Widespread	HMF
Lychas `majerorum`	Potential	
Lychas `prendinii`	Potential	
Lychas `sp. indet.`	Potential	
Lychas `subsplendens`	Potential	
Lychas jonesae	Widespread	
Lychas splendens	Widespread	
Urodacus `armatus`	Widespread	
Urodacus `woodwardii`	Potential	
Urodacus hartmeyeri	Widespread	
Urodacus novaehollandiae	Widespread	HMF
Urodacus planimanus	Confirmed	HMF
Phylum: Onychophora (Velvet worms)		
Kumbadjena `sp. indet.`	Potential	
Occiperipatoides `sp. indet.`	Widespread	
Occiperipatoides gilesii	Widespread	HMF
Class: Crustacea, Order: Isopoda (Slaters)		
Acanthodillo `sp. 1 (Judd 2002)`	Potential	HMF
Acanthodillo `sp. 2 (Judd 2002)`	Potential	
Acanthodillo `sp. 3 (Judd 2002)`	Potential	
Acanthodillo `sp. 5`	Potential	
Acanthodillo `sp. indet.`	Potential	
Acanthodillo `sp. worsley A`	Potential	
Acanthodillo `sp. worsley B`	Potential	
Acanthodillo flavus	Potential	HMF

Buddelundia `sp. 1 (Judd 2002)`	Potential	
Buddelundia `sp. 4 (Judd 2002)`	Potential	
Buddelundia `sp. 5 (Judd 2002)`	Potential	HMF
Buddelundia `sp. 5 Worsley`	Potential	HMF
Buddelundia `sp. 6 (Judd 2002)`	Potential	
Buddelundia `sp. 7 (Judd 2002)`	Potential	
Buddelundia cinerascens	Potential	
Buddelundia nigripes	Potential	
Buddelundia nitidissima	Widespread	HMF
Buddelundia opaca	Widespread	
Cubaris `sp. 1 (Judd 2002)`	Potential	
Laevophiloscia `sp. 1 (Judd 2002)`	Widespread	HMF
Laevophiloscia `sp. 2 (Judd 2002)`	Widespread	HMF
Laevophiloscia cf. perlata	Potential	
Laevophiloscia cf. yalgoonensis	Potential	
Laevophiloscia perlata	Widespread	
Laevophiloscia yalgoonensis	Widespread	
Paraplatyarthrus sp. indet.	Potential	
Philosciidae `Phoenix0208`	Potential	HMF
Philosciidae `Phoenix0209`	Potential	HMF
Philosciidae `s/1`	Potential	HMF
Pseudodiploexochus `Phoenix0214`	Potential	HMF
Pseudodiploexochus `sp. 1 (Judd 2002)`	Widespread	
Pseudodiploexochus `sp. 2 (Judd 2002)`	Widespread	
Pseudodiploexochus sp. indet.	Likely	
Pseudolaureola `sp. nov.`	Potential	
Spherillo `1`	Potential	
Spherillo `sp. 2 (Judd 2002)`	Potential	
Spherillo `sp. 4 (Judd 2002)`	Potential	
Spherillo `sp. 5 (Judd 2002)`	Widespread	HMF
Styloniscus `sp. 1 (Judd 2002)`	Widespread	HMF
Styloniscus `sp. 7 (Judd 2002)`	Widespread	HMF
Styloniscus cf. australiensis	Potential	
Trichorhina `sp. 1 (Judd 2002)`	Widespread	
Class: Gastropoda, Superorder: Eupulmonata (Land snails)		
Annoselix cf. dolosa	Widespread	HMF
Annoselix dolosa	Widespread	
Bothriembryon bradshawi	Widespread	
Bothriembryon bulla	Widespread	
Bothriembryon cf. bradshawi	Potential	HMF
Bothriembryon cf. bulla	Potential	
Bothriembryon cf. indutus	Potential	
Bothriembryon cf. kendricki	Potential	
Bothriembryon cf. serpentinus	Potential	HMF
Bothriembryon indutus	Widespread	
Bothriembryon kendricki	Widespread	

Bothriembryon n.sp.	Potential	
Bothriembryon serpentinus	Potential	HMF
Bothriembryon sp.	Potential	
cf. Westralaoma sp. indet.	Potential	
Epinicium restifer	Potential	
Luinodiscus cf. sublestus	Widespread	HMF
Luinodiscus sp.	Widespread	
Westralaoma sp.	Potential	HMF
Whissonia cf. repens	Potential	



PHOENIX
ENVIRONMENTAL SCIENCES

Short-range endemic invertebrate fauna survey for the O'Neil Mine Development

Prepared for GHD Pty Ltd, on behalf of Alcoa of Australia Ltd

June 2024

Final



Short-range endemic invertebrate fauna survey for the O'Neil Mine Development

Prepared for GHD Pty Ltd, on behalf of Alcoa of Australia Ltd

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Phoenix Environmental Sciences Pty Ltd

2/3 King Edward Road OSBORNE PARK WA 6017

P: 08 6323 5410

E: admin@phoenixenv.com.au

Job code: 1482-HM-GHD-TIN

EXECUTIVE SUMMARY

Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by GHD Pty Ltd, on behalf of Alcoa Australia Limited (Alcoa), to undertake a baseline short-range endemic (SRE) invertebrate survey for the O'Neil Mine Development (O'Neil; the Project), located approximately 25 km north-east of Dwellingup, Western Australia. The purpose of the survey was to assist in understanding environmental values and constraints, and support business planning and approvals for the Project.

Accordingly, Phoenix completed a 2-phase detailed SRE field survey over 2 seasons, between July and October 2023. The study area for the survey was 10,414.5 ha, of which approximately 1,163.1 ha is currently rehabilitation or cleared land. The study area is in the Northern Jarrah Forest subregion of the Jarrah Forest bioregion.

Sampling was conducted at 17 sites, 12 inside the study area and 5 outside of the study area as reference sites. Three systematic sampling methods were employed at all sites: wet pit trapping, active foraging, and litter /soil sieving. Identification of collected specimens was completed by Phoenix taxonomists, external specialist taxonomists and molecular sequencing. SRE habitat mapping was undertaken based on vegetation mapping provided by Mattiske Consulting. Each habitat was rated for its potential to support SREs (potential habitat rating; PHR) as High, Low or None.

Native vegetation represents 9,249.8 ha (88.8%) of the study area, with 1,020.9 ha (9.8%) comprising rehabilitated land and the remainder 142.2 ha (1.4%) is cleared. Nine SRE habitats were defined within study area, which was dominated by Jarrah/Marri woodland/forest habitats. Five habitats were classified as having High PHR, with habitat attributes that often give rise to specialisation or dependency in invertebrate fauna, particularly more mesic habitats on lower slopes and valley floors. These represented 6,624.8 ha (32.1%) of the study area. The remaining 4 habitats were classified as low PHR.

A total of 64 taxa from groups known to include SREs were collected in the field survey and of these, 45 taxa (70%) from 19 families were classified as SREs, comprising:

- 3 Confirmed SREs, represented by *Antichiropus* 'Phoenix0217' (a millipede), *Urodacus planimanus* (a scorpion) and *Pseudotyrannochthonius* 'Darling Range 2' (a pseudoscorpion)
- 5 Likely SREs, represented by 4 isopods (*Buddelundia* 'sp. 5', Philosciidae 's/1', Pseudodiploexochus 'Phoenix0214' and *Styloniscus* '7') and one millipede (*Podykipus* 'DIP241')
- 37 Potential SREs, represented by 14 mygalomorph spider taxa, 6 isopods, 2 millipedes, 7 opiliones, 3 land snails, one araneomorph spider (family Selenopidae) and 4 pseudoscorpions.

Of the 45 SRE taxa, 28 species are described species or are morphospecies that were matched either morphologically or genetically to previously recorded taxa, and 7 are new species not previously known from morphological or molecular analysis. The remaining 10 are indeterminate taxa.

The high proportion of taxa collected from representatives of SRE groups that were classified as SREs (70%) was consistent with previous Northern Jarrah Forest subregion SRE surveys.

All but 3 of the recorded SRE taxa have been collected from outside the study area from either reference sites in the current survey, or from other SRE surveys of the Northern Jarrah Forest subregion. The 3 taxa are all Potential SRE's, known only from sites within O'Neil are one Mygalomorph spider *Euoplos* 'Phoenix0211'; and 2 isopods, Philosciidae 'Phoenix0208' and Philosciidae 'Phoenix0209'. All 3 were collected from only a single site; however, broader distributions are inferred for each taxon based on habitat of the collected specimens and/or wider distributional records of other (related) SREs from those locations.

Several comparable 2-phase SRE surveys have been undertaken by Phoenix since 2020 in the Northern Jarrah Forest subregion between Jarrahdale and Collie. The current survey at O'Neil recorded a high number of species or morphospecies in common with surveys at adjacent study areas Myara North

and Holyoake. There was also considerable overlap in taxa at other study areas (Holyoake East, Holyoake West and at Worsley).

The current survey highlights the value of continued sampling in increasing knowledge of SRE species, their distributions and habitat requirements, therefore informing Northern Jarrah Forest biodiversity values and conservation significance. While the survey results broadened known distributions for many taxa (including some species previously collected only from one other survey), the absence of additional collections of other SRE taxa from adjacent study areas supports the notion of some species from the subregion having highly restricted distributions.

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ACRONYMS AND ABBREVIATIONS

BoM	Bureau of Meteorology
DBCA	Department of Biodiversity, Conservation and Attractions
DRA	Disease Risk Area
EIA	Environmental impact assessment
EPA	Environmental Protection Authority
ESA	Environmentally sensitive areas
IBRA	Interim Biogeographic Regionalisation of Australia
MNES	Matter of National Environmental Significance
PDWSA	Proclaimed Drinking Water Source Areas
PHR	Potential habitat rating
SCP	Swan Coastal Plain
SP	Specially protected
SRE	Short-range endemic
SWAA	Surface water allocation areas
WA	Western Australia
T&P	Threatened and Priority
WAM	Western Australian Museum

1 INTRODUCTION

In 2023, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by GHD Pty Ltd, on behalf of Alcoa Australia Limited (Alcoa), to undertake a baseline short-range endemic (SRE) invertebrate survey for the O'Neil Mine Development (O'Neil; the Project), located approximately 25 km north-east of Dwellingup, Western Australia (WA; Figure 1-1). The purpose of the survey was to assist in understanding environmental values and constraints, and support business planning and approvals for the Project.

1.1 BACKGROUND

Alcoa was granted approval to mine bauxite at the Huntly Mine, within mineral lease 1SA (ML1SA), under the *Alumina Refinery Agreement Act 1961*. The Huntly Mine has operated since 1976 and includes several mining regions.

Alcoa is proposing to extend its mining operations within ML1SA to enable continuity of bauxite supply to its Pinjarra Alumina Refinery. O'Neil is one of the regions under investigation for development.

The survey was required to be conducted to a level required to support an environmental impact assessment under Part IV of the WA *Environmental Protection Act 1986* (EP Act), and under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Previous SRE surveys for the Huntly Mine expansion included detailed surveys in the Myara North and Holyoake study areas in 2020 (Phoenix 2021c). Concurrent SRE surveys also took place in the Holyoake East, and Holyoake West study areas (Phoenix in prep.-b) in 2022 and 2023.

1.2 SCOPE OF WORK

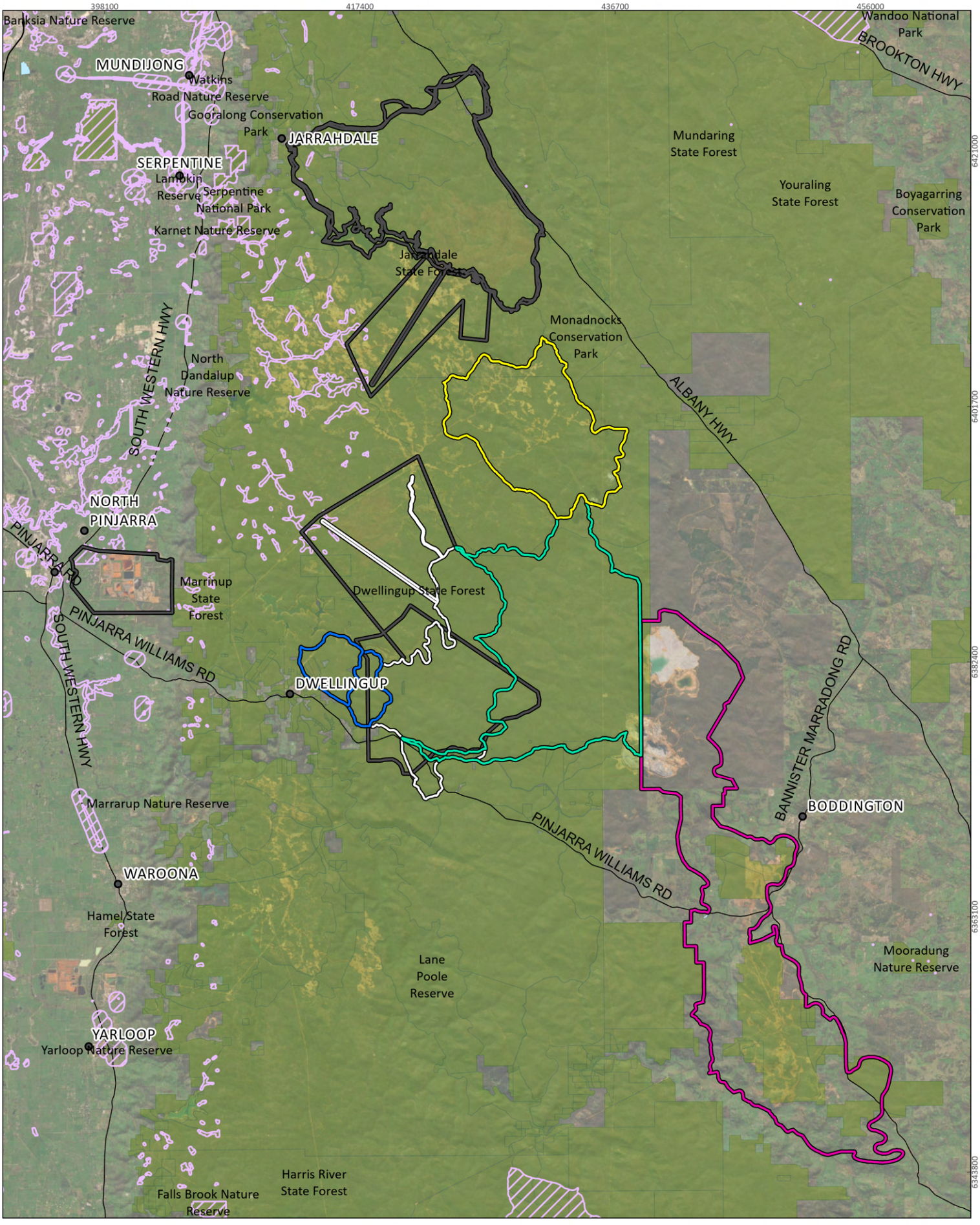
The scope of works for the SRE invertebrate survey was as follows:

- undertake a 2-phase detailed SRE field survey
- prepare a concise technical report documenting desktop review, field survey and data analysis results
- prepare an Index of Biodiversity Surveys for Assessments (IBSA) data package suitable for submission to the IBSA website.

The survey was to be conducted in accordance with *Technical Guidance: Sampling of short-range endemic invertebrate fauna*. Environmental Protection Authority (EPA 2016).

1.3 STUDY AREA

O'Neil (the study area) is 10,414.5 ha, of which approximately 1,163.1 ha is currently rehabilitation or cleared. It partially overlaps areas previously mined for the Huntly Mine operations. The study area is part of a larger scope of investigations for future mining. It is 3.5 km south of the Myara North study area survey by Phoenix in 2020 (Phoenix 2021c) and is directly north of the Holyoake East study area surveyed by Phoenix in 2023 (Phoenix in prep.-b) (Figure 1-1).





GHD Pty Ltd - Holyoake Stage 2 Project
O'Neil Mine Development

Project No	1482
Date	21/05/2024
Drawn by	JL
Map author	AJ

0 6 12
Kilometers

1:369,600(at A4) GDA 1994 MGA Zone 50

All information within this map is current as of 21/05/2024. This product is subject to COPYRIGHT and is property of Phoenix Environmental Sciences (Phoenix). While Phoenix has taken care to ensure the accuracy of this product, Phoenix make no representations or warranties about its accuracy, completeness or suitability for any particular purpose.

P:\Data\Projects\HuntlyMine\1482-HM-GHD-TIN\Mapping\MapDocuments\Figures\CMRA\1482_CMRA_maps_portrait.aprx

- Study area
- Holyoake East (Phoenix in prep)
- Holyoake West (Phoenix in prep)
- Worsley (Phoenix 2021)
- Holyoake (Phoenix 2021)
- Myara North (Phoenix 2021)
- DBCA managed land
- Lakes
- Environmentally Sensitive Areas
- Roads

Figure 1-1

Project location and study area

PHOENIX ENVIRONMENTAL SCIENCES

2 LEGISLATIVE CONTEXT

The protection of fauna in WA is principally governed by 3 acts:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- State *Biodiversity Conservation Act 2016* (BC Act)
- State *Environmental Protection Act 1986* (EP Act).

2.1 COMMONWEALTH

Under the EPBC Act, actions that have, or are likely to have, a significant impact on a matter of national environmental significance (MNES), require approval from the Australian Government minister for the Environment. The EPBC Act provides for the listing of Threatened native fauna as MNES.

Few invertebrate taxa from WA are listed as MNES. Those that are mostly include species that have experienced significant range contractions and population declines due to habitat loss, for example the Margaret River Marron (*Cherax tenuimanus*) (Critically Endangered) and the Shield-backed Trapdoor Spider (*Idiosoma nigrum*) (Vulnerable) (DoEE 2018).

2.2 STATE

In WA, the BC Act provides for the listing of Threatened fauna species (Government of Western Australia 2018a, b) in the following categories:

- Critically Endangered (CR) – species facing an extremely high risk of extinction in the wild in the immediate future[1]
- Endangered (EN) – species facing a very high risk of extinction in the wild in the near future[1]
- Vulnerable (VU) – species facing a high risk of extinction in the wild in the medium-term future[1].

Species may also be listed as specially protected (SP) under the BC Act under the category of 'species of special conservation interest' (conservation dependent fauna, CD), including species with a restricted natural range.

The Department of Biodiversity, Conservation and Attractions (DBCA) administers the BC Act and also maintains a non-statutory list of Priority fauna. Priority species are still considered to be of conservation significance – that is they may be Threatened – but cannot be considered for listing under the BC Act until there is adequate understanding of threat levels imposed on them. Species on the Priority fauna list are assigned to one of 4 Priority (P) categories, P1 (highest) – P4 (lowest), based on level of knowledge/concern.

Few SRE invertebrate taxa are currently listed under the BC Act and while there are several invertebrate species on DBCA's Priority list (some of which are SRE taxa), these lists cannot be relied on as a complete guide to significant invertebrate taxa within a particular location. The most up-to-date listings of terrestrial invertebrates and their distribution are available through the WA Museum invertebrate databases.

2.3 OVERVIEW OF SRE INVERTEBRATES

Short-range endemic (SRE) fauna are defined as animals that display restricted geographic distributions, nominally less than 10,000 km^2, that may also be disjunct and highly localised (Harvey

[1] As determined in accordance with criteria set out in the ministerial guidelines.

2002; Ponder & Colgan 2002). Short-range endemism in terrestrial invertebrates is believed to have evolved through two primary processes (Harvey 2002), relictual short-range endemism – where drying climate has forced range contraction into small pockets with remaining moist conditions (e.g. south-facing rock faces or slopes of mountains or gullies) – and habitat specialist SREs that may have settled in particular isolated habitat types (e.g. rocky or granite outcrops) by means of dispersal and evolved in isolation into distinct species. However, SRE invertebrates have also been reported in more widespread habitats such as spinifex plains or woodlands mainly in groups with low dispersal capabilities such as mygalomorph spiders and millipedes.

Short-range endemic fauna need to be considered in environmental impact assessments (EIA) as localised, small populations of species are generally at greater risk of changes in conservation status due to environmental change than other, more widely distributed taxa (EPA 2016).

There can be uncertainty in categorising a specimen as SRE due to a number of factors including poor regional survey density, lack of taxonomic research and problems of identification, i.e. specimens that may represent SREs cannot be identified to species level based on the life stage at hand. For example, in contrast to mature males, juvenile and female millipedes, mygalomorph spiders and scorpions cannot be identified to species level. Molecular techniques such as 'barcoding' (Hebert *et al.* 2003a; Hebert *et al.* 2003b) are routinely employed to overcome taxonomic or identification problems.

3 EXISTING ENVIRONMENT

3.1 INTERIM BIOGEOGRAPHIC REGIONALISATION OF AUSTRALIA

The Interim Biogeographic Regionalisation of Australia (IBRA) classifies Australia's landscapes into large 'bioregions' and 'subregions' based on climate, geology, landform, native vegetation and species information (DoEE 2016). The study area is located in the Northern Jarrah Forest subregion (JF1) of the Jarrah Forest bioregion (Figure 3-1) which is predominantly comprised of jarrah–marri forest in the west with bullich and blackbutt in the valleys (Williams & Mitchell 2001). This grades to wandoo and marri woodlands in the east, with powderbark on breakaways. Heath is found on granite rocks and there are extensive but localised sandsheets with *Banksia* low woodlands (Williams & Mitchell 2001).

3.2 LAND SYSTEMS AND SURFACE GEOLOGY

DPIRD undertakes land system mapping for WA using a nesting soil-landscape mapping hierarchy (Schoknecht & Payne 2011). While the primary purpose of the mapping is to inform pastoral and agricultural land capability, it is also useful for informing biological assessments. Under this hierarchy, land systems are defined as areas with recurring patterns of landforms, soils, vegetation and drainage (Payne & Leighton 2004).

The study area intersects 2 land systems, the Darling Plateau and Murray Valleys land system. The Darling Plateau comprises over 93% of the baseline study area (Table 3-1; Figure 3-2).

Table 3-1 Land systems and extent in baseline study area

Land system	Description	Area ha (%)
Darling Plateau System	Lateritic plateau. Duplex sandy gravels, loamy gravels and wet soils. Jarrah-marri-wandoo forest and woodland.	10,385.2 (99.7%)
Murray Valleys System	Western Darling Range from the Avon Valley to Harvey. Deeply incised valleys with Red loamy earths, shallow duplexes and rock outcrop and Jarrah-marri-wandoo forest and woodland with mixed shrubland	29.3 (0.3%)
	TOTAL	**10,414.5**

According to the Surface Geology of Australia 1:1,000,000 scale, Western Australia database (Stewart *et al.* 2008), the study area intersects 4 geological formations (Table 3-2; Figure 3-2).

Table 3-2 Surface geology of the study area, extent by deposit type

Surface geology	Abbreviation	Description	Area (ha)	% of study area
Felsic intrusives 74292	Ag	Undifferentiated felsic intrusive rocks, including monzogranite, granodiorite, granite, tonalite, quartz monzonite, syenogranite, diorite, monzodiorite, pegmatite. Locally metamorphosed, foliated, gneissic. Local abundant mafic and ultramafic inclusions	4,390.3	42.2
Gneiss, granulite, migmatite 74310	An	Banded granitic gneiss (monzogranitic to granodioritic), quartzofeldspathic gneiss	672.7	6.5

Surface geology	Abbreviation	Description	Area (ha)	% of study area
		with mafic bands, migmatite, granofels, mafic and felsic granulites, hypersthene-plagioclase-quartz granulite; schist, pelitic or mafic granofels		
Ferruginous duricrust 38498	Czl	Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite	5,184.0	49.8
Sand plain 38499	Czs	Sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, silcrete, silt, clay, alluvium, colluvium, aeolian sand	167.5	1.6
		TOTAL	**10,414.5**	**100%**





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Kilometers

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Study area

Region, subregion

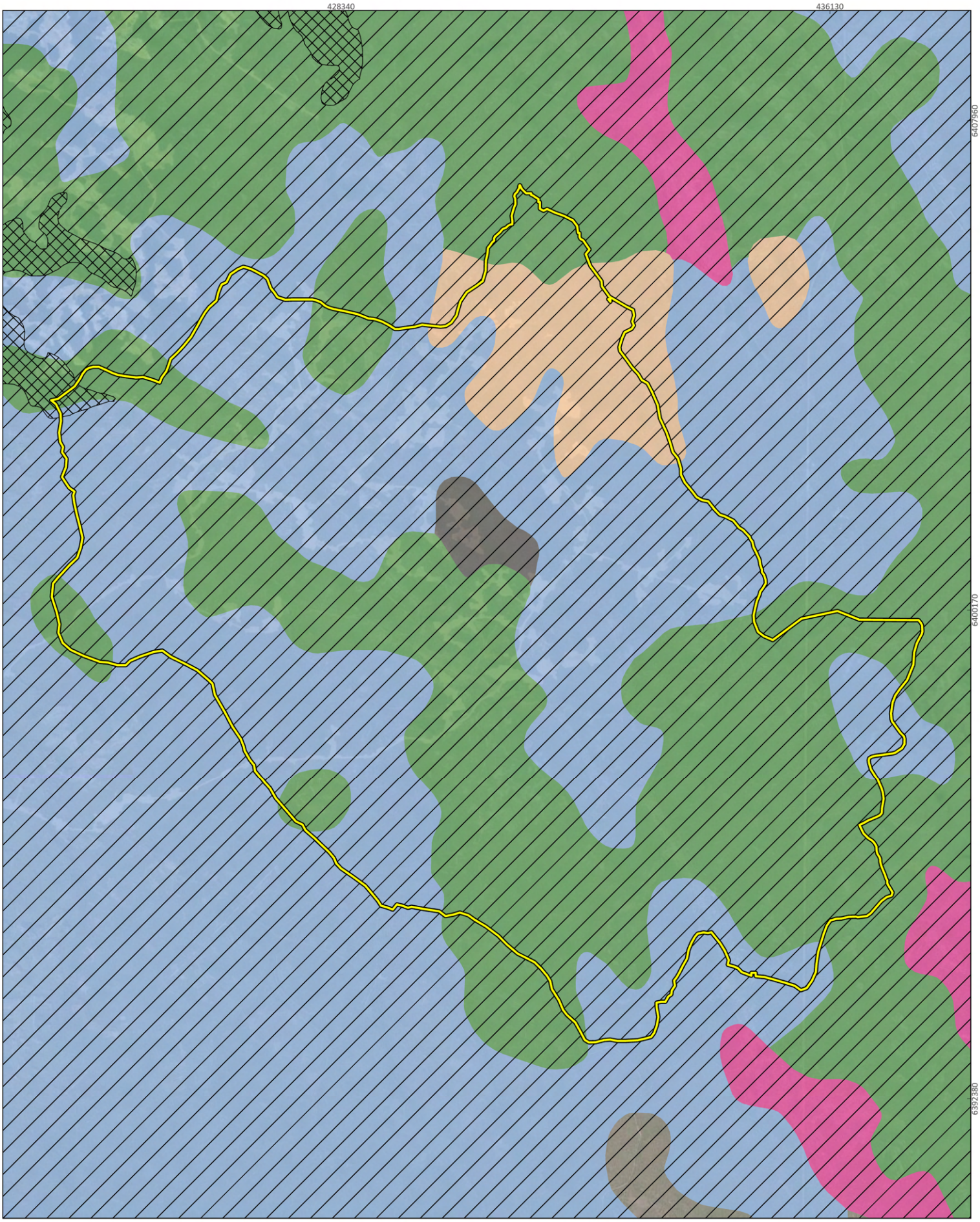
Jarrah Forest, Northern Jarrah Forest

Swan Coastal Plain, Perth

Figure 3-1

Study area in relation to IBRA bioregions and subregions

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Study area

Surface geology

Ag
An
Czl
Czs
Qrc

Land system

Darling Plateau System
Murray Valleys System

Figure 3-2

Land systems and surface geology in the study area

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3.3 CLIMATE AND WEATHER

The climate of the Northern Jarrah Forest subregion is Warm Mediterranean, with cool wet winters and warm dry summers. The nearest Bureau of Meteorology (BoM) weather station with comprehensive data collection and recent historic climate data is Karnet (no. 009111, Latitude: 32.44°S Longitude 116.08°E), located 13.5 km north-west of the study area.

Karnet (1963–2024) records the highest mean maximum monthly temperature (30.7°C) in January (lowest in July 15.5°C) and the lowest minimum mean monthly temperature (6.3°C) in July and August, with the highest (15.8°C) in February (Figure 3-3). The average annual rainfall at Karnet is 1,121.7 mm with June and July recording the highest monthly averages of 203.9 mm and 219.8 mm, respectively (Figure 3-3).

Daily mean maximum and minimum temperatures recorded at Karnet during the survey period were similar to long-term averages leading up to the field survey but were above the long-term annual average during the survey (Figure 3-3). Rainfall at Karnet in 2023 was significantly drier than the long-term average. In 2023, Karnet received a total of 636.2 mm, compared to the 10-year (2013 to 2023) average of 962.7 mm, and long-term average (1965 to 2023) of 1,134.2 mm. The previous year (2022) also experienced a significantly drier year (671.3 mm); however, 2021 and 2020 recorded 1,307 and 1,013 mm respectively. These conditions are considered less favourable for SREs but are a well-documented trend towards a drying climate.

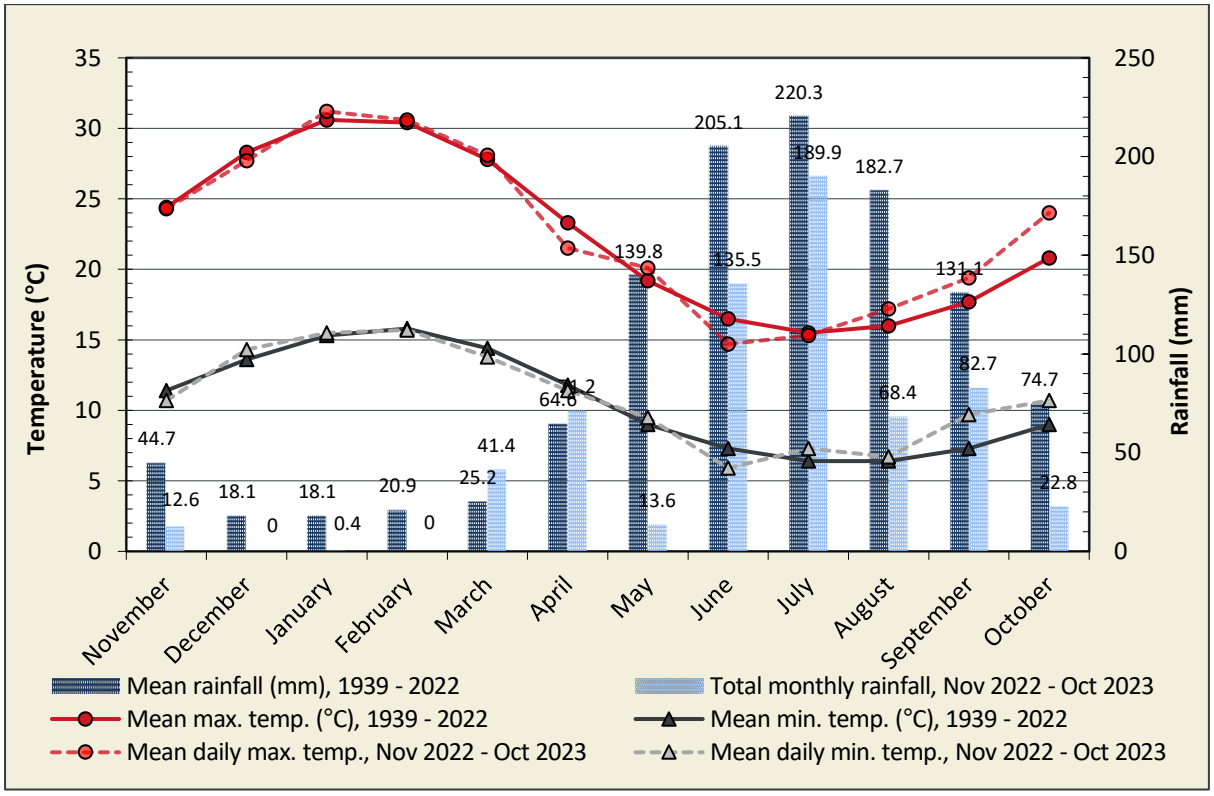


Figure 3-3 Annual climate and weather data for Karnet (no. 009111) and mean monthly data for the 12 months preceding the survey (BoM 2024)

3.4 LAND USE

Land use statistics were derived from the Australian Bureau of Agriculture and Resource Economics and Sciences' Catchment Scale Land Use Mapping for WA 2018 dataset (ABARES 2018), for the Northern Jarrah Forest subregion. The dataset is a compilation derived from various vector datasets,

with land use classified according to the Australian Land Use and Management Classification (v8); a three-tiered hierarchical structure.

Approximately 10,410.9 ha (97.3%) of the study area is 'uncleared' and used for production native forests (Table 3-3). The singular land use in the cleared portion of the study area are roads, occupying <0.1%.

Table 3-3 Land uses of the study area

Land use	Area (ha)	Area (%)
1. Cleared		
1.1 Intensive uses		
1.1.1 Roads	3.6	<0.1
2. Uncleared		
2.1 Conservation and natural environments		
2.1.1 National park	33.1	0.3
2.1.2 Other conserved area	527.9	5.1
2.1.3 Residual native cover	300.5	2.9
2.2 Production from relatively natural environments		
2.2.1 Production native forests	9,549.0	91.7
2.3 Water		
2.3.1 Marsh/wetland	0.4	<0.1
TOTAL	**10,414.5**	**100**

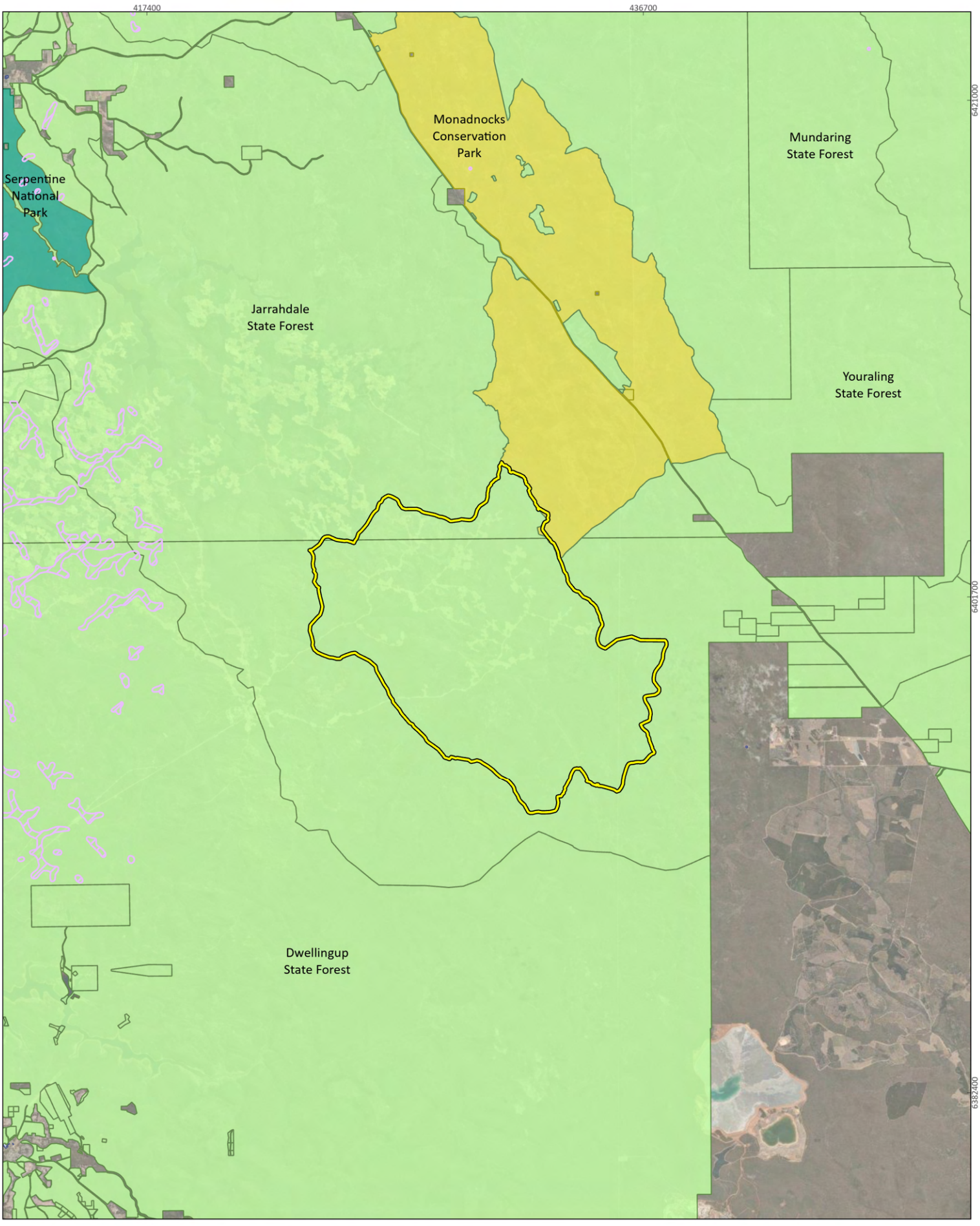
3.5 CONSERVATION RESERVES AND ENVIRONMENTALLY SENSITIVE AREAS

The study area is located almost entirely within Dwellingup State Forest (9,389.8 ha) and Jarrahdale State Forest (991.6 ha; Figure 3-4). A small area falls within Monadnocks Conservation Park (33.1 ha) (a Section 5(1)(g) Reserve), which borders the north-eastern corner of the study area. No environmentally sensitive areas (ESAs) intersect the study area.

3.6 HYDROLOGICAL VALUES

The study area intersects several important urban and agricultural water sources. This includes a surface water allocation area (SWAA): Serpentine River Catchment, and a Proclaimed Drinking Water Source Area (PDWSA) under the *Metropolitan Water Supply Sewerage and Drainage Act 1909* intersect the study area: Serpentine Dam Catchment Area (Figure 3-5). One proclaimed surface water area also intersects the study area: the Serpentine River System, as proclaimed under the *Rights in Water and Irrigation Act 1914*.

Two perennial rivers occur within the study area, Serpentine River and O'Neil Brook. Both rivers drain in a north-westerly direction toward Serpentine Dam, located 17 km north-west of the study area. Several non-perennial unnamed tributaries merging with either the Serpentine River or O'Neill Brook flow though the study area.



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- Study area
- Environmentally Sensitive Areas

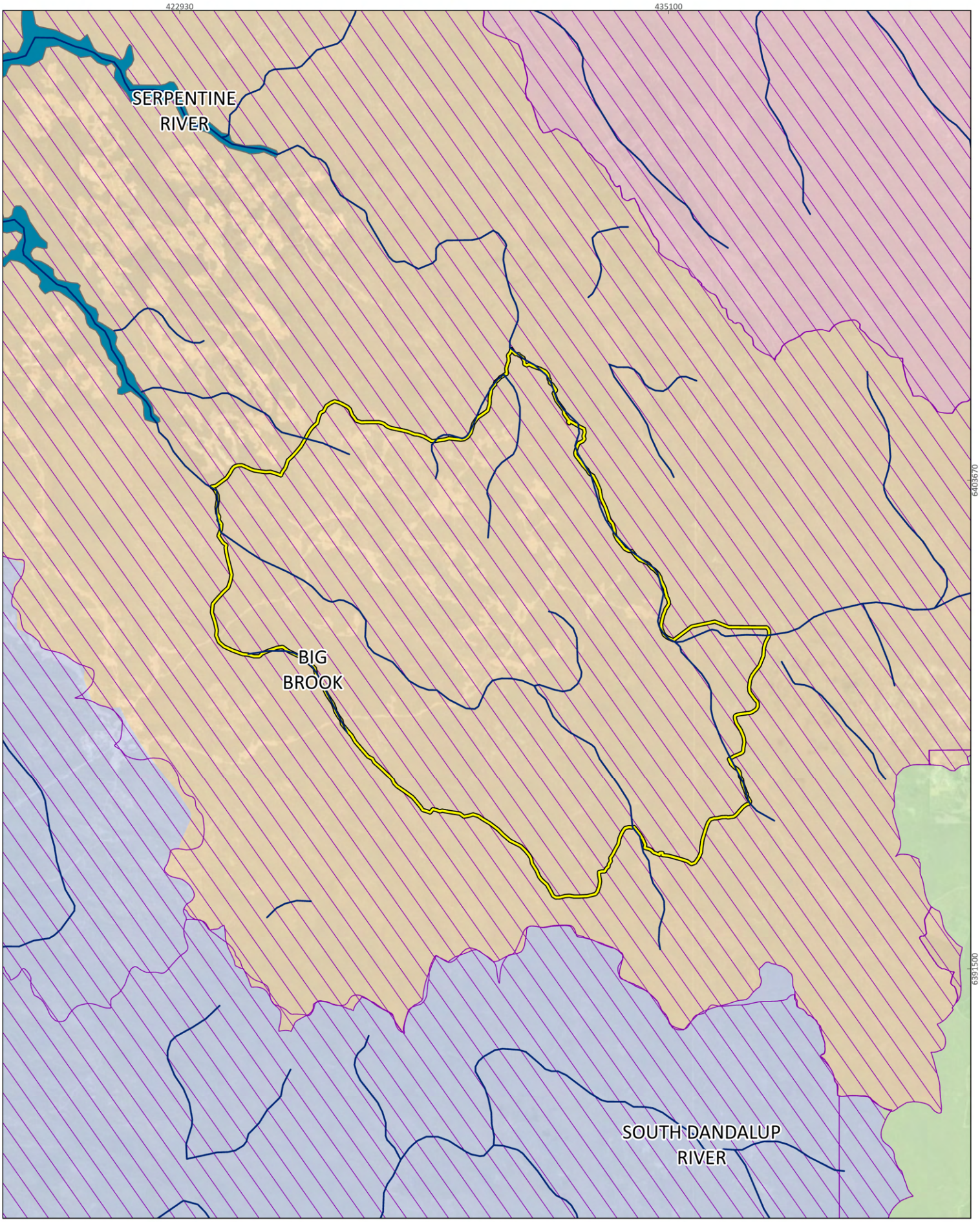
DBCA managed lands

- National Park
- Section 5(1)(g) Reserve
- Section 5(1)(h) Reserve
- State Forest

Figure 3-4

Conservation reserves and ESAs in the study area

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- Study area
- Serpentine Dam
- Public Drinking Water Source Area
- Watercourses

Surface Water Allocation Area (SWAA)

- Canning River
- Dandalup River System
- Murray River & Tributaries
- Serpentine River Catchment

Figure 3-5

Hydrological values in the study area

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4 METHODS

The SRE invertebrate survey was conducted in accordance with Environmental Protection Authority (EPA) Technical Guidance: Sampling of short-range endemic invertebrate fauna (EPA 2016).

4.1 DESKTOP REVIEW

Searches of several biological databases were undertaken to identify records of SREs from the vicinity of the study area (Table 4-1). A literature search was conducted for accessible reports for biological surveys conducted within 100 km of the study area to build on the lists developed from the database searches (Table 4-2). A significant desktop data source for the current survey were 2 similar large scale SRE surveys conducted by Phoenix (Table 4-2).:

- Phoenix (2021c) – Huntly Mine Expansion Project – Myara North and Holyoake, located south and north of the study area in state forest
- Phoenix (2021a) for the Worsley Expansion Project, located east of the study area in state forest and mining tenure between Boddington and Collie (referred to as 'the Worsley survey' in this report).

The results of these surveys were included in the desktop results and were also analysed together with the results of the current survey to provide additional data to inform species distributions.

Table 4-1 Database searches conducted for the desktop review

Database	Target group/s	Search coordinates and extent
DBCA Threatened and Priority Fauna Database (DBCA 2020b)	Threatened and Priority invertebrates	Study area plus a 5 km buffer
DBCA Threatened and Priority Ecological Communities Database (DBCA 2020a)	TECs and PECs	Study area plus a 5 km buffer
WA Museum Arachnid and Myriapod Database, Mollusca Database	Arachnid, myriapod and mollusc SREs	100 km^2 search area encompassing the Holyoake Stage 2 Project assessment area between -31.669°S, 115.417°E (northwest corner) and -32.907°S, 114.445°E (southeast corner). This search area was then clipped to a 100 km radius buffer to the study area
WA Museum Insect and Mollusc Database	Threatened and Priority invertebrates	As above but clipped to 40 km buffer of the study area

Table 4-2 Survey reports included in the desktop review

Report author	Survey description	Project
Phoenix (2021c)	Short-range endemic invertebrate fauna survey for the Huntly Mine – Myara North and Holyoake	Huntly Mine
Phoenix (2021b)	Identification of invertebrate specimens collected from the Huntly Mine area	Huntly Mine
Phoenix (2021a)	Four-phase short-range endemic invertebrate fauna survey for the Worsley Mine Expansion Project	Worsley Mine Expansion Project

Report author	Survey description	Project
Phoenix (2012)	Level 2 short-range endemic (SRE) invertebrate survey for the Worsley Primary Bauxite Area Expansion Project	Worsley Mine Expansion Project
Outback Ecology (2012)	Terrestrial short-ranged endemic invertebrate fauna baseline survey for the Boddington Gold Mine (BGM)	Newmont BGM

4.2 HABITAT ASSESSMENT

Spatial analysis of several environmental databases was undertaken within the study area:

- Vegetation Complexes (Mattiske & Havel 1998)
- Watercourses (Geoscience Australia 2020)
- Granites (dataset supplied by Alcoa)
- Old growth forest (dataset supplied by Alcoa).

Vegetation complexes within the study area were re-interpreted in relation to SRE invertebrates, based on factors considered important in defining fauna assemblages, including vegetation type and structure, soils/ substrate and position in the landscape. Each fauna habitat was then rated for its potential to support SREs (potential habitat rating; PHR) as follows:

- High – defined/known areas of habitat that contain elements that often give rise to specialisation or dependency in invertebrate fauna, such as aspect (e.g. south-facing slopes, deeply incised gullies), geological features (e.g. granite), soil types that retain water (e.g. clay, loam).
- Low – areas of largely intact native vegetation that occur broadly across the landscape, are less incised and typically link more restricted habitats. This includes land that was cleared but has since been rehabilitated or is in the process of being rehabilitated.
- None – land that has been previously cleared for other uses that no longer contains native vegetation.

4.3 FIELD SURVEY

Field surveys were conducted over 2 seasons, between July and October 2023 (Table 4-3).

The following methods were employed in the survey:

- wet pit trapping (see 4.3.2)
- active foraging (see 4.3.3)
- litter/soil sieving (see 4.3.4).

Table 4-3 Survey dates

Trip #	Dates	Activity
1	24 – 28 July 2023	Install phase 1 wet pitfall traps, foraging/litter sieving
2	29 August – 1 September 2023	Retrieve wet pitfall traps, Install phase 2 wet pitfall traps
3	2 – 6 October 2023	Retrieve phase 2 wet pitfall traps. Foraging/litter sieving

The personnel involved in the surveys are listed in Table 4-4. All survey work was carried out under Fauna Taking (Biological Assessment) licence BA27000664-2 issued by DBCA under the BC Act, with

Reg 4 (received 12/07/2022 from Shawn Debono) and Disease Risk Area (DRA) Permit #3291 issued from DBCA Perth Hills region. Wet pit trapping was carried out under Wildlife Animal Ethics permit WAEC 22-06-71 under the *Animal Welfare Act 2002*.

Table 4-4 Survey personnel

Name	Qualifications	Roles	Years experience
Anna Jacks	BSc (Environmental Science) (Hons)	Field management, field surveys, GIS, report writing, taxonomy, lab work	18+
Simon Pynt	BSc (Zoology)	Field survey	18+
Lachlan Petersen	BSc (Zoology, Physics)	Field survey, Lab work	5+

4.3.1 Site selection

Initial habitat characterisation was undertaken using various remote geographical tools, including aerial photography (Google Earth®), land system maps and topographic maps. Habitats with the potential to support significant terrestrial fauna species were identified based on known habitats of such species within the Jarrah Forest bioregion. Tentative sites were selected for the survey to represent all habitat types. Final survey site selection was conducted after ground-truthing of site characteristics.

At the broadest scale, site selection considered aspect, topography and land systems. At the finer scale, consideration was given to proximity to water bodies (drainage lines and creek), vegetation complexes and condition, soil and rock type (e.g. granite outcrops). Sites were primarily chosen to represent the best example of distinct habitats within the broader habitat associations of the study area with a focus on habitats of SRE taxa identified in the desktop review.

No impact area or indicative disturbance footprint was available for the study area, therefore site selection here focused on representative sampling of habitats and coverage across this area, with some reference sites placed outside the study area (Figure 4-1; Table 4-5).

Habitat descriptions and characteristics were recorded at all sites (Appendix 1).

4.3.2 Wet pit trapping

A total of 17 wet pitfall trapping sites were established across the study area, including 12 inside the study area and 5 outside of the study area as reference sites (Table 4-5; Figure 4-1). Each wet pitfall trap site comprised of five one litre plastic containers with a 70 mm diameter dug in flush with the surface in suitable microhabitats at each site. Pit traps were half-filled with propylene glycol/ethanol mixture, which has been shown to preserve DNA under laboratory conditions in invertebrates (Vink *et al.* 2005) and Phoenix has successfully sequenced the mitochondrial cytochrome oxidase subunit 1 (COI) gene from specimens caught in propylene glycol pitfall traps from previous surveys. All traps were covered with a plastic lid elevated 25 mm above the trap with wooden blocks to minimise by-catch of vertebrates where possible. Traps remained open following the setup and were retrieved approximately 5 weeks later.

4.3.3 Active foraging

Active foraging for SRE invertebrate groups comprised inspection of logs, larger plant debris, within the foliage and stem of shrubs such as *Xanthorrhoea preissii*, the underside of bark of larger trees and the underside of rocks. Methodical searches were conducted amongst the leaf litter of shade-bearing tall shrubs and trees. Rocks and rock crevices were inspected, particularly for pseudoscorpions.

A standardised approach was undertaken whereby each site was sampled for one person hour per phase, a total search effort of 34 hours in total (Table 4-5;). Trapdoor spider burrows identified during the searches were excavated if they were considered inhabited. Excavation involved removing soil from around the burrow to carefully expose the burrow chamber and remove the spider.

4.3.4 Litter/soil sieving

Combined litter/soil sifts were undertaken at all sites, with 3 sifts conducted at each site per phase. In total, 102 sifts were undertaken (Table 4-5). The collection of leaf litter samples was standardised volumetrically by the diameter and height (310 mm x 50 mm = 1.55 L) of the sieves which were filled with compressed litter and the upper layers of underlying soil. Samples were sieved through 3 stages of decreasing mesh size over a round tray and invertebrates were picked from the sieves and tray with forceps. These samples particularly targeted small spiders (Araneomorphae), pseudoscorpions, buthid scorpions, millipedes, smaller species of molluscs and slaters.

Table 4-5 Survey site locations and effort

Site	Habitat description	Lat.	Long.	Inside/ outside O'Neil	Phase 1			Phase 2		
					WPT (# nights)	Foraging (hrs)	Sieves (#)	WPT (# nights)	Foraging (hrs)	Sieves (#)
CMRA-001	E. *rudis*/*Melaleuca* shrubland	-32.5652	116.2321	inside	37	1	3	35	1	3
CMRA-002	Jarrah/Marri forest	-32.5384	116.1932	inside	37	1	3	35	1	3
CMRA-003	Jarrah forest	-32.5270	116.2182	inside	37	1	3	35	1	3
CMRA-005	Jarrah/Marri	-32.5049	116.2435	inside	37	1	3	35	1	3
CMRA-006	Jarrah/Marri/*Casuarina*	-32.5376	116.2622	inside	37	1	3	35	1	3
CMRA-007	Jarrah/Marri forest	-32.499	116.2719	inside	37	1	3	35	1	3
CMRA-008	Jarrah/Marri along drainage	-32.4576	116.2675	outside	37	1	3	35	1	3
OE-001	Jarrah/Marri forest	-32.5736	116.2598	inside	37	1	3	35	1	3
OE-002	Jarrah/Marri along creek	-32.4796	116.3160	outside	37	1	3	35	1	3
OE-003	Jarrah/Marri forest	-32.5283	116.3376	outside	37	1	3	35	1	3
OE-004	Jarrah/Marri at base of granite	-32.4923	116.3332	outside	37	1	3	35	1	3
OE-006	Jarrah/Marri forest	-32.5724	116.2995	inside	37	1	3	35	1	3
OE-007	Jarrah/Marri forest	-32.5230	116.3070	outside	37	1	3	35	1	3
OE-008	Jarrah/Marri forest	-32.5064	116.2905	inside	37	1	3	35	1	3
OE-009	Jarrah/Marri forest	-32.5577	116.2614	inside	37	1	3	35	1	3
OE-010	Wandoo woodland	-32.5627	116.3221	inside	37	1	3	35	1	3
OE-012	Jarrah/*Casuarina* woodland	-32.5458	116.3014	inside	37	1	3	35	1	3

4.4 IDENTIFICATION OF SRE TAXA

4.4.1 SRE status rating

Currently, there is no accepted system to determine the likelihood that a species is an SRE. The WA Museum applies 3 categories: Confirmed, Potential, and Widespread. Confirmed SREs are taxa for which the distribution is known to be less than 10,000 km^2, the taxonomy is well known, and the group is well represented in collections and/or via comprehensive sampling (WAM 2013). Potential SREs include those taxa for which there is incomplete knowledge of taxonomy or geographic distribution, and the group is not well represented in collections. Phoenix applies 4 categories based on the WA Museum criteria (Table 4-6).

Table 4-6 Short-range endemic categories

SRE category	Criteria
Confirmed	Distribution <10,000 km^2. Taxonomy of the group is well known (but not necessarily published); group is well represented in collections, in particular from the region in question; high levels of endemism exist in documented species; inference is often possible from immature specimens.
Likely	Distribution < 10,000 km^2. Taxonomically poorly resolved group but group is generally well represented in collections; unusual morphology for the group (e.g. some form of troglomorphism); often recorded as singletons in survey and few, if any, regional records.
Potential	Distribution <10,000 km^2. Taxonomically poorly resolved group; patchy distribution, often common in certain microhabitats, but no other regional records; congeners (= species in the same genus) both widespread and restricted in distribution.
Widespread	Distribution >10,000 km^2.

4.4.2 SRE taxonomy

Initial higher-level (class, order, family) identifications of specimens were undertaken by Phoenix staff in Phoenix's invertebrate laboratory. Final species designations were allocated using specialist morphological and/or molecular sequencing (Table 4-7).

Where possible, identifications were compared with reference material from the WA Museum and/or taxonomist reference collections.

Table 4-7 Specialist taxonomists

Person	Title	Taxa
Dr Damilo Harms	Taxonomist, Phoenix	Pseudoscorpiones
Dr Karen Cullen	Taxonomist	Iulomorphidae millipedes
Dr Sharon Zuiddam	Taxonomic consultant	Opiliones
Dr Calum Irvine	Zoologist, Phoenix	Selenopidae spiders, Gastropoda, Isopoda
Dr Simon Judd	Taxonomic consultant	Isopoda–advice
Ethan Broom	Zoologist, Phoenix	Scorpiones
Anna Jacks	Invertebrate zoologist, Phoenix	*Antichiropus* millipedes, mygalomorph spiders, molecular analysis

Genomic analysis was undertaken for all specimens for which morphological identification did not provide sufficient taxonomic resolution. A total of 70 specimens were sent for molecular analyses, comprising 47 mygalomorph spiders, 12 millipedes, and 11 isopods etc. Of these, 69 produced a successful sequence. Tissue from each specimen was obtained in Phoenix' laboratory and sequenced by Genotyping Australia.

Sequences were edited and analysed using Genious Prime 2023.0.3. Sequences for comparison were sourced from GenBank (Benson *et al.* 2012) and Phoenix's DNA database using the megablast search function in Geneious. For each sequence, the most similar 10 matches were retrieved. In cases where the retrieved sequences represented a species more than twice, the 2 longest sequences were retained and the shorter conspecific sequences discarded. Where megablast results yielded families differing from the morphological assessment, additional sequences were obtained from GenBank, representing the morphological taxonomic assessment. If all the resulting blast sequences represented organisms from a different taxonomic class, sequences were discarded as likely contamination.

Nucleotide alignment and RAxML Tree builds were used to assess species delineation between survey specimens and relevant reference specimens.

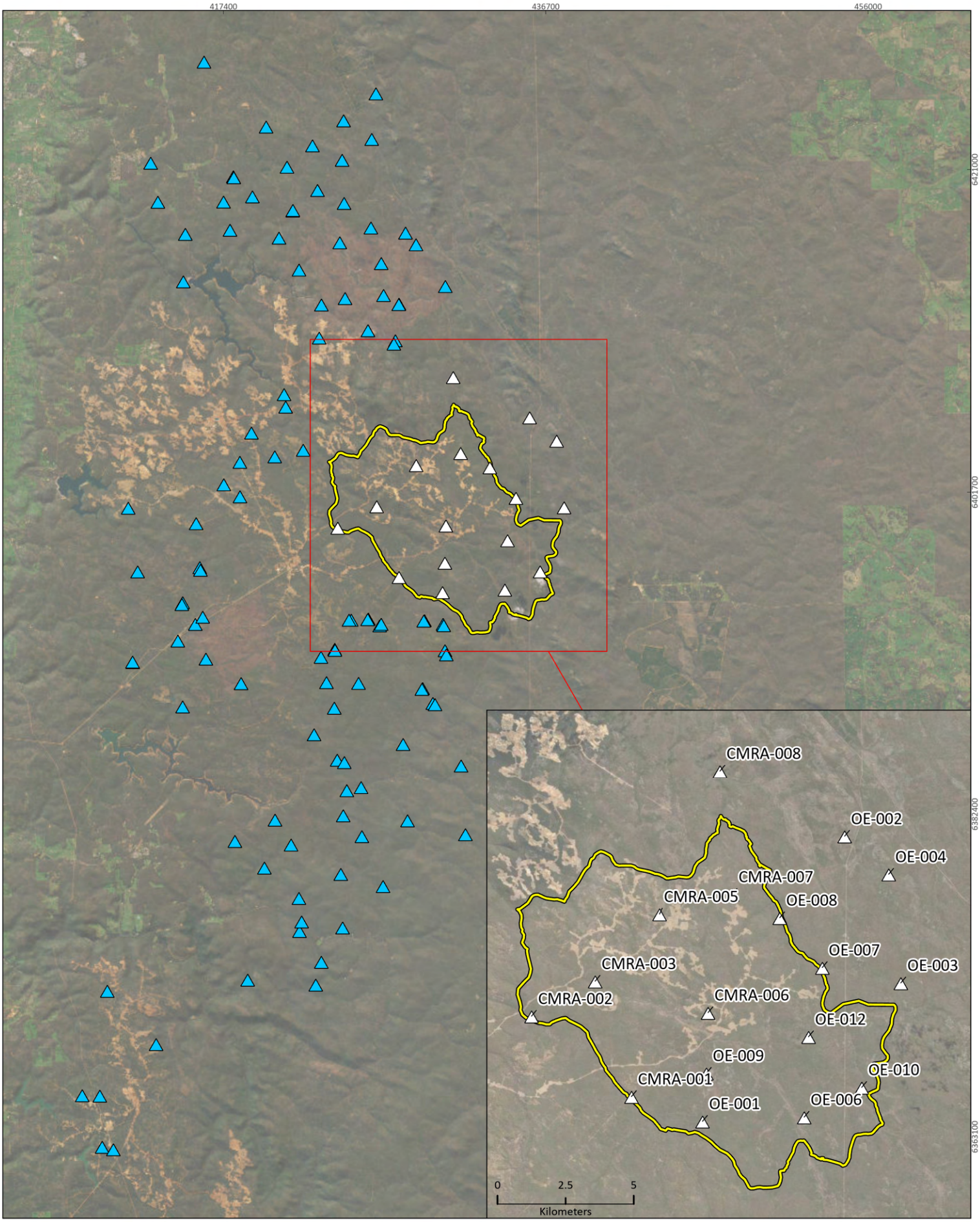
Where mygalomorph spiders failed to return a match to a previously recorded species or a species name not recognised by the WA Museum, sequences were sent to the WA Museum for further analyses.

Species that did not return a match to an existing species was given a unique 'PhoenixXXXX' morpho-code (ie. *Euoplos* 'Phoenix0211').

SRE specimens collected during the survey have been lodged with the WA Museum.

4.4.3 Analysis of survey completeness

The efficiency of the survey effort was evaluated by comparing the observed species richness against the predicted species richness of 4 widely used species richness estimators. Species accumulation curves were calculated with Primer V6 (Clarke & Gorley 2006) to obtain an estimate of survey completeness, i.e. whether the results adequately represent the assemblage of the study area. All sample types were aggregated per site and no data transformation was undertaken. The maximum number of permutations was set at 999.





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O'Neil Mine Development

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Date	21/05/2024
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Study area
2-phase SRE site
Previous survey sites (Phoenix 2021)

Figure 4-1

Survey sites

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5 RESULTS

5.1 DESKTOP REVIEW

5.1.1 Species records

The desktop review identified a total of 395 taxa from 9 invertebrate groups within the desktop search area (Table 5-1; Figure 5-1). Of these records, 39 are Confirmed (C) SRE taxa, 17 are Likely (L) SRE taxa, 237 are Potential (P) SRE taxa and 102 are widespread (W) taxa (Table 5-1). Of the Potential SREs, 3 are also Priority 3 (P3) fauna (Table 5-1).

No desktop records of SREs were returned inside the study area; however, the Confirmed SRE scorpion *Urodacus planimanus*, a species that is common throughout the Jarrah Forest, but with a well-documented range of less than 10,000 km^2 has been recorded just 130 m outside of the study area. Five other Potential SREs with indeterminate taxonomy have been recorded within 5 km of the study area. No Threatened terrestrial invertebrates were identified in the desktop review.

Mygalomorph spiders represented the largest group of SREs in the desktop results, accounting for approximately one-third of all taxa, and 42% of all SRE taxa (C, L and P). Millipedes and slaters were also well represented in the desktop results with 19% of all taxa (21% of SRE taxa), and 16% of all taxa (15% of SRE taxa), respectively (Table 5-1). SRE pseudoscorpions, Opiliones (harvest spiders), land snails and scorpions were also returned in the desktop searches. Velvet worms were also returned; however, only widespread species are known from the desktop search area.

Thirty-eight of the 39 Confirmed SREs are millipedes, of which most belong to the genus *Antichiropus*. The remaining single species is the scorpion *Urodacus planimanus*. Four of the 39 Confirmed SRE taxa are formally described species: *Antichiropus minimus*, *A. whistleri*, *Dinocambala ingens* (all millipedes) and *U. planimanus* (the scorpion).

Table 5-1 Summary of taxa from the desktop review, by taxonomic group and status

Group	Status					Total
	Confirmed	Likely	Potential	Widespread	Priority/ P3	
Mygalomorph spider			125	12	3	140
Araneomorph spider			1	2		3
Harvestmen spider			18	3		21
Scorpion	1		8	9		18
Pseudoscorpion			23	26		49
Millipede	38	2	23	10		73
Land snail			6	17		23
Slater		15	30	21		66
Velvet worm				2		2
Total	**39**	**17**	**234**	**102**	**3**	**395**

The 3 Priority species identified within the area of the desktop review comprise 3 mygalomorph spiders:

- *Idiosoma sigillatum* (P3) – all records within the desktop search area are located to the west between Ledge Point and Bunbury along the Swan Coastal Plain (SWA). This species is unlikely to occur in the study area.

- *Idiosoma schoknechtorum* (P3) – recorded from 23 km north of the study area in the Northern Jarrah Forest. This species may occur in the study area.
- *Euoplos inornatus* (P3) – 20 records from locations between Muchea (north of Perth) and Boddington, and a single record from Narrogin. A recent male specimen collected by Phoenix (2021a) extended the known range of this species 34 km further south than was previously known; however, most records are from the foothills of the Darling Scarp. This species may occur in the study area.

Of the 295 SRE or significant taxa, 31 are named species, 220 comprise taxa named only to morphospecies codes as applied by the WA Museum or are not identified to confirmed species level (i.e. "sp." or "cf.") and 44 taxa are unidentifiable/ indeterminate ("sp. indet.", i.e. female or juvenile specimens) or could not be identified to species or morphospecies and may represent new species or other species listed in the same genus where records exist.

There is an apparent divide of species between bioregions, with 195 (66%) SRE taxa from the desktop review only recorded within the Jarrah Forest bioregion, and 63 (21%) exclusively from the SWA bioregion. A total of 38 (13%) species were collected from more than one bioregion; however, 21 of these are indeterminate species and may represent a widespread species. One SRE species from the Jarrah Forest bioregion was also recorded in the Avon Wheatbelt bioregion.

A recent survey of Holyoake and Myara North (Phoenix 2021c) revealed a high diversity of SRE taxa. Between the 2 study areas, 83 SRE taxa were recorded, including 25 new and 10 Confirmed SREs. Based on these results and considering the proximity of Myara North and Holyoake to the current study area, a high diversity of SRE taxa was expected to occur in the study area.

5.1.2 SRE habitats

Based on Mattiske (2024) vegetation mapping and re-interpretation for SRE habitat, a total of 9 SRE habitats were defined within study area (Table 5-2). Native vegetation represents 9,249.8 ha (88.8%) of the study area and 1,020.9 ha (9.8%) represents rehabilitated land. The remainder (1.4%) is cleared (e.g. for infrastructure, plantations or dams;

Table 5-3).

The study area was dominated by Jarrah/Marri woodland/forest habitats (2, 4 and 5), with SRE Habitat 4 being the most abundant, comprising 57.4 % of the study area, and occurring evenly throughout, followed by SRE habitat 2, comprising 14.1% of the study area. The south-eastern part of the study area is more diverse, with habitats 1, 3, 7 and 11 primarily occurring in this area.

Notable habitats that were in low abundance within the study area but present in the other nearby areas such Myara North and Holyoake study areas, were SRE habitat 1 (*Melaleuca* woodlands/shrublands), and 11 (Open wandoo woodlands). Large granite outcrops were also absent from this study area.

Approximately 3,339.3 ha (32.1%) of the study area has a high potential habitat rating (PHR).

Two habitats (1 and 7) were not surveyed because representation in the study area was very low:

- 1–*Melaleuca* woodlands/shrublands on seasonally wet or water-logged clays and clay-loams on valley floors (0.88% of the study area). Site CMRA-001 is mapped as being in Habitat 10, (being Flooded Gum); however, *Melaleuca* was also dense in the understory.
- 7–Open forest to woodland of Jarrah/Marri on slopes and less undulating hills (0.39% of the study area); this is similar to habitat 4.

Rehabilitated areas were not surveyed due to the lower quality of habitat for SREs. Rehabilitation occurs mainly in the north-western part of the study area.

Table 5-2 Description of SRE habitats in the baseline study area and corresponding vegetation types

SRE habitat code	Vegetation units (Mattiske 2021)	SRE habitat description	PHR[1]
1	A	*Melaleuca* woodlands/shrublands on seasonally wet or water-logged clays and clay-loams on valley floors	High
2	AW, AW/CW, C, D, DA, DG, J, CW	Open Jarrah/Marri or Blackbutt woodlands on sands, clay-loam or sandy-gravel on lower slopes and valley floors	High
3	GR, G, G1, R, RG	Heath/shrubland/woodland on shallow soils on granite or outcrops	High
4	P, PS, PT, S, SP, ST, T, TS	Open forest to woodland of Jarrah/Marri on sandy-loam gravelly soils on mid-slopes and ridges	Low
5	WA, PW, SW, W, WD	Open forest of Jarrah/Marri forest, seasonally moist, sandy gravels on slopes	High
6	Cleared, plantation	Cleared land (including plantations, dams)	n/a
7	AD, E	Open forest to woodland of Jarrah/Marri on slopes and less undulating hills	Low
10	AC, AX, AY	Open woodlands of Wandoo and/or Flooded Gum on seasonally wet or water-logged clays and clay-loams on valley floors	High
11	M, Y, YG, YS	Open woodlands of Wandoo with clay-loams and some gravel on slopes	Low
12	n/a	Rehabilitation (post-mining rehabilitation using mostly native species)	Low

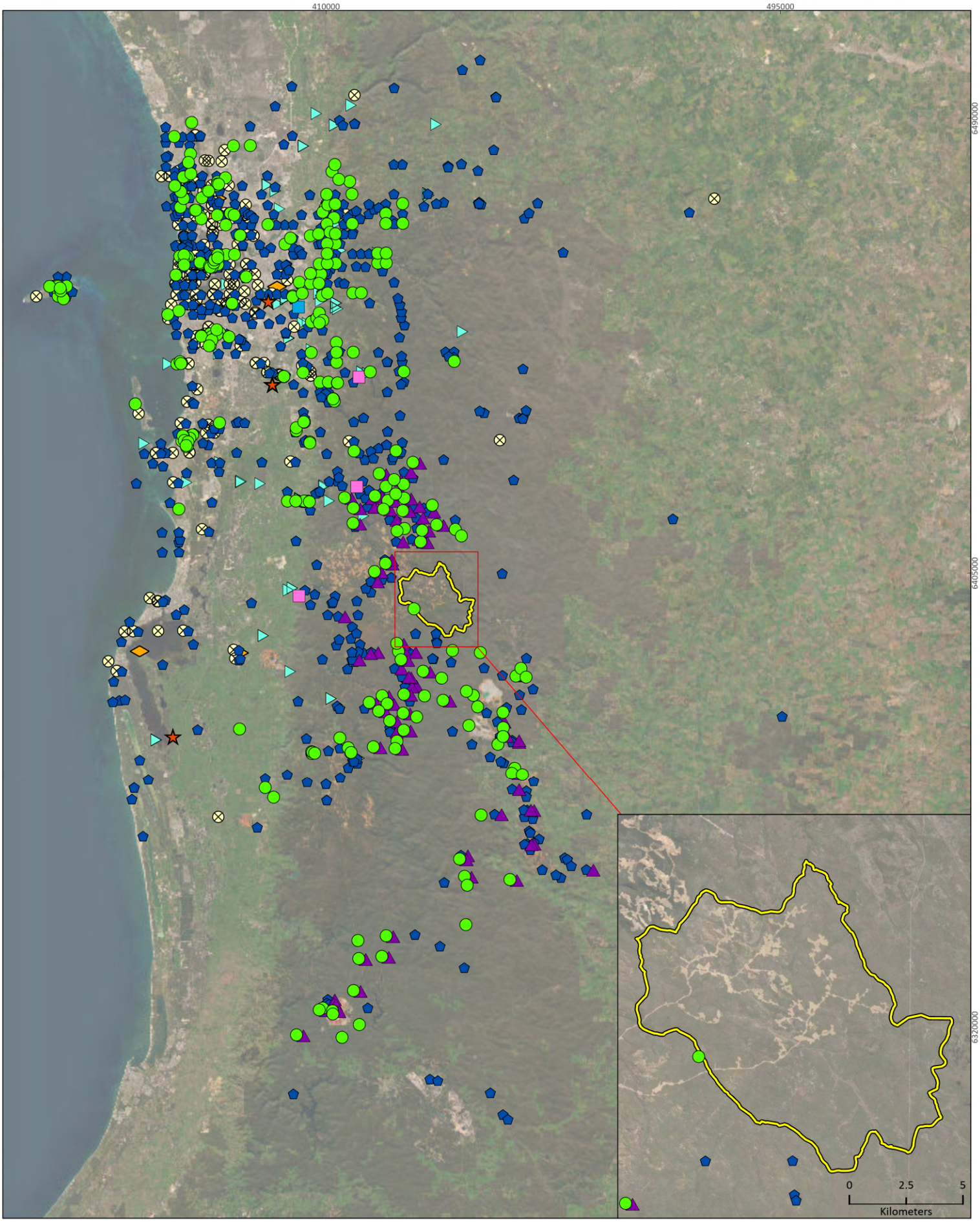
Table 5-3 Extent of each SRE habitat in the study area

SRE habitat type	PHR[1]	Survey sites	Area (ha, (%))
1	High		91.4 (0.9%)
2	High	CMRA-005, OE-008, OE-006, CMRA-003, *OE-002^*	1,463.7 (14.1%)
3	High	*OE-004^*	237.3 (2.3%)
4	Low	CMRA-006, OE-012, OE-001, *OE-003, OE-007*	5,977.5 (57.4%)
5	High	CMRA-007, CMRA-002, OE-009	975.0 (9.4%)
6 (cleared)	n/a		142.2 (1.4%)
7	Low		40.9 (0.4%)
10	High	CMRA-001, *CMRA-008*	429.7 (4.1%)
11	Low	OE-010	35.9 (0.3%)
12 (Rehabilitation)	Low		1,020.9 (9.8%)
Total			**10,414.5**

1 – Potential habitat rating.

^ – outside of vegetation mapping, habitat type extrapolated using site description.

Italics = site located outside of study area.





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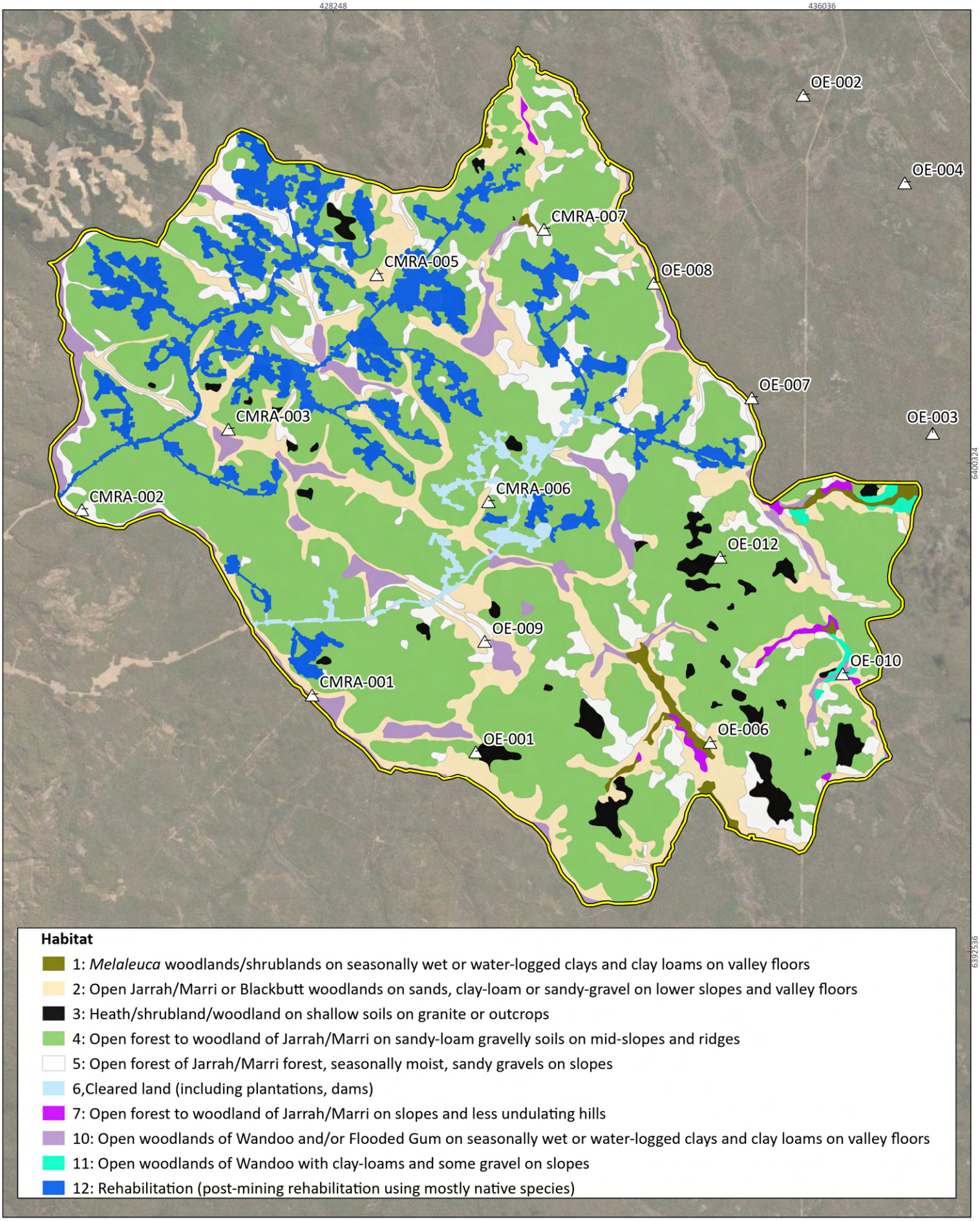
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Study area
Status
Confirmed
EN
Likely
P2
P3
Potential
Potential/P3
Restricted
VU

Figure 5-1
Desktop SRE records

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Study area
Survey site

Figure 5-2

SRE habitats in the study area

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5.2 FIELD SURVEY

5.2.1 Species records

A total of 64 taxa from groups known to include SREs were collected in the field survey and of these, 45 taxa (70%) were classified as SREs (Table 5-4), as follows:

- 3 are Confirmed SREs, represented by:
    - *Antichiropus* 'Phoenix0217' (millipede)
    - *Urodacus planimanus* (scorpion)
    - *Pseudotyrannochthonius* 'Darling Range 2' (pseudoscorpion)
- 5 are Likely SREs, represented by 4 isopods and one millipede
    - *Buddelundia* 'sp. 5' (isopod)
    - Philosciidae 's/1' (isopod)
    - Pseudodiploexochus 'Phoenix0214' (isopod)
    - *Styloniscus* '7' (isopod)
    - *Podykipus* 'DIP241' (millipede)
- 37 are Potential SREs represented by members of all target groups.

Table 5-4 Summary of taxa collected during the survey, by taxonomic group and status

SRE group	Status				Total
	Confirmed	Likely	Potential	Widespread	
Araneomorph spider			1		1
Land snail			3	2	5
Millipede	1	1	2	3	7
Mygalomorph spider			14	2	16
Opiliones			7		7
Pseudoscorpion	1		4	4	9
Scorpion	1			3	4
Slater		4	6	4	14
Velvet worm				1	1
Total	**3**	**5**	**37**	**19**	**64**

A total of 19 taxa were collected that were Widespread, therefore not considered SREs (Table 5-5). These were represented by pseudoscorpions (4 taxa), millipedes (3 taxa), scorpions (3 species), slaters (4 species), mygalomorphs (2 species), land snails (2 species) and a velvet worm.

Of the 45 SRE taxa from the survey, 28 species are described species or are morphospecies that were matched either morphologically or genetically to previously recorded species and 7 are new species not previously known from morphological or molecular analysis (Table 5-5). The remaining 10 are indeterminate taxa which may represent new or Widespread species but the uncertainty around these taxa cannot be resolved, and they are therefore not discussed further. Of the 28 species or morphospecies, 12 are mygalomorph spiders, 7 are isopods, 2 are scorpions, 4 are pseudoscorpions, 2 are land snails, and one each of Opiliones, land snail and millipede.

Of the 7 new species, 3 are currently known from sites within O'Neil only:

- Mygalomorph spider (Figure 5-3)
    - *Euoplos* 'Phoenix0211', recorded from one site within O'Neil (CMRA-002, 100 m from the study area boundary)
- Isopod (Figure 5-7)
    - Philosciidae 'Phoenix0208', recorded from one site within O'Neil (CMRA-006)
    - Philosciidae 'Phoenix0209', recorded from one site within O'Neil (CMRA-007).

The remaining species collected from the study area were either recorded outside O'Neil during the survey, e.g. from reference sites, other areas of the Projects (e.g. Holyoake) or were matched to a taxon identified from the desktop review (Table 5-5; Figure 5-3 –Figure 5-8).

From the full list of 64 taxa collected, 21 species have been formally described, of which 7 are considered SREs. A further 28 were allocated to morphospecies based on previously collected specimens, or newly collected specimens that were not the same as any other taxon known from the WA Museum collection or by the taxonomist.

The remaining 27 are indeterminate (including 23 belonging to taxa that have SRE representatives) due to poor taxonomic knowledge, poor genetic knowledge, inadequate life stage or sex, or a specimen in poor condition. The indeterminate 'SRE' taxa could represent any of the collected or previously collected taxa, or possibly new taxa.

A total of 1,379 specimens were recorded from the survey. The majority (63.1%) were collected in wet pitfall traps and 36.9% were collected via active searches, i.e. foraging, litter sift and burrow excavations (Table 5-5).

Millipede, isopod, pseudoscorpion and Opiliones records were much higher in wet pitfall traps than other collection methods (Table 5-6). Of the 7 species recorded from O'Neil, most (86.7% of wet pitfall specimens and 77% of all millipede specimens), comprised of a single Widespread and abundant species *Atelomastix nigrescens*. This species was the most abundantly collected in the survey with a total of 315 specimens. The isopod *Styloniscus* '1' was the second most abundant species with 198 specimens collected, of which 166 were from wet pitfall traps.

Mygalomorph and araneomorph spiders were the only SRE groups in which active searches yielded a higher number of records. Scorpions and land snails were recorded relatively evenly between active searching and pitfall trap sample methods.

A total of 70 specimens were sequenced, comprising 47 mygalomorph spiders, 12 millipedes and, and 11 isopods, mostly indeterminate taxa due to being juveniles, females, too small and singletons or poor condition. Tissue from each specimen was obtained in Phoenix's laboratory and sequenced by Genotyping Australia. Of these, 69 specimens produced a successful sequence, 8 taxa were found be significantly different to specimens where a taxonomist was able to allocate a species or morphospecies identification. Three of these however were previously recorded by Phoenix in 2021 from Holyoake.

Table 5-5 Specimens from SRE groups recorded in the field survey

Higher order/ Family	Species	SRE status [1]	SRE hab. code	PHR[2]	Outside SA[3]	Within SA[3]	Sites[4]	Comments
Class: Arachnida, Infraorder: Mygalomorphae (mygalomorph spiders)								
Anamidae	*Aname* 'Phoenix0010'	P	4	L	Y	N	*OE-003*	Molecular match to a specimen from Holyoake (Phoenix 2021) and Holyoake East study area
Anamidae	Anamidae sp. indet.	P	10	H	Y	N	*CMRA-008*	CMRA-008 is a reference site, specimen failed sequencing, likely represents a collected specimen
Anamidae	*Proshermacha* 'MYG485'	P	5, 2	H	Y	Y	CMRA-007, OE-006	Also known from records from Myara North to Boddington (800 km^2), more common in the Dwellingup area
Anamidae	*Proshermacha* 'MYG495'	P	4	L	Y	Y	*OE-003*, OE-012	Also known from Holyoake and to Boddington
Anamidae	*Proshermacha* 'MYG658'	P	2	H	Y	Y	*OE-002*	Also known from 3 other records in Myara North, Holyoake East and Collie
Anamidae	*Proshermacha* 'Phoenix0027'	P	2, 3, 4, 5, 10,	H, L	Y	Y	CMRA-003, CMRA-005, CMRA-006, *CMRA-008*, OE-001, *OE-002*, OE-006, *OE-007*, OE-008, OE-009, OE-012	Also known from 2 locations at Myara North
Anamidae	*Teyl* 'MYG245'	P	5	H	Y	Y	CMRA-007	Also known from 2 locations SE of the study area, both 15 km NW of Boddington
Anamidae	*Teyl* 'MYG355'	P	2, 5	H	Y	Y	CMRA-002, CMRA-003, OE-008	Also known from Holyoake East and Myara North
Barychelidae	*Synothele michaelseni*	W	2	H	Y	Y	CMRA-003	Also known from Perth and near Bindoon
Barychelidae	*Synothele mullaloo*	P	2, 3, 4, 5, 10, 11	H, L	Y	Y	CMRA-001, CMRA-003, CMRA-007, *CMRA-008*, OE-001, *OE-003, OE-004*, OE-006, *OE-007*, OE-008, OE-009, OE-010	Also known from Holyoake, Holyoake East, Holyoake West, and near Boddington
Idiopidae	*Bungulla harrisonae*	P	2	H	Y	Y	CMRA-003, OE-008	Also known from a record near Mundaring, ca. 140 km north of the study area
Idiopidae	*Eucyrtops* 'MYG645'	P	5, 10,	H	Y	Y	CMRA-001, CMRA-002, OE-001, OE-012	Also known from Holyoake, Holyoake East, Holyoake West and Quindanning

Higher order/ Family	Species	SRE status [1]	SRE hab. code	PHR[2]	Outside SA[3]	Within SA[3]	Sites[4]	Comments
Idiopidae	*Eucyrtops* 'Phoenix0029'	P	2, 3, 4	H, L	Y	N	*OE-002*, *OE-004*, *OE-007*	Also known from 2 locations at Myara North
Idiopidae	*Euoplos* 'Phoenix0211'	P	5	H	**N**	**Y**	CMRA-002	Recorded 100 m from O'Neil boundary
Idiopidae	*Idiosoma jarrah*	W	4, 5	H, L	Y	Y	CMRA-007, OE-012	Also known from numerous records from Holyoake, Myara North and Mundaring. Common near Mundaring
Idiopidae	*Idiosoma* 'WAM T129362'	P	5, 11	H, L	Y	Y	CMRA-002, OE-009, OE-010	Aso known from records at Myara North and Holyoake East
Class: Arachnida, Infraorder: Araneomorphae (araneomorph spiders)								
Selenopidae	*Karaops* sp. indet.	P	3, 11	H, L	Y	Y	CMRA-005, OE-010	Likely represents a widespread species, either *K. jarrit* or *K. ellenae*, both widespread throughout the Jarrah Forest
Class: Arachnida, Order: Opiliones (Harvestmen spiders)								
Neopilionidae	*Ballarra longipalpus*	P	2, 3, 4, 5, 10	H, L	Y	Y	CMRA-001, *CMRA-008*, OE-001, *OE-002*, *OE-003*, *OE-004*, *OE-007*, OE-008, OE-009, OE-010, OE-012	Also known from Holyoake East, Holyoake West, Myara North, Perth and Perth Hills
Neopilionidae	*Megalopsalis* sp. indet.	P	2, 3, 4, 5, 10, 11	H, L	Y	Y	CMRA-001, CMRA-002, CMRA-005, CMRA-007, *CMRA-008*, OE-001, *OE-003*, *OE-004*, *OE-007*, OE-008, OE-010	This genus occurs in Holyoke East, Holyoake West, Perth and Perth Hills
Neopilionidae	Neopilionidae sp. indet.	P	2, 3, 4, 5, 10	H, L	Y	Y	CMRA-001, CMRA-002, CMRA-003, CMRA-005, OE-001, *OE-002*, *OE-007*, OE-008, OE-009, OE-010	This family occurs in Holyoake East, Perth and Perth Hills
Triaenonychidae	Triaenonychidae 'genus 003' sp. indet.	P	5	H		Y	CMRA-002	Other members of this genus occur near Boddington
Triaenonychidae	Triaenonychidae 'genus 004' sp. indet.	P	2, 3, 4, 5	H, L	Y	Y	CMRA-002, CMRA-003, CMRA-007, *OE-003*, *OE-004*, OE-012	Other members of this genus occur near Myara North

Higher order/ Family	Species	SRE status [1]	SRE hab. code	PHR[2]	Outside SA[3]	Within SA[3]	Sites[4]	Comments
Triaenonychidae	Triaenonychidae 'genus 008' sp. indet.	P	2, 3, 4, 5, 10, 11	H, L	Y	Y	CMRA-001, CMRA-002, CMRA-003, CMRA-005, CMRA-007, *CMRA-008*, OE-001, *OE-004*, OE-006, *OE-007*, OE-008, OE-009, OE-010, OE-012	Other members of this genus occur at Myara North, Holyoake East, Holyoake, Holyoake West, and north to Mundaring
Trigoniulidae	*Calliuncus* sp. indet.	P	2, 5	H	Y	Y	CMRA-002, CMRA-003	Other members of this genus occur at Myara North, Holyoake, Holyoake West, and near Boddington
Class: Arachnida, Order: Scorpiones (scorpions)								
Bothriuridae	*Cercophonius sulcatus*	W	2, 3, 4, 5, 10, 11	H, L	Y	Y	CMRA-001, CMRA-003, CMRA-005, CMRA-006, CMRA-007, *CMRA-008*, OE-001, *OE-002*, *OE-00*4, OE-006, OE-008, OE-009, OE-010	Widespread and common, particularly on the SCP and near Mundaring. Other nearby records from Boddington, Waroona, Holyoake and Myara North
Buthidae	*Lychas* 'austroccidentalis'	W	2, 3	H	Y	Y	CMRA-005, OE-006	Widespread and common from SCP, Perth Hills, Boddington, Waroona, Holyoake and Myara North
Urodacidae	*Urodacus novaehollandiae*	W	2, 4, 5, 10, 11	H, L	Y	Y	CMRA-001, CMRA-002, CMRA-003, OE-008, OE-009, OE-010, OE-012	Widespread and common from SCP, Perth Hills, Boddington, Waroona, Holyoake and Myara North
Urodacidae	*Urodacus planimanus*	C	2, 3, 4, 5,	H, L	Y	Y	CMRA-002, CMRA-007, OE-001, *OE-002*, *OE-003*, *OE-004*, OE-006, OE-008	Common in the Perth Hills to Myara North and Holyoake
Class: Arachnida, Order: Pseudoscorpiones (pseudoscorpions)								
Atemnidae	*Oratemnus curtus*	W	2, 4	H, L	Y	Y	CMRA-003, CMRA-006	Widespread throughout the Southwest, from Perth to Albany
Chthoniidae	*Austrochthonius* 'medium 2'	P	2, 3, 4	H, L	Y	Y	*OE-004*, OE-008	Only known the study area and a reference site
Chthoniidae	*Austrochthonius muchmorei*	P	2, 3, 4, 10, 11	H, L	Y	Y	CMRA-001, CMRA-003, CMRA-005, *CMRA-008*, *OE-002*, *OE-003*, *OE-004*, OE-006, *OE-007*, OE-008, OE-010	Commonly collected between Byford and Collie
Chthoniidae	*Austrochthonius* 'PSE188, similis'	P	2, 4, 5, 10	H, L	Y	Y	CMRA-001, CMRA-006, CMRA-007, OE-001, *OE-003*, *OE-007*, OE-008, OE-010, OE-012	Common in the Southwest, also known from Mundaring, Perth, Myara North and Boddington

Higher order/ Family	Species	SRE status [1]	SRE hab. code	PHR[2]	Outside SA[3]	Within SA[3]	Sites[4]	Comments
Chthoniidae	*Austrochthonius* 'PSE191, grandis'	P	2, 3, 4, 5, 11	H, L	Y	Y	CMRA-007, *OE-002*, *OE-003*, *OE-004*, OE-010	Also known from Holyoake, Myara North, and near Boddington
Chthoniidae	*Lagynochthonius australicus*	W	2, 4, 5	H,L	Y	Y	CMRA-002, OE-001, OE-008	Widespread across the Southwest, also collected from Holyoake, Holyoake East and Holyoake West
Geogarypidae	*Synsphyronus magnus*	W	2, 4	H, L	Y	Y	CMRA-003, CMRA-006	Widespread across the Southwest, Perth Hills, SCP and Manjimup
Olpiidae	*Beierolpium bornemisszai*	W	5	H	Y	Y	CMRA-002	Also known from Myara North, near Boddington and near Collie
Pseudotyrannochthoniidae	*Pseudotyrannochthonius* 'Darling Range 2' ('DS2')	C	2, 3, 4, 5	H, L	Y	Y	CMRA-002, CMRA-003, CMRA-007, *OE-004*, *OE-007*, OE-008	Also known from Perth Hills, Myara North, Holyoake East and Holyoake West
Class: Diplopoda (millipedes)								
Dalodesmidae	*Sphaerotrichopus* `sp. indet.`	P	10	H	Y	?	*CMRA-008*	This genus was also recorded from Holyoake East. Likely the same species. Sequencing failed. Other members of this genus are known from the Jarrahdale and Mundaring areas
Iulomorphidae	*Atelomastix nigrescens*	W	2, 3, 4, 5	H, L	Y	Y	CMRA-002, CMRA-003, CMRA-005, CMRA-006, CMRA-007, OE-002, *OE-007*, *OE-008*, OE-012	Widespread species commonly recorded from Myara North, Holyoake, Holyoake East, Holyoake West and Boddington
Iulomorphidae	*Podykipus collinus*	P	2, 3, 11	H, L	Y	Y	OE-004, OE-006, OE-010	Also known from Holyoake East and Holyoake West
Iulomorphidae	*Podykipus* 'DIP241'	L	5	H	Y	Y	CMRA-007	A new species, also recorded from 2 sites at Holyoake East
Iulomorphidae	*Podykipus leptoiuloides*	W	4, 5, 10	H, L	Y	Y	CMRA-002, CMRA-006, *CMRA-008*, OE-009	Widespread species commonly recorded from Myara North. Also recorded from Holyoake, Holyoake West and Boddington
Paradoxosomatidae	*Antichiropus* 'Phoenix0217'	C	3, 5, 10, 4, 11	H, L	Y	Y	CMRA-001, CMRA-002, CMRA-005, CMRA-007, *OE-003*, *OE-007*, OE-010	A new species known only from 7 sites within or near O'Neil. Two of these sites are reference sites outside of the study area and

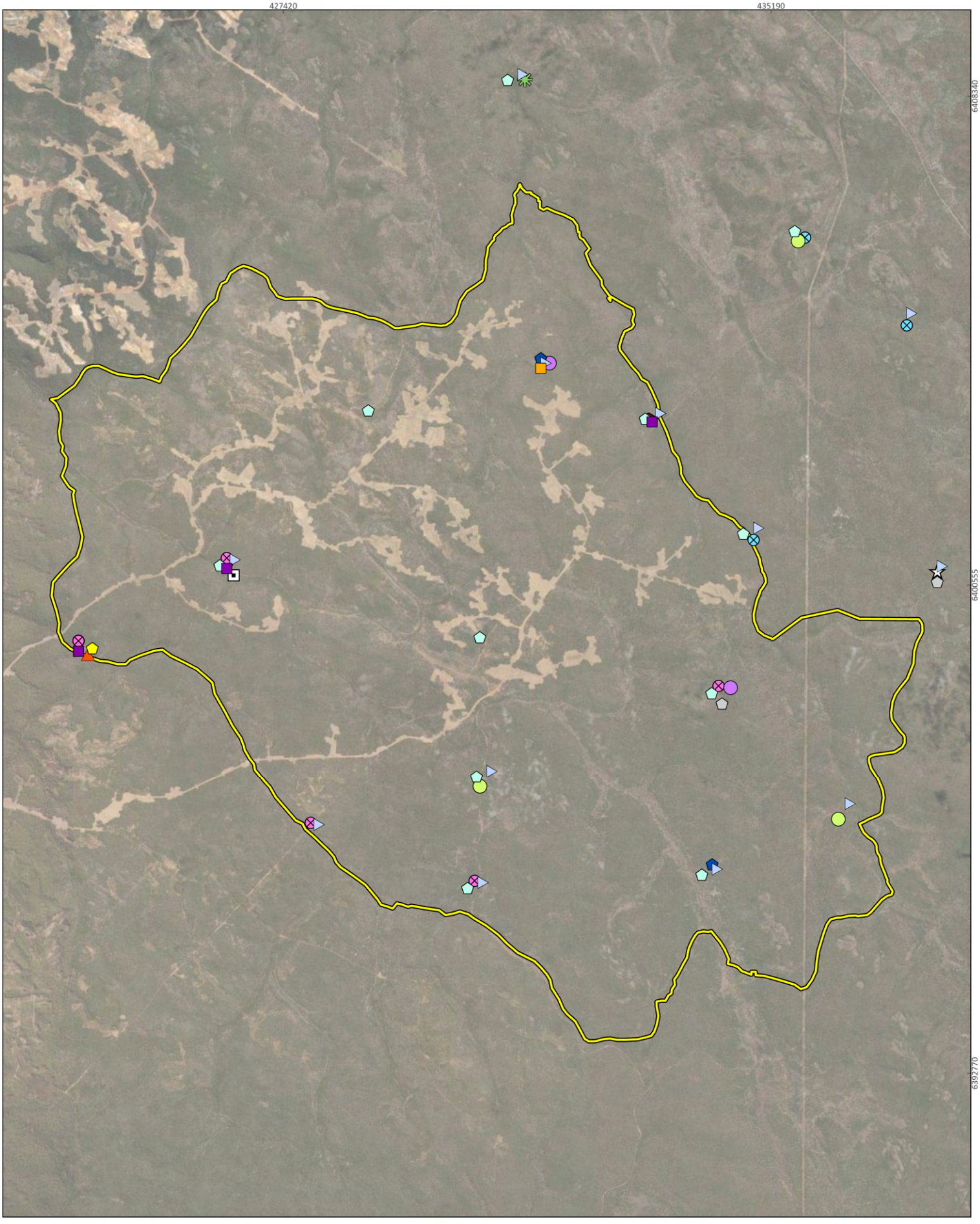
Higher order/ Family	Species	SRE status [1]	SRE hab. code	PHR[2]	Outside SA[3]	Within SA[3]	Sites[4]	Comments
								another 2 sites are within 200 m of the study area boundary
Paradoxosomatidae	*Antichiropus variabilis*	W	2, 3, 4, 5, 10, 11	H, L	Y	Y	CMRA-001, CMRA-002, CMRA-005, *CMRA-008*, OE-001, OE-002, *OE-003*, *OE-004*, OE-005, OE-006, *OE-007*, OE-009, OE-010, OE-012	Common, widespread species, most records are from Mundaring, Boddington, Myara North and Holyoake, however also known from north of Bindoon and south of Manjimup
Class: Malacostraca, Order: Isopoda (slaters)								
Armadillidae	*Acanthodillo* '1'	P	2	H	Y	Y	OE-010	Also known from Holyoake and Holyoake East and near Boddington
Armadillidae	*Armadillo flavus*	P	5, 11	H, L	Y	Y	CMRA-002, OE-010	Also known from a few records near Holyoake East, Holyoake West, Myara North, Collie and near Byford
Armadillidae	*Buddelundia nitidissima*	W	2, 3, 4, 5, 10, 11	H, L	Y	Y	CMRA-006, CMRA-007, *CMRA-008*, *OE-002*, OE-003, *OE-004*, OE-006, OE-008, OE-010, OE-012	Commonly collected from Holyoake, Quindanning, Boddington and Myara North
Armadillidae	*Buddelundia* 'sp. 04'	P	3	H	Y	N	*OE-004*	Also known from near Boddington and Perth Hills
Armadillidae	*Buddelundia* 'sp. 5'	L	2, 4, 5, 10	H, L	Y	Y	CMRA-001, CMRA-002, CMRA-003, CMRA-006, *OE-007*	Also known from Holyoake, Holyoake East, Holyoake West and Myara North
Armadillidae	*Pseudodiploexochus* 'Phoenix0214'	L	2, 4, 5, 10	H, L	Y	Y	CMRA-002, CMRA-003, CMRA-006, CMRA-007, OE-001, *OE-003*, *OE-007*	A new species recorded from 7 sites in or near O'Neil, and one reference site near Holyoake West
Armadillidae	*Spherillo* '5'	W	2, 3	H	Y	Y	CMRA-003, OE-008	Also commonly known from Myara North, Holyoake East, Boddington and Collie
Philosciidae	*Laevophiloscia* '1'	W	2, 3, 4, 5, 11	H, L	Y	Y	CMRA-002, CMRA-003, CMRA-005, CMRA-006, CMRA-007, *OE-002*, *OE-003*, OE-004, OE-006, *OE-007*, OE-008, OE-009, OE-010, OE-012	Commonly collected throughout the Northern Jarrah Forest and near Perth on the SCP
Philosciidae	*Laevophiloscia* '2'	W	2, 3, 4, 5, 10,	H, L	Y	Y	CMRA-001, CMRA-002, CMRA-003, CMRA-005, CMRA-006, CMRA-007,	Commonly collected throughout the Northern Jarrah Forest and near Perth on the SCP

Higher order/ Family	Species	SRE status [1]	SRE hab. code	PHR[2]	Outside SA[3]	Within SA[3]	Sites[4]	Comments
							CMRA-008, OE-001, OE-002, *OE-003*, OE-006, OE-008, OE-009	
Philosciidae	Philosciidae 'Phoenix0208'	P	4	L	N	Y	CMRA-006	2 specimens collected from a pitfall trap Sequenced but unsuccessful
Philosciidae	Philosciidae 'Phoenix0209'	P	5	H	N	Y	CMRA-007	2 specimens collected from a foraging sample Sequenced but no close matches
Philosciidae	Philosciidae 's/1'	L	2, 3, 4, 5, 10,	H, L	Y	Y	CMRA-007, *CMRA-008*, OE-001, *OE-003*, OE-004, *OE-007*, OE-008, OE-009, OE-012	Commonly recorded from Myara North and Holyoake East. Also known from Holyoake, and Perth Hills
Styloniscidae	*Styloniscus* '1'	P	2, 3, 4, 5, 10, 11	H, L	Y	Y	CMRA-002, CMRA-003, CMRA-005, CMRA-006, CMRA-007, *CMRA-008*, OE-001, *OE-002*, OE-003, *OE-004*, OE-006, *OE-007*, OE-008, OE-009, OE-010, OE-012	Commonly recorded from Myara North, Holyoake East and Holyoake West. Also known from Holyoake, Boddington and Collie
Styloniscidae	*Styloniscus* '7'	L	2, 3, 5	H	Y	Y	CMRA-002, CMRA-003, CMRA-005, *OE-004*	Also known from Holyoake East, Myara North, Boddington and Collie
Class: Gastropoda, Superorder: Eupulmonata (land snail)								
Bothriembryontidae	*Bothriembryon* cf. *bradshawi*	W	2, 3, 11	H, L	Y	Y	*OE-002*, *OE-004*, OE-010	Also collected from Holyoake and Holyoake East and Boddington
Bothriembryontidae	*Bothriembryon* cf. *serpentinus*	P	2	H	Y	Y	CMRA-003	Also collected from near Boddington, Collie, Waroona, Dwellingup, and Jarrahdale
Charopidae	*Annoselix* cf. *dolosa*	P	2	H	Y	Y	CMRA-003, OE-006	Also collected from Holyoake West, Myara North and near Boddington
Charopidae	*Luinodiscus* cf. sublesta	W	2, 4	H, L	Y	Y	CMRA-003, OE-008, OE-012	Also known from near Boddington
Punctidae	cf. *Westralaoma* sp. indet.	P	2	H	Y	Y	OE-008	Also collected from Holyoake East
Phylum: Onychophora (velvet worms)								
Peripatopsidae	*Occipperipatoides gilesii*	W	2, 3, 11	H, L	Y	Y	CMRA-003, CMRA-005, OE-008, OE-010	Also known from numerous records between Holyoake, Holyoake East, Holyoake West, Myara Norther and north to Mundaring

1 – SRE status (C = confirmed, P = Potential, L = Likely; H = High, L=Low); 2 – Potential habitat rating (H = High, L = Low); 3 – SA (study area); 4 – Italics = reference sites (outside of O'Neil).

Table 5-6 SRE records by sample type

SRE group/sample type	Active searching			Wet pitfall trap	Total
	Burrow excavation	Foraging	Litter sieve		
Araneomorph spider		100%			100%
Land snail		30%	10%	60%	100%
Millipede	0.2%	19.6%	8.3%	71.8%	100%
Mygalomorph spider	45.9%	42.2%	0%	11.9%	100%
Opiliones		17.1%	18.5%	64.4%	100%
Pseudoscorpion			35.8%	64.2%	100%
Scorpion		49.3%		50.7%	100%
Slater		11.0%	18.9%	70.1%	100%
Velvet worm		80%	20%		100%
Total	**3.7%**	**18.4%**	**14.8%**	**63.1%**	**100%**





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- Study area

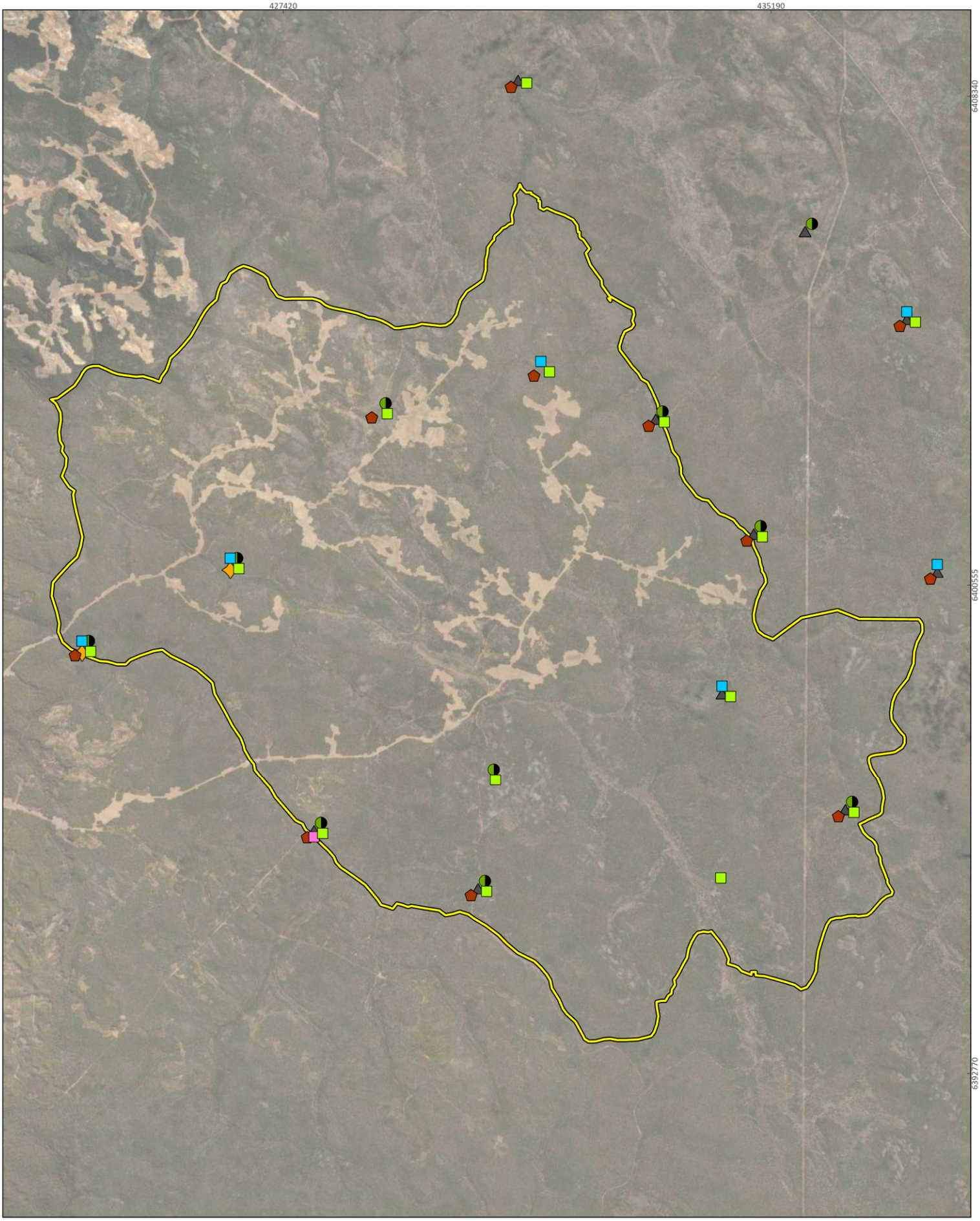
Species, SRE status

- *Aname* 'Phoenix0010', Potential
- Anamidae sp. indet., Potential
- *Bungulla harrisonae*, Potential
- *Eucyrtops* 'MYG645', Potential
- *Eucyrtops* 'Phoenix0029', Potential
- *Euoplos* 'Phoenix0211', Potential
- *Idiosoma* 'WAM T129362', Potential
- *Idiosoma jarrah*, Widespread
- *Proshermacha* 'MYG485', Potential
- *Proshermacha* 'MYG495', Potential
- *Proshermacha* 'MYG658', Potential
- *Proshermacha* 'Phoenix0027', Potential
- *Synothele michaelseni*, Widespread
- *Synothele mullaloo*, Potential
- *Teyl* 'MYG245', Potential
- *Teyl* 'MYG355', Potential

Figure 5-3

Field records of SRE and significant mygalomorph spiders

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Study area

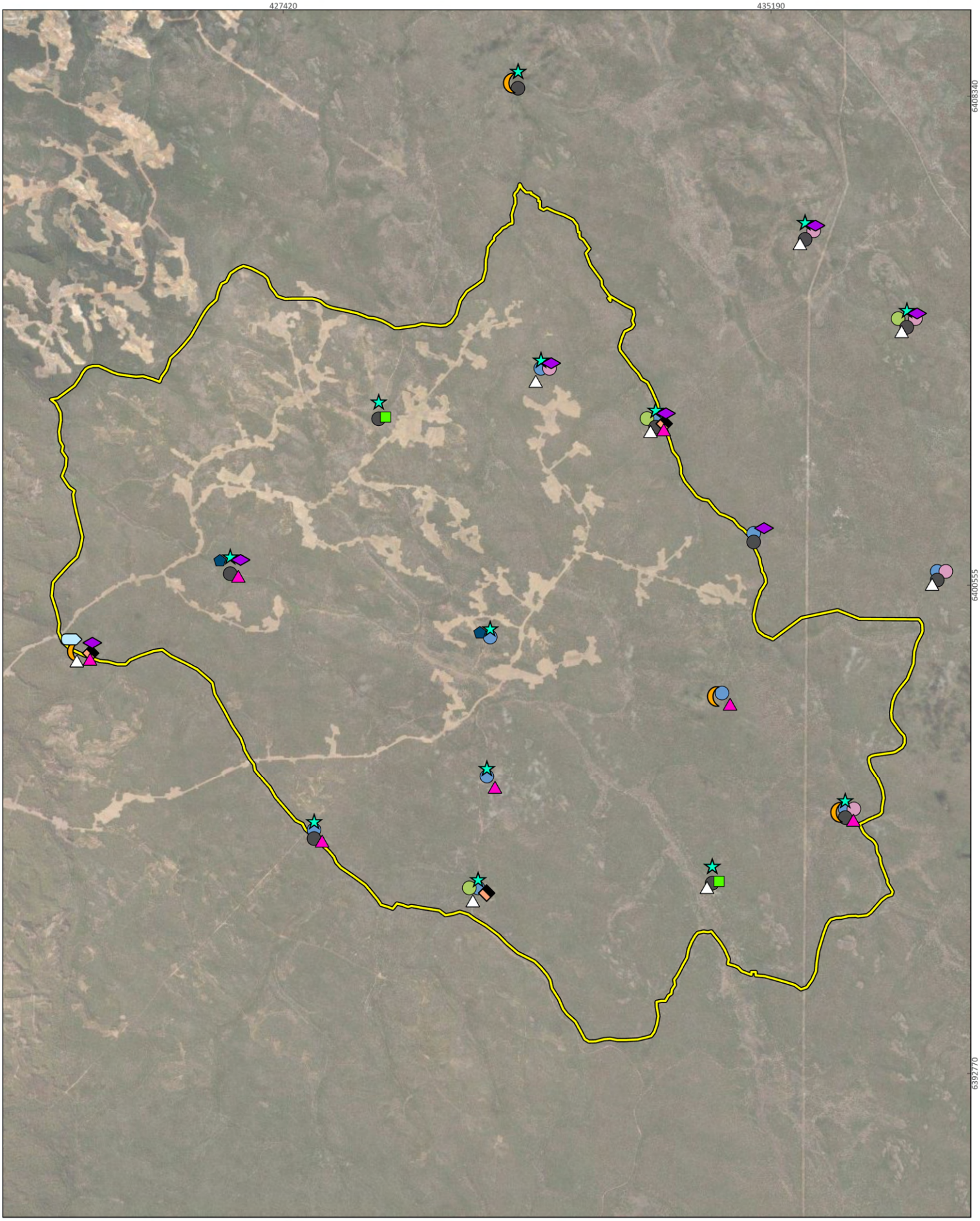
Species, SRE status

- *Ballarra longipalpus*, Potential
- *Calliuncus* sp. indet., Potential
- *Megalopsalis* sp. indet., Potential
- Neopilionidae sp. indet., Potential
- Triaenonychidae 'genus 003' sp. indet., Potential
- Triaenonychidae 'genus 004' sp. indet., Potential
- Triaenonychidae 'genus 008' sp. indet., Potential

Figure 5-4

Field records of SRE opiliones (harvest spiders)

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- Study area

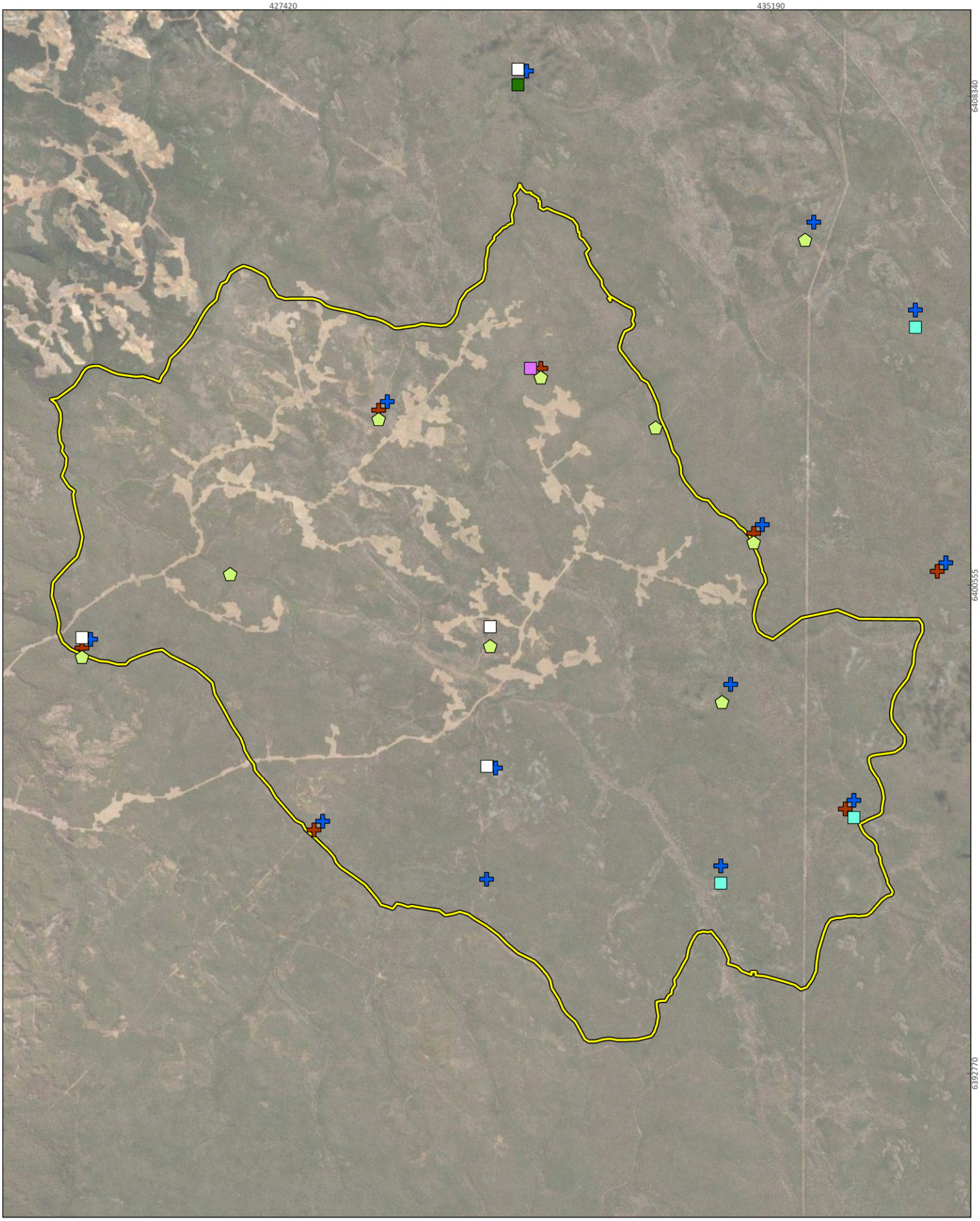
Species, SRE status

- *Austrochthonius* 'PSE188, similis', Potential
- *Austrochthonius* 'PSE191, grandis', Potential
- *Austrochthonius* 'medium 2', Potential
- *Austrochthonius muchmorei*, Potential
- *Beierolpium bornemisszai*, Widespread
- *Cercophonius sulcatus*, Widespread
- *Lagynochthonius australicus*, Widespread
- *Lychas* 'austroccidentalis', Widespread
- *Oratemnus curtus*, Widespread
- *Pseudotyrannochthonius* 'Darling Range 2', Confirmed
- *Synsphyronus magnus*, Widespread
- *Urodacus novaehollandiae*, Widespread
- *Urodacus planimanus*, Confirmed

Figure 5-5

Field records of SRE scorpions and pseudoscorpions

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Study area

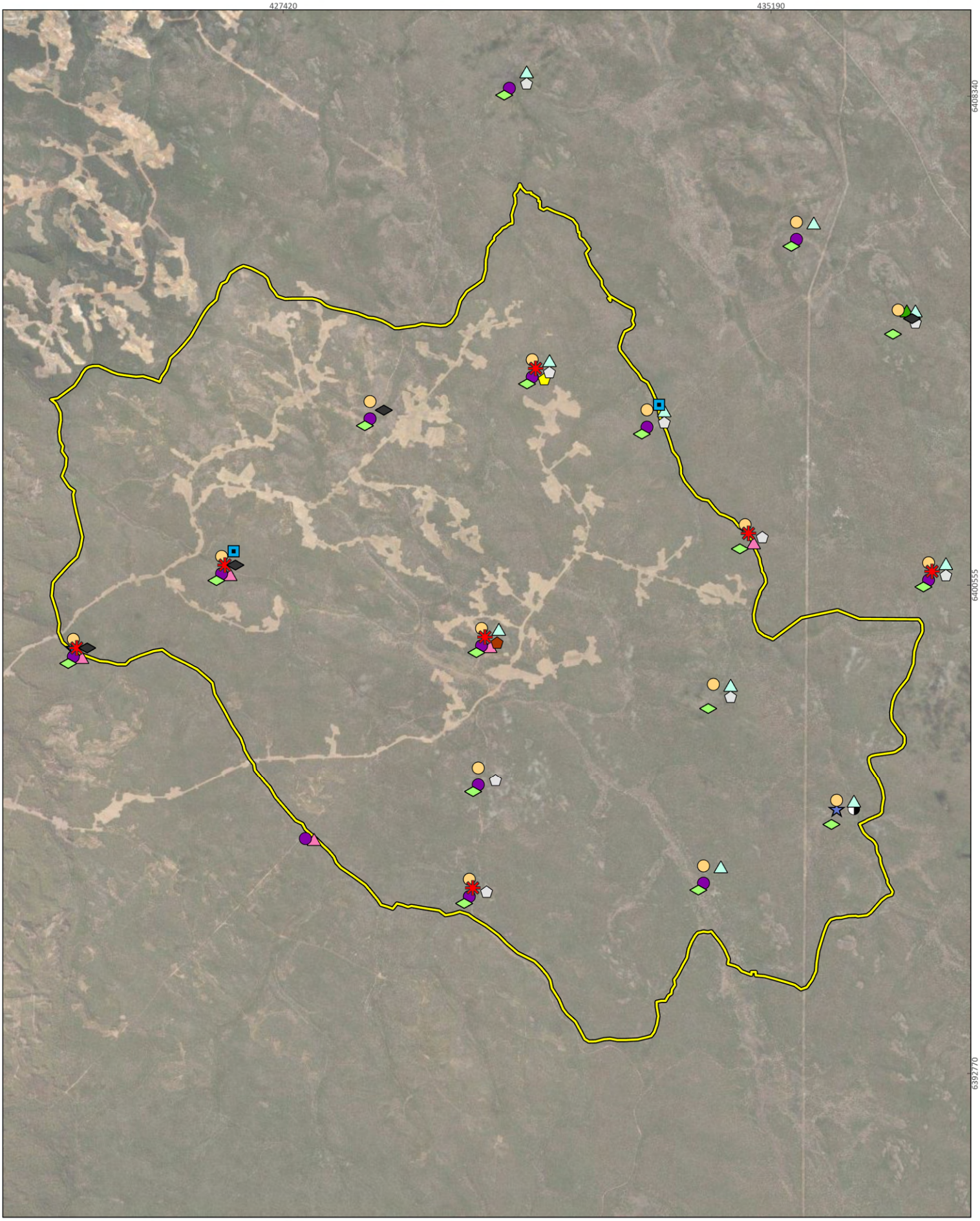
Species, SRE status

- *Antichiropus* 'Phoenix0217', Confirmed
- *Antichiropus variabilis*, Widespread
- *Atelomastix nigrescens*, Widespread
- *Podykipus* 'DIP241', Likely
- *Podykipus collinus*, Potential
- *Podykipus leptoiuloides*, Widespread
- *Sphaerotrichopus* `sp. indet.`, Potential

Figure 5-6

Field records of SRE millipedes

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Study area

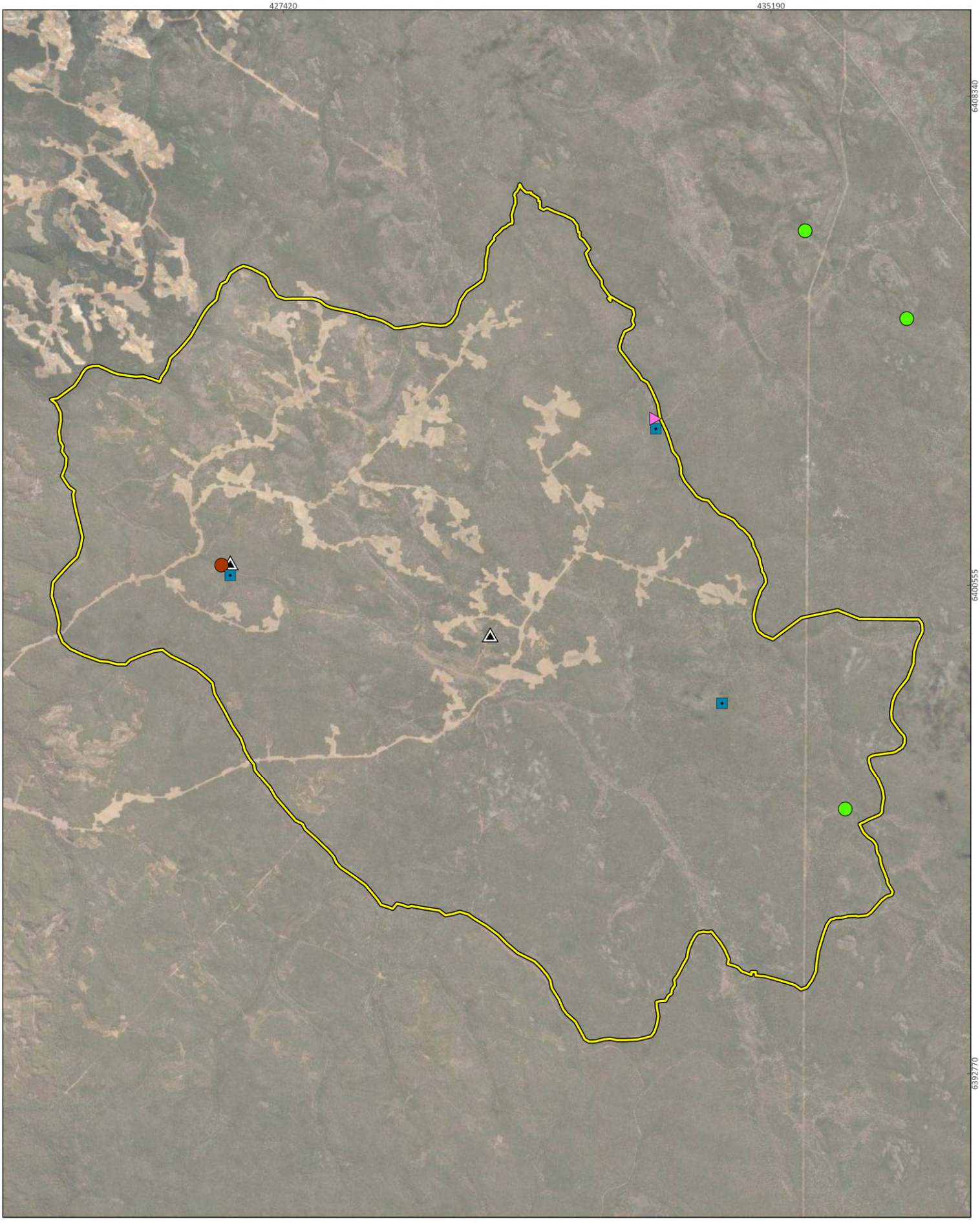
Species, SRE status

- *Acanthodillo* '1', Potential
- *Armadillo flavus*, Potential
- *Buddelundia* 'sp. 04', Potential
- *Buddelundia* 'sp. 5', Likely
- *Buddelundia nitidissima*, Widespread
- *Laevophiloscia* '1', Widespread
- *Laevophiloscia* '2', Widespread
- Philosciidae 'Phoenix0208', Potential
- Philosciidae 'Phoenix0209', Potential
- Philosciidae 's/1', Likely
- *Pseudodiploexochus* 'Phoenix0214', Likely
- *Spherillo* '5', Widespread
- *Styloniscus* '1', Potential
- *Styloniscus* '7', Likely

Figure 5-7

Field records of SRE isopods

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Study area

Species, SRE status

- *Annoselix* cf. *dolosa*, Potential
- *Bothriembryon bradshawi*, Widespread
- *Bothriembryon* cf. *serpentinus*, Potential
- *Luinodiscus* cf. *sublesta*, Widespread
- cf. *Westralaoma* sp. indet., Potential

Figure 5-8

Field records of SRE land snails

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5.2.2 SRE taxa and fauna habitats

A summary of SRE taxa recorded per habitat type is presented below (Table 5-7). Six native fauna habitats recorded SRE taxa, as follows:

- High Potential SRE habitats
    - SRE habitat 2: Open Jarrah/Marri or Blackbutt woodlands on sands, clay-loam or sandy-gravel on lower slopes and valley floors (46 taxa)
    - SRE habitat 3: Heath/shrubland/woodland on shallow soils on granite or outcrops (21 taxa)
    - SRE habitat 5: Open forest of Jarrah/Marri forest, seasonally moist, sandy gravels on slopes (39 taxa)
    - SRE habitat 10: Open woodlands of Wandoo and Flooded Gum on seasonally wet or water-logged clays and clay-loams on valley floors (23 taxa)
    - SRE habitat 11: Open woodlands of Wandoo with clay-loams and some gravel on slopes (23 taxa)
- Low Potential SRE habitats
    - SRE habitat 4: Open forest of Jarrah/Marri on sandy-loam gravelly soils on mid slopes and ridges (37 taxa).

Habitat type 2 (Open Jarrah/Marri or Blackbutt woodlands on sands, clay-loam or sandy-gravel on lower slopes and valley floor) recorded the highest number of SRE taxa (46 taxa), followed by SRE habitat 5 (39 taxa). Both are high Potential SRE habitats, and the second and fourth most widespread habitat in the study area, respectively. The most widespread and the only Low Potential SRE habitat (4) recorded 37 species. Both habitat 2 and habitat 4 sampled the same number of sites (5 sites each).

Of the 64 SRE taxa recorded from the study area, 61 were collected from High Potential SRE habitats (2, 3, 5, 10 and 11) and of these, 17 were recorded only from a single habitat type or site within the study area; however, 14 of these are known from outside the study area. The remaining 3 taxa were recorded from a single habitat type or site within study area and are the only known records of those species:

- *Euoplos* 'Phoenix0211' (High Potential SRE habitat 5)
- Philosciidae 'Phoenix0208' (Low Potential SRE habitat 4)
- Philosciidae 'Phoenix0209' (High Potential SRE habitat 5).

One taxon is known from only one habitat type but has been recorded from Holyoake East (Phoenix, in prep):

- *Podykipus* 'DIP241' (High Potential SRE habitat 5 and SRE habitats 4 (Low) in the O'Neil and 2 (High) from Holyoake).

Two species known only from the survey were collected from at least 2 habitat types:

- *Antichiropus* 'Phoenix0217' (High Potential SRE habitats 2, 5, and 10)
- *Austrochthonius* 'medium 2' (High Potential SRE habitats 2 and 5).

Table 5-7 Summary of SRE taxa recorded in this survey with respect to fauna habitat

Taxa	Fauna habitat						Number of habitat types
	High SRE Potential			Low SRE Potential			
	2 (5 sites)	3 (1 site)	5 (3 sites)	10 (2 sites)	4 (5 sites)	11 (1 site)	
Araneomorph spiders							
Karaops sp. indet.	●					●	2
Mygalomorph spiders							
Aname 'Phoenix0010'					●		1
Anamidae sp. indet.				●			1
Bungulla harrisonae	●						1
Eucyrtops 'MYG645'	●		●	●	●		4
Eucyrtops 'Phoenix0029'	●	●			●		3
Euoplos 'Phoenix0211'			●				1
Idiosoma jarrah			●		●		2
Idiosoma 'WAM T129362'	●		●			●	3
Proshermacha 'MYG485'	●		●				2
Proshermacha 'MYG495'					●		1
Proshermacha 'MYG658'			●				1
Proshermacha 'Phoenix0027'	●		●	●	●		4
Synothele michaelseni	●						1
Synothele mullaloo	●	●	●	●	●	●	6
Synsphyronus magnus			●				1
Teyl 'MYG245'			●				1
Teyl 'MYG355'	●		●				2
Opiliones							
Ballarra longipalpus	●	●		●	●	●	5
Calliuncus sp. indet.	●		●				2
Megalopsalis sp. indet.	●	●	●	●	●	●	6
Neopilionidae sp. indet.	●		●	●	●	●	5
Triaenonychidae 'genus 003' sp. indet.				●			1
Triaenonychidae 'genus 004' sp. indet.	●	●	●		●		4
Triaenonychidae 'genus 008' sp. indet.	●	●	●	●	●	●	6
Pseudoscorpions							
Austrochthonius 'medium 2'	●	●			●		3
Austrochthonius muchmorei	●	●		●	●	●	5
Austrochthonius 'PSE188, similis'	●		●	●	●	●	5
Austrochthonius 'PSE191, grandis'	●	●	●		●	●	5
Beierolpium bornemisszai			●	●	●	●	4
Lagynochthonius australicus	●		●		●		3
Oratemnus curtus	●				●		2
Pseudotyrannochthonius 'DS 2'	●	●	●		●		4
Scorpions							
Cercophonius sulcatus	●	●	●	●	●	●	6

Taxa	Fauna habitat						Number of habitat types
	High SRE Potential			Low SRE Potential			
	2 (5 sites)	3 (1 site)	5 (3 sites)	10 (2 sites)	4 (5 sites)	11 (1 site)	
Lychas 'austroccidentalis'	●						1
Urodacus novaehollandiae	●		●	●	●	●	5
Urodacus planimanus	●	●	●		●		4
Millipedes							
Atelomastix nigrescens	●		●		●		3
Antichiropus 'Phoenix0217'	●		●	●	●	●	5
Antichiropus variabilis	●	●	●	●	●	●	6
Podykipus collinus	●	●				●	3
Podykipus 'DIP241'			●				1
Podykipus leptoiuloides			●	●	●		3
Sphaerotrichopus `sp. indet.`				●			1
Slaters							
Acanthodillo '1'						●	1
Armadillo flavus			●			●	2
Buddelundia nitidissima	●	●	●	●	●	●	6
Buddelundia 'sp. 04'		●					1
Buddelundia 'sp. 5'	●		●	●	●		4
Laevophiloscia '1'	●	●	●		●	●	5
Laevophiloscia '2'	●		●	●	●		4
Philosciidae 'Phoenix0208'					●		1
Philosciidae 'Phoenix0209'			●				1
Philosciidae 's/1'	●	●	●	●	●		5
Pseudodiploexochus 'Phoenix0214'	●		●		●		3
Spherillo '5'	●						1
Styloniscus '1'	●	●	●	●	●	●	6
Styloniscus '7'	●	●	●				3
Land snails							
Annoselix cf. *dolosa*	●				●		2
Bothriembryon bradshawi	●	●				●	3
Bothriembryon cf. *serpentinus*	●						1
Luinodiscus cf. sublesta	●				●		2
cf. *Westraloma* sp. indet.	●						1
Velvet worms							
Occipperipatoides gilesii	●					●	1
Total	**46**	**21**	**39**	**23**	**37**	**23**	

5.3 STATISTICAL ANALYSIS OF SURVEY COMPLETENESS

The species records for the survey were aggregated for the species accumulation analysis. The curves of all 4 indices of 7 orders examined (Figure 5-9 - Figure 5-15) were beginning to flatten or had flattened, suggesting most species in these orders had been collected. Three of the 4 curves for the groups Scorpiones, Pseudoscorpiones and Diplopoda had flattened, suggesting few taxa remain undetected.

Species accumulation curves were not analysed for Selenopidae (flat spiders) or Onychophora (velvet worms), which are typically SRE taxa in other bioregions, were not included because they only contained a few representatives, and all of these were described and known to be Widespread.

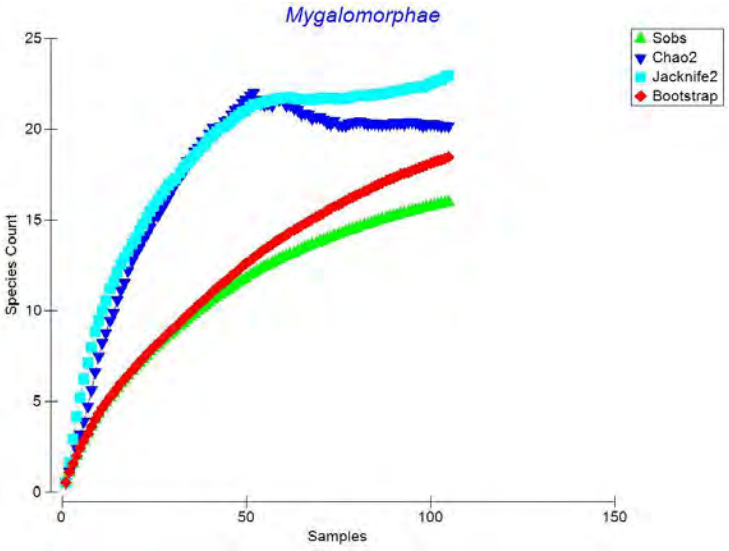


Figure 5-9 Species accumulation curve for Mygalomorphae

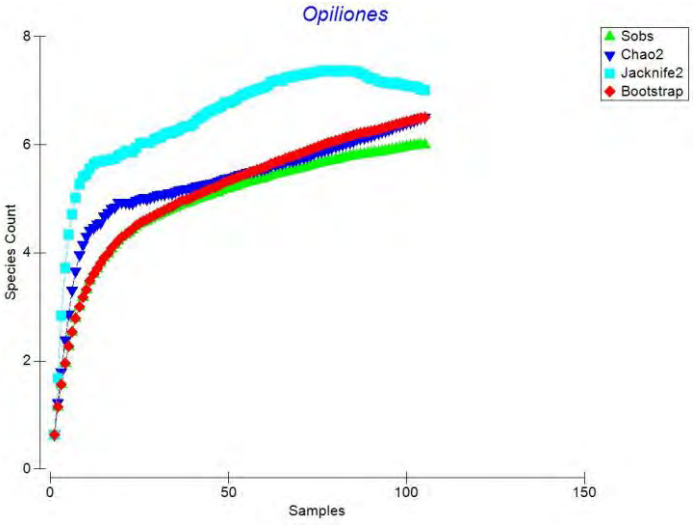


Figure 5-10 Species accumulation curve for Opiliones

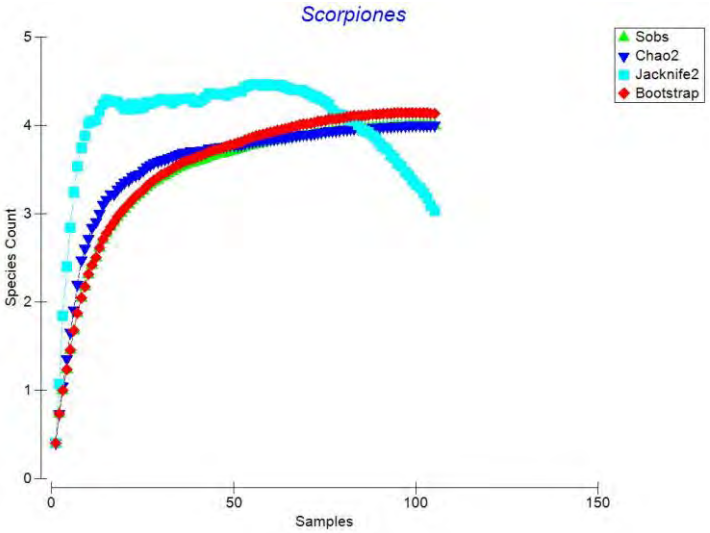


Figure 5-11 Species accumulation curve for Scorpiones

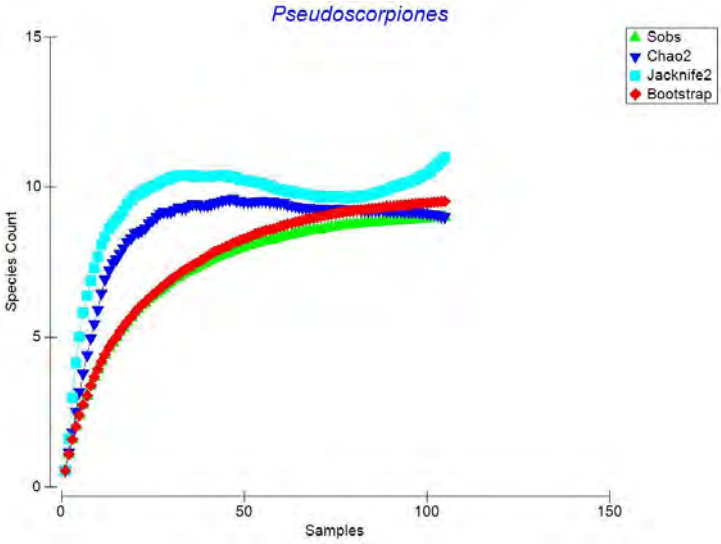


Figure 5-12 Species accumulation curve for Pseudoscorpiones

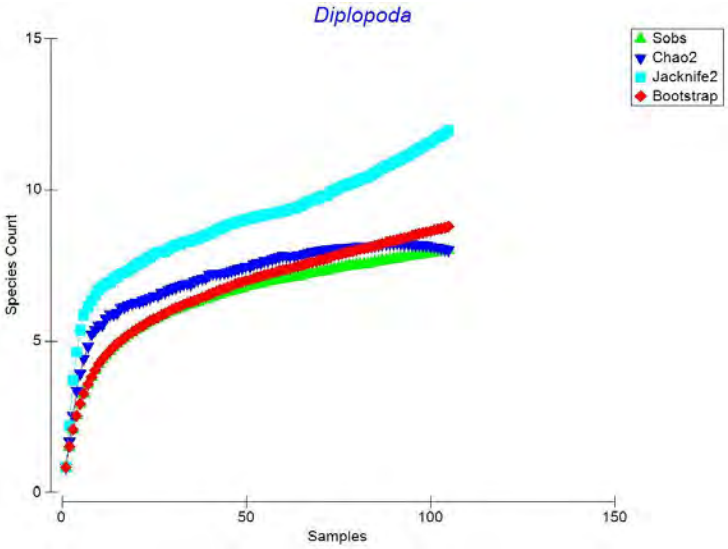


Figure 5-13 Species accumulation curve for Diplopoda

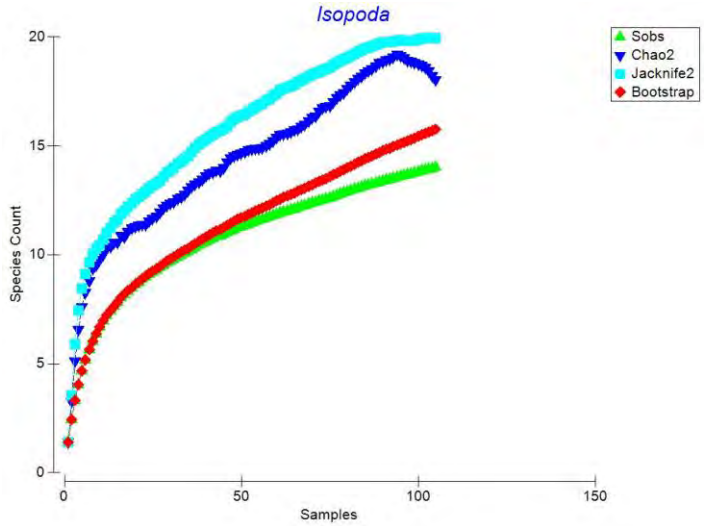


Figure 5-14 Species accumulation curve for Isopoda

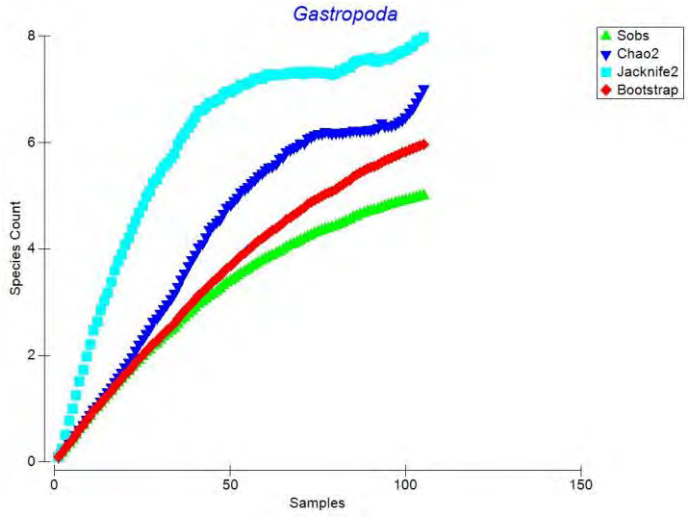


Figure 5-15 Species accumulation curve for Mollusca

6 DISCUSSION

6.1 SPECIES RECORDS

This survey recorded a diverse range of SRE invertebrate fauna in the study area. A total of 64 taxa were recorded from the survey, of which 58 were collected from sites within O'Neil. All but 3 taxa (potential SRE's) have been collected from outside the study area from either reference sites or other surveys, therefore have known wider distributions. Further comment is provided in section 6.5 on the 3 taxa that are known only from the study area, as these species are potentially most at risk from the Project.

The SRE assemblage comprised 3 Confirmed SREs (one millipede, one scorpion, and one pseudoscorpion), 5 Likely SREs (4 isopods and one millipede) and 37 Potential SREs (14 mygalomorphs, 7 opiliones, 6 isopods, 4 pseudoscorpions, 3 land snails, 2 millipedes, and one araneomorph spider). The 3 Confirmed SRE taxa were mainly classified as such based on knowledge of the specific taxonomic group:

- The Confirmed SRE millipede *Antichiropus* 'Phoenix0217' was recorded from 7 sites during the survey (CMRA-001, CMRA-002, CMRA-005, CMRA-007, OE-003, OE-007, OE-010; Habitats 1, 5, 2 (High) and 4 and 11 (L). Of the described *Antichiropus* species, only a few have ranges that exceed the nominal limits of short-range endemism (Car & Harvey 2014). All other species of the genus are SREs and many are known from only a few hundred square kilometres (Car & Harvey 2014; Car *et al.* 2013; Wojcieszek & Simmons 2011). From the specimens obtained from 2023 and 2024, molecular and morphological studies were undertaken, and a distinct clade was formed from specimens from this area. However, due to the complex relationship between the molecular and morphological identifications of *Antichiropus* specimens from the Northern Jarrah Forest subregion, more survey work and taxonomy (both morphological and molecular) is required to delineate between morphospecies and their distributions.
- The Confirmed SRE scorpion *Urodacus planimanus* is restricted to the western parts of the Northern Jarrah Forest subregion (E. Volschenk pers. comm.); however, the species is very close to exceeding the nominal upper limit of 10,000 km^2 for SREs and records are common within its range.
- The Confirmed SRE pseudoscorpion presently undescribed but referred to as *Pseudotyrannochthonius '*Darling Range 2' in a recent phylogenetic analysis of the family in south-western Australia (Harms 2018). This is a Confirmed SRE species that occurs in the Perth Hills, between Dwellingup (northern distributional limit) and Collie (southern limit) where it is moderately common in undisturbed microhabitats with high moisture retention and abundant leaf litter.

Taxa were recorded from all main target SRE groups relevant to southern WA but there was high variability in species richness between groups, with mygalomorph spiders and isopods represented by much higher diversity than others.

The high proportion of taxa collected from representatives of SRE groups that were classified as SREs (70%) was consistent with previous Northern Jarrah Forest subregion SRE surveys (Table 6-1). This is likely attributable to 2 main factors:

- A known diverse ecosystem comprising of a relatively narrow strip of hills and gullies with widescale clearing to the east and west.
- The use of molecular analysis enabled resolution of distinct taxa which otherwise would be unable to be morphologically identified due to life stage (juveniles), sex (females), or a simple lack of taxonomic knowledge.

The evolution of endemism within the Jarrah Forest has been documented by Wardell-Johnson and Horwitz (2000) to be the outcome of the long and complex geological and climatic history of the region. Through the interrogation of molecular results and geographic datasets, it can be inferred that active speciation via sympatry is prominent within the Northern Jarrah Forest subregion. Examples from within the 2 most speciose taxon groups from the survey, mygalomorph spiders and millipedes, demonstrate clear sister-species that overlap in distribution; however, are genetically dissimilar. This study highlights a clear gap of knowledge relating to uncovering cryptic, sympatric and/or allopatric speciation within the Northern Jarrah Forest subregion and highlights potential endemicity for many taxa.

6.2 SRE HABITATS

Native vegetation occupies 88.8% of the study area and comprises of 8 SRE habitats. An additional 9.8% represents rehabilitated land and the remainder (1.4%) is cleared (e.g. for infrastructure, plantations or dams). This is slightly lower than other study areas that were subject to SRE surveys (Holyoake, Holyoake East and Myara), which consist of around 96% to 97% native vegetation. Holyoake West is comprised of approximately 89.5% native vegetation; however, the non-native areas in Holyoake West are primarily agriculture and plantations and have not been rehabilitated with native vegetation like O'Neil.

Of the SRE habitats defined within the study area, 5 were classified as having High PHR with habitat attributes that often give rise to specialisation or dependency in invertebrate fauna, particularly more mesic habitats on lower slopes and valley floors and large isolated granite outcrops. These represented 6,624.8 ha (32.1%) of the study area.

Rehabilitated areas covered 9.8% of the study area and represent parts of the study area that have been previously mined. This is a relatively large proportion in comparison with other study areas (Holyoake, Holyoake East, Holyoake West and Myara) and the near regional landscape. Rehabilitated areas have been shown to support some SRE taxa, generally the more common and less restricted SRE taxa, and also have lower diversity than sites with remnant vegetation (Phoenix 2021a, c).

A total of 38 out of the 64 taxa were recorded from both Low and High PHR habitats, and most of these are now known to have wider distributions; however, 23 were recorded only from High PHR habitats, and 3 were recorded only from Low PHR habitats. Despite 6 of the 17 sites being situated in the Low PHR habitat, and the remaining 11 in High PHR habitats, the proportion of taxa recorded only in a High PHR habitat is much greater, indicating High PHR habitats are more favourable for highly range-restricted SRE taxa.

All habitats except Low PHR habitat 4 recorded similar diversity relative to the number of sites sampled. Although habitat 4 recorded a high diversity of SRE taxa, the diversity was noticeably lower than habitats with similar numbers of site sampled sites, i.e. habitat 2 had the same number of sites but recorded 9 more taxa, and habitat 5 recorded 2 more taxa than habitat 4 despite surveying 2 less sites in that habitat type.

The other Low PHR SRE habitat, 11, recorded a relatively high diversity, indicating that despite its position higher in the landscape, it might support habitat features desirable for SREs. The Low PHR habitats mainly woodlands on mid and upper slopes, occur more broadly and typically lacked distinguishing features that facilitate habitat specialisation. At the site level however, microhabitat features suitable for SREs were sometimes present that are not reflected in the broader scale habitat mapping.

Given that only one species (Philosciidae 'Phoenix0208') was recorded only from a single Low PHR habitat is site/habitat (CMRA-006, habitat 4) which is widespread, and that species is from a very poorly studied group of SREs, this species is unlikely to be highly restricted. This supports the notion from Phoenix (2021c) that taxa within the Low PHR habitats, such as habitat 4 are unlikely to be highly restricted.

It is possible that finer habitat attributes within habitats or sites may be influencing distribution of some species that were only recorded from one habitat/site type, making inferences about distribution and habitat preference difficult.

6.3 SURVEY COMPLETENESS

A total of 12 sites were systematically surveyed in the study area across an area of 10,414.5 ha and an additional 5 sites outside of the study area, across 9 habitat types. From this survey, 64 taxa from 9 SRE groups were delineated; however, species accumulation curves were only run for 7 of these as taxa from velvet worms and selenopids appear to be widespread from the region, with no new species recorded from several large-scale regional surveys (Phoenix 2021a, c, in prep.-a). Species accumulation curves from Scorpiones, Pseudoscorpiones and Diplopoda suggest few taxa remain undetected and that additional efforts focused on these orders is likely to only marginally improve the knowledge concerning the species richness of these groups.

The curves of the indices of the remaining 5 SRE groups (mygalomorphs, isopods, millipedes, opiliones and land snails) continued to rise slightly indicating that these groups are more speciose and additional taxa remain to be collected. These trends are considered reflective of the high level of endemicity, and hence diversity, in the Northern Jarrah Forest subregion as concluded by Wardell-Johnson and Horwitz (1996) and Wardell-Johnson and Horwitz (2000).

6.4 COMPARISON BETWEEN OTHER SURVEYS

Since 2020, several comparable 2-phase SRE surveys have been undertaken in the Northern Jarrah Forest between Jarrahdale and Collie (Figure 1-1):

- Myara North (Phoenix 2021c) – 3.5 km north of the study area
- Holyoake (Phoenix 2021c) – 5 km south-west of the study area
- Holyoake East (Phoenix in prep.-b) – directly south of the study area
- Holyoake West (Phoenix in prep.-b) – 15 km south-west of the study area
- Worsley (Phoenix 2021a) – 15 km east of the study area and extends to Collie.

The study area is situated between Myara North and Holyoake. Phoenix (2021c) noted considerable differences in the SRE assemblages between Myara North and Holyoake, with just 30 out of 83 taxa (36%) being common to both study areas, and 36 and 17 SRE taxa being exclusively recorded from the Myara North and Holyoake, respectively.

Being situated between Myara North and Holyoake, we expected more overlap to occur, and perhaps fewer species to ultimately be known exclusively from each study area once O'Neil was sampled. This was certainly the case for some taxa; the survey at O'Neil recorded 38 species or morphospecies in common with Myara North, and 39 species or morphospecies in common with Holyoake. Furthermore, 39 species or morphospecies from O'Neil were in common with taxa from Holyoake East, 22 from Holyoake West and 42 were in common with the Worsley studies.

The current survey highlights the value of continued sampling in increasing knowledge of species, their distributions and habitat tolerances, therefore informing Northern Jarrah Forest biodiversity values and conservation significance. While the survey results broadened known distributions for many taxa, the absence of additional collections of other SRE taxa from adjacent study areas supports the notion of some species from the subregion having highly restricted ranges. In summary, 16 species or morphospecies are known from all 6 surveys (Table 6-1), 12 species or morphospecies from 5 surveys, 16 species or morphospecies from 4 surveys and 32 from 2 surveys. A total of 89 species or

morphospecies are known from only one of the surveys, although most of these are not restricted to the study areas or impact areas within the study areas.

It makes sense that Holyoake West, being the smallest and furthest away from O'Neil had the least in common. Worsley however, also being a similar distance at its closest point had the largest number of species in common with O'Neil, but it is a much larger study area than Holyoake West with a wider variety of habitats. Being one of the most central study areas, O'Neil has a similar number of common/different species to those at Holyoake, Holyoake East and Myara North.

Three species that were previously only known from Myara North were re-recorded during the current survey, extending their known distribution:

- *Proshermacha* 'Phoenix0027' – previously only known from 2 sites in Myara North, now also known from another 11 sites in O'Neil
- *Eucyrtops* 'Phoenix0029' – previously only known from 3 sites in Myara North, now also known from another 3 sites in O'Neil
- Dalodesmidae 'Phoenix0038' – previously only known from 2 sites in Myara North, now also possibly known from another 2 sites in Holyoake East and a site in O'Neil; however, molecular tests failed.

No taxa that were only known from Holyoake were recorded in the O'Neil study area; however, 6 taxa previously only known from Holyoake were re-recorded from Holyoake East or Holyoake West, and one taxon from Myara North was also re-recorded from Holyoake East (Phoenix in prep.-b).

Species assemblage is similar across all studies, with mygalomorph spiders being the dominant group, comprising (25-40% of all taxa), followed by isopods and millipedes (10-20% of all taxa), with the remaining SRE groups all representing less than 10% of the assemblage in each study area (

Table 6-2).

Compared to the other study areas, the habitat within O'Neil is fairly consistent, i.e. primarily consisting of Jarrah/Marri forest with a mix of upland and valley habitats. Large granite outcrops were absent from O'Neil and there was very little wandoo woodland present. The habitat is also less connected with current and historic mining taking place; however, it is not likely this has affected SRE communities as the vast majority is still remnant vegetation and isolation of habitats has not occurred.

Table 6-1 Species or morphospecies common to Huntly and Worsley study areas

Species	O'Neil	Holyoake East	Holyoake West	Holyoake	Myara North	Worsley
Acanthodillo '1'	□	□		□		
Acanthodillo '5'		□				□
Akamptogonus novarae					□	
Aname 'Phoenix0004'					□	
Aname 'Phoenix0006'		□		□		
Aname 'Phoenix0010'	□	□		□		□
Aname 'Phoenix0020'		□		□		
Aname 'Phoenix0037'				□		□
Anamidae 'Phoenix0009'					□	□
Anamidae 'Phoenix0022'						□
Annoselix cf. *dolosa*	□		□		□	□
Antichiropus 'DIP046, boddington'						□
Antichiropus 'DIP097, marradong'		□		□		□
Antichiropus 'DIP108, mt saddleback'						□
Antichiropus 'DIP135, minnivale2?'					□	
Antichiropus 'DIP202, WorsleyDNA18'						□
Antichiropus 'DIP224, dwellingup'				□	□	
Antichiropus 'forest'				□		
Antichiropus 'holyoake'				□		
Antichiropus 'jarrah'					□	
Antichiropus 'Mini'					□	
Antichiropus 'Myara'				□		
Antichiropus 'Phoenix0216'		□	□			
Antichiropus 'Phoenix0217'	□					
Antichiropus 'Phoenix0218'		□				
Antichiropus 'southern'			□	□		
Antichiropus variabilis	□	□	□	□	□	□
Antichiropus 'Worsley DIP176'						□
Armadillo flavus	□			□	□	□
Atelomastix nigrescens	□	□	□	□	□	
Aurecocrypta 'Phoenix0014'						□
Austrochthonius 'medium 2'	□					
Austrochthonius muchmorei	□	□	□	□	□	□
Austrochthonius 'PSE188'	□	□		□	□	□
Austrochthonius 'PSE191, grandis'	□			□		□
Ballarra longipalpus	□	□		□		□
Barychelidae 'WorsleyDNA10'						□

Species	O'Neil	Holyoake East	Holyoake West	Holyoake	Myara North	Worsley
Beierolpium bornemisszai	□	□	□	□	□	□
Beierolpium 'WorsleyDNA18'						□
Beierolpium 'WorsleyDNA19'						□
Bothriembryon cf. *bradshawi*	□	□		□		□
Bothriembryon cf. *indutus*					□	
Bothriembryon cf. *serpentinus*	□					
Buddelundia nigripes					□	□
Buddelundia nitidissima	□	□	□	□	□	□
Buddelundia 'sp. 04'	□					□
Buddelundia 'sp. 5'	□	□	□	□	□	
Buddelundia sp. indet. A (Worsley)						□
Bungulla harrisonae	□			□	□	
Bungulla 'WorsleyDNA11'						□
Calliuncus 'WorsleyDNA21'						□
Cercophonius sulcatus	□	□	□	□	□	□
cf *'Sphaerotrichopus'*? 'WorsleyDNA01'						□
cf. *Westralaoma* sp. indet.	□	□		□	□	
Chernetidae 'boddington'		□	□		□	□
Dalodesmidae 'Phoenix0038'				□	□	
Eucanippe nemestrina		□				
Eucyrtops `collie`						□
Eucyrtops latior					□	□
Eucyrtops 'MYG645'	□	□	□	□	□	□
Eucyrtops 'Phoenix0001'						□
Eucyrtops 'Phoenix0018'						□
Eucyrtops 'Phoenix0029'	□				□	
Eucyrtops 'Phoenix0030'					□	
Eucyrtops 'Phoenix0032'				□	□	
Eucyrtops 'Phoenix0043'						□
Eucyrtops 'Phoenix0045'						□
Euoplos inornatus						□
Euoplos 'Phoenix0011'					□	
Euoplos 'Phoenix0012'		□	□	□		
Euoplos 'Phoenix0013'						□
Euoplos 'Phoenix0211'	□					
Geogarypus taylori					□	
Idiosoma jarrah	□	□		□	□	□
Idiosoma 'MYG741'						□
Idiosoma 'MYG790'		□	□	□		
Idiosoma 'Phoenix0002'						□
Idiosoma 'rhaphiduca group'						□
Idiosoma 'WAM T129362'	□	□		□	□	
Isometroides 'jarrah'		□			□	
Iulomorphidae 'WorsleyDNA20'						□

Species	O'Neil	Holyoake East	Holyoake West	Holyoake	Myara North	Worsley
Karaops ellenae				□	□	
Karaops jarrit		□		□		
Kwonkan 'Phoenix0005'		□			□	
Kwonkan 'Phoenix0008'			□	□		
Kwonkan 'Phoenix0210'		□				
Laevophiloscia '1'	□	□	□	□	□	□
Laevophiloscia '2'	□	□	□	□	□	□
Laevophiloscia cf. perlata						□
Lagynochthonius australicus	□		□	□	□	□
Luinodiscus cf. sublesta	□					□
Lychas 'austroccidentalis'	□	□		□	□	□
Megalopsalis 'WorsleyDNA22'						□
Megalopsalis 'WorsleyDNA23'						□
'Megalosiphon' 'WorsleyDNA14'		□				
'Megalosiphon' 'WorsleyDNA15'		□	□			
Missulena 'MYG198'		□		□		
Missulena 'MYG639'						□
Missulena 'Phoenix0046'						□
Nunciella 'WorsleyDNA25'						□
Occipperipatoides gilesii	□	□	□	□	□	□
Ommatoiulus moreletii		□	□	□	□	□
Oratemnus curtus	□					□
Paraplatyarthridae sp. indet.				□	□	□
Paraplatyarthrus sp. indet. A						□
Paraplatyarthrus sp. indet. B						□
Paraplatyarthrus sp. indet. C						□
Paraplatyarthrus sp. indet. D						□
Philosciidae 'Phoenix0208'	□					
Philosciidae 'Phoenix0209'	□					
Philosciidae 's/1'	□	□		□	□	□
Podykipus collinus	□	□	□			□
Podykipus 'DIP241'	□	□				□
Podykipus leptoiuloides	□	□	□	□	□	□
Proshermacha 'MYG485'	□	□	□	□	□	□
Proshermacha 'MYG495'	□	□		□	□	
Proshermacha 'MYG646'						□
Proshermacha 'MYG658'	□	□		□	□	□
Proshermacha 'Phoenix0024'					□	
Proshermacha 'Phoenix0027'	□				□	
Proshermacha 'Phoenix0028'					□	
Proshermacha 'Phoenix0213'		□				
Proshermacha 'WorsleyDNA12'						□
Protochelifer 'boddington'		□		□	□	□
Protogarypinus giganteus				□		

Species	O'Neil	Holyoake East	Holyoake West	Holyoake	Myara North	Worsley
Pseudodiploexochus '1'						□
Pseudodiploexochus 'Phoenix0214'	□	□	□			
Pseudodiploexochus sp. indet.				□	□	
Pseudodiploexochus sp. indet. A (Worsley)						□
Pseudodiploexochus sp. indet. B (Worsley)						□
Pseudotyrannochthonius 'Darling Range 2'	□	□	□	□	□	□
Siphonotidae `DIPAAF` `DIP188` `boddington`					□	□
Siphonotidae `DIPAAF` `WorsleyDNA14`						□
Siphonotidae `DIPAAF` `WorsleyDNA15`						□
Siphonotidae `DIPAAG` `DIP189` `collie`		□	□	□		□
Siphonotidae `DIPAAG` `DIP192` `mt saddleback`		□		□	□	□
Siphonotidae `DIPAAG` 'Phoenix0040, DIP219'				□	□	
Siphonotidae `DIPAAH` `DIP190` `harris river`						□
Siphonotidae 'DIPAAF' 'cf. michaelseni'		□	□	□	□	□
Sphaerotrichopus `sp. indet.`	□	□				□
Spherillo '1'			□		□	
Spherillo '5'	□	□		□	□	□
Styloniscus '1'	□	□	□	□	□	□
Styloniscus '7'	□	□	□	□	□	□
Styloniscus 'A' (Worsley)						□
Styloniscus 'B' (Worsley)						□
Synothele michaelseni	□	□	□	□	□	□
Synothele mullaloo	□	□		□	□	
Synothele 'MYG640'						□
Synothele rubripes						□
Synothele 'WorsleyDNA17'						□
Synsphyronus magnus	□					
Teyl 'MYG241'		□				
Teyl 'MYG245'	□				□	
Teyl 'MYG355'	□	□		□	□	
Teyl 'Phoenix0007'				□	□	
Teyl 'Phoenix0017'						□
Teyl 'Phoenix0019'					□	
Teyl 'Phoenix0021'					□	
Teyl 'Phoenix0212'		□				
Triaenonychidae 'genus 003' sp. indet.	□					□
Triaenonychidae 'genus 003' 'WorsleyDNA24'						□

Species	O'Neil	Holyoake East	Holyoake West	Holyoake	Myara North	Worsley
Triaenonychidae 'genus 003' 'WorsleyDNA26'						□
Triaenonychidae 'genus 003' 'WorsleyDNA27'						□
Triaenonychidae 'genus 004' sp. indet.	□					
Triaenonychidae 'genus 008' sp. indet.	□	□	□	□	□	□
Triaenonychidae 'genus 008' sp. indet.						□
Triaenonychidae 'genus 008' 'WorsleyDNA28'						□
Triaenonychidae 'genus 008' 'WorsleyDNA29'						□
Triaenonychidae 'genus 008' 'WorsleyDNA30'						□
Urodacus novaehollandiae	□	□		□	□	□
Urodacus planimanus	□	□		□	□	

Table 6-2 Comparison of Huntly and Worsley studies, by report

Survey	O'Neil	Holyoake East and Holyoake West (Phoenix in prep.-b)	Myara North and Holyoake (Phoenix 2021c)	Worsley (Phoenix 2021a)
Baseline study area size (ha)	10,414.5 ha	24,737	28,132 ha	124,651 ha 29,360 (CBME and WMDE) 95,291 (regional study area)
Number of sites	17 sites in toral	32 sites in total 26 HE 6 HW	60 sites in total 28 MN-MA 22 H-MA 5 MN-CC 3 H-CC 1 MN-HR 1 H-HR	47 sites in total 10 CBME (2019) 22 WMDE (2019) 15 regional study area (2020)
Number of taxa from SRE groups	64	76	117	134
Number of SRE taxa	Confirmed: 3 Likely: 5 Potential: 37 Total: 45	Confirmed: 8 Likely: 7 Potential: 41 Total: 56	Confirmed: 11 Likely: 5 Potential: 67 Total: 83	Confirmed: 9 Likely: 12 Potential: 77 Total: 98
% of taxa from SRE groups that are SREs	70%	74%	73%	73%
Number of families and genera	Families: 25 Genera: 34	Families: 28 Genera: 41	Families: 19 Genera: 24	Families: 19 Genera: 30
Number of taxa in each group	Mygalomorphs: 16 (25.0%) Opiliones: 7 (10.9%) Pseudoscorpions: 9 (14.0%) Scorpions: 4 (6.25%) Millipedes: 17 (22.7%) Isopods: 7 (10.9%) Land snails: 5 (7.8%) Araneomorphs: 1 (1.6%) velvet worm: 1 (1.6%)	Mygalomorphs: 23 (30.7%) Opiliones: 5 (6.7%) Pseudoscorpions: 7 (9.3%) Scorpions: 5 (6.7%) Millipedes: 17 (22.7%) Isopods: 13 (17.3%) Land snails: 3 (4.0%) Araneomorphs: 2 (2.7%) velvet worm: 1 (1.3%)	Mygalomorphs: 35 (42.2%) Opiliones: 7 (8.4%) Pseudoscorpions: 2 (2.4%) Scorpions: 2 (2.4%) Millipedes: 16 (19.3%) Isopods: 16 (19.3%) Land snails: 5 (6.0%)	Mygalomorphs: 40 (40.8%) Opiliones: 8 (8.2%) Pseudoscorpions: 4 (4.1%) Scorpions: 0 Millipedes: 19 (19.4%) Isopods: 24 (24.5%) Land snails: 3 (3%)
Number of native habitat types	8	TBC	8	9
Number of sites in rehabilitation survey	0	0	12	8

6.5 REVIEW OF TAXA KNOWN ONLY FROM THE STUDY AREA

A total of 3 taxa are known only from the study area. These are represented by one mygalomorph spider and 2 isopods. The other species were collected at 2 or more sites and have been collected outside the study area.

6.5.1 *Euoplos* 'Phoenix0211'

Euoplos is a widely distributed genus in Australia. It includes *Euoplos inornatus*, a Priority 3 species, which was returned in the desktop review.

Only one juvenile (singleton) was collected from a wet pitfall trap, therefore morphological comparison could not be made. The specimen was sequenced and analysed against the Phoenix and GenBank database, and upon no matches was then analysed against Museum databases by Dr. Michael Rix. The specimen does not closely match any other species of *Euoplos* that have been sequenced by the WAM. It is part of the difficult and unrevised *Euoplos inornatus* complex, which includes *E. inornatus*, *E. festivus* plus several other undescribed species from the Jarrah Forest and Warren bioregions. This specimen is 12.2% divergent from *Euoplos* 'Phoenix0012' from Holyoake Corridors (Phoenix 2021c), 11.9–12.5% divergent from *E. inornatus*; and 12.4% divergent from *E. Festivus* (WAM database). With Idiopid mygalomorph spiders, a divergence of 8.5% may be considered conservatively conspecific with decreasing divergence having higher confidence for conspecifity.

Euoplos 'Phoenix0211' was collected from one site (CMRA-002), a High PHR habitat comprising of Open forest of Jarrah/Marri forest, seasonally moist, sandy gravels on slopes. The site is located approximately 100 m from the O'Neil boundary (Figure 5-3) and there do not appear to be any restricted microhabitats or geographical barriers present, so it is likely this species also occurs outside the study area. The specimen was caught in a wet pitfall trap, so it is not known if the site/habitat is breeding/burrowing habitat or just dispersal habitat, as no females were collected from burrows, which could have been either not seen or not present at the site. It is unlikely to have travelled too far from its original site, however.

6.5.2 Philosciidae 'Phoenix0208' and 'Phoenix0209'

The Philosciidae are a poorly known family within the isopod order. There are several common morpho-species within the family identified by Judd (2004) and Judd and Horwitz (2003). Many of these were widely recorded during the survey and from the other Northern Jarrah Forest surveys, e.g. Philosciidae 's/1' was recorded from 5 of the 6 studies, and *Laevophiloscia* '1' and *Laevophiloscia* '2' which are known from all 6 studies. These 2 specimens were morphologically different (pers. comm. Dr. Simon Judd) and considered different species:

- Philosciidae 'Phoenix0208 was recorded from one site within O'Neil (CMRA-006), a Low PHR habitat (4 – Open forest to woodland of Jarrah/Marri on sandy-loam gravelly soils on mid-slopes and ridges). This habitat type occupies 57.4% of the study area. This specimen was sequenced; however, it failed to amplify. The specimen was described as "body outline complete, no waist, 2 flagellum, setae all over". Only 2 specimens of this species were recorded from the one site from a wet pitfall trap, indicating it is also a very cryptic animal. Six other isopods were collected from this site that were all recorded from several other locations, including 3 species considered Likely or Potential SREs (Figure 5-7). Therefore, it is reasonable to infer that Philosciidae 'Phoenix0208' is also likely to occur more broadly outside the study area.
- Philosciidae 'Phoenix0209' recorded from one site within O'Neil (CMRA-007), a High PHR habitat (5 – Open forest of Jarrah/Marri forest, seasonally moist, sandy gravels on slopes). This habitat type occupies 9.4% of the study area. This specimen was sequenced; however, there were no close matches. Only 2 specimens of this species were recorded from the one site from foraging, indicating it is also a very cryptic animal. Six other isopods were collected

from this site that were all recorded from several other locations, including 3 species considered Likely or Potential SREs (Figure 5-7). Therefore, it is reasonable to infer that Philosciidae 'Phoenix0209' is also likely to occur more broadly outside the study area.

6.6 CONCLUSION

A rich assemblage of invertebrate taxa was recorded from the study area with 64 SREs collected, represented by 3 Confirmed, 5 Likely and 37 Potential SREs. Taxa were recorded from several SRE groups but there was high variability in species richness between groups, with mygalomorph spiders, millipedes and isopods having highest species richness.

Only 3 taxa collected from the survey (*Euoplos* 'Phoenix0211', Philosciidae 'Phoenix0208' and 'Philosciidae 'Phoenix0209'); are currently known only from the study area, all from single sites, although broader distributions outside the study area are inferred for all. The remaining 62 taxa are known from outside the study area, indicating that O'Neil does not support extreme range-restricted taxa; however, like study areas from the previous surveys of the Northern Jarrah Forest subregion, it does provide habitat for several species likely to meet the definition of an SRE and it is anticipated that with additional sampling, many of the potential SRE taxa from the survey would be reclassified as likely or confirmed SREs.

Some groups of SREs are still poorly known, even the relatively well studied groups such as mygalomorph spiders and *Antichiropus* millipedes, with 7 new species recorded from the survey. With the use of molecular techniques, we have been able to identify and learn more about species previously considered unidentifiable.

Several species previously only known from one other survey, or from a handful of records, were re-collected in this survey, highlighting the importance of surveying to increase knowledge of SRE values in the Northern Jarrah Forest subregion.

The impacts to SREs from the proposal are variable, with highly restricted species or species where few records/locations are known, are most at most risk, these include:

- *Antichiropus* 'Phoenix 0017' – recorded from 7 sites but is only known from the study area
- *Austrochthonius* 'medium 2 – recorded from 2 sites, of which one is outside the study area
- *Euoplos* 'Phoenix011'– recorded from 2 sites, of which one is outside the study area, however close to the boundary therefore is highly likely to occur outside the study area
- Philosciidae 'Phoenix0208' – recorded from 1 site within the study are but based on habitat, is likely to occur more broadly
- Philosciidae 'Phoenix0209'– recorded from 1 site within the study area, however using species surrogates, we may infer this species is not restricted to the habitat it was recorded from.

The remaining species appear to be unrestricted to a particular habitat type and/or the study area, therefore their habitat may constitute the range from which they are currently known rather than habitat types. These taxa mostly occur in both High and Low habitat types, however for some species we are still seeing local restriction (ie. In several habitat types but not widespread throughout the region, indicating that spatial distance and the presence and abundance of habitat features (e.g. fallen logs, leaf litter, coarse woody debris, grass trees) may play a larger role in species distributions than general habitat type.

REFERENCES

ABARES. 2018. *Catchment Scale Land Use Mapping for Western Australia 2008-2017 in* Sciences, A. B. o. A. a. R. E. a., ed. Government of Western Australia.

Benson, D. A., Cavanaugh, M., Clark, K., Karsch-Mizrachi, I., Lipman, D., Ostell, J. & Sayers, E. W. 2012. GenBank. *Nucleic Acids Research* **41**: D36–D42.

BoM. 2024. *Climate statistics for Australian locations*. Commonwealth of Australia, Bureau of Meteorology. Available at: http://www.bom.gov.au/climate/data (accessed February 2024).

Car, C. A. & Harvey, M. S. 2014. The millipede genus *Antichiropus* (Diplopoda: Polydesmida: Paradoxosomatidae), part 2: species of the Great Western Woodlands region of Western Australia. *Records of the Western Australian Museum* **29**: 20–77.

Car, C. A., Wojcieszek, J. M. & Harvey, M. S. 2013. The millipede genus *Antichiropus* (Diplopoda: Polydesmida: Paradoxosomatidae), part 1: redefinition of the genus and redescriptions of existing species. *Records of the Western Australian Museum* **28**: 83–118.

Clarke, K. R. & Gorley, R. N. P. 2006. *PRIMER v6: user manual/tutorial*. Primer-E Ltd, Plymouth, UK. Available at: http://www.primer-e.com/ (accessed February 2014).

DBCA. 2020a. *Threatened and Priority Ecological Communities Database*. Department of Biodiversity Conservation and Attractions, Kensington, WA.

DBCA. 2020b. *Threatened and Priority Fauna database search*. Department of Biodiversity, Conservation and Attractions, Kensington, WA.

DoEE. 2016. *Maps: Australia's bioregions (IBRA)*. Department of the Environment and Energy, Canberra, ACT. Available at: http://www.environment.gov.au/topics/land/national-reserve-system/science-maps-and-data/australias-bioregions-ibra

DoEE. 2018. *Species Profile and Threats Database*. Department of the Environment and Energy, Australian Government, Canberra, ACT. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

EPA. 2016. *Technical Guidance: Sampling of short range endemic invertebrate fauna*. Environmental Protection Authority, Perth, WA. Available at: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Sampling-SREs-Dec-2016.pdf

Geoscience Australia. 2020. *GEODATA TOPO 250K Series 3 Topographic Data*, Canberra, Australia.

Government of Western Australia. 2018a. *Wildlife Conservation Act 1950 Wildlife Conservation (Rare Flora) Notice 2018*. Government Gazette, WA. Government of Western Australia, Perth, WA.

Government of Western Australia. 2018b. *Wildlife Conservation Act 1950, Wildlife Conservation (Specially Protected Fauna) Notice 2018*. Government Gazette, WA, Perth, WA.

Harms, D. 2018. The origins of diversity in ancient landscapes: deep phylogeographic structuring in a pseudoscorpion (Pseudotyrannochthoniidae: Pseudotyrannochthonius) reflects Plio-Pleistocene climate fluctuations. *Zoologischer Anzeiger* **273**: 112-123.

Harvey, M. S. 2002. Short-range endemism among the Australian fauna: some examples from non-marine environments. *Invertebrate Systematics* **16**: 555–570.

Hebert, P. D. N., A., C., Ball, S. L. & de Waard, J. R. 2003a. Biological identifications through DNA barcodes. *Proceedings of the Royal Society London B* **270**: 313–321.

Hebert, P. D. N., Ratnasingham, S. & de Waard, J. R. 2003b. Barcoding animal life: Cytochrome c oxidase subunit 1 divergences among closely related species. *Proceedings of the Royal Society London B, Supplement* **270**: 96–99.

Judd, S. 2004. *Terrestrial isopods (Crustacea: Oniscidea) and biogeographical patterns from south-western Australia*. PhD. thesis. Edith Cowan University, Joondalup, WA.

Judd, S. & Horwitz, P. 2003. Diversity and biogeography of terrestrial isopods (Isopoda: Oniscidea) from south-western Australia: organic matter and microhabitat utilisation in seasonally dry landscapes. *Crustaceana Monographs* **2**: 191–215.

Mattiske. 2021. *Vegetation mapping for the Huntly Mine Expansion Project*. Mattiske Consulting, Kalamunda, WA.

Mattiske. 2024. *Vegetation mapping dataset for the Holyoake Stage 2 Project*. Mattiske Consulting, Kalamunda, WA.

Mattiske, E. M. & Havel, J. J. 1998. *Vegetation complexes of the South-west Forest Region of Western Australia*. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.

Outback Ecology. 2012. *Terrestrial Short-ranged Endemic Invertebrate Fauna Baseline Survey for the Boddington Gold Mine*. Outback Ecology Services, Jolimont, WA.

Payne, A. L. & Leighton, K. A. 2004. Land systems. *In:* van Vreeswyk, A. M. E., Payne, A. L., Leighton, K. A. & Hennig, P. (eds) *Technical Bulletin 9. An inventory and condition survey of the Pilbara region, Western Australia*. Department of Agriculture, Government of Western Australia, South Perth, WA, pp. 175–384.

Phoenix. 2012. *Level 2 short-range endemic (SRE) invertebrate survey for the Worsley Primary Bauxite Area Expansion Project*. Phoenix Environmental Sciences Pty Ltd, Balcatta, W.A. Unpublished report prepared for Strategen Environmental Consultants.

Phoenix. 2021a. *Four-phase short-range endemic invertebrate fauna survey for the Worsley Mine Expansion Project*. Phoenix Environmental Sciences Pty Ltd, Osborne Park, WA. Report prepared for South32 Ltd.

Phoenix. 2021b. *Memo: Identification of invertebrate specimens collected from the Huntly Mine area*. Phoenix Environmental Sciences Pty Ltd, Osborne Park, WA.

Phoenix. 2021c. *Short-range Endemic invertebrate survey for the Alcoa Huntly Mine – Myara North and Holyoake*. Phoenix Environmental Sciences, Osborne Park, WA. Report prepared for GHD Ltd.

Phoenix. in prep.-a. *Short-range endemic invertebrate fauna survey for the Holyoake Stage 2 Project – O'Neil Mine Development*. Phoenix Environmental Sciences, Osborne Park, WA. Report prepared for GHD Ltd.

Phoenix. in prep.-b. *Short-range Endemic invertebrate survey for the Holyoake Stage 2 Project – Holyoake East and Holyoake West*. Phoenix Environmental Sciences, Osborne Park, WA. Report prepared for GHD Ltd.

Ponder, W. F. & Colgan, D. J. 2002. What makes a narrow-range taxon? Insights from Australian freshwater snails. *Invertebrate Systematics* **16**: 571–582.

Schoknecht, N. R. & Payne, A. L. 2011. *Land systems of the Kimberley region, Western Australia*. Department of Agriculture and Food, Western Australia, Perth.

Stewart, A. J., Sweet, I. P., Needham, R. S., Raymond, O. L., Whitaker, A. J., Liu, S. F., Phillips, D., Retter, A. J., Connolly, D. P. & Stewart, G. 2008. *Surface geology of Australia 1:1,000,000 scale, Western Australia [Digital Dataset]*, Canberra.

Vink, C. J., Thomas, S. M., Paquin, P., Hayashi, C. Y. & Hedin, M. 2005. The effects of preservatives and temperatures on arachnid DNA. *Invertebrate Systematics* **19**: 99–104.

WAM. 2013. *WAM short-range endemic categories and sub-categories*. Western Australian Museum, Welshpool.

Wardell-Johnson, G. & Horwitz, P. 1996. Conserving biodiversity and the recognition of heterogeneity in ancient landscapes: a case study from south-western Australia. *Forest Ecology & Management* **85**: 219–238.

Wardell-Johnson, G. & Horwitz, P. 2000. The recognition of heterogeneity and restricted endemism in the management of forested ecosystems in south-western Australia. *Australian Forestry* **63**: 218-225 10.1080/00049158.2000.10674834.

Williams, K. & Mitchell, D. 2001. Jarrah Forest 1 (JF1—Northern Jarrah Forest subregion). *In:* May, J. E. & McKenzie, N. L. (eds) *A biodiversity audit of Western Australia's biogeographical*

subregions in 2002. Department of Conservation and Land Management, Perth, WA, pp. 369–381.

Wojcieszek, J. M. & Simmons, L. W. 2011. Male genital morphology influences paternity success in the millipede *Antichiropus variabilis*. *Behavioral Ecology and Sociobiology* **65**: 1843–1856 DOI 10.1007/s00265-011-1192-4.

Appendix 1 Survey site descriptions

Site details			
Site	**CMRA-001**	**Position (WGS84)**	116.2320298 -32.56517451
Slope	gentle	**Topography**	riparian zone
Soil colour	brown, orange	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	none

Site description

Melaleuca shrubland

Habitat	shrubland
Disturbance	evidence of feral animals, vehicle tracks

Vegetation condition		**Fire age**	< 1
year			
Total veg. cover (%)	69.0	**Litter distribution**	even/continuous
Tree cover (%)	5.0	**Litter depth (cm)**	2.0
Shrub cover (%)	60.0	**Litter cover (%)**	100.0
Grass cover (%)	2.0		
Herb cover (%)	2.0		



Site details			
Site	**CMRA-002**	**Position (WGS84)**	116.1929147 -32.538773
Slope	moderate	**Topography**	hill slope
Soil colour	brown, orange	**Soil texture**	clay loam and laterite
Rock cover (%)	5	**Rock type**	laterite

Site description

Jarrah/Marri forest over grass tree and *Banksia grandis* over mixed shrubs and herbs

Habitat	forest		
Disturbance	historic clearing		
Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	101.0	**Litter distribution**	even/continuous
Tree cover (%)	30.0	**Litter depth (cm)**	2.0
Shrub cover (%)	60.0	**Litter cover (%)**	100.0
Grass cover (%)	1.0		
Herb cover (%)	10.0		



Site details			
Site	**CMRA-003**	**Position (WGS84)**	116.2181588 -32.5269559
Slope		**Topography**	hill slope
Soil colour	orange, brown	**Soil texture**	clay loam and laterite
Rock cover (%)	0	**Rock type**	laterite

Site description

Jarrah over grass tree over mixed herbs

Habitat	forest
Disturbance	

Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	155.0	**Litter distribution**	even/continuous
Tree cover (%)	50.0	**Litter depth (cm)**	5.0
Shrub cover (%)	50.0	**Litter cover (%)**	100.0
Grass cover (%)	5.0		
Herb cover (%)	50.0		



Site details			
Site	**CMRA-005**	**Position (WGS84)**	116.2435601 -32.50487347
Slope	gentle	**Topography**	undulating plain
Soil colour	brown-grey	**Soil texture**	gravel, loam
Rock cover (%)	1	**Rock type**	laterite

Site description

Dense Jarrah, Marri, and Casuarina forest with an understory of mixed shrubs (*Banksia sessilis* and *Xanthorrhoea preissii* trees that vary from open to very dense. On a gentle slope with small patches of orange laterite gravel, otherwise continuous leaf litter

Habitat	forest
Disturbance	vehicle tracks

Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	100.0	**Litter distribution**	even/continuous
Tree cover (%)	40.0	**Litter depth (cm)**	1.0
Shrub cover (%)	50.0	**Litter cover (%)**	90.0
Grass cover (%)	0.0		
Herb cover (%)	10.0		



Site details			
Site	**CMRA-006**	**Position (WGS84)**	116.2621741 -32.53763225
Slope	gentle	**Topography**	hill slope
Soil colour	brown, orange	**Soil texture**	clay loam and laterite
Rock cover (%)	5	**Rock type**	laterite

Site description

Jarrah and Marri forest with *Allocasuarina* over *Banksia grandis* over mixed herbs

Habitat	forest		
Disturbance	excavation, current operations, historic clearing, vehicle tracks		
Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	96.0	**Litter distribution**	even/continuous
Tree cover (%)	50.0	**Litter depth (cm)**	2.0
Shrub cover (%)	25.0	**Litter cover (%)**	75.0
Grass cover (%)	1.0		
Herb cover (%)	20.0		



Site details			
Site	**CMRA-007**	**Position (WGS84)**	116.2719306 -32.49863711
Slope	gentle	**Topography**	undulating plain
Soil colour	brown-grey	**Soil texture**	gravel, loam
Rock cover (%)	1	**Rock type**	laterite

Site description

Jarrah and Marri forest on gentle slope over dense understory of mixed shrubs and herbs.

Habitat	forest
Disturbance	evidence of feral animals, historic clearing, vehicle tracks

Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	105.0	**Litter distribution**	even/continuous
Tree cover (%)	40.0	**Litter depth (cm)**	1.0
Shrub cover (%)	60.0	**Litter cover (%)**	95.0
Grass cover (%)	0.0		
Herb cover (%)	5.0		



Site details			
Site	**CMRA-008**	**Position (WGS84)**	116.2675706 -32.45759268
Slope	Negligible	**Topography**	foot slope
Soil colour	brown	**Soil texture**	clay loam
Rock cover (%)	0	**Rock type**	laterite

Site description

Mix of open and dense Jarrah and Marri woodland over mixed shrub understory alongside a drainage line.

Habitat	forest
Disturbance	vehicle tracks

Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	115.0	**Litter distribution**	even/continuous
Tree cover (%)	30.0	**Litter depth (cm)**	2.0
Shrub cover (%)	80.0	**Litter cover (%)**	100.0
Grass cover (%)	0.0		
Herb cover (%)	5.0		



Site details			
Site	**OE-001**	**Position (WGS84)**	116.2597356 -32.57356674
Slope	gentle	**Topography**	hill slope
Soil colour	orange, brown	**Soil texture**	clay loam and laterite
Rock cover (%)	5	**Rock type**	laterite

Site description

Jarrah and Marri

Habitat	forest
Disturbance	historic clearing

Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	86.0	**Litter distribution**	even/continuous
Tree cover (%)	50.0	**Litter depth (cm)**	5.0
Shrub cover (%)	10.0	**Litter cover (%)**	100.0
Grass cover (%)	1.0		
Herb cover (%)	25.0		



Site details			
Site	**OE-002**	**Position (WGS84)**	116.3159995 -32.47956468
Slope	gentle	**Topography**	foot slope
Soil colour	brown, orange	**Soil texture**	clay loam and laterite
Rock cover (%)	1	**Rock type**	laterite

Site description

Jarrah and Marri forest over Xanthorrhoea preissii over mixed herbs. Footslope next to small flowing creek.

Habitat	forest
Disturbance	

Vegetation condition		**Fire age**	>5 years
Total veg. cover (%)	155.0	**Litter distribution**	even/continuous
Tree cover (%)	50.0	**Litter depth (cm)**	5.0
Shrub cover (%)	50.0	**Litter cover (%)**	100.0
Grass cover (%)	5.0		
Herb cover (%)	50.0		



Site details			
Site	**OE-003**	**Position (WGS84)**	116.3379463 -32.52855857
Slope	gentle	**Topography**	undulating plain
Soil colour	brown, orange	**Soil texture**	clay loam and laterite
Rock cover (%)	2	**Rock type**	laterite

Site description

Jarrah and Marri forest over *Banksia grandis* and *Xanthorrhoea preissii*.

Habitat	forest		
Disturbance	excavation, historic clearing, vehicle tracks		
Vegetation condition		**Fire age**	<1 year
Total veg. cover (%)	71.0	**Litter distribution**	even/continuous
Tree cover (%)	50.0	**Litter depth (cm)**	2.0
Shrub cover (%)	10.0	**Litter cover (%)**	75.0
Grass cover (%)	1.0		
Herb cover (%)	10.0		



Site details			
Site	**OE-004**	**Position (WGS84)**	116.3331779 -32.49229165
Slope	gentle	**Topography**	foot slope
Soil colour	brown, orange	**Soil texture**	clay loam and laterite
Rock cover (%)	1	**Rock type**	laterite

Site description

Jarrah and Marri open forest over Xanthorrhoea preissii and mixed herb understory at southern base of large granite outcrop

Habitat	forest
Disturbance	historic clearing

Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	152.0	**Litter distribution**	even/continuous
Tree cover (%)	20.0	**Litter depth (cm)**	3.0
Shrub cover (%)	40.0	**Litter cover (%)**	100.0
Grass cover (%)	2.0		
Herb cover (%)	90.0		



Site details			
Site	**OE-006**	**Position (WGS84)**	116.299519 -32.57243208
Slope	Gentle	**Topography**	Mid slope
Soil colour	Brown, orange	**Soil texture**	clay loam and laterite
Rock cover (%)	5	**Rock type**	laterite

Site description

Jarrah forest over *Xanthorrhoea preissii* over mixed herbs

Habitat	forest		
Disturbance	historic clearing, vehicle tracks		
Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	151.0	**Litter distribution**	even/continuous
Tree cover (%)	50.0	**Litter depth (cm)**	3.0
Shrub cover (%)	50.0	**Litter cover (%)**	100.0
Grass cover (%)	1.0		
Herb cover (%)	50.0		



Site details			
Site	**OE-007**	**Position (WGS84)**	116.3069551 -32.52303474
Slope	moderate	**Topography**	hill slope
Soil colour	orange, brown	**Soil texture**	clay loam and laterite
Rock cover (%)	5	**Rock type**	laterite

Site description

Jarrah forest over grass trees over mixed herbs on south facing slope

Habitat	forest
Disturbance	historic clearing, vehicle tracks

Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	112.0	**Litter distribution**	even/continuous
Tree cover (%)	50.0	**Litter depth (cm)**	100.0
Shrub cover (%)	50.0	**Litter cover (%)**	100.0
Grass cover (%)	2.0		
Herb cover (%)	10.0		



Site details			
Site	**OE-008**	**Position (WGS84)**	116.2904667 -32.50640649
Slope	moderate	**Topography**	hill slope
Soil colour	brown, orange	**Soil texture**	gravel, sandy loam
Rock cover (%)	5	**Rock type**	laterite

Site description

Jarrah Mand Marri forest

Habitat	forest		
Disturbance	vehicle tracks, evidence of feral animals, historic clearing		
Vegetation condition		**Fire age**	< 1 year
Total veg. cover (%)	96.0	**Litter distribution**	even/continuous
Tree cover (%)	20.0	**Litter depth (cm)**	1.0
Shrub cover (%)	70.0	**Litter cover (%)**	100.0
Grass cover (%)	1.0		
Herb cover (%)	5.0		



Site details			
Site	**OE-009**	**Position (WGS84)**	116.2614176 -32.5577234
Slope	negligible 1-5% cover	**Topography**	plain
Soil colour	brown	**Soil texture**	loam
Rock cover (%)	0	**Rock type**	laterite

Site description

Jarrah and marri forest with open understory of moderately dense grass trees. Recent fire has removed most other veg. Ground is covered in fresh *Banksia* sprouts.

Habitat	forest
Disturbance	vehicle tracks

Vegetation condition		**Fire age**	< 1 year
Total veg. cover (%)	100.0	**Litter distribution**	even/continuous
Tree cover (%)	60.0	**Litter depth (cm)**	1.0
Shrub cover (%)	30.0	**Litter cover (%)**	90.0
Grass cover (%)	5.0		
Herb cover (%)	5.0		



Site details			
Site	**OE-010**	**Position (WGS84)**	116.3220867 -32.56273127
Slope	gentle	**Topography**	hill top
Soil colour	brown,orange	**Soil texture**	clay loam and laterite
Rock cover (%)	5	**Rock type**	laterite

Site description			
Wandoo woodland			
Habitat	woodland		
Disturbance	vehicle tracks, historic clearing		
Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	111.0	**Litter distribution**	even/continuous
Tree cover (%)	20.0	**Litter depth (cm)**	2.0
Shrub cover (%)	50.0	**Litter cover (%)**	50.0
Grass cover (%)	1.0		
Herb cover (%)	40.0		



Site details			
Site	**OE-012**	**Position (WGS84)**	116.301462, -32.54583401
Slope	moderate	**Topography**	hill slope
Soil colour	orange, brown	**Soil texture**	clay loam and laterite
Rock cover (%)	1	**Rock type**	laterite

Site description

Casuarina woodland with scattered jarrah and *banksia grandis*. Sparse understory

Habitat	woodland
Disturbance	excavation, historic clearing

Vegetation condition		**Fire age**	1-5 years
Total veg. cover (%)	82.0	**Litter distribution**	even/continuous
Tree cover (%)	50.0	**Litter depth (cm)**	3.0
Shrub cover (%)	2.0	**Litter cover (%)**	100.0
Grass cover (%)	10.0		
Herb cover (%)	20.0		



Appendix 2 Short-range endemic invertebrate desktop results

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Class: Araneae, Infraorder: Mygalomorphae					
Actinopodidae	*Missulena* 'MYG198'	P		JF	
Actinopodidae	*Missulena* 'black chelicerae'	P	inside building	SCP	
Actinopodidae	*Missulena granulosa*	W	sandy loam	JF/SCP	
Actinopodidae	*Missulena hoggi*	P	tuart woodland, jarrah/marri forest, degraded shrubland	JF/SCP	
Actinopodidae	*Missulena* 'MYG198'	P	jarrah/marri forest; drainage line	JF	
Actinopodidae	*Missulena occatoria*	W		JF/SCP	
Actinopodidae	*Missulena* 'Phoenix0046'	P		JF	
Actinopodidae	*Missulena* 'sp. indet'	P		JF/SCP	
Anamidae	*Aname* 'Brennan sp. 1'	P		JF	
Anamidae	*Aname* 'Brennan sp. 2'	P	excavated from burrow	JF	
Anamidae	*Aname* 'cf. mainae'	P	wattle	JF	
Anamidae	*Aname* 'coastal plain'	P		SCP	
Anamidae	*Aname* 'Dwellingup'	P		JF	
Anamidae	*Aname* 'false black wish-bone'	P		SCP	
Anamidae	*Aname* 'kwonkan spp. group.'	P		SCP	
Anamidae	*Aname mainae*	P	wetland with Melaleuca & marri, dryandra, Acacia, urban areas	JF/SCP	
Anamidae	*Aname* 'metropolitan'	P		SCP	
Anamidae	*Aname* 'MYG010'	P		JF	
Anamidae	*Aname* 'MYG119'	P		JF	
Anamidae	*Aname* 'MYG242'	P	plain	JF	
Anamidae	*Aname* 'MYG242'	P	swale	JF	
Anamidae	*Aname* 'MYG383'	P	jarrah forest	JF	
Anamidae	*Aname* 'MYG405'	P		SCP	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Anamidae	*Aname* 'MYG496'	P		SCP	
Anamidae	*Aname* 'MYG633'	P		SCP	
Anamidae	*Aname* 'Phoenix0004'	P	jarrah/marri forest	JF	
Anamidae	*Aname* 'Phoenix0006'	P	jarrah/marri forest; hill slope	JF	
Anamidae	*Aname* 'Phoenix0010'	P	jarrah/marri forest	JF	
Anamidae	*Aname* 'Phoenix0020'	P	jarrah/marri forest	JF	
Anamidae	*Aname* 'Phoenix0036'	P	jarrah/marri forest	JF	
Anamidae	*Aname* 'Phoenix0037'	P	jarrah/marri forest	JF	
Anamidae	*Aname* 'sp. indet'	P	woodland, forest	JF/SCP	
Anamidae	*Aname* 'sp. nov.'	P		JF/SCP	
Anamidae	*Aname tepperi*	W		SCP	
Anamidae	*Aname* 'UBS Cat sp. 126'	P		SCP	
Anamidae	*Aname* 'UBS sp. 2'	P		SCP	
Anamidae	*Aname* 'WorsleyDNA09'	P		JF	
Anamidae	Anamidae 'Phoenix0009'	P	undulating jarrah/marri forest heading towards dam	JF	
Anamidae	Anamidae 'Phoenix0022'	P		JF	
Anamidae	Anamidae 'sp. indet'	P	tuart woodland	SCP	
Anamidae	*Chenistonia* 'maculata?'	P		SCP	
Anamidae	*Chenistonia* 'tepperi'	P		SCP	
Anamidae	*Kwonkan* 'MYG060'	P		SCP	
Anamidae	*Kwonkan* 'PES0329'	P		SCP	
Anamidae	*Kwonkan* 'Phoenix0005'	P	creekline	JF	
Anamidae	*Kwonkan* 'Phoenix0008'	P	jarrah/marri forest; undulating plain	JF	
Anamidae	*Kwonkan* 'sp. indet'	P	jarrah/marri woodland, Allocasuarina	JF/SCP	
Anamidae	*Kwonkan* 'sp. nov.'	P		JF	
Anamidae	*Kwonkan* 'UBS Cat sp. 124'	P		SCP	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Anamidae	*Kwonkan* 'UBS Cat sp. 126'	P		SCP	
Anamidae	*Proshermacha* 'MYG449'	P	wetland with Melaleuca & marri	SCP	
Anamidae	*Proshermacha* 'MYG485'	P	jarrah/marri forest, rehab	JF	
Anamidae	*Proshermacha* 'MYG495'	P	Plain	JF	
Anamidae	*Proshermacha* 'MYG596'	P	drainage depression	JF	
Anamidae	*Proshermacha* 'MYG658'	P	ex burrow; under sheoak trees, in mixed jarrah woodland	JF	
Anamidae	*Proshermacha* 'Phoenix0023'	P	jarrah/marri forest; hill slope, granite	JF	
Anamidae	*Proshermacha* 'Phoenix0024'	P	south-facing slope in jarrah/marri forest	JF	
Anamidae	*Proshermacha* 'Phoenix0027'	P	gully in jarrah/marri forest	JF	
Anamidae	*Proshermacha* 'Phoenix0028'	P	hilltop in jarrah/marri forest	JF	
Anamidae	*Proshermacha* 'sp. indet'	P	tuart, melaleuca/banksia, laterite, granite, forest, drainage	JF/SCP	
Anamidae	*Proshermacha subarmata*	P		JF	
Anamidae	*Proshermacha* 'villosa'	P		JF	
Anamidae	*Proshermacha* 'WorsleyDNA12'	P		JF	
Anamidae	*Teyl* 'Brennan sp. 2'	P		JF	
Anamidae	*Teyl* 'luculentus?'	P	wandoo woodland	JF	
Anamidae	*Teyl* 'mandgedal sp. group'	P		JF	
Anamidae	*Teyl* 'MYG241'	P	wandoo woodland	JF	
Anamidae	*Teyl* 'MYG245'	P	Jarrah/Marri	JF	
Anamidae	*Teyl* 'MYG249'	P	Melaleuca woodland, reafforestation	SCP	
Anamidae	*Teyl* 'MYG355'	P	jarrah/marri forest	JF	
Anamidae	*Teyl* 'Phoenix0007'	P	jarrah/marri forest, rehab	JF	
Anamidae	*Teyl* 'Phoenix0019'	P	jarrah/marri forest on hilltop with granite outcropping	JF	
Anamidae	*Teyl* 'Phoenix0021'	P	mid slope of jarrah/marri forest	JF	
Anamidae	*Teyl* 'sampeyae'	P	under granite rock, wandoo woodland	JF	
Anamidae	*Teyl* 'sp. indet'	P	wandoo, jarrah/marri, granite, drainage, rehab	JF/SCP	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Anamidae	*Teyl* 'UBS Cat sp. 148'	P		SCP	
Anamidae	*Teyl* 'UBS Cat sp. 149'	P		SCP	
Anamidae	*Teyl* 'waldockae'	P	melaleuca/banksia woodland, tuart woodland, degraded shrubland	SCP	
Barychelidae	*Aurecocrypta lugubris*	W		SCP	
Barychelidae	*Aurecocrypta* 'Phoenix0014'	P		JF	
Barychelidae	Barychelidae 'sp. indet'	P	forset	JF	
Barychelidae	Barychelidae 'WorsleyDNA10'	P		JF	
Barychelidae	*Idiommata blackwalli*	W	forest, urban areas	JF/SCP	
Barychelidae	*Idiommata* 'sp. indet'	P	jarrah forest	JF/SCP	
Barychelidae	*Idiommata* 'UBS Cat sp. 123'	P		SCP	
Barychelidae	*Synothele durokoppin*	W	Jarrah/Marri, Wandoo, granite	JF/SCP	
Barychelidae	*Synothele harveyi*	P		JF	
Barychelidae	*Synothele longbottomi*	W		JF	
Barychelidae	*Synothele michaelseni*	W	jarrah/marri forest; hill slope	JF/SCP	
Barychelidae	*Synothele mullaloo*	P	Wandoo Woodland, tuart	JF/SCP	
Barychelidae	*Synothele* 'Phoenix0015'	P	jarrah/marri forest; hill slope	JF	
Barychelidae	*Synothele* 'Phoenix0016'	P	jarrah/marri forest; drainage line	JF	
Barychelidae	*Synothele rastelloides*	P		SCP	
Barychelidae	*Synothele rubripes*	P	woodland	JF	
Barychelidae	*Synothele* 'sp. indet'	P	Wandoo Woodland, sheoak, granite	JF/SCP	
Barychelidae	*Synothele* 'WorsleyDNA17'	P		JF	
Euagridae	*Cethegus fugax*	W	under laterite boulder, jarrah/marri	JF	
Euagridae	*Cethegus* 'sp. indet'	P	Jarrah/Marri forest, drainage depression	JF/SCP	
Idiopidae	*Bungulla* 'WorsleyDNA11'	P		JF	
Idiopidae	*Bungulla harrisonae*	P	jarrah forest	JF	
Idiopidae	*Bungulla parva*	P		JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Idiopidae	*Eucanippe nemestrina*	P		JF	
Idiopidae	*Eucyrtops latior*	P	Jarrah/Marri, hilltop, flat	JF/SCP	
Idiopidae	*Eucyrtops* 'MYG142'	P	running on rocks, drizzle,late afternoon	JF	
Idiopidae	*Eucyrtops* 'MYG645'	P		JF	
Idiopidae	*Eucyrtops* 'Phoenix0001'	P		JF	
Idiopidae	*Eucyrtops* 'Phoenix0003'	P	jarrah/marri forest, rehab	JF	
Idiopidae	*Eucyrtops* 'Phoenix0018'	P		JF	
Idiopidae	*Eucyrtops* 'Phoenix0029'	P	marri, jarrah and allocasuarina on mid-slope	JF	
Idiopidae	*Eucyrtops* 'Phoenix0030'	P	hilltop in jarrah/marri forest, granite, creek	JF	
Idiopidae	*Eucyrtops* 'Phoenix0032'	P	jarrah/marri forest; hill slope	JF	
Idiopidae	*Eucyrtops* 'Phoenix0033'	P	jarrah/marri forest, rehab	JF	
Idiopidae	*Eucyrtops* 'Phoenix0043'	P		JF	
Idiopidae	*Eucyrtops* 'Phoenix0044'	P		JF	
Idiopidae	*Eucyrtops* 'Phoenix0045'	P		JF	
Idiopidae	*Eucyrtops* 'sp. indet'	P	wandoo, drainage	JF/SCP	
Idiopidae	*Eucyrtops* 'WorsleyDNA06'	P	jarrah/marri forest; undulating plain	JF	
Idiopidae	*Euoplos* 'minimus'	P		JF	
Idiopidae	*Euoplos* 'Phoenix0011'	P	undulating white sands in jarrah/marri forest	JF	
Idiopidae	*Euoplos* 'Phoenix0012'	P	jarrah/marri forest; hill slope	JF	
Idiopidae	*Euoplos* 'Phoenix0013'	P		JF	
Idiopidae	*Euoplos* 'sp. indet'	P		JF	
Idiopidae	*Euoplos* 'sp. nov.'	P		JF	
Idiopidae	*Gaius cooperi*	P		JF	
Idiopidae	*Gaius* 'sp. indet'	P		SCP	
Idiopidae	*Gaius villosus*	W		SCP	
Idiopidae	*Idiosoma* 'MYG741'	P		JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Idiopidae	*Idiosoma jarrah*	W	forest, Jarrah/Marri	JF	
Idiopidae	*Idiosoma* 'MYG075'	P	under rock	JF	
Idiopidae	*Idiosoma* 'MYG187'	P	jarrah/marri	JF	
Idiopidae	*Idiosoma* 'MYG188'	P	coastal plain woodland	SCP	
Idiopidae	*Idiosoma* 'MYG189'	P		SCP	
Idiopidae	*Idiosoma* 'Phoenix0002'	P		JF	
Idiopidae	*Idiosoma* 'Phoenix0035'	P	jarrah/marri forest; hill slope	JF	
Idiopidae	*Idiosoma rhaphiduca*	W		JF/SCP	
Idiopidae	*Idiosoma schoknechtorum*	P/P3		JF	
Idiopidae	*Idiosoma* 'sp. indet'	P	woodland, reafforestation,	JF/SCP	
Idiopidae	*Idiosoma* 'WAM T129362'	P	jarrah/marri forest, granite	JF	
Idiopidae	*Euoplos inornatus*	P/P3	in clay bank, jarrah forest, limestone/sand	JF/SCP	
Idiopidae	*Idiosoma sigillatum*	P/P3	woodland, pine, urban areas	SCP/AW	
Class: Araneae, Infraorder: Araneomorphae					
Selenopidae	*Karaops ellenae*	W	granite, jarrah/Marri forest, plain, creekline	JF/SCP	
Selenopidae	*Karaops jarrit*	W	jarrah/marri forest; undulating plain	JF/SCP	
Selenopidae	*Karaops* 'sp. indet'	P	granite, jarrah, Banksia gully	JF/SCP	
Class: Araneae, Order: Opiliones					
Caddidae	*Hesperopilio mainae*	P		JF	
Lomanellidae	*Abaddon despoliator*	P	jarrah/marri forest; hill slope	JF	
Neopilionidae	*Ballarra longipalpus*	P	limestone	JF/SCP	
Neopilionidae	*Ballarra* 'sp. indet'	P	Melaleuca/Banksia woodland	SCP	
Neopilionidae	*Megalopsalis* 'sp. indet'	P	Melaleuca/Banksia woodland, Jarrah/Marri,	JF/SCP	
Neopilionidae	*Megalopsalis tanisphyros*	W		JF/SCP	
Neopilionidae	Neopilionidae 'sp. indet'	P	Jarrah/Marri, stream edge	JF/SCP	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Triaenonychidae	*Calliuncus* 'sp. indet'	P	jarrah/marri forest	JF	
Triaenonychidae	*Nunciella aspera*	W	Jarrah banksia gully	JF/SCP	
Triaenonychidae	*Nunciella karriensis*	W	marri, macrozamia. rich immature soil	JF	
Triaenonychidae	*Nunciella* 'sp. 10'	P		SCP	
Triaenonychidae	*Nunciella* 'sp. 6?'	P	under granite rock on granite outcrop	JF	
Triaenonychidae	*Nunciella* 'sp. indet'	P	Jarrah, Casuarina, granite, limestone, pine plantation, drainage, Bullich	JF/SCP	
Triaenonychidae	*Nunciella* 'sp. nov.'	P		JF	
Triaenonychidae	*Perthacantha* 'sp. indet'	P		JF	
Triaenonychidae	Triaenonychidae 'Genus 3' 'sp. indet'	P	forest adjacent to stream, woodland	JF	
Triaenonychidae	Triaenonychidae 'Genus 4' 'sp. indet'	P	wandoo woodland, jarrah forest	JF	
Triaenonychidae	Triaenonychidae 'Genus 8' 'dna - S Zuiddam study'	P	Marri, regrowth eucalypt forest with complex understorey	JF	
Triaenonychidae	Triaenonychidae 'Genus 8' 'sp. indet'	P	forest litter, jarrah/marri woodland	JF	
Triaenonychidae	Triaenonychidae 'Genus 8' 'sp.5, dna - S Zuiddam study'	P		JF	
Triaenonychidae	Trianonychidae 'sp. indet'	P	south-facing slope in jarrah/marri forest	JF	
Class: Araneae, Order: Scorpiones					
Bothriuridae	*Cercophonius granulosus*	W	Tuart and Banksia bushland, Allocaruarina	JF/SCP	
Bothriuridae	*Cercophonius michaelseni*	W		SCP	
Bothriuridae	*Cercophonius* 'sp. indet'	P	Melaleuca woodland, Marri, urban aras	JF/SCP	
Bothriuridae	*Cercophonius squama*	W	Jarah/Marri, Wandoo, Banksia, Melaleuca, gully, drainage, sand, rehab	JF/SCP	
Buthidae	*Isometroides* 'jarrah'	P	jarrah/marri forest	JF	
Buthidae	*Isometroides* 'sp. indet'	P	Banksia woodland	JF/SCP	
Buthidae	*Isometroides* 'vescus'	W	tuart forest	JF/SCP	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Buthidae	*Lychas* 'austroccidentalis'	W	Banksia, Tuart, Melaleuca, Marri, granite, limestone, rehab, urban areas	JF/SCP	
Buthidae	*Lychas* 'majeri'	P		SCP	
Buthidae	*Lychas* 'majerorum'	P	Banksia woodland, along a sandy track	SCP	
Buthidae	*Lychas* 'prendinii'	P		SCP	
Buthidae	*Lychas* 'sp. indet'	P	Banksia, Melaleuca, drainage	JF/SCP	
Buthidae	*Lychas splendens*	W		JF/SCP	
Urodacidae	*Urodacus* 'armatus'	W		JF/SCP	
Urodacidae	*Urodacus hartmeyeri*	W		SCP	
Urodacidae	*Urodacus novaehollandiae*	W	Banksia, Jarrah/Marri, Wandoo, Bulich, granite, laterite, tuart, allocasuarina, drainage, urban areas	JF/SCP	
Urodacidae	*Urodacus planimanus*	C	jarrah/marri, wandoo, granite	JF	
Urodacidae	*Urodacus* 'woodwardii'	P		SCP	
Class: Araneae, Order: Pseudoscorpiones					
Atemnidae	Atemnidae 'sp. indet'	P	forest adjacent to stream	JF	
Atemnidae	*Oratemnus curtus*	W		JF/SCP	
Atemnidae	*Oratemnus* 'sp. indet'	W	jarrah/marri forest; woodland	JF	
Cheiridiidae	*Apocheiridium* 'sp. indet'	P	under bark	SCP	
Cheliferidae	*Protochelifer* 'boddington'	W	jarrah/marri forest	JF	
Cheliferidae	*Protochelifer* 'sp. indet'	W	Jarrah/Marri, grasstree	JF	
Chernetidae	*Balgachernes occultus*	P	in crown of Xanthorrhoea preisii	JF	
Chernetidae	Chernetidae 'boddington'	W	jarrah/marri/allocasuarina forest on hill, creekline	JF	
Chernetidae	Chernetidae 'sp. indet'	P	Melaleuca woodland	JF/SCP	
Chernetidae	Chernetidae 'tarsus IV without tactile seta'	P		JF/SCP	
Chernetidae	*Haplochernes* 'sp. indet'	P	granite outcrop	JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Chernetidae	*Lamprochernes savignyi*	W	associated with fly	SCP	
Chernetidae	*Nesidiochernes* 'sp. indet'	W		SCP	
Chernetidae	PSEAAF' 'PSE130'	P		SCP	
Chthoniidae	*Austrochthonius* '4'	P		SCP	
Chthoniidae	*Austrochthonius australis*	W	Marri	JF	
Chthoniidae	*Austrochthonius muchmorei*	W	jarrah/marri forest, Wandoo woodland, drainage	JF	
Chthoniidae	*Austrochthonius* 'PSE188, similis'	W	forest, woodland, banksia, granite, limestone	JF/SCP	
Chthoniidae	*Austrochthonius* 'PSE189, austini'	P	Jarrah/Marri	JF	
Chthoniidae	*Austrochthonius* 'PSE191, grandis'	W	jarrah/marri forest; sheoak, drainage	JF	
Chthoniidae	*Austrochthonius* 'PSE192, lesueuri'	P	under Blackbutt, last burnt 26-27/01/1961	JF	
Chthoniidae	*Austrochthonius* 'sp. indet'	W	Jarrah/Marii woodland forest	JF/SCP	
Chthoniidae	*Austrochthonius* 'sp. nov. 4'	P		SCP	
Chthoniidae	Chthoniidae 'sp. indet'	P	riparian zone	JF	
Chthoniidae	*Lagynochthonius australicus*	W	Jarrah/Marri, Shoak, reahb	JF	
Chthoniidae	*Lagynochthonius* 'sp. indet'	W	jarrah forest	JF	
Chthoniidae	*Tyrannochthonius australicus*	W		JF	
Chthoniidae	*Tyrannochthonius* 'sp. indet'	W	under rock	JF	
Garypidae	*Synsphyronus callus*	W		SCP	
Garypidae	*Synsphyronus magnus*	W	pine, Jarrah	JF/SCP	
Garypidae	*Synsphyronus mimulus*	W		JF	
Garypidae	*Synsphyronus* 'sp. indet'	P	under marri bark, summit	JF/SCP	
Garypinidae	*Aldabrinus* 'PSE187'	P		SCP	
Garypinidae	*Protogarypinus giganteus*	W	jarrah/marri forest	JF/SCP	
Garypinidae	*Protogarypinus* 'sp. indet'	W	Xanthorrhoea skirts	JF	
Garypinidae	*Solinus* 'sp. indet'	P	under bark	SCP	
Geogarypidae	*Geogarypus* 'sp. indet'	W	jarrah/marri forest between two granite outcrops	JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Geogarypidae	*Geogarypus taylori*	W	Jarrah/Marri, drainage, granite, rehab	JF/SCP	
Olpiidae	*Beierolpium bornemisszai*	W	jarrah/marri forest; gully, granite	JF	
Olpiidae	*Beierolpium* 'sp. 8/4'	P		JF	
Olpiidae	*Beierolpium* 'sp. 8/4 lge'	P	Jarrah/Marri	JF	
Olpiidae	*Beierolpium* 'sp. indet'	P	jarrah/marri forest between granite outcrops, woodland	JF/SCP	
Olpiidae	*Indolpium* 'sp. indet'	P	Jarrah/Marri, drainage	JF	
Olpiidae	*Xenolpium* 'sp. indet'	P		SCP	
Pseudotyrannochthoniidae	*Pseudotyrannochthonius* 'Darling Range 1'	P	wandoo woodland, Jarrah/Marri woodland	JF	
Pseudotyrannochthoniidae	*Pseudotyrannochthonius* 'Darling Range 2'	W	Jarrah/Marri, sheoak	JF	
Pseudotyrannochthoniidae	*Pseudotyrannochthonius* 'Darling Range 3'	P	Marri	JF	
Syarinidae	*Ideoblothrus* 'sp. Perth'	P	marri litter	JF	
Withiidae	*Withius piger*	W		JF/SCP	
Class: Diplopoda					
Dalodesmidae	cf Sphaerotrichopus?' 'sp. indet'	P	woodland	JF	
Dalodesmidae	Dalodesmidae 'Phoenix0038'	P	hilltop in jarrah/marri forest	JF	
Dalodesmidae	*Sphaerotrichopus ramosus*	P		JF/SCP	
Dalodesmidae	*Sphaerotrichopus* 'sp. indet'	P		JF	
Dalodesmidae	*Sphaerotrichopus* 'S-W forests'	P		JF	
Henicopidae	*Dichelobius flavens*	W		SCP	
Iulomorphidae	*Atelomastix nigrescens*	W	jarrah/marri forest, woodland, drainage, granite, bullich,	JF	
Iulomorphidae	*Atelomastix* 'sp. indet'	W	forest (upland), bullich	JF	
Iulomorphidae	*Dinocambala ingens*	C	granite, leaf litter	JF/SCP	
Iulomorphidae	Iulomorphidae 'Genus indet.' 'large, black sp.'	P		JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Iulomorphidae	Iulomorphidae 'Genus indet.' 'small, brown sp.'	P	under rock	JF	
Iulomorphidae	*Podykipus collinus*	P		SCP	
Iulomorphidae	*Podykipus leptoiuloides*	W	Jarrah/Marri, Bullich, Creekline, Wandoo, granite, rehab	JF	
Iulomorphidae	Polyzoniida 'Phoenix0039'	P	jarrah/marri forest; hill slope	JF	
Iulomorphidae	Polyzoniida 'Phoenix0042'	P	jarrah/marri forest in gully	JF	
Iulomorphidae	Polyzoniida 'Phoenix0043'	P	jarrah/marri forest in gully	JF	
Iulomorphidae	Polyzoniida 'Phoenix0044'	P	undulating forest/woodland	JF	
Paradoxosomatidae	*Akamptogonus novarae*	W	leaf litter, Jarrah/Marri forest, Wandoo, Banksia	JF/SCP	
Paradoxosomatidae	*Antichiropus* 'boddington'	C	woodland	JF	
Paradoxosomatidae	*Antichiropus* 'DIP022, janine'	C	from bike path	SCP	
Paradoxosomatidae	*Antichiropus* 'DIP062, darling'	C		JF	
Paradoxosomatidae	*Antichiropus* 'DIP082/DIP172, GI/UBS1'	C	Tuart forest, limestone, reafforestation, Melaleuca	SCP	
Paradoxosomatidae	*Antichiropus* 'DIP097, marradong'	C	granite, Jarrah/Marri woodland, Wandoo, drainage	JF	
Paradoxosomatidae	*Antichiropus* 'DIP108, mt saddleback'	C		JF	
Paradoxosomatidae	*Antichiropus* 'DIP112, Norman Road 1'	C		SCP	
Paradoxosomatidae	*Antichiropus* 'DIP126, accinctus'	C		SCP	
Paradoxosomatidae	*Antichiropus* 'DIP126, UBS2, disgregus'	C	open woodland, Melaleuca, Banksia, tuart	SCP	
Paradoxosomatidae	*Antichiropus* 'DIP127, UBS3'	C	Melaleuca, Acacia, Tuart	SCP	
Paradoxosomatidae	*Antichiropus* 'DIP141, UBS1/GI'	C		SCP	
Paradoxosomatidae	*Antichiropus* 'DIP143, serpentine'	C	Jarrah forest	JF	
Paradoxosomatidae	*Antichiropus* 'DIP166 whistlepipe'	C	under rock	JF	
Paradoxosomatidae	*Antichiropus* 'DIP168, susannah'	C		JF	
Paradoxosomatidae	*Antichiropus* 'DIP170, nadia'	C	walking on path	SCP	
Paradoxosomatidae	*Antichiropus* 'DIP171, ellisbrook'	C	under rock, heath on ridge	JF	
Paradoxosomatidae	*Antichiropus* 'DIP172, rottnest'	C	tuart woodland	SCP	
Paradoxosomatidae	*Antichiropus* 'DIP177, Collie'	C		JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Paradoxosomatidae	*Antichiropus* 'DIP178, bannister'	C	woodland	JF	
Paradoxosomatidae	*Antichiropus* 'DIP181, lane poole'	C	jarrah forest	JF	
Paradoxosomatidae	*Antichiropus* 'DIP182, saddleback 3'	C	jarrah/marri forest	JF	
Paradoxosomatidae	*Antichiropus* 'DIP183, southwest'	C	jarrah/marri forest	JF	
Paradoxosomatidae	*Antichiropus* 'DIP186, kirsten'	C	on laterite loam/granite	JF	
Paradoxosomatidae	*Antichiropus* 'dwellingup'	C	jarrah/marri forest; hill slope, between granite, gully	JF	
Paradoxosomatidae	*Antichiropus* 'forest'	C	forest	JF	
Paradoxosomatidae	*Antichiropus* 'holyoake'	C	jarrah/marri forest; undulating plain	JF	
Paradoxosomatidae	*Antichiropus* 'jarrah'	C	forest	JF	
Paradoxosomatidae	*Antichiropus* 'Mini'	C	jarrah/marri forest; hill slope	JF	
Paradoxosomatidae	*Antichiropus minimus*	C		JF	
Paradoxosomatidae	*Antichiropus* 'Myara'	C	jarrah/marri forest; hill slope	JF	
Paradoxosomatidae	*Antichiropus* 'southern'	C	jarrah/marri forest; drainage line	JF	
Paradoxosomatidae	*Antichiropus* 'sp. indet'	P	Jarrah/Marri, Wandoo, Melealecua, Banksia, rehab, pine, drainage	JF/SCP	
Paradoxosomatidae	*Antichiropus variabilis*	W	granite, forest, woodland, banksia, arrah/marri, gully, granite	JF/SCP	
Paradoxosomatidae	*Antichiropus whistleri*	C	Heath, tuart, banksia, woodland, marri	SCP	
Polyxenidae	*Unixenus attemsi*	W	forest litter, jarrah / marri woodland	JF/SCP	
Polyxenidae	*Unixenus mjoebergi*	W	forest litter, jarrah / marri woodland	JF/SCP	
Siphonotidae	DIPAAG, Hesperisiphon' 'cacaoi'	P	leaf litter	JF	
Siphonotidae	DIPAAF' 'DIP188?'	P		JF	
Siphonotidae	DIPAAG' 'DIP189' 'collie'	P	jarrah/marri forest; hill slope	JF	
Siphonotidae	*Megalosiphon'* 'cf. michaelseni'	P	woodland	JF	
Siphonotidae	*Megalosiphon'* 'sp. indet'	P	woodland	JF	
Siphonotidae	*Megalosiphon'* 'WorsleyDNA14'	P		JF	
Siphonotidae	*Megalosiphon'* 'WorsleyDNA15'	P		JF	
Siphonotidae	*Rhinotus michaelseni*	P		JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Siphonotidae	Siphonotidae 'DIPAAF' 'cf. michaelseni'	Lik.	Jarrah/Marri woodland	JF	
Siphonotidae	Siphonotidae 'DIPAAF' 'DIP188' 'boddington'	C		JF	
Siphonotidae	Siphonotidae 'DIPAAF' 'sp. indet'	Lik.	Not mapped	JF	
Siphonotidae	Siphonotidae 'DIPAAF' WorsleyDNA14'	P	Open Jarrah/Marri woodlands on sands, clay loam or sandy-gravel on lower slopes and valley floors	JF	
Siphonotidae	Siphonotidae 'DIPAAF' 'WorsleyDNA15'	P	Open forest of Jarrah/Marri on sandy-loam gravelly soils on mid slopes and ridges	JF	
Siphonotidae	Siphonotidae 'DIPAAG' 'DIP189' 'collie'	C	Jarrah/Marri forest	JF	
Siphonotidae	Siphonotidae 'DIPAAG' 'DIP192' 'mt saddleback'	C		JF	
Siphonotidae	Siphonotidae 'DIPAAH' 'DIP190' 'harris river'	C		JF	
Siphonotidae	Siphonotidae 'genus indet.' 'Marradong'	P		JF	
Siphonotidae	Siphonotidae 'Marradong'	C		JF	
Siphonotidae	*Siphonotus flavomarginatus*	W		SCP	
Synxenidae	*Phryssonotus novaehollandiae*	W		SCP	
Class: Malacostraca, Order: Isopoda					
Platyarthidae	*Trichorhina* cf. australiensis	W		JF	
Armadillidae	*Pseudodiploexochus* sp. indet.	Lik.	forest, woodland	JF	
Armadillidae	*Pseudodiploexochus* sp. indet. A (Worsley)	Lik.		JF	
Armadillidae	*Pseudodiploexochus* sp. indet. B (Worsley)	P		JF	
Armadillidae	*Pseudodiploexochus* 'X'	Lik.		JF	
Armadillidae	*Acanthodillo* '1'	P		JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Armadillidae	*Acanthodillo* '5'	P	woodland	JF	
Armadillidae	*Acanthodillo* flavus	P	forest, woodland	JF/SCP	
Armadillidae	*Acanthodillo* 'sp. 2 (Judd 2002)'	P		JF/SCP	
Armadillidae	*Acanthodillo* 'sp. 3 (Judd 2002)'	P		JF	
Armadillidae	*Buddelundia* '5' (Huntly)	Lik.	forest, woodland	JF	
Armadillidae	*Buddelundia cinerascens*	P	banksia	SCP	
Armadillidae	*Buddelundia inaequalis*	P	Under Rocks	SCP	
Armadillidae	*Buddelundia nigripes*	P	forest	JF/SCP	
Armadillidae	*Buddelundia nitidissima*	W	forest, woodland, shrubland	JF/SCP	
Armadillidae	*Buddelundia opaca*	W		JF/SCP	
Armadillidae	*Buddelundia* 'sp. 04'	P		JF	
Armadillidae	*Buddelundia* 'sp. 1 (Judd 2002)'	P		SCP	
Armadillidae	*Buddelundia* 'sp. 3 (Judd 2002)'	P		SCP	
Armadillidae	*Buddelundia* 'sp. 5 (Judd 2002)'	P		JF	
Armadillidae	*Buddelundia* 'sp. 7 (Judd 2002)'	P	Marri	SCP	
Armadillidae	*Buddelundia* sp. indet.	P	forest	JF	
Armadillidae	*Buddelundia* sp. indet. A (Worsley)	Lik.		JF	
Armadillidae	*Cubaris* 'sp. 1 (Judd 2002)'	P		SCP	
Armadillidae	*Cubaris* 'sp. 2 (Judd 2002)'	P		SCP	
Armadillidae	*Laevophiloscia* '2'	W	forest, woodland	JF	
Armadillidae	*Laevophiloscia* cf. perlata	P		JF	
Armadillidae	*Laevophiloscia* cf. yalgoonensis	W		JF	
Armadillidae	*Pseudodiploexochus* '1'	Lik.		JF	
Armadillidae	*Pseudodiploexochus* 'sp. 1 (Judd 2002)'	W	Leaf Litter	JF/SCP	
Armadillidae	*Pseudodiploexochus* 'sp. 2 (Judd 2002)'	W	Jarrah, Banksia, Allocasuarina,	JF/SCP	
Armadillidae	*Spherillo* '1'	Lik.	woodland	JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Armadillidae	*Spherillo* '5'	W		JF	
Armadillidae	*Spherillo* 'sp. 2 (Judd 2002)'	P		SCP	
Armadillidae	*Spherillo* 'sp. 3 (Judd 2002)'	P	Under Bark Eucalyptus Diversicolor	SCP	
Armadillidae	*Spherillo* 'sp. 4 (Judd 2002)'	P	Jarrah, Marri, Sheoak, Wandoo	JF/Avon Wheatbelt	
Armadillidae	*Spherillo* 'sp. 5 (Judd 2002)'	W	Jarrah/Marri	JF/SCP	
Philosciidae	*Laevophiloscia* '1'	P	forest	JF	
Philosciidae	*Laevophiloscia perlata*	W		JF/SCP	
Philosciidae	*Laevophiloscia* 'sp. 1 (Judd 2002)'	W		JF	
Philosciidae	*Laevophiloscia* 'sp. 2 (Judd 2002)'	W	Under Rotting Bark In Bed Of Lit	JF	
Philosciidae	*Laevophiloscia* sp. indet.	P	forest	JF	
Philosciidae	*Laevophiloscia yalgoonensis*	W		SCP	
Philosciidae	Philosciidae 's'	Lik.	forest, woodland	JF	
Philosciidae	Philosciidae 'sp. 1 (Judd 2002)'	W	Leaf Litter	JF/SCP	
Platyarthridae	Paraplatyarthridae sp. indet.	P	woodland	JF	
Platyarthridae	*Paraplatyarthrus* sp. indet.	P	forest	JF	
Platyarthridae	*Paraplatyarthrus* sp. indet. A	Lik.		JF	
Platyarthridae	*Paraplatyarthrus* sp. indet. B	Lik.		JF	
Platyarthridae	*Paraplatyarthrus* sp. indet. C	Lik.		JF	
Platyarthridae	*Paraplatyarthrus* sp. indet. D	Lik.		JF	
Platyarthridae	Platyarthridae 'sp. 1 (Judd 2002)'	W		SCP	
Platyarthridae	Platyarthridae 'sp. 2 (Judd 2002)'	W		JF	
Platyarthridae	Platyarthridae 'sp. 3 (Judd 2002)'	W		SCP	
Platyarthridae	Platyarthridae 'sp. 3 (Judd 2002)'	W		SCP	
Platyarthridae	Platyarthridae sp. indet.	P		JF	
Platyarthidae	*Trichorhina* 'sp. 1 (Judd 2002)'	W	Under Rocks	SCP	
Platyarthidae	*Trichorhina* sp. indet.	P		JF	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Styloniscidae	*Styloniscus* '1'	P	woodland, forest	JF	
Styloniscidae	*Styloniscus* '2'	P		JF	
Styloniscidae	*Styloniscus* '7'	Lik.	forest	JF	
Styloniscidae	*Styloniscus* 'A' (Worsley)	Lik.		JF	
Styloniscidae	*Styloniscus* 'B' (Worsley)	Lik.		JF	
Styloniscidae	*Styloniscus* 'sp. 1 (Judd 2002)'	W	Jarrah, swamp	JF/SCP	
Styloniscidae	*Styloniscus* 'sp. 7 (Judd 2002)'	W	Jarrah	SCP	
Styloniscidae	*Styloniscus* sp. indet.	P	forest	JF	
Class: Gastropoda					
Bothriembryontidae	*Bothriembryon bradshawi*	W		SCP	
Bothriembryontidae	*Bothriembryon bulla*	W	Damp yellow/white sandy soil, deep F.nodosa leaf litter; Banksia sessilis, sand dune, limestone	JF/SCP	
Bothriembryontidae	*Bothriembryon* cf. bradshawi	P	open woodland on plain; veldt grass	JF/SCP	
Bothriembryontidae	*Bothriembryon* cf. bulla	P		SCP	
Bothriembryontidae	*Bothriembryon* cf. indutus	P	woodland, forest	JF	
Bothriembryontidae	*Bothriembryon* cf. kendricki	W	granite	JF/SCP	
Bothriembryontidae	*Bothriembryon* cf. serpentinus	P	granite, sandy	JF	
Bothriembryontidae	*Bothriembryon indutus*	W	granite/limestone	JF/SCP	
Bothriembryontidae	*Bothriembryon kendricki*	W	sand, leaf litter, granite, doleraite, laterite	JF/SCP	
Bothriembryontidae	*Bothriembryon serpentinus*	P	granite, doleraite, clay/loam, leaf litter	JF/SCP	
Charopidae	*Annoselix* cf. dolosa	W	open woodland on moderate hill mid-slope	JF	
Charopidae	*Annoselix* dolosa	W		JF	
Charopidae	*Epinicium restifer*	P	side of stream under stones	SCP	
Charopidae	*Luinodiscus* cf. repens	W		JF	
Charopidae	*Luinodiscus* cf. sublestus	W	limestone boulders	JF	
Charopidae	*Luinodiscus sublestus*	W	occassional limestone boulders	SCP	
Helicidae	*Theba pisana*	W	Limestone	SCP	

Family	Taxon	SRE status1	Habitat	IBRA2	Record in study area
Punctidae	cf. Paralaoma caputspinulae	W	Loam	SCP	
Pupillidae	*Omegapilla* australis	W	Stones		
Succineidae	*Succinea* cf. contenta	W	many large limestone boulders outcropping	SCP	
Succineidae	*Succinea contenta*	W		JF/SCP	
Succineidae	*Succinea scalarina*	W		SCP	
Succineidae	*Succinea strigillata*	W		SCP	
Glacidorbidae	*Glacidorbis occidentalis*	P3	Sand/gravel	JF	
Class: Bivalvia					
Hyriidae	*Westralunio carteri*	VU	sand/mud	JF/SCP	
Phylum: Onychophora					
Peripatopsidae	*Occiperipatoides gilesii*	W	Marri, Banksia, granite	JF/SCP	
Peripatopsidae	*Occiperipatoides* 'sp. indet'	W	Jarrah/Marri, granite	JF	

1 – SRE status (C = confirmed, P = potential, L = likely, W = widespread). 2 – JAF = Jarrah Forest, SCP = Swan Coastal Plain, AW = Avon Wheatbelt.



Alcoa Myara – Carter's Freshwater Mussel Targeted Survey

Myara,
Huntly Mine

Alcoa of Australia Limited

181-205 Davy Street, Booragoon WA 6154

Prepared by:

SLR Consulting Australia

SLR Project No.: 675.VX5890.00002

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Revision Record

Revision	Date	Prepared By	Checked/ Authorised By	Details
01	15 May 2024	JM	NN	
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Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Alcoa of Australia Limited (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1.0 Introduction

1.1 Background

Alcoa of Australia Limited (Alcoa) operates Huntly and Willowdale bauxite mines in the Darling Ranges located south-east of Perth, Western Australia. Alcoa committed to undertaking pre-clearance surveys for Carter's Freshwater Mussel (*Westralunio carteri*) within the Huntly Mine, Myara region as part of Alcoa's Mining and Management Program (MMP) assessment. Carter's freshwater mussel (CFM) is listed as a Vulnerable threatened species under the *Biodiversity Conservation Act 2016* (state, Western Australia), the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) and the IUCN Redlist of Threatened Species 2020 (International).

Historical records have identified the presence of CFM in the Serpentine River which is approximately 12km downstream of the survey area. A previous fauna survey of the area surrounding the serpentine dam conducted by GHD identified that the species is known to reside in Serpentine Dam, and mussels may disperse upstream during winter/spring flows as larvae (glochidia) attached to migrating fish but are unlikely to survive the extended dry summer period (GHD 2021).

A targeted survey for CFM at Myara was undertaken by SLR in October 2023. Six sites were targeted within the proposed survey area with only three sites successfully sampled and the remaining three sites being dry. Monitoring was conducted along the length and width of inundated channel areas at the site locations – employing visual observations for shells, manual hand sorting through benthic sediments, and the gentle use of mussel rakes and wire baskets where water depth allowed. These targeted survey methods for CFM followed that of Klunzinger *et al.* (2012) and the *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020).

1.2 Scope of works

The scope of work for the Myara CFM survey of the proposed location is:

- Review previous CFM studies of this region.
- Conduct a targeted field search for Carter's Freshwater Mussel at the proposed survey location.
- Prepare a report suitable for Alcoa to:
    - amend the preliminary designs to avoid significant fauna;
    - inform translocation and construction management plans as required; and
    - assist Alcoa in preparing MMP submission to the MMPLG.
- Provide any GIS data in accordance with IBSA requirements.

2.0 Carter's freshwater mussel

Westralunio carteri, Carter's freshwater mussel (CFM; **Photo 1**), is listed as a Vulnerable threatened species under the *Biodiversity Conservation Act 2016* (state, Western Australia), the Environment Protection and *Biodiversity Conservation Act 1999* (Commonwealth) and the IUCN Redlist of Threatened Species 2020 (International). The current distribution of CFM is limited to within 50-100 km of the coast from Gingin Brook in the north, to the Kent River and Waychinicup River along the southern coast (Klunzinger & Walker 2014, Klunzinger *et al*. 2015). CFM is limited to Australia's southwest and was long considered to be the only Westralunio species in Australia. However new research confirms the existence of three evolutionary lineages of the Carter's freshwater mussel, the original *Westralunio carteri* from western coastal drainages and two significantly smaller and less elongated subspecies: *Westralunio inbisi inbisi* from southern coastal drainages, and *Westralunio inbisi meridiemus* from the southwestern corner.

CFM occurs in greatest abundance in slower flowing permanent/semi-permanent stream and riverine habitats with stable sediments and low salinity, living two thirds to almost fully buried in sand and finer sediment (Klunzinger *et al.* 2010, Klunzinger 2012). Klunzinger (2012) only found CFM in perennial (permanent/semi-permanent) stream and riverine habitats, and dehydration exposure experiments demonstrated CFM cannot survive prolonged drying (i.e., 76% mortality occurring under experimental conditions, within five days of exposure to dry conditions in sand filled bath tubs) (Lymbery *et al.* 2021). CFM also occurs in lentic (still water) waters including large water supply dams and on-stream farm dams (Klunzinger *et al*. 2015, DWER 2022). CFM require perennial streams or shallow pools or damp mud to retreat to during low water levels and drought. However, they may survive in seasonally-flowing creeks if the period of zero flow is sufficiently short, and/or there are residual pools or low lying areas that remain damp/wet.

Freshwater mussels (Bivalvia: Unionoida) are a keystone species in freshwater ecosystems due to their filter-feeding ability, the important role they play in nutrient cycling and bio-deposition, as well as the structural habitat and the food source they provide for other organisms (Klunzinger *et al.* 2014, Vaughn and Hakenkamp 2001, Spooner and Vaughn 2008). Freshwater mussel species are endangered throughout the world with a multitude of threats influencing their persistence and survival.



Photo 1. *Westralunio carteri* Carter's freshwater mussel. Photo by B. Clark, SLR Consulting.

The CFM lifecycle involves an obligate parasitic 'larval' stage, known as glochidia, which attach to host fish for several weeks to months to complete their development (Bauer and Wächtler 2001, Strayer 2008, Klunzinger *et al*. 2012). The glochidia aids with the distribution of this species, with individuals being dispersed by migrating fish. CFM is a long-lived species, becoming sexually mature within six years at approximately 27 mm shell length, and living for at least 50 years (Klunzinger *et al.* 2014; Figure 1). Despite this known information, there is a distinct knowledge gap with respect to the ecology of CFM, thereby confounding conservation efforts and status of the species, whilst emphasising the protection of any known/new populations of the species (Klunzinger *et al.* 2015).

CFM is currently under threat across south-western Australia due to secondary salinisation, loss of suitable host species, nutrient pollution, habitat loss, water extraction, as well as sedimentation resulting in increased turbidity. Reservoir dewatering and declining rainfall also appear to have had a negative effect on populations (Klunzinger *et al*. 2012). Secondary threats are trampling by cattle, changes in water quality and possible loss of suitable host fishes for larval stages (glochidia). Confirmed native host species for glochidia are freshwater cobbler, western minnows, western pygmy perch, nightfish, Swan River goby and southwestern goby, and the exotic species gambusia and one-spot livebearer (Klunzinger *et al.* 2012, 2015).

Barriers to upstream movement of fish may therefore also restrict gene flow between mussel populations, limit upstream-downstream recruitment of CFM, restrict distributions and prevent recolonisation. As well as weirs and dams, barriers include low flow regimes that make natural barriers (waterfalls, riffle zones) impassable for fish. CFM are filter feeders and are vulnerable to water pollutants and sedimentation. Burial by deep loose sands and silts will also kill CFM. CFM also appear intolerant of average salinity levels > 1,500 mg/L (~3,000 μS/cm; Klunzinger *et al*. 2012). Klunzinger *et al*. (2015) speculated that the species extent of occurrence (EOO) had declined by 49% in less than 50 years, due primarily to secondary salination, and emphasised the importance of habitat protection where the species persists. The former range for this species extended from Moore River in the north to King George Sound in the south and inland to the Avon River (Klunzinger & Walker 2014, Klunzinger *et al*. 2015).

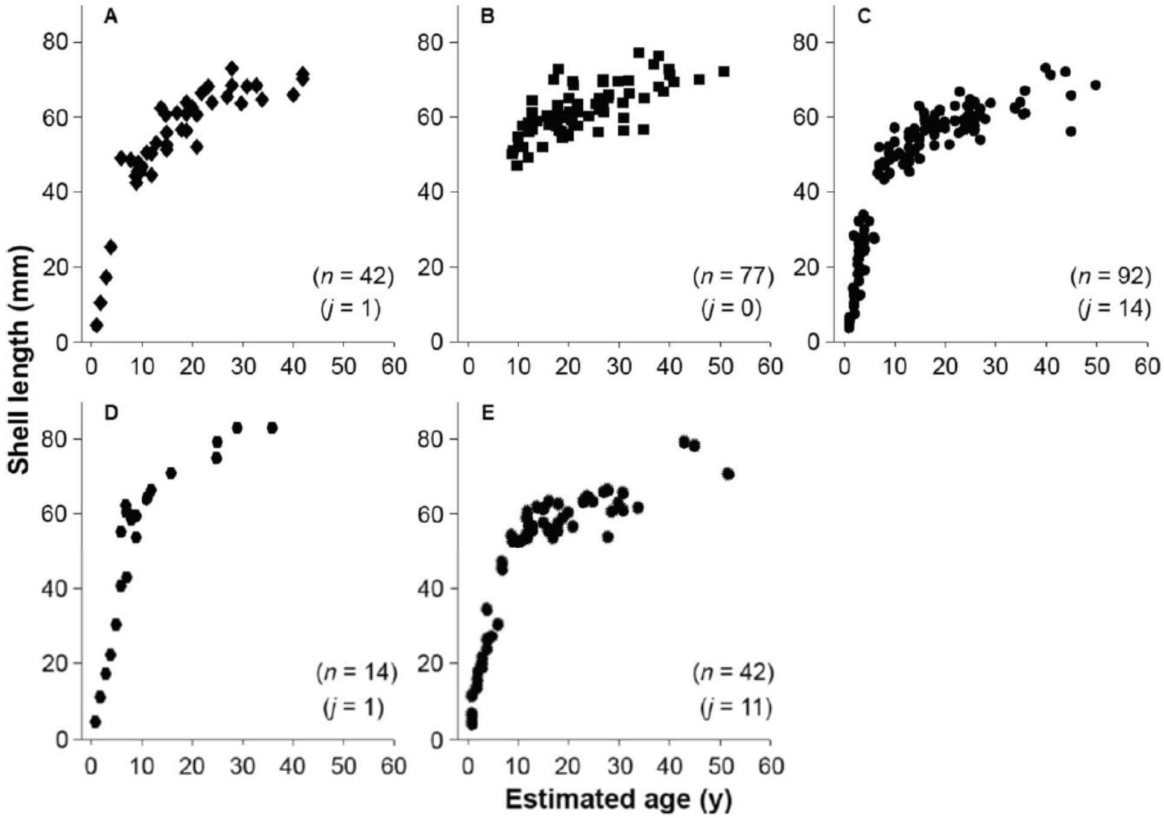


Figure 1. Figure 1 from Klunzinger et al. (2014); age-at-length measurements for CFM at Bennett Brook (A), Brunswick River (B), Collie River (C), Serpentine River at Dog Hill (D), and Serpentine River at Horse Drink (E).

2.1 Past surveys for CFM in the study area region

Past aquatic and relevant CFM survey reports were sourced and reviewed as part of the desktop assessment. This included, but was not limited to, relevant scientific reports and studies that have been undertaken on a local and regional scale, together with published and grey literature (Table 1). Locations of CFM records are shown in Figure 2. The Department of Water and Environmental Regulation Healthy Rivers database (DWER 2022) was also searched for CFM records within 50 km of the current study area.

In 2022 SLR conducted a targeted survey for CFMs in the Myara North area of the Huntly Mine. Upstream and downstream of a stream crossing and an associated tributary were surveyed in full for CFM but no evidence was present of living or dead individuals.

The CFM record closest to the study area was made by Klunzinger et al. (2012), in the Serpentine River approximately 12 km downstream of the current study area (Figure 2). CFM is also known from recent (post-2010) mussel watch surveys and historic (1900 - 1959) WAM records for the Serpentine River along the southern boundary of the Myara North region. It was also recorded from upper Wungong Brook (Vardi Road gauging station) approximately 10 km north of Myara North during Wungong Catchment Trial Project (WCT) monitoring (ARL 2007). The method used for the WCT was quantitative quadrat (Surber) sampling which is not designed to target mussels, so mussels may actually be more widespread throughout the upper Wungong catchment than recorded during field sampling for the WCT.

Table 1. CFM survey reports relevant to the study area

Reports and Journal Publications	Author	Year
Wungong Catchment Environment and Water Management Project: Aquatic Fauna Biodiversity Assessment October 2006	Storey & Creagh (ARL)	2007
Mitigating the Impact of Serpentine Pipehead Dam Works on Carter's Freshwater Mussel	Klunzinger et al.	2012
Range decline and conservation status of *Westralunio carteri* Iredale, 1934 (Bivalvia: Hyriidae) from south-western Australia	Klunzinger et al.	2015
Byford Railway Extension Targeted Fauna Survey for *Westralunio carteri* Carter's Freshwater Mussel	Stream Environment and Water	2021
SLR Myara North Carter's Freshwater Mussel Targeted Survey	SLR	2022

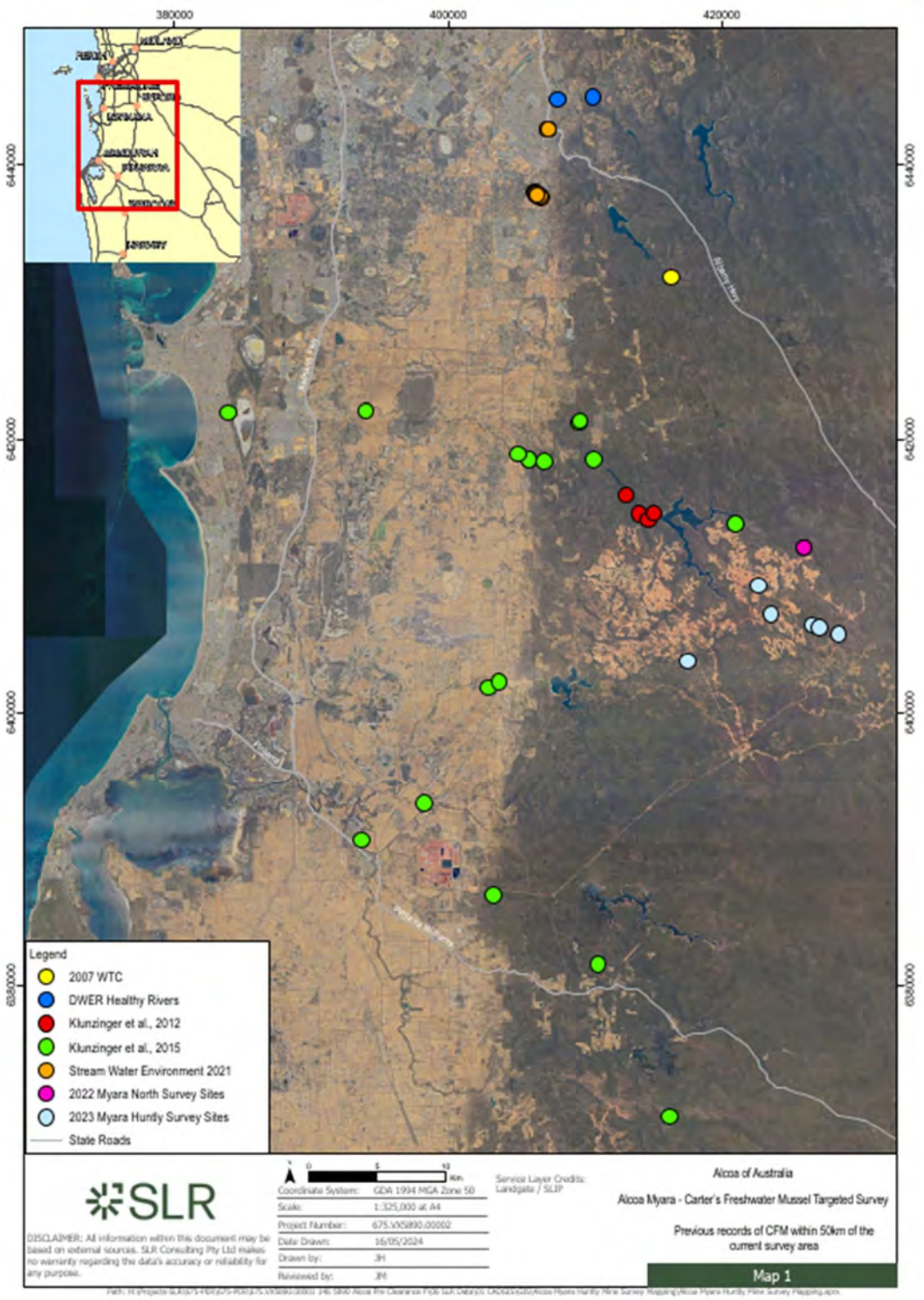


Figure 2. Carter's freshwater mussel previous records within 50 km of the current survey area. Note 2022 Myara North Survey did not record any evidence of CFM presence.

3.0 Survey methods

The project area surveyed for CFM is shown in Figure 3. It consists of six sites in a survey area approximately 12 km upstream of the Serpentine Dam (Table 2). A team of two aquatic ecologists visited all six proposed sites in October 2023, conducting a targeted search of inundated channel areas for mussels. To establish the presence of mussels in the search area, a range of methods were used, including visual observations for shells, manual hand sorting through benthic sediments, and the gentle use of mussel rakes and wire baskets where water depth allowed. GPS locations of captured mussels were to have been recorded, along with a density estimate (live mussels per m^2) and micro-habitat preference. All mussels were to have been gently returned alive to the site of capture. These targeted survey methods for CFM followed that of Klunzinger *et al.* (2012) and the *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020).

Table 2: Locations of Myara, Huntly Mine 2023 sampling sites (GDA2020)

Huntly Site Names	ID	Easting	Northing
Cable 1	6	426452	6406264
Cable 2	7	427003	6406067
Cable 5	8	428416	6405571
Kisler Road realignment	9	422552	6409146
Rhodes 2	10	417377	6403642
Schou 1	11	423460	6407074

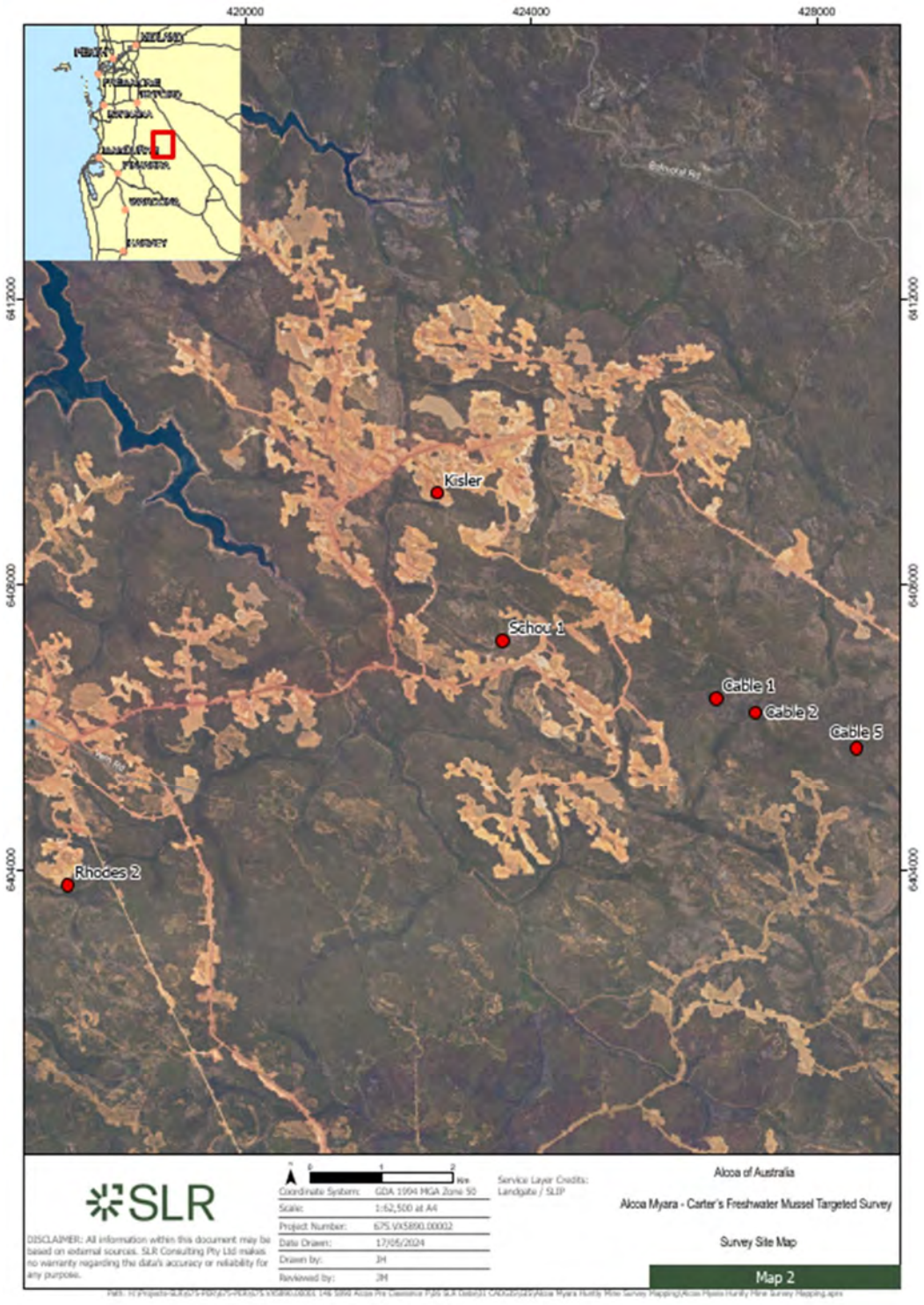


Figure 3: Locations of the Myara, Huntly Mine 2023 sampling sites and the previous 2022 Myara North mussel survey.

3.1 Licences

The survey was carried out under a Department of Biodiversity, Conservation and Attractions (DBCA) for Authorisation to Take or Disturb Threatened Species (TFA 2223-0096) and a Fauna Taking (Biological Assessment) License issued under Regulation 27 of the Biodiversity Conservation Regulations 2018 and the *Biodiversity Conservation Act 2016* (BA27000735), issued 5th October 2022. SLR Consulting (nee Wetland Research & Management) also hold a current Instrument of Exemption under the *Fish Resources Management Act 1994* to undertake freshwater aquatic fauna surveys in major rivers and tributaries of South-West WA, including the Serpentine River.

3.2 Survey Limitations

Table 3 below summarises the potential limitations and constraints affecting the Myara, Huntly Mine CFM targeted survey.

Table 3. Survey limitations

Aspect	Constraint?	Comment
Competency	No	The survey was conducted by two aquatic ecologists with prior experience in CFM targeted surveys in South West Western Australia aquatic ecosystems. The combined number of years' experience in aquatic ecology held by the personnel is 9 years. Both personnel hold university-level degrees in biological sciences. The survey was conducted under a Fauna Taking (Biological Assessment) License and an Authorisation to Take or Disturb Threatened Species issued by DBCA on the 5th October 2022.
Scope	No	The scope was prepared by Alcoa. The scope is considered sufficient to inform the impact assessment with regards to the distribution and density of mussels within the survey area.
Fauna detected if present in the survey area	No	All sites were thoroughly assessed for any evidence of CFM. This included visual observations, physical searches and searches for desiccated shell remnants in dry creek beds.
Sources of information	No	The desktop assessment collated the previous findings in the region as presented in relevant targeted CFM surveys and the DWER databases.
The proportion of the task achieved and further work	No	The surveys were completed adequately, carried out to a sufficient level with respect to the scope.
Timing/weather/season/cycle	No	Surveys were carried out in spring after the winter rainfall season. Three sites were dry however if these sites are dry immediately after the winter rainfall season it indicates these sites do not hold water in a permanent/semi-permanent capacity. Timing of the survey was not a limitation for the survey.
Disturbances	No	There were no disturbances that affected the survey.

Aspect	Constraint?	Comment
Intensity (in retrospect was the intensity adequate)	No	Based on the results the survey intensity is considered adequate to have met the scope. The entire area of possible habitat within the survey area was searched for CFM.
Completeness (e.g., was relevant area fully surveyed)	No	The entire area of possible habitat within the survey area was searched for CFM.
Resources	No	The resources made available to the survey were sufficient.
Remoteness and/or access problems	No	The entire length of the channel within the survey area was accessible.

4.0 Fauna

No CFM were recorded in the survey location during the targeted field survey (Table 4). This included live specimens, but also absence of shells of deceased individuals. Habitat observations of each site identified the substrate composition to be unsuitable for mussels to be present. Rhodes 2 consisted primarily of gravels and pebbles covered with large amounts of detritus/leaf litter. Schou 1 had a similar mineral substrate mainly consisting of gravel and pebbles with bedrock also present. Kisler had a substrate consisting primarily of clay with a large layer of detritus/leaf litter covering it. CFM generally occur in stable sand and finer sediment areas where they can bury themselves partially or completely (Klunzinger *et al.* 2010, Klunzinger 2012). Habitats consisting of course gravel and pebbles or hard clays prevent mussels from burying themselves.

Dispersal of glochidia, the obligate parasitic larval stage of CFM, may have also been impacted for these sites due to the distance upstream and the vegetation barriers present between the Serpentine Dam and the upstream survey sites. The CFM relies on native fish species to act as hosts for the parasitic larval stage allowing the CFM to disperse as these fish species move upstream. If obstructions to fish movement are present then the movement of CFM larvae would also be limited.

CFM have a limited ability to survive in a system that has receded and dried out. This species cannot withstand exposure for longer than five days without moist sediments and shade (Lymbery *et al.* 2021). As sites dry out and remain dry over long periods of time mussel populations will die out.

Table 4: Summary of mussels caught during the Alcoa Huntly 23 survey. Water quality was taken at three of the six sites – three sites were dry

Huntly Site Names	ID	Water quality	Mussel presence
Cable 1	6	Dry	Not detected
Cable 2	7	Dry	Not detected
Cable 5	8	Dry	Not detected
Kisler	9	✓	Not detected
Rhodes 2	10	✓	Not detected
Schou 1	11	✓	Not detected

5.0 Water quality

Water quality was compared to ANZG (2018) default guidelines of water quality for the South-West region of Western Australia (Table 5). Water quality concentrations and exceedances of note included:

- EC exceeded the ANZG (2018) default guideline at; Kisler and Rhodes 2
- pH values below ANZG (2018) default guidelines at all sites where water quality was taken; Kisler, Schou 1, and Rhodes 2
- Dissolved oxygen readings were below ANZG (2018) default guidelines at all sites where water quality was taken; Kisler, Schou 1, and Rhodes 2
- Exceedance of Al at Schou 1 in comparison to ANZG (2018) guidelines

5.1 Electrical conductivity

Electrical conductivity (EC) readings ranged from 224.6 μS/cm (Schou 1) to 436.2 μS/cm (Rhodes 2). EC at Kisler and Rhodes 2 was above the default DGV (300 μS/cm). However, this exceedance is not one of concern as CFM are tolerant to levels < 3,000 μS/cm (Klunzinger *et al*. 2012).

5.2 pH

Readings for all sites where water quality samples were taken were below ANZG (2018) guidelines (pH 6.5-8.0). All sites were slightly acidic with values ranging from 5.6 pH (Shou 1) to 6.1 pH (Rhodes 2). The slightly acidic levels of pH could be related to the recent influx of rainwater at sampling sites. pH is not classified as a predicting environmental factor for CFM distribution and no established tolerance levels have been defined for CFMs however previous studies have recorded the presence of CFM in a pH range from 6.7 to 8.2 (Klunzinger *et al.* 2015, Paice and Beatty 2021, Stream Water and Environment 2021, SLR unpub. dat.). This indicates that the current state of the water quality is outside the preferred range of the CFM.

5.3 Dissolved oxygen

Dissolved oxygen (DO) was recorded slightly under the ANZG (2018) values (85-120%) at all sites. With the lowest dissolved oxygen at 60.5% (Rhodes 2). The low levels of dissolved oxygen could be in relation to the lack of aeration due to low flows. DO generally exhibits a diurnal pattern, reflecting the flux between aquatic respiration and photosynthesis, so spot measurements of DO such as these provide only a snapshot of typical daily conditions, which may vary considerably depending on the time of measurement. Additionally in field observations of CFM have been made by SLR with healthy CFM populations occurring in freshwater systems experiencing dissolved oxygen levels ranging from 30-100%.

5.4 Metals

The majority of the metal levels recorded at all sites were at the limit of reporting and below the ANZG (2018) DGV. Slight exceedances of the 95% ANZG (2018) protection guideline for Al was recorded at Shou1. This concentration is likely due to evapo-concentration effects on reducing sites and lack of streamflow.

Table 5. Water quality parameters (in situ and laboratory analysis) measured at Myara, Huntly Mine October 23. Values are compared to the ANZG (2018) Water quality default guideline values (DGVs) relevant to the South-West region (np = not provided). Highlighted values indicate values in exceedance of respective guideline values.

Analyte	*Limits of Reporting*	ANZG (2018) 95% DGV	Units	Kisler	Schou 1	Rhodes 2
Al	*0.005*	0.055	mg/L	0.007	0.084	0.011
Alkalin	*1*	np	mg/L	7	3	8
As	*0.00005*	np	mg/L	<0.00005	<0.00005	<0.00005
B	*0.02*	np	mg/L	0.03	<0.02	<0.02
Ba	*0.002*	np	mg/L	0.052	0.011	0.015
CO3	*1*	np	mg/L	<1	<1	<1
Ca	*0.1*	np	mg/L	2.5	1	1.9
Cd	*0.0001*	np	mg/L	<0.0001	<0.0001	<0.0001
Cl	*1*	np	mg/L	115	64	123
Co	*0.0001*	np	mg/L	0.0007	0.0001	0.0006
Cr	*0.0005*	0.0002	mg/L	<0.0005	<0.0005	<0.0005
Cu	*0.0001*	0.0014	mg/L	0.0001	<0.0001	0.0001
ECond	*0.2*	np	mS/m	40.8	22.9	42.3
Fe	*0.005*	np	mg/L	0.091	0.025	0.36
HCO3	*1*	np	mg/L	8	4	10
Hardness	*1*	np	mg/L	38	17	25
K	*0.1*	np	mg/L	2.6	0.8	1.3
Mg	*0.1*	np	mg/L	7.6	3.5	4.9
Mn	*0.001*	1.9	mg/L	0.005	0.005	0.013
Mo	*0.001*	0.073	mg/L	<0.001	<0.001	<0.001
N_NH3	*0.01*	0.9	mg/L	<0.01	<0.01	<0.01
N_NO2	*0.01*	9.3	mg/L	<0.01	<0.01	<0.01
N_NO3	*0.01*	np	mg/L	0.01	0.02	<0.01
N_NOx	*0.01*	np	mg/L	0.01	0.02	<0.01
N_total	*0.01*	0.3	mg/L	0.04	0.16	0.11
Na	*0.1*	np	mg/L	57.6	33.8	67.2
Ni	*0.001*	0.011	mg/L	<0.001	<0.001	<0.001
OH	*1*	np	mg/L	<1	<1	<1
P_total	*0.005*	np	mg/L	<0.005	<0.005	<0.005
Pb	*0.0001*	0.0034	mg/L	<0.0001	<0.0001	<0.0001
S	*0.1*	np	mg/L	3	1.7	1.9
SO4_S	*0.1*	np	mg/L	9.1	4.9	5.7
Se	*0.001*	np	mg/L	<0.001	<0.001	<0.001
Si	*0.05*	np	mg/L	3.7	2.1	2.2

Analyte	*Limits of Reporting*	ANZG (2018) 95% DGV	Units	Kisler	Schou 1	Rhodes 2
Sr	*0.002*	np	mg/L	0.049	0.019	0.029
TDS_calc	*5*	np	mg/L	220	130	230
U	*0.0001*	0.005	mg/L	<0.0001	<0.0001	<0.0001
V	*0.0001*	0.0006	mg/L	0.0004	<0.0001	0.0001
Zn	*0.001*	0.008	mg/L	<0.001	<0.001	<0.001
pH	*0.1*	6.5-8.0		5.9	5.6	6.1
Turbidity-field (NTU)		20		1.7	4.5	4.64
DO-field (% sat)		85-120	%	71.6	71.67	60.5
EC-field (µs/cm)		300	µs/cm	401.2	224.6	436.2

6.0 Conclusion

No CFM were recorded in the survey location during the targeted field survey. This included live specimens, but also absence of shells of deceased individuals. Water quality parameters for the only three sites with water identified pH to be outside the ANZG (2018) DGV of 6.5-8.0 and outside the pH range of locations where mussels had been previously recorded in other studies. The remaining three sites without water appeared to potentially hold water on a short-term basis after a heavy rainfall event but not over long periods of time. Locations not holding water for long periods of time will most likely impact any potential mussel populations.

7.0 References

ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines

ARL (2007) Wungong Catchment Trial Project: Aquatic Fauna Biodiversity Assessment October 2006. Unpublished report to the Water Corporation prepared by the Aquatic Research Laboratory, the University of Western Australia, June 2007.

Bauer G and Wächtler K (2001) *Ecology and evolution of the freshwater mussels Unionoida.* Springer-Verlag, New York

Department of Water and Environmental Regulation (2022) Carter's freshwater mussel - *Westralunio carteri*. Healthy Rivers fauna records https://rivers.dwer.wa.gov.au/species/westralunio-carteri/ [Accessed 17th October 2022].

Environmental Protection Authority (2020) Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment, EPA, Western Australia. https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA-Technical-Guidance-Vertebrate-Fauna-Surveys.pdf [Accessed 17th October 2022].

GHD (2021) Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North Pinjarra Alumina Refinery Revised Proposal. Alcoa of Australia Limited, August 2021.

Klunzinger MW, Beatty SJ, and Lymbery A (2010) Acute salinity tolerance of the freshwater mussel *Westralunio carteri* Iredale, 1934 of south-west Western Australia. *Tropical Natural History* **Suppl. 3**: 112.

Klunzinger MW, Beatty SJ, Allen MG, Keleher (2012) Mitigating the Impact of Serpentine Pipehead Dam Works on Carter's Freshwater Mussel. Prepared for the Department of Fisheries by the Freshwater Fish Group and Fish Health Unit, Murdoch University. April 2012.

Klunzinger M, Walker KF (2014) *Westralunio carteri*. [*In*] IUCNRed List of Threatened Species. Version 2014.3. www.iucnredlist.org.

Klunzinger MW, Beatty, SJ, Morgan DL, Lymbery AJ, Haag WR (2014) Age and growth in the Australian freshwater mussel, *Westralunio carteri*, with an evaluation of the fluorochrome calcein for validating the assumption of annulus formation. *Freshwater Science* **33**: 1127-1135. doi:10.1086/677815.

Klunzinger M, Beatty S, Pinder A, Morgan D, Lymbery A (2015) Range decline and conservation status of *Westralunio carteri* Iredale, 1934 (Bivalvia: Hyriidae) from south-western Australia. *Australian Journal of Zoology* **63**: 127-135. doi:10.1071/ZO15002.

Lymbery A, Ma L, Lymbery S, Klungzinger M, Beatty S, Morgan D (2021) Burrowing behaviour protects a threatened freshwater mussel in drying rivers. *Hydrobiologia* **848**: 12-13.

Paice R and Beatty S (2021) Survey of Carter's Freshwater Mussel in the Lower Vasse River to inform future sediment removal. Prepared for City of Busselton. a71d58ad-4cba-48b6-8dab-f3091fc31cd5 (environment.gov.au) [Accessed 17th May 2024].

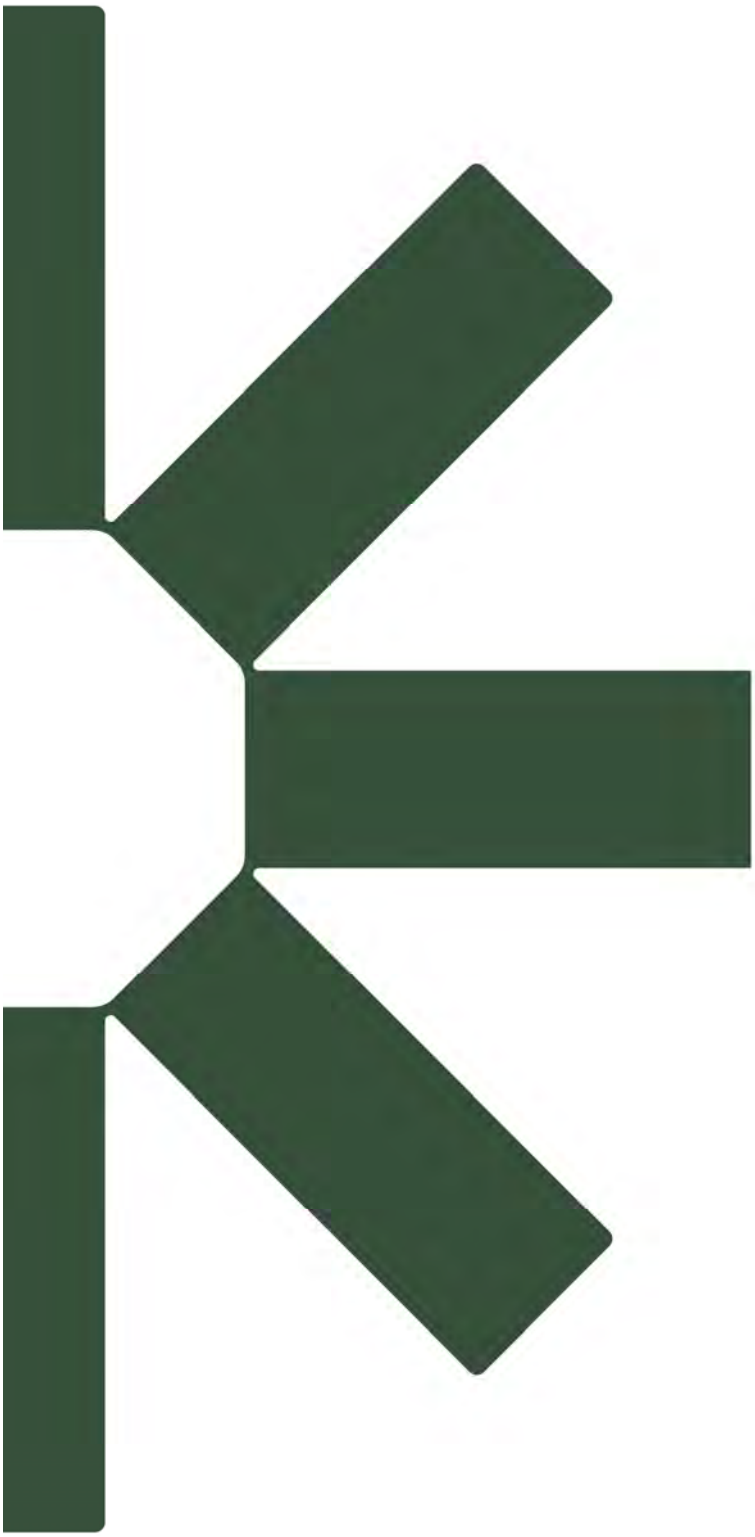
Spooner D and Vaughn CC (2008) A trait-based approach to species' roles in stream ecosystems: climate change, community structure, and material cycling. *Oecologia* (Berlin), **158**, 307–317.

Stantec (2022) Carter's Freshwater Mussel Survey at Williams and Hotham Rivers. EPA, Western Australia. Proposal / Report Template (epa.wa.gov.au) [Accessed 15th May 2024].

Strayer DL (2008) *Freshwater mussel ecology: a multifactor approach to distribution and abundance*. University of California Press, Berkley.

Stream Water and Environment (2021) Byford Railway Extension Targeted Fauna Survey for *Westralunio carteri* Carter's Freshwater Mussel. Prepared for GHD Pty Ltd on behalf of Western Australian Government's METRONET program, January 2021. https://www.epa.wa.gov.au/sites/default/files/PER_documentation2/Appendix%20H%20-%20Carters%20Mussel%20Stream%20Environment%20and%20Water%20200405%20BRE%20Targeted%20Fauna%20Survey_Rev0_Final%20-%2018%20January%202021.pdf [Accessed 17th October 2022].

Vaughn CC and Hakenkamp CC (2001) The functional role of burrowing bivalves in freshwater ecosystems. *Freshwater Biology,* **46**, 1431–1446.



Making Sustainability Happen

Black Cockatoo Habitat Assessment

Huntly Mine – Myara Region

Alcoa of Australia Ltd

181 - 205 Davy Road, Booragoon WA 6154, Australia

Prepared by:

SLR Consulting Australia

Level 1, 500 Hay Street, Subiaco WA 6008, Australia

SLR Project No.: 675.VX5890.00001

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Revision: 2.2

Revision Record

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2.0	11 July 2024	K. Griffith	E. Webb	E. Webb
2.1	29 July 2024	E. Webb		E. Webb
2.2	7 August 2024	E. Webb		E. Webb

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Alcoa of Australia Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

Alcoa of Australia Ltd commissioned SLR Consulting Australia Pty Ltd to undertake a fauna desktop assessment and black cockatoo habitat assessment for the Huntly Mine Myara region as part of its Mining Management Program assessment by the Mining Management Planning Liaison Group. The survey was undertaken within a defined area that consists of 157 individual polygons (the Survey Area) that covers 501.7 hectares and is located approximately 20 km northeast of the Pinjarra townsite, in the Jarrah Forest bioregion of Western Australia.

The objective of the survey was to identify key black cockatoo habitat values within the Survey Area as part of the Mining Management Program assessment process.

The black cockatoo habitat assessment was undertaken in accordance with methods outlined in the *Referral guideline for 3 WA threatened black cockatoo species*, a scoring system for the assessment of foraging value of vegetation developed by the Department of Climate Change, Energy, the Environment and Water, and a black cockatoo nesting and potential nesting tree ranking system developed by Bamford Consulting Ecologists. Black cockatoo habitat mapping was based on a combination of field observations, habitat assessment data, and aerial imagery. The field survey consisted of two phases:

- Phase 1: Ground-based assessment of all potential, suitable, and known nesting trees, foraging habitat quality scoring, and observations/evidence of black cockatoos using the Survey Area.
- Phase 2: Follow up assessment of all trees identified as potentially suitable nesting trees, known nesting trees, or Alcoa Significant Trees during phase 1. Phase 2 surveys were undertaken by black cockatoo specialist Tony Kirkby using drone, pole camera, or telephoto lens where necessary.

All three southwest black cockatoo taxa, Baudin's Cockatoo (*Zanda baudinii*) and Carnaby's Cockatoo (*Zanda latirostris*), both listed as Endangered under the EPBC Act and BC Act, and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), listed as Vulnerable under the EPBC Act and BC Act, were recorded within the Survey Area. Given the large number of records from both the field survey and desktop assessment, all three species appear to regularly occur and use habitats within the Survey Area and surrounds.

A total of five known nesting trees were recorded within the Survey Area, of which four had been recorded by Tony Kirkby during previous surveys, and one was newly identified during the current survey. A Carnaby's Cockatoo was flushed from one of the known nesting trees and the remaining four known nesting trees were identified by chew marks around the hollow entrance. A further 10,034 trees were categorised as potential nesting trees because they do not yet have suitable hollows but may develop them in future. One Alcoa Significant Tree was also identified.

This survey indicated that the Survey Area contains suitable habitat to support black cockatoo foraging and roosting. Eleven black cockatoo roosting sites were recorded, of which six were confirmed to be Forest Red-tailed Black Cockatoo roosting sites and five were not able to be attributed to a specific black cockatoo taxon. Foraging evidence for all three black cockatoo taxa was recorded in the form of feeding debris, and Forest Red-tailed Black Cockatoo foraging evidence was particularly widespread throughout the entire Survey Area.



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Acronyms and Abbreviations

°C	Degree Celsius
BAM Act	*Biosecurity and Agriculture Management Act 2007*
BC Act	*Biodiversity Conservation Act 2016*
BoM	Bureau of Meteorology
CR	Critically Endangered
DAWE	Department of Agriculture Water and Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEE	Department of the Environment and Energy
Desktop Study Area	The area that was studied during the desktop assessment encompassing the Survey Area and surrounds
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DoE	Department of the Environment
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning, Lands and Heritage
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection Biodiversity and Conservation Act 1999*
ESA	Environmentally Sensitive Area
GIS	Geographic Information System
GPS	Global Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
km	Kilometres
Lat	Latitude
Long	Longitude
m	Metres
MA	Marine
mm	Millimetres
MMP	Mining and Management Program
MMPLG	Mining Management Planning Liaison Group

MNES	Matters of National Environmental Significance
OS	Other Specially Protected Fauna
P	Priority
PMST	Protected Matters Search Tool
Alcoa	Alcoa of Australia Ltd
SLR	SLR Consulting Australia
Survey Area	The area that was surveyed
T	Threatened
TEC	Threatened Ecological Community
VU	Vulnerable
WA	Western Australia
WAM	Western Australian Museum

1.0 Introduction

1.1 The Project

Alcoa of Australia Ltd (Alcoa) commissioned SLR Consulting Australia Pty Ltd (SLR) to undertake a fauna desktop assessment and black cockatoo habitat assessment for the Huntly Mine Myara region (the Project) as part of its Mining Management Program (MMP) assessment by the Mining Management Planning Liaison Group (MMPLG). The survey was undertaken within a defined area that consists of 157 individual polygons (the Survey Area) that covers 501.7 hectares and is located approximately 20 km northeast of the Pinjarra townsite, in the Jarrah Forest bioregion of Western Australia (**Map 1**). All maps are provided in **Appendix A**.

1.2 Objective and Scope

The objective of the survey was to identify key black cockatoo habitat values within the Survey Area as part of the MMP assessment process for the Project. The following scope of work was completed:

- A desktop assessment of the Huntly Mine Myara region including an overview of black cockatoo habitat, inventory of likely species present and background environmental information.
- A targeted survey for Carnaby's Cockatoo, Baudin's Cockatoo, and Forest Red-tailed Black Cockatoo consisting of two phases:
    - Phase 1: Ground-based assessment of all potential, suitable, and known nesting trees, foraging habitat quality scoring, and observations/evidence of black cockatoos using the Survey Area.
    - Phase 2: Follow up assessment of all trees identified as potentially suitable nesting trees, known nesting trees, or Alcoa Significant Trees during phase 1. Phase 2 surveys were undertaken by black cockatoo specialist Tony Kirkby using drone, pole camera, or telephoto lens where necessary. The results of the phase 2 assessment have been incorporated into this report.
- A technical biological report.

2.0 Background

2.1 Statutory and Regulatory Framework

Western Australian fauna is governed by the following legislative measures:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). (Commonwealth of Australia, 1999).
- *Biodiversity Conservation Act 2016* (WA) (BC Act) (Government of Western Australia, 2016).
- *Environmental Protection Act 1986* (WA) (EP Act) (Government of Western Australia, 1986).

In addition to these legislative measures, the following non-legislative lists are considered on a case-by-case basis:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora, and ecological communities.
- Recognition of locally significant populations by DBCA.

The EIA process is supported by guidance documents published by the Environmental Protection Authority (EPA), DBCA and the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

Western Australia

- *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020).
- *Environmental Factor Guideline – Terrestrial Fauna* (EPA, 2016).

Commonwealth

- *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (DoE, 2013).
- *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022).
- *Survey guidelines for Australia's threatened birds* (DEWHA, 2010).

2.2 Existing Environment

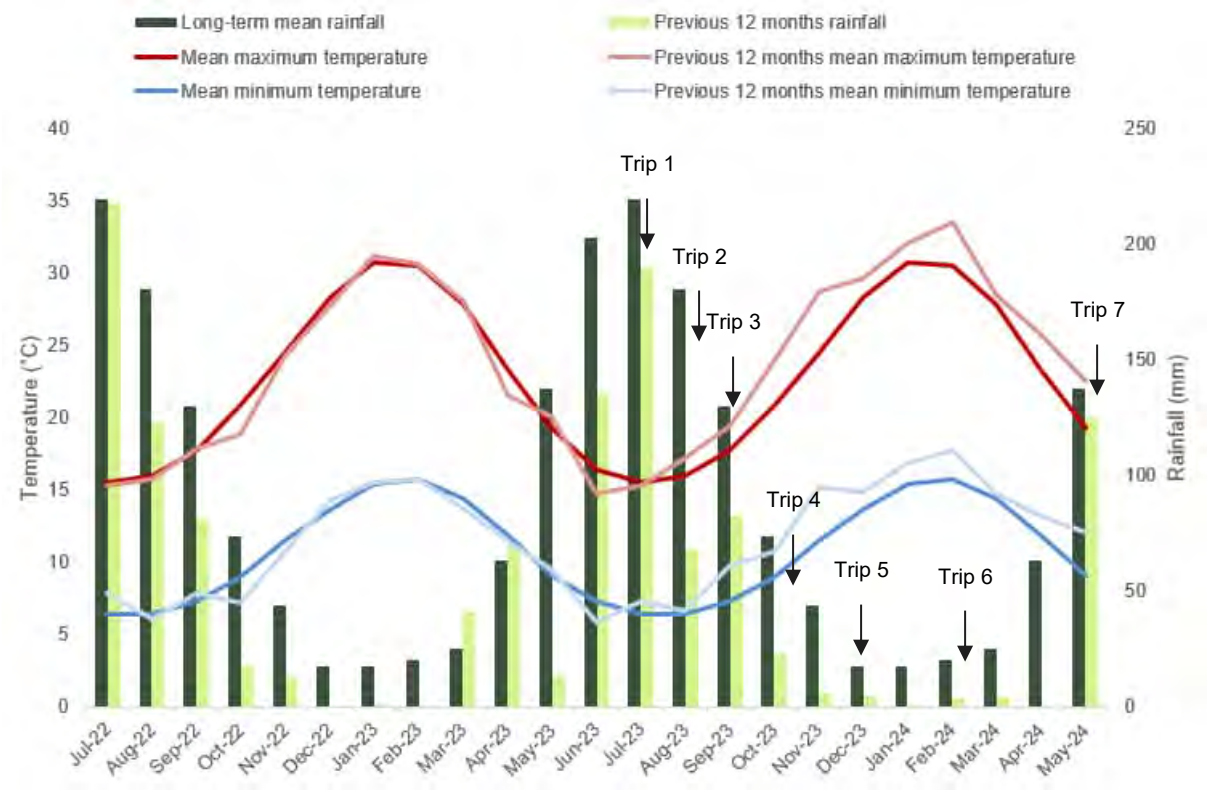
2.2.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a complete dataset is Karnet Weather Station (Station 9111), located within site, approximately 0.3 km from the closest polygon of the Survey Area.

Climate statistics were calculated using data from the most current climate normal, which is defined as a 30-year interval where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate (BoM, 2007).

The long-term (1965 to 2024) mean minimum temperature for Karnet Weather Station ranges from 6.3˚C (July) to 15.8˚C (February) and the long-term mean maximum temperature ranges from 15.5˚C (July) to 30.6˚C (January) (**Graph 1**) (BoM, 2023).

The Karnet Weather Station recorded 714.4 mm of rainfall in the 12 months prior to trip 1 of the field survey (July 2022 to June 2023), which is 422.6 mm below the long-term average of 1137 mm from 1964 to 2024 (BoM, 2023). In the three months prior to trip 1 of the field survey (April 2023 to June 2023), 220.3 mm of rainfall was recorded, which is 186.0 mm below the long-term average of 406.3 mm for the same period (BoM, 2023). Rainfall data from 2023 was the lowest recorded within the 60 years of rainfall data from Karnet Weather Station.



Graph 1: Climate summary of Karnet Weather Station

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (DEE, 2016). The Survey Area occurs within the Jarrah Forest bioregion and the Northern Jarrah Forest (JAF01) subregion.

The Northern Jarrah Forest subregion overlays Archaean granite and metamorphic rocks with an average elevation of 300 m, capped by extensive lateritic duricrust and interrupted by later drainage and dissected by occasional granite hills. In the east the laterite becomes greatly separated until it compresses isolated remnants. Vegetation comprises of Jarrah-Marri Forest in the west with Bullich and Blackbutt in the valleys grading to Wandoo and Marri woodlands in the east with Powder bark on breakaways. A common understorey of heath is found on granite rocks in the north and east forests and woodlands. The lower slopes, where rapid changes in the site conditions occur, support most of the diversity in the communities. The subregional area is 2,255,904 ha (Williams and Mitchell, 2001).

2.2.3 Soil Landscape Mapping

Soil landscape mapping of Western Australia consists of a compilation of various surveys at different scales varying between 1:20,000 and 1:3,000,000 (DPIRD, 2022). The mapping

comprises a nested hierarchy of levels, with each level a subdivision of the preceding level. Soil landscape mapping provides an indication of potential vegetation types and fauna habitats within the Survey Area and has been described below to the highest level of detail available for the Survey Area.

The Survey Area occurs across four soil landscape subsystems and one phase (**Table 1**; **Map 2**).

Table 1: Soil landscape subsystems and phases within the Survey Area

Subsystem or phase		Description	Area and percentage within Survey Area
Name	Code		
Cooke subsystem	255DpCO	Crests and upper slopes dominated by granite outcrop and very shallow yellow duplex soils, and yellow and brown massive earths.	119.64 ha 23.78 %
Dwellingup subsystem	255DpDW	Divides, lower to upper slopes and hillcrests. Duplex sandy gravels and loamy gravels with minor areas of shallow gravels, deep sandy gravels, yellow deep sands, and yellow and pale deep sands, often gravelly.	317.87 ha 63.18 %
Yarragil subsystem	255DpYG	Shallow, narrow, upper valleys of the deeply dissected Murray, Bindoon, and Helena units. Alluvial, clay and loam soils, moderately well drained, often gravelly, with some sands and loams. Salt prone. Woodland of *E. wandoo*, *E. accedens.*	33.34 ha 6.62 %
Yarragil DpYGh phase	255DpYGh	Very gentle to moderately inclined (<20%) concave valley side slopes. Moderately well drained yellow duplex soils and yellow and brown massive earths.	15.17 ha 3.02 %
Murray subsystem	255MvMy	Deeply incised valleys with red loamy earths, shallow duplexes, rock outcrops, Jarrah-Marri-Wandoo forest and woodland with mixed shrubland.	17.09 ha 3.40 %
Total			**501.7 ha, 100.0%**

2.2.4 Hydrography

No hydrographic features intersect the Survey Area. A total of 10 named hydrographical features occur within a 5 km radius of the Survey Area. Hydrographic features are listed below in **Table 2** and shown in **Map 3** (DWER, 2018).

Table 2: Hydrographic features in the vicinity of the Survey Area

Hydrographical feature	Description	Distance from Survey Area
Big Brook	Major River	0.1 km south
Dirk Brook	Significant stream	70 m northwest
Karnet Brook	Significant stream	3.5 km northwest
Myara Brook	Major Trib	3 km west
North Dandalup Reservoir	Water supply reservoir	1.7 km southwest
North Dandalup River	Minor River	4.7 km south
O'Neil Brook	Major Trib	2.8 km south

Hydrographical feature	Description	Distance from Survey Area
Serpentine Pipehead Dam	Mainstream	3.3 km north
Serpentine Reservoir	Water supply reservoir	0.7 km north
Serpentine River	Mainstream	0.8 km east

2.2.5 Pre-European Vegetation

The major source of data for pre-European vegetation mapping in Western Australia is the published and unpublished mapping of J. S. Beard at 1:250,000 scale. These vegetation types were later refined by Shepherd, Beeston, and Hopkins (2002), resulting in 819 Vegetation Association-level units, and a subsequent reclassification resulted in the creation of over 2,175 finer-scale System Associations (Beard *et al.*, 2013). The Survey Area occurs within one System Association, WEST DARLING_3, which comprises Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) (**Map 4**).

2.2.6 Conservation Areas

Conservation areas consist of areas protected for the purpose of conservation, including but not limited to National Parks, Nature Reserves, Conservation Parks, and Regional Parks. The Survey Area occurs within the Jarrahdale State Forest, which is vested under Conservation Commission of WA (DBCA, 2023a, 2023b). Nearby conservation areas are listed below and shown in **Map 5**.

- Dwellingup State Forest, located 70 m south of the Survey Area and is vested under Conservation Commission of WA.
- Serpentine National Park, located 0.8 km north of the Survey Area and is vested under Conservation Commission of WA.

2.2.7 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs), or significant wetlands. The Survey Area does not intersect any mapped ESAs (DWER, 2021). There are 34 ESAs within a 5 km radius of the Survey Area, comprising:

- 32 Swan Coastal Plain wetlands.
- One area on the Register of National Estate.
- One Threatened flora.

ESAs are shown in **Map 5**.

2.2.8 Land Use

No pastoral leases apply to the Survey Area. A single mining tenement exists within the Survey Area, Mineral Lease 1SA (ML1SA), held by Alcoa.

3.0 Methods

The surveys documented in this report were undertaken in accordance with relevant EPA and DAWE guidelines (see **Section 2.1**).

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds (the Desktop Study Area) was compiled prior to the field survey. The literature review considered a selection of relevant reports or datasets detailing assessments undertaken in the region that were either publicly available from sources such as the Index of Biodiversity Surveys for Assessments (IBSA) website, the EPA Consultation Hub, internet searches, or provided by Alcoa. These reports and datasets are listed below, summarised in **Appendix B**, and their locations in relation to the current Survey Area, as represented by their nearest point, are shown in **Map 6**:

- *Alcoa Black Cockatoo Nests - Myara Region (2011 - 2024)* (Kirkby and Alcoa of Australia Ltd, 2024).
- *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006), intersects the Survey Area.
- *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North* (GHD, 2021b), 1 km north of the Survey Area.
- *Black Cockatoo Habitat Assessment - Pinjarra Racecourse* (Harewood, 2019), 6 km west of the Survey Area.
- *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a), 8 km south of the Survey Area.
- *Fauna Assessment of the Rail Reserves in the Shire of Serpentine Jarrahdale* (GHD, 2012), 10 km north of the Survey Area.
- *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)* (Harewood, 2017), 17.5 km south of the Survey Area.

3.1.2 Database Searches

Database searches were undertaken to identify known black cockatoo values within the Desktop Study Area (**Table 3**).

Table 3: Database search details

Database name	Date received	Search target	Buffer around the Survey Area
Threatened and Priority Fauna database search plus additional black cockatoo database search (DBCA, 2023c)	08 June 2023	Threatened and Priority fauna	20 km
Protected Matters Search Tool (PMST) (DCCEEW, 2023b)	14 July 2023	Threatened flora, fauna, and ecological communities	20 km
NatureMap (DBCA, 2023d)	07 June 2023	Fauna	20 km

3.2 Field Surveys

3.2.1 Survey Timing

The field surveys were undertaken across four field trips as shown in **Table 4**.

Table 4: Survey timing

Phase	Survey trip	Tasks completed	Dates	Person field days
1	1	Ground-based habitat assessment	July 2023	12
1	2	Ground-based habitat assessment	August – September 2023	12
2	3	Follow-up hollow assessment	September 2023	7
1	4	Ground-based habitat assessment	October – November 2023	30
1	5	Ground-based habitat assessment	December 2023	30
2	6	Follow-up hollow assessment	February – March 2024	14
2	7	Follow-up hollow assessment	May – June 2024	16

3.2.2 Field Personnel

Details of field personnel, including their level of experience and role for each field trip are detailed in **Table 5**.

Table 5: Field personnel

Personnel	Experience	Role	Trips
Dr Michael Lohr	11 years	Principal Zoologist	1, 4, & 5
Evan Webb	7 years	Associate Zoologist	1, 2, 4, & 5
Poppy Walker	5 years	Senior Zoologist	1, 2, & 5
Datta Li	2 years	Zoologist	1, 2, 4, & 5
Lewis Berry	2 years	Ecologist	2, 4, & 5
Jack Munns	1 year	Ecologist	4 & 5
Chloe Hill	1 year	Ecologist	4
Tony Kirkby	25 years	Black Cockatoo Specialist	3, 6, & 7

3.2.3 Breeding Habitat

Black cockatoos nest in hollows that form in large trees, therefore breeding habitat was assessed by the presence or absence of habitat trees. During phase 1 surveys, trees that meet the following criteria were recorded using a GPS-enabled handheld device:

- Tree taxa is known to form suitable hollows, including trees endemic to southwest Western Australia such as Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), Tuart (*E. gomphocephala*), Karri (*E. diversicolor*), Wandoo (*E. wandoo*),

and Salmon Gum (*E. salmonophloia*), and non-endemic *Eucalyptus* and *Corymbia* trees.

- Tree is of a suitable diameter at breast height (DBH) to develop a nest hollow, which is greater than 500 mm for most tree species, regardless of the presence or absence of hollows. DBH was measured approximately 1.3 m above the ground, except in instances where trees had swelling or forking at breast height, in which case the diameter measurement was taken just above the swelling or forking. In instances where trees had multiple stems at breast height, the stem with the largest diameter was recorded.
- Tree contains hollows that are suitable for nesting by black cockatoos. The suitability of a hollow is contingent on its physical dimensions and orientation. Suitable hollows are usually oriented upwards, above 3 m high, and have an estimated opening diameter of greater than 100 mm (Saunders, Mawson and Dawson, 2014).

Recorded trees were categorised as potential, suitable, or known nesting trees in accordance with the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022) and given a ranking of 1 – 5 based on the black cockatoo nesting and potential nesting tree ranking system developed by Bamford Consulting Ecologists:

- Known nesting tree:
  1. Active nest observed. Adult or immature bird seen entering or emerging from hollow.
  2. Hollow of suitable size and angle (i.e. near-vertical) visible with chew marks around entrance.
- Suitable nesting tree:
  3. Potentially suitable hollow visible but no chew marks present.
- Potential nesting tree:
  4. Tree with large hollows that are not vertical or near vertical.
  5. Tree with intact branches and a spreading crown, lacking large hollows.

Phase 2 assessment of trees assessed as suitable in ground-based phase 1 assessments were either confirmed as having suitable hollows, or not having suitable hollows present. If hollows were not present, these trees were re-classed as potential nesting trees.

Following the phase 1 on-ground assessment, trees categorised as known or suitable nesting trees (ranked 1 – 3) were inspected by Tony Kirkby during phase 2 assessments. Where necessary, a drone, telescopic pole camera, or telephoto lens was used. The presence of suitable nest hollows was either confirmed, or trees were re-categorised as potential nesting trees.

3.2.4 Night Roosting Habitat

Potential black cockatoo roosting habitat consists of tall trees, particularly when they occur near water sources (DAWE, 2022). Areas containing tall trees suitable for black cockatoo roosting were identified and recorded. If observed, evidence of black cockatoo roosting, which typically consists of large amounts of scat with branch clippings and moulted feathers at the base of trees, was recorded.

3.2.5 Foraging Habitat

Foraging habitat was assessed based on the presence and coverage of known foraging plants for black cockatoos as outlined in the *Referral guideline for 3 WA threatened black cockatoo species* (DAWE, 2022) or other available literature. Foraging habitat was mapped

and classified using the Foraging Habitat Scoring Tool (DAWE, 2022) and the scoring system for the assessment of foraging value of vegetation (DCCEEW, 2023a). For the purposes of referral to the Minister for the Environment, the Foraging Habitat Scoring Tool is to be applied once to the entire impact area of a proposed action, even if there is more than one type of foraging habitat (DAWE, 2022), however for the purposes of this report a foraging habitat score has been calculated for each habitat type.

If observed, evidence of black cockatoo foraging, including direct observations of foraging and chewed foraging material (e.g. nuts or cones) was recorded.

3.2.6 Alcoa Significant Trees

Alcoa Significant Trees are defined as the following:

- A jarrah tree with a diameter of not less than 2,000 mm at a height of 1,300 mm above ground level.
- A marri tree with a diameter of not less than 1,500 mm at a height of 1,300 mm above ground level.

AND

- Is healthy (i.e. retaining majority of limbs, with high percentage leaf cover on remaining limbs) and may provide roosting habitat for black cockatoos, as determined by a suitably qualified and experienced person.

Potential significant trees were identified from phase 1 survey data and were subject to follow up assessment by Tony Kirkby during phase 2 assessments.

3.2.7 Limitations

Limitations and constraints of the black cockatoo survey are detailed below in **Table 6**.

Table 6: Limitations and constraints associated with the survey

Variable	Degree of limitation	Potential constraints on survey outcomes
Availability of data and information	None	Sufficient data and information, including regional and local contextual information, was available to complete the scope of the survey.
Competency and experience of the survey team	None	The survey was undertaken by a team with extensive experience undertaking similar scopes within the bioregion: • Principal Zoologist Dr Michael Lohr – 11 years' experience. • Associate Zoologist Evan Webb – 7 years' experience. • Senior Zoologist Poppy Walker – 5 years' experience. • Zoologist Datta Li – 2 years' experience. • Ecologist Lewis Berry – 2 years' experience. • Ecologist Jack Munns – 1 year experience. • Ecologist Chloe Hill – 1 year experience. • Phase 2 checks were undertaken by Tony Kirkby, a black cockatoo specialist with 25 years' experience.
The proportion of fauna identified, recorded, or collected	None	Targeted fauna taxa were able to be identified to species level with a high degree of confidence.

Variable	Degree of limitation	Potential constraints on survey outcomes
Scope of the survey	None	The scope of the survey was limited to black cockatoos. No further exclusions were made within this group.
Adequacy of the survey intensity and proportion of survey achieved	None	Sufficient time and effort were allocated to the survey given the size and complexity of the Survey Area and the expected level of survey intensity.
Access problems	None	The Survey Area was sufficiently accessed on foot.
Timing, weather, and season	None	Black cockatoo habitat assessments can be undertaken at any time of year. The primary survey period for breeding activity of all three black cockatoos in the Jarrah Forest region is between August – December, however this was outside the scope of this assessment.
Disturbance that may have affected the results of survey	None	Areas of disturbance associated with mining activities and bushfires were present within the Survey Area but were not a limitation on the results of the survey.
Problems with data and analysis, including sampling biases	None	No problems with data and analysis were encountered.

4.0 Results

4.1 Desktop Assessment

The Survey Area occurs within the modelled distribution of all three significant species of black cockatoo, the Baudin's Cockatoo, Carnaby's Cockatoo, and Forest Red-tailed Black Cockatoo (DAWE, 2022).

Additional surveys were undertaken for Alcoa between 2011 and 2024 within the Huntly Mine Myara region. These surveys identified 413 nest trees (i.e. known nesting trees), 178 possible nest trees (i.e. suitable nesting trees), and 29 Alcoa Significant Trees (Kirkby and Alcoa of Australia Ltd, 2024). Locations of trees recorded during these additional surveys are presented in **Map 7**. Ten nest trees, six possible nest trees, and two Alcoa Significant Trees occur within the Survey Area occur within the current Survey Area as detailed in **Table 7**.

A previous survey undertaken by GHD (2021b), approximately 1 km north of the Survey Area, recorded large numbers of black cockatoos (854 records consisting of 443 Carnaby's Cockatoos, 40 Baudin's Cockatoos, and 371 Forest Red-tailed Black Cockatoos). GHD recorded one black cockatoo roost site and 112 black cockatoo foraging sites, comprising 106 Forest Red-tailed Black Cockatoo, nine Carnaby's Cockatoo, and one Baudin's Cockatoo. The GHD report refers to two main areas of known black cockatoo breeding, a Forest Red-tailed Black Cockatoo breeding site approximately 10 km north of the Survey Area and a Baudin's Cockatoo breeding site approximately 6 km northeast of the Survey Area.

The DBCA database search results are presented in **Map 7** and summarised below:

- A total of 962 black cockatoo records were identified, comprising 138 Baudin's Cockatoo records, 578 Carnaby's Cockatoo records, 192 Forest Red-tailed Black Cockatoo records, and 54 White-tailed Black Cockatoo (i.e. Baudin's Cockatoo or Carnaby's Cockatoo) records.
- Baudin's Cockatoo records were identified 4.2 km west of the Survey Area, Carnaby's Cockatoo records within the Survey Area, Forest Red-tailed Black Cockatoo records 1.7 km east of the Survey Area and White-tailed Cockatoo records 2.1 km north of the Survey Area.
- Two confirmed White-tailed Black Cockatoo (i.e. Baudin's Cockatoo or Carnaby's Cockatoo) breeding sites occur 4.7 km north-northwest and 12.3 km northeast of the Survey Area. Both were recorded in 2019 and occur in natural hollows.
- Eight potential White-tailed Black Cockatoo breeding sites occur to the west and northwest of the Survey Area, the closest of which is 3.3 km north of the Survey Area. All occur in artificial hollows.
- Four potential Forest Red-tailed Black Cockatoo breeding sites occur to the north of the Survey Area, the closest of which is 3.3 km north of the Survey Area. All were recorded in 2019 and occur in natural hollows.
- Fifty-eight black cockatoo roost sites were returned by the database results, of which 37 recorded black cockatoo activity since 2010, occurring mostly to the north and west of the Survey Area. The nearest site is approximately 2 km west of the Survey Area.

Key findings of the literature review are summarised in **Appendix B**.

Table 7: Black cockatoo nesting trees recorded during additional surveys between 2011 and 2024 within the Survey Area

Tree type	Tree taxa	Location (WGS84)	
		Latitude	Longitude
Nest tree	Marri (*Corymbia calophylla*)	-32.4346654	116.0651835
Nest tree	Marri (*Corymbia calophylla*)	-32.47524049	116.1227723
Nest tree	Marri (*Corymbia calophylla*)	-32.48910476	116.0667231
Nest tree	Marri (*Corymbia calophylla*)	-32.47600105	116.1283732
Nest tree	Marri (*Corymbia calophylla*)	-32.43501916	116.0703281
Nest tree	Jarrah (*Eucalyptus marginata*)	-32.47560849	116.1616754
Nest tree	Marri (*Corymbia calophylla*)	-32.45267177	116.0785361
Nest tree	Marri (*Corymbia calophylla*)	-32.47529313	116.1225589
Nest tree	Jarrah (*Eucalyptus marginata*)	-32.47273521	116.1664245
Nest tree	Stag	-32.46984424	116.2445461
Possible nest tree	Marri (*Corymbia calophylla*)	-32.47510541	116.1279987
Possible nest tree	Jarrah (*Eucalyptus marginata*)	-32.49015533	116.1155107
Possible nest tree	Marri (*Corymbia calophylla*)	-32.46891339	116.2232762
Possible nest tree	Marri (*Corymbia calophylla*)	-32.47102919	116.062956
Possible nest tree	Marri (*Corymbia calophylla*)	-32.47273973	116.0653784
Possible nest tree	Marri (*Corymbia calophylla*)	-32.48482331	116.0938686
Alcoa Significant Tree	Marri (*Corymbia calophylla*)	-32.47302941	116.2271562
Alcoa Significant Tree	Jarrah (*Eucalyptus marginata*)	-32.45911919	116.2111872

4.2 Fauna Habitat

Three fauna habitats were identified and mapped within the Survey Area. Fauna habitats are presented in **Map 8** and are described below in **Table 8**. Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding.

Table 8: Fauna habitat recorded within the Survey Area

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Jarrah-Marri Forest	492.4 ha, 98.2%	Undulating plains, mid and low slopes and broad valleys with loam soils and laterite rock. Vegetation consists of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) open forest, over Macrozamia and Grass tree (*Xanthorrhoea preissii*) shrubland, with isolated areas of *Banksia grandis* and *Allocasuarina fraseriana*. Over areas of low *Persoonia sp., Bossiaea sp.,* sedges, ferns. Microhabitats include hollows in trees and logs, leaf litter and woody debris.	
Drainage Line	9.2 ha, 1.8%	Drainage line and seasonal creeks with a clay loam and open mosaic woodland of Flooded Gum (*Eucalyptus rudis*), Bullich (*E. megacarpa*), Blackbutt (*E. patens*), Jarrah (*E. marginata*) and Marri (*C. calophylla*), over mixed shrubland of Melaleuca and other *Myrtaceae sp.,* over low shrub/sedgeland and herbs. Microhabitats include tree and log hollows, woody debris, peeling bark and leaf litter. This habitat is considered high quality with little to no disturbances or fire evidence.	

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Rehab	0.1 ha, 0.01%	Former mine pits that have been ripped and replanted, currently occupied by seedlings.	-
Total	501.7 ha, 100.0%		

4.3 Black Cockatoo Observations

The presence of Baudin's Cockatoo, Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo within the Survey Area were confirmed via sightings, calls, foraging evidence, roosting evidence, and feathers as shown below in **Table 9.** Locations are presented in **Map 8** and **Appendix C**.

Table 9: Black cockatoo observations within Survey Area

Observation type	Carnaby's Cockatoo	Baudin's Cockatoo	Forest Red-tailed Black Cockatoo	White-tailed Black Cockatoo Sp.	Black Cockatoo Sp.	Total
Sighting	1	-	23	1	-	**25**
Sighting - Overhead	1	9	-	-	-	**10**
Call	-	-	4	-	-	**4**
Foraging evidence	-	2	38	-	-	**40**
Scat	-	-	-	-	11	**11**
Feather	-	-	10	1		**11**
Total	**2**	**11**	**75**	**2**	**11**	**101**

4.4 Breeding Habitat

The Jarrah-Marri Forest and Drainage Line habitats constitute black cockatoo breeding habitat. Following phase 1 and phase 2 surveys, total of five known nesting trees and 10,034 potential nesting trees were recorded within these habitat types. A Carnaby's Cockatoo was flushed from one of the known nesting trees, and the remaining four known nesting trees were identified by chew marks around the hollow entrance. A summary of these trees is presented in **Table 10**. All recorded trees are presented in **Map 9** and **Appendix D**.

Table 10: Black cockatoo nesting trees recorded within the Survey Area

Tree taxa	Known nesting tree		Suitable nesting tree	Potential nesting tree		Total
	Category 1	Category 2	Category 3	Category 4	Category 5	
Blackbutt (*E. patens*)	-	-	-	-	55	**55**
Bullich (*E. megacarpa*)	-	-	-	-	9	**9**
Flooded gum (*E. rudis*)	-	-	-	-	6	**6**
Jarrah (*E. marginata*)	1	-	-	135	7,115	**7,251**
Marri (*C. calophylla*)	-	3	-	26	1,864	**1,893**
Stag	-	1	-	41	783	**825**
Total	**1**	**4**	**-**	**202**	**9,832**	**10,039**

4.5 Night Roosting Habitat

During the surveys, eleven black cockatoo roosting sites were recorded within the Survey Area, of which six were confirmed to be Forest Red-tailed Black Cockatoo roosting sites and five were not able to be attributed to a specific black cockatoo taxon. All Jarrah-Marri Forest and Drainage Line habitat constitutes potential night roosting habitat and it is likely that additional roosting sites occur within these habitats that weren't detected during the field surveys (**Map 8; Appendix D**).

4.6 Foraging Habitat

Evidence of black cockatoo foraging (feeding debris) was observed to occur almost continuously throughout the Jarrah-Marri Forest habitat. Feeding debris consisted of chewed Jarrah and Marri nuts, mostly attributed to Forest Red-tailed Black Cockatoos with some evidence of Baudin's Cockatoo and Carnaby's Cockatoo foraging.

According to the DAWE (2022) Foraging Habitat Scoring Tool, the Survey Area contains 501.6 ha of high quality foraging habitat for Carnaby's Cockatoos, Baudin's Cockatoos, and Forest Red-tailed Black Cockatoos (**Table 11; Map 9**).

According to the DCCEEW (2023a) scoring system for the assessment of foraging value of vegetation, the Survey Area contains 501.6 ha of very high foraging value habitat for all three Black Cockatoos (**Table 12; Table 13; Table 14; Map 9**).

Table 11: DAWE foraging habitat scoring tool results

Taxa	Area (ha)	Starting Habitat Score	Foraging Potential	Connectivity	Proximity to Breeding	Proximity to Roosting	Impact from Disease	Total Score	Quality
Carnaby's Cockatoo	501.6	10	0	0	0	0	0	10	High
Baudin's Cockatoo	501.6	10	0	0	0	0	0	10	High
Forest Red-tailed Black Cockatoos	501.6	10	0	0	0	0	0	10	High

Table 12: DCCEEW scoring system results for Baudin's Cockatoo

Habitat	Area	Foraging Value
Jarrah-Marri Forest	492.4 ha	Very High (7) – Native Kwongan heath and shrubland (>30% projected foliage cover), *Banksia* and *Eucalypt* woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.
Drainage Line	9.2 ha	Very High (7) – Native Kwongan heath and shrubland (>30% projected foliage cover), *Banksia* and *Eucalypt* woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.

Habitat	Area	Foraging Value
Rehab	0.06 ha	None (0) – No Proteaceae, Eucalypts or other potential sources of food. May include bare ground or developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).
Site Context	**Proximity of the site in relation to other habitat**	**Justification**
Ranking: 3 **(top ranking)**	3 - Site is within 6 km of known breeding site.	Two confirmed White-tailed Black Cockatoo breeding sites occur 4.7 km north northwest and 12.3 km northeast of the Survey Area. GHD (2021b) refers to a known Baudin's Cockatoo breeding site approximately 6 km northeast of the Survey Area.
	3 - Site is within 12 km of other foraging resources with site condition of at least 3.	Foraging resources occur throughout the Survey Area and surrounds.

Table 13: DCCEEW scoring system results for Carnaby's Cockatoo

Habitat	Area	Foraging Value
Jarrah-Marri Forest	492.4 ha	Very High (7) – Marri-Jarrah Forest and woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.
Drainage Line	9.2 ha	Very High (7) – Marri-Jarrah Forest and woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.
Rehab	0.06 ha	None (0) – No Proteaceae, Eucalypts or other potential sources of food. May include bare ground or developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).
Site Context	**Proximity of the site in relation to other habitat**	**Justification**
Ranking: 3 **(top ranking)**	3 - Site is within 6 km of known breeding site.	Two confirmed White-tailed Black Cockatoo breeding sites occur 4.7 km north northwest and 12.3 km northeast of the Survey Area.
	3 - Site is within 12 km of other foraging resources with site condition of at least 3.	Foraging resources occur throughout the Survey Area and surrounds.

** Confirmed record from the DBCA database search is located within Serpentine Reservoir.

Table 14: DCCEEW scoring system results for Forest Red-tail Black Cockatoo

Habitat	Area	Foraging Value
Jarrah-Marri Forest	492.4 ha	Very High (7) - Marri-Jarrah-Karri Forest, other *Eucalypt* woodlands, or *Allocasuarina* woodlands, with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.
Drainage Line	9.2 ha	Very High (7) - Marri-Jarrah-Karri Forest, other *Eucalypt* woodlands, or *Allocasuarina* woodlands, with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.
Rehab	0.06 ha	None (0) – No Proteaceae, Eucalypts or other potential sources of food. May include bare ground or developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).
Site Context	**Proximity of the site in relation to other habitat**	**Justification**
Ranking: 3 **(top ranking)**	2 - Site is within 12 km of known breeding site.	GHD (2021b) refers to a known Forest Red-tailed Black Cockatoo breeding site approximately 10 km north of the Survey Area.
	3 - Site is within 12 km of other foraging resources with site condition of at least 3.	Foraging resources occur throughout the Survey Area and surrounds.

4.7 Alcoa Significant Trees

One Alcoa Significant Tree was confirmed in the phase 2 assessment (**Map 9**).

4.8 Non-target Fauna

An inventory of non-target fauna opportunistically recorded during the field survey is provided below in **Table 15**.

Table 15: Non-target fauna recorded within the Survey Area

Family	Scientific Name	Common Name	Conservation Status		Remains	Scat	Sighting	Total
			State	Common wealth				
Birds								
Acanthizidae	*Smicrornis brevirostris*	Weebill	-	-			3	**3**
Accipitridae	*Accipiter fasciatus*	Brown Goshawk	-	MA			1	**1**
Artamidae	*Cracticus nigrogularis*	Pied Butcherbird	-	-			1	**1**
Artamidae	*Cracticus torquatus*	Grey Butcherbird	-	-			1	**1**
Artamidae	*Strepera versicolor*	Grey Currawong	-	-			1	**1**
Cacatuidae	*Eolophus roseicapilla*	Galah	-	-	1			**1**
Columbidae	*Phaps chalcoptera*	Common Bronzewing	-	-			1	**1**
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	-	-			4	**4**
Petroicidae	*Petroica boodang*	Scarlet Robin	-	-			1	**1**
Petroicidae	*Petroica goodenovii*	Red-capped Robin	-	-			1	**1**
Psittaculidae	*Barnardius zonarius*	Australian Ringneck	-	-	1		1	**2**
Strigidae	*Ninox boobook*	Boobook Owl	-	MA			2	**2**
Mammals								
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4	-			1	**1**
Suidae	**Sus scrofa*	Pig	-	-		1		**1**
Tachyglossidae	*Tachyglossus aculeatus acanthion*	Short-beaked Echidna	-	-		1		**1**
Reptiles								
Agamidae	*Pogona minor*	Dwarf Bearded Dragon	-	-			1	**1**
Scincidae	*Egernia kingii*	King's Skink	-	-			1	**1**
Scincidae	*Egernia napoleonis*	South-western Crevice-skink	-	-			2	**2**
Scincidae	*Hemiergis initialis initialis*	Southwestern Earless Skink	-	-			2	**2**
Varanidae	*Varanus rosenbergi*	Heath Goanna	-	-			1	**1**

* = introduced species

5.0 Discussion and Conclusion

All three southwest black cockatoo taxa were recorded within the Survey Area. Given the large number of records from both the field survey and desktop assessment, all three species appear to regularly occur and use habitats within the Survey Area and surrounds.

A total of five known nesting trees were recorded within the Survey Area, of which four had been recorded by Tony Kirkby during previous surveys, and one was newly identified during the current survey. A Carnaby's Cockatoo was flushed from one of the known nesting trees, and the remaining four known nesting trees were identified by chew marks around the hollow entrance. Given that suitable nest hollows likely take up to 200 years to develop, these trees provide a resource for black cockatoos that is critical for their long-term survival and unable to be replaced in the short-term (DAWE, 2022). Potential nesting trees, of which 10,034 were recorded, are not currently suitable for black cockatoo breeding, however the retention of these trees is important to secure the supply of hollows in future (DAWE, 2022). One Alcoa Significant Tree was also identified.

Black cockatoos prefer roosting sites located near water sources and require foraging resources within 20 km of their roosts (DAWE, 2022). Eleven black cockatoo roosting sites were recorded, of which six were confirmed to be Forest Red-tailed Black Cockatoo roosting sites and five were not able to be attributed to a specific black cockatoo taxon. The actual number of roosting sites within the Survey Area is likely to be far greater given the abundance of suitable habitat and availability of water sources associated with Drainage Line habitat, generally where vegetation is sufficiently open to facilitate black cockatoo access, and mining infrastructure such as sumps and dams.

Foraging evidence for all three black cockatoo taxa was recorded in the form of feeding debris, and Forest Red-tailed Black Cockatoo foraging evidence was particularly widespread throughout the entire Survey Area. Similar foraging habitat is widespread throughout the broader region outside the Survey Area, although substantial clearing has occurred in the immediate vicinity of the Survey Area for mining activities. Despite this, habitat connectivity remains relatively intact as clearing has been undertaken in a patchy manner, forming a mosaic with surrounding habitat. These foraging habitats are likely relied upon by all three species, both during the breeding season for the successful fledging of their chicks, and during the non-breeding season to rebuild condition.



6.0 References

Beard, J.S. *et al.* (2013) 'The vegetation of Western Australia at the 1:3,000,000 scale. Explanatory memoir. Second edition', *Conservation Science W. Aust.*, 9(1), pp. 1–152.

BoM (2007) *About Climate Statistics*. Available at: http://www.bom.gov.au.

BoM (2024) *Climate Data Online*. Available at: http://www.bom.gov.au.

Commonwealth of Australia (1999) *Environment Protection and Biodiversity Conservation Act 1999*. Australia. Available at: www.legislation.gov.au.

DAWE (2022) *Referral guideline for 3 WA threatened black cockatoo species*. Canberra, Australia. Available at: https://doi.org/978-176003-330-9.

DBCA (2023a) *DBCA - Lands of Interest (DBCA-012)*. Available at: https://catalogue.data.wa.gov.au.

DBCA (2023b) *DBCA - Legislated Lands and Waters (DBCA-011)*. Available at: https://catalogue.data.wa.gov.au.

DBCA (2023c) *DBCA Threatened and Priority Fauna Database request (Custom Search)*.

DBCA (2023d) *NatureMap Database Search*. Perth, Australia.

DCCEEW (2023a) *Habitat scoring system for WA black cockatoo foraging habitat*. Canberra, Australia.

DCCEEW (2023b) *Protected Matters Search Tool*. Available at: https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool.

DEE (2016) *Interim Biogeographic Regionalisation for Australia, Version 7*. Canberra, Australia. Available at: www.environment.gov.au.

DEWHA (2010) *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.dcceew.gov.au.

DoE (2013) *Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.environment.gov.au.

DPIRD (2022) *Soil Landscape Mapping - Best Available (DPIRD-027)*. Perth, Australia. Available at: https://catalogue.data.wa.gov.au.

DWER (2018) *Hydrography, Linear (Hierarchy) (DWER-031)*. Perth, Australia: Landgate. Available at: https://catalogue.data.wa.gov.au.

DWER (2021) *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*. Available at: https://catalogue.data.wa.gov.au/.

Environmental Management and Research Consultants (2006) *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region*.

EPA (2016) *Environmental Factor Guideline - Terrestrial Fauna*. Perth. Available at: https://www.epa.wa.gov.au.

EPA (2020) *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment*. Available at: https://www.epa.wa.gov.au.

GHD (2012) *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment*.

GHD (2021a) *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine-Holyoake*.



GHD (2021b) *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine-Myara North*.

Government of Western Australia (1986) *Environmental Protection Act 1986*. Available at: www.legislation.wa.gov.au.

Government of Western Australia (2016) *Biodiversity Conservation Act 2016*. Available at: www.legislation.wa.gov.au.

Harewood, G. (2017) *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)*.

Harewood, G. (2019) *Black Cockatoo Habitat Assessment - Pinjarra Racecourse*.

Kirkby, T. and Alcoa of Australia Ltd (2024) *Alcoa Black Cockatoo Nests - Myara Region (2011 - 2024)*. Perth, Australia.

Saunders, D.A., Mawson, P.R. and Dawson, R. (2014) 'Use of tree hollows by Carnaby's Cockatoo and the fate of large hollow-bearing trees at Coomallo Creek, Western Australia 1969-2013', *Biological Conservation* [Preprint]. Available at: https://doi.org/10.1016/j.biocon.2014.07.002.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J. (2002) *Native vegetation in Western Australia: Extent, type and status. Resource Management Technical Report 249*. Perth, Australia. Available at: https://library.dpird.wa.gov.au.

Williams, K. and Mitchell, D. (2001) *Jarrah Forest 1 (JF1 – Northern Jarrah Forest subregion)*. Perth, Australia.

7.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our 2023 Charity Partner - Lifeline, for every completed form.

Appendix A Maps

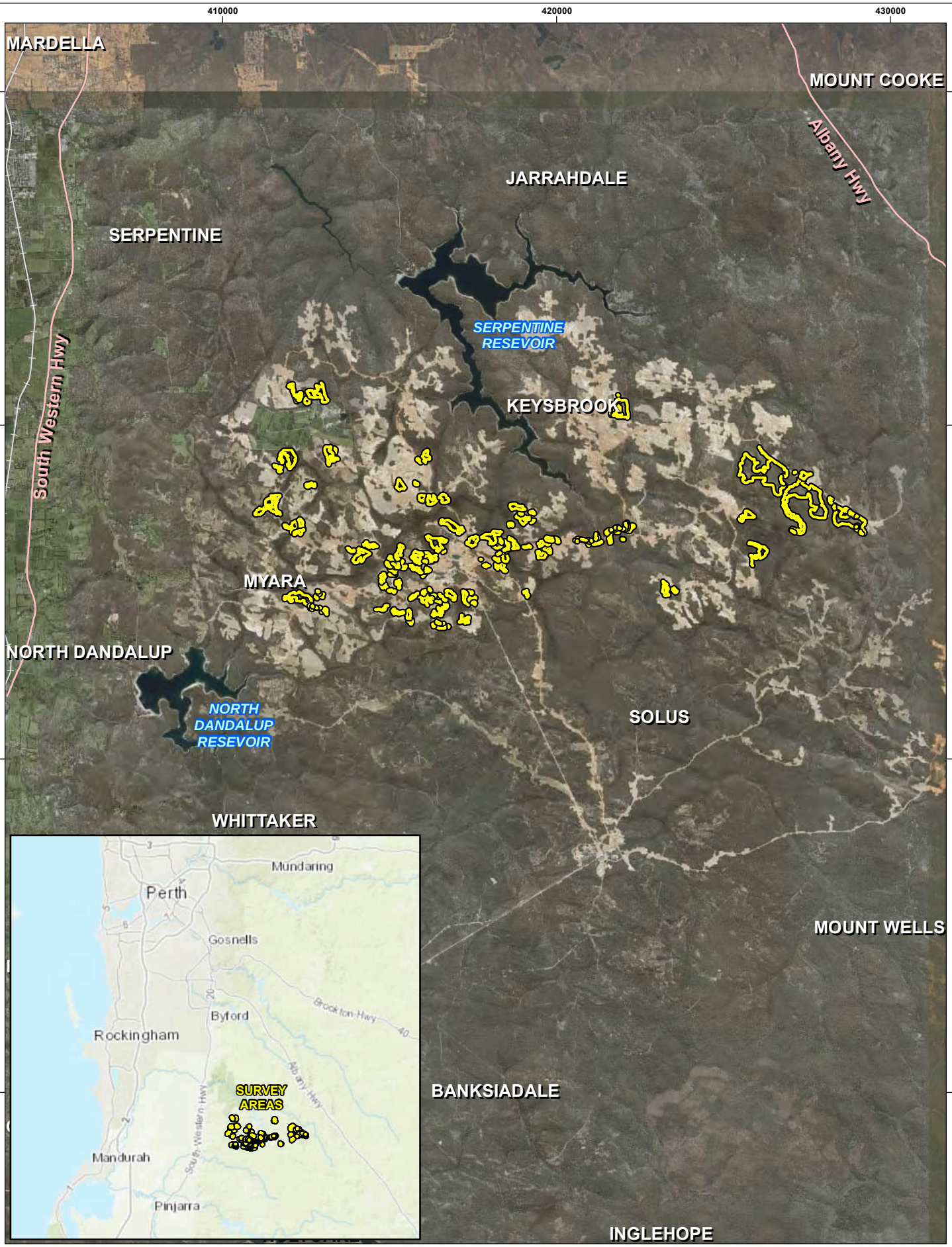
Black Cockatoo Habitat Assessment

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

11 July 2024



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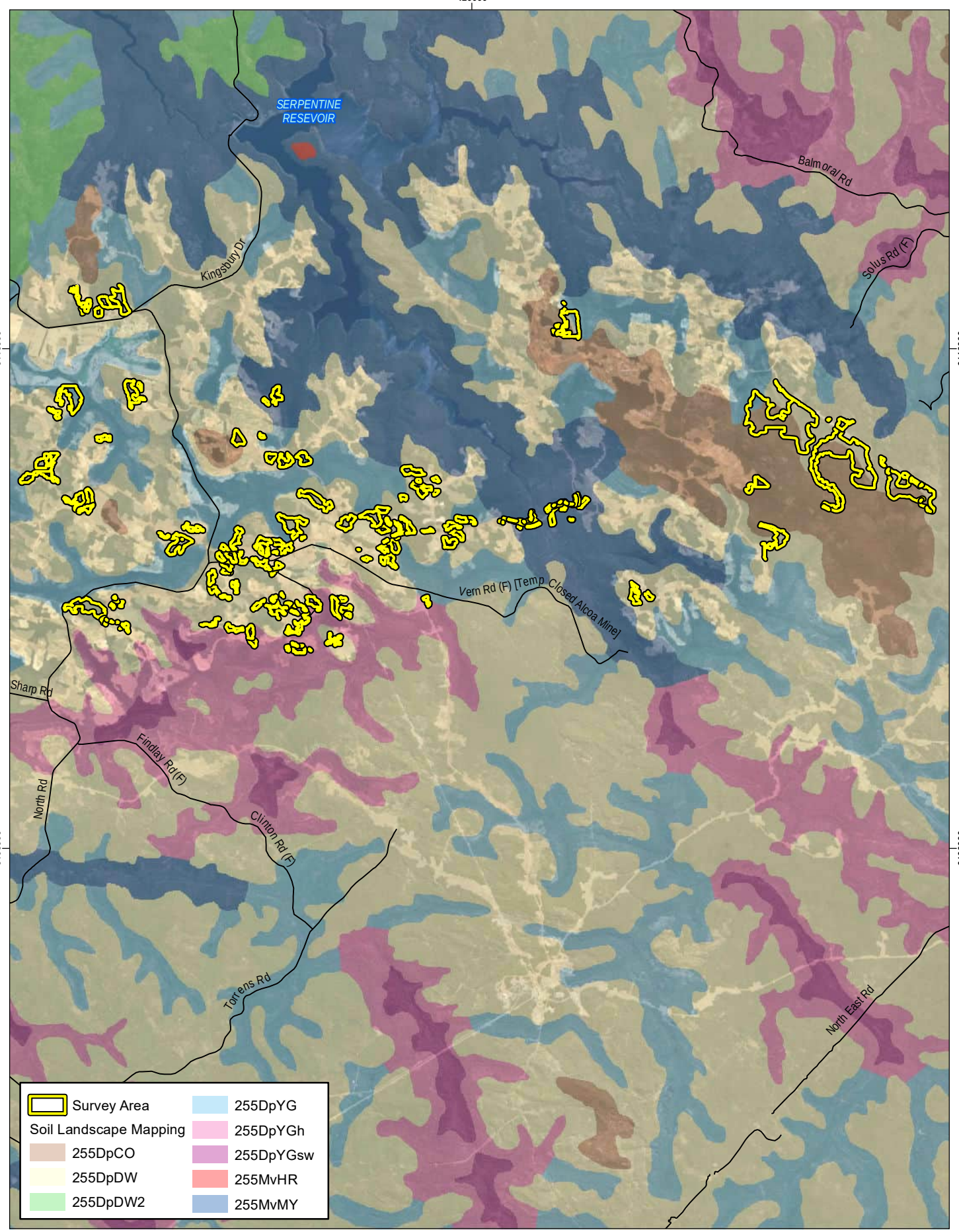
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Survey Area

MAP 1

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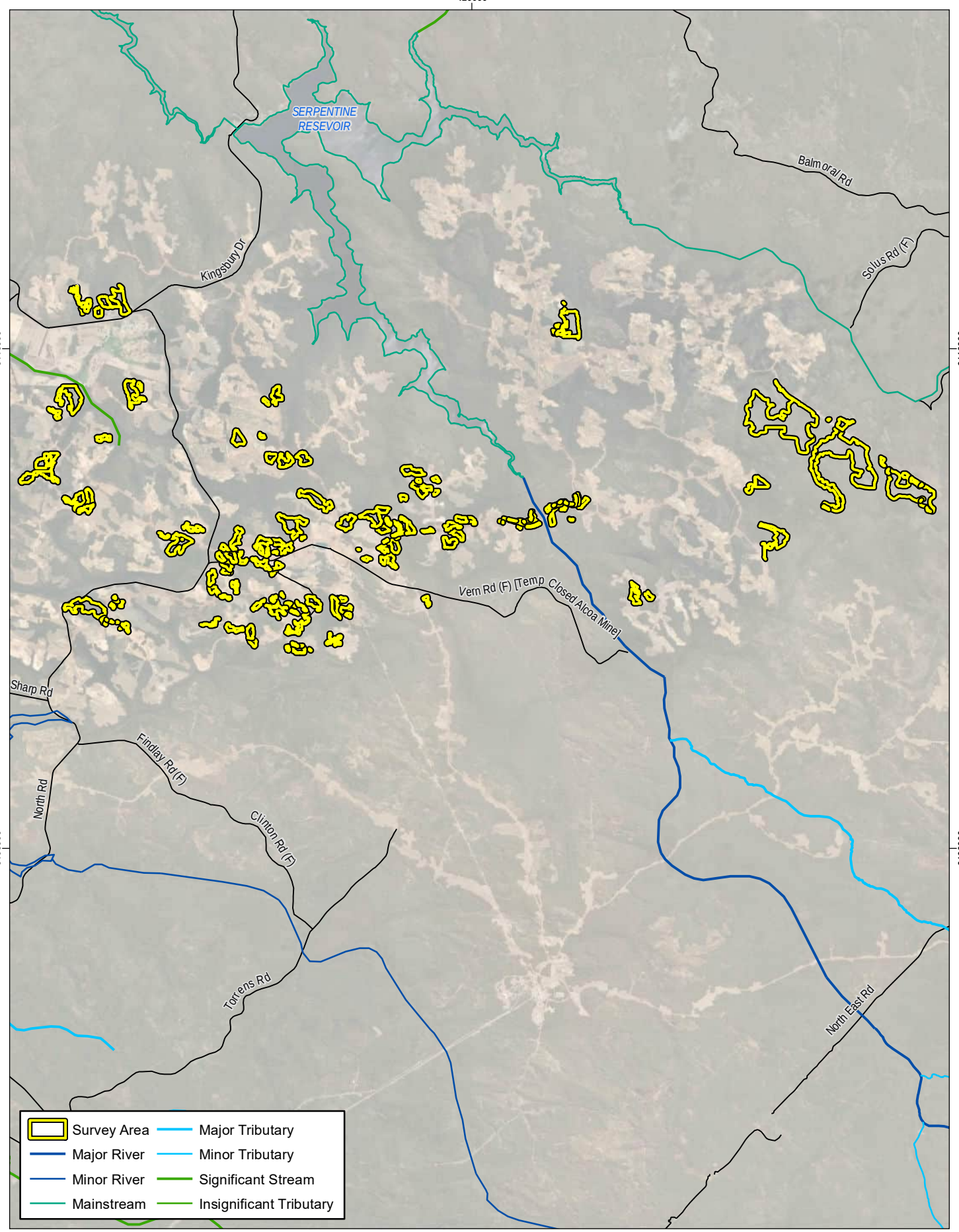
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Soil Landscape Mapping

MAP 2

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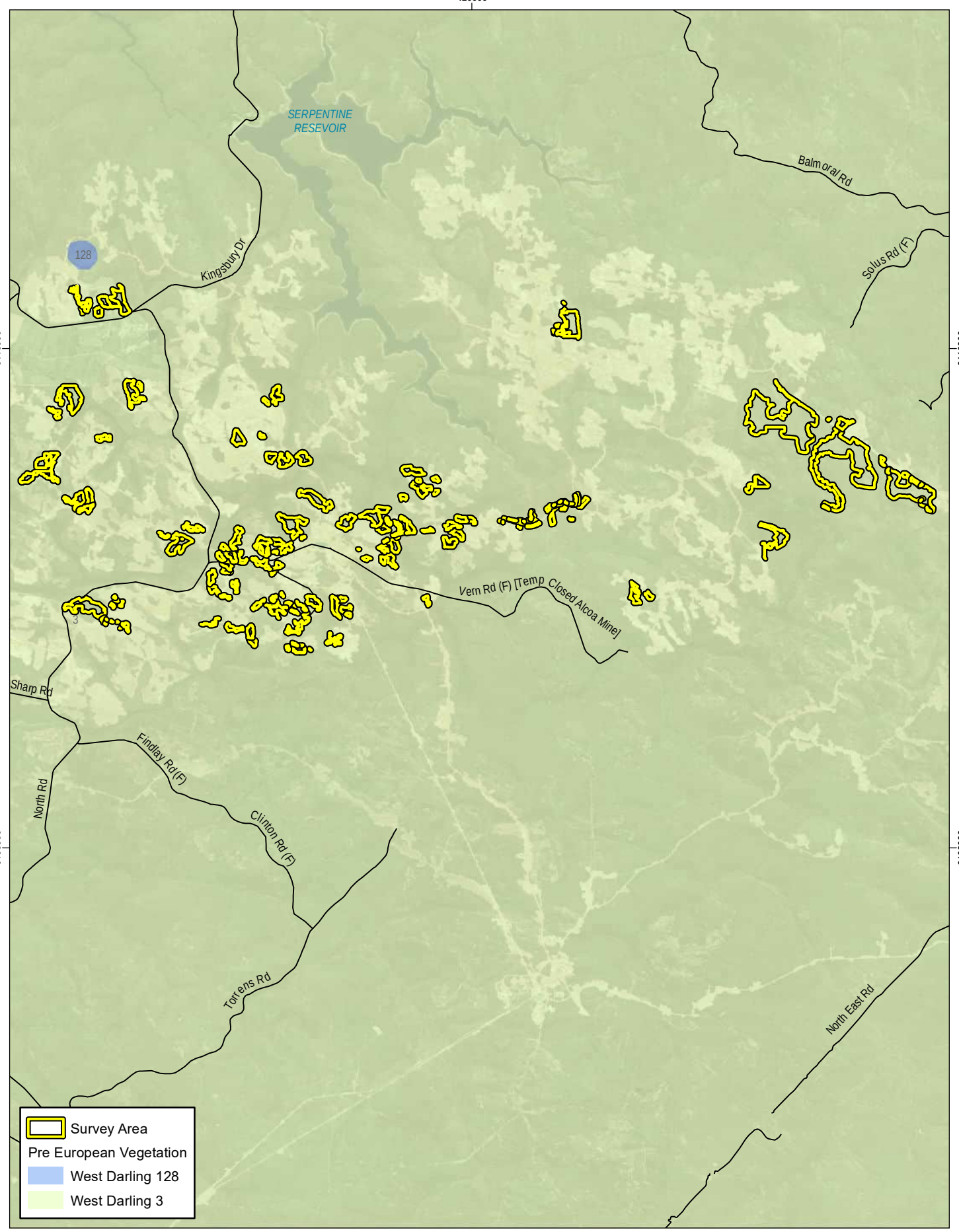
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Hydrography

MAP 3

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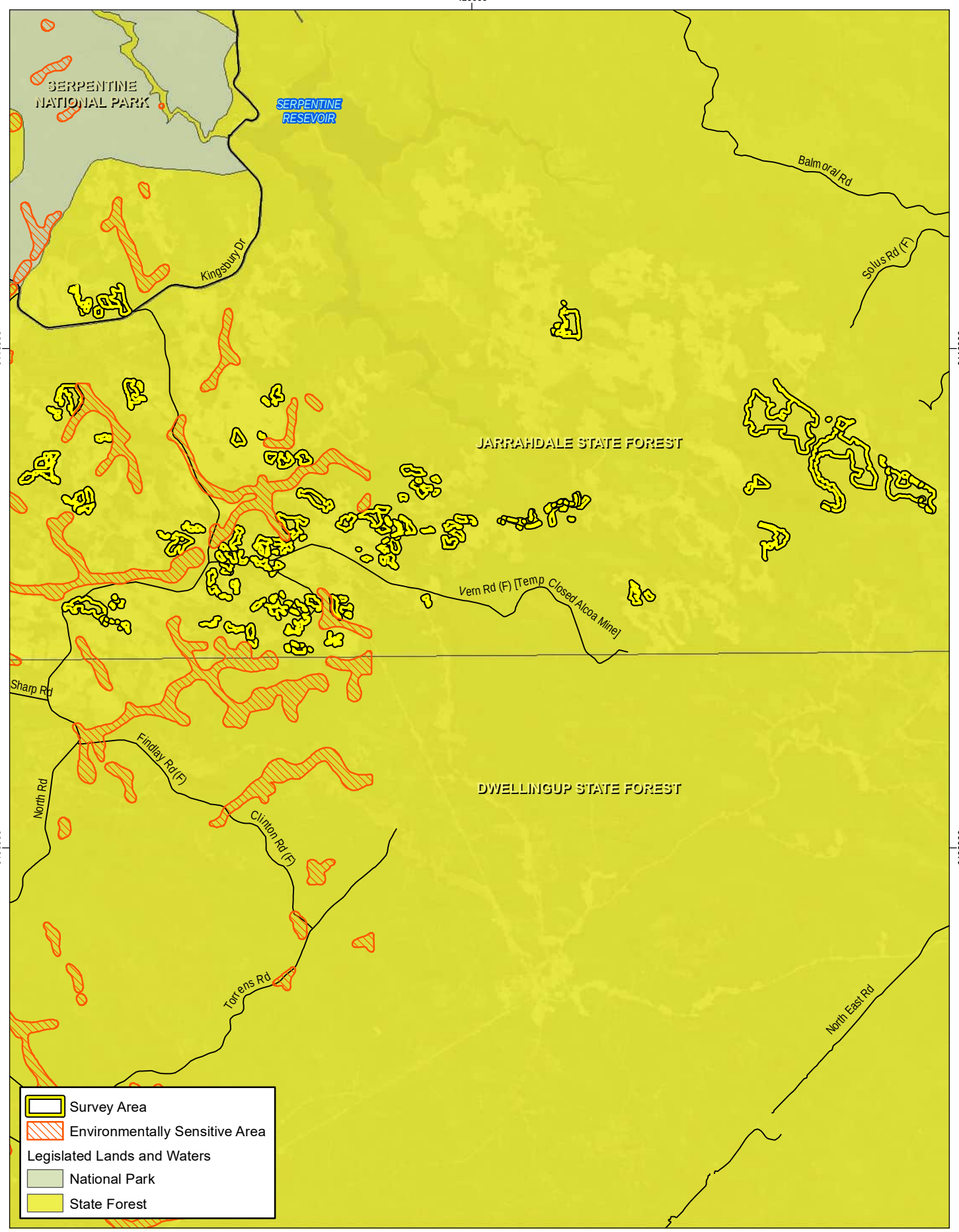
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Pre-European Vegetation

MAP 4

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Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

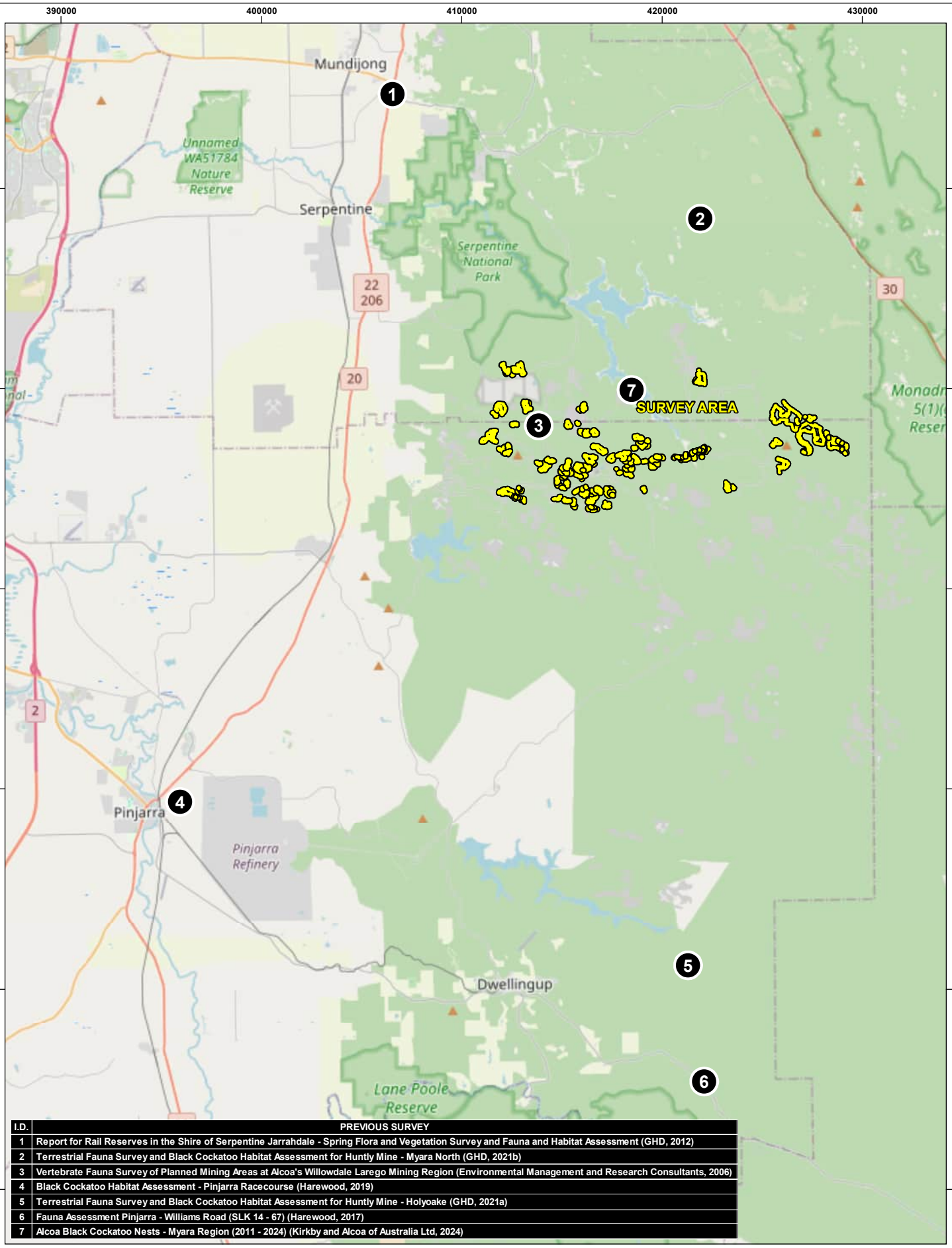
Conservation and Environmentally Sensitive Areas

MAP 5

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I.D.	PREVIOUS SURVEY
1	Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment (GHD, 2012)
2	Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North (GHD, 2021b)
3	Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region (Environmental Management and Research Consultants, 2006)
4	Black Cockatoo Habitat Assessment - Pinjarra Racecourse (Harewood, 2019)
5	Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake (GHD, 2021a)
6	Fauna Assessment Pinjarra - Williams Road (SLK 14 - 67) (Harewood, 2017)
7	Alcoa Black Cockatoo Nests - Myara Region (2011 - 2024) (Kirkby and Alcoa of Australia Ltd, 2024)

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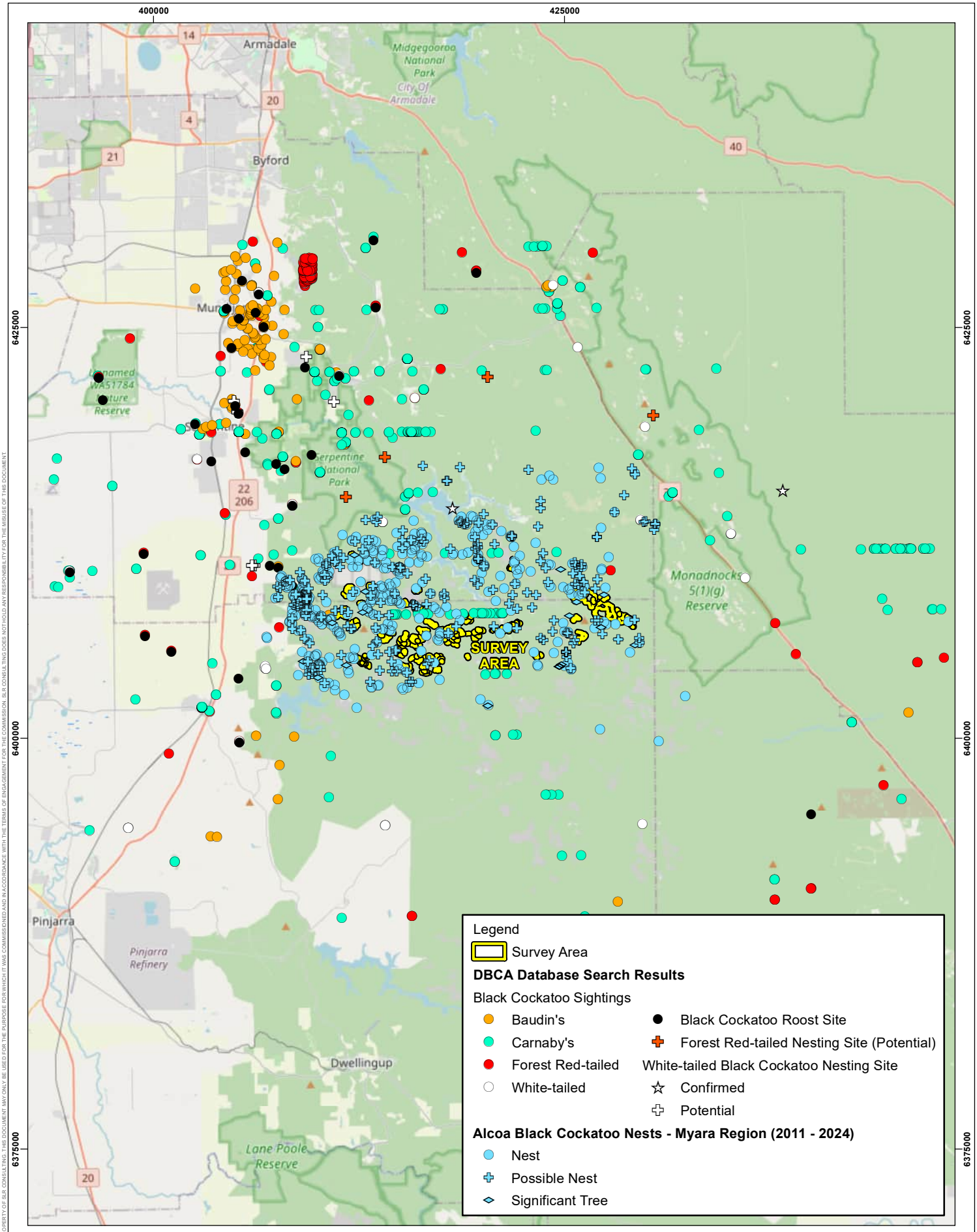
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Project Number : 675.VX5890.00001
Date Drawn : 11/07/2024
Drawn By : Environmaps
Reviewed By : PD

Alcoa
Black Cockatoo Habitat Assessment Huntly Mine
Myara Region

Previous Surveys in the Locality
MAP 6

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N 0 2.5 5 10 km

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Coordinate System: GDA 1994 MGA Zone 50 @ A4

Scale	: 1:300,000 @ A4
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Black Cockatoo Habitat Assessment Huntly Mine

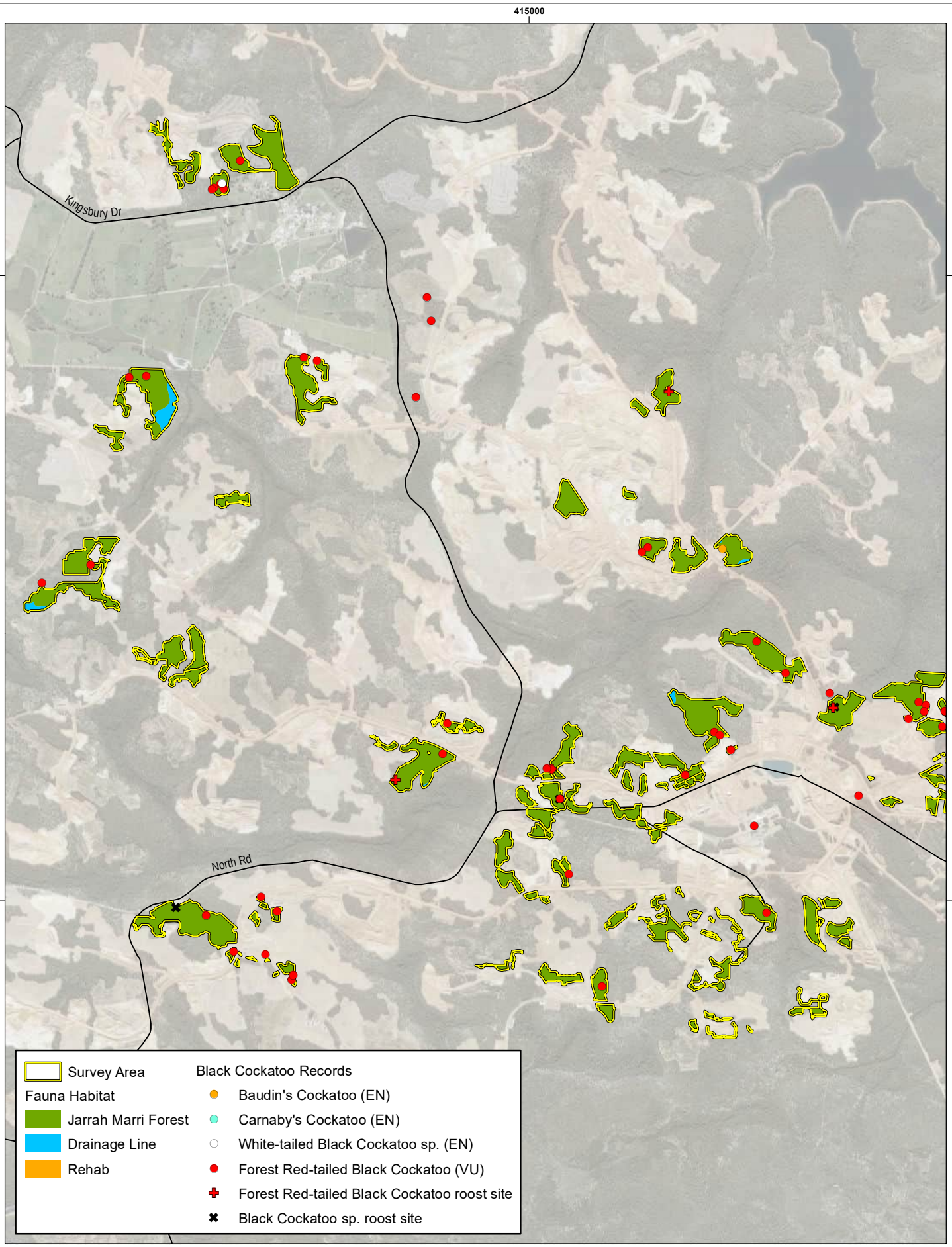
Myara Region

Black Cockatoo Database Search Results

MAP 7

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N 0 0.375 0.75 1.5 km

Service Layer Credits: Landgate / SLIP

Coordinate System: GDA 1994 MGA Zone 50 @ A4

Scale	: 1:40,000 @ A4
Project Number	: 675.VX5890.00001
Date Drawn	: 19/03/2024
Drawn By	: Environmaps
Reviewed By	: PD

Alcoa

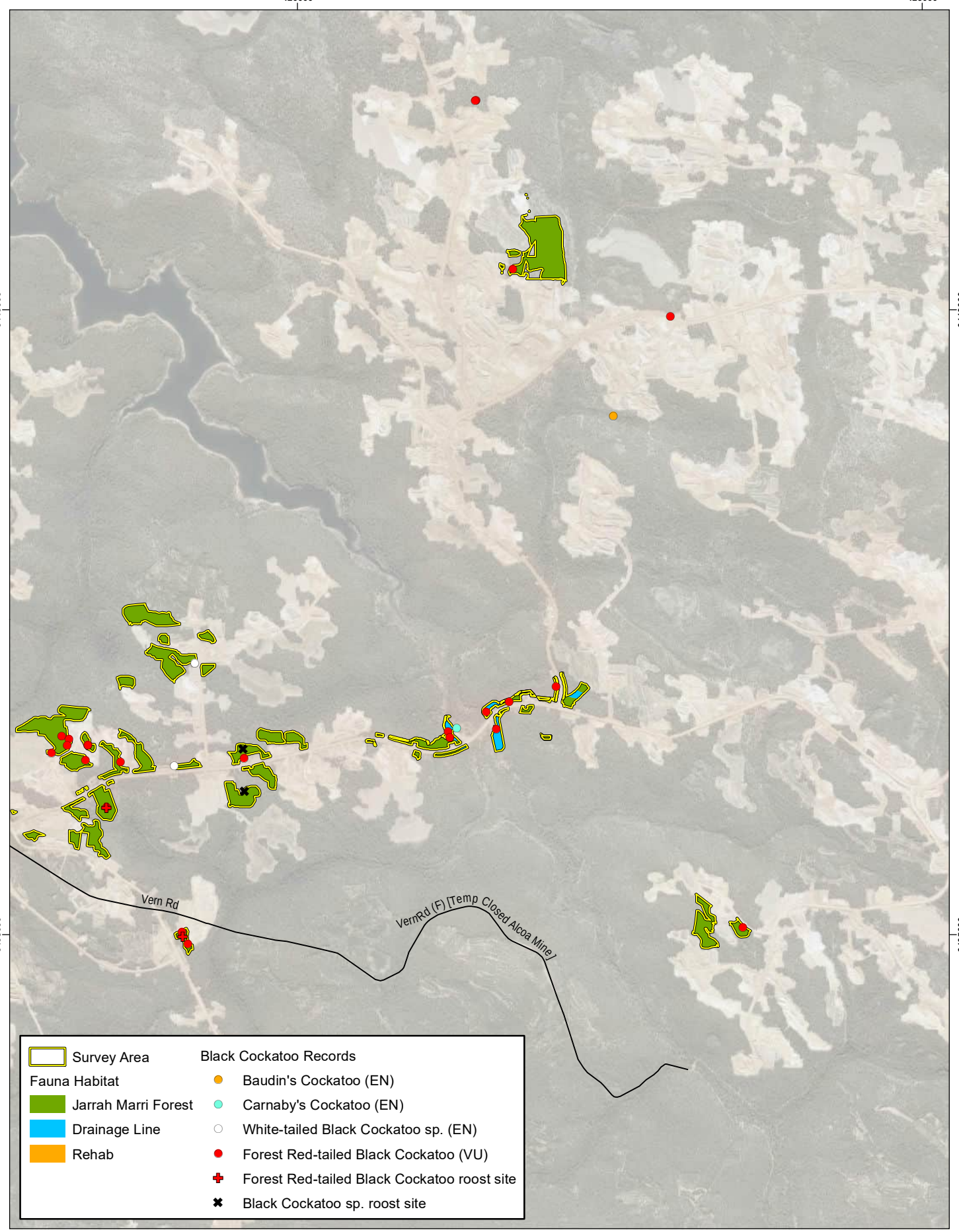
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Fauna Habitat and Black Cockatoo Records

MAP 8-1

C:\GIS\Jobs\360\675.VX5890.00001 - Myara and Larego Surveys, Alcoa\Figures_MyaraBC\675-VX5890-0001_MBC_M08a Fauna Habitat and Black Cockatoo Records_240319.mxd



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N 0 0.375 0.75 1.5 km

Service Layer Credits: Landgate / SLIP

Coordinate System: GDA 1994 MGA Zone 50 @ A4

Scale	: 1:40,000 @ A4
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Date Drawn	: 19/03/2024
Drawn By	: Environmaps
Reviewed By	: PD

Alcoa

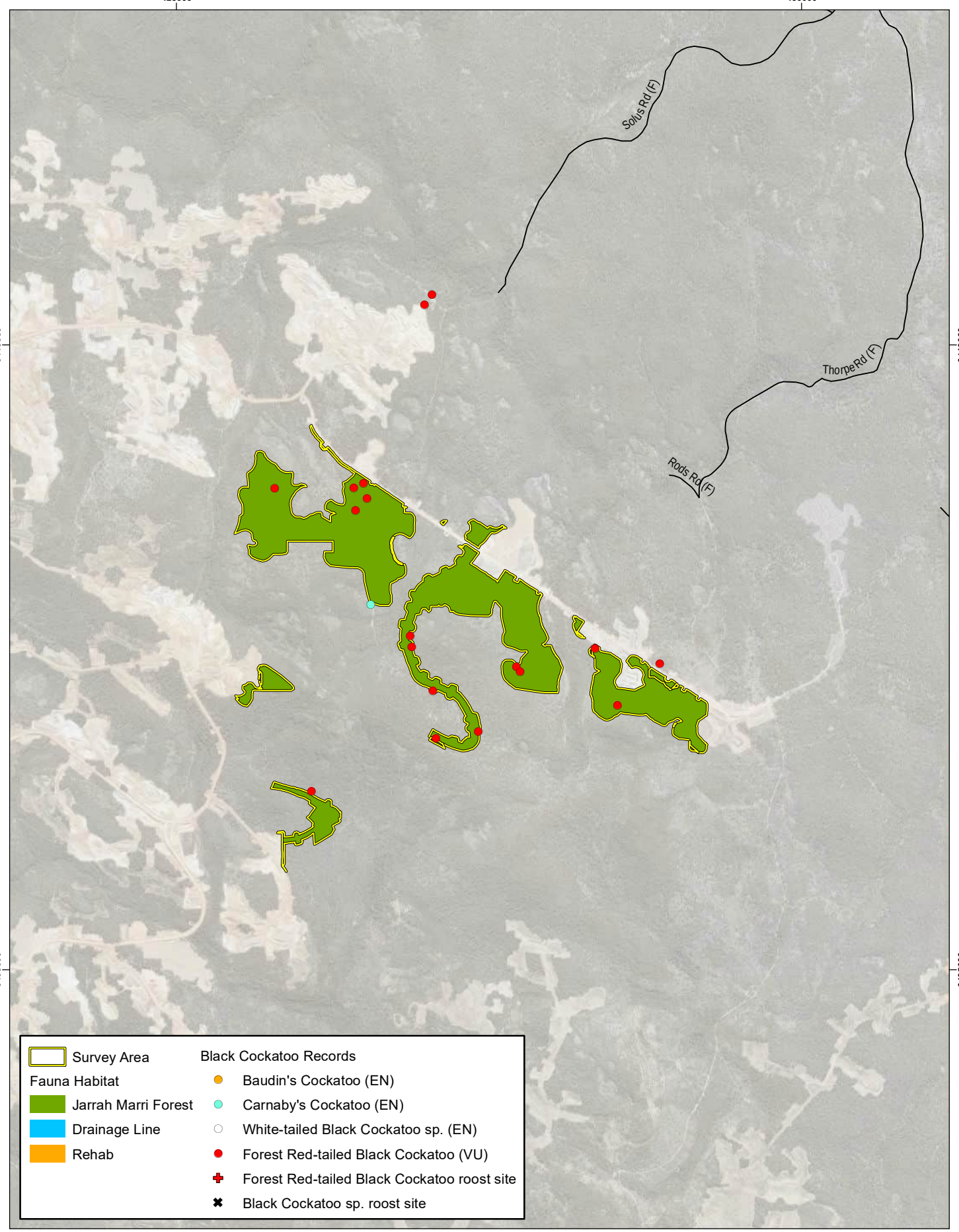
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Fauna Habitat and Black Cockatoo Records

MAP 8-2

C:\GIS\Jobs\360\675.VX5890.00001 - Myara and Larego Surveys, Alcoa\Figures_MyaraBC\675-VX5890-0001_MBC_M08b Fauna Habitat and Black Cockatoo Records_240319.mxd



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N 0 0.375 0.75 1.5 km

Service Layer Credits: Landgate / SLIP

Coordinate System: GDA 1994 MGA Zone 50 @ A4

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Drawn By	: Environmaps
Reviewed By	: PD

Alcoa

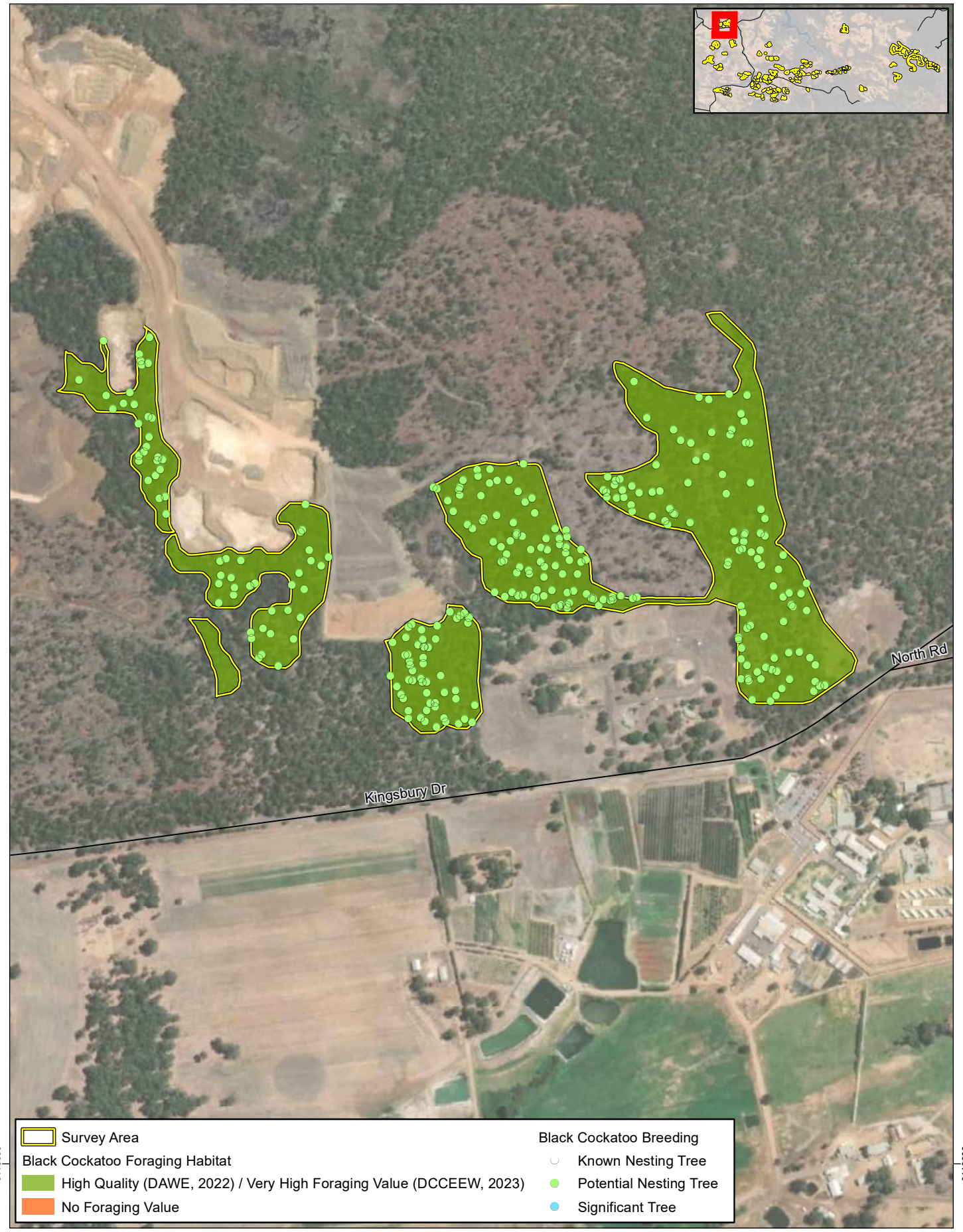
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Fauna Habitat and Black Cockatoo Records

MAP 8-3

C:\GIS\Jobs\360\675.VX5890.00001 - Myara and Larego Surveys, Alcoa\Figures_MyaraBC\675-VX5890-0001_MBC_M08c Fauna Habitat and Black Cockatoo Records_240319.mxd



N 0 62.5 125 250 m

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Coordinate System: GDA 1994 MGA Zone 50 @ A4

Scale	: 1:7,500 @ A4
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Alcoa

Black Cockatoo Habitat Assessment Huntly Mine

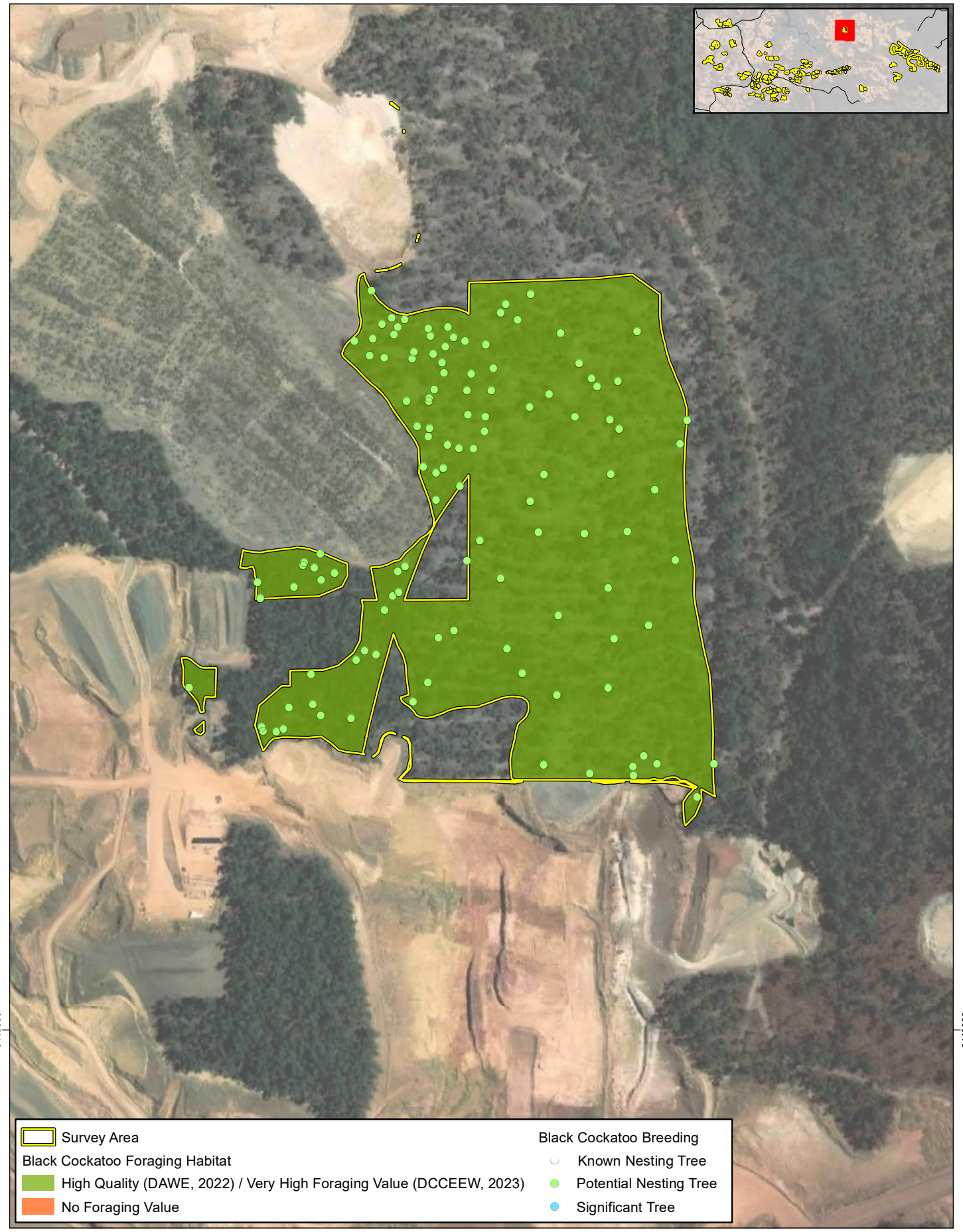
Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-1

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N 0 50 100 200 m

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Coordinate System: GDA 1994 MGA Zone 50 @ A4

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Project Number	: 675.VX5890.00001
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Alcoa

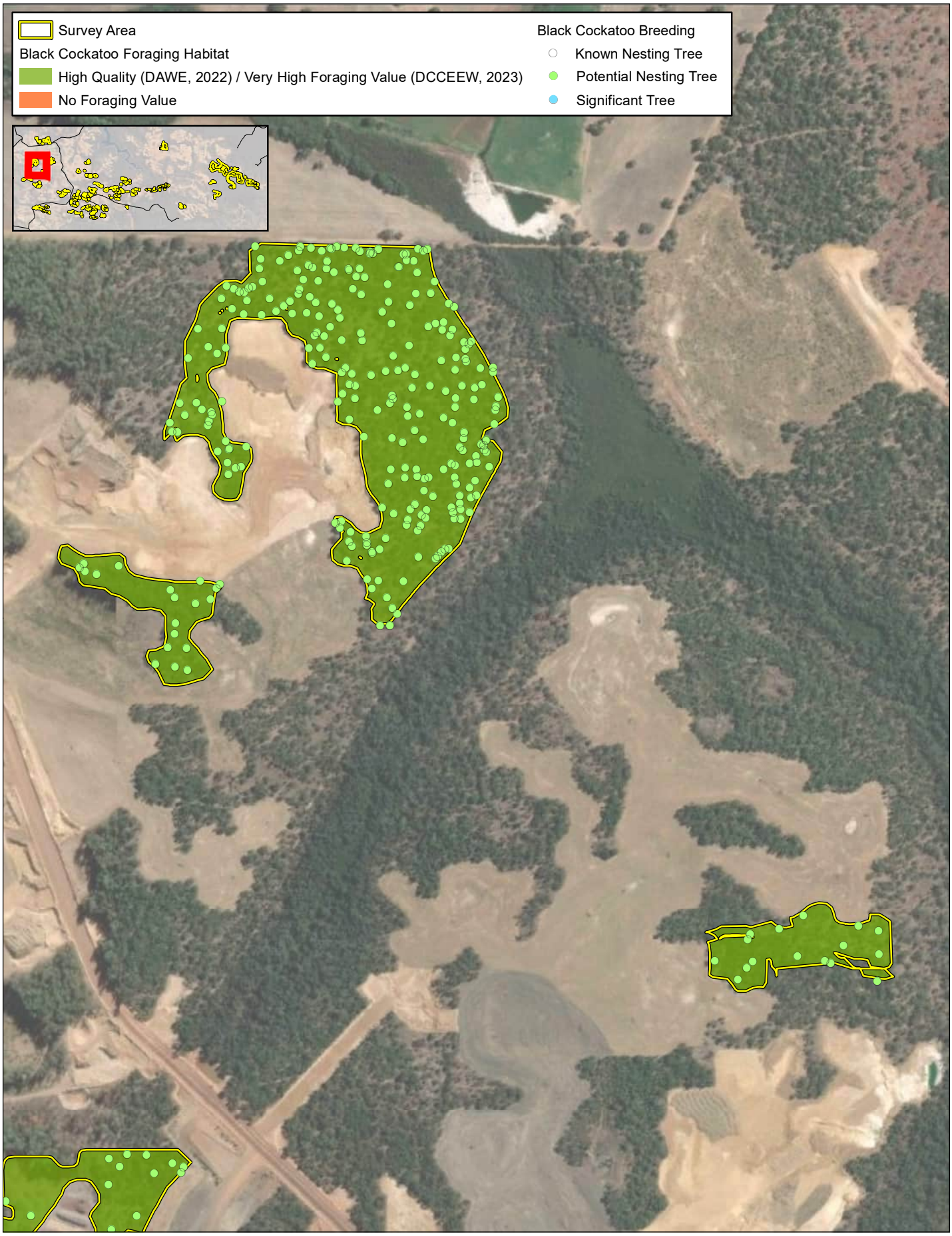
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-2

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N 0 75 150 300 m

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Coordinate System: GDA 1994 MGA Zone 50 @ A4

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Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-3

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Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-4

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Project Number	: 675.VX5890.00001
Date Drawn	: 11/07/2024
Drawn By	: Environmaps
Reviewed By	: PD

Alcoa

Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

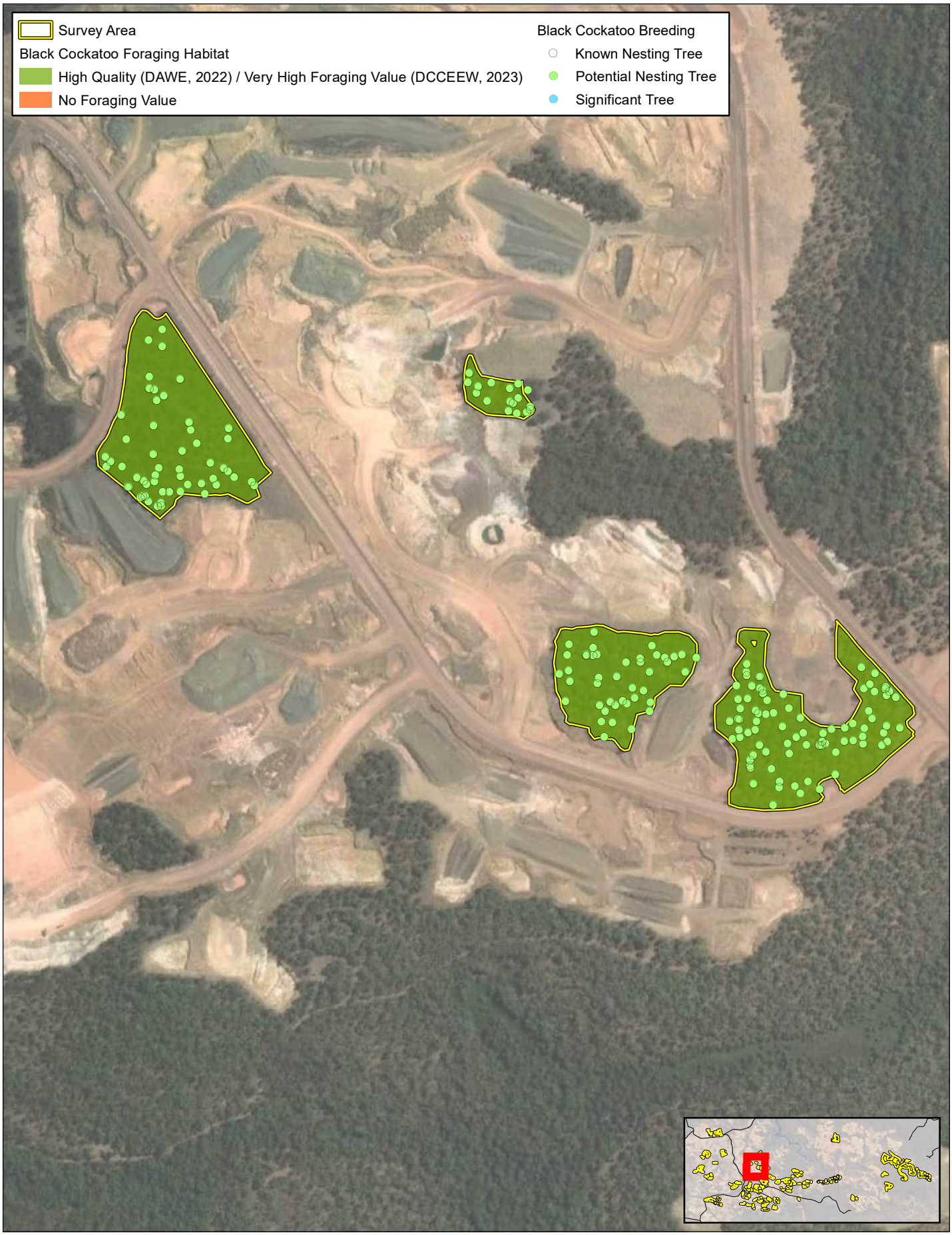
Black Cockatoo Breeding and Foraging Habitat

MAP 9-5

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Alcoa

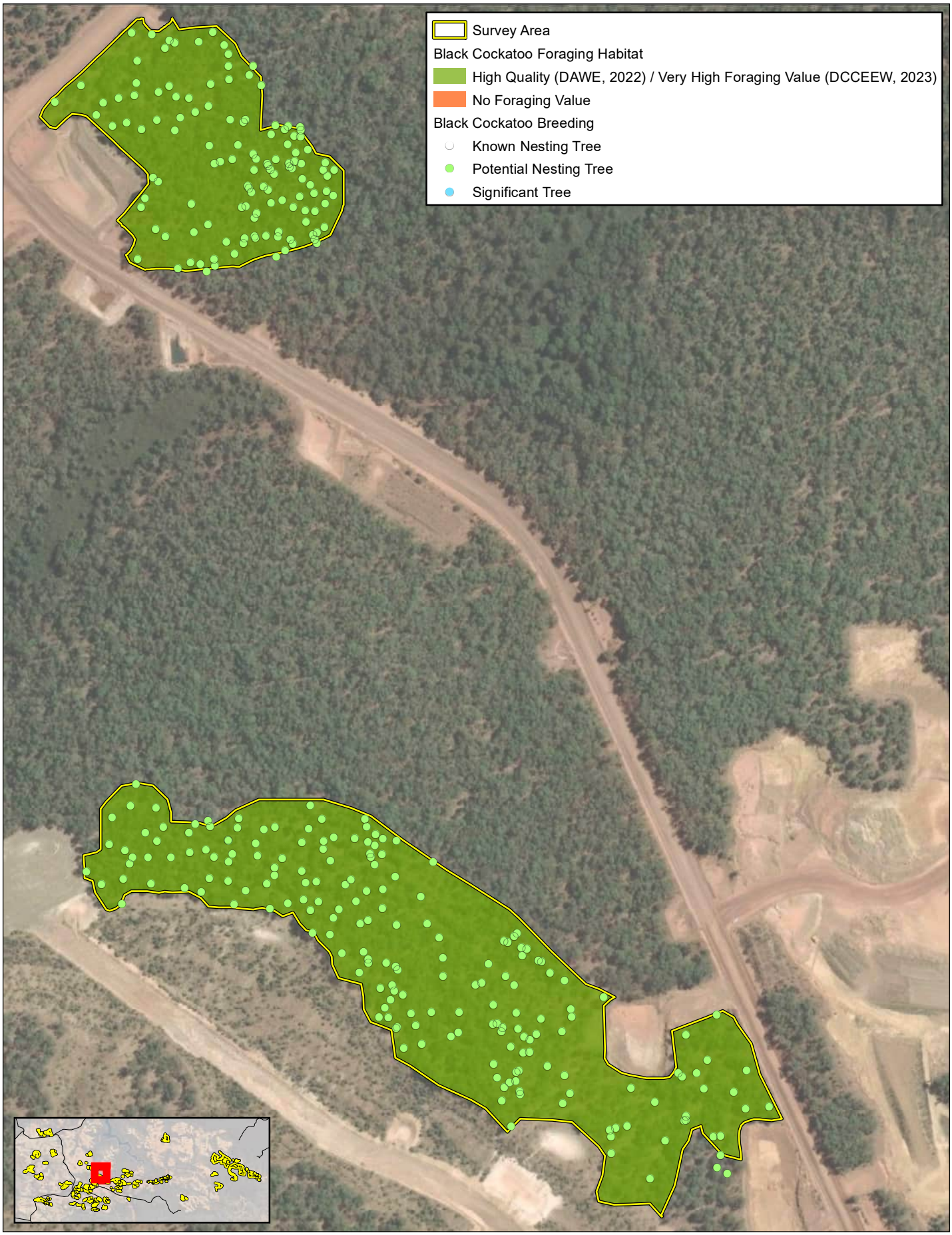
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-6

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Coordinate System: GDA 1994 MGA Zone 50 @ A4

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Alcoa

Black Cockatoo Habitat Assessment Huntly Mine

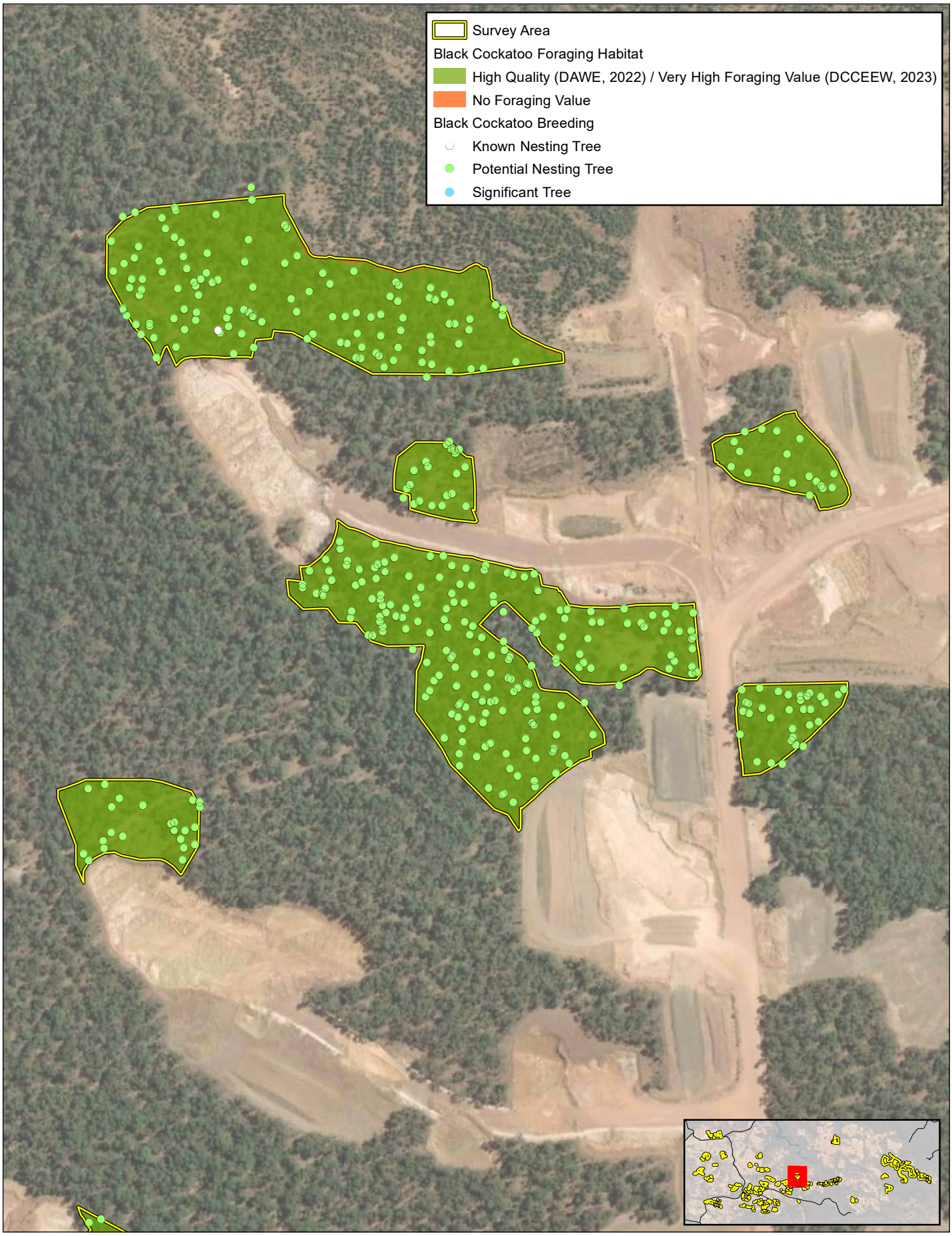
Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-7

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Drawn By	: Environmaps
Reviewed By	: PD

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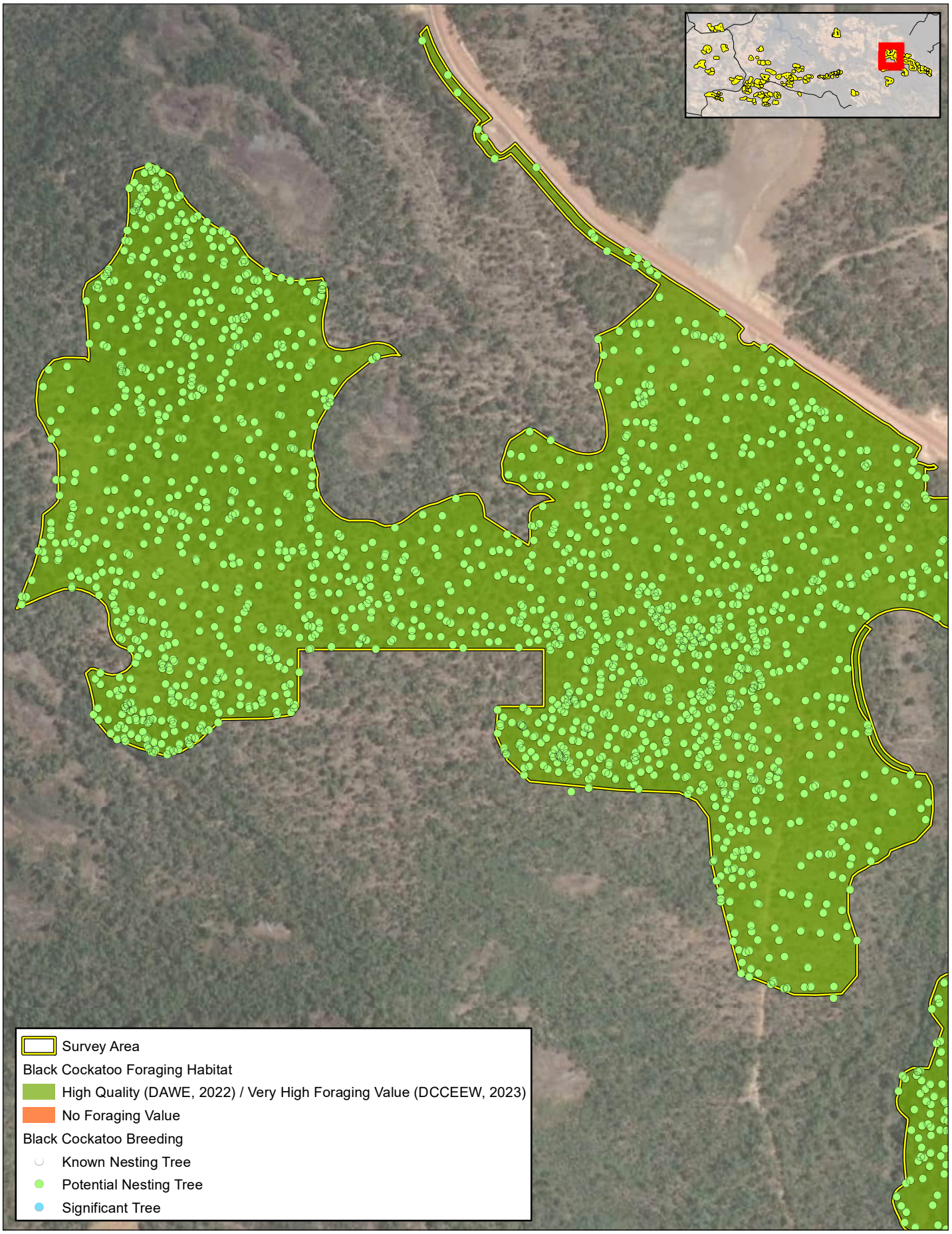
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-8

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Alcoa

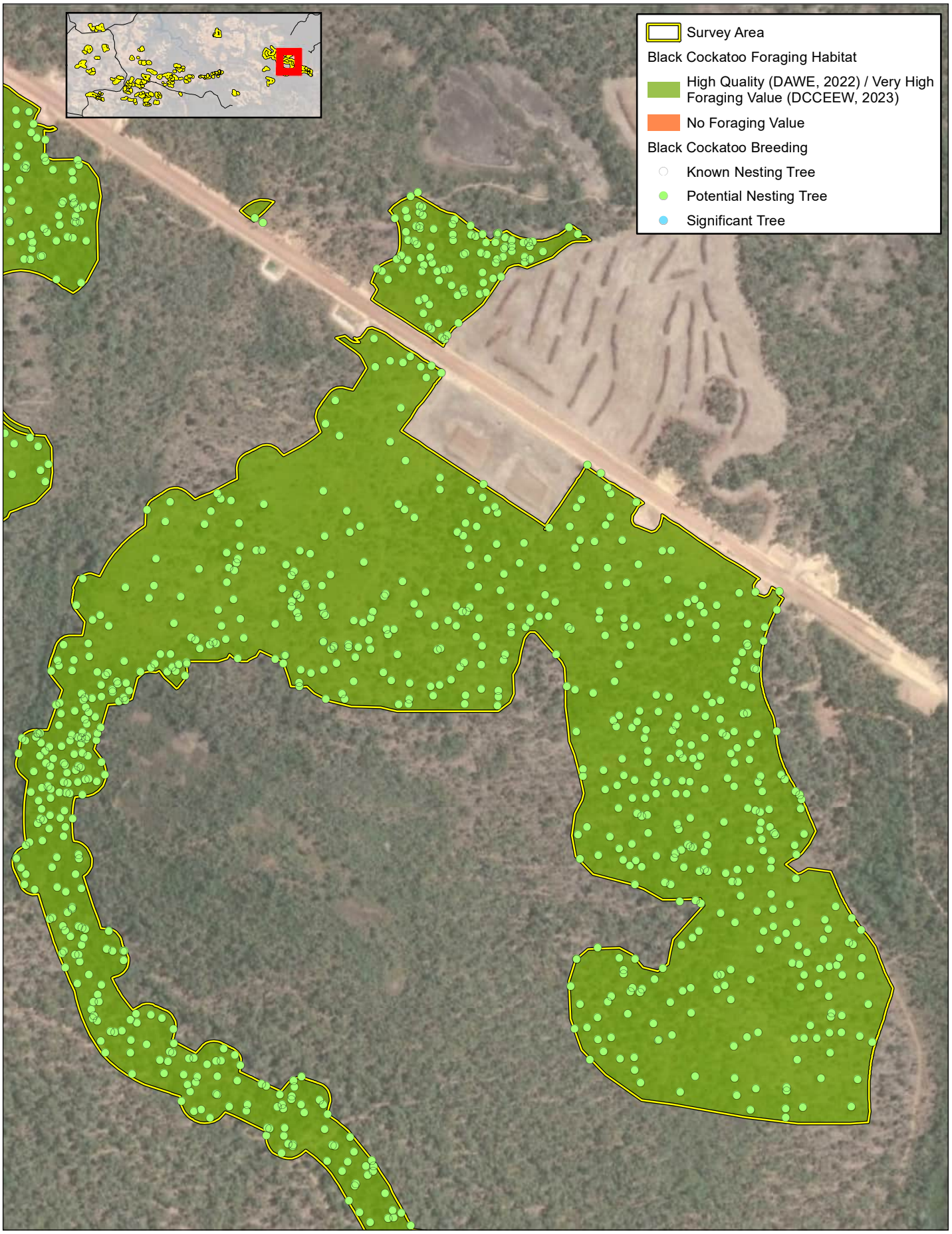
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-9

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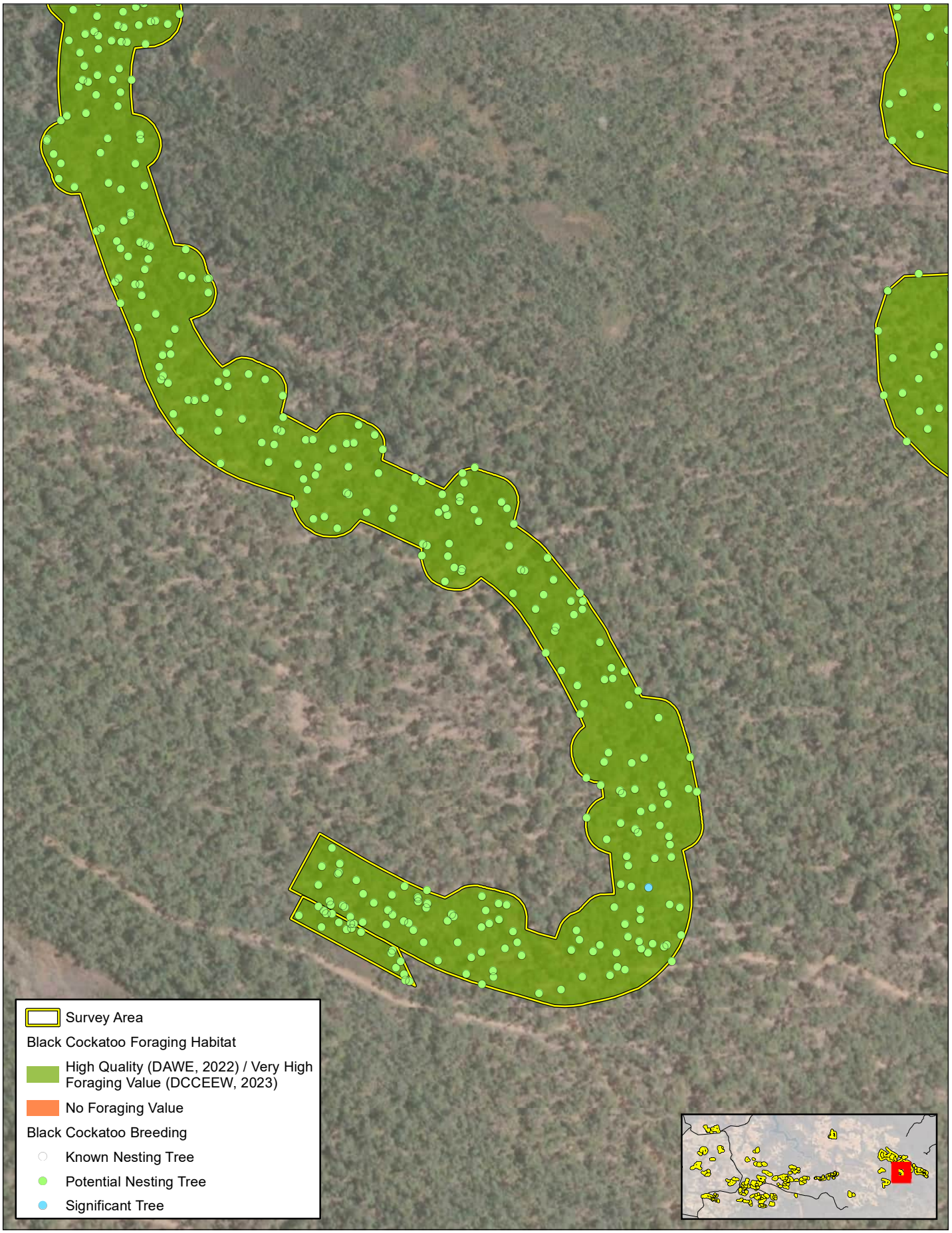
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-10

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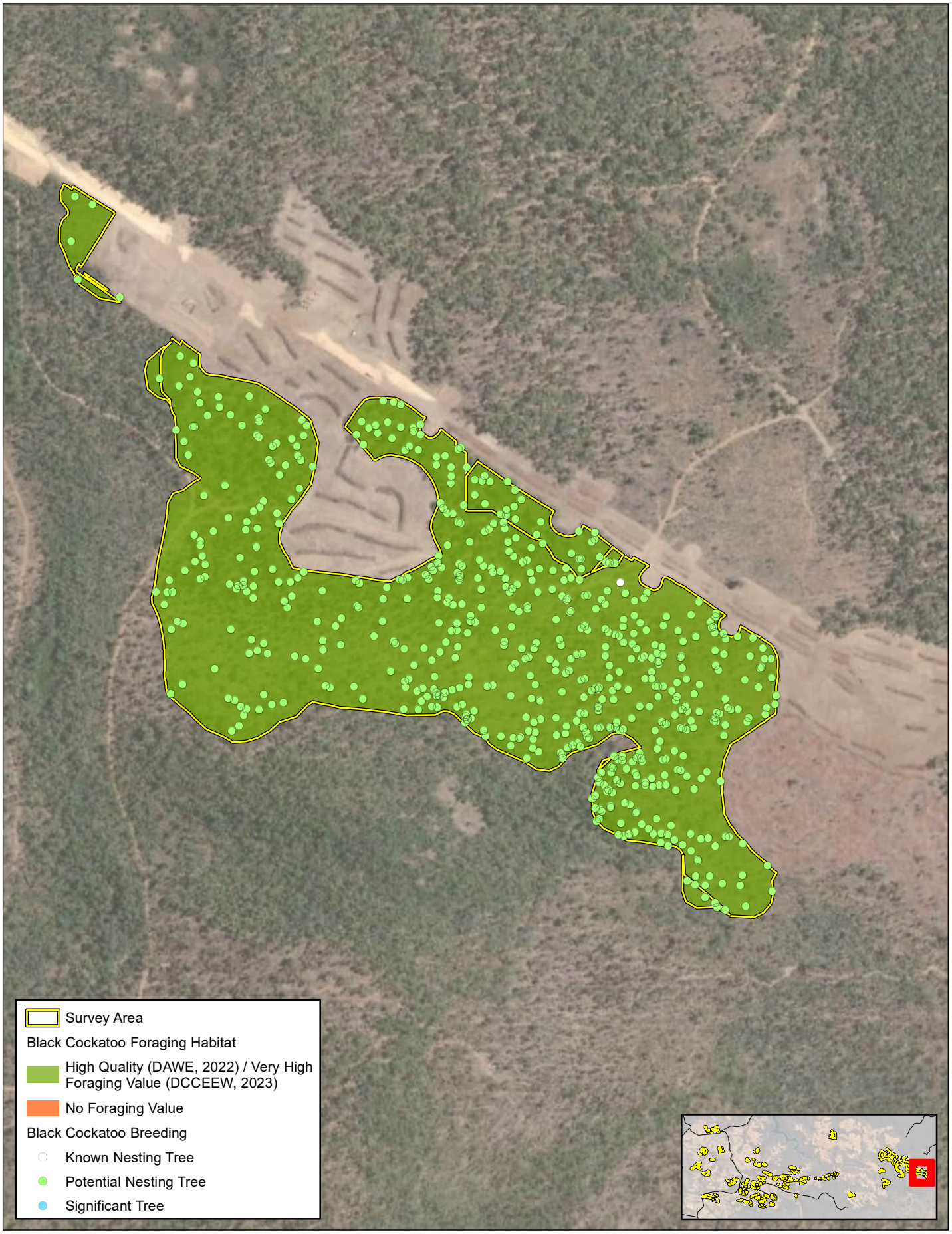
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-11

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Black Cockatoo Habitat Assessment Huntly Mine

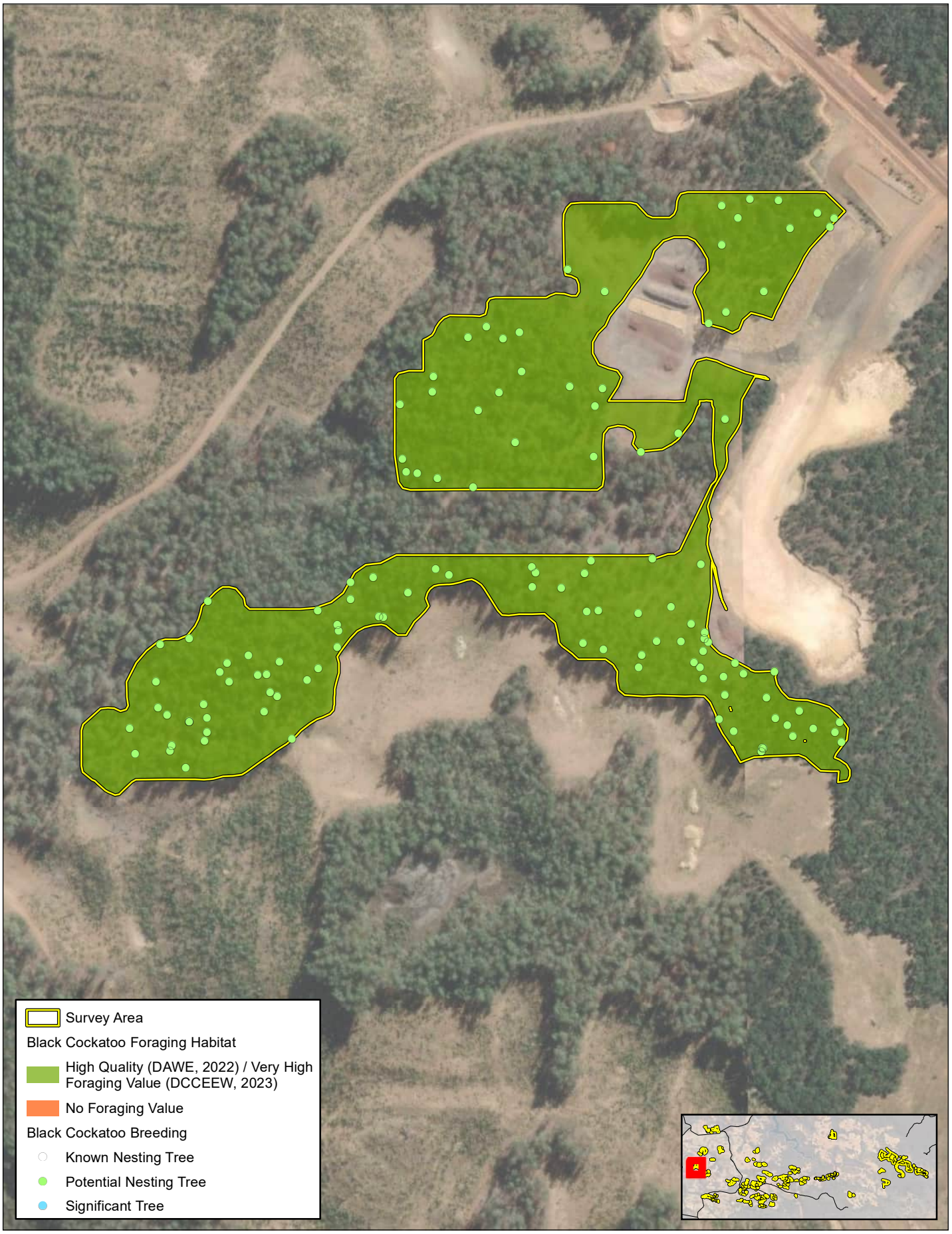
Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-12

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N 0 50 100 200 m

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Coordinate System: GDA 1994 MGA Zone 50 @ A4

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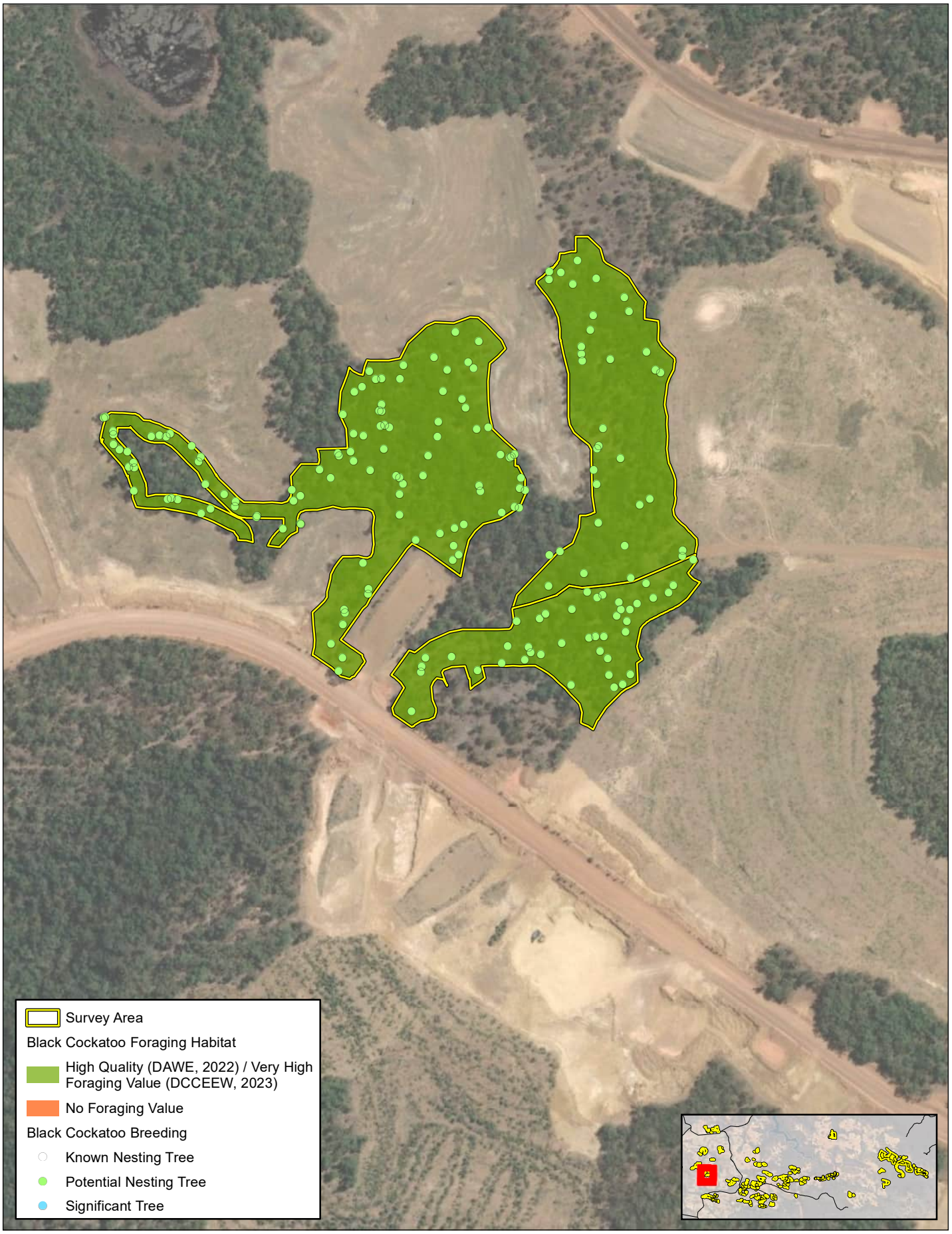
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Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-13

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Alcoa

Black Cockatoo Habitat Assessment Huntly Mine

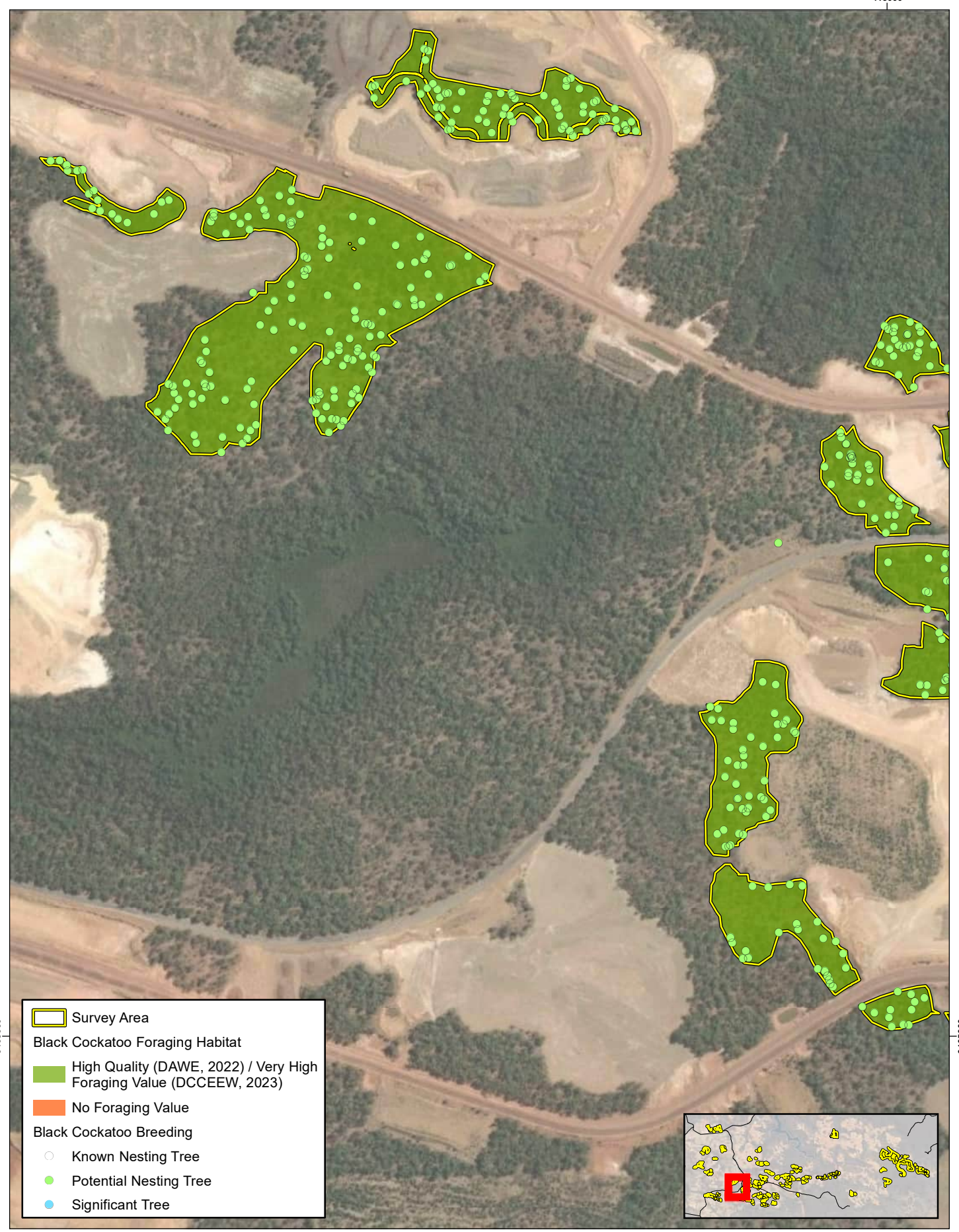
Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-14

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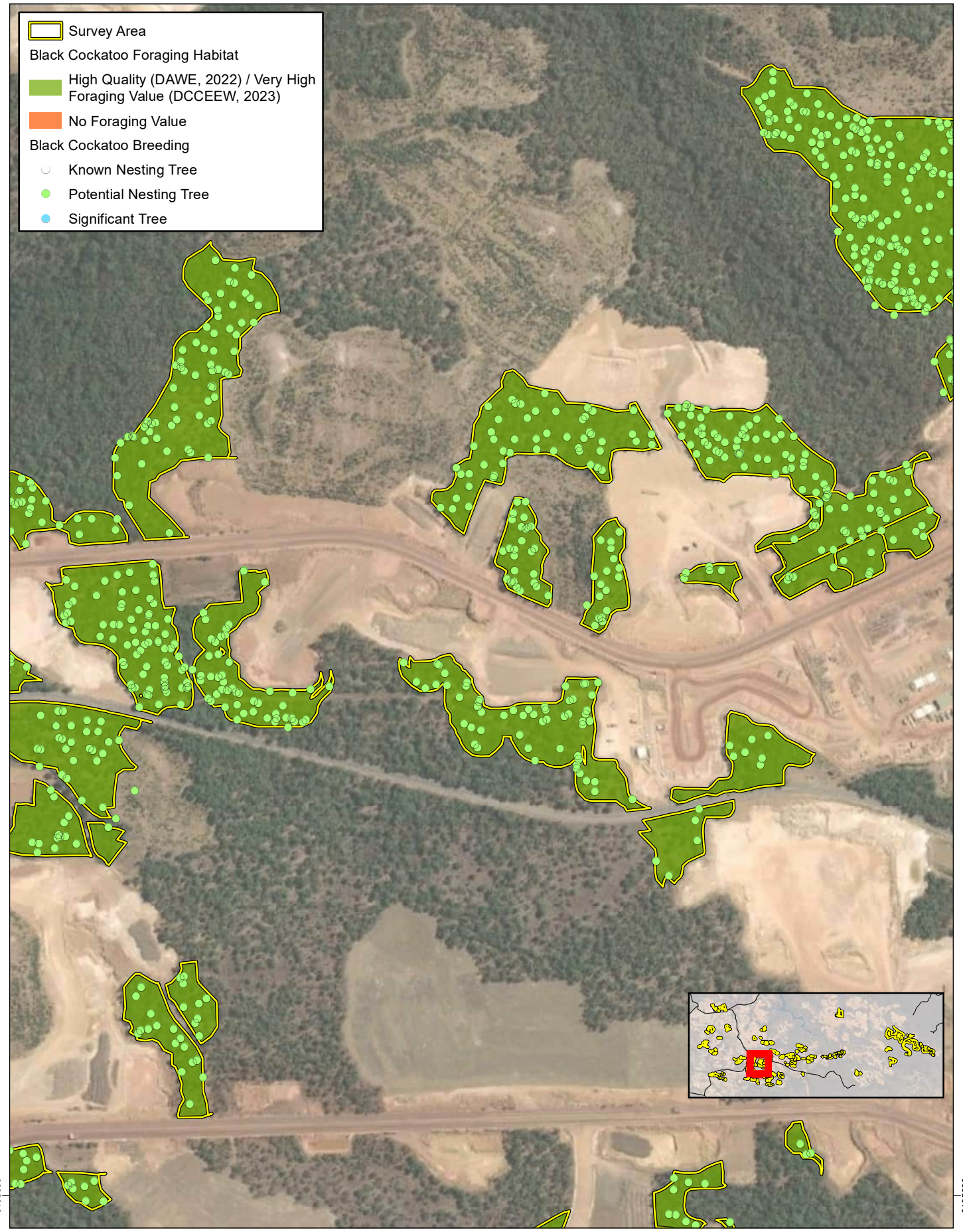
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-15

C:\GIS\Jobs\360\675.VX5890.00001 - Myara and Larego Surveys, Alcoa\Figures_MyaraBC\675-VX5890-0001_MBC_M09-15 Black Cockatoo Breeding and Foraging Habitat_240711.mxd



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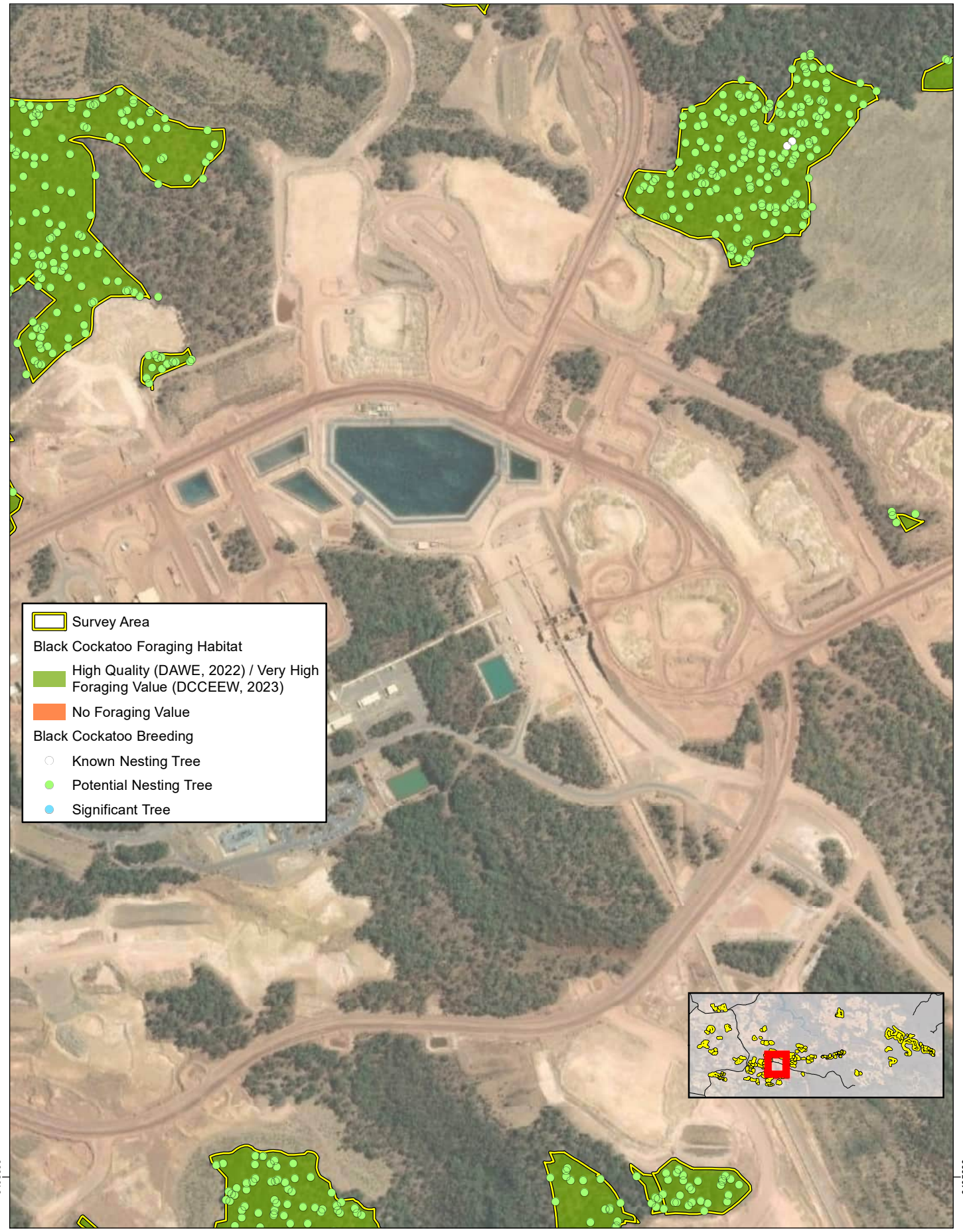
Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-16

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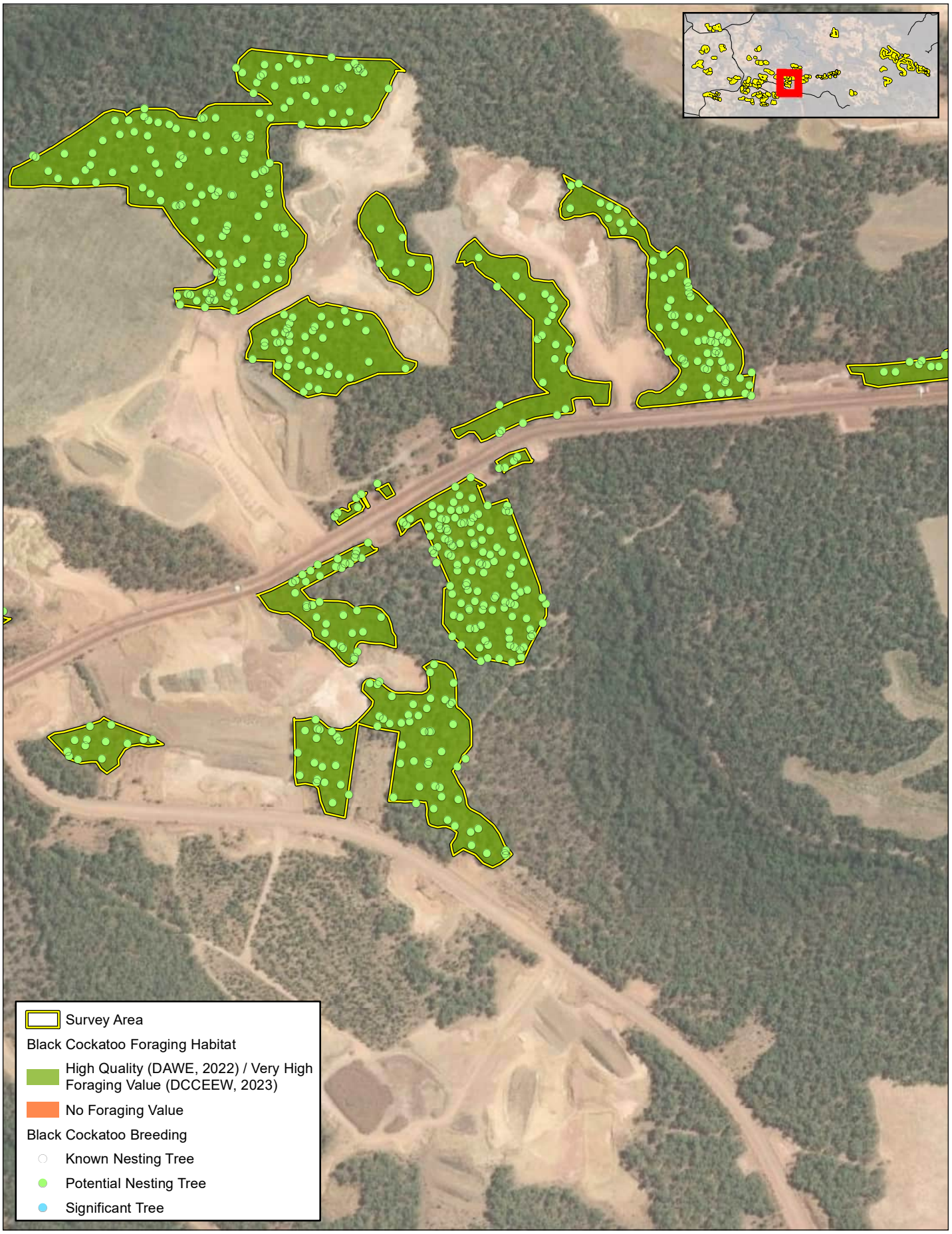
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Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-17

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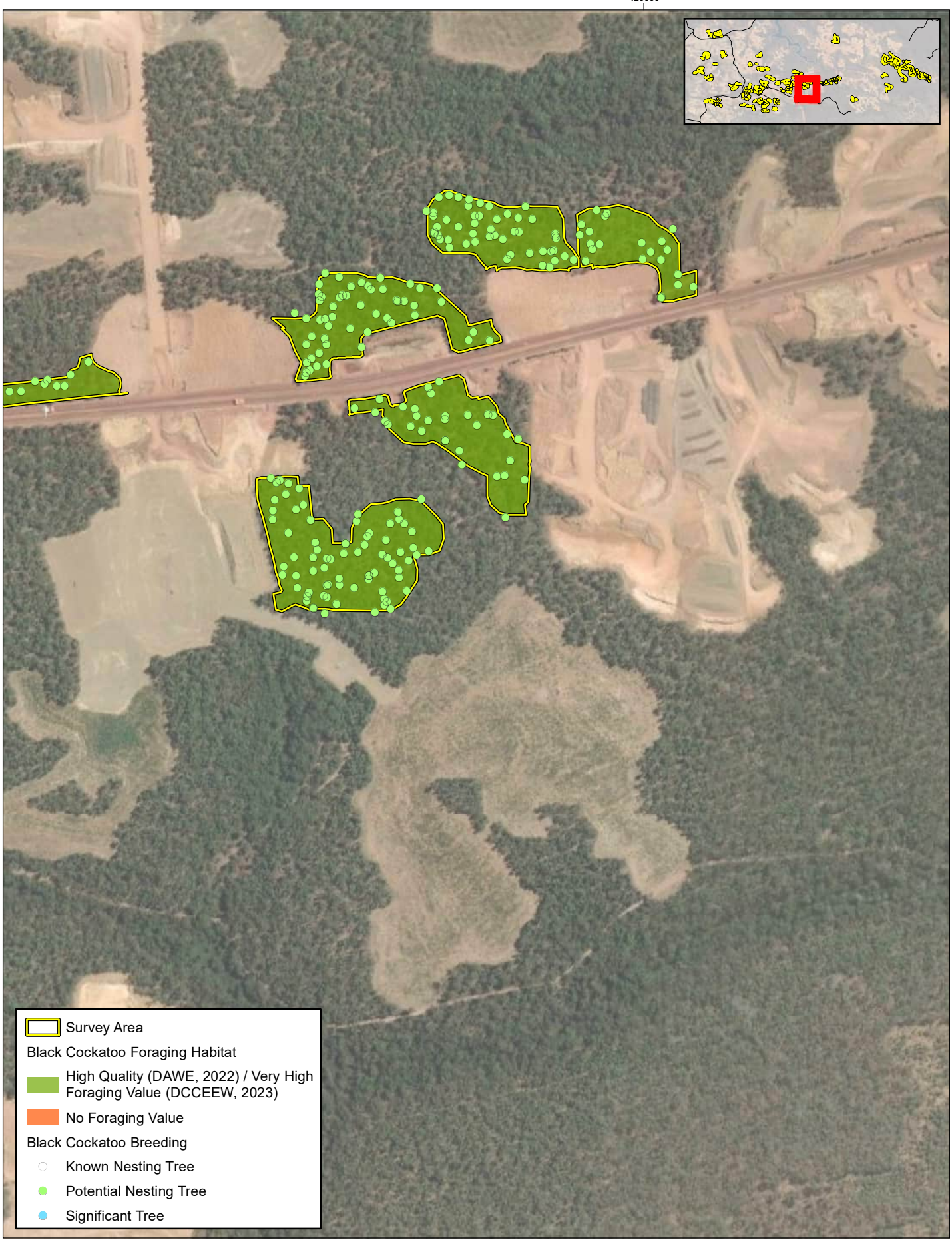
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Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-18

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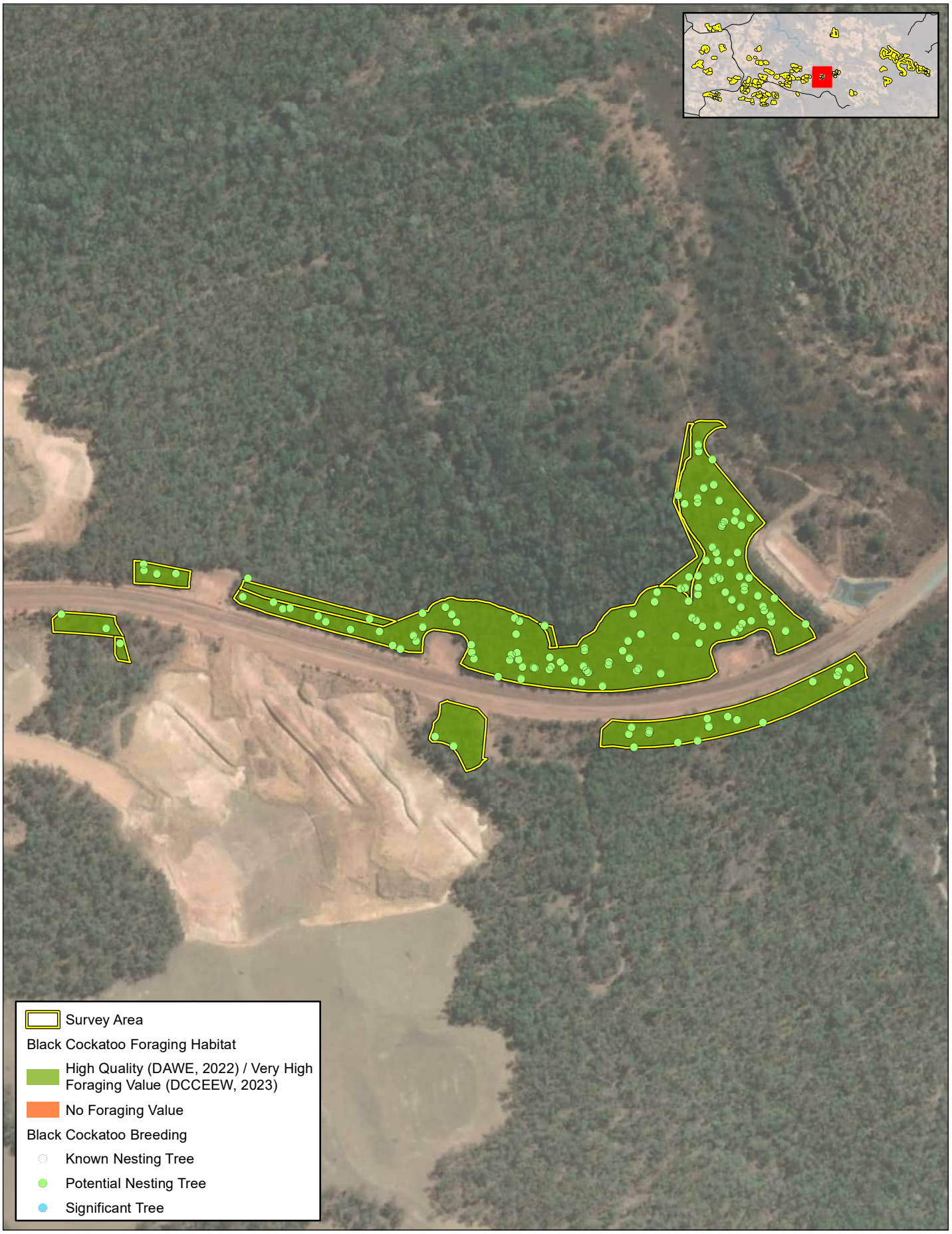
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-19

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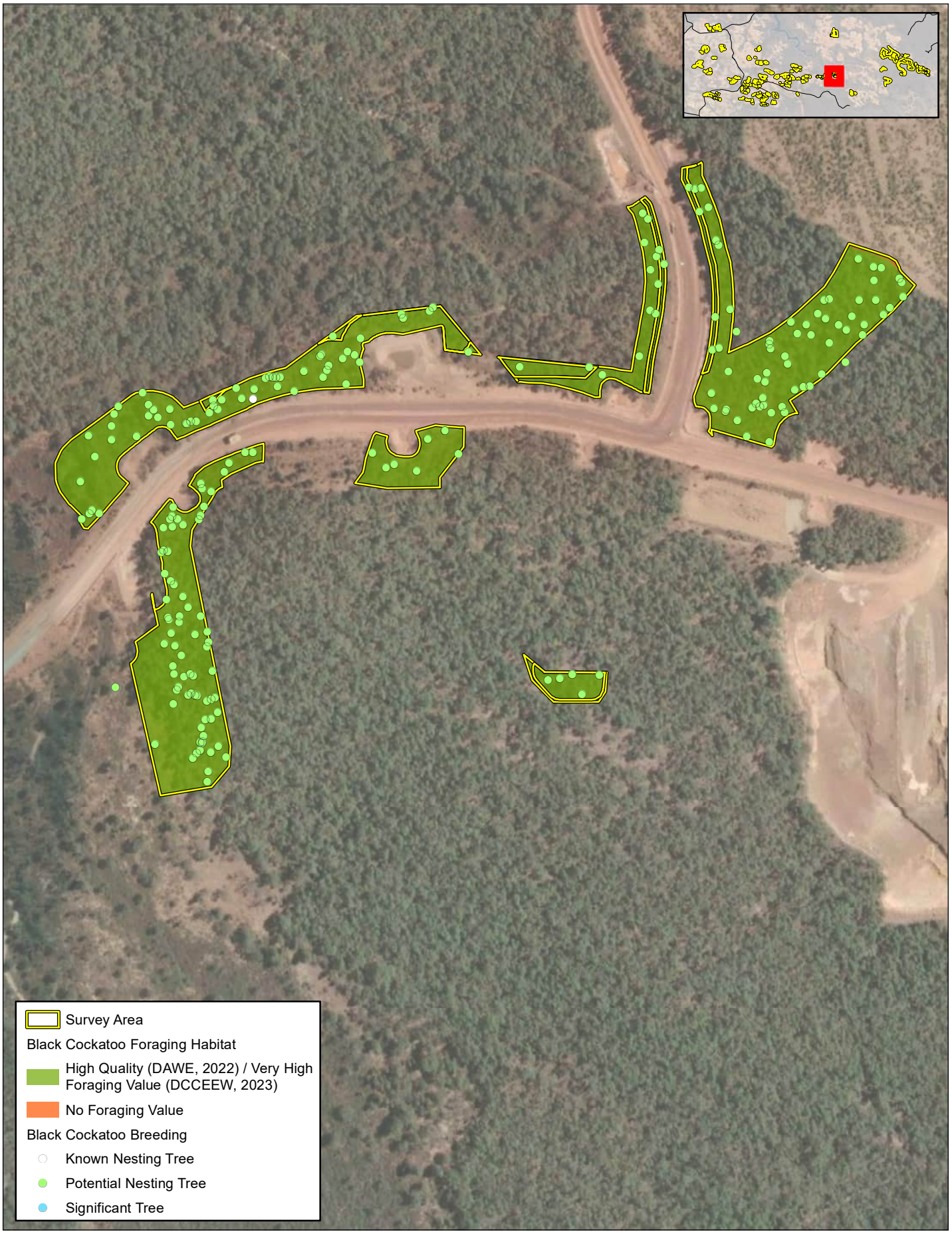
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-20

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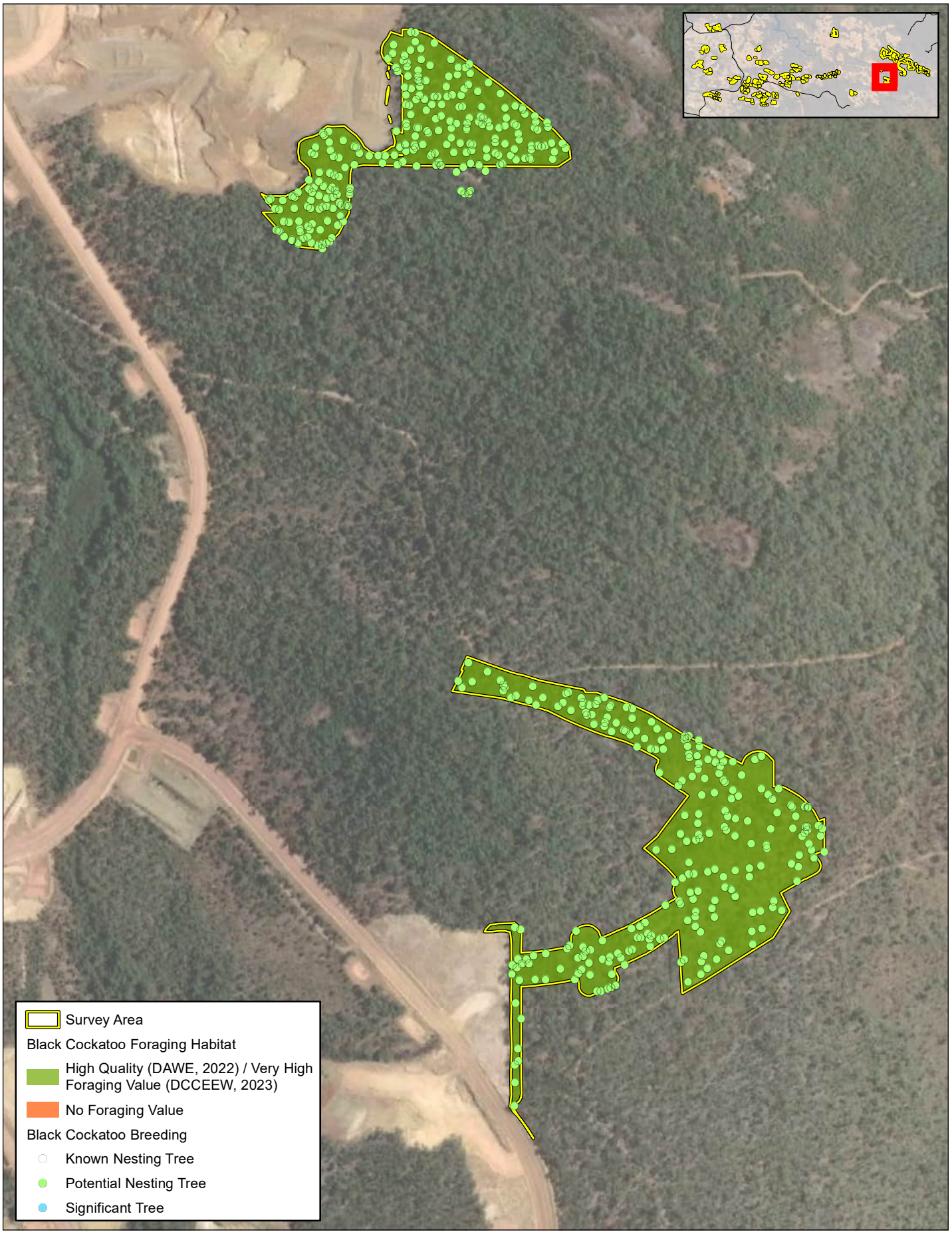
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-21

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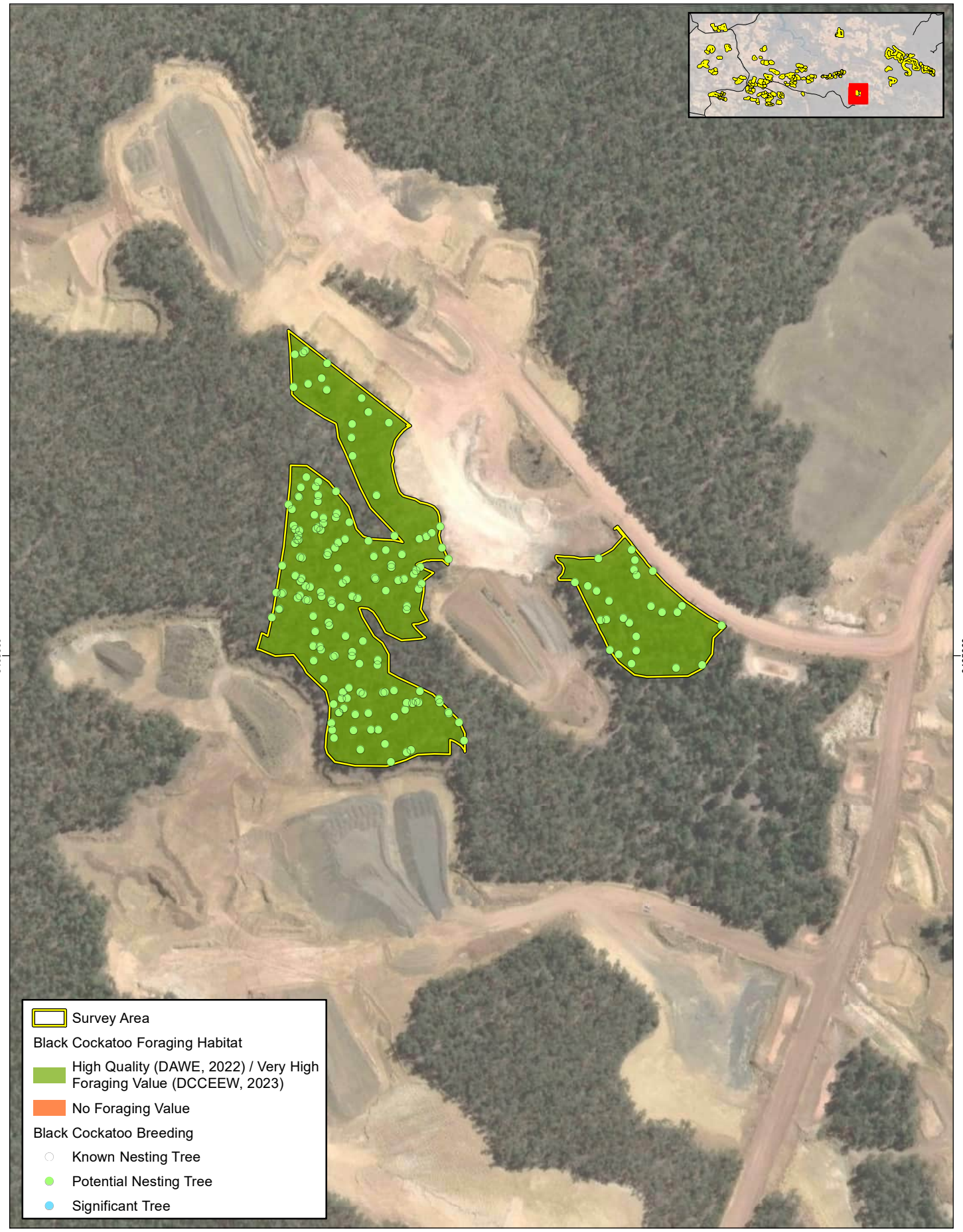
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Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-22

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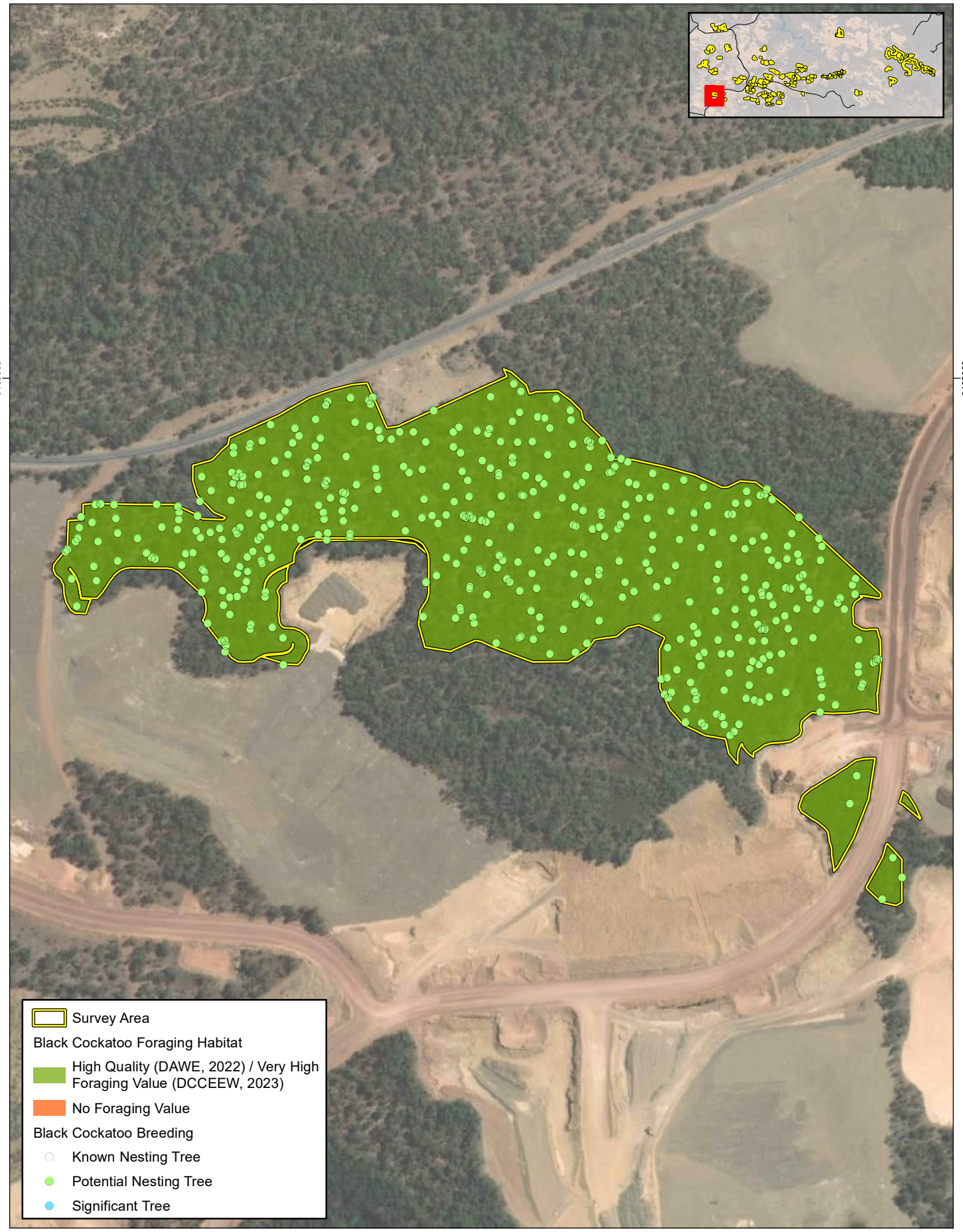
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-23

C:\GIS\Jobs\360\675.VX5890.00001 - Myara and Larego Surveys, Alcoa\Figures_MyaraBC\675-VX5890-0001_MBC_M09-23 Black Cockatoo Breeding and Foraging Habitat_240711.mxd



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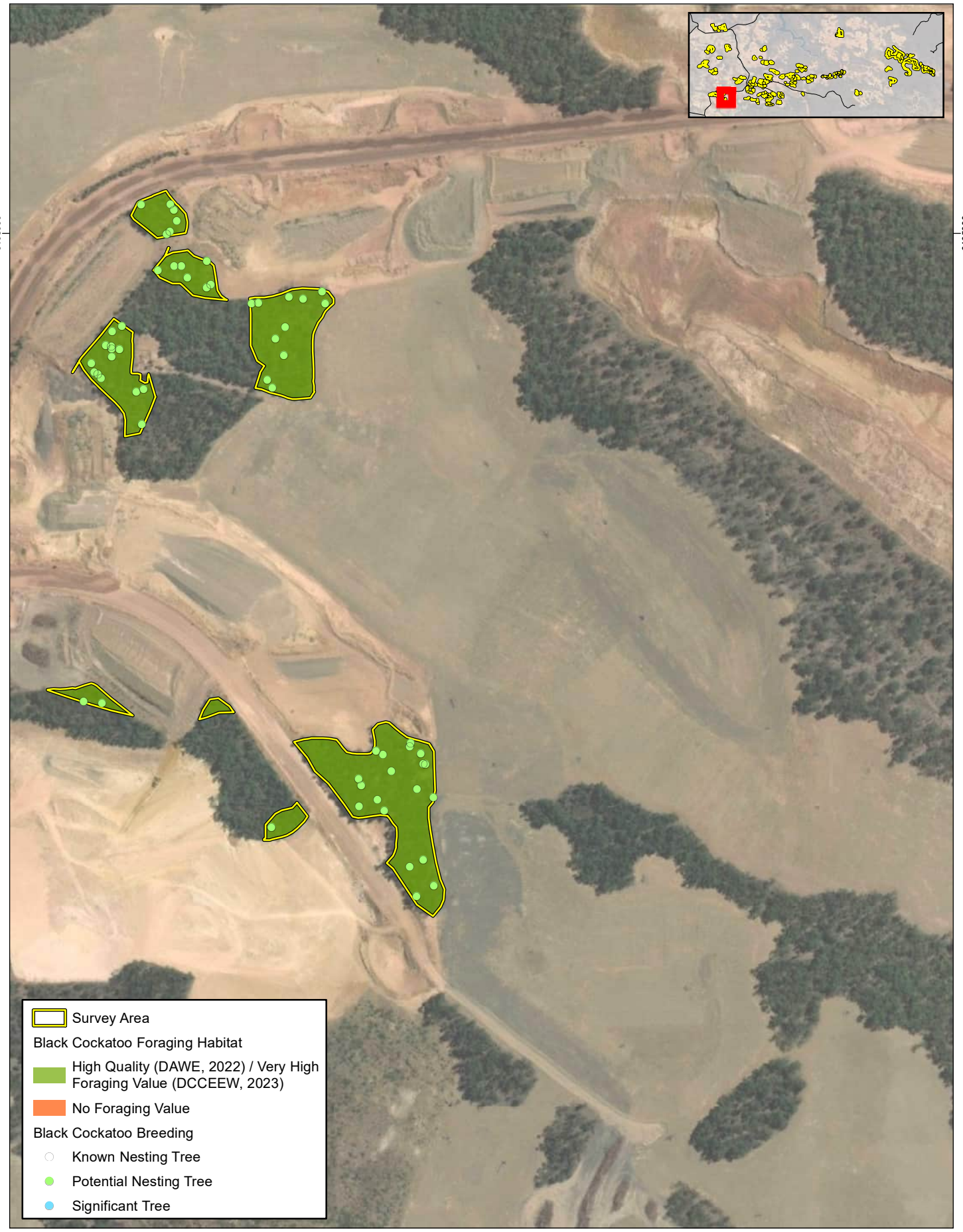
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-24

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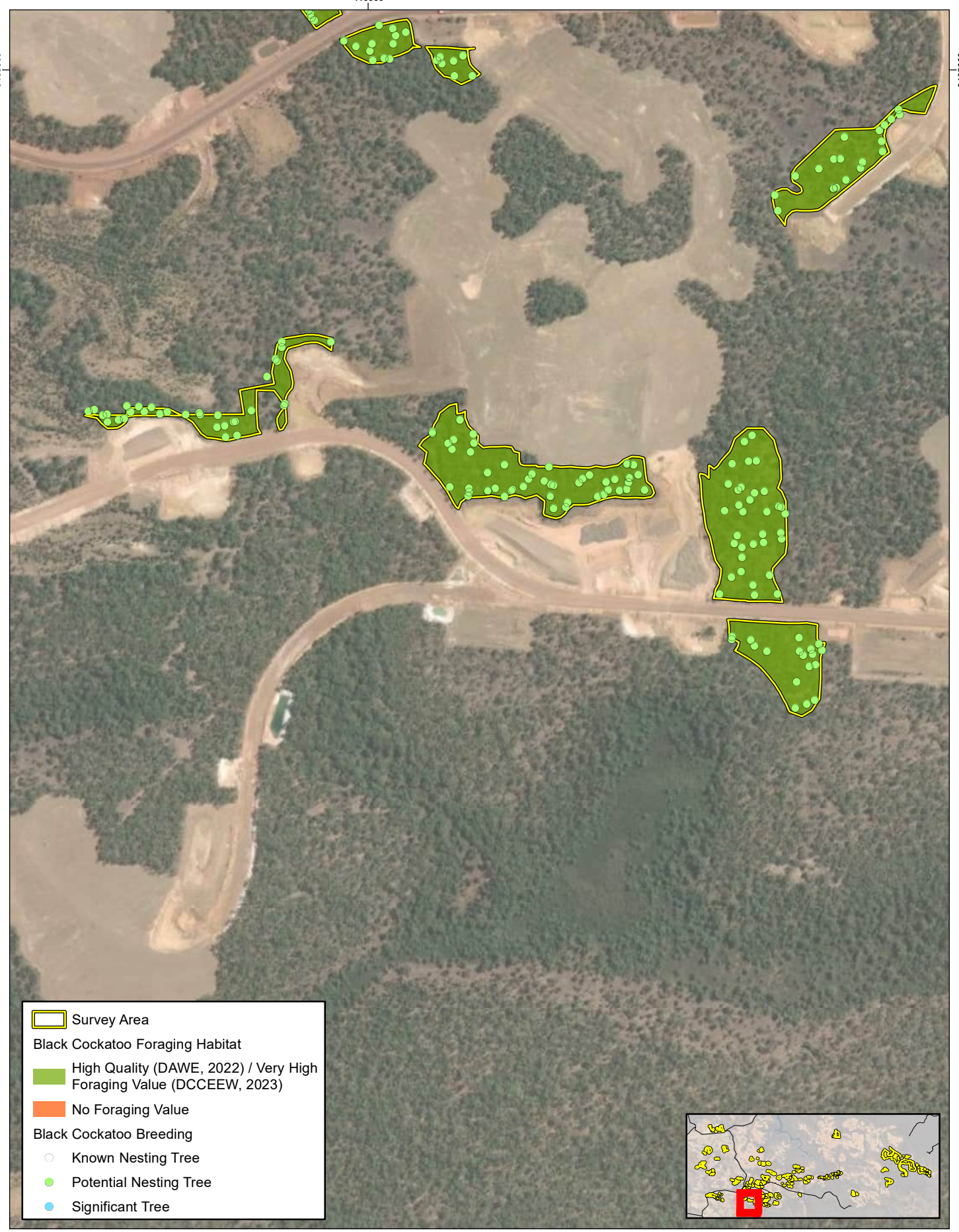
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-25

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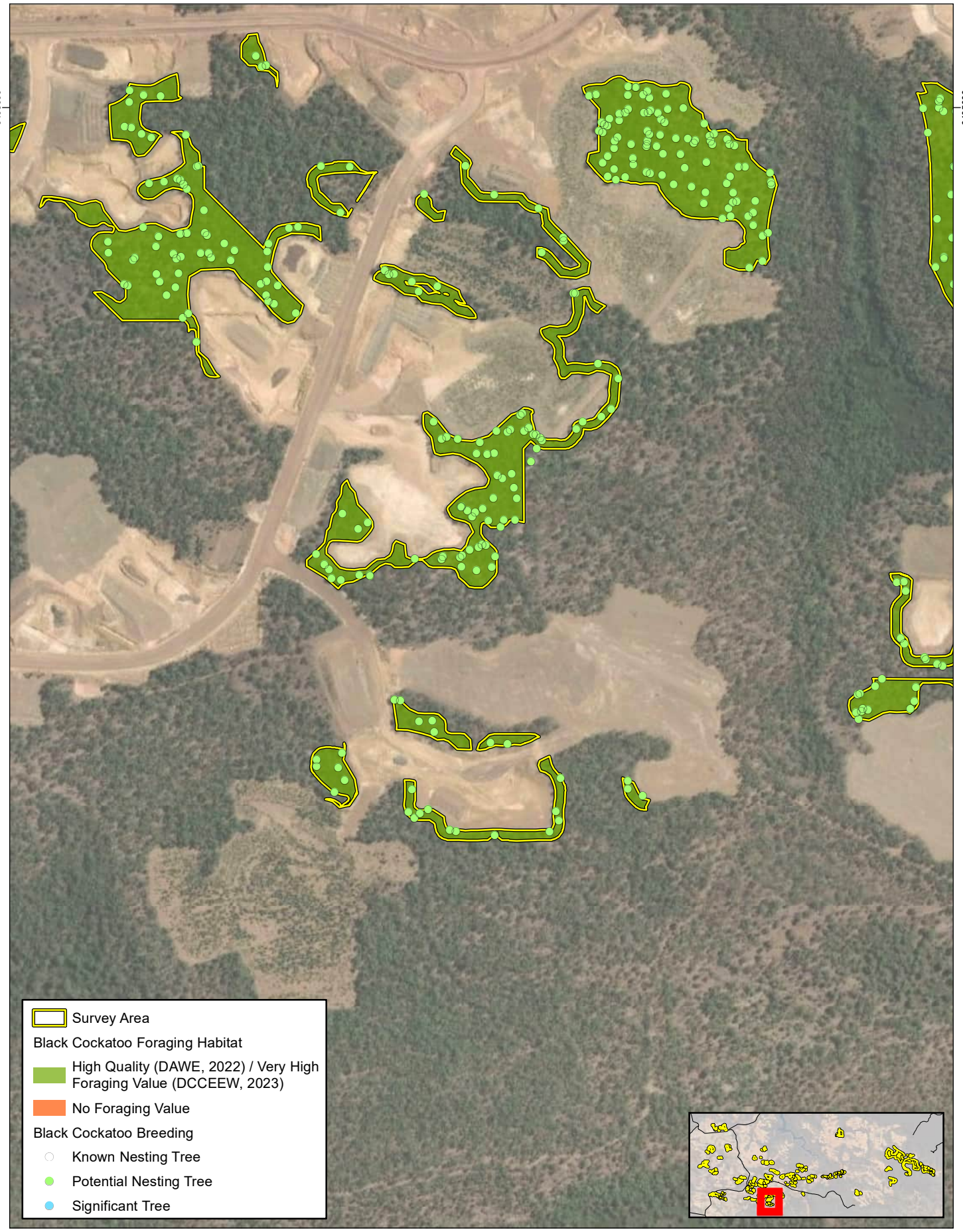
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-26

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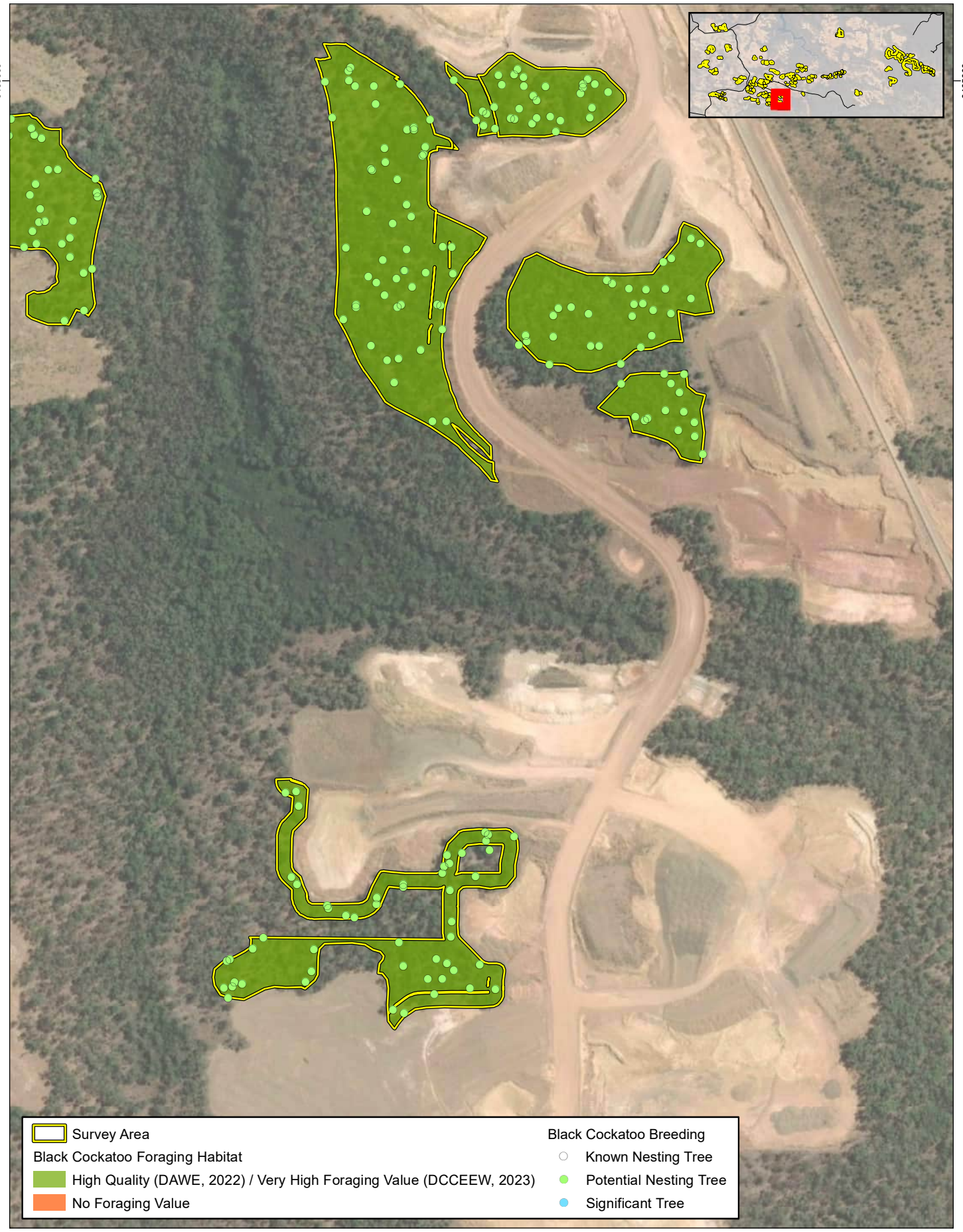
Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-27

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Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-28

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Black Cockatoo Habitat Assessment Huntly Mine

Myara Region

Black Cockatoo Breeding and Foraging Habitat

MAP 9-29

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Appendix B Literature Review Summary

Black Cockatoo Habitat Assessment

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

11 July 2024

Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Alcoa Black Cockatoo Nests - Myara Region (2011 - 2024) (Kirkby and Alcoa of Australia Ltd, 2024)	Overlaps Survey Area	2011 - 2024	Black cockatoo nesting tree surveys	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act	N/A
Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region (Environmental Management and Research Consultants, 2006)	Overlaps Survey Area	1996-2006	Long Term Fauna Monitoring Program	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Noisy Scrubbird (*Atrichornis clamosus*) – Listed as Endangered under the BC Act and EPBC Act • Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act	N/A
Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North (GHD, 2021b)	1 km north of Survey Area	August 2021	Targeted Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo, Chuditch, Quokka, and other Priority species	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*)	Eight fauna habitats were identified: • Jarrah-Marri forest • Bullich forest • Granite outcrop • Blackbutt forest • Flooded Gum woodland • Melaleuca dampland

Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
				– Listed at Vulnerable under the BC Act and EPBC Act • Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act • Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act • Peregrine Falcon (*Falco peregrinus*) – Listed as Special Protection (Schedule 7) under the BC Act • Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Listed as Conservation Dependent By DBCA • Masked Owl Southwest (*Tyto novaehollandiae*) – Listed as Priority 3 by the DBCA • Western False Pipistrelle (*Falsistrellus mackenziei*) - Listed as Priority 3 by the DBCA • Southern Death Adder (*Acanthophis antarcticus*) – Listed as Priority 3 by the DBCA • Rakali (*Hydromys chrysogaster*) – Listed as Priority 4 by the DBCA	• Mine rehabilitation • Pine plantation

Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
				• Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	
Black Cockatoo Habitat Assessment - Pinjarra Racecourse (Harewood, 2019)	6 km west of the Survey Area	2019	Targeted Black Cockatoo Habitat Assessment	• Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act	N/A
Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake (GHD, 2021a)	8 km south of the Survey Area	August 2021	Targeted Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo, Chuditch, Quokka, Carters's Freshwater Mussel, and other Priority species	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act • Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act • Peregrine Falcon (*Falco peregrinus*) – Listed as Special Protection under the BC Act	Seven fauna habitats were identified: • Bullich forest • Granite outcrop • Blackbutt forest • Flooded Gum woodland • Jarrah-Marri forest • Mine rehabilitation • Pine plantation

Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
				• Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Listed as Conservation Dependent By DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA • Western False Pipistrelle (*Falsistrellus mackenziei*) - Listed as Priority 3 by the DBCA	
Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment (GHD, 2012)	10 km north of the Survey Area	November 2011	Level 1 Fauna and Habitat Assessment	• Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Letter-winged kite (*Elanus scriptus*) – Listed as Priority 4 the DBCA	Five fauna habitats were identified: • Melaleuca wetlands • Swampland • Jarrah/Marri forest • *Banksia*/*Allocasuarina* woodlands • Dense shrublands on clay flats

Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67) (Harewood, 2017)	17.5 km south of Survey Area	August 2011	Basic Fauna Assessment and Black Cockatoo Habitat Assessment	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	Four fauna habitats were identified: • Remnant native vegetation • Plantations • Existing cleared areas • River and ephemeral streams

Appendix C Black Cockatoo Observations

Black Cockatoo Habitat Assessment

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

11 July 2024

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Zanda baudinii	Baudin's Cockatoo	EN	EN	1	23-08-2023	-32.4637	116.112	Foraging evidence
Zanda baudinii	Baudin's Cockatoo	EN	EN	1	24-08-2023	-32.4521	116.1758	Foraging evidence
Zanda latirostris	Carnaby's Cockatoo	EN	EN	40	26-08-2023	-32.4635	116.2185	Sighting
Zanda latirostris	Carnaby's Cockatoo	EN	EN	10	10-09-2023	-32.4746	116.1622	Sighting - overhead
Zanda sp.	White-tailed Black Cockatoo sp.	EN	EN	1	04-12-2023	-32.4771	116.1382	Feather
Zanda sp.	White-tailed Black Cockatoo sp.	EN	EN	1	04-12-2023	-32.4371	116.0697	Remains
Zanda sp.	White-tailed Black Cockatoo sp.	EN	EN	2	07-12-2023	-32.4697	116.14	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	05-07-2023	-32.4667	116.2376	Call
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	7	05-07-2023	-32.4449	116.1807	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	06-07-2023	-32.4748	116.1615	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	06-07-2023	-32.4752	116.1616	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	06-07-2023	-32.4752	116.1616	Call
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	06-07-2023	-32.4734	116.1647	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	07-07-2023	-32.4708	116.2394	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	07-07-2023	-32.4747	116.1656	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	4	07-07-2023	-32.4732	116.2239	Call
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	10	07-07-2023	-32.4679	116.2431	Sighting

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	22-08-2023	-32.4658	116.0541	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	22-08-2023	-32.49	116.1155	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	22-08-2023	-32.4952	116.1014	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	22-08-2023	-32.4772	116.1116	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	22-08-2023	-32.4509	116.0631	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	8	22-08-2023	-32.4526	116.086	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4752	116.1213	Scat
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4704	116.1148	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4523	116.1075	Scat
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4801	116.1323	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4801	116.1323	Scat
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4769	116.2133	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	23-08-2023	-32.4716	116.1707	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	3	23-08-2023	-32.4454	116.087	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	4	23-08-2023	-32.4816	116.1234	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	6	23-08-2023	-32.4837	116.1145	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	7	23-08-2023	-32.4742	116.121	Sighting

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	7	23-08-2023	-32.4471	116.0874	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	9	23-08-2023	-32.4727	116.1667	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	30	23-08-2023	-32.4751	116.1292	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	24-08-2023	-32.4292	116.1643	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	24-08-2023	-32.4293	116.1642	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	24-08-2023	-32.4414	116.1673	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	24-08-2023	-32.4411	116.2239	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	4	24-08-2023	-32.4418	116.2233	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	26-08-2023	-32.455	116.2104	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	31-08-2023	-32.4547	116.2179	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	01-09-2023	-32.455	116.2171	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	01-09-2023	-32.4558	116.2182	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	01-09-2023	-32.4566	116.2172	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	02-09-2023	-32.468	116.2308	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	02-09-2023	-32.4684	116.2312	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	11	09-09-2023	-32.4645	116.0583	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	10-09-2023	-32.477	116.1112	Foraging evidence

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	11-09-2023	-32.4891	116.1864	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	30-10-2023	-32.4727	116.2276	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	31-10-2023	-32.4697	116.2237	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	31-10-2023	-32.4665	116.222	Call
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	3	31-10-2023	-32.4898	116.0678	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	3	31-10-2023	-32.4657	116.2218	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	01-11-2023	-32.4817	116.098	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	02-11-2023	-32.4802	116.084	Scat
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	02-11-2023	-32.4783	116.088	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	03-11-2023	-32.451	116.0617	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	25	03-11-2023	-32.4762	116.0885	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4767	116.1306	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4756	116.1308	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4756	116.1308	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4761	116.1277	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4371	116.0696	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4374	116.0699	Foraging evidence

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4374	116.069	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4375	116.0689	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4925	116.0701	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4942	116.0752	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	04-12-2023	-32.4727	116.1172	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	6	04-12-2023	-32.4927	116.0728	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	15	04-12-2023	-32.4945	116.0751	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	05-12-2023	-32.4749	116.1286	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	05-12-2023	-32.4354	116.0713	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	05-12-2023	-32.4885	116.0725	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	05-12-2023	-32.4756	116.129	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	05-12-2023	-32.48	116.1086	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	05-12-2023	-32.4768	116.1336	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	05-12-2023	-32.4896	116.0739	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	3	05-12-2023	-32.4871	116.0987	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	3	05-12-2023	-32.4782	116.1125	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	06-12-2023	-32.4895	116.1388	Scat

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	06-12-2023	-32.4795	116.0973	Scat
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	06-12-2023	-32.4795	116.0973	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	06-12-2023	-32.4795	116.0969	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	06-12-2023	-32.49	116.1392	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	3	06-12-2023	-32.4891	116.1387	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	07-12-2023	-32.4499	116.0777	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	07-12-2023	-32.4497	116.0765	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	08-12-2023	-32.4636	116.1057	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	08-12-2023	-32.4639	116.1052	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	08-12-2023	-32.4766	116.1441	Feather
Calyptorhynchinae sp.	Black Cockatoo sp. roost	EN/VU	EN/VU	1	01-11-2023	-32.4893	116.0653	Scat
Calyptorhynchinae sp.	Black Cockatoo sp. roost	EN/VU	EN/VU	1	01-11-2023	-32.4817	116.098	Scat
Calyptorhynchinae sp.	Black Cockatoo sp. roost	EN/VU	EN/VU	1	05-12-2023	-32.4752	116.1215	Scat
Calyptorhynchinae sp.	Black Cockatoo sp. roost	EN/VU	EN/VU	1	08-12-2023	-32.4759	116.144	Scat
Calyptorhynchinae sp.	Black Cockatoo sp. roost	EN/VU	EN/VU	1	08-12-2023	-32.479	116.1441	Scat

Appendix D Black Cockatoo Nesting Habitat Trees

Black Cockatoo Habitat Assessment

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

11 July 2024

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472710	116.166516	600	20	1	Known nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466610	116.135047	1100	24	2	Known nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475225	116.122625	900	14	2	Known nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475287	116.122540	840	20	2	Known nesting tree	No
Stag	07-07-2023	-32.469835	116.244579	770	10	2	Known nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.473027	116.227171	1658	20	5	Potential nesting tree	Yes
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456471	116.219961	1572	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455572	116.218973	1500	25	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456279	116.218640	1500	18	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459831	116.216070	1500	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473611	116.227164	1477	27	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453480	116.210480	1400	17	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490223	116.064231	1400	20	4	Potential nesting tree	No
Stag	05-07-2023	-32.470481	116.245492	1400	14	4	Potential nesting tree	No
Stag	31-10-2023	-32.469547	116.225205	1356	22	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475666	116.161338	1300	35	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478152	116.110658	1300	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476851	116.129524	1264	19	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450197	116.076358	1238	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480176	116.212733	1200	17	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454138	116.210683	1200	18	4	Potential nesting tree	No
Stag	25-08-2023	-32.459308	116.226598	1200	10	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456774	116.217142	1200	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469305	116.223681	1178	27	4	Potential nesting tree	No
Stag	05-12-2023	-32.474565	116.133735	1168	31	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472994	116.067201	1150	25	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456001	116.219138	1150	18	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473221	116.225448	1136	23	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450096	116.075551	1101	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475171	116.161190	1100	32	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472984	116.223680	1100	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468317	116.234374	1100	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479712	116.103623	1100	12	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476560	116.161102	1085	18	4	Potential nesting tree	No
Stag	31-10-2023	-32.466283	116.220862	1057	18	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454038	116.209999	1028	22	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489875	116.067938	1010	29	4	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.457129	116.216280	1000	20	4	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.469627	116.210137	1000	15	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490271	116.066229	1000	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489643	116.066340	1000	27	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471406	116.246235	1000	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471858	116.172569	1000	16	4	Potential nesting tree	No
Stag	04-12-2023	-32.473126	116.117639	1000	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488979	116.066952	980	35	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451232	116.061455	974	20	4	Potential nesting tree	No
Stag	07-07-2023	-32.469549	116.244356	961	11	4	Potential nesting tree	No
Stag	07-07-2023	-32.473319	116.224147	961	16	4	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471017	116.246128	960	16	4	Potential nesting tree	No
Stag	31-08-2023	-32.461616	116.218361	960	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491021	116.119549	950	28	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476613	116.129653	933	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453580	116.210092	920	22	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458041	116.215121	920	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476601	116.210724	920	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489153	116.066831	920	28	4	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.476665	116.129115	914	26	4	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480293	116.210912	910	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473273	116.225109	904	16	4	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466005	116.232900	900	25	4	Potential nesting tree	No
Stag	07-07-2023	-32.470744	116.241716	900	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489057	116.182602	900	25	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476638	116.210060	900	15	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469532	116.211558	900	25	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490610	116.115841	900	25	4	Potential nesting tree	No
Stag	05-07-2023	-32.472823	116.244707	900	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475332	116.156933	900	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473651	116.246884	900	12	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456370	116.219399	900	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470705	116.133636	900	18	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473640	116.225293	891	21	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455306	116.219053	890	18	4	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.491261	116.067133	890	25	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476543	116.161311	885	17	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.473081	116.168358	882	19	4	Potential nesting tree	No
Stag	05-07-2023	-32.472425	116.245265	880	12	4	Potential nesting tree	No
Stag	07-07-2023	-32.473905	116.245733	880	10	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476925	116.110611	880	22	4	Potential nesting tree	No
Stag	05-07-2023	-32.471504	116.245606	860	12	4	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473887	116.246169	860	16	4	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475009	116.155599	859	16	4	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474155	116.125118	850	23	4	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.491511	116.068040	850	19	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.491628	116.068146	850	25	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491389	116.068464	850	24	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489764	116.067160	850	20	4	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450030	116.076819	844	22	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469577	116.210254	840	17	4	Potential nesting tree	No
Stag	31-10-2023	-32.469476	116.208079	830	11	4	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.468743	116.222180	828	17	4	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.449983	116.075848	824	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469566	116.208856	820	12	4	Potential nesting tree	No
Stag	31-10-2023	-32.469137	116.208006	820	16	4	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469350	116.136606	820	19	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472630	116.245444	820	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469951	116.208331	800	23	4	Potential nesting tree	No
Stag	05-07-2023	-32.472513	116.246150	800	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475223	116.156509	800	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475385	116.166084	800	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460560	116.216338	800	18	4	Potential nesting tree	No
Stag	05-07-2023	-32.471414	116.239218	796	25	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489732	116.063595	780	20	4	Potential nesting tree	No
Stag	05-07-2023	-32.471296	116.245394	780	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471971	116.245197	780	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473563	116.245779	780	10	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470793	116.243882	780	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464652	116.221909	770	18	4	Potential nesting tree	No
Stag	01-11-2023	-32.491275	116.066862	750	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469418	116.207731	750	18	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469872	116.207923	750	19	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490023	116.064008	750	13	4	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.491170	116.066294	750	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471719	116.246580	750	16	4	Potential nesting tree	No
Stag	07-07-2023	-32.474149	116.246050	740	14	4	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475939	116.160929	730	30	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468967	116.210464	730	15	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469100	116.210714	730	16	4	Potential nesting tree	No
Stag	31-10-2023	-32.469953	116.207513	730	18	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491426	116.068979	730	25	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469322	116.211720	720	13	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489967	116.064070	720	15	4	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.491171	116.063428	720	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456102	116.218802	720	12	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469514	116.211123	710	13	4	Potential nesting tree	No
Stag	30-10-2023	-32.469354	116.209137	700	30	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489076	116.182577	700	25	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469321	116.210808	700	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469362	116.211389	700	17	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469810	116.207851	700	19	4	Potential nesting tree	No
Stag	31-10-2023	-32.470017	116.207458	700	22	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490958	116.067993	700	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491027	116.068832	700	25	4	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.490924	116.119086	700	29	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473016	116.245133	700	16	4	Potential nesting tree	No
Stag	06-07-2023	-32.475699	116.158172	700	10	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475733	116.158929	700	18	4	Potential nesting tree	No
Stag	07-07-2023	-32.470824	116.244955	700	14	4	Potential nesting tree	No
Stag	06-07-2023	-32.473200	116.167774	690	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453626	116.210297	681	22	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468981	116.223658	681	11	4	Potential nesting tree	No
Stag	05-07-2023	-32.470101	116.245831	680	8	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472080	116.172376	680	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472418	116.172787	680	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490126	116.184174	675	15	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470099	116.208167	670	21	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476452	116.160802	670	2	4	Potential nesting tree	No
Stag	07-07-2023	-32.471543	116.244221	665	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482193	116.099064	660	22	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471795	116.245522	660	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472734	116.171908	660	18	4	Potential nesting tree	No
Stag	31-08-2023	-32.461572	116.218153	660	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469950	116.113701	660	18	4	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453090	116.210026	659	17	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470850	116.243795	650	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491123	116.066538	650	13	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471531	116.246278	650	18	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472866	116.171997	650	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460625	116.216449	650	14	4	Potential nesting tree	No
Stag	01-09-2023	-32.459508	116.216964	650	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476812	116.211118	640	9	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490012	116.063831	640	22	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491143	116.068864	640	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472312	116.244419	640	14	4	Potential nesting tree	No
Stag	25-08-2023	-32.460451	116.225822	640	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449938	116.077863	633	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469988	116.210165	630	13	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489653	116.063621	630	18	4	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.477627	116.085880	630	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469950	116.210100	620	13	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468245	116.210247	620	19	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468814	116.210430	620	10	4	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469107	116.211276	620	14	4	Potential nesting tree	No
Stag	05-07-2023	-32.472336	116.244660	620	10	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473383	116.223976	614	11	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468289	116.210183	610	13	4	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475870	116.159766	608	17	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477667	116.214073	600	30	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469603	116.210721	600	13	4	Potential nesting tree	No
Stag	05-07-2023	-32.470754	116.246077	600	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470443	116.246029	600	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470435	116.246059	600	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472163	116.244462	600	14	4	Potential nesting tree	No
Stag	05-07-2023	-32.473335	116.245200	600	10	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474691	116.123134	600	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469686	116.207852	590	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489984	116.063689	590	19	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471551	116.246323	580	18	4	Potential nesting tree	No
Stag	31-10-2023	-32.464776	116.221406	570	15	4	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471154	116.246547	570	17	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491704	116.069025	560	17	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470596	116.246249	560	18	4	Potential nesting tree	No
Stag	05-07-2023	-32.471237	116.245166	560	18	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472126	116.172796	560	18	4	Potential nesting tree	No
Stag	07-07-2023	-32.474070	116.245898	560	14	4	Potential nesting tree	No
Stag	07-07-2023	-32.471515	116.244218	554	15	4	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.469572	116.210255	550	13	4	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489843	116.066580	550	19	4	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475761	116.159347	550	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470523	116.246218	540	18	4	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469398	116.211222	530	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469314	116.211539	530	13	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469989	116.208334	520	18	4	Potential nesting tree	No
Stag	01-11-2023	-32.491142	116.066690	520	10	4	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471379	116.245172	520	16	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475877	116.159579	520	20	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472026	116.172577	520	18	4	Potential nesting tree	No
Stag	07-07-2023	-32.475313	116.165683	520	14	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459525	116.217036	520	18	4	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465466	116.231028	3100	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434464	116.064986	2800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463339	116.106322	2800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456230	116.210887	2600	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.489543	116.182823	2400	30	5	Potential nesting tree	No
Stag	11-09-2023	-32.489517	116.182813	2355	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469469	116.208902	2300	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467867	116.240975	2300	30	5	Potential nesting tree	No
Stag	07-07-2023	-32.469128	116.243930	2200	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461543	116.230743	2200	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450766	116.064392	2100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489230	116.186445	2050	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459118	116.211209	2050	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475147	116.146390	2000	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462937	116.232007	2000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490505	116.063659	2000	21	5	Potential nesting tree	No
Stag	07-07-2023	-32.472880	116.223886	2000	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458626	116.220213	2000	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457716	116.218846	2000	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472966	116.067290	2000	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472897	116.117229	2000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.473334	116.167918	2000	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468889	116.223274	2000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441338	116.170696	2000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435324	116.070732	2000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470284	116.240152	2000	25	5	Potential nesting tree	No
Stag	31-10-2023	-32.463185	116.227536	2000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473244	116.223820	2000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456261	116.220077	2000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468276	116.231225	2000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453420	116.076014	1950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435776	116.071559	1910	20	5	Potential nesting tree	No
Stag	04-12-2023	-32.434577	116.072397	1910	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476872	116.212179	1900	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461803	116.228030	1900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453003	116.104554	1900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494779	116.109606	1870	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472828	116.065756	1850	40	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472637	116.166951	1850	35	5	Potential nesting tree	No
Stag	30-10-2023	-32.473511	116.225782	1846	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470662	116.242725	1800	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.469521	116.243100	1800	25	5	Potential nesting tree	No
Stag	30-10-2023	-32.481716	116.210853	1800	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461286	116.220071	1800	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457531	116.217134	1800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475810	116.149408	1800	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457489	116.218133	1800	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463169	116.106510	1800	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.466351	116.230491	1800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462147	116.228080	1800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463740	116.227928	1800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458573	116.219757	1800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456455	116.219712	1800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468769	116.230077	1800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475395	116.121969	1800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496451	116.119898	1800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449826	116.076039	1767	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464722	116.113941	1750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479343	116.144055	1750	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479288	116.087042	1700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463299	116.226792	1700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478171	116.087005	1700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434713	116.070271	1700	30	5	Potential nesting tree	No
Stag	31-10-2023	-32.463336	116.228187	1700	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468110	116.241819	1700	30	5	Potential nesting tree	No
Stag	06-12-2023	-32.475451	116.110562	1700	30	5	Potential nesting tree	No
Stag	05-07-2023	-32.470833	116.246635	1662	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467099	116.053366	1650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434944	116.071121	1650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462631	116.225745	1650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453522	116.064959	1650	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456844	116.218892	1650	20	5	Potential nesting tree	No
Stag	11-09-2023	-32.490117	116.183321	1639	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490677	116.070079	1620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450297	116.077789	1601	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466852	116.232356	1600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468456	116.222656	1600	30	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464388	116.105739	1600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466459	116.231459	1600	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456977	116.221068	1600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458046	116.216894	1600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470023	116.241199	1600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469913	116.243507	1600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457779	116.216477	1600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464362	116.231075	1600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456214	116.211528	1600	18	5	Potential nesting tree	No
Stag	25-08-2023	-32.460957	116.227088	1600	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458207	116.217559	1600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464386	116.232486	1600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464232	116.227106	1600	25	5	Potential nesting tree	No
Stag	07-12-2023	-32.451847	116.076823	1600	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.471171	116.067032	1600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464246	116.231925	1600	20	5	Potential nesting tree	No
Stag	06-12-2023	-32.475132	116.111869	1600	14	5	Potential nesting tree	No
Stag	30-10-2023	-32.480222	116.211361	1600	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458509	116.209312	1600	35	5	Potential nesting tree	No
Stag	03-11-2023	-32.450590	116.062216	1595	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.471301	116.067594	1592	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469998	116.238755	1592	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463983	116.113968	1592	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497799	116.109315	1590	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475212	116.148594	1580	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.433884	116.073951	1560	16	5	Potential nesting tree	No
Stag	11-09-2023	-32.489707	116.186863	1553	17	5	Potential nesting tree	No
Stag	31-10-2023	-32.463107	116.230140	1550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.466139	116.230638	1550	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471519	116.065626	1550	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469032	116.136739	1550	18	5	Potential nesting tree	No
Stag	31-10-2023	-32.468836	116.211085	1530	15	5	Potential nesting tree	No
Stag	05-07-2023	-32.469792	116.239340	1528	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486729	116.097818	1528	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464658	116.220965	1525	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463206	116.230735	1512	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457569	116.215666	1510	25	5	Potential nesting tree	No
Stag	01-09-2023	-32.458149	116.216828	1500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457010	116.221527	1500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457160	116.220666	1500	20	5	Potential nesting tree	No
Stag	31-10-2023	-32.464787	116.232535	1500	16	5	Potential nesting tree	No
Stag	02-11-2023	-32.438631	116.170607	1500	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.470937	116.067289	1500	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456579	116.210727	1500	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457302	116.212069	1500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473178	116.223679	1500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460616	116.217558	1500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472169	116.167657	1500	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456434	116.215932	1500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478372	116.213576	1500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477572	116.145184	1500	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469925	116.241687	1500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469219	116.242929	1500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455351	116.219349	1500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437195	116.069158	1500	23	5	Potential nesting tree	No
Stag	04-12-2023	-32.494487	116.075169	1500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459521	116.210838	1500	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456216	116.211640	1500	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.490897	116.119694	1500	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473332	116.224632	1500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475391	116.122308	1500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470453	116.241985	1500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456752	116.211265	1500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467281	116.238714	1500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477554	116.213657	1500	25	5	Potential nesting tree	No
Stag	31-10-2023	-32.463021	116.227288	1500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461207	116.218825	1500	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496008	116.120284	1500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463830	116.113900	1496	20	5	Potential nesting tree	No
Stag	31-10-2023	-32.469783	116.223906	1477	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485730	116.093119	1470	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451295	116.062633	1464	30	5	Potential nesting tree	No
Stag	08-12-2023	-32.463879	116.114108	1464	10	5	Potential nesting tree	No
Stag	07-12-2023	-32.467503	116.059759	1464	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438941	116.171556	1450	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472326	116.066482	1450	28	5	Potential nesting tree	No
Stag	07-12-2023	-32.467163	116.053461	1450	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464529	116.114084	1450	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464636	116.232274	1450	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451748	116.064255	1450	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463466	116.230631	1448	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461618	116.227069	1448	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470156	116.242371	1448	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436231	116.071630	1432	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460395	116.099324	1432	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436442	116.075062	1432	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.433679	116.072920	1432	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460542	116.098632	1432	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468906	116.223323	1430	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473691	116.227414	1429	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451827	116.061211	1426	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454716	116.209152	1420	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467974	116.209048	1420	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491637	116.069359	1420	22	5	Potential nesting tree	No
Stag	11-09-2023	-32.489233	116.186606	1413	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462318	116.224394	1408	28	5	Potential nesting tree	No
Stag	07-07-2023	-32.472868	116.223896	1401	14	5	Potential nesting tree	No
Stag	05-07-2023	-32.471158	116.237617	1401	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436936	116.074911	1401	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467193	116.053886	1401	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.459751	116.098804	1400	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459924	116.215970	1400	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457106	116.219219	1400	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466598	116.134693	1400	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450474	116.064498	1400	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.462747	116.226752	1400	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463493	116.226512	1400	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462161	116.225403	1400	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437356	116.069664	1400	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.432534	116.065024	1400	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480655	116.132911	1400	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456555	116.209036	1400	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458536	116.210101	1400	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458095	116.211915	1400	12	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470274	116.244796	1400	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455507	116.218244	1400	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455311	116.218804	1400	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458000	116.213813	1400	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468187	116.239045	1400	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489898	116.139106	1400	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453383	116.077255	1400	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452187	116.076416	1400	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463126	116.113540	1400	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480055	116.212256	1400	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456693	116.218787	1400	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460070	116.219676	1400	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471836	116.115543	1400	18	5	Potential nesting tree	No
Stag	25-08-2023	-32.460247	116.227017	1400	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456837	116.221389	1400	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.476375	116.088303	1400	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475729	116.160525	1400	40	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461587	116.228498	1400	28	5	Potential nesting tree	No
Stag	03-11-2023	-32.452136	116.063649	1400	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459434	116.208429	1400	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468131	116.141284	1400	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468732	116.137496	1400	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465250	116.221846	1397	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456894	116.211620	1390	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458008	116.212579	1390	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475274	116.128456	1385	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470979	116.246812	1375	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459635	116.209915	1370	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457407	116.213396	1370	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490451	116.069742	1370	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435637	116.067721	1369	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464115	116.114316	1369	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434565	116.074557	1369	20	5	Potential nesting tree	No
Stag	31-10-2023	-32.465043	116.221417	1362	9	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.458256	116.209603	1360	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468914	116.209315	1360	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476747	116.210918	1360	17	5	Potential nesting tree	No
Stag	01-11-2023	-32.463772	116.222169	1359	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449901	116.075347	1359	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473164	116.223807	1353	13	5	Potential nesting tree	No
Stag	30-10-2023	-32.472468	116.227297	1353	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467846	116.222002	1350	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476408	116.109430	1350	13	5	Potential nesting tree	No
Stag	03-11-2023	-32.478233	116.087550	1350	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463968	116.105672	1350	40	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476772	116.210837	1350	7	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452477	116.065274	1350	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.491426	116.068209	1350	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455341	116.208912	1343	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490455	116.065881	1340	25	5	Potential nesting tree	No
Stag	31-10-2023	-32.467749	116.221630	1337	18	5	Potential nesting tree	No
Stag	05-07-2023	-32.466839	116.237832	1337	25	5	Potential nesting tree	No
Stag	02-11-2023	-32.489950	116.114841	1337	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467984	116.222203	1334	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457028	116.208631	1330	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450546	116.078209	1327	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471224	116.244525	1327	15	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469699	116.223655	1324	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.473810	116.226760	1321	18	5	Potential nesting tree	No
Stag	07-12-2023	-32.464842	116.058501	1321	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489809	116.114021	1320	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470449	116.244335	1315	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475238	116.110027	1310	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490560	116.061801	1310	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456426	116.210028	1310	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476466	116.129524	1308	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473764	116.226915	1305	18	5	Potential nesting tree	No
Stag	08-12-2023	-32.464478	116.109195	1305	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466623	116.233235	1300	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.462582	116.059676	1300	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476325	116.109211	1300	32	5	Potential nesting tree	No
Stag	31-08-2023	-32.451974	116.214442	1300	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.455419	116.217062	1300	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466514	116.231701	1300	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468046	116.229646	1300	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477813	116.214132	1300	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463466	116.226316	1300	30	5	Potential nesting tree	No
Stag	04-12-2023	-32.437600	116.069088	1300	60	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.433605	116.064994	1300	30	5	Potential nesting tree	No
Stag	05-07-2023	-32.470080	116.237336	1300	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457020	116.209219	1300	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459000	116.216450	1300	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453001	116.079029	1300	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451655	116.077276	1300	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466498	116.134580	1300	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.474781	116.145292	1300	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457652	116.209822	1300	11	5	Potential nesting tree	No
Stag	07-07-2023	-32.469656	116.239557	1300	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471884	116.242670	1300	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457721	116.219837	1300	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478028	116.215077	1300	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463329	116.106714	1300	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.457695	116.226945	1300	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461633	116.228371	1300	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.455131	116.063868	1300	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488844	116.095545	1300	22	5	Potential nesting tree	No
Stag	02-09-2023	-32.469042	116.229942	1300	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.479208	116.214598	1300	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475644	116.160584	1300	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470027	116.240815	1300	25	5	Potential nesting tree	No
Stag	01-09-2023	-32.457939	116.213373	1300	9	5	Potential nesting tree	No
Stag	01-09-2023	-32.460797	116.215746	1300	14	5	Potential nesting tree	No
Stag	25-08-2023	-32.458395	116.227727	1300	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480515	116.212062	1300	20	5	Potential nesting tree	No
Stag	30-10-2023	-32.480683	116.212391	1300	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456751	116.218746	1300	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457847	116.218720	1300	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.492674	116.094650	1300	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466200	116.136232	1300	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472447	116.226883	1296	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.476394	116.135634	1286	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.456009	116.209067	1283	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472594	116.226735	1280	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472350	116.170606	1280	35	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476950	116.211785	1280	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.493743	116.096703	1280	25	5	Potential nesting tree	No
Stag	11-09-2023	-32.489064	116.183158	1273	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478121	116.087940	1273	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.433369	116.074233	1273	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467400	116.053855	1273	10	5	Potential nesting tree	No
Stag	07-12-2023	-32.466479	116.053702	1273	5	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.432578	116.064293	1273	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465001	116.056016	1273	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467640	116.053656	1273	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464880	116.221798	1270	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458902	116.210337	1270	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.463200	116.218572	1270	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454976	116.210363	1261	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453463	116.209063	1261	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454827	116.208669	1260	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494389	116.112128	1260	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488740	116.185769	1251	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463677	116.225967	1250	25	5	Potential nesting tree	No
Stag	30-10-2023	-32.469314	116.210251	1250	5	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476659	116.110524	1250	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477804	116.213186	1250	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.492902	116.093764	1250	25	5	Potential nesting tree	No
Stag	05-12-2023	-32.460155	116.098642	1250	18	5	Potential nesting tree	No
Stag	31-10-2023	-32.467355	116.221928	1248	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455343	116.209952	1248	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475381	116.158410	1241	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490975	116.067387	1240	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482157	116.104883	1240	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.486235	116.092947	1240	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452474	116.061276	1238	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.469927	116.225092	1238	20	5	Potential nesting tree	No
Stag	01-11-2023	-32.489085	116.183218	1235	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.466625	116.220986	1232	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.471255	116.244166	1232	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490013	116.065774	1230	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464016	116.229623	1225	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473180	116.227395	1222	20	5	Potential nesting tree	No
Stag	03-11-2023	-32.450564	116.061914	1222	19	5	Potential nesting tree	No
Stag	01-11-2023	-32.462151	116.224702	1220	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490973	116.063238	1220	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491679	116.069184	1220	22	5	Potential nesting tree	No
Stag	31-10-2023	-32.465383	116.221104	1219	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449769	116.075413	1219	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473596	116.226579	1213	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.474946	116.161670	1210	20	5	Potential nesting tree	No
Stag	05-07-2023	-32.467693	116.237836	1210	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436060	116.070844	1210	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434807	116.067480	1210	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477606	116.098668	1210	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489225	116.120755	1210	20	5	Potential nesting tree	No
Stag	06-12-2023	-32.477524	116.098542	1210	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454740	116.211136	1210	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491343	116.070325	1210	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.481272	116.130351	1206	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462290	116.218244	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471001	116.243766	1200	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463573	116.232412	1200	30	5	Potential nesting tree	No
Stag	31-10-2023	-32.461423	116.230343	1200	18	5	Potential nesting tree	No
Stag	02-09-2023	-32.468441	116.223157	1200	30	5	Potential nesting tree	No
Stag	06-12-2023	-32.478783	116.097535	1200	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.454147	116.217198	1200	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451393	116.076605	1200	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462146	116.218094	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462249	116.218103	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462416	116.229252	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467963	116.230981	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459981	116.215602	1200	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471077	116.064913	1200	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434124	116.064837	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478505	116.087619	1200	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463401	116.112112	1200	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458351	116.214186	1200	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456745	116.219418	1200	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456148	116.217095	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467837	116.233602	1200	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478157	116.214325	1200	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463806	116.226711	1200	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461913	116.226196	1200	20	5	Potential nesting tree	No
Stag	31-10-2023	-32.463925	116.226237	1200	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479855	116.086689	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493925	116.075282	1200	25	5	Potential nesting tree	No
Stag	05-12-2023	-32.460336	116.099818	1200	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463923	116.105842	1200	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471506	116.238833	1200	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459321	116.211293	1200	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466245	116.232721	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464411	116.230450	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468833	116.238772	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453220	116.076165	1200	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457810	116.213025	1200	14	5	Potential nesting tree	No
Stag	31-08-2023	-32.458420	116.208693	1200	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457975	116.209957	1200	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457036	116.210397	1200	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.469972	116.244662	1200	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459123	116.219395	1200	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457724	116.219813	1200	16	5	Potential nesting tree	No
Stag	25-08-2023	-32.459839	116.227427	1200	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.470527	116.240664	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462290	116.218102	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467080	116.232034	1200	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478275	116.215292	1200	18	5	Potential nesting tree	No
Stag	30-10-2023	-32.477852	116.213707	1200	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.478393	116.088703	1200	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.469791	116.065550	1200	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460221	116.099230	1200	25	5	Potential nesting tree	No
Stag	08-12-2023	-32.459753	116.103761	1200	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469790	116.243184	1200	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469850	116.242946	1200	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.462336	116.219787	1200	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.458111	116.209113	1200	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456294	116.210515	1200	20	5	Potential nesting tree	No
Stag	01-09-2023	-32.457306	116.214009	1200	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.457095	116.216473	1200	35	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	31-10-2023	-32.464430	116.231813	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464169	116.231246	1200	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.467537	116.238046	1200	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438405	116.168962	1200	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452834	116.209327	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471075	116.114629	1200	30	5	Potential nesting tree	No
Stag	07-07-2023	-32.470856	116.244748	1200	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.467733	116.237549	1200	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456335	116.219591	1200	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489214	116.119162	1200	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458111	116.216980	1200	15	5	Potential nesting tree	No
Stag	07-07-2023	-32.470958	116.239780	1200	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456942	116.221099	1200	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479911	116.214795	1200	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474475	116.165758	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.464994	116.231255	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464000	116.227460	1200	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469460	116.238547	1200	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452924	116.065110	1200	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.454372	116.210580	1200	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456950	116.215326	1200	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493955	116.092957	1200	14	5	Potential nesting tree	No
Stag	01-09-2023	-32.455029	116.217606	1200	25	5	Potential nesting tree	No
Stag	02-11-2023	-32.439417	116.170036	1200	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459675	116.219886	1200	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.453396	116.077854	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457928	116.221831	1200	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469852	116.140738	1200	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.461380	116.224099	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459193	116.219945	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440215	116.167473	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451696	116.065238	1200	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457847	116.221425	1200	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456696	116.219397	1200	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.489666	116.103768	1200	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469249	116.139065	1200	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476020	116.144130	1200	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478807	116.144695	1200	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456097	116.209196	1200	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489567	116.185884	1197	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464065	116.114386	1194	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476591	116.129364	1191	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450406	116.062543	1187	29	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475888	116.128598	1184	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470814	116.244336	1181	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.472172	116.227691	1181	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475154	116.128132	1181	18	5	Potential nesting tree	No
Stag	04-12-2023	-32.434466	116.072290	1178	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453641	116.105405	1178	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.484857	116.093843	1178	18	5	Potential nesting tree	No
Stag	31-10-2023	-32.467076	116.221433	1171	18	5	Potential nesting tree	No
Stag	31-10-2023	-32.464991	116.222227	1165	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.480577	116.211815	1160	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490266	116.183422	1159	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468619	116.222341	1155	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470915	116.066134	1150	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463225	116.226887	1150	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Stag	05-12-2023	-32.488724	116.072614	1150	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480374	116.210822	1150	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459950	116.216446	1150	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.463346	116.224215	1150	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457493	116.222154	1150	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455658	116.219548	1150	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.453341	116.216180	1150	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478937	116.088239	1150	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464392	116.113950	1150	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464292	116.114375	1150	30	5	Potential nesting tree	No
Stag	31-08-2023	-32.456965	116.208128	1150	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457631	116.218860	1150	15	5	Potential nesting tree	No
Stag	31-10-2023	-32.462581	116.227026	1150	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451302	116.076155	1150	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482644	116.099740	1150	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.453758	116.210969	1150	18	5	Potential nesting tree	No
Stag	01-09-2023	-32.460207	116.214962	1150	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471107	116.066232	1150	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.435041	116.070294	1150	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491478	116.122087	1150	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468318	116.222037	1143	18	5	Potential nesting tree	No
Stag	07-12-2023	-32.450248	116.075754	1140	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.492781	116.113758	1140	20	5	Potential nesting tree	No
Stag	02-09-2023	-32.466480	116.232836	1140	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466543	116.232124	1140	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489935	116.067676	1140	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471112	116.244403	1136	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.473131	116.171972	1136	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454258	116.208955	1136	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470121	116.244337	1133	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477301	116.129572	1133	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477321	116.135370	1130	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.478688	116.213819	1130	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491500	116.106729	1130	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.465981	116.221616	1130	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473503	116.224788	1124	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460043	116.215167	1120	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494356	116.097404	1120	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.467955	116.209697	1120	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457727	116.212575	1120	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454329	116.209403	1120	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495352	116.111479	1120	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472107	116.226676	1120	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463727	116.108087	1115	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470992	116.246792	1114	12	5	Potential nesting tree	No
Stag	06-07-2023	-32.475534	116.161759	1114	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480098	116.096652	1114	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.472012	116.067384	1114	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.470145	116.067664	1114	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464506	116.109247	1114	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.471356	116.067487	1114	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435146	116.067428	1114	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460910	116.098644	1114	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434711	116.074167	1114	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.494001	116.074495	1114	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434453	116.074110	1114	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.457957	116.208706	1110	5	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470051	116.207268	1110	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494573	116.109359	1110	25	5	Potential nesting tree	No
Stag	31-10-2023	-32.467522	116.221613	1108	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.466402	116.220936	1108	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463389	116.231998	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464154	116.112524	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.474808	116.161481	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435863	116.066666	1100	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460070	116.218380	1100	25	5	Potential nesting tree	No
Stag	06-12-2023	-32.476180	116.108946	1100	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.461780	116.224441	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463595	116.105660	1100	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437495	116.069516	1100	25	5	Potential nesting tree	No
Stag	30-10-2023	-32.477531	116.214044	1100	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.462988	116.059374	1100	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.470010	116.241677	1100	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.467058	116.232620	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497123	116.120208	1100	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470019	116.241862	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474920	116.165668	1100	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457606	116.218934	1100	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467700	116.234273	1100	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468500	116.222759	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468380	116.222748	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479943	116.214636	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.478070	116.214054	1100	32	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.461735	116.230330	1100	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436459	116.069556	1100	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436966	116.069330	1100	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464622	116.114203	1100	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464349	116.108018	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472713	116.166088	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460717	116.220119	1100	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457322	116.215761	1100	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464148	116.228531	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468345	116.239187	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438336	116.168197	1100	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452806	116.079076	1100	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463269	116.112305	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452631	116.208803	1100	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458577	116.211770	1100	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477049	116.212358	1100	9	5	Potential nesting tree	No
Stag	01-11-2023	-32.490555	116.067128	1100	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476683	116.110542	1100	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476646	116.109924	1100	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470569	116.246436	1100	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471370	116.243994	1100	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458339	116.217182	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460115	116.099204	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471067	116.170656	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457949	116.215607	1100	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.468874	116.232229	1100	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489357	116.067436	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495310	116.111722	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475214	116.161615	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457224	116.219979	1100	20	5	Potential nesting tree	No
Stag	01-09-2023	-32.460217	116.218611	1100	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Stag	01-09-2023	-32.458285	116.216970	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463102	116.230539	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476049	116.088162	1100	32	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472711	116.065208	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475074	116.161233	1100	20	5	Potential nesting tree	No
Stag	26-08-2023	-32.457784	116.227855	1100	22	5	Potential nesting tree	No
Stag	26-08-2023	-32.463384	116.218935	1100	7	5	Potential nesting tree	No
Stag	26-08-2023	-32.463446	116.219527	1100	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460005	116.220082	1100	18	5	Potential nesting tree	No
Stag	31-08-2023	-32.457369	116.209212	1100	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456126	116.211077	1100	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464677	116.232638	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463655	116.228618	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467372	116.237927	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440511	116.167020	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452291	116.065088	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463018	116.113280	1100	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477140	116.212151	1100	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493642	116.091000	1100	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475051	116.146650	1100	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468928	116.230160	1100	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475230	116.121998	1100	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458109	116.219516	1100	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472703	116.065481	1100	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490003	116.114234	1100	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.468883	116.241931	1100	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.470041	116.243750	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471041	116.243703	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460139	116.214937	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469450	116.209642	1100	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479395	116.086481	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434284	116.070953	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475292	116.161227	1100	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473674	116.165661	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460759	116.219583	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457631	116.209820	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452449	116.065656	1100	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.469273	116.244133	1100	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474770	116.111960	1100	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470611	116.241808	1100	20	5	Potential nesting tree	No
Stag	01-11-2023	-32.489929	116.183236	1100	25	5	Potential nesting tree	No
Stag	25-08-2023	-32.461490	116.223347	1100	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464267	116.228520	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452885	116.064332	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453861	116.210528	1100	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458428	116.212171	1100	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491880	116.119354	1100	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490347	116.063009	1100	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482204	116.097752	1100	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.470914	116.226103	1100	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441467	116.167566	1100	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453924	116.064896	1100	27	5	Potential nesting tree	No
Stag	26-08-2023	-32.459118	116.227626	1100	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456655	116.218871	1100	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456506	116.221184	1100	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454718	116.218037	1100	12	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459629	116.218376	1100	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457697	116.218097	1100	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468129	116.230593	1100	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469036	116.230425	1100	20	5	Potential nesting tree	No
Stag	31-10-2023	-32.461848	116.230255	1100	35	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.460610	116.221128	1100	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471574	116.245820	1095	7	5	Potential nesting tree	No
Stag	06-12-2023	-32.479364	116.131626	1092	16	5	Potential nesting tree	No
Stag	31-10-2023	-32.466666	116.221511	1092	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450434	116.063019	1092	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.491127	116.063417	1090	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.498164	116.109356	1090	25	5	Potential nesting tree	No
Stag	26-08-2023	-32.453672	116.210282	1085	6	5	Potential nesting tree	No
Stag	07-12-2023	-32.450123	116.075726	1085	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464150	116.056315	1082	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489789	116.073650	1082	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451004	116.107424	1080	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457541	116.211519	1080	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457328	116.209922	1080	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.486957	116.093956	1080	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479673	116.213745	1080	28	5	Potential nesting tree	No
Stag	07-12-2023	-32.465923	116.057895	1080	30	5	Potential nesting tree	No
Stag	01-09-2023	-32.456414	116.210265	1080	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470622	116.207507	1080	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489635	116.065386	1080	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489044	116.118916	1080	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475501	116.159702	1079	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.468607	116.222520	1076	18	5	Potential nesting tree	No
Stag	31-10-2023	-32.466488	116.221010	1073	13	5	Potential nesting tree	No
Stag	07-07-2023	-32.473064	116.224152	1070	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.433189	116.072718	1070	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455695	116.211188	1070	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464690	116.221017	1070	24	5	Potential nesting tree	No
Stag	11-09-2023	-32.478561	116.215295	1070	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.461799	116.223890	1070	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457585	116.211712	1070	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458439	116.208985	1070	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490025	116.065959	1070	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.452494	116.060613	1063	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491591	116.119636	1060	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491465	116.070134	1060	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466753	116.134599	1060	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458335	116.212012	1060	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482198	116.104363	1060	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471126	116.244962	1060	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.466279	116.221856	1060	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466970	116.054553	1050	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478778	116.097513	1050	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.459451	116.070422	1050	25	5	Potential nesting tree	No
Stag	08-12-2023	-32.463189	116.105581	1050	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.462047	116.229846	1050	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461546	116.226965	1050	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463599	116.226266	1050	25	5	Potential nesting tree	No
Stag	02-11-2023	-32.438659	116.169482	1050	28	5	Potential nesting tree	No
Stag	02-11-2023	-32.480756	116.086451	1050	32	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.436273	116.069762	1050	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466636	116.054329	1050	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	08-12-2023	-32.464252	116.114304	1050	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469759	116.237426	1050	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457321	116.211765	1050	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472827	116.064284	1050	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434978	116.070523	1050	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476558	116.210220	1050	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463003	116.225771	1050	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.476371	116.088224	1050	32	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.452732	116.209605	1050	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.474815	116.148045	1050	15	5	Potential nesting tree	No
Stag	25-08-2023	-32.459615	116.226858	1050	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470378	116.207733	1050	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.455130	116.061070	1050	20	5	Potential nesting tree	No
Stag	08-12-2023	-32.464651	116.113662	1050	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488490	116.095890	1050	16	5	Potential nesting tree	No
Stag	31-08-2023	-32.462500	116.218249	1050	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498846	116.111017	1050	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459796	116.215317	1050	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.433983	116.073456	1050	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471029	116.244559	1050	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436646	116.074344	1050	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.461046	116.098884	1050	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435899	116.066588	1050	18	5	Potential nesting tree	No
Stag	05-07-2023	-32.470869	116.246963	1050	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.476368	116.135469	1047	15	5	Potential nesting tree	No
Stag	06-07-2023	-32.472054	116.172212	1047	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453144	116.209408	1044	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476293	116.129041	1041	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454106	116.208647	1040	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453544	116.208840	1040	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466517	116.134808	1040	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490618	116.070110	1040	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455328	116.209914	1040	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479123	116.131870	1035	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476344	116.109743	1030	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458656	116.208984	1030	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.485889	116.092809	1030	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.467967	116.221813	1025	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476033	116.127347	1025	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.470053	116.244278	1022	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467006	116.221670	1022	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489866	116.063497	1020	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467445	116.233669	1020	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458341	116.215277	1020	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490036	116.062939	1020	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485905	116.093007	1020	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468284	116.210070	1020	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470168	116.207712	1020	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.487510	116.183559	1019	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.436119	116.072050	1019	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436005	116.071730	1019	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460838	116.099060	1019	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.461101	116.098493	1019	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467070	116.053848	1019	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.460341	116.071582	1019	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463552	116.111877	1019	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.466233	116.221849	1019	12	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Stag	06-12-2023	-32.477258	116.099454	1019	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435570	116.067560	1019	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466225	116.231421	1019	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471128	116.246972	1015	13	5	Potential nesting tree	No
Stag	05-12-2023	-32.476413	116.133220	1012	9	5	Potential nesting tree	No
Stag	01-11-2023	-32.464299	116.221805	1012	5	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458440	116.211531	1010	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450395	116.061827	1009	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470637	116.207958	1005	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465411	116.231799	1003	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480542	116.131946	1000	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.464650	116.221859	1000	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468106	116.231972	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466081	116.056022	1000	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451100	116.107040	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478883	116.215788	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469339	116.223554	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462062	116.230078	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.432882	116.064999	1000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434589	116.069516	1000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452125	116.075721	1000	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440348	116.169568	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436471	116.066790	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488869	116.183813	1000	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.459627	116.070040	1000	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463292	116.105472	1000	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474059	116.107748	1000	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454529	116.063643	1000	28	5	Potential nesting tree	No
Stag	07-12-2023	-32.466286	116.058457	1000	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480209	116.083991	1000	28	5	Potential nesting tree	No
Stag	01-11-2023	-32.464013	116.222402	1000	12	5	Potential nesting tree	No
Stag	04-12-2023	-32.475617	116.130569	1000	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471293	116.241656	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471294	116.243648	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457576	116.219631	1000	20	5	Potential nesting tree	No
Stag	31-08-2023	-32.461853	116.218295	1000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462061	116.218624	1000	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456176	116.217397	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477368	116.213812	1000	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.479917	116.211840	1000	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463104	116.231241	1000	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462989	116.225346	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462842	116.225264	1000	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440442	116.170705	1000	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440982	116.169627	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441203	116.169788	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479713	116.087178	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472133	116.066925	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437384	116.075535	1000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436618	116.067274	1000	25	5	Potential nesting tree	No
Stag	05-12-2023	-32.490255	116.072173	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466550	116.057872	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464962	116.113030	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464351	116.113716	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464165	116.107864	1000	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471217	116.239963	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457031	116.207851	1000	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457396	116.207737	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460114	116.209531	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460122	116.209697	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458569	116.210462	1000	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.456062	116.215462	1000	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457904	116.216689	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458855	116.216685	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462937	116.228093	1000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462888	116.227203	1000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469651	116.241611	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468860	116.239143	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468702	116.238923	1000	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441495	116.167312	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441453	116.168627	1000	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452060	116.065381	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453387	116.076588	1000	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.453283	116.077904	1000	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.453164	116.078027	1000	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.452957	116.107190	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455579	116.208593	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458608	116.213232	1000	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459393	116.218722	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476726	116.211704	1000	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489143	116.066754	1000	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490167	116.115509	1000	26	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.492549	116.122619	1000	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471699	116.246052	1000	18	5	Potential nesting tree	No
Stag	05-07-2023	-32.471547	116.245555	1000	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.472652	116.223827	1000	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.473851	116.224638	1000	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459156	116.227460	1000	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489635	116.063788	1000	29	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.458417	116.227611	1000	18	5	Potential nesting tree	No
Stag	26-08-2023	-32.459111	116.227938	1000	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461305	116.219863	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459824	116.217256	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468605	116.229898	1000	22	5	Potential nesting tree	No
Stag	04-12-2023	-32.470343	116.113985	1000	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.467022	116.237774	1000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467837	116.230488	1000	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468077	116.230625	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469137	116.209573	1000	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.462196	116.231148	1000	35	5	Potential nesting tree	No
Stag	01-11-2023	-32.462617	116.223080	1000	35	5	Potential nesting tree	No
Stag	02-11-2023	-32.442026	116.171211	1000	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471895	116.168424	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.457587	116.227119	1000	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.463361	116.218925	1000	8	5	Potential nesting tree	No
Stag	26-08-2023	-32.463443	116.219889	1000	8	5	Potential nesting tree	No
Stag	26-08-2023	-32.462775	116.219940	1000	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459553	116.219887	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459559	116.220001	1000	26	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456459	116.207913	1000	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458750	116.209477	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459696	116.211309	1000	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457602	116.213653	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478625	116.213511	1000	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477908	116.213544	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.466033	116.231817	1000	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464489	116.230731	1000	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464468	116.232054	1000	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.488583	116.182557	1000	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.441705	116.167038	1000	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480984	116.132113	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452305	116.075786	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458431	116.208942	1000	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469619	116.208261	1000	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491583	116.121969	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473228	116.244523	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475903	116.162927	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457972	116.222044	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476925	116.109812	1000	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.473207	116.245210	1000	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455868	116.208479	1000	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472768	116.166097	1000	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473085	116.128691	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473170	116.128633	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472089	116.115992	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455050	116.219137	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479207	116.214186	1000	22	5	Potential nesting tree	No
Stag	30-10-2023	-32.468025	116.209475	1000	30	5	Potential nesting tree	No
Stag	06-12-2023	-32.479387	116.095344	1000	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.473185	116.166506	1000	15	5	Potential nesting tree	No
Stag	07-07-2023	-32.470705	116.239853	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477365	116.213217	1000	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464040	116.228263	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467291	116.238226	1000	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471706	116.245229	1000	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.476422	116.160611	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474985	116.123567	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465225	116.233013	1000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.487924	116.093083	1000	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476827	116.111030	1000	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.458247	116.226970	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461256	116.219909	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457916	116.221744	1000	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456136	116.218945	1000	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459557	116.215454	1000	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468427	116.230548	1000	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.470174	116.225883	1000	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470456	116.113612	1000	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474443	116.123715	1000	20	5	Potential nesting tree	No
Stag	06-12-2023	-32.474970	116.111414	1000	10	5	Potential nesting tree	No
Stag	05-07-2023	-32.471546	116.246435	1000	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477480	116.213247	1000	20	5	Potential nesting tree	No
Stag	11-09-2023	-32.489160	116.183740	996	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469952	116.225725	996	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.473739	116.226837	996	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490155	116.063274	990	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495419	116.109788	990	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.489018	116.183516	987	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475291	116.160864	987	30	5	Potential nesting tree	No
Stag	08-12-2023	-32.464272	116.110215	987	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463626	116.113433	987	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	08-12-2023	-32.463702	116.114037	987	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473369	116.225400	987	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436010	116.070477	987	3100	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465522	116.230653	987	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434022	116.073616	987	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478889	116.132248	984	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476097	116.127937	984	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470666	116.245124	980	4	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481669	116.097609	980	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451471	116.106763	980	28	5	Potential nesting tree	No
Stag	01-11-2023	-32.462488	116.225882	980	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478320	116.214219	980	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437028	116.074481	980	25	5	Potential nesting tree	No
Stag	02-11-2023	-32.480209	116.086305	980	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.471767	116.066640	980	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466261	116.058038	980	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453714	116.208464	980	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479378	116.109438	980	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468568	116.209326	980	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456955	116.208865	980	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482172	116.104655	980	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495072	116.111371	980	20	5	Potential nesting tree	No
Stag	01-11-2023	-32.463758	116.225403	980	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.488573	116.072237	980	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470672	116.207821	980	30	5	Potential nesting tree	No
Stag	07-12-2023	-32.466693	116.054658	980	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467810	116.209389	980	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470461	116.207859	980	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483037	116.104274	980	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460836	116.217594	980	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.454922	116.216306	980	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488835	116.183838	980	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.469564	116.244410	974	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.471863	116.227137	974	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.464485	116.221556	974	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436510	116.069307	970	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478544	116.215498	970	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459709	116.208622	970	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459076	116.209879	970	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490905	116.119983	970	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466774	116.136947	970	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.497400	116.117535	970	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.491134	116.063384	970	25	5	Potential nesting tree	No
Stag	30-10-2023	-32.469437	116.209693	970	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.495188	116.110497	970	22	5	Potential nesting tree	No
Stag	31-08-2023	-32.461700	116.218474	970	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.487582	116.093568	970	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473505	116.225149	968	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465742	116.221248	968	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469612	116.225052	965	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449676	116.075867	961	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467330	116.221716	961	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.479530	116.214047	960	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479314	116.087144	960	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476240	116.087222	960	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471317	116.171429	960	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455043	116.219268	960	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Stag	31-10-2023	-32.469464	116.208648	960	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.460142	116.225978	960	14	5	Potential nesting tree	No
Stag	26-08-2023	-32.461817	116.219383	960	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.462655	116.230287	960	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469095	116.209438	960	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469698	116.137900	960	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476411	116.091067	960	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469694	116.224486	958	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454320	116.211106	958	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477407	116.135971	955	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473076	116.224457	955	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489515	116.120610	955	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489332	116.114533	955	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498408	116.114091	955	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489883	116.109056	955	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435125	116.073236	955	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434667	116.073120	955	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435359	116.074438	955	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436061	116.075156	955	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436298	116.075431	955	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436317	116.074420	955	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436222	116.074391	955	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.436080	116.072490	955	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436105	116.072015	955	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435177	116.067396	955	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460943	116.099393	955	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486828	116.097523	955	25	5	Potential nesting tree	No
Stag	06-12-2023	-32.477827	116.098215	955	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466464	116.059162	955	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.465075	116.108759	955	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463660	116.113769	955	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463999	116.113679	955	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485317	116.092931	955	18	5	Potential nesting tree	No
Stag	03-11-2023	-32.495347	116.101118	955	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436221	116.075186	955	16	5	Potential nesting tree	No
Stag	05-12-2023	-32.489468	116.073399	955	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465653	116.230428	955	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498319	116.113857	955	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.460725	116.098715	955	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465875	116.056317	955	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465689	116.232815	955	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473972	116.226005	955	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.489465	116.073473	955	20	5	Potential nesting tree	No
Stag	03-11-2023	-32.495056	116.101885	955	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485184	116.093036	955	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434522	116.072415	955	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465440	116.232709	955	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.434680	116.072994	955	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.436676	116.074349	955	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.433277	116.064705	955	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.484944	116.093575	955	18	5	Potential nesting tree	No
Stag	05-07-2023	-32.470844	116.245068	952	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.452835	116.208929	952	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459929	116.218635	950	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434353	116.070420	950	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479151	116.097659	950	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466811	116.054426	950	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479793	116.213614	950	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455300	116.218546	950	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.486242	116.092602	950	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463404	116.224060	950	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.469348	116.243170	950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457292	116.219618	950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456990	116.221093	950	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467942	116.234254	950	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463577	116.229459	950	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462396	116.229790	950	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464157	116.226096	950	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462915	116.225261	950	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480587	116.086578	950	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479748	116.087219	950	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472731	116.067132	950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436360	116.069869	950	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437553	116.069511	950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493686	116.074839	950	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460199	116.099829	950	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.450867	116.107675	950	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456548	116.207606	950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459310	116.209318	950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456438	116.210541	950	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464794	116.108050	950	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458106	116.212081	950	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489660	116.067969	950	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490393	116.066906	950	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476253	116.120820	950	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.472207	116.245293	950	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469640	116.243964	950	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488597	116.094901	950	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435414	116.071619	950	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453324	116.065308	950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490015	116.066255	950	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467806	116.209327	950	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.496747	116.101017	950	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.467303	116.233744	950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462492	116.225260	950	35	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.462707	116.060391	950	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.479218	116.213538	950	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471248	116.063896	950	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480749	116.108007	950	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491910	116.121760	950	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479380	116.144984	950	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477907	116.214195	950	18	5	Potential nesting tree	No
Stag	01-11-2023	-32.463058	116.225375	950	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.467141	116.054490	950	15	5	Potential nesting tree	No
Stag	08-12-2023	-32.463523	116.106468	950	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.461283	116.228323	950	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456852	116.209091	950	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474682	116.128213	950	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469245	116.210652	950	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488818	116.096801	950	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469974	116.138889	950	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473387	116.246057	950	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468156	116.208956	950	25	5	Potential nesting tree	No
Stag	31-10-2023	-32.461498	116.229874	950	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Stag	25-08-2023	-32.461481	116.224312	950	13	5	Potential nesting tree	No
Stag	26-08-2023	-32.462830	116.220262	950	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489948	116.064806	950	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464056	116.113539	950	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.461456	116.224147	950	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464632	116.108673	950	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.459779	116.227662	950	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456262	116.219524	950	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459410	116.217319	950	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469474	116.233060	950	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469302	116.232243	950	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469214	116.138687	950	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469615	116.138879	950	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479374	116.144438	950	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.495951	116.120310	950	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468466	116.222130	945	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454510	116.217768	940	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453725	116.216819	940	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462182	116.224239	940	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458085	116.213059	940	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458480	116.214855	940	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494055	116.112048	940	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.476852	116.121850	940	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474652	116.165721	940	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479161	116.213722	940	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.471654	116.244745	940	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491520	116.120763	940	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469083	116.209244	940	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466174	116.233220	940	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489896	116.062059	940	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469333	116.139732	940	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469978	116.239365	939	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489189	116.183736	939	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464370	116.110168	939	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.453848	116.211201	939	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451982	116.062717	939	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465742	116.221763	936	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466918	116.231390	930	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464612	116.113794	930	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454699	116.209516	930	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455289	116.207412	930	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455335	116.207844	930	5	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458819	116.211956	930	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459378	116.218665	930	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489563	116.183154	930	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.491227	116.063419	930	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476538	116.210668	930	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493576	116.112512	930	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.476182	116.122358	930	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.491181	116.067256	930	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474882	116.145504	930	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455649	116.208975	929	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.484188	116.093346	926	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434210	116.073861	923	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436049	116.071936	923	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455205	116.210220	923	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.490158	116.073559	923	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489230	116.072721	923	13	5	Potential nesting tree	No
Stag	06-12-2023	-32.478580	116.097758	923	20	5	Potential nesting tree	No
Stag	07-12-2023	-32.460148	116.069516	923	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.496152	116.101386	923	18	5	Potential nesting tree	No
Stag	07-12-2023	-32.464884	116.055976	923	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465524	116.230859	923	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471251	116.246763	920	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460137	116.218047	920	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434360	116.070218	920	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438421	116.170416	920	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450868	116.062820	920	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490556	116.183555	920	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.477059	116.129600	920	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456869	116.219995	920	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480105	116.214126	920	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463005	116.230152	920	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437510	116.074844	920	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437032	116.075564	920	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459215	116.210240	920	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457443	116.214937	920	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459214	116.218966	920	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.491025	116.063688	920	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470975	116.062085	920	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471189	116.062136	920	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472406	116.064333	920	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.490949	116.101809	920	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485466	116.092733	920	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.487708	116.094483	920	27	5	Potential nesting tree	No
Stag	06-12-2023	-32.477580	116.110532	920	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468320	116.209434	920	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490024	116.062272	920	35	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.491182	116.118953	920	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468122	116.136990	920	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.490556	116.115928	920	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461760	116.220492	920	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460502	116.216988	920	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457437	116.217502	920	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478410	116.112369	920	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478717	116.130239	920	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488681	116.095089	920	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451154	116.078452	914	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473540	116.226653	910	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.435602	116.070585	910	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477116	116.212324	910	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488321	116.094429	910	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476544	116.121922	910	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469028	116.136650	910	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469886	116.140939	910	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458684	116.213502	910	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493600	116.091663	910	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482577	116.103855	910	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.485747	116.093306	910	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490052	116.119400	910	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489445	116.186167	907	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477639	116.098817	907	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453007	116.209153	907	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450458	116.062517	907	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	04-12-2023	-32.477109	116.129896	907	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450499	116.075484	907	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477268	116.129420	907	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.472145	116.227036	907	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454773	116.211415	904	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.487152	116.182707	901	12	5	Potential nesting tree	No
Stag	05-07-2023	-32.470045	116.244956	901	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471823	116.245120	901	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.466396	116.221430	901	14	5	Potential nesting tree	No
Stag	06-12-2023	-32.481008	116.132610	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.433622	116.065055	900	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461876	116.229365	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474503	116.165580	900	25	5	Potential nesting tree	No
Stag	01-09-2023	-32.460119	116.217799	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478400	116.086479	900	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466657	116.231156	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474570	116.109075	900	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437333	116.069838	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467375	116.060528	900	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480237	116.129358	900	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.452627	116.078543	900	26	5	Potential nesting tree	No
Stag	31-10-2023	-32.462423	116.230284	900	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482669	116.131126	900	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.473912	116.128320	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478610	116.097730	900	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471298	116.238909	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453797	116.065212	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470325	116.240802	900	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460052	116.215145	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455497	116.218468	900	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456287	116.218051	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466376	116.232847	900	20	5	Potential nesting tree	No
Stag	02-09-2023	-32.467001	116.233863	900	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467160	116.234119	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467804	116.233755	900	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467755	116.233164	900	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.478656	116.214370	900	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.477838	116.214486	900	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463953	116.230381	900	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463372	116.226484	900	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462911	116.225748	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.461617	116.223994	900	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489603	116.183151	900	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438461	116.169509	900	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.435149	116.070135	900	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436548	116.066910	900	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479397	116.095887	900	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464417	116.108784	900	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464780	116.113859	900	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475442	116.161260	900	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.468455	116.242520	900	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.457916	116.227860	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458024	116.228538	900	25	5	Potential nesting tree	No
Stag	26-08-2023	-32.463450	116.219426	900	7	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.462635	116.220109	900	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.460329	116.219528	900	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457475	116.208029	900	30	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459525	116.209412	900	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460084	116.209123	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460197	116.209151	900	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457017	116.210449	900	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459608	116.210737	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459002	116.210972	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459027	116.211301	900	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459090	116.216431	900	30	5	Potential nesting tree	No
Stag	02-09-2023	-32.458133	116.216106	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464613	116.231294	900	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463575	116.228648	900	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.468151	116.239527	900	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.440627	116.168333	900	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.438367	116.168647	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438206	116.168037	900	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438508	116.169274	900	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454331	116.063857	900	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480221	116.133156	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479733	116.132612	900	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490546	116.139156	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490450	116.139054	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454196	116.075973	900	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.453464	116.076834	900	27	5	Potential nesting tree	No
Stag	07-12-2023	-32.452541	116.076394	900	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452367	116.076059	900	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.452376	116.106353	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.453882	116.210832	900	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453639	116.210578	900	7	5	Potential nesting tree	No
Stag	26-08-2023	-32.454703	116.209926	900	5	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459433	116.210111	900	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458564	116.212336	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458640	116.215173	900	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457247	116.214229	900	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479867	116.110180	900	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466445	116.134819	900	21	5	Potential nesting tree	No
Stag	05-07-2023	-32.470293	116.245311	900	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.476480	116.160587	900	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471935	116.171571	900	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.474192	116.246537	900	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471136	116.243946	900	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.466194	116.231611	900	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471196	116.066216	900	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458738	116.227933	900	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460595	116.216075	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468772	116.233348	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490526	116.063559	900	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471343	116.241507	900	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455246	116.217999	900	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462204	116.225564	900	15	5	Potential nesting tree	No
Stag	01-11-2023	-32.490028	116.183726	900	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.490024	116.183853	900	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471216	116.066275	900	25	5	Potential nesting tree	No
Stag	05-12-2023	-32.490130	116.071796	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.474929	116.161542	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.474931	116.161416	900	25	5	Potential nesting tree	No
Stag	06-07-2023	-32.471458	116.170793	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470820	116.243117	900	30	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459907	116.219614	900	13	5	Potential nesting tree	No
Stag	01-09-2023	-32.459593	116.210493	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457961	116.211435	900	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458119	116.216107	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459036	116.216070	900	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466161	116.231840	900	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.468810	116.241786	900	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.467995	116.242070	900	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468971	116.238660	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440989	116.168121	900	25	5	Potential nesting tree	No
Stag	02-11-2023	-32.438097	116.168821	900	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452111	116.065583	900	18	5	Potential nesting tree	No
Stag	03-11-2023	-32.453598	116.063900	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474069	116.126936	900	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474134	116.125072	900	25	5	Potential nesting tree	No
Stag	06-12-2023	-32.481026	116.131370	900	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.453289	116.076282	900	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452255	116.075778	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464318	116.108137	900	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.487473	116.093855	900	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466768	116.136564	900	200	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459434	116.217268	900	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470369	116.246006	900	17	5	Potential nesting tree	No
Stag	06-07-2023	-32.472821	116.171798	900	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459676	116.216703	900	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479064	116.106842	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471705	116.170811	900	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454637	116.216832	900	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460626	116.216025	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475196	116.161816	900	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459798	116.209251	900	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465350	116.230406	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.477805	116.086027	900	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.480371	116.085262	900	18	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475980	116.159448	900	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489966	116.119136	900	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495011	116.111627	900	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464484	116.113540	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.480795	116.096574	900	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458607	116.227836	900	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460899	116.220549	900	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461103	116.220840	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459164	116.219224	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458025	116.220030	900	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456203	116.220942	900	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461358	116.218292	900	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459496	116.217653	900	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468564	116.230956	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469489	116.231375	900	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476980	116.111092	900	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477450	116.110910	900	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478147	116.110605	900	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471140	116.241149	900	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458634	116.209373	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469261	116.139490	900	24	5	Potential nesting tree	No
Stag	11-09-2023	-32.477340	116.212953	900	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469020	116.210389	900	13	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Stag	02-11-2023	-32.487442	116.094190	900	21	5	Potential nesting tree	No
Stag	26-08-2023	-32.461214	116.219359	900	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.471522	116.241360	900	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.469873	116.240876	900	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473245	116.244612	900	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453355	116.061575	898	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.475920	116.128336	898	26	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.476669	116.128921	898	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470348	116.207284	895	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488502	116.184005	894	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.467038	116.237287	891	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472459	116.167057	891	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497099	116.110247	891	17	5	Potential nesting tree	No
Stag	04-12-2023	-32.433384	116.074515	891	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434027	116.074490	891	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436109	116.075062	891	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436931	116.075478	891	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.436107	116.072673	891	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436137	116.072320	891	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486778	116.098089	891	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.471816	116.067934	891	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.465119	116.109152	891	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463668	116.113902	891	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.473367	116.168239	891	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450703	116.076115	891	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466520	116.059155	891	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489896	116.109515	891	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435506	116.074560	891	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465470	116.231506	891	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494862	116.101326	891	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491865	116.108640	891	16	5	Potential nesting tree	No
Stag	05-12-2023	-32.474899	116.133591	891	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434939	116.072677	891	18	5	Potential nesting tree	No
Stag	04-12-2023	-32.435455	116.074417	891	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436746	116.069347	890	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468089	116.209033	890	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489942	116.183261	890	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493606	116.092027	890	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.474878	116.146299	890	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458595	116.209863	890	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.496860	116.117915	890	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459299	116.208281	890	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.453836	116.211006	888	21	5	Potential nesting tree	No
Stag	11-09-2023	-32.490032	116.183790	885	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478639	116.131734	885	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.466958	116.221743	882	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474681	116.165606	882	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490270	116.183161	882	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453853	116.209320	882	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491724	116.069084	880	25	5	Potential nesting tree	No
Stag	05-12-2023	-32.490550	116.072224	880	5	5	Potential nesting tree	No
Stag	01-11-2023	-32.464155	116.225798	880	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460029	116.216894	880	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.484247	116.095864	880	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489374	116.119180	880	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.450786	116.107409	880	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475175	116.161141	880	15	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	01-11-2023	-32.462397	116.223798	880	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436356	116.070068	880	15	5	Potential nesting tree	No
Stag	05-12-2023	-32.490232	116.072247	880	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.487355	116.098211	880	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475467	116.108745	880	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453400	116.104481	880	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458934	116.208881	880	19	5	Potential nesting tree	No
Stag	31-08-2023	-32.460034	116.208993	880	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.460034	116.208881	880	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458551	116.213391	880	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.480615	116.097450	880	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.474959	116.147639	880	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474580	116.145695	880	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482668	116.103999	880	22	5	Potential nesting tree	No
Stag	02-09-2023	-32.467319	116.234261	880	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.478954	116.215620	880	18	5	Potential nesting tree	No
Stag	06-12-2023	-32.475611	116.109033	880	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483557	116.097502	880	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472881	116.067145	880	330	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479778	116.143758	880	24	5	Potential nesting tree	No
Stag	02-09-2023	-32.470685	116.226214	880	20	5	Potential nesting tree	No
Stag	30-10-2023	-32.478486	116.213788	880	18	5	Potential nesting tree	No
Stag	01-09-2023	-32.460349	116.218162	880	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.459042	116.220017	880	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458402	116.219673	880	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477019	116.110359	880	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.476331	116.143962	880	18	5	Potential nesting tree	No
Stag	08-12-2023	-32.497342	116.120373	880	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473184	116.223957	879	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489301	116.185788	879	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473253	116.225087	875	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.466726	116.221643	875	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489896	116.111352	875	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475428	116.157850	875	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.466496	116.221799	875	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476794	116.133556	872	23	5	Potential nesting tree	No
Stag	31-08-2023	-32.455535	116.218900	870	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.455360	116.217414	870	15	5	Potential nesting tree	No
Stag	01-09-2023	-32.460225	116.216855	870	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468782	116.209237	870	25	5	Potential nesting tree	No
Stag	01-09-2023	-32.460195	116.218400	870	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478775	116.215550	870	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.480343	116.212357	870	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462437	116.225305	870	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458123	116.208478	870	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457707	116.215084	870	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459652	116.217502	870	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471301	116.116125	870	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490935	116.066052	870	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456960	116.211656	870	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458744	116.215598	870	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.468714	116.209401	870	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.486414	116.092732	870	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491129	116.106057	870	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455844	116.211709	870	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.492243	116.107055	870	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460596	116.218893	870	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	04-12-2023	-32.470381	116.113695	870	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477166	116.112009	870	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477391	116.135313	869	20	5	Potential nesting tree	No
Stag	05-07-2023	-32.472433	116.244821	869	14	5	Potential nesting tree	No
Stag	05-07-2023	-32.471697	116.245694	869	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450416	116.078184	869	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472110	116.227317	866	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472396	116.226524	866	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469926	116.224812	863	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472155	116.226879	863	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473184	116.166426	860	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.461905	116.218599	860	20	5	Potential nesting tree	No
Stag	31-08-2023	-32.462941	116.218390	860	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466971	116.233142	860	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466909	116.231639	860	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479686	116.095637	860	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456181	116.208486	860	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459926	116.210002	860	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458659	116.210187	860	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458078	116.211655	860	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458492	116.211760	860	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457921	116.212512	860	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493478	116.112253	860	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459319	116.216910	860	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472663	116.172246	860	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458207	116.221052	860	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470459	116.207169	860	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469136	116.209752	860	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476548	116.209999	860	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491541	116.068349	860	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476374	116.110923	860	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470566	116.207590	860	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489327	116.113525	860	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498567	116.110674	860	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461356	116.220614	860	18	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474573	116.161718	859	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475072	116.161767	859	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.468485	116.238317	859	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473147	116.224264	859	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472569	116.227393	859	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.497090	116.110157	859	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435547	116.075067	859	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435813	116.071260	859	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.433313	116.064328	859	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460971	116.100229	859	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460747	116.099040	859	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467386	116.054778	859	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463581	116.112767	859	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463696	116.113867	859	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489283	116.186030	859	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437061	116.074773	859	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485061	116.093346	859	22	5	Potential nesting tree	No
Stag	04-12-2023	-32.493751	116.074491	859	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479689	116.214649	858	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482002	116.129497	856	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453988	116.209138	856	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450922	116.075332	856	21	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	11-09-2023	-32.488668	116.186121	856	16	5	Potential nesting tree	No
Stag	31-10-2023	-32.466270	116.220866	856	12	5	Potential nesting tree	No
Stag	02-11-2023	-32.484519	116.092507	853	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479050	116.131722	853	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.449714	116.076520	853	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437702	116.069655	850	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470920	116.066116	850	28	5	Potential nesting tree	No
Stag	02-09-2023	-32.468433	116.233786	850	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.466740	116.237622	850	30	5	Potential nesting tree	No
Stag	31-08-2023	-32.462825	116.218297	850	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438585	116.170827	850	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475064	116.161327	850	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439953	116.170456	850	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474330	116.107516	850	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437715	116.069975	850	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476975	116.135598	850	21	5	Potential nesting tree	No
Stag	07-12-2023	-32.467282	116.060580	850	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.463540	116.223169	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454138	116.211021	850	17	5	Potential nesting tree	No
Stag	07-12-2023	-32.467621	116.137481	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478385	116.146706	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475283	116.161686	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475084	116.161869	850	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470853	116.241586	850	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.471232	116.242020	850	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470148	116.242873	850	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466514	116.231830	850	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.477566	116.214162	850	30	5	Potential nesting tree	No
Stag	31-10-2023	-32.463215	116.229650	850	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462753	116.233004	850	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463074	116.226516	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439937	116.170911	850	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479879	116.087100	850	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436325	116.069927	850	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.436714	116.069251	850	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434625	116.069923	850	28	5	Potential nesting tree	No
Stag	05-12-2023	-32.436242	116.066935	850	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435733	116.067372	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434201	116.064840	850	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.488573	116.072548	850	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464443	116.113561	850	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471482	116.241577	850	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458493	116.228624	850	25	5	Potential nesting tree	No
Stag	26-08-2023	-32.460201	116.220010	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456986	116.209421	850	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459785	116.209397	850	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460108	116.209248	850	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459596	116.209752	850	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459543	116.209642	850	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457116	116.210614	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458233	116.210646	850	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.459563	116.210854	850	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458575	116.210879	850	25	5	Potential nesting tree	No
Stag	01-09-2023	-32.459446	116.211246	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457276	116.216365	850	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440348	116.167664	850	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.477903	116.085892	850	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480709	116.083886	850	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453766	116.065301	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454080	116.064948	850	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473584	116.128672	850	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453483	116.076809	850	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451555	116.075785	850	25	5	Potential nesting tree	No
Stag	26-08-2023	-32.453008	116.209882	850	6	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.455508	116.209606	850	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455008	116.208638	850	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458387	116.211615	850	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458704	116.212450	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457940	116.214983	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458860	116.217676	850	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.488157	116.182806	850	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.488358	116.182858	850	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476634	116.210743	850	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468491	116.210547	850	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488279	116.094382	850	7	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476664	116.111569	850	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475328	116.110271	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467041	116.137248	850	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475803	116.159424	850	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.469483	116.244255	850	22	5	Potential nesting tree	No
Stag	07-07-2023	-32.471349	116.242828	850	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.462047	116.230514	850	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.490075	116.071729	850	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.463464	116.219097	850	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457839	116.209175	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457875	116.216298	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456848	116.216352	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458531	116.218626	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440007	116.169351	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466639	116.134234	850	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476991	116.110670	850	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492925	116.093794	850	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466239	116.134242	850	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480644	116.085292	850	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491921	116.068863	850	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491287	116.068682	850	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479460	116.109271	850	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466469	116.134079	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472612	116.244374	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474807	116.123098	850	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470470	116.207221	850	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489871	116.063169	850	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494062	116.096514	850	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458635	116.219408	850	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459698	116.218195	850	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458101	116.216843	850	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468832	116.234429	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475436	116.122916	850	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474827	116.121437	850	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474485	116.111942	850	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469149	116.138039	850	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466091	116.134927	850	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465582	116.134050	850	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465529	116.134609	850	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479458	116.144858	850	20	5	Potential nesting tree	No
Stag	11-09-2023	-32.488959	116.183893	850	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490273	116.110698	847	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452928	116.208959	847	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489354	116.187072	844	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472764	116.227242	844	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436053	116.070931	844	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464296	116.109558	844	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489578	116.120321	844	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471534	116.246893	840	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479468	116.095486	840	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.478705	116.213754	840	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480350	116.212042	840	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467618	116.233404	840	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468400	116.209922	840	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469591	116.209094	840	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437211	116.074702	840	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459829	116.210150	840	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458348	116.215165	840	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459156	116.217494	840	24	5	Potential nesting tree	No
Stag	30-10-2023	-32.476817	116.212214	840	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490727	116.115924	840	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471852	116.068048	840	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476124	116.122502	840	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466820	116.135210	840	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.497308	116.117493	840	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471660	116.246607	840	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459332	116.216875	840	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470352	116.207367	840	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475470	116.161886	840	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479676	116.214772	840	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475970	116.162792	840	14	5	Potential nesting tree	No
Stag	25-08-2023	-32.455236	116.210892	840	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459254	116.218420	840	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.486411	116.092786	840	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489961	116.119124	840	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489765	116.119703	840	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489607	116.119508	840	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494656	116.096534	840	32	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.462144	116.220160	840	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455913	116.219580	840	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460432	116.217154	840	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456814	116.217218	840	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.479640	116.108562	840	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.495932	116.120280	840	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465088	116.221815	840	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455017	116.211171	840	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481901	116.129314	837	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465403	116.221716	837	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490394	116.183495	834	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.464382	116.222130	834	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450656	116.075487	831	17	5	Potential nesting tree	No
Stag	01-11-2023	-32.463626	116.222593	831	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456430	116.217509	830	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466868	116.054121	830	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471618	116.115340	830	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	02-09-2023	-32.467210	116.233238	830	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476160	116.088620	830	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476108	116.110589	830	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459601	116.210110	830	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458330	116.213482	830	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459360	116.217977	830	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459306	116.217858	830	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469531	116.210981	830	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471858	116.064554	830	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471175	116.114868	830	19	5	Potential nesting tree	No
Stag	04-12-2023	-32.471140	116.114677	830	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.469887	116.112994	830	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475642	116.121509	830	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474799	116.110549	830	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489722	116.103631	830	16	5	Potential nesting tree	No
Stag	05-12-2023	-32.488842	116.072505	830	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477577	116.144505	830	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489662	116.065044	830	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490317	116.061737	830	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490037	116.065988	830	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.493908	116.096263	830	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489447	116.106912	830	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.461341	116.218526	830	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489425	116.121473	828	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497689	116.102019	828	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494767	116.101399	828	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435478	116.074702	828	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.433100	116.063896	828	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476888	116.098696	828	20	5	Potential nesting tree	No
Stag	03-11-2023	-32.497632	116.102203	828	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.484825	116.092866	828	17	5	Potential nesting tree	No
Stag	05-12-2023	-32.490229	116.073611	828	20	5	Potential nesting tree	No
Stag	05-07-2023	-32.470564	116.245779	824	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478836	116.131704	821	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490033	116.182952	821	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488861	116.186345	821	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489572	116.186163	821	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.467557	116.221574	821	20	5	Potential nesting tree	No
Stag	01-11-2023	-32.463772	116.222849	821	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434400	116.065097	820	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486166	116.098244	820	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477659	116.214348	820	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479097	116.214601	820	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468044	116.209317	820	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460253	116.215113	820	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479064	116.214781	820	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463002	116.232965	820	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463222	116.226767	820	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436436	116.069151	820	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436741	116.069346	820	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479885	116.095265	820	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479645	116.095276	820	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479662	116.095690	820	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479406	116.095498	820	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.456525	116.214788	820	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458294	116.208783	820	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458835	116.215424	820	8	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	02-09-2023	-32.457603	116.215153	820	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458848	116.214927	820	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489607	116.182952	820	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469432	116.208491	820	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.480745	116.107938	820	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493690	116.091345	820	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.471084	116.226935	820	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468333	116.209110	820	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489624	116.065951	820	20	5	Potential nesting tree	No
Stag	11-09-2023	-32.479475	116.214370	820	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.478106	116.213850	820	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469427	116.209990	820	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462851	116.231658	820	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.467221	116.053697	820	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490887	116.068831	820	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475001	116.123046	820	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457609	116.212122	820	20	5	Potential nesting tree	No
Stag	25-08-2023	-32.458258	116.227140	820	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464660	116.113784	820	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480040	116.213174	820	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.491549	116.119110	820	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490028	116.067425	820	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.484187	116.096260	820	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482321	116.104782	820	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460585	116.218385	820	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473087	116.118454	820	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477099	116.109336	820	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477132	116.110171	820	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477923	116.111080	820	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466070	116.133944	820	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465852	116.134215	820	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465915	116.134936	820	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479967	116.144465	820	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477835	116.146611	820	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455530	116.211959	818	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.464470	116.221992	818	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477154	116.130080	818	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476626	116.135932	818	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479197	116.131492	818	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.465616	116.221265	815	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494962	116.101825	815	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463930	116.222490	815	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.484766	116.093581	815	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473671	116.224942	815	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490502	116.063207	815	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464995	116.221343	812	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464895	116.221247	812	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491345	116.110208	812	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476597	116.160635	812	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475088	116.128154	812	6	5	Potential nesting tree	No
Stag	30-10-2023	-32.473597	116.225399	812	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478624	116.215481	810	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453703	116.217010	810	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456482	116.217002	810	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459303	116.218768	810	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476554	116.090884	810	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482151	116.097999	810	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482395	116.097898	810	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483182	116.104568	810	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.491302	116.115859	810	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469309	116.209220	810	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470469	116.207202	810	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482971	116.102914	810	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.486966	116.093411	810	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497972	116.108909	810	22	5	Potential nesting tree	No
Stag	31-10-2023	-32.466690	116.221891	809	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473224	116.227084	809	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.484293	116.106444	809	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472180	116.227342	809	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489555	116.138555	805	27	5	Potential nesting tree	No
Stag	31-10-2023	-32.464996	116.221627	805	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471566	116.173091	802	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473099	116.224728	802	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465020	116.221647	802	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479195	116.131584	802	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457424	116.219185	800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473342	116.224392	800	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454659	116.217751	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482475	116.096294	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464051	116.232552	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475876	116.108977	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468857	116.209560	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475105	116.161486	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469784	116.242024	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.481500	116.210903	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456994	116.220190	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479628	116.213999	800	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479132	116.087325	800	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486367	116.098613	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457423	116.220863	800	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490599	116.068928	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452689	116.076088	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481134	116.131311	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464932	116.112722	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453980	116.105628	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460323	116.215182	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453851	116.217169	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460222	116.215484	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479655	116.129975	800	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479721	116.129921	800	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450684	116.064092	800	25	5	Potential nesting tree	No
Bullich (Eucalyptus megacarpa)	03-11-2023	-32.453518	116.064544	800	25	5	Potential nesting tree	No
Stag	30-10-2023	-32.477012	116.212114	800	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470376	116.244893	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470814	116.134736	800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468036	116.233581	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475272	116.162137	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475582	116.160721	800	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472828	116.166051	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469778	116.240381	800	20	5	Potential nesting tree	No
Stag	07-07-2023	-32.470006	116.243660	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471757	116.243713	800	1425	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457449	116.221860	800	28	5	Potential nesting tree	No
Stag	31-08-2023	-32.457463	116.221846	800	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460175	116.216324	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460013	116.218235	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458296	116.217302	800	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.467515	116.234134	800	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467818	116.231112	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469557	116.209754	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462986	116.226548	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462314	116.226415	800	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463346	116.223735	800	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438558	116.170547	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479709	116.086495	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480572	116.086347	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476232	116.088269	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472183	116.067027	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437129	116.069604	800	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437308	116.075711	800	25	5	Potential nesting tree	No
Stag	05-12-2023	-32.489995	116.071695	800	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476203	116.109286	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464500	116.108647	800	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464431	116.114181	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464364	116.114289	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471441	116.239039	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.474858	116.161522	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475090	116.161562	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475832	116.160377	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472514	116.167256	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472414	116.167316	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471205	116.240343	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470323	116.243562	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471817	116.243110	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470176	116.243104	800	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.457997	116.228792	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458086	116.228797	800	25	5	Potential nesting tree	No
Stag	26-08-2023	-32.463404	116.218891	800	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455996	116.207533	800	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457389	116.207388	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455998	116.209556	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459675	116.209063	800	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459471	116.209524	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459990	116.209300	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460216	116.209084	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459908	116.209859	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455740	116.210539	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458077	116.210473	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457988	116.210805	800	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456993	116.211115	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459562	116.211279	800	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.457605	116.216314	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458636	116.218644	800	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458720	116.218430	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458588	116.218305	800	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.458633	116.218092	800	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458360	116.217293	800	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.458540	116.216907	800	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465322	116.232647	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465263	116.232163	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464723	116.230848	800	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462081	116.228958	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469680	116.242562	800	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468679	116.239374	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488786	116.182419	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438648	116.168879	800	28	5	Potential nesting tree	No
Stag	02-11-2023	-32.438261	116.169001	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438747	116.168584	800	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.438182	116.168230	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439517	116.169140	800	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.440812	116.169068	800	16	5	Potential nesting tree	No
Stag	02-11-2023	-32.479259	116.085886	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452458	116.064979	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454062	116.064490	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450445	116.064410	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454084	116.064208	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453921	116.063803	800	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451153	116.063936	800	20	5	Potential nesting tree	No
Stag	03-11-2023	-32.450688	116.064109	800	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.452387	116.063189	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472937	116.128759	800	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473349	116.129418	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477391	116.136089	800	20	5	Potential nesting tree	No
Stag	06-12-2023	-32.480557	116.132902	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482402	116.131730	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481699	116.130961	800	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480736	116.129783	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480170	116.129561	800	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490058	116.139373	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453387	116.076234	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453381	116.076528	800	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453363	116.077123	800	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452390	116.075923	800	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.465092	116.108505	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.465328	116.108413	800	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463206	116.113498	800	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463122	116.113276	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452187	116.106525	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459481	116.103646	800	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454734	116.208367	800	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457784	116.208598	800	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459647	116.208805	800	16	5	Potential nesting tree	No
Stag	31-08-2023	-32.459366	116.208641	800	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457225	116.211641	800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457919	116.211854	800	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457609	116.212814	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458770	116.214606	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458355	116.214791	800	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458933	116.218689	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488784	116.183576	800	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.488551	116.182578	800	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491850	116.068683	800	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489743	116.066816	800	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.491117	116.066555	800	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489666	116.066338	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481725	116.097553	800	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482591	116.099917	800	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471497	116.063896	800	19	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	04-12-2023	-32.470187	116.113249	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480828	116.104940	800	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.489596	116.103748	800	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468508	116.136314	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458826	116.208771	800	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471590	116.246094	800	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471791	116.245723	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470625	116.245573	800	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.471705	116.244509	800	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473211	116.224412	800	16	5	Potential nesting tree	No
Stag	25-08-2023	-32.458409	116.227364	800	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477111	116.109720	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455413	116.211732	800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455431	116.208709	800	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458462	116.208562	800	15	5	Potential nesting tree	No
Stag	30-10-2023	-32.479868	116.210871	800	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456390	116.221222	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470148	116.207908	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490007	116.063137	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474899	116.165553	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.462192	116.231295	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.436230	116.067187	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.467142	116.237601	800	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469717	116.237989	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475516	116.161531	800	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470576	116.239855	800	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.471543	116.242246	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.461362	116.228121	800	11	5	Potential nesting tree	No
Stag	26-08-2023	-32.462225	116.219512	800	8	5	Potential nesting tree	No
Stag	31-08-2023	-32.460031	116.209723	800	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.457221	116.216053	800	22	5	Potential nesting tree	No
Stag	02-09-2023	-32.457308	116.216167	800	18	5	Potential nesting tree	No
Stag	02-09-2023	-32.458827	116.217159	800	17	5	Potential nesting tree	No
Stag	02-09-2023	-32.458909	116.216848	800	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477980	116.213481	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477601	116.213657	800	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466008	116.229783	800	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465220	116.231046	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439396	116.168890	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480723	116.085203	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453994	116.065188	800	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.455506	116.063752	800	15	5	Potential nesting tree	No
Stag	03-11-2023	-32.452116	116.063341	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474803	116.127428	800	20	5	Potential nesting tree	No
Stag	06-12-2023	-32.480107	116.132363	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479814	116.132587	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451505	116.075394	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464312	116.107880	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464090	116.108182	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463434	116.111440	800	18	5	Potential nesting tree	No
Stag	05-07-2023	-32.471179	116.245476	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472613	116.245730	800	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473998	116.246955	800	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471284	116.237429	800	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458164	116.219173	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469348	116.211437	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467937	116.209394	800	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494717	116.099240	800	22	5	Potential nesting tree	No
Stag	03-11-2023	-32.469875	116.065798	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472436	116.169339	800	30	5	Potential nesting tree	No
Stag	07-07-2023	-32.470701	116.241142	800	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470850	116.243457	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470916	116.243553	800	20	5	Potential nesting tree	No
Stag	25-08-2023	-32.457999	116.227246	800	25	5	Potential nesting tree	No
Stag	02-11-2023	-32.479802	116.084440	800	20	5	Potential nesting tree	No
Stag	01-11-2023	-32.483054	116.096997	800	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467692	116.137584	800	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470254	116.246097	800	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457983	116.221190	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490777	116.119240	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491911	116.106841	800	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.475581	116.088024	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479527	116.131390	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458288	116.219967	800	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457989	116.219591	800	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456606	116.221408	800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461309	116.218430	800	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455279	116.216558	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460797	116.218766	800	16	5	Potential nesting tree	No
Stag	01-09-2023	-32.460528	116.215870	800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460331	116.215027	800	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459790	116.215327	800	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459488	116.217864	800	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468190	116.230290	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469704	116.233320	800	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.471895	116.226711	800	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471189	116.115949	800	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470046	116.114322	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478103	116.113043	800	18	5	Potential nesting tree	No
Stag	06-12-2023	-32.491280	116.121419	800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488435	116.095681	800	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468818	116.138139	800	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.475811	116.144295	800	18	5	Potential nesting tree	No
Stag	08-12-2023	-32.496729	116.119914	800	12	5	Potential nesting tree	No
Stag	08-12-2023	-32.497128	116.119397	800	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497550	116.119400	800	14	5	Potential nesting tree	No
Stag	31-08-2023	-32.458110	116.207046	800	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.458222	116.227492	800	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464128	116.227497	800	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469589	116.242074	800	20	5	Potential nesting tree	No
Stag	03-11-2023	-32.477044	116.082190	800	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478764	116.103218	800	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454394	116.208892	799	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479681	116.132144	796	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.476600	116.133129	796	33	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.488211	116.182802	796	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495452	116.101066	796	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434980	116.073348	796	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434928	116.074723	796	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435343	116.074306	796	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435477	116.074373	796	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.494039	116.074759	796	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.436127	116.072349	796	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.436125	116.072204	796	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435561	116.066118	796	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489298	116.072971	796	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486567	116.097727	796	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.471799	116.066526	796	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464416	116.109836	796	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464474	116.109546	796	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464005	116.114039	796	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477130	116.129074	796	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471034	116.245071	796	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.485104	116.093019	796	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498882	116.112605	796	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.433501	116.064437	796	16	5	Potential nesting tree	No
Stag	02-11-2023	-32.485250	116.092781	796	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493602	116.112538	796	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.487020	116.098253	796	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.466041	116.230284	796	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466021	116.233370	796	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.485316	116.093029	796	200	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436090	116.072348	796	18	5	Potential nesting tree	No
Stag	02-11-2023	-32.484885	116.093872	796	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495440	116.101537	796	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463776	116.223281	793	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455909	116.209264	793	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464834	116.221329	793	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.481647	116.097997	790	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482431	116.097583	790	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458808	116.215512	790	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455583	116.211909	790	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458124	116.211672	790	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457797	116.214168	790	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468578	116.210160	790	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468916	116.211125	790	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481523	116.098738	790	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490414	116.115601	790	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466417	116.134688	790	15	5	Potential nesting tree	No
Stag	08-12-2023	-32.474664	116.146036	790	14	5	Potential nesting tree	No
Stag	31-08-2023	-32.461776	116.218215	790	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.480504	116.097820	790	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489601	116.067288	790	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490332	116.065962	790	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489619	116.113995	790	22	5	Potential nesting tree	No
Stag	30-10-2023	-32.468660	116.210111	790	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450466	116.062882	789	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463773	116.223413	786	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475653	116.165939	786	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481287	116.130472	786	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471980	116.172496	786	20	5	Potential nesting tree	No
Stag	26-08-2023	-32.454092	116.208993	786	10	5	Potential nesting tree	No
Stag	02-11-2023	-32.480614	116.099261	786	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465761	116.221302	786	15	5	Potential nesting tree	No
Stag	05-07-2023	-32.472734	116.244109	783	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479134	116.131824	783	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.474919	116.155462	783	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471686	116.173096	783	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.470174	116.225217	783	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476255	116.129996	783	22	5	Potential nesting tree	No
Stag	01-11-2023	-32.463815	116.222300	783	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460030	116.216648	780	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468458	116.209557	780	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477570	116.213780	780	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466776	116.059105	780	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455502	116.218689	780	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.478364	116.213804	780	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469210	116.209378	780	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.484763	116.105986	780	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489287	116.121644	780	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479894	116.129348	780	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465878	116.231358	780	30	5	Potential nesting tree	No
Stag	07-07-2023	-32.473370	116.224029	780	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455369	116.218832	780	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460012	116.216592	780	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477635	116.214697	780	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.477935	116.214225	780	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463766	116.225767	780	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462350	116.225173	780	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480368	116.086817	780	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.475728	116.088043	780	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476502	116.088245	780	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437168	116.069295	780	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437491	116.074555	780	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437209	116.074379	780	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.460011	116.098130	780	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.459532	116.099069	780	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464276	116.108569	780	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464425	116.114078	780	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.454983	116.211673	780	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452536	116.209216	780	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.459101	116.218874	780	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459300	116.218240	780	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470166	116.207149	780	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490989	116.063696	780	26	5	Potential nesting tree	No
Stag	01-11-2023	-32.481284	116.096429	780	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476632	116.090252	780	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468673	116.136163	780	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473583	116.245783	780	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471273	116.244698	780	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473255	116.223471	780	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456847	116.210381	780	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.461946	116.219880	780	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472701	116.166395	780	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.482124	116.097455	780	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478343	116.112324	780	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474927	116.166003	780	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457568	116.214784	780	16	5	Potential nesting tree	No
Stag	31-10-2023	-32.461836	116.226356	780	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470622	116.208008	780	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490399	116.065777	780	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482169	116.102479	780	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480816	116.094616	780	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489844	116.119672	780	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489609	116.119584	780	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460392	116.216768	780	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459751	116.216966	780	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459740	116.216890	780	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459586	116.217694	780	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459597	116.219013	780	22	5	Potential nesting tree	No
Stag	02-09-2023	-32.469276	116.231609	780	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480053	116.103786	780	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475179	116.121479	780	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469331	116.137256	780	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469557	116.139807	780	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482197	116.129196	777	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483867	116.106473	777	17	5	Potential nesting tree	No
Stag	25-08-2023	-32.455337	116.211196	777	9	5	Potential nesting tree	No
Stag	05-07-2023	-32.472392	116.244797	777	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476028	116.162895	774	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489550	116.114894	774	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489154	116.114582	774	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490442	116.183232	773	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480047	116.129181	770	20	5	Potential nesting tree	No
Stag	04-12-2023	-32.476100	116.127655	770	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460233	116.214689	770	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454993	116.218965	770	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434542	116.070407	770	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434507	116.070531	770	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457646	116.220491	770	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457124	116.219086	770	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458072	116.218593	770	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.461032	116.229972	770	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462578	116.224234	770	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470640	116.064844	770	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434919	116.069829	770	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454370	116.210975	770	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452977	116.209624	770	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456862	116.209986	770	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458966	116.217938	770	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488915	116.183099	770	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482414	116.099138	770	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482100	116.098924	770	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481365	116.094748	770	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489630	116.115559	770	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470855	116.064431	770	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472789	116.065165	770	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472392	116.066173	770	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471575	116.114847	770	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478907	116.105519	770	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474729	116.109237	770	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496233	116.119839	770	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490002	116.065238	770	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.468277	116.209082	770	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470656	116.207896	770	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489267	116.065292	770	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490850	116.065916	770	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481884	116.097708	770	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481177	116.097753	770	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.490099	116.113744	770	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495398	116.109611	770	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459817	116.215463	770	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459788	116.214675	770	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472357	116.118529	770	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470856	116.134209	770	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	30-10-2023	-32.470031	116.224798	770	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473412	116.225733	770	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475853	116.128066	770	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453625	116.209188	767	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477599	116.133491	764	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.474858	116.161750	764	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488902	116.183397	764	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.488842	116.106024	764	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464243	116.109684	764	20	5	Potential nesting tree	No
Stag	08-12-2023	-32.452235	116.107620	764	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467527	116.222382	764	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489301	116.139083	764	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450725	116.075522	764	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450863	116.076402	764	16	5	Potential nesting tree	No
Stag	31-10-2023	-32.466933	116.221743	764	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465724	116.232678	764	25	5	Potential nesting tree	No
Stag	04-12-2023	-32.433914	116.074240	764	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470473	116.244988	761	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472003	116.171413	761	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470638	116.244625	761	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464605	116.222163	761	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.452976	116.208996	761	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460290	116.217601	760	25	5	Potential nesting tree	No
Stag	04-12-2023	-32.493846	116.075107	760	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.463258	116.218693	760	20	5	Potential nesting tree	No
Stag	01-09-2023	-32.460271	116.216043	760	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467533	116.230080	760	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463121	116.223391	760	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476665	116.088440	760	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455624	116.208236	760	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459000	116.209919	760	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459268	116.209931	760	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457837	116.214706	760	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.496960	116.117802	760	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471121	116.244006	760	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.473575	116.224461	760	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.458812	116.227315	760	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460974	116.221415	760	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471026	116.134505	760	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470339	116.207980	760	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481588	116.098156	760	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489074	116.118892	760	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498604	116.110363	760	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458511	116.219071	760	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.459844	116.217490	760	16	5	Potential nesting tree	No
Stag	01-09-2023	-32.459826	116.216851	760	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459463	116.218613	760	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.471260	116.227079	760	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.472509	116.118654	760	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.479575	116.108541	760	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476757	116.109192	760	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469121	116.137435	760	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468038	116.137025	760	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466002	116.134059	760	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474627	116.110201	758	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.484615	116.093533	758	17	5	Potential nesting tree	No
Stag	05-07-2023	-32.471229	116.245127	758	15	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	05-12-2023	-32.475508	116.129026	758	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479449	116.132390	758	22	5	Potential nesting tree	No
Stag	31-10-2023	-32.466037	116.221280	758	15	5	Potential nesting tree	No
Stag	31-10-2023	-32.467578	116.221838	758	7	5	Potential nesting tree	No
Stag	26-08-2023	-32.455066	116.209044	754	10	5	Potential nesting tree	No
Stag	11-09-2023	-32.489103	116.182935	754	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.473469	116.226950	754	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463678	116.223465	754	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476933	116.135337	751	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472634	116.244344	751	16	5	Potential nesting tree	No
Stag	01-11-2023	-32.463902	116.222478	751	15	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474580	116.161611	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464172	116.107888	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472289	116.167516	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460276	116.214716	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464382	116.113449	750	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464049	116.106462	750	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478123	116.214433	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.459995	116.070322	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.440196	116.171420	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.473945	116.107749	750	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478961	116.098397	750	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490328	116.063721	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463918	116.108328	750	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456139	116.211366	750	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482265	116.097711	750	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489496	116.118718	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.461342	116.230297	750	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466726	116.136341	750	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.468262	116.241906	750	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.473033	116.165279	750	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471264	116.241903	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470465	116.241896	750	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.468574	116.242920	750	15	5	Potential nesting tree	No
Stag	07-07-2023	-32.469633	116.243725	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457622	116.221607	750	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455569	116.219303	750	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455740	116.219410	750	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453283	116.216132	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460177	116.215583	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467923	116.233350	750	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477454	116.213825	750	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480581	116.210934	750	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468933	116.209796	750	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463039	116.231808	750	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462636	116.225497	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462093	116.224448	750	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489599	116.182969	750	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489929	116.183053	750	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441402	116.170150	750	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438697	116.170093	750	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480309	116.086265	750	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471375	116.066212	750	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435380	116.071516	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466809	116.054518	750	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463875	116.106230	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464273	116.114172	750	32	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Blackbutt (Eucalyptus patens)	06-07-2023	-32.476047	116.160310	750	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472797	116.165461	750	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472506	116.166690	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472148	116.167362	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471528	116.170873	750	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474370	116.165662	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471647	116.242196	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.468758	116.242446	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.461530	116.224833	750	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.457809	116.227284	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458031	116.228389	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.463188	116.219483	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460598	116.220400	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460020	116.220468	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459596	116.219468	750	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457376	116.207847	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457399	116.207590	750	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.457631	116.207624	750	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.458224	116.207040	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457214	116.207517	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457125	116.207518	750	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456000	116.209619	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459122	116.209382	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460212	116.209435	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458286	116.210611	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458345	116.210571	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459485	116.210513	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458964	116.210831	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457146	116.211130	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459085	116.211123	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459355	116.211213	750	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457528	116.211352	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457240	116.213643	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456457	116.216479	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456960	116.216670	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458815	116.216554	750	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.459179	116.216548	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459111	116.216761	750	20	5	Potential nesting tree	No
Stag	02-09-2023	-32.459308	116.216765	750	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458510	116.216341	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458448	116.216316	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456417	116.216067	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458691	116.215910	750	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458446	116.215747	750	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457716	116.215752	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458502	116.218814	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458869	116.217234	750	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478730	116.213611	750	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477475	116.213046	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465283	116.230687	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464819	116.231585	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464063	116.229747	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463208	116.228742	750	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463288	116.228742	750	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463980	116.227599	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469744	116.241207	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438977	116.168698	750	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438723	116.168827	750	22	5	Potential nesting tree	No
Stag	02-11-2023	-32.438053	116.168333	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480831	116.085148	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480808	116.084754	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481014	116.084736	750	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452786	116.064929	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454481	116.064855	750	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454481	116.064793	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452665	116.064410	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454513	116.063634	750	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450422	116.063239	750	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.473150	116.129227	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473611	116.126840	750	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.473878	116.126895	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474328	116.125900	750	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480388	116.131793	750	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452483	116.075885	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451940	116.076596	750	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.462938	116.113237	750	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455376	116.209624	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456937	116.209995	750	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458313	116.210197	750	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459941	116.209923	750	9	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458804	116.210244	750	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456778	116.211732	750	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457744	116.212201	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458468	116.213266	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458413	116.214998	750	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457550	116.214530	750	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459408	116.217984	750	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476875	116.211230	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480492	116.210817	750	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469303	116.210093	750	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469508	116.211194	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469442	116.207784	750	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470018	116.208070	750	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470054	116.207714	750	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490534	116.067926	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490071	116.066154	750	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482174	116.100611	750	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490405	116.115661	750	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.473189	116.065054	750	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472874	116.067372	750	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471601	116.116815	750	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.479779	116.102403	750	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478249	116.104077	750	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475816	116.120257	750	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474762	116.110614	750	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468926	116.136155	750	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.470061	116.137483	750	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.474575	116.145384	750	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474716	116.146751	750	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.473912	116.245897	750	17	5	Potential nesting tree	No
Stag	07-07-2023	-32.473360	116.223709	750	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459302	116.216846	750	26	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.462211	116.219218	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459525	116.216043	750	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436986	116.067027	750	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455275	116.208655	750	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458101	116.208272	750	10	5	Potential nesting tree	No
Stag	05-07-2023	-32.471424	116.245448	750	12	5	Potential nesting tree	No
Stag	26-08-2023	-32.459298	116.227675	750	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456633	116.219152	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458490	116.221567	750	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490874	116.065919	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468973	116.209708	750	35	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.461626	116.226149	750	12	5	Potential nesting tree	No
Stag	01-11-2023	-32.463067	116.222102	750	30	5	Potential nesting tree	No
Stag	02-11-2023	-32.438146	116.170221	750	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475924	116.109282	750	28	5	Potential nesting tree	No
Stag	05-07-2023	-32.467888	116.237677	750	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472610	116.166338	750	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471009	116.243552	750	25	5	Potential nesting tree	No
Stag	26-08-2023	-32.462425	116.220027	750	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457735	116.211164	750	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458260	116.211428	750	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458347	116.214011	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479417	116.213655	750	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477305	116.213658	750	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477112	116.213060	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467534	116.238412	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478399	116.086130	750	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.451438	116.064800	750	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473141	116.129332	750	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458695	116.213233	750	13	5	Potential nesting tree	No
Stag	06-12-2023	-32.474792	116.108607	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493652	116.092835	750	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466575	116.135157	750	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.471956	116.168091	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458857	116.212659	750	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.471149	116.226807	750	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470125	116.208204	750	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.470364	116.241987	750	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467432	116.238240	750	18	5	Potential nesting tree	No
Stag	07-12-2023	-32.453573	116.076074	750	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472560	116.245176	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470779	116.243969	750	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490126	116.062926	750	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481875	116.098033	750	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494657	116.097706	750	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.457929	116.228150	750	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457530	116.211230	750	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441283	116.168790	750	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475933	116.122691	750	10	5	Potential nesting tree	No
Stag	25-08-2023	-32.460702	116.226848	750	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457886	116.219755	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458072	116.221176	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456434	116.220437	750	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454684	116.217906	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460893	116.219060	750	10	5	Potential nesting tree	No
Stag	31-08-2023	-32.461435	116.218049	750	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454605	116.216557	750	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455598	116.216785	750	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459677	116.218000	750	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459690	116.214587	750	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459641	116.215669	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459506	116.215706	750	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469182	116.230654	750	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.469063	116.233237	750	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468971	116.233757	750	16	5	Potential nesting tree	No
Stag	02-09-2023	-32.469732	116.232490	750	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.471156	116.226725	750	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479023	116.129815	750	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477249	116.112520	750	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475913	116.143798	750	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479355	116.132155	748	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470049	116.239246	748	30	5	Potential nesting tree	No
Stag	31-10-2023	-32.465055	116.221900	748	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491623	116.113087	748	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473310	116.225044	748	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463682	116.221563	748	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.473166	116.223934	748	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472182	116.226905	745	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464767	116.221593	745	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472292	116.171993	742	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.470037	116.225074	742	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476576	116.158727	742	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449853	116.075515	742	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475857	116.165922	740	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435187	116.071616	740	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479402	116.213780	740	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482271	116.097735	740	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467453	116.232936	740	25	5	Potential nesting tree	No
Stag	30-10-2023	-32.469235	116.209956	740	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480501	116.086253	740	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434445	116.070228	740	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.470000	116.066885	740	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455034	116.211628	740	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457850	116.208229	740	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459108	116.217729	740	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489355	116.064156	740	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468533	116.136693	740	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494612	116.098595	740	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470038	116.207969	740	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475929	116.165847	740	14	5	Potential nesting tree	No
Stag	11-09-2023	-32.488715	116.182630	740	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491984	116.068811	740	22	5	Potential nesting tree	No
Stag	05-07-2023	-32.472467	116.245057	740	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469323	116.209231	740	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490111	116.063591	740	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489896	116.065864	740	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489705	116.066007	740	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489775	116.119272	740	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489650	116.114234	740	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.459688	116.227508	740	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.459559	116.227173	740	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460669	116.218879	740	20	5	Potential nesting tree	No
Stag	06-12-2023	-32.475140	116.112356	740	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489960	116.102883	740	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469199	116.138454	740	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476047	116.135470	739	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464860	116.220907	739	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473092	116.225410	739	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477431	116.135774	739	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472552	116.244306	739	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463723	116.223023	735	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.484710	116.093719	735	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.470153	116.225224	735	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464904	116.222014	735	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451198	116.062273	735	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451039	116.062505	735	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.476980	116.129300	735	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454773	116.210476	735	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.465305	116.221369	735	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450690	116.078312	732	13	5	Potential nesting tree	No
Stag	05-07-2023	-32.469773	116.238603	732	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466252	116.231785	732	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489522	116.120650	732	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489654	116.114402	732	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494746	116.101555	732	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434255	116.073697	732	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436184	116.071525	732	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.461174	116.098550	732	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486970	116.098111	732	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.487203	116.098454	732	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476863	116.099332	732	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478313	116.098718	732	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478636	116.098137	732	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466388	116.059018	732	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.467278	116.053064	732	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466664	116.058492	732	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463906	116.113983	732	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464049	116.113710	732	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.454850	116.210391	732	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453178	116.209048	732	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477050	116.133467	732	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476148	116.135175	732	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465666	116.232477	732	22	5	Potential nesting tree	No
Stag	05-12-2023	-32.475124	116.129024	732	12	5	Potential nesting tree	No
Stag	03-11-2023	-32.495465	116.101373	732	12	5	Potential nesting tree	No
Stag	07-12-2023	-32.467508	116.059772	732	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466269	116.231329	732	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.481714	116.095441	732	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.473112	116.224735	732	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436875	116.066716	730	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479270	116.215355	730	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475910	116.160673	730	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.468703	116.243023	730	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455567	116.217552	730	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458075	116.218320	730	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458309	116.217370	730	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478401	116.215340	730	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469552	116.209184	730	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480176	116.086896	730	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437762	116.070102	730	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437114	116.074953	730	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.434495	116.069993	730	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435590	116.071930	730	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436611	116.066601	730	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476059	116.110749	730	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479655	116.095747	730	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454915	116.212705	730	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481247	116.097467	730	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471436	116.063432	730	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.481285	116.104901	730	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469908	116.137205	730	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.475307	116.147194	730	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.480079	116.143339	730	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459132	116.218405	730	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.473290	116.245836	730	16	5	Potential nesting tree	No
Stag	26-08-2023	-32.454462	116.209545	730	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470178	116.207852	730	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494709	116.097509	730	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493467	116.075037	730	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459391	116.208543	730	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469099	116.211489	730	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457604	116.210382	730	14	5	Potential nesting tree	No
Stag	06-12-2023	-32.474424	116.107581	730	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470035	116.207079	730	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489812	116.069179	730	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495250	116.109060	730	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497994	116.109256	730	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494778	116.096822	730	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494462	116.097138	730	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458167	116.221346	730	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475082	116.111773	730	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.479658	116.144224	730	16	5	Potential nesting tree	No
Bullich (Eucalyptus megacarpa)	07-12-2023	-32.459668	116.071613	730	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470523	116.226495	729	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475581	116.158314	729	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455399	116.211863	729	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475552	116.129009	729	19	5	Potential nesting tree	No
Stag	01-11-2023	-32.464109	116.222231	729	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460455	116.218741	728	16	5	Potential nesting tree	No
Stag	02-11-2023	-32.489608	116.120443	726	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471787	116.244199	726	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479233	116.132280	726	27	5	Potential nesting tree	No
Stag	01-11-2023	-32.489005	116.183863	726	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475871	116.166036	723	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471863	116.173112	723	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472754	116.227419	723	17	5	Potential nesting tree	No
Stag	31-10-2023	-32.468898	116.222252	723	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475681	116.131332	723	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479904	116.129135	723	19	5	Potential nesting tree	No
Stag	01-11-2023	-32.463541	116.223335	723	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490736	116.063473	720	32	5	Potential nesting tree	No
Stag	01-09-2023	-32.455326	116.217033	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478583	116.215530	720	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462417	116.224356	720	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.480119	116.214642	720	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.455490	116.211873	720	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476096	116.108759	720	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435260	116.070924	720	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474666	116.108790	720	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481828	116.098003	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457707	116.221952	720	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456796	116.220034	720	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460286	116.215452	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458117	116.217143	720	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.479346	116.214211	720	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.479867	116.213734	720	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480306	116.212255	720	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480572	116.211188	720	30	5	Potential nesting tree	No
Stag	02-11-2023	-32.440899	116.170763	720	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479950	116.087148	720	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476084	116.087191	720	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471708	116.065515	720	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436884	116.069328	720	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437448	116.069848	720	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437695	116.069280	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437311	116.075631	720	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.459650	116.098582	720	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460571	116.097876	720	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476195	116.109663	720	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463968	116.105920	720	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464882	116.112862	720	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464358	116.112872	720	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451623	116.106589	720	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.456535	116.215240	720	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454185	116.209777	720	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455024	116.209765	720	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459799	116.208852	720	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458311	116.212281	720	18	5	Potential nesting tree	No
Stag	01-09-2023	-32.458254	116.212706	720	9	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458262	116.213262	720	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457931	116.214845	720	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488553	116.183875	720	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490108	116.183006	720	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476782	116.212318	720	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.469436	116.210650	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489684	116.064306	720	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489660	116.067059	720	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489365	116.066696	720	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481474	116.096975	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490835	116.116157	720	20	5	Potential nesting tree	No
Stag	03-11-2023	-32.470136	116.064639	720	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476592	116.111033	720	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468745	116.136680	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466497	116.138051	720	10	5	Potential nesting tree	No
Stag	08-12-2023	-32.475071	116.145917	720	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496603	116.118609	720	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.497297	116.117583	720	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472104	116.245423	720	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470520	116.244790	720	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473238	116.223760	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472814	116.223716	720	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.473673	116.224542	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491439	116.069195	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479578	116.213261	720	15	5	Potential nesting tree	No
Stag	31-10-2023	-32.469430	116.211590	720	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490953	116.068011	720	50	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488870	116.096382	720	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475871	116.159462	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472084	116.172720	720	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460746	116.216020	720	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479508	116.213706	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469695	116.210033	720	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470554	116.207668	720	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489361	116.067284	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490893	116.069991	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491816	116.069723	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489880	116.064687	720	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490029	116.066024	720	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483141	116.104556	720	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482121	116.101995	720	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489624	116.114245	720	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496734	116.102089	720	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494718	116.099645	720	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494805	116.098890	720	25	5	Potential nesting tree	No
Stag	30-10-2023	-32.476620	116.211182	720	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461720	116.220190	720	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460442	116.216349	720	14	5	Potential nesting tree	No
Stag	01-09-2023	-32.460438	116.217918	720	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459764	116.217169	720	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459856	116.214813	720	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456777	116.216761	720	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470337	116.111709	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479213	116.104792	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474905	116.121689	720	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477785	116.110650	720	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474649	116.111467	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490737	116.101760	720	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468659	116.136889	720	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468837	116.137367	720	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.467922	116.140632	720	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466086	116.136488	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466080	116.134464	720	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465955	116.134168	720	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.480146	116.144316	720	20	5	Potential nesting tree	No
Stag	01-09-2023	-32.460456	116.217743	720	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470869	116.246862	719	14	5	Potential nesting tree	No
Stag	31-10-2023	-32.465877	116.221389	719	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475971	116.135466	719	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473610	116.226828	716	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475611	116.131060	716	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489292	116.185851	716	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488916	116.183711	716	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488515	116.182593	716	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463964	116.113769	716	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471339	116.245740	716	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475540	116.157953	713	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473271	116.224014	713	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451755	116.061344	713	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475786	116.135198	713	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476095	116.135493	713	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464519	116.222217	713	14	5	Potential nesting tree	No
Stag	31-10-2023	-32.465497	116.221220	713	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489616	116.063507	710	35	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489715	116.063517	710	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472070	116.245156	710	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455675	116.209234	710	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453557	116.209006	710	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451103	116.075425	710	19	5	Potential nesting tree	No
Stag	07-07-2023	-32.473852	116.245612	710	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455245	116.212029	710	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467687	116.230672	710	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463721	116.230452	710	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.457831	116.208861	710	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456558	116.209802	710	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488401	116.183135	710	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489101	116.066567	710	20	5	Potential nesting tree	No
Stag	01-11-2023	-32.481864	116.097349	710	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476589	116.091327	710	35	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471292	116.063210	710	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472059	116.067546	710	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480136	116.109406	710	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474808	116.108960	710	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468682	116.136393	710	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468577	116.136316	710	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470448	116.137742	710	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468151	116.137161	710	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468818	116.210442	710	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468192	116.209198	710	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482094	116.097988	710	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482165	116.104685	710	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482782	116.103018	710	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488852	116.114085	710	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496718	116.101021	710	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459417	116.218644	710	14	5	Potential nesting tree	No
Stag	06-12-2023	-32.493544	116.091780	710	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469820	116.139252	710	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466348	116.137343	710	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465545	116.134178	710	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.473349	116.246496	707	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465246	116.222150	707	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489427	116.120702	707	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479109	116.130899	707	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.484699	116.092534	707	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475828	116.159866	703	13	5	Potential nesting tree	No
Stag	07-12-2023	-32.450127	116.075300	703	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489034	116.185751	703	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476044	116.128129	703	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450753	116.075189	703	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474965	116.128640	703	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477063	116.136028	703	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.470854	116.171205	700	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470217	116.243775	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475727	116.165962	700	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471486	116.241977	700	25	5	Potential nesting tree	No
Stag	07-12-2023	-32.466631	116.059138	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458640	116.214008	700	20	5	Potential nesting tree	No
Stag	01-11-2023	-32.488444	116.182801	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478568	116.215757	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463286	116.105638	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478812	116.097898	700	28	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463067	116.229339	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458083	116.229085	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456976	116.218520	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.486971	116.182912	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478347	116.215048	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457216	116.218523	700	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.439024	116.169408	700	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466225	116.135415	700	18	5	Potential nesting tree	No
Bullich (Eucalyptus megacarpa)	03-11-2023	-32.453876	116.064322	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475479	116.162104	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473506	116.165968	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470209	116.243797	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462084	116.218443	700	20	5	Potential nesting tree	No
Stag	31-08-2023	-32.462810	116.218687	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.452389	116.215260	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460198	116.217051	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460160	116.214921	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460005	116.217709	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455831	116.216661	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466663	116.232317	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467268	116.232875	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467326	116.232719	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468390	116.222982	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478673	116.215445	700	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.477591	116.214805	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480268	116.213868	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480265	116.211948	700	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480193	116.211992	700	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480495	116.211873	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463453	116.232485	700	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463067	116.231435	700	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.461967	116.225793	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463564	116.225161	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462265	116.224411	700	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462952	116.224097	700	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489325	116.182915	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.442028	116.170008	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.437797	116.169910	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.437960	116.169590	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480291	116.086547	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471551	116.065526	700	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471596	116.065371	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471243	116.064948	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437346	116.075032	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434800	116.070976	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435328	116.070459	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.433697	116.064839	700	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434083	116.064924	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.463813	116.057051	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.462983	116.105592	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463536	116.105038	700	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463390	116.106096	700	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464185	116.105696	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464025	116.108674	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464681	116.113917	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464207	116.113636	700	28	5	Potential nesting tree	No
Flooded gum (Eucalyptus rudis)	06-07-2023	-32.474021	116.161492	700	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474275	116.161400	700	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474250	116.161503	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475081	116.161529	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475229	116.161328	700	28	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.473695	116.164800	700	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472645	116.165345	700	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472522	116.166648	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471330	116.170670	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473281	116.166256	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473536	116.166063	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474336	116.165626	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475172	116.165825	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474817	116.165881	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470143	116.240429	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471236	116.241439	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471491	116.241664	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471087	116.242170	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469261	116.242198	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.468838	116.242785	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469090	116.242755	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.469274	116.242804	700	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.471406	116.243292	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.472115	116.243624	700	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470138	116.243103	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471885	116.242425	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.461463	116.228305	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.461187	116.227634	700	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458191	116.228026	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458080	116.227513	700	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458050	116.227293	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.457400	116.227197	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.457840	116.227561	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.457944	116.228229	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.457925	116.229852	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.462818	116.219027	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.462691	116.219366	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460662	116.219412	700	23	5	Potential nesting tree	No
Stag	31-08-2023	-32.457179	116.207809	700	23	5	Potential nesting tree	No
Stag	31-08-2023	-32.457274	116.207944	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457858	116.207979	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457845	116.207833	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457894	116.207206	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457615	116.207421	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457499	116.207312	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456796	116.209396	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457091	116.209324	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457340	116.209664	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458207	116.209277	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458952	116.209312	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460230	116.209116	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460254	116.209338	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460052	116.209676	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459865	116.209623	700	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457103	116.209707	700	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.457046	116.209615	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457679	116.210508	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459611	116.210639	700	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457437	116.211135	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457527	116.211127	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458968	116.210948	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458637	116.211271	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456562	116.216576	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456727	116.216545	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458726	116.216328	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458366	116.218762	700	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458580	116.218656	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458799	116.217879	700	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458806	116.217848	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458849	116.218358	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477339	116.213631	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465235	116.232687	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465227	116.229872	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465146	116.230191	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.464969	116.231739	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464857	116.232316	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464928	116.231395	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464621	116.229766	700	18	5	Potential nesting tree	No
Stag	31-10-2023	-32.463716	116.228268	700	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462932	116.228740	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461670	116.228542	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462923	116.227875	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463492	116.227621	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462729	116.227391	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469745	116.242037	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469687	116.242002	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469467	116.242895	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.468029	116.241392	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467921	116.239139	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468144	116.239016	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469650	116.238778	700	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468777	116.238873	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488536	116.183945	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489028	116.182351	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488947	116.183054	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488914	116.183408	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438749	116.168819	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438180	116.169088	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438873	116.169235	700	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.439179	116.169289	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.477904	116.085868	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.478624	116.086091	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.478748	116.085862	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479105	116.085501	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480688	116.085043	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480130	116.084495	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452813	116.065597	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451798	116.065141	700	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451731	116.065203	700	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451707	116.065128	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453333	116.065197	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453771	116.065037	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453336	116.064904	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452999	116.065103	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453780	116.064612	700	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454235	116.064362	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454164	116.064411	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450513	116.064216	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.455351	116.064028	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454424	116.063557	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454915	116.064132	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450446	116.063780	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450475	116.063491	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473260	116.129725	700	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474090	116.127856	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474495	116.126071	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474268	116.127381	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474366	116.128710	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474559	116.127557	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477298	116.136419	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477440	116.136445	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477409	116.136345	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477051	116.136124	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479659	116.131425	700	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480206	116.132589	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480109	116.132663	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480386	116.132621	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480480	116.133103	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480143	116.133100	700	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480027	116.132865	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478896	116.132557	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.483570	116.132188	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481924	116.131206	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482351	116.130822	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481788	116.130980	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480846	116.130155	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480916	116.130111	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480940	116.130101	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480216	116.129457	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479378	116.130337	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479529	116.130144	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489713	116.138933	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453362	116.076513	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.452860	116.078585	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452940	116.076912	700	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.452978	116.076733	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452869	116.076507	700	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451948	116.077076	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451830	116.077230	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451413	116.075859	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451432	116.076350	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451308	116.076385	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451303	116.076464	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451248	116.077325	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464028	116.107902	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463579	116.108007	700	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463297	116.113625	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.454043	116.107175	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453836	116.107052	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459617	116.103998	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.453950	116.211871	700	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454762	116.210498	700	12	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453383	116.209743	700	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452425	116.209319	700	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.452855	116.208921	700	11	5	Potential nesting tree	No
Stag	31-08-2023	-32.455023	116.207791	700	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457419	116.208398	700	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456107	116.208821	700	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459947	116.208949	700	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459711	116.208173	700	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458369	116.209859	700	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458852	116.211595	700	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458687	116.211450	700	5	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458352	116.212593	700	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456333	116.215600	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458591	116.215490	700	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458640	116.214383	700	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459248	116.218747	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458880	116.218556	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476301	116.210163	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480200	116.212678	700	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489570	116.064299	700	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.491779	116.068310	700	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488956	116.066260	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483337	116.096343	700	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482008	116.098909	700	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481562	116.098802	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.487714	116.092829	700	40	5	Potential nesting tree	No
Stag	02-11-2023	-32.490874	116.119477	700	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490189	116.116223	700	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490608	116.115568	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489942	116.115702	700	34	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477502	116.082657	700	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470714	116.064567	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471841	116.118026	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470193	116.114707	700	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470526	116.114664	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480348	116.105110	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475828	116.121950	700	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.476113	116.122351	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476227	116.120576	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474705	116.110411	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491190	116.121996	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493565	116.090866	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466527	116.137708	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475295	116.147809	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497069	116.117525	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471366	116.245473	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470413	116.245262	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471736	116.245301	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.472552	116.245290	700	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473220	116.245076	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476347	116.161413	700	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475394	116.158720	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472283	116.171451	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472172	116.172425	700	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473789	116.245751	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473791	116.224580	700	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.458375	116.227807	700	10	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458513	116.226827	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470144	116.208308	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494791	116.097403	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475342	116.162016	700	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.469912	116.239852	700	15	5	Potential nesting tree	No
Stag	07-07-2023	-32.471647	116.243551	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472019	116.242821	700	30	5	Potential nesting tree	No
Stag	02-09-2023	-32.467777	116.233279	700	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471790	116.238397	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470751	116.238974	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470786	116.239409	700	15	5	Potential nesting tree	No
Stag	07-07-2023	-32.470598	116.240977	700	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.470060	116.243734	700	20	5	Potential nesting tree	No
Stag	26-08-2023	-32.458018	116.229132	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457070	116.207833	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477303	116.213328	700	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.477066	116.212761	700	20	5	Potential nesting tree	No
Stag	11-09-2023	-32.477233	116.212825	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464608	116.230874	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462280	116.228382	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463186	116.227869	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469565	116.242027	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.467716	116.240608	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.468091	116.239479	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468219	116.239281	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440291	116.167805	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440235	116.168552	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438357	116.168353	700	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452576	116.065621	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453238	116.065300	700	20	5	Potential nesting tree	No
Stag	03-11-2023	-32.454589	116.064374	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454021	116.064424	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453963	116.064505	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452315	116.064293	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477202	116.136272	700	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479654	116.132815	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452634	116.078231	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451954	116.076159	700	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451800	116.076006	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491189	116.068385	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491310	116.118820	700	12	5	Potential nesting tree	No
Stag	02-09-2023	-32.469358	116.230749	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458261	116.229091	700	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477233	116.109644	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493631	116.091066	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455470	116.211963	700	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457959	116.219619	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.457995	116.227868	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458692	116.228039	700	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470821	116.239582	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472101	116.243269	700	20	5	Potential nesting tree	No
Stag	26-08-2023	-32.463036	116.219109	700	18	5	Potential nesting tree	No
Stag	01-11-2023	-32.488708	116.182606	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469256	116.208234	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472388	116.245935	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472216	116.244522	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461180	116.218131	700	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478453	116.106300	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468471	116.209459	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470136	116.208264	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490228	116.069145	700	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490619	116.065560	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482525	116.104699	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482506	116.103774	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481895	116.102353	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482161	116.102303	700	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.486395	116.092814	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489213	116.118964	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489275	116.113653	700	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494547	116.111342	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495150	116.111249	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495169	116.111213	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489867	116.107107	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478511	116.088437	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469593	116.242409	700	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479972	116.132658	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480766	116.132233	700	22	5	Potential nesting tree	No
Stag	26-08-2023	-32.454172	116.209905	700	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460360	116.216963	700	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480995	116.104919	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459196	116.219063	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458961	116.219188	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458390	116.218966	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458174	116.221321	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457939	116.218786	700	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455329	116.216212	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460648	116.218622	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460564	116.215825	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460535	116.219022	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459789	116.217088	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459749	116.216264	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459683	116.216144	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459851	116.215833	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459619	116.215538	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459436	116.217956	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.459560	116.218283	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459426	116.218643	700	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456825	116.217365	700	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457308	116.218260	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457619	116.218326	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458249	116.217763	700	16	5	Potential nesting tree	No
Stag	02-09-2023	-32.470165	116.225844	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.471073	116.226271	700	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478855	116.108031	700	12	5	Potential nesting tree	No
Stag	05-12-2023	-32.479282	116.107985	700	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479042	116.106792	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475305	116.121443	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474305	116.122863	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474440	116.122863	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474827	116.121848	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.482001	116.125657	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477018	116.110094	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476849	116.109223	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491221	116.121100	700	14	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493519	116.091384	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469182	116.136901	700	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468647	116.137268	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468914	116.137705	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468966	116.138412	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469575	116.138587	700	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469265	116.139773	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468046	116.141407	700	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466335	116.137280	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475638	116.143789	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.479585	116.144702	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478952	116.144570	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497521	116.119286	700	16	5	Potential nesting tree	No
Stag	30-10-2023	-32.465129	116.229872	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469758	116.242321	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453870	116.065032	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456730	116.208896	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472653	116.244433	700	18	5	Potential nesting tree	No
Stag	01-11-2023	-32.490941	116.066757	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473448	116.245676	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470559	116.238721	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490205	116.182927	700	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490264	116.182938	700	15	5	Potential nesting tree	No
Stag	05-07-2023	-32.470743	116.238686	700	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475166	116.161817	700	20	5	Potential nesting tree	No
Stag	05-07-2023	-32.467689	116.237819	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470314	116.237545	700	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473789	116.225237	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473201	116.226810	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498159	116.112790	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498209	116.113859	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494372	116.101047	700	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.491487	116.108353	700	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.491618	116.108167	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434654	116.072523	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435228	116.074278	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436064	116.075343	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436490	116.074534	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436794	116.074391	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436640	116.074755	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436201	116.072129	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436030	116.071631	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435754	116.066127	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.432904	116.064900	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.461081	116.099444	700	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.460950	116.099173	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.461047	116.098774	700	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.489086	116.072929	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486787	116.097561	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486904	116.098198	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477954	116.099048	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478118	116.098771	700	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478511	116.098575	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.471766	116.067936	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467004	116.054631	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466860	116.054948	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465143	116.056724	700	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-12-2023	-32.460067	116.069615	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464485	116.110232	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464315	116.109344	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464371	116.109207	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.465176	116.108845	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463608	116.113454	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463761	116.114035	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464030	116.113913	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464043	116.113940	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463957	116.113561	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463914	116.113531	700	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453597	116.105272	700	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475884	116.165889	700	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454571	116.211295	700	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450426	116.062712	700	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481804	116.130845	700	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489213	116.121506	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489148	116.120750	700	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435551	116.066446	700	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467324	116.053884	700	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454410	116.210411	697	17	5	Potential nesting tree	No
Stag	31-10-2023	-32.465463	116.221413	697	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476194	116.127785	697	22	5	Potential nesting tree	No
Stag	07-07-2023	-32.469940	116.244376	694	6	5	Potential nesting tree	No
Stag	06-12-2023	-32.479573	116.131663	694	19	5	Potential nesting tree	No
Stag	05-07-2023	-32.471619	116.246872	694	4	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470931	116.245184	694	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.476139	116.165998	694	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453434	116.210256	694	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472644	116.227403	694	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464735	116.221908	691	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470892	116.245170	691	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490371	116.184334	691	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451766	116.062843	691	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460200	116.214684	690	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.461920	116.218574	690	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460000	116.215033	690	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456109	116.216896	690	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480158	116.211699	690	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480443	116.211927	690	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.461237	116.098750	690	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458312	116.213487	690	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488970	116.182662	690	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488901	116.182623	690	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469344	116.207796	690	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489656	116.063549	690	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489362	116.066358	690	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471873	116.116377	690	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470078	116.114983	690	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475863	116.121959	690	32	5	Potential nesting tree	No
Stag	08-12-2023	-32.496418	116.119402	690	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466486	116.231787	690	25	5	Potential nesting tree	No
Stag	30-10-2023	-32.480344	116.213824	690	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469467	116.210702	690	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469185	116.211018	690	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477456	116.144347	690	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457875	116.212082	690	13	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477619	116.144553	690	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468402	116.209436	690	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491336	116.069126	690	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.464641	116.222005	688	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463944	116.222227	688	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472503	116.227036	688	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488926	116.183645	688	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.467530	116.222570	688	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450835	116.075482	688	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.467267	116.222323	688	11	5	Potential nesting tree	No
Stag	05-12-2023	-32.476349	116.135188	688	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.465253	116.221624	688	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.473352	116.226919	688	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.471285	116.244443	684	11	5	Potential nesting tree	No
Stag	07-07-2023	-32.471778	116.244246	684	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.486873	116.182655	684	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489232	116.120985	684	18	5	Potential nesting tree	No
Stag	02-11-2023	-32.489608	116.114986	684	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480038	116.097230	684	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473263	116.246284	684	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471239	116.244235	684	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454151	116.210066	684	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.455175	116.209123	684	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.489402	116.138162	684	26	5	Potential nesting tree	No
Stag	03-11-2023	-32.495639	116.101187	684	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471366	116.245170	684	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.454872	116.211118	681	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.472827	116.226960	681	22	5	Potential nesting tree	No
Stag	01-11-2023	-32.464162	116.222616	681	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472006	116.243814	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490519	116.066129	680	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482839	116.096304	680	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.484145	116.096281	680	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.470850	116.067039	680	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.463113	116.218430	680	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472591	116.066651	680	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455565	116.219614	680	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.462972	116.218490	680	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453788	116.217056	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460104	116.215771	680	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455428	116.217942	680	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458176	116.218542	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466306	116.231024	680	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480139	116.211951	680	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469315	116.209503	680	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.462669	116.231791	680	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462942	116.231747	680	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463567	116.225144	680	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476068	116.087248	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.458863	116.098787	680	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.459003	116.098569	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486433	116.098491	680	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476215	116.110364	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474379	116.108462	680	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480215	116.095802	680	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463287	116.105166	680	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464702	116.113241	680	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455424	116.209848	680	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453606	116.208811	680	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453470	116.208709	680	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457588	116.208498	680	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458680	116.208593	680	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458700	116.208838	680	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458481	116.215379	680	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.457766	116.215131	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457407	116.215175	680	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488711	116.183390	680	13	5	Potential nesting tree	No
Stag	11-09-2023	-32.489924	116.183867	680	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.479966	116.212978	680	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489390	116.064394	680	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490002	116.068160	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491697	116.068408	680	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.483146	116.096530	680	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.484176	116.096301	680	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.480923	116.096917	680	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481320	116.097020	680	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481153	116.096458	680	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482357	116.098726	680	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482526	116.099248	680	19	5	Potential nesting tree	No
Stag	02-11-2023	-32.490876	116.116070	680	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472243	116.116224	680	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469763	116.112447	680	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.480653	116.106671	680	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478578	116.130500	680	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476372	116.109178	680	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.491065	116.122028	680	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468844	116.136695	680	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468721	116.136384	680	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468973	116.136064	680	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.471137	116.133997	680	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474696	116.145849	680	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.495678	116.118302	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466424	116.135321	680	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471717	116.246086	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470892	116.245191	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476020	116.162537	680	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472495	116.171548	680	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475357	116.165801	680	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.470076	116.244806	680	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490052	116.066057	680	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.485781	116.093349	680	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480438	116.213922	680	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462744	116.225351	680	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.435097	116.070055	680	18	5	Potential nesting tree	No
Stag	06-07-2023	-32.471969	116.170780	680	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453785	116.210665	680	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471986	116.243893	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491449	116.069719	680	15	5	Potential nesting tree	No
Stag	06-12-2023	-32.474756	116.107790	680	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456405	116.220493	680	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474637	116.122045	680	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481173	116.098614	680	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.470952	116.238133	680	10	5	Potential nesting tree	No
Stag	06-12-2023	-32.476240	116.110168	680	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468270	116.209256	680	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.482681	116.096264	680	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481407	116.094743	680	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494694	116.109752	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496968	116.102158	680	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494701	116.099356	680	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494673	116.096833	680	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.493943	116.096909	680	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491858	116.106926	680	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491312	116.106777	680	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479997	116.213034	680	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461237	116.220217	680	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458315	116.219010	680	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456011	116.220206	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460780	116.217628	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460725	116.219046	680	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460769	116.218726	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460769	116.216815	680	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459505	116.216585	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459527	116.217792	680	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.459527	116.218897	680	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456855	116.217058	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452813	116.209078	680	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457772	116.218223	680	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468783	116.231027	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.470516	116.226000	680	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.471388	116.226977	680	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471556	116.115992	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469748	116.112176	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480233	116.103690	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479097	116.108212	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479304	116.107896	680	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478562	116.106392	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475467	116.122637	680	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477106	116.111307	680	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476777	116.110000	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477864	116.110274	680	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469197	116.136972	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469295	116.137005	680	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469674	116.139780	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466146	116.134249	680	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475948	116.143475	680	16	5	Potential nesting tree	No
Stag	08-12-2023	-32.477639	116.145957	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468545	116.209459	680	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457708	116.220823	680	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469941	116.224855	678	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465641	116.221634	678	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.476482	116.129088	678	31	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476070	116.127862	675	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463836	116.223559	675	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455464	116.210208	675	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477917	116.132438	675	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476684	116.135715	675	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451261	116.078228	672	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463614	116.221803	672	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479798	116.129295	672	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449685	116.075645	672	15	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	07-12-2023	-32.450010	116.076585	672	15	5	Potential nesting tree	No
Stag	01-11-2023	-32.464119	116.221971	672	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.477010	116.135400	672	11	5	Potential nesting tree	No
Stag	02-11-2023	-32.484757	116.093675	672	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454657	116.217790	670	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436751	116.069411	670	25	5	Potential nesting tree	No
Stag	04-12-2023	-32.493537	116.074751	670	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457435	116.221681	670	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470730	116.065354	670	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461151	116.230188	670	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457722	116.221888	670	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.462716	116.218324	670	15	5	Potential nesting tree	No
Stag	31-08-2023	-32.451370	116.214020	670	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460069	116.216352	670	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460140	116.217266	670	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467569	116.232655	670	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437211	116.069313	670	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.434778	116.069746	670	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.433882	116.065002	670	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475978	116.109143	670	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478716	116.097786	670	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456661	116.215433	670	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454323	116.209930	670	12	5	Potential nesting tree	No
Stag	31-08-2023	-32.459464	116.208578	670	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458481	116.212975	670	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476421	116.210463	670	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469906	116.208339	670	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491099	116.068434	670	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490617	116.068637	670	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490032	116.068812	670	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482476	116.096371	670	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.480649	116.097254	670	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.487668	116.094278	670	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481177	116.094808	670	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.490636	116.115438	670	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489484	116.115312	670	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489354	116.115159	670	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.477737	116.085448	670	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479238	116.102659	670	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475639	116.122376	670	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476150	116.121742	670	17	5	Potential nesting tree	No
Stag	06-12-2023	-32.476679	116.110674	670	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493643	116.092321	670	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469184	116.136732	670	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468765	116.136521	670	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468891	116.135916	670	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470788	116.138009	670	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.475055	116.147767	670	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474826	116.146022	670	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475112	116.147226	670	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.474247	116.246210	670	8	5	Potential nesting tree	No
Stag	30-10-2023	-32.469603	116.209788	670	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468176	116.209959	670	30	5	Potential nesting tree	No
Stag	30-10-2023	-32.469964	116.210228	670	11	5	Potential nesting tree	No
Stag	03-11-2023	-32.477781	116.083694	670	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477738	116.082836	670	23	5	Potential nesting tree	No
Stag	01-09-2023	-32.458189	116.212559	670	9	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469091	116.209408	670	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470593	116.207406	670	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470480	116.207542	670	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470162	116.207454	670	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490177	116.064755	670	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489877	116.065543	670	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482036	116.097986	670	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481416	116.097687	670	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490389	116.119548	670	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494496	116.111237	670	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.494681	116.111672	670	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491144	116.107610	670	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458529	116.221958	670	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460570	116.218279	670	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459583	116.215704	670	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474759	116.121532	670	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469158	116.138963	670	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469326	116.209365	670	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475493	116.155062	668	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470116	116.241926	668	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490115	116.184167	668	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.433848	116.074264	668	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481822	116.095545	668	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489530	116.120246	668	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489502	116.121032	668	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489167	116.120012	668	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490285	116.111812	668	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497336	116.102039	668	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495029	116.101590	668	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489428	116.106207	668	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434503	116.072481	668	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434969	116.073321	668	18	5	Potential nesting tree	No
Stag	04-12-2023	-32.435628	116.074195	668	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435677	116.074722	668	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436527	116.074480	668	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436196	116.071620	668	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.435868	116.066091	668	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436018	116.066328	668	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.433427	116.064604	668	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489687	116.073754	668	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.464879	116.058002	668	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466268	116.057912	668	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.455777	116.060385	668	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464514	116.109843	668	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464468	116.109692	668	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463754	116.113964	668	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452906	116.107682	668	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.452093	116.107110	668	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.470722	116.246837	668	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473302	116.225589	668	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.470142	116.225142	668	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494076	116.101245	668	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.466031	116.232914	668	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435072	116.073191	668	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465454	116.233241	668	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454134	116.209038	665	12	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475725	116.160123	665	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	06-12-2023	-32.476860	116.135944	665	23	5	Potential nesting tree	No
Stag	02-11-2023	-32.483111	116.107212	665	12	5	Potential nesting tree	No
Stag	07-07-2023	-32.470181	116.244193	662	8	5	Potential nesting tree	No
Stag	07-07-2023	-32.474704	116.165712	662	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472533	116.227069	662	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.489178	116.186328	662	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473558	116.227334	662	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469484	116.225022	662	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479750	116.129425	662	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478667	116.215735	660	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470833	116.114978	660	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490344	116.063386	660	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473360	116.166205	660	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460277	116.216765	660	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469102	116.209955	660	30	5	Potential nesting tree	No
Stag	03-11-2023	-32.476677	116.088392	660	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.487790	116.098335	660	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.459861	116.071055	660	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456241	116.214826	660	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.455786	116.210761	660	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454732	116.210609	660	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457544	116.208720	660	15	5	Potential nesting tree	No
Stag	31-08-2023	-32.459209	116.208589	660	14	5	Potential nesting tree	No
Stag	02-09-2023	-32.458995	116.217083	660	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490025	116.184076	660	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476916	116.212396	660	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471275	116.062600	660	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476610	116.110766	660	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476754	116.110237	660	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476652	116.109661	660	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469231	116.136730	660	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468771	116.136194	660	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468205	116.137651	660	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469902	116.141267	660	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.474977	116.145691	660	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475205	116.145813	660	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475505	116.147020	660	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479785	116.143557	660	19	5	Potential nesting tree	No
Stag	05-07-2023	-32.470815	116.245256	660	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472814	116.171878	660	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475188	116.165856	660	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474796	116.166008	660	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471590	116.244003	660	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456681	116.220986	660	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472354	116.245472	660	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472440	116.245618	660	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476288	116.143616	660	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.473727	116.224494	660	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470142	116.207966	660	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489526	116.067637	660	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490817	116.067284	660	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490322	116.069390	660	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490095	116.065691	660	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490681	116.066015	660	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481560	116.097742	660	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482722	116.104634	660	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483031	116.103765	660	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482537	116.103025	660	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.454647	116.209679	660	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485897	116.093102	660	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489198	116.114202	660	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490068	116.113898	660	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494612	116.099385	660	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490036	116.106771	660	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456054	116.218576	660	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461221	116.218634	660	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460703	116.216735	660	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459467	116.217803	660	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459590	116.217848	660	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459456	116.218488	660	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456903	116.217361	660	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468472	116.233947	660	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474918	116.123059	660	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476822	116.109595	660	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474771	116.111408	660	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474943	116.111362	660	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488746	116.095316	660	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.488396	116.095463	660	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.488603	116.094895	660	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477509	116.145819	660	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469103	116.210197	660	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463671	116.223081	659	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476895	116.129116	659	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481755	116.129486	659	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475211	116.129061	659	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476865	116.135868	656	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479658	116.132100	656	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465406	116.230220	656	20	5	Potential nesting tree	No
Stag	05-07-2023	-32.469845	116.238763	653	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473882	116.225403	653	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472341	116.227096	653	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473821	116.226468	653	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489470	116.120354	653	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470785	116.245161	653	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471056	116.171252	653	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475793	116.165946	653	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.484706	116.092678	653	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475492	116.161790	650	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478239	116.086366	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.456034	116.060500	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470253	116.113207	650	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474266	116.107613	650	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456150	116.211386	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451043	116.064605	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460198	116.218073	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462315	116.218687	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456958	116.218636	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468588	116.223338	650	28	5	Potential nesting tree	No
Bullich (Eucalyptus megacarpa)	03-11-2023	-32.453537	116.064477	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475379	116.162027	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464573	116.230655	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469305	116.241850	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475347	116.161778	650	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475425	116.162092	650	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475504	116.162464	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472799	116.166141	650	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473847	116.165651	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475002	116.165735	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470823	116.241958	650	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469173	116.243258	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.469434	116.243812	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472145	116.243649	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471905	116.242978	650	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.470612	116.242733	650	20	5	Potential nesting tree	No
Stag	07-07-2023	-32.470411	116.242852	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457637	116.221880	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456890	116.221412	650	20	5	Potential nesting tree	No
Stag	31-08-2023	-32.462618	116.218581	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459896	116.214962	650	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459960	116.215775	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459931	116.218042	650	30	5	Potential nesting tree	No
Stag	01-09-2023	-32.455114	116.217066	650	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.455839	116.216962	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455825	116.216822	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456423	116.216912	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458035	116.217052	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468082	116.231552	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479624	116.214965	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.478579	116.214238	650	28	5	Potential nesting tree	No
Stag	30-10-2023	-32.477625	116.213954	650	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463604	116.232640	650	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464238	116.226948	650	35	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463032	116.225799	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463811	116.225559	650	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462254	116.223117	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462385	116.224271	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462638	116.222625	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463416	116.223960	650	28	5	Potential nesting tree	No
Stag	02-11-2023	-32.480239	116.086840	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472164	116.067085	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436643	116.069327	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493308	116.070577	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434501	116.070722	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.434595	116.069938	650	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.459671	116.098661	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460632	116.097951	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.461103	116.098453	650	20	5	Potential nesting tree	No
Stag	05-12-2023	-32.489866	116.071911	650	22	5	Potential nesting tree	No
Stag	05-12-2023	-32.489846	116.071909	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475655	116.109170	650	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474604	116.109297	650	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479967	116.096340	650	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.471723	116.067323	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.459594	116.071292	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463145	116.105193	650	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463640	116.105205	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463948	116.106104	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464205	116.105873	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464848	116.112303	650	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464668	116.113434	650	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464610	116.112901	650	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	08-12-2023	-32.464297	116.114019	650	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464238	116.113685	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464199	116.113471	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451045	116.107535	650	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.459307	116.215967	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441570	116.167650	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469743	116.237917	650	25	5	Potential nesting tree	No
Stag	05-07-2023	-32.471464	116.238545	650	18	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474344	116.161129	650	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474415	116.161192	650	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474603	116.161592	650	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475518	116.161372	650	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472940	116.165016	650	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472792	116.165634	650	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472905	116.165912	650	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472618	116.166527	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472512	116.166727	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472329	116.167226	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472300	116.168795	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474661	116.165595	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471587	116.242123	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471190	116.242164	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469095	116.242508	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.468385	116.242442	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469010	116.242736	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471838	116.243217	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470706	116.243204	650	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.471804	116.242398	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458303	116.228544	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458174	116.228063	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.457616	116.227336	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.457661	116.227393	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458027	116.229064	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.463601	116.219882	650	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.460320	116.219883	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459926	116.220456	650	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459935	116.219379	650	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456184	116.207712	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456760	116.207652	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456869	116.207863	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457984	116.207838	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458003	116.207838	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456212	116.209230	650	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457004	116.209483	650	16	5	Potential nesting tree	No
Stag	31-08-2023	-32.458974	116.209439	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459007	116.209464	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459079	116.209374	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459436	116.209408	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459567	116.209446	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459784	116.209116	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459941	116.209450	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460098	116.209683	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455799	116.210580	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456026	116.210675	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.459143	116.210496	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459298	116.210482	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459680	116.210347	650	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458632	116.211127	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459640	116.211356	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458486	116.213781	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458810	116.213882	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457248	116.216594	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458392	116.216500	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458686	116.216536	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459125	116.216414	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459352	116.216648	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459288	116.216228	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456697	116.216309	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456681	116.216417	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457049	116.216024	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457777	116.216102	650	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458906	116.216148	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458789	116.218870	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458656	116.218846	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458776	116.217553	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458551	116.217369	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458467	116.217098	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458851	116.218861	650	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.479012	116.213643	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477444	116.213632	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477311	116.213585	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.466202	116.230433	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465995	116.230894	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.464995	116.230492	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.464998	116.231612	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464934	116.232216	650	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464559	116.230403	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462351	116.228884	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462663	116.228228	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461854	116.228209	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462996	116.228038	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461726	116.227219	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469547	116.241690	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469666	116.242681	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469621	116.242543	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468743	116.241742	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468239	116.239714	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464689	116.236249	650	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488924	116.182610	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489032	116.182423	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488740	116.184180	650	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440498	116.168423	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440465	116.168483	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440414	116.167379	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438088	116.169031	650	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438212	116.169209	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439175	116.169134	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.477948	116.085876	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480295	116.084061	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453022	116.065466	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451929	116.065142	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453992	116.064927	650	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453616	116.064982	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452575	116.064975	650	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452719	116.064792	650	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453407	116.064354	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453008	116.064465	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450455	116.064559	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450609	116.064341	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451204	116.064269	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450917	116.063927	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450481	116.063653	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452277	116.063393	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450719	116.063311	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451256	116.063132	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472927	116.129282	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473061	116.128736	650	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.473277	116.129951	650	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.473723	116.127240	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473509	116.126848	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473853	116.127601	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474435	116.125464	650	22	5	Potential nesting tree	No
Stag	04-12-2023	-32.474359	116.126337	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474325	116.126677	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474403	116.128592	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480547	116.132030	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480022	116.131922	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479958	116.131889	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480237	116.132172	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479562	116.132689	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479323	116.132647	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.483575	116.132468	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482682	116.131448	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482103	116.130856	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454204	116.076523	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454098	116.076132	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453172	116.076266	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451921	116.075962	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.452046	116.077408	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451596	116.076011	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451343	116.076912	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464719	116.108053	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463891	116.108021	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464610	116.108305	650	18	5	Potential nesting tree	No
Stag	08-12-2023	-32.464837	116.108390	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463352	116.112535	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453538	116.106865	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452712	116.106462	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468831	116.210807	650	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452674	116.209030	650	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459791	116.208739	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459259	116.210121	650	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458554	116.213062	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457803	116.213280	650	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458303	116.215001	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.487413	116.183345	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.487990	116.182681	650	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488318	116.183004	650	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468972	116.210826	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469387	116.210952	650	14	5	Potential nesting tree	No
Stag	31-10-2023	-32.469987	116.208135	650	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489633	116.064082	650	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490121	116.064174	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489756	116.067792	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491689	116.068938	650	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489172	116.067110	650	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489504	116.066485	650	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490133	116.066460	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490083	116.066199	650	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.481316	116.097181	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.480731	116.097052	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482442	116.098950	650	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482601	116.099764	650	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.481930	116.098434	650	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.488074	116.094635	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.487934	116.092994	650	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472334	116.116267	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.481381	116.104841	650	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478952	116.102940	650	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478486	116.105486	650	19	5	Potential nesting tree	No
Stag	05-12-2023	-32.479863	116.109383	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475658	116.121347	650	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.480379	116.124229	650	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476569	116.111595	650	20	5	Potential nesting tree	No
Stag	06-12-2023	-32.475369	116.109551	650	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474786	116.107758	650	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491247	116.122103	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491147	116.122506	650	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470780	116.138027	650	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470167	116.138345	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468108	116.137447	650	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466646	116.136518	650	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475152	116.145529	650	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475086	116.145364	650	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475058	116.145306	650	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474882	116.146859	650	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479637	116.142858	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.480159	116.143519	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496396	116.119401	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497259	116.117606	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497165	116.118420	650	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470818	116.245547	650	20	5	Potential nesting tree	No
Stag	07-07-2023	-32.470653	116.244768	650	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473214	116.223738	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473393	116.224681	650	14	5	Potential nesting tree	No
Stag	25-08-2023	-32.460617	116.226041	650	10	5	Potential nesting tree	No
Stag	25-08-2023	-32.458776	116.227413	650	8	5	Potential nesting tree	No
Stag	01-09-2023	-32.460349	116.217775	650	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463423	116.231325	650	30	5	Potential nesting tree	No
Stag	05-12-2023	-32.489937	116.071912	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470391	116.240063	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.457348	116.227312	650	14	5	Potential nesting tree	No
Stag	26-08-2023	-32.457966	116.228693	650	18	5	Potential nesting tree	No
Stag	26-08-2023	-32.458035	116.228982	650	12	5	Potential nesting tree	No
Stag	26-08-2023	-32.460549	116.220728	650	13	5	Potential nesting tree	No
Stag	26-08-2023	-32.460687	116.220879	650	15	5	Potential nesting tree	No
Stag	26-08-2023	-32.460731	116.221253	650	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.459267	116.216415	650	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	11-09-2023	-32.480622	116.213613	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462951	116.229051	650	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.467377	116.241002	650	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.469096	116.238129	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440191	116.167488	650	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.438326	116.168869	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491357	116.069012	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457712	116.221866	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469936	116.113017	650	25	5	Potential nesting tree	No
Stag	26-08-2023	-32.461622	116.220568	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455941	116.218982	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475169	116.161332	650	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.457542	116.209600	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470512	116.246071	650	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489895	116.062710	650	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489972	116.064672	650	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490662	116.066019	650	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.482984	116.095960	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482400	116.098248	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481903	116.098311	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489520	116.119754	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489580	116.114251	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494393	116.098117	650	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494706	116.097131	650	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494143	116.096572	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491026	116.105669	650	22	5	Potential nesting tree	No
Stag	01-09-2023	-32.458849	116.214042	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468382	116.210055	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472112	116.116561	650	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.457740	116.224847	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461985	116.220041	650	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458334	116.220033	650	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458218	116.221154	650	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456223	116.221155	650	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454871	116.216866	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460419	116.216587	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459828	116.217632	650	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456556	116.217817	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458296	116.218156	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458132	116.217954	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468779	116.233191	650	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.470391	116.226087	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474727	116.122443	650	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477071	116.109966	650	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476776	116.109402	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469483	116.137073	650	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475208	116.160892	650	20	5	Potential nesting tree	No
Stag	04-12-2023	-32.471134	116.115465	650	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.471394	116.244281	649	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449632	116.075689	649	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480758	116.099597	649	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472567	116.244803	649	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450872	116.061940	649	16	5	Potential nesting tree	No
Stag	01-11-2023	-32.463654	116.223590	649	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479001	116.132095	649	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449760	116.076699	646	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479228	116.131606	646	17	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451556	116.062796	646	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455604	116.208965	646	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473157	116.225585	646	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464723	116.221272	646	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477114	116.129717	646	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465726	116.230720	646	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479419	116.132029	643	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472994	116.226880	643	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472869	116.244165	643	17	5	Potential nesting tree	No
Stag	07-07-2023	-32.473258	116.246226	643	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477541	116.132446	643	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489443	116.138424	643	23	5	Potential nesting tree	No
Stag	31-10-2023	-32.467099	116.221381	643	15	5	Potential nesting tree	No
Stag	05-07-2023	-32.472198	116.244897	643	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475778	116.165950	640	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.469569	116.244501	640	16	5	Potential nesting tree	No
Stag	31-10-2023	-32.462622	116.230580	640	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469752	116.225776	640	17	5	Potential nesting tree	No
Stag	31-10-2023	-32.465039	116.221864	640	18	5	Potential nesting tree	No
Stag	01-11-2023	-32.463616	116.221543	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489450	116.120312	640	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489514	116.121450	640	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470527	116.244494	640	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475557	116.128382	640	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.475783	116.128047	640	29	5	Potential nesting tree	No
Stag	05-07-2023	-32.471210	116.245834	640	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459979	116.208760	640	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472580	116.167500	640	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.461742	116.218006	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455773	116.217661	640	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466497	116.232307	640	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466656	116.232224	640	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479041	116.215270	640	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479083	116.215379	640	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478573	116.214943	640	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478785	116.214873	640	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479371	116.214307	640	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.479751	116.214036	640	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478351	116.088047	640	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470320	116.065417	640	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455178	116.209777	640	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456919	116.209855	640	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459861	116.209892	640	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459158	116.218465	640	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491286	116.068777	640	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490903	116.068625	640	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.490027	116.116204	640	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493241	116.112227	640	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476490	116.089392	640	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472651	116.117398	640	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475208	116.108563	640	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475080	116.109618	640	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474894	116.108361	640	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490782	116.122302	640	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468712	116.136715	640	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468988	116.136742	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469864	116.138142	640	17	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467757	116.141048	640	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475923	116.160156	640	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472175	116.172970	640	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	07-07-2023	-32.475438	116.165644	640	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470545	116.207289	640	30	5	Potential nesting tree	No
Stag	05-12-2023	-32.435299	116.071508	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476777	116.110864	640	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460874	116.219814	640	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490677	116.063399	640	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490497	116.069289	640	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490990	116.066061	640	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482162	116.097990	640	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482390	116.104425	640	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480975	116.094710	640	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490665	116.118850	640	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490448	116.119349	640	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489900	116.119276	640	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489455	116.113545	640	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489354	116.113570	640	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489372	116.113616	640	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496765	116.101318	640	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.460853	116.219903	640	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454366	116.218201	640	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460406	116.215526	640	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460453	116.216659	640	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459504	116.216513	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456595	116.217204	640	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470689	116.114372	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480042	116.103685	640	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479836	116.108586	640	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480228	116.124160	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474842	116.112654	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492221	116.122036	640	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489874	116.103441	640	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.493603	116.093370	640	14	5	Potential nesting tree	No
Stag	07-12-2023	-32.466174	116.134796	640	10	5	Potential nesting tree	No
Stag	07-12-2023	-32.466232	116.134625	640	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466054	116.134719	640	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.476916	116.143258	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475898	116.143514	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475866	116.143462	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.480051	116.144468	640	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478885	116.146397	640	20	5	Potential nesting tree	No
Stag	31-08-2023	-32.461489	116.218207	640	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.468617	116.237984	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469435	116.237953	637	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471722	116.238515	637	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470133	116.239292	637	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488239	116.182491	637	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488163	116.182593	637	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488334	116.182765	637	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.484739	116.092879	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482893	116.107580	637	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481880	116.095796	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481760	116.095544	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489412	116.120434	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489139	116.114830	637	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.492580	116.113441	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491292	116.110054	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491350	116.110126	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497676	116.111680	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494935	116.101144	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496137	116.100823	637	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.434313	116.073063	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434740	116.072269	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434559	116.073567	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435053	116.074784	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435099	116.073591	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435673	116.074183	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435590	116.074664	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435734	116.074992	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436243	116.075213	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493941	116.074688	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436222	116.071427	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436069	116.071255	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435990	116.071154	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435676	116.070876	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435665	116.071448	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436126	116.066088	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460926	116.100187	637	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.460665	116.099538	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489431	116.073948	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489367	116.074148	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489162	116.072413	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486771	116.097682	637	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476704	116.099077	637	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477400	116.098823	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478263	116.098822	637	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464554	116.059396	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454633	116.059070	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.455446	116.060515	637	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.460098	116.070850	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.460304	116.069372	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463771	116.109862	637	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463654	116.112045	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452879	116.107318	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452593	116.107950	637	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.452071	116.107201	637	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452020	116.107468	637	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472448	116.244208	637	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470497	116.244393	637	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468207	116.222159	637	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465400	116.221660	637	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450939	116.061784	637	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451266	116.075446	637	17	5	Potential nesting tree	No
Stag	07-12-2023	-32.467174	116.060153	637	14	5	Potential nesting tree	No
Stag	04-12-2023	-32.434651	116.072219	637	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465906	116.229925	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465495	116.233304	637	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465554	116.233333	637	25	5	Potential nesting tree	No
Stag	04-12-2023	-32.494182	116.073565	637	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.470689	116.244340	633	7	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463404	116.221638	633	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472943	116.224082	633	17	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-07-2023	-32.474975	116.155468	633	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475818	116.166119	633	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453312	116.210062	633	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454281	116.209136	633	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.471907	116.227004	633	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476728	116.133348	633	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477880	116.132480	633	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436293	116.069996	630	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491385	116.069079	630	25	5	Potential nesting tree	No
Stag	05-07-2023	-32.471484	116.247029	630	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472668	116.067053	630	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464695	116.221732	630	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490254	116.068246	630	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497332	116.120102	630	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457696	116.220830	630	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460288	116.217125	630	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460130	116.216931	630	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460046	116.216063	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469007	116.223115	630	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478025	116.214800	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.478639	116.213798	630	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463803	116.232638	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463174	116.231587	630	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480410	116.086419	630	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480185	116.086542	630	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479781	116.086852	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.479039	116.087952	630	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470117	116.065743	630	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437597	116.069375	630	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436526	116.066595	630	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.460703	116.098136	630	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476103	116.110148	630	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456684	116.215288	630	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454923	116.212703	630	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455439	116.209767	630	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455099	116.209603	630	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452634	116.209069	630	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459558	116.208768	630	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459589	116.208712	630	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459234	116.208199	630	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.459236	116.210142	630	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458506	116.212953	630	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457448	116.213104	630	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457824	116.215399	630	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457320	116.215459	630	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458478	116.214954	630	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457532	116.214637	630	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458868	116.218703	630	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489888	116.183116	630	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490111	116.183009	630	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480037	116.213000	630	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.480230	116.212500	630	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469401	116.210276	630	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.468812	116.210972	630	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469076	116.210992	630	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469585	116.208412	630	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.488989	116.064529	630	17	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490484	116.068658	630	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489242	116.066883	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481561	116.097529	630	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482084	116.098564	630	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.492234	116.119753	630	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493891	116.112354	630	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477817	116.084957	630	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471049	116.116294	630	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472363	116.116270	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475514	116.121799	630	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476055	116.122128	630	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476265	116.121463	630	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476570	116.109691	630	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493627	116.091908	630	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469599	116.137225	630	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469644	116.137525	630	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470097	116.138555	630	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466668	116.136765	630	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.475013	116.146203	630	15	5	Potential nesting tree	No
Stag	08-12-2023	-32.474864	116.146640	630	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477284	116.144419	630	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475575	116.161709	630	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479120	116.214377	630	20	5	Potential nesting tree	No
Stag	01-11-2023	-32.489933	116.183476	630	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459149	116.208286	630	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468788	116.209290	630	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490225	116.061844	630	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490634	116.067665	630	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490205	116.064749	630	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482377	116.104479	630	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482478	116.104031	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482740	116.102861	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481130	116.094605	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489526	116.113781	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489869	116.113540	630	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494542	116.099391	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494713	116.099062	630	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494583	116.098038	630	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490689	116.106225	630	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491426	116.106480	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491090	116.106819	630	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490797	116.107237	630	25	5	Potential nesting tree	No
Stag	26-08-2023	-32.461650	116.219661	630	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460362	116.218439	630	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459657	116.214987	630	26	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468622	116.229701	630	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470948	116.115426	630	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469848	116.111981	630	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489921	116.062932	630	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474711	116.122269	630	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480262	116.124536	630	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476913	116.109772	630	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.493138	116.093629	630	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493530	116.091571	630	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466401	116.137981	630	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473311	116.227082	630	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465738	116.221564	630	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	05-12-2023	-32.459093	116.098785	628	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.466697	116.221153	627	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464063	116.221918	627	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489757	116.114498	627	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482333	116.129463	627	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473207	116.227504	627	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450223	116.078434	627	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470013	116.065325	625	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451888	116.060751	624	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465965	116.232667	624	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468435	116.222053	624	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475574	116.159400	624	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475919	116.166196	624	20	5	Potential nesting tree	No
Stag	07-07-2023	-32.471401	116.244463	624	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453421	116.210122	624	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469231	116.223708	624	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477001	116.129752	624	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474875	116.134221	624	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476268	116.135798	624	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479442	116.131443	624	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473327	116.224020	624	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467198	116.221840	621	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464126	116.222084	621	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.460776	116.099812	621	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476618	116.099430	621	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477085	116.098880	621	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464304	116.110430	621	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464620	116.109407	621	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463688	116.112355	621	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452421	116.107294	621	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475463	116.127854	621	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.495023	116.101205	621	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475908	116.135445	621	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460740	116.099744	621	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463776	116.106373	620	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.463390	116.222032	620	7	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.434686	116.065250	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435268	116.071634	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469038	116.211479	620	50	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489720	116.068298	620	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436675	116.068844	620	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471577	116.238593	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472456	116.167296	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470329	116.239768	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469812	116.240441	620	20	5	Potential nesting tree	No
Stag	07-07-2023	-32.471341	116.241704	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.468636	116.242282	620	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.470208	116.242966	620	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457054	116.218702	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457270	116.220811	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462699	116.218591	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.450671	116.213468	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459928	116.217767	620	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.455802	116.218248	620	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466362	116.230696	620	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467676	116.230420	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469563	116.223459	620	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469183	116.223184	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478967	116.215628	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478048	116.214343	620	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479744	116.213734	620	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479143	116.213940	620	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480288	116.211864	620	20	5	Potential nesting tree	No
Stag	30-10-2023	-32.468171	116.209487	620	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463786	116.232600	620	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463697	116.232320	620	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462810	116.224342	620	18	5	Potential nesting tree	No
Stag	02-11-2023	-32.442326	116.171630	620	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479587	116.086630	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476011	116.087736	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471173	116.065790	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472369	116.066419	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472352	116.067233	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437441	116.074934	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493506	116.070364	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434708	116.065156	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476286	116.109693	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475961	116.109551	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474633	116.109167	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474231	116.108284	620	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474483	116.108273	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474398	116.108072	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466741	116.059477	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466368	116.055275	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.462635	116.059380	620	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463527	116.107035	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464648	116.113536	620	28	5	Potential nesting tree	No
Stag	08-12-2023	-32.464544	116.113050	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451870	116.107249	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451692	116.106655	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459860	116.103930	620	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453802	116.210636	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455292	116.209754	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452588	116.209259	620	14	5	Potential nesting tree	No
Stag	31-08-2023	-32.456419	116.208203	620	5	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458831	116.208937	620	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459607	116.208669	620	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459893	116.208547	620	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459454	116.210191	620	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458731	116.212930	620	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458675	116.215385	620	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490091	116.183709	620	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476896	116.212415	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479895	116.212722	620	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480657	116.212456	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468517	116.210229	620	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468642	116.210735	620	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469353	116.211221	620	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490694	116.063854	620	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490308	116.063878	620	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489627	116.063586	620	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490600	116.063653	620	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490064	116.067905	620	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489935	116.068978	620	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489815	116.066702	620	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489668	116.066620	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490539	116.066151	620	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489242	116.066242	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483007	116.096833	620	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483775	116.096987	620	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.480997	116.096547	620	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482365	116.099406	620	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482258	116.099176	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482239	116.099127	620	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482201	116.098898	620	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482010	116.098569	620	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481383	116.098973	620	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491192	116.119851	620	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.493575	116.110942	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476679	116.090214	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470319	116.064478	620	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470868	116.064296	620	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471340	116.063201	620	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470701	116.062326	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470837	116.062073	620	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472144	116.067784	620	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.472181	116.117942	620	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470943	116.116221	620	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470400	116.114971	620	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470021	116.114766	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470292	116.114754	620	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470067	116.113209	620	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.479670	116.108919	620	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480753	116.106264	620	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475722	116.122886	620	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475559	116.122347	620	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475590	116.121686	620	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475491	116.120821	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476098	116.122137	620	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476092	116.120988	620	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476414	116.122541	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476359	116.122782	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476586	116.109932	620	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474809	116.108501	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474745	116.108417	620	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.491826	116.122428	620	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468770	116.135991	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467851	116.137645	620	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469868	116.141626	620	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470048	116.141276	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466478	116.136767	620	15	5	Potential nesting tree	No
Stag	07-12-2023	-32.466562	116.134323	620	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466889	116.136899	620	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.470833	116.134812	620	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474765	116.145185	620	12	5	Potential nesting tree	No
Stag	08-12-2023	-32.474605	116.145867	620	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479418	116.143560	620	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470949	116.246090	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471760	116.246234	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472578	116.245074	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475448	116.157386	620	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471833	116.173401	620	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.471708	116.173388	620	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.470722	116.244838	620	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473127	116.223796	620	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.458408	116.226738	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490005	116.061904	620	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491757	116.069885	620	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461865	116.218215	620	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.478123	116.086380	620	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459967	116.208438	620	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470984	116.062141	620	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456727	116.219088	620	10	5	Potential nesting tree	No
Stag	03-11-2023	-32.476134	116.090503	620	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470126	116.208291	620	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489895	116.062259	620	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490445	116.062969	620	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490896	116.063473	620	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490446	116.067604	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489597	116.065032	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483222	116.095990	620	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482670	116.104748	620	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482335	116.102676	620	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489591	116.119582	620	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489897	116.114026	620	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490051	116.113618	620	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495199	116.110924	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495441	116.109171	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498300	116.110418	620	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494508	116.099544	620	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.491116	116.106748	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491045	116.107133	620	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456576	116.221273	620	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458397	116.220352	620	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458462	116.220449	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457981	116.219681	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456595	116.219661	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460836	116.218179	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.463305	116.218545	620	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455554	116.216948	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460440	116.215304	620	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460472	116.217381	620	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459654	116.218395	620	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.459698	116.217941	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459691	116.215450	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459618	116.215943	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456796	116.217697	620	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457141	116.217324	620	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468265	116.230238	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471735	116.115174	620	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470254	116.114283	620	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479190	116.103394	620	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.478858	116.103257	620	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.479659	116.108548	620	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479579	116.108155	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479124	116.106928	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474240	116.123228	620	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475731	116.112535	620	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491469	116.120751	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492670	116.093865	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468812	116.138365	620	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469378	116.138660	620	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466205	116.134813	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465818	116.134665	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475025	116.149091	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475799	116.145343	620	20	5	Potential nesting tree	No
Stag	08-12-2023	-32.480101	116.144565	620	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469597	116.209710	620	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469021	116.210536	620	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.496388	116.118278	620	16	5	Potential nesting tree	No
Stag	31-08-2023	-32.456001	116.208267	620	7	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452884	116.060574	618	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.454632	116.210444	618	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473937	116.226240	618	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469616	116.225705	618	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469363	116.224804	618	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465802	116.221205	618	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.465219	116.221970	618	18	5	Potential nesting tree	No
Stag	02-11-2023	-32.489316	116.120852	618	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.455189	116.211453	618	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453299	116.061361	618	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476515	116.129489	618	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475599	116.129005	618	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479152	116.131466	618	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489594	116.138410	618	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449652	116.075953	618	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450265	116.076134	618	15	5	Potential nesting tree	No
Stag	01-11-2023	-32.464029	116.222672	618	12	5	Potential nesting tree	No
Stag	01-11-2023	-32.464173	116.222513	618	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482386	116.129587	614	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479301	116.131335	614	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.487182	116.182555	614	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473409	116.226406	614	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452871	116.208913	614	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488957	116.185519	614	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469382	116.225253	614	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465420	116.221917	614	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475123	116.128932	614	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479061	116.131505	614	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481447	116.130700	614	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452757	116.060453	614	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467576	116.221784	614	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488809	116.183883	611	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.472690	116.244163	611	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.472126	116.244870	611	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454741	116.211207	611	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467531	116.222550	611	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475274	116.130927	611	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450355	116.078365	611	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450761	116.075412	611	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490016	116.114297	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.481670	116.210909	610	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478984	116.098058	610	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469624	116.237675	610	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475400	116.160638	610	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460258	116.217917	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457932	116.217819	610	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.469433	116.223595	610	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478268	116.215484	610	25	5	Potential nesting tree	No
Stag	11-09-2023	-32.478254	116.215270	610	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478827	116.214879	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463360	116.231536	610	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479470	116.087124	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436934	116.069117	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434746	116.071084	610	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435618	116.071853	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434320	116.065178	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460701	116.097886	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486634	116.098470	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474658	116.110513	610	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454014	116.211846	610	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453409	116.209645	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453075	116.209552	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455067	116.208658	610	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.454143	116.208101	610	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458608	116.212130	610	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458634	116.215539	610	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459222	116.218727	610	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489176	116.182378	610	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489299	116.182902	610	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.482268	116.210843	610	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479871	116.212857	610	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480574	116.211351	610	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469387	116.208035	610	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.491012	116.063920	610	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490194	116.068600	610	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489553	116.066485	610	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470694	116.064467	610	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471541	116.063710	610	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472217	116.117982	610	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472439	116.117694	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470996	116.116152	610	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471762	116.116090	610	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472301	116.116106	610	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471749	116.114977	610	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471665	116.114883	610	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475855	116.121408	610	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475388	116.109906	610	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475039	116.109060	610	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474980	116.109273	610	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474690	116.109010	610	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474921	116.108495	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492258	116.122531	610	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488887	116.096650	610	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.493509	116.093908	610	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469195	116.136422	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469748	116.138080	610	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470028	116.138388	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470151	116.138332	610	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.484380	116.095944	610	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472047	116.243732	610	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469027	116.209242	610	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490770	116.067639	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490837	116.069917	610	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.482580	116.095365	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481335	116.097733	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485760	116.092937	610	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480971	116.094713	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488909	116.114261	610	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489956	116.113720	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489674	116.113727	610	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495166	116.111777	610	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.490881	116.105660	610	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.491102	116.106086	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490951	116.106424	610	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490779	116.106811	610	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459446	116.215881	610	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459528	116.217300	610	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478773	116.106503	610	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474877	116.123174	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474674	116.123075	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.482079	116.125829	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469284	116.137448	610	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469070	116.137937	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465944	116.134684	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475453	116.147697	610	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479496	116.144606	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478632	116.145068	610	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489740	116.067718	610	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470450	116.226375	608	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465855	116.221647	608	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489213	116.120517	608	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471506	116.245030	608	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472241	116.244756	608	13	5	Potential nesting tree	No
Stag	25-08-2023	-32.455028	116.211328	608	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.454541	116.210307	608	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455518	116.209138	608	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455372	116.209290	608	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.476094	116.127853	608	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.475993	116.128162	608	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489017	116.138623	608	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450669	116.075822	608	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451002	116.077014	608	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.473140	116.224732	608	18	5	Potential nesting tree	No
Stag	25-08-2023	-32.458195	116.227040	608	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458375	116.227064	608	14	5	Potential nesting tree	No
Stag	05-07-2023	-32.470713	116.238812	605	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490452	116.183768	605	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455701	116.209346	605	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465130	116.221681	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463713	116.223362	605	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481946	116.095374	605	16	5	Potential nesting tree	No
Stag	02-11-2023	-32.490201	116.114949	605	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488951	116.114554	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493354	116.113186	605	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493457	116.113088	605	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.491451	116.110485	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.493991	116.101363	605	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494332	116.101428	605	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494728	116.101138	605	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.495392	116.101825	605	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.495332	116.101519	605	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495881	116.101626	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489483	116.106360	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.488997	116.106014	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.488922	116.106515	605	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491234	116.108199	605	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.433842	116.073341	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434675	116.072269	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434754	116.072426	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434853	116.072658	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434598	116.072673	605	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.435006	116.072994	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434906	116.073271	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435957	116.074910	605	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436862	116.075145	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436941	116.074387	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436101	116.072734	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436073	116.072473	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436163	116.071665	605	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436203	116.071499	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436085	116.071097	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435752	116.070826	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435774	116.071794	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435520	116.067836	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.432855	116.064884	605	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.461243	116.098690	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.487226	116.098380	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476722	116.099158	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476932	116.099401	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477173	116.098895	605	18	5	Potential nesting tree	No
Stag	06-12-2023	-32.477028	116.099528	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477340	116.099075	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477421	116.099177	605	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477859	116.098293	605	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477883	116.098890	605	16	5	Potential nesting tree	No
Stag	06-12-2023	-32.477922	116.098994	605	1900	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478390	116.098185	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467305	116.060025	605	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466238	116.055067	605	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466757	116.055066	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465014	116.056134	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464742	116.057171	605	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464267	116.058100	605	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454983	116.061162	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454933	116.061220	605	18	5	Potential nesting tree	No
Stag	07-12-2023	-32.460062	116.070755	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463716	116.109959	605	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463888	116.110372	605	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464536	116.110143	605	20	5	Potential nesting tree	No
Stag	08-12-2023	-32.464069	116.109935	605	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464160	116.108855	605	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463623	116.112195	605	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459977	116.104610	605	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475786	116.159754	605	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454485	116.208924	605	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476658	116.133057	605	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.494956	116.101783	605	10	5	Potential nesting tree	No
Stag	05-12-2023	-32.489326	116.072926	605	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.454660	116.210256	605	14	5	Potential nesting tree	No
Stag	04-12-2023	-32.493812	116.074517	605	14	5	Potential nesting tree	No
Bullich (Eucalyptus megacarpa)	06-12-2023	-32.478132	116.098171	605	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482371	116.129798	602	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.484227	116.093556	602	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465109	116.221151	602	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473174	116.225670	602	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476419	116.129128	602	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476006	116.127508	602	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478954	116.131796	602	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479643	116.132341	602	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470348	116.242279	600	25	5	Potential nesting tree	No
Stag	08-12-2023	-32.463243	116.113280	600	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478856	116.215591	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469165	116.209589	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.465919	116.057379	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463329	116.230238	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.452657	116.209369	600	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459606	116.103624	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479468	116.095915	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.462760	116.060567	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.453711	116.075865	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458391	116.217031	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.466089	116.232699	600	20	5	Potential nesting tree	No
Stag	01-11-2023	-32.469706	116.241490	600	16	5	Potential nesting tree	No
Stag	06-12-2023	-32.479228	116.132611	600	10	5	Potential nesting tree	No
Bullich (Eucalyptus megacarpa)	03-11-2023	-32.453507	116.064365	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475799	116.160598	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475890	116.160695	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472352	116.167467	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472317	116.167593	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473787	116.165931	600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473782	116.165704	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469733	116.239461	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.468771	116.242109	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.469758	116.243801	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.469796	116.243693	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471913	116.242962	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470705	116.243013	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457531	116.221914	600	20	5	Potential nesting tree	No
Stag	31-08-2023	-32.457392	116.221835	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460211	116.215633	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460000	116.214578	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466431	116.230604	600	28	5	Potential nesting tree	No
Stag	02-09-2023	-32.466336	116.229811	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467683	116.229748	600	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480354	116.210981	600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462154	116.229765	600	25	5	Potential nesting tree	No
Stag	31-10-2023	-32.463240	116.229694	600	60	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462896	116.231542	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463569	116.226935	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463428	116.226158	600	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463621	116.224996	600	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.462148	116.224801	600	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462670	116.225121	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.461751	116.223267	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463010	116.222223	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489686	116.183420	600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478782	116.086928	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479449	116.087297	600	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478466	116.087847	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476181	116.088368	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476581	116.088454	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436635	116.069527	600	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437088	116.074869	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475926	116.109045	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475786	116.108705	600	30	5	Potential nesting tree	No
Stag	06-12-2023	-32.474472	116.108223	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474347	116.108014	600	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479566	116.095501	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469157	116.066849	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.471040	116.067005	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466420	116.055285	600	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.459696	116.069574	600	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464679	116.114171	600	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451610	116.107702	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453341	116.104373	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.473651	116.127745	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.469919	116.237388	600	15	5	Potential nesting tree	No
Stag	05-07-2023	-32.469910	116.237212	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469546	116.238000	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469506	116.237840	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.469830	116.238516	600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470422	116.238396	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.471376	116.238453	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469788	116.239159	600	25	5	Potential nesting tree	No
Flooded gum (Eucalyptus rudis)	06-07-2023	-32.473891	116.161345	600	18	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474368	116.161330	600	25	5	Potential nesting tree	No
Flooded gum (Eucalyptus rudis)	06-07-2023	-32.474411	116.161328	600	23	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474392	116.161558	600	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474619	116.161583	600	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475605	116.161087	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475855	116.160376	600	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.473724	116.164771	600	18	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.473725	116.164875	600	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472753	116.165408	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472926	116.165813	600	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472903	116.165852	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473754	116.165646	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473781	116.165625	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.474077	116.165530	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474574	116.165808	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475172	116.165658	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470639	116.240139	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470122	116.240403	600	23	5	Potential nesting tree	No
Stag	07-07-2023	-32.471517	116.241131	600	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470627	116.241003	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470919	116.241299	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471107	116.241214	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471409	116.241414	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471651	116.242148	600	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471616	116.242111	600	20	5	Potential nesting tree	No
Stag	07-07-2023	-32.471459	116.242064	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470487	116.242152	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470258	116.242201	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470105	116.242069	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469125	116.242434	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.468446	116.242402	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.468458	116.242806	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.468908	116.242786	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.468893	116.242688	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469689	116.243156	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469293	116.243363	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469659	116.243522	600	20	5	Potential nesting tree	No
Stag	07-07-2023	-32.471421	116.243301	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471660	116.243307	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471877	116.243554	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472184	116.243082	600	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.472046	116.243174	600	10	5	Potential nesting tree	No
Stag	07-07-2023	-32.471928	116.243185	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471697	116.243199	600	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.471382	116.243162	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471072	116.243141	600	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.470844	116.243064	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470635	116.243243	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469949	116.243277	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469902	116.242871	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471213	116.242462	600	20	5	Potential nesting tree	No
Stag	25-08-2023	-32.461353	116.225778	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458256	116.228562	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458170	116.228306	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.457987	116.227152	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.457531	116.227337	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.457683	116.227143	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.457905	116.228566	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458229	116.228658	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458156	116.229292	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.463457	116.219146	600	18	5	Potential nesting tree	No
Stag	26-08-2023	-32.462330	116.219482	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.462176	116.219089	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460733	116.219625	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459987	116.220474	600	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460047	116.220263	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459864	116.219333	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459723	116.220045	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459574	116.220104	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459529	116.219656	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456548	116.207702	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457524	116.207636	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457607	116.207633	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457783	116.207939	600	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457298	116.207506	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456253	116.209491	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456588	116.209431	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457234	116.209250	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457190	116.209578	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457442	116.209561	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.458063	116.209551	600	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	31-08-2023	-32.458625	116.209297	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458900	116.209041	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459025	116.209254	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459092	116.209269	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459179	116.209687	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459334	116.209622	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459511	116.209172	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459811	116.209432	600	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.459853	116.209425	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460198	116.209369	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460192	116.209508	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459561	116.209707	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458019	116.210496	600	14	5	Potential nesting tree	No
Stag	01-09-2023	-32.459336	116.210633	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459646	116.210635	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459436	116.210860	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458825	116.210703	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458819	116.210832	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457549	116.210844	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456988	116.210812	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456266	116.211034	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457625	116.211270	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458568	116.211126	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458575	116.211187	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458862	116.210947	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458885	116.210976	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458976	116.211082	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459479	116.211054	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459723	116.211082	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459595	116.211363	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458246	116.213689	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458080	116.213853	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458700	116.213695	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457720	116.214064	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457542	116.214122	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456835	116.213946	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456211	116.216572	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456309	116.216650	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458042	116.216671	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458348	116.216553	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458362	116.216722	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458800	116.216521	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458846	116.216591	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458979	116.216680	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457433	116.216329	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457602	116.216094	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458697	116.216174	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458843	116.216136	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459042	116.216014	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458390	116.218624	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458774	116.218686	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458488	116.218014	600	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458624	116.217839	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458496	116.217710	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458498	116.217637	600	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.458611	116.217572	600	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458673	116.217598	600	17	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458711	116.217644	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458653	116.217310	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458354	116.217146	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458484	116.217204	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458763	116.217699	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458805	116.217716	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.480356	116.213500	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477351	116.213583	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477489	116.213128	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477210	116.213151	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478828	116.213369	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.466158	116.231521	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465283	116.233071	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465377	116.232263	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465310	116.231564	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465217	116.230517	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465044	116.230896	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.464993	116.231461	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465099	116.231688	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465021	116.232510	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464719	116.231806	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464890	116.230901	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464469	116.230358	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464539	116.231350	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464425	116.231383	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464656	116.232084	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464693	116.232150	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464397	116.232421	600	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464638	116.232948	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464347	116.230774	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464105	116.230040	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464139	116.231044	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464143	116.231844	600	20	5	Potential nesting tree	No
Stag	31-10-2023	-32.464066	116.228534	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463458	116.228283	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463081	116.228240	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462716	116.228582	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462497	116.228634	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462088	116.228524	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461976	116.227999	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462372	116.228110	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462996	116.227971	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464127	116.228010	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463913	116.227784	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463955	116.227131	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469723	116.242041	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469544	116.243036	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469512	116.242349	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468228	116.241683	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467723	116.241311	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467361	116.240842	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467648	116.240907	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468025	116.241184	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467610	116.239548	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467820	116.239573	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467863	116.239386	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.467961	116.239079	600	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469000	116.239171	600	2	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469616	116.239069	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469084	116.238642	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469234	116.237917	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469147	116.237828	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468917	116.238370	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488813	116.183009	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.488410	116.182860	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.488120	116.182998	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488082	116.182624	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488172	116.182603	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488281	116.182526	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488558	116.182597	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488877	116.182558	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488977	116.182713	600	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.489127	116.182947	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441308	116.166258	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441669	116.167021	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441686	116.167254	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441024	116.168240	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440238	116.167593	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439341	116.168758	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439145	116.169016	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439069	116.168814	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438309	116.168667	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438148	116.168457	600	25	5	Potential nesting tree	No
Stag	02-11-2023	-32.437999	116.168435	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479320	116.086039	600	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.479642	116.085904	600	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478971	116.085598	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480897	116.085072	600	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480889	116.084338	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480409	116.084002	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480220	116.084279	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480076	116.084186	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479772	116.084411	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479648	116.084506	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479497	116.084487	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480284	116.084433	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480310	116.084805	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480160	116.085154	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453190	116.065460	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453156	116.065429	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452621	116.065612	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451965	116.065158	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452283	116.065402	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453362	116.064963	600	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451186	116.064884	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453410	116.064782	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454522	116.064738	600	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453699	116.064471	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450893	116.064667	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452693	116.064221	600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453385	116.064177	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453947	116.064251	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454375	116.063275	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454122	116.063059	600	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452988	116.063968	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452413	116.063979	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450502	116.063646	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450501	116.063694	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451292	116.063833	600	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452729	116.063296	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451670	116.063512	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450977	116.063368	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450810	116.063421	600	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.450704	116.063478	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450426	116.063419	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451662	116.063189	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473267	116.130725	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472929	116.130192	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472845	116.129821	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472884	116.129475	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472964	116.128983	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473311	116.128578	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473221	116.128918	600	20	5	Potential nesting tree	No
Stag	04-12-2023	-32.473256	116.129927	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473582	116.130107	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.473592	116.129836	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473709	116.129658	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473434	116.129555	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473739	116.129340	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473517	116.129067	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473784	116.127344	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473697	116.127065	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473670	116.126917	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473850	116.126455	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473881	116.127826	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474128	116.128428	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474080	116.128105	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474106	116.126015	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474478	116.125742	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474260	116.125985	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474197	116.128402	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474258	116.128830	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474748	116.127092	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474817	116.127332	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474808	116.128738	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476688	116.135994	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479486	116.131362	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480076	116.131669	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480647	116.131669	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480502	116.132126	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480176	116.132029	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479931	116.131902	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479766	116.131984	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480798	116.132096	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480294	116.132308	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480135	116.132340	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480777	116.132579	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480797	116.132800	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480627	116.132941	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480418	116.132845	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478967	116.132529	600	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478294	116.132662	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.483278	116.131931	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.483456	116.131942	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.483237	116.132054	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.483200	116.131683	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482959	116.131349	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482807	116.131476	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.482845	116.131738	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482661	116.131369	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482292	116.131860	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.481829	116.131668	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481499	116.131541	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.481280	116.131684	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481483	116.131314	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481614	116.131255	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481711	116.131113	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480578	116.130247	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480290	116.130158	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480351	116.129937	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480590	116.130081	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480208	116.129361	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480379	116.129512	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479483	116.130158	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490542	116.139221	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490262	116.139447	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489941	116.138842	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489483	116.138744	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.454443	116.076285	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.454111	116.076501	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453227	116.076303	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453221	116.076357	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453264	116.076719	600	22	5	Potential nesting tree	No
Stag	07-12-2023	-32.453254	116.076807	600	18	5	Potential nesting tree	No
Stag	07-12-2023	-32.453326	116.076855	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.452657	116.078101	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.453044	116.077498	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453043	116.077020	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.453044	116.076948	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452880	116.076332	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452464	116.076071	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452253	116.076095	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452334	116.076182	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452364	116.076335	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452064	116.076138	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451954	116.075903	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451920	116.075693	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451611	116.076300	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451283	116.075412	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451212	116.077163	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451245	116.076906	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451212	116.076727	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463717	116.107842	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464409	116.107891	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464651	116.108102	600	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463533	116.108005	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463596	116.108224	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463756	116.108213	600	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464087	116.108431	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464103	116.108307	600	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464525	116.108202	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463300	116.112649	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463395	116.112723	600	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.462957	116.112607	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.462908	116.112711	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463977	116.113183	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463960	116.113310	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453494	116.107215	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453756	116.106986	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452823	116.107019	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453327	116.105207	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459717	116.104579	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459634	116.104422	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459696	116.104290	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.453879	116.210769	600	10	5	Potential nesting tree	No
Stag	26-08-2023	-32.452760	116.209560	600	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452623	116.209220	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452373	116.209227	600	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452907	116.208896	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453972	116.208301	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457418	116.208988	600	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459766	116.208841	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459813	116.209050	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.460033	116.208651	600	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.460073	116.208673	600	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458103	116.212449	600	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457919	116.212323	600	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458437	116.212577	600	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458170	116.212863	600	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457229	116.212975	600	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458887	116.215428	600	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459224	116.218379	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459160	116.217943	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459018	116.217198	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458932	116.218647	600	24	5	Potential nesting tree	No
Stag	11-09-2023	-32.489930	116.183497	600	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476684	116.210717	600	6	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.480385	116.212608	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480510	116.212407	600	16	5	Potential nesting tree	No
Stag	31-10-2023	-32.469347	116.211323	600	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469135	116.211328	600	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490230	116.064508	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489921	116.064424	600	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490223	116.063777	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489443	116.063527	600	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.491676	116.068117	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491625	116.068391	600	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491662	116.068411	600	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491458	116.068763	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490249	116.068819	600	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490033	116.068765	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489694	116.066760	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489482	116.066856	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489850	116.066361	600	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.482986	116.096409	600	23	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	02-11-2023	-32.482641	116.100053	600	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.481834	116.099022	600	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481752	116.098701	600	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488115	116.094303	600	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481115	116.094784	600	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491198	116.118954	600	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.494241	116.112082	600	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477827	116.085194	600	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477625	116.083817	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476576	116.090864	600	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476702	116.090343	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470274	116.064561	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471403	116.062843	600	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472709	116.064328	600	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471498	116.117160	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471171	116.116506	600	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470212	116.112602	600	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479494	116.102867	600	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480134	116.109085	600	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480071	116.110053	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475529	116.121390	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476385	116.121736	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476736	116.121949	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474790	116.110649	600	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488920	116.096462	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470036	116.138019	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468176	116.137102	600	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468089	116.137502	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467727	116.137541	600	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474548	116.145548	600	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474928	116.145947	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496972	116.118452	600	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480290	116.212551	600	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471816	116.245620	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471613	116.245439	600	20	5	Potential nesting tree	No
Stag	05-07-2023	-32.471137	116.245625	600	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471744	116.245276	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472221	116.245244	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472383	116.244414	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472531	116.244566	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475629	116.155208	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472783	116.171836	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475210	116.170157	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.474207	116.246087	600	10	5	Potential nesting tree	No
Stag	07-07-2023	-32.473791	116.245974	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470004	116.244016	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490063	116.069518	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490930	116.065524	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472190	116.243645	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462763	116.232627	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471698	116.242105	600	10	5	Potential nesting tree	No
Stag	01-09-2023	-32.457203	116.210832	600	20	5	Potential nesting tree	No
Stag	11-09-2023	-32.480318	116.213554	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479527	116.213481	600	18	5	Potential nesting tree	No
Stag	11-09-2023	-32.476934	116.212759	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465300	116.231200	600	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.467823	116.241431	600	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Stag	02-11-2023	-32.437752	116.168222	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453404	116.063947	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473662	116.126596	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480597	116.129646	600	20	5	Potential nesting tree	No
Stag	08-12-2023	-32.453454	116.105301	600	12	5	Potential nesting tree	No
Stag	31-10-2023	-32.490674	116.067999	600	14	5	Potential nesting tree	No
Stag	07-12-2023	-32.469954	116.137896	600	10	5	Potential nesting tree	No
Stag	08-12-2023	-32.474823	116.145293	600	11	5	Potential nesting tree	No
Stag	06-07-2023	-32.471019	116.171351	600	18	5	Potential nesting tree	No
Stag	26-08-2023	-32.462454	116.219731	600	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454011	116.211844	600	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455310	116.210695	600	9	5	Potential nesting tree	No
Stag	31-08-2023	-32.457771	116.208478	600	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476877	116.110875	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.474768	116.147881	600	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461342	116.218865	600	14	5	Potential nesting tree	No
Stag	02-09-2023	-32.470717	116.226201	600	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470445	116.207538	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489972	116.062946	600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490143	116.063544	600	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490117	116.067620	600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489999	116.067419	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491071	116.069105	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.491306	116.069192	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489574	116.065328	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489757	116.065778	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489263	116.066112	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483545	116.096170	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482175	116.098262	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481041	116.097829	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483377	116.104585	600	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.483310	116.104533	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482606	116.104341	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482848	116.103632	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481279	116.094367	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489829	116.119682	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489163	116.118896	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489173	116.118644	600	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489444	116.114256	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488946	116.113442	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496916	116.101575	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494945	116.098379	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494486	116.097846	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491605	116.106587	600	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491048	116.107260	600	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466832	116.232843	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.457719	116.227891	600	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.438894	116.169417	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480489	116.083909	600	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474258	116.127014	600	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.481554	116.131033	600	22	5	Potential nesting tree	No
Stag	31-10-2023	-32.470178	116.207216	600	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461660	116.219879	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458499	116.219480	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458084	116.219765	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457892	116.220477	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457967	116.220850	600	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457969	116.221571	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457879	116.221167	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456114	116.219680	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456229	116.221143	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460884	116.218005	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461040	116.218188	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461116	116.218619	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461668	116.218681	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.463259	116.218420	600	20	5	Potential nesting tree	No
Stag	31-08-2023	-32.454711	116.216219	600	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454860	116.216469	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460739	116.218360	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460600	116.217416	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460540	116.216291	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460332	116.215472	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460475	116.215733	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460484	116.216117	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459768	116.217150	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459865	116.215232	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459879	116.214620	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459709	116.215069	600	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459491	116.218278	600	24	5	Potential nesting tree	No
Stag	01-09-2023	-32.459491	116.218299	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456645	116.217254	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457421	116.216782	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457301	116.217857	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457393	116.218023	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468123	116.231427	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468420	116.231556	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468752	116.234231	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468770	116.233552	600	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469840	116.233045	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.471465	116.226463	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470091	116.113498	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478490	116.103926	600	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480393	116.108455	600	16	5	Potential nesting tree	No
Stag	05-12-2023	-32.479876	116.108333	600	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478867	116.107264	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.479174	116.106689	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478594	116.106552	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478839	116.106246	600	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478418	116.106332	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478156	116.112650	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475044	116.122045	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475102	116.122499	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474081	116.122824	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476895	116.110982	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477096	116.110619	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476919	116.109899	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476812	116.109469	600	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476806	116.109463	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477190	116.112140	600	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475438	116.113298	600	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.490977	116.121615	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488641	116.095347	600	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493532	116.093894	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469234	116.138375	600	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468019	116.141106	600	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467978	116.140931	600	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.476193	116.144551	600	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456649	116.216820	600	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489210	116.121379	598	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473041	116.244182	598	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471280	116.244116	598	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469676	116.223770	598	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.468114	116.222142	598	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.477331	116.135732	598	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449951	116.075923	598	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482508	116.129227	595	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450649	116.062667	595	16	5	Potential nesting tree	No
Stag	03-11-2023	-32.453369	116.061488	595	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.454462	116.217498	595	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466488	116.232512	595	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.436612	116.069057	595	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470591	116.207409	595	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.466108	116.232513	595	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467677	116.221856	595	18	5	Potential nesting tree	No
Stag	31-10-2023	-32.465328	116.221275	595	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465214	116.222019	595	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.484021	116.106410	595	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489565	116.120835	595	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469623	116.225356	595	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.465698	116.221404	595	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.465345	116.221418	595	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452493	116.063115	595	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477056	116.129417	595	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478934	116.131893	595	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481921	116.129744	595	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479822	116.129575	595	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476671	116.128725	592	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.463760	116.221442	592	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455759	116.209248	592	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.470380	116.225760	592	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453453	116.061371	592	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451093	116.061285	592	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451341	116.062832	592	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.476948	116.135376	592	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477079	116.135747	592	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.482599	116.129621	592	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451049	116.078394	592	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450083	116.076616	592	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450861	116.076030	592	24	5	Potential nesting tree	No
Stag	01-11-2023	-32.464593	116.221211	592	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472188	116.244824	592	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464598	116.221227	592	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475586	116.128079	592	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489527	116.066162	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468090	116.230783	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464142	116.114048	590	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470213	116.113054	590	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471415	116.066028	590	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478782	116.097431	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490390	116.062687	590	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471493	116.238637	590	30	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472866	116.165506	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472597	116.166772	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471575	116.170729	590	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460074	116.218554	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.454863	116.217458	590	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467029	116.232869	590	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478280	116.215533	590	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478762	116.214631	590	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477570	116.213778	590	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463210	116.231998	590	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463680	116.225124	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479733	116.087004	590	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476396	116.088537	590	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471221	116.065801	590	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472538	116.067095	590	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435487	116.071608	590	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.461124	116.098424	590	50	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475805	116.110046	590	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454738	116.059088	590	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463665	116.105640	590	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464641	116.114158	590	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464194	116.114134	590	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456169	116.215191	590	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459236	116.208752	590	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456724	116.209936	590	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458751	116.215235	590	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457213	116.215144	590	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489040	116.182407	590	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489640	116.183423	590	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490114	116.063845	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490826	116.067137	590	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494075	116.111821	590	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.493789	116.111661	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477173	116.082560	590	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477006	116.138961	590	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471424	116.114948	590	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470059	116.114841	590	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471173	116.114676	590	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475751	116.120409	590	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475773	116.122509	590	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476114	116.122260	590	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474757	116.107588	590	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.490025	116.103471	590	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470144	116.137812	590	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470360	116.137833	590	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470623	116.138171	590	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470602	116.138579	590	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470262	116.138975	590	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466452	116.135372	590	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466542	116.134322	590	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475228	116.147927	590	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475361	116.146511	590	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.476506	116.146172	590	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479647	116.143069	590	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.473844	116.224591	590	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490843	116.069734	590	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491063	116.069118	590	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489402	116.065857	590	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.482166	116.098359	590	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481935	116.098268	590	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482587	116.103684	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.486955	116.093156	590	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.486938	116.093752	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494486	116.111248	590	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.496906	116.102451	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494509	116.098765	590	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494879	116.098413	590	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494554	116.097790	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494694	116.097534	590	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.493922	116.096262	590	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.459699	116.227337	590	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460648	116.218658	590	14	5	Potential nesting tree	No
Stag	01-09-2023	-32.460600	116.217581	590	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470626	116.112080	590	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491007	116.121674	590	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468802	116.138081	590	16	5	Potential nesting tree	No
Bullich (Eucalyptus megacarpa)	06-12-2023	-32.478596	116.097879	590	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471259	116.244219	589	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471126	116.245067	589	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483019	116.106969	589	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489502	116.114452	589	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436856	116.075309	589	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479882	116.096628	589	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477647	116.099141	589	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463808	116.110271	589	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463603	116.112515	589	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452420	116.107568	589	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473576	116.227091	589	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.467235	116.221949	589	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451498	116.060911	589	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476697	116.135602	589	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483191	116.107478	589	12	5	Potential nesting tree	No
Bullich (Eucalyptus megacarpa)	06-12-2023	-32.478607	116.097820	589	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478929	116.131491	586	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464588	116.221928	586	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.484544	116.092635	586	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489166	116.121431	586	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454245	116.210243	586	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453818	116.209222	586	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469672	116.225074	586	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453086	116.061658	586	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452652	116.061125	586	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476834	116.135891	586	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479175	116.131298	586	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479144	116.130950	586	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455322	116.216963	585	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467909	116.232039	585	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479950	116.213815	585	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468252	116.209622	585	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489240	116.182744	585	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.488692	116.183688	583	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473544	116.227360	583	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469478	116.224029	583	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463785	116.222338	583	17	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489515	116.120888	583	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489293	116.114470	583	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490172	116.114662	583	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497585	116.102329	583	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472520	116.244234	583	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476385	116.162006	583	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453221	116.210118	583	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452742	116.208987	583	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453147	116.061207	583	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452740	116.061072	583	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451301	116.061638	583	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475237	116.128070	583	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475532	116.135071	583	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479071	116.131586	583	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479621	116.131896	583	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.473917	116.246455	583	9	5	Potential nesting tree	No
Stag	31-10-2023	-32.464647	116.221192	583	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.454788	116.211219	583	16	5	Potential nesting tree	No
Stag	05-12-2023	-32.488816	116.072542	580	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471929	116.168389	580	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462587	116.231234	580	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479643	116.096127	580	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466303	116.055758	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478456	116.214575	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480087	116.098087	580	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463142	116.225002	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479804	116.095854	580	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472511	116.166759	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472382	116.167648	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473832	116.165762	580	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.470356	116.241703	580	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471298	116.241788	580	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.457150	116.221840	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461982	116.218285	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460229	116.216464	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456023	116.216647	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466689	116.231245	580	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467358	116.233076	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467325	116.231692	580	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467501	116.231408	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478527	116.215699	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478543	116.215526	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477654	116.214200	580	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.479102	116.214053	580	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462782	116.229288	580	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463320	116.223660	580	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.440783	116.171130	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480249	116.086316	580	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478630	116.088065	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478670	116.088967	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476724	116.089100	580	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472230	116.067255	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436852	116.069041	580	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437223	116.075149	580	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435891	116.067251	580	25	5	Potential nesting tree	No
Stag	05-12-2023	-32.489838	116.071852	580	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.486698	116.098425	580	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475610	116.110394	580	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474701	116.110658	580	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479791	116.095482	580	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479067	116.097230	580	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478785	116.097447	580	25	5	Potential nesting tree	No
Stag	06-12-2023	-32.478836	116.097706	580	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.470825	116.067060	580	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.467509	116.053121	580	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.465810	116.057962	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.463694	116.059228	580	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.463198	116.057743	580	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463909	116.106039	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464581	116.112493	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464330	116.113835	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464216	116.113482	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451209	116.107525	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459667	116.103789	580	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.455944	116.215124	580	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454776	116.210529	580	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455228	116.209769	580	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453795	116.209675	580	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454763	116.208426	580	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453871	116.208555	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459697	116.208952	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457445	116.210082	580	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458693	116.211640	580	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458555	116.212110	580	11	5	Potential nesting tree	No
Stag	01-09-2023	-32.457587	116.211945	580	5	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456664	116.215685	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458581	116.214670	580	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.459073	116.217407	580	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458880	116.217528	580	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458856	116.218018	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488526	116.183611	580	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.477245	116.212428	580	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.469589	116.210768	580	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469049	116.210951	580	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469747	116.208163	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469925	116.208101	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489728	116.063623	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490015	116.068403	580	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488914	116.066579	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.480710	116.096441	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489522	116.115240	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493338	116.110816	580	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477820	116.085481	580	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477925	116.085069	580	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471227	116.063090	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472768	116.066012	580	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472295	116.067375	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472068	116.118250	580	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471115	116.116306	580	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480906	116.105019	580	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480730	116.105226	580	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475644	116.120684	580	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475899	116.121104	580	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476584	116.109065	580	17	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476317	116.109020	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476405	116.111261	580	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475212	116.109393	580	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475099	116.111017	580	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469355	116.136655	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468855	116.136223	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470276	116.137399	580	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470313	116.137597	580	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470411	116.138544	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467642	116.140488	580	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466671	116.134367	580	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466534	116.135509	580	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466862	116.136503	580	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477130	116.145190	580	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.495551	116.118277	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497275	116.117688	580	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497053	116.117558	580	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.470298	116.246087	580	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470697	116.245241	580	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472137	116.171636	580	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475237	116.169737	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.473216	116.168683	580	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471814	116.244555	580	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.469997	116.244061	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458377	116.226657	580	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472169	116.245566	580	16	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475704	116.160122	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455211	116.209593	580	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.454476	116.208266	580	12	5	Potential nesting tree	No
Stag	31-10-2023	-32.468855	116.211086	580	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488538	116.095730	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468451	116.209433	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468218	116.209258	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469357	116.209387	580	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470269	116.208191	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489511	116.067530	580	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490792	116.069946	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490259	116.069727	580	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491065	116.069392	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490061	116.064686	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489322	116.065085	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489272	116.065862	580	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490509	116.066120	580	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482176	116.098342	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.480652	116.097823	580	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482575	116.104409	580	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482518	116.104046	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481862	116.101793	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481466	116.094875	580	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.481521	116.094468	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490282	116.119499	580	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489199	116.119441	580	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489786	116.113622	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494676	116.112100	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498924	116.111732	580	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496843	116.101378	580	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.491110	116.107301	580	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490116	116.106868	580	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457934	116.220172	580	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.454505	116.216789	580	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460351	116.215673	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460346	116.216746	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459776	116.216362	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459880	116.214951	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468477	116.230072	580	26	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468777	116.231040	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468745	116.230287	580	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.469319	116.233613	580	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469446	116.232575	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.470823	116.226678	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.471372	116.226507	580	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470078	116.114216	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470619	116.114155	580	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480433	116.103569	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480780	116.103555	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478390	116.103695	580	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480386	116.108641	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479083	116.107142	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474583	116.122609	580	16	5	Potential nesting tree	No
Stag	06-12-2023	-32.476820	116.110699	580	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474699	116.111167	580	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.493622	116.092538	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468927	116.137167	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469545	116.137493	580	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465771	116.134594	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465571	116.135038	580	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465327	116.135408	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476833	116.143432	580	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478925	116.144041	580	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.470676	116.241996	580	15	5	Potential nesting tree	No
Stag	04-12-2023	-32.469868	116.113318	580	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.470418	116.244624	579	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451028	116.078516	579	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473458	116.227516	579	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469334	116.224732	579	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468623	116.222407	579	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467659	116.222557	579	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470546	116.244562	579	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470942	116.244399	579	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454320	116.208975	579	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464591	116.221255	579	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450692	116.061889	579	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477789	116.132819	579	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479252	116.131980	579	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472906	116.244266	579	15	5	Potential nesting tree	No
Stag	07-07-2023	-32.473321	116.223894	579	6	5	Potential nesting tree	No
Stag	07-07-2023	-32.475285	116.165699	579	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475531	116.128788	576	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.475583	116.165983	576	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453118	116.061383	576	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490473	116.183721	576	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472083	116.172990	576	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488845	116.186150	576	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472037	116.226521	576	15	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	31-10-2023	-32.466264	116.221509	576	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475996	116.127804	576	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475613	116.134904	576	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479402	116.131803	576	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473411	116.224125	576	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439153	116.171481	575	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438901	116.170367	575	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493035	116.071583	575	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464862	116.221926	573	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450085	116.076089	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463776	116.110200	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.487286	116.183276	573	11	5	Potential nesting tree	No
Stag	05-07-2023	-32.470338	116.237643	573	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469020	116.224010	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464152	116.221943	573	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482188	116.095333	573	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489762	116.114780	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491625	116.113055	573	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493194	116.113642	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493526	116.112440	573	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490872	116.112899	573	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.490478	116.112515	573	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498608	116.112712	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497697	116.111946	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497372	116.110753	573	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497101	116.102350	573	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494339	116.101309	573	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.495004	116.100913	573	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.495310	116.101811	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495832	116.101174	573	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495909	116.101016	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491462	116.108083	573	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.433408	116.073750	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.433737	116.074467	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.433635	116.074418	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434031	116.074546	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434750	116.072545	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.434687	116.072784	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435284	116.074782	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435931	116.075436	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.494815	116.075095	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.494546	116.075023	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436098	116.071139	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435728	116.071015	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435604	116.071209	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435529	116.066209	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435921	116.066341	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.433440	116.064770	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.432765	116.064858	573	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.460873	116.099580	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.461042	116.099058	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460824	116.098664	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489416	116.073797	573	20	5	Potential nesting tree	No
Stag	05-12-2023	-32.489938	116.073737	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486328	116.097495	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486211	116.097576	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476416	116.098853	573	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476863	116.098932	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476954	116.098735	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477902	116.098792	573	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478558	116.098218	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478655	116.097706	573	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469615	116.067391	573	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469985	116.067573	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.470169	116.067719	573	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.472080	116.066515	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467405	116.060082	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466553	116.059195	573	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466731	116.059047	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465931	116.056456	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465861	116.057335	573	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.465853	116.059124	573	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465063	116.056343	573	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.464394	116.055957	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464296	116.057005	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464425	116.058020	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464108	116.057247	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454999	116.060433	573	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.455590	116.060497	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.460047	116.069011	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463483	116.109827	573	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463814	116.110035	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463754	116.110209	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463862	116.110224	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464919	116.109397	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464528	116.109157	573	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464520	116.108945	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463697	116.112706	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463535	116.112925	573	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463999	116.114291	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464062	116.114271	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463999	116.113911	573	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.452868	116.108117	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.460018	116.104557	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.460031	116.104402	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476486	116.158533	573	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.473004	116.168546	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.453908	116.211531	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451118	116.061693	573	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478123	116.098795	573	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465856	116.232101	573	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465765	116.230794	573	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.464043	116.222408	573	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463912	116.105134	570	25	5	Potential nesting tree	No
Stag	01-09-2023	-32.459910	116.214985	570	10	5	Potential nesting tree	No
Stag	01-11-2023	-32.489984	116.183040	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463296	116.106980	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480487	116.105145	570	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470790	116.114678	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475144	116.145395	570	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479667	116.215112	570	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479881	116.129186	570	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482558	116.129505	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467916	116.231973	570	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482934	116.107317	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450687	116.062737	570	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478791	116.132003	570	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450844	116.078224	570	24	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472924	116.165804	570	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.471250	116.241613	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471334	116.241653	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462010	116.218040	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.462958	116.218549	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460269	116.218879	570	20	5	Potential nesting tree	No
Stag	01-09-2023	-32.460124	116.215867	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460298	116.215550	570	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460006	116.217289	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456037	116.217634	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467982	116.232510	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469010	116.209934	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468547	116.209877	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468784	116.209645	570	30	5	Potential nesting tree	No
Stag	30-10-2023	-32.469405	116.209228	570	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463480	116.232500	570	35	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.461607	116.229801	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479670	116.086922	570	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470062	116.065684	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471428	116.064947	570	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435075	116.070783	570	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435498	116.070668	570	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.436829	116.066765	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435952	116.067452	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486479	116.098244	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475685	116.109874	570	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475611	116.111539	570	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479862	116.095192	570	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466840	116.059566	570	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466140	116.055417	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.462842	116.060099	570	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.462747	116.059552	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.463592	116.059413	570	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463388	116.106327	570	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464048	116.105758	570	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464896	116.112962	570	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451533	116.107257	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456540	116.215315	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453210	116.209756	570	10	5	Potential nesting tree	No
Stag	31-08-2023	-32.457341	116.208217	570	57	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453049	116.209557	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455039	116.208666	570	15	5	Potential nesting tree	No
Stag	31-08-2023	-32.457385	116.208091	570	12	5	Potential nesting tree	No
Stag	31-08-2023	-32.456974	116.208727	570	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457267	116.210194	570	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458546	116.211653	570	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458735	116.212514	570	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457804	116.215623	570	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458555	116.215511	570	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459455	116.217984	570	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459013	116.218457	570	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469528	116.211209	570	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469889	116.207764	570	14	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489291	116.064223	570	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.491110	116.064033	570	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482178	116.097472	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481490	116.098894	570	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.487647	116.092801	570	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.493435	116.112329	570	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.493623	116.111550	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477822	116.084648	570	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477593	116.083933	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476700	116.091245	570	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476562	116.091081	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476259	116.089472	570	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472301	116.064361	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472078	116.067836	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472242	116.067453	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471759	116.114966	570	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471207	116.114964	570	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469882	116.114656	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470402	116.113006	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479319	116.102864	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478568	116.104712	570	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478808	116.105460	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476080	116.122666	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476681	116.121669	570	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.482259	116.126088	570	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475281	116.109958	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474855	116.109226	570	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491301	116.121882	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490645	116.102747	570	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493741	116.093115	570	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493733	116.091070	570	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468784	116.136786	570	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470091	116.137547	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470192	116.137593	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469754	116.138112	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470517	116.138718	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470298	116.141088	570	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466494	116.136258	570	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466430	116.135167	570	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.471090	116.134540	570	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.475108	116.146186	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496315	116.118217	570	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476467	116.160795	570	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472832	116.171519	570	16	5	Potential nesting tree	No
Stag	05-12-2023	-32.488624	116.072583	570	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491273	116.068500	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454229	116.210771	570	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468121	116.209218	570	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470567	116.208045	570	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470455	116.207701	570	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490773	116.067246	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489988	116.067228	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491568	116.070177	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489862	116.069107	570	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490950	116.069360	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489173	116.064820	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490022	116.065625	570	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482672	116.096260	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481641	116.098095	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481586	116.097682	570	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482643	116.104064	570	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482517	116.103534	570	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482460	116.102963	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488962	116.113949	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489150	116.113952	570	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494625	116.111417	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495041	116.111513	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496960	116.102300	570	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494960	116.098189	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494727	116.096840	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494060	116.096922	570	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491453	116.105914	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479225	116.143858	570	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.461662	116.219666	570	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457932	116.220428	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459672	116.218701	570	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480334	116.103494	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480852	116.103922	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478957	116.106384	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478687	116.106247	570	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467957	116.141279	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465799	116.135378	570	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476172	116.143677	570	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479619	116.144313	570	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490341	116.182953	567	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473197	116.224817	567	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465268	116.221688	567	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491517	116.110895	567	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.470837	116.171141	567	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473530	116.227214	567	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.476328	116.129635	567	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476892	116.128531	567	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474922	116.134347	567	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476860	116.135754	567	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479536	116.131613	567	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481849	116.130465	567	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450625	116.078534	567	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465925	116.232828	567	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464810	116.113324	565	18	5	Potential nesting tree	No
Stag	31-08-2023	-32.457509	116.222004	565	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455416	116.216852	565	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462873	116.229447	565	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.439418	116.170741	565	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.439656	116.169888	565	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475329	116.158652	563	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450673	116.076337	563	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451138	116.062375	563	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469290	116.224345	563	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483278	116.107450	563	16	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475460	116.159437	563	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472813	116.172114	563	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455077	116.209279	563	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452618	116.061111	563	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476234	116.133334	563	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475038	116.134199	563	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477199	116.135949	563	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476595	116.135825	563	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450060	116.077681	563	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449655	116.075475	563	15	5	Potential nesting tree	No
Stag	01-11-2023	-32.463746	116.221771	563	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469066	116.223865	563	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469229	116.224026	563	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463675	116.223590	563	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460286	116.214719	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459880	116.217015	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467483	116.053489	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472314	116.117444	560	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489568	116.064298	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455142	116.218846	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437364	116.069382	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479697	116.129822	560	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.487641	116.183164	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463837	116.108585	560	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475246	116.161963	560	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.473027	116.164770	560	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472709	116.166183	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471990	116.168111	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471939	116.170725	560	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473856	116.165555	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474268	116.165563	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471374	116.240482	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471358	116.241770	560	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457369	116.219410	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456755	116.220690	560	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455793	116.220045	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461846	116.218325	560	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.462330	116.218711	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460119	116.218631	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460284	116.215667	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459930	116.215428	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460037	116.216063	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460057	116.217865	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456512	116.217307	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466948	116.231728	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479536	116.214978	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.478620	116.213966	560	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.479901	116.210960	560	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480298	116.211046	560	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463427	116.232748	560	32	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462769	116.223505	560	22	5	Potential nesting tree	No
Stag	02-11-2023	-32.438247	116.169430	560	25	5	Potential nesting tree	No
Stag	02-11-2023	-32.479788	116.086422	560	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476537	116.088885	560	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471076	116.065196	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470086	116.064999	560	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437706	116.069083	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434697	116.069931	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435296	116.071298	560	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.459816	116.098692	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460943	116.098521	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486088	116.098195	560	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475800	116.110978	560	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475512	116.109034	560	38	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474672	116.110812	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474632	116.110373	560	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474538	116.108652	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479737	116.095881	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479499	116.095697	560	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467539	116.059749	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467027	116.059364	560	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466529	116.053398	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.462836	116.060521	560	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.465799	116.058614	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454780	116.059270	560	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463390	116.106753	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463319	116.106864	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463929	116.106477	560	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464360	116.108902	560	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464915	116.113117	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464576	116.114278	560	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464645	116.112596	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451777	116.107770	560	22	5	Potential nesting tree	No
Stag	25-08-2023	-32.454169	116.211752	560	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452946	116.209287	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458698	116.208631	560	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457927	116.208548	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458543	116.211581	560	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458422	116.214393	560	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457884	116.214596	560	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488458	116.182779	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488671	116.182905	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489099	116.182691	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476844	116.211978	560	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469609	116.210389	560	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489362	116.063707	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.491146	116.068245	560	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489774	116.068108	560	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491907	116.068465	560	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490789	116.069008	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490922	116.069030	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491024	116.069069	560	18	5	Potential nesting tree	No
Stag	01-11-2023	-32.491054	116.067009	560	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489181	116.066489	560	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490736	116.066201	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482754	116.096742	560	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.482603	116.096751	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482623	116.096973	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481592	116.097405	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481395	116.094900	560	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493521	116.112403	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476541	116.090931	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476770	116.090397	560	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472153	116.116259	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472648	116.116172	560	26	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471373	116.114928	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470487	116.112742	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469916	116.112859	560	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478446	116.104753	560	13	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480792	116.107907	560	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480240	116.108024	560	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480723	116.109201	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479625	116.109831	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475688	116.120321	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475899	116.121314	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476050	116.122585	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476238	116.121777	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476697	116.111046	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475357	116.108702	560	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475041	116.109304	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474784	116.107656	560	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474569	116.107768	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469136	116.136436	560	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469856	116.137253	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470526	116.137561	560	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469564	116.137481	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469825	116.137863	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469948	116.137809	560	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469928	116.141238	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466639	116.135296	560	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466950	116.136799	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466929	116.137302	560	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475940	116.148899	560	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475220	116.147779	560	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475083	116.147224	560	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478364	116.142829	560	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.480089	116.143346	560	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470800	116.246221	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475400	116.157303	560	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475665	116.158924	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471853	116.172619	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475344	116.165833	560	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.475415	116.166001	560	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471925	116.244075	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471689	116.243874	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490450	116.062033	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.451871	116.214341	560	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491163	116.068646	560	20	5	Potential nesting tree	No
Stag	05-07-2023	-32.472358	116.245522	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475355	116.121863	560	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468400	116.209269	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490202	116.062502	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490336	116.062594	560	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490395	116.063440	560	35	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490165	116.063555	560	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489412	116.067311	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490039	116.067688	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491169	116.070142	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491401	116.070132	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490580	116.069557	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490732	116.069607	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490791	116.069615	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490674	116.069160	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489229	116.065917	560	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490945	116.065863	560	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490234	116.066005	560	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483631	116.096214	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481245	116.098051	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481336	116.097852	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.480970	116.097767	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.480735	116.097846	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483728	116.105414	560	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483479	116.104683	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483016	116.102960	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481886	116.102330	560	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482208	116.102136	560	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.490663	116.119876	560	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489168	116.114310	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488955	116.114190	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488855	116.114069	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488845	116.113955	560	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489577	116.113729	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494571	116.111466	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494519	116.111585	560	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.494767	116.111870	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.495304	116.111239	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495403	116.109777	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498684	116.110456	560	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.496919	116.102094	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494557	116.098654	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494793	116.098142	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494702	116.097141	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494179	116.096867	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489875	116.107083	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490439	116.069386	560	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458648	116.228024	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459064	116.219464	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458512	116.219495	560	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458126	116.219703	560	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457693	116.219954	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456400	116.220958	560	12	5	Potential nesting tree	No
Stag	31-08-2023	-32.456452	116.220456	560	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.461290	116.218251	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460417	116.215965	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459812	116.218270	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459873	116.217965	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459519	116.217940	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459553	116.218650	560	16	5	Potential nesting tree	No
Stag	02-09-2023	-32.470574	116.226404	560	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470984	116.116111	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470265	116.112162	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480789	116.103517	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480910	116.103654	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478857	116.104692	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479821	116.108831	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478963	116.106664	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474043	116.122923	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474247	116.122840	560	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474257	116.122635	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474832	116.122418	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474874	116.121202	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478284	116.110413	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474589	116.112157	560	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492208	116.121907	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469068	116.137624	560	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469533	116.138840	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469252	116.138973	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469175	116.140042	560	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469867	116.140550	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466144	116.134137	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479237	116.144160	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479286	116.144931	560	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478898	116.144713	560	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.477764	116.146436	560	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.471204	116.242549	560	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489539	116.121137	560	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482103	116.095464	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489074	116.120687	560	18	5	Potential nesting tree	No
Stag	05-07-2023	-32.470586	116.246679	560	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475576	116.166042	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490152	116.183593	560	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467504	116.222284	560	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475692	116.135331	560	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479674	116.129541	560	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450934	116.078459	560	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471359	116.171454	560	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.473035	116.224830	560	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.473281	116.245952	560	9	5	Potential nesting tree	No
Stag	01-11-2023	-32.464251	116.221981	560	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475207	116.134434	557	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.489322	116.186095	557	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.466186	116.231563	557	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473818	116.225523	557	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489123	116.120652	557	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489338	116.106047	557	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.488519	116.108202	557	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490718	116.108542	557	20	5	Potential nesting tree	No
Stag	03-11-2023	-32.491700	116.108200	557	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.460500	116.099088	557	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479887	116.096856	557	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477317	116.098707	557	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466704	116.054102	557	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464287	116.056301	557	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466536	116.058650	557	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454883	116.060912	557	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463737	116.113721	557	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452492	116.107967	557	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459996	116.104266	557	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472360	116.172147	557	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473367	116.245541	557	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470328	116.244630	557	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453785	116.209084	557	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.471859	116.227623	557	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452796	116.061053	557	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450725	116.062494	557	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451303	116.062406	557	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476522	116.130336	557	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475947	116.132420	557	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474595	116.133608	557	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450717	116.075422	557	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475031	116.127628	557	22	5	Potential nesting tree	No
Stag	02-09-2023	-32.466285	116.230103	555	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458129	116.217081	555	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468984	116.223579	555	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463488	116.225881	555	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479221	116.086895	555	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435418	116.071216	555	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482875	116.129744	554	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469638	116.224217	554	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468854	116.224137	554	18	5	Potential nesting tree	No
Stag	31-10-2023	-32.465154	116.222276	554	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463603	116.224404	554	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463561	116.222043	554	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471365	116.247045	554	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472235	116.244913	554	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475194	116.165757	554	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453209	116.210259	554	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.473339	116.225483	554	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467254	116.221634	554	15	5	Potential nesting tree	No
Stag	03-11-2023	-32.451099	116.062051	554	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450521	116.062356	554	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476328	116.130225	554	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476713	116.128724	554	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476124	116.133278	554	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473331	116.224050	554	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450752	116.063077	554	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453844	116.210015	551	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482770	116.130007	551	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469080	116.224394	551	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.464119	116.222586	551	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491027	116.108197	551	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491735	116.108294	551	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472430	116.172173	551	22	5	Potential nesting tree	No
Stag	07-07-2023	-32.473779	116.246485	551	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.455258	116.210422	551	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.487519	116.183171	551	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489607	116.185979	551	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488988	116.185658	551	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490265	116.183344	551	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451265	116.062152	551	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450438	116.063038	551	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476946	116.130375	551	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476440	116.129770	551	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476236	116.128244	551	19	5	Potential nesting tree	No
Stag	01-11-2023	-32.463928	116.222631	551	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476304	116.109593	550	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464120	116.112472	550	18	5	Potential nesting tree	No
Stag	06-12-2023	-32.480047	116.132068	550	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.435014	116.070314	550	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470073	116.241831	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493053	116.071778	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480514	116.213814	550	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467843	116.232190	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455794	116.219279	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479427	116.095401	550	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470597	116.065362	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479928	116.096059	550	28	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Stag	31-10-2023	-32.463116	116.227747	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475564	116.162249	550	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474550	116.161886	550	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.473773	116.164690	550	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472932	116.165640	550	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471192	116.239889	550	15	5	Potential nesting tree	No
Stag	07-07-2023	-32.471075	116.241628	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.468966	116.242924	550	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.470910	116.242899	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457441	116.218492	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461945	116.218103	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453524	116.216373	550	20	5	Potential nesting tree	No
Stag	01-09-2023	-32.460328	116.216775	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460137	116.215267	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455836	116.217098	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455904	116.217080	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458054	116.218360	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457927	116.217210	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469203	116.223497	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479388	116.214323	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489999	116.184068	550	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.439017	116.170838	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.477903	116.087170	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479289	116.087091	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478972	116.087832	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476123	116.088229	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470472	116.065654	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470205	116.064962	550	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472692	116.066427	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472295	116.067281	550	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437184	116.069101	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437824	116.069529	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437123	116.074637	550	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437240	116.074505	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493626	116.075203	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435399	116.070580	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434195	116.065130	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486064	116.098257	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475649	116.108889	550	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474227	116.107721	550	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466051	116.057645	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.456079	116.060696	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464256	116.113510	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.450958	116.107878	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451539	116.106640	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459944	116.104608	550	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.468068	116.237744	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470417	116.237448	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469811	116.238384	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471350	116.238349	550	20	5	Potential nesting tree	No
Flooded gum (Eucalyptus rudis)	06-07-2023	-32.473946	116.161346	550	16	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.473438	116.164682	550	18	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472831	116.165040	550	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472764	116.165088	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472312	116.167239	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473463	116.165954	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473669	116.165986	550	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473746	116.165950	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.474069	116.165597	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474651	116.165938	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471217	116.241159	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471276	116.241345	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471667	116.242137	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470336	116.242205	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469018	116.242579	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469638	116.243307	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471192	116.243220	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458193	116.228402	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.457545	116.227386	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.457803	116.227346	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.457903	116.228585	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458111	116.228673	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458093	116.228691	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.457834	116.229710	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458231	116.229000	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.463472	116.219149	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.463049	116.218863	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.462648	116.218960	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.462725	116.219681	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459902	116.219885	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455903	116.207625	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456572	116.207897	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456920	116.207880	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458121	116.207119	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456772	116.209537	550	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457791	116.209238	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458469	116.209121	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.458786	116.209356	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458820	116.209265	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459330	116.209482	550	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459401	116.209408	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459784	116.209063	550	20	5	Potential nesting tree	No
Stag	31-08-2023	-32.460037	116.209783	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456280	116.210491	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456724	116.210437	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456878	116.210696	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457698	116.210402	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458444	116.210471	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458545	116.210833	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456417	116.211133	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456791	116.211310	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459687	116.211067	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459162	116.211439	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458126	116.211419	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456458	116.211387	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456138	116.211328	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458519	116.213852	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456367	116.216622	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456465	116.216660	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.457590	116.216357	550	20	5	Potential nesting tree	No
Stag	02-09-2023	-32.459262	116.216414	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459373	116.216217	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458400	116.216310	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456943	116.215881	550	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457575	116.215967	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458016	116.215992	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458299	116.216120	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458480	116.216036	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458564	116.216117	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458762	116.216239	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459144	116.215977	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458650	116.215938	550	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458627	116.215905	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458246	116.215883	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457760	116.215906	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457685	116.215813	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458726	116.218661	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458481	116.218109	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458728	116.217950	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458738	116.217820	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458584	116.217780	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458766	116.217471	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458354	116.217040	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458528	116.217138	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458850	116.217540	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479568	116.213497	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479172	116.213629	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.477291	116.212721	550	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465949	116.231382	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465310	116.231183	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465319	116.230997	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465061	116.232278	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464331	116.231659	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463071	116.229188	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463142	116.229042	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463214	116.228971	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.469780	116.241129	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469603	116.241588	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469458	116.241706	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469768	116.242760	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468471	116.241911	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.468377	116.241916	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468017	116.242026	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467412	116.241116	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467715	116.241117	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467977	116.241249	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467794	116.240750	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467817	116.240413	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468529	116.239499	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469063	116.238827	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467580	116.238860	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467678	116.238597	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469284	116.237917	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.465179	116.235906	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488809	116.183575	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488571	116.183333	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488696	116.182895	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489175	116.182387	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489096	116.182666	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489061	116.182836	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441198	116.167551	550	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441597	116.167968	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441069	116.168029	550	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440367	116.166991	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440278	116.168479	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.440877	116.168906	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438084	116.168498	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.478568	116.086084	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478938	116.085880	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480775	116.084306	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480464	116.083722	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480086	116.083898	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480114	116.083970	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480359	116.084288	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480119	116.084576	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478861	116.085260	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453381	116.065504	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453082	116.065379	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453029	116.065462	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453571	116.065279	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453161	116.065093	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451910	116.064997	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451616	116.064901	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451449	116.064675	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451538	116.064785	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452365	116.064827	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454581	116.064676	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452044	116.064189	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454160	116.064188	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.455273	116.063956	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454883	116.063556	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454441	116.063322	550	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454190	116.063136	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454301	116.063547	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454384	116.063559	550	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454484	116.063756	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454004	116.063989	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452088	116.063879	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451449	116.063979	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452966	116.063525	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452452	116.063388	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451573	116.063490	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451367	116.063160	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473052	116.130334	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472988	116.130277	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472854	116.129166	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473043	116.128409	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.472976	116.128306	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473131	116.129427	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473228	116.130000	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473714	116.130020	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473931	116.126180	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473877	116.128294	550	20	5	Potential nesting tree	No
Stag	04-12-2023	-32.474141	116.127412	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474110	116.125570	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474343	116.128755	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474665	116.128827	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474601	116.127898	550	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474576	116.126813	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474678	116.127750	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477227	116.136038	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479685	116.131759	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479970	116.131638	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480365	116.131692	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480766	116.131806	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480274	116.131932	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480702	116.132184	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480268	116.132496	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480192	116.132510	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.480055	116.132751	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480578	116.132564	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480683	116.132572	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480833	116.132739	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480948	116.132409	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478239	116.132724	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.483539	116.132489	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.482195	116.131480	550	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.481535	116.131661	550	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.481925	116.131291	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482888	116.131070	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482326	116.131040	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479570	116.130139	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479582	116.130237	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.454397	116.076430	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454350	116.076372	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453440	116.076123	550	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453182	116.077580	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453253	116.077415	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452961	116.076521	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453107	116.076113	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451855	116.077226	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451601	116.076633	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464194	116.107730	550	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464826	116.108055	550	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463428	116.108008	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463598	116.108202	550	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463823	116.108261	550	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463480	116.113062	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463071	116.112315	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.462818	116.112258	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.462889	116.112653	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464301	116.112382	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453803	116.107077	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452192	116.106983	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452353	116.106518	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469273	116.136763	550	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.454400	116.211690	550	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.454046	116.210974	550	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453589	116.209591	550	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453440	116.209507	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453092	116.209684	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454231	116.208665	550	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453339	116.208784	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453923	116.208291	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456701	116.208409	550	12	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458318	116.208930	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456522	116.208701	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457128	116.209971	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456379	116.211672	550	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458849	116.211621	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457420	116.212618	550	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458013	116.212406	550	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458755	116.212893	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458127	116.212840	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457760	116.212814	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457830	116.213306	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458521	116.214948	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458933	116.217432	550	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476785	116.211950	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477228	116.212619	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477234	116.212648	550	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.480018	116.212816	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480278	116.212372	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469987	116.210227	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469433	116.210191	550	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469034	116.210207	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468951	116.210416	550	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469577	116.210754	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469082	116.210807	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468948	116.211278	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489016	116.064509	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490116	116.064061	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490198	116.063805	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489860	116.063884	550	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489334	116.063830	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489190	116.063924	550	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490376	116.063661	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490427	116.066370	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482848	116.096359	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482899	116.096496	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481088	116.097305	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.480875	116.097327	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481271	116.096508	550	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482722	116.099948	550	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482216	116.098985	550	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482307	116.093614	550	19	5	Potential nesting tree	No
Stag	02-11-2023	-32.490494	116.115532	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489873	116.115190	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476383	116.089316	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471424	116.063433	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470684	116.061925	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471257	116.062531	550	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471359	116.062943	550	19	5	Potential nesting tree	No
Stag	03-11-2023	-32.472580	116.064207	550	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472402	116.067341	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477134	116.138734	550	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470916	116.116254	550	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471630	116.116238	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472252	116.116159	550	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472419	116.116074	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471399	116.114801	550	26	5	Potential nesting tree	No
Stag	04-12-2023	-32.470088	116.114685	550	24	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470817	116.114595	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479765	116.102851	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479793	116.102589	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479652	116.102658	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479022	116.104208	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478043	116.112361	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478067	116.112565	550	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475689	116.121421	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475896	116.121750	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476113	116.121998	550	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476229	116.122819	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476753	116.121630	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.482216	116.125571	550	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.482262	116.125711	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476616	116.111381	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476460	116.110801	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475322	116.111142	550	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475329	116.110428	550	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475111	116.110127	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475049	116.110174	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468699	116.136784	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469316	116.136762	550	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468994	116.136134	550	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470057	116.137841	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469916	116.138373	550	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470398	116.138269	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470401	116.138559	550	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467551	116.140940	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470046	116.141200	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469964	116.141171	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466451	116.135879	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466498	116.135140	550	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466406	116.134047	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466419	116.134047	550	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466764	116.135419	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466736	116.136406	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466624	116.137696	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466969	116.137848	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471168	116.134608	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474811	116.146471	550	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475528	116.147134	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475384	116.147372	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475319	116.147155	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478551	116.142921	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478408	116.142964	550	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.479203	116.143376	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478696	116.143195	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479877	116.143271	550	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.477214	116.145235	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471902	116.246210	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472934	116.244805	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491366	116.070324	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469311	116.238815	550	20	5	Potential nesting tree	No
Stag	02-11-2023	-32.438996	116.168826	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473819	116.126685	550	17	5	Potential nesting tree	No
Stag	31-08-2023	-32.459786	116.208252	550	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478489	116.104248	550	13	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490299	116.061756	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490564	116.067388	550	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489734	116.067217	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491377	116.070295	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490462	116.069518	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491686	116.069738	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489901	116.069233	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490771	116.069194	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489485	116.064721	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489737	116.064825	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489781	116.065057	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.488979	116.064968	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.488954	116.065005	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489603	116.065529	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489354	116.065568	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489851	116.066020	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.484256	116.095968	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481445	116.098007	550	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482673	116.104631	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482585	116.103381	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482389	116.102985	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482690	116.102748	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485529	116.093364	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.486256	116.093019	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.490683	116.119496	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489490	116.114288	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489196	116.113907	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489439	116.113483	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495467	116.109322	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.495114	116.108931	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498868	116.111118	550	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497884	116.108910	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494360	116.099365	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494548	116.099408	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494571	116.099170	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494643	116.098191	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494012	116.096600	550	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490469	116.107191	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.490814	116.106468	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.457799	116.228147	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.457918	116.228339	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472976	116.130082	550	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464052	116.108148	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.459640	116.227060	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457826	116.218851	550	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.460907	116.218224	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461604	116.218454	550	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.454494	116.216876	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460795	116.218671	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460493	116.218960	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472752	116.118309	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472923	116.118383	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471236	116.114989	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470147	116.114210	550	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.469554	116.112240	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480340	116.103891	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478860	116.103933	550	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478487	116.104837	550	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478751	116.107241	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478531	116.106024	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475405	116.122674	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475299	116.121253	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474862	116.122622	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477039	116.111888	550	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477241	116.112232	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475127	116.112078	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474768	116.112415	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474571	116.111668	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468984	116.137497	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469276	116.137714	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469508	116.137750	550	18	5	Potential nesting tree	No
Stag	07-12-2023	-32.469557	116.138102	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469009	116.137932	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468839	116.138260	550	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469660	116.139301	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467869	116.140457	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470063	116.140562	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466291	116.134844	550	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466220	116.134117	550	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465692	116.134498	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471212	116.134757	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476119	116.143086	550	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475583	116.143569	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475764	116.143982	550	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.480200	116.214257	550	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460396	116.215721	550	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469461	116.224006	548	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465170	116.221405	548	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480594	116.099271	548	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.484931	116.093152	548	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489638	116.121085	548	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472561	116.171853	548	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453891	116.209263	548	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453505	116.209385	548	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.468215	116.222070	548	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453006	116.061337	548	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450925	116.061370	548	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451014	116.061647	548	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451612	116.062909	548	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477037	116.130958	548	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476003	116.127899	548	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479184	116.132126	548	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481716	116.130494	548	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450348	116.077638	548	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450559	116.075841	548	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454009	116.210463	548	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475863	116.120361	548	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490126	116.183180	547	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455705	116.219745	545	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459906	116.214630	545	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467182	116.233691	545	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468733	116.222664	545	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478287	116.215537	545	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469611	116.209398	545	30	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463188	116.232498	545	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463134	116.226389	545	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.479045	116.087573	545	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472288	116.066760	545	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.463706	116.056878	545	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455691	116.211147	545	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449596	116.076917	544	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482631	116.129878	544	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.487803	116.183173	544	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.468946	116.224309	544	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463468	116.223798	544	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491072	116.112559	544	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475007	116.155806	544	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.453889	116.211342	544	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.465390	116.221557	544	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451767	116.062663	544	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475553	116.132135	544	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476987	116.135791	544	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489009	116.138762	544	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450906	116.076232	544	15	5	Potential nesting tree	No
Stag	03-11-2023	-32.450701	116.062953	544	13	5	Potential nesting tree	No
Stag	04-12-2023	-32.476789	116.129383	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453106	116.061391	541	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469878	116.238487	541	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.486888	116.182571	541	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469612	116.224504	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464218	116.221513	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481940	116.095487	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489127	116.120482	541	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489207	116.114422	541	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489545	116.114707	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493297	116.113487	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490919	116.112910	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497527	116.110785	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497126	116.102246	541	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494691	116.101180	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496017	116.101356	541	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.496139	116.101752	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.489329	116.105936	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.488393	116.108037	541	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490923	116.108218	541	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.491430	116.108175	541	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491006	116.107674	541	20	5	Potential nesting tree	No
Stag	04-12-2023	-32.433435	116.073906	541	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435247	116.074461	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435266	116.074448	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.492390	116.070105	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436014	116.070752	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436070	116.070639	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435766	116.071032	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479891	116.097261	541	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476522	116.099163	541	18	5	Potential nesting tree	No
Stag	06-12-2023	-32.477017	116.099125	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477262	116.099264	541	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477622	116.098325	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477903	116.098337	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477959	116.098520	541	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477817	116.098764	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466783	116.054023	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464455	116.056785	541	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464174	116.109991	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464307	116.109868	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464016	116.113690	541	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463836	116.113070	541	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452445	116.107608	541	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475884	116.159909	541	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.454925	116.210065	541	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470060	116.226131	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467192	116.221593	541	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451159	116.062776	541	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476338	116.129176	541	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476664	116.128977	541	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476787	116.129043	541	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476700	116.135808	541	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479337	116.131557	541	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.449720	116.076259	541	20	5	Potential nesting tree	No
Stag	06-12-2023	-32.477768	116.098296	541	16	5	Potential nesting tree	No
Stag	01-11-2023	-32.464188	116.221574	541	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465859	116.232686	541	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.465796	116.231569	541	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465753	116.230887	541	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490154	116.062292	540	20	5	Potential nesting tree	No
Flooded gum (Eucalyptus rudis)	06-07-2023	-32.473215	116.164835	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465988	116.055415	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468080	116.233301	540	25	5	Potential nesting tree	No
Bullich (Eucalyptus megacarpa)	02-11-2023	-32.480604	116.086692	540	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464838	116.113765	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453049	116.209816	540	10	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474492	116.161738	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472512	116.166800	540	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.471116	116.170708	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475096	116.165644	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.468431	116.242284	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470590	116.243615	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470663	116.243642	540	20	5	Potential nesting tree	No
Stag	07-07-2023	-32.471637	116.243070	540	15	5	Potential nesting tree	No
Stag	07-07-2023	-32.470968	116.242849	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456877	116.221919	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456952	116.221938	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456828	116.220949	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456917	116.219749	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455707	116.219813	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455662	116.219675	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454614	116.217601	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460324	116.216243	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459900	116.214978	540	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460059	116.218068	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460065	116.218354	540	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.454496	116.217061	540	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456156	116.218008	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458177	116.217113	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466450	116.230788	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469025	116.223245	540	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.478107	116.214905	540	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468675	116.209676	540	25	5	Potential nesting tree	No
Stag	30-10-2023	-32.469467	116.209624	540	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463222	116.230539	540	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463464	116.226163	540	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463383	116.225763	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463445	116.225929	540	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462609	116.225487	540	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463376	116.224011	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441955	116.171069	540	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438930	116.170739	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480674	116.086642	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476176	116.088409	540	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476576	116.089018	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436472	116.069102	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437130	116.068808	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437744	116.069347	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437255	116.075560	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.492642	116.070029	540	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.493529	116.075152	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435160	116.071443	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435219	116.070831	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434005	116.064965	540	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.461195	116.098748	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476230	116.109413	540	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475571	116.109833	540	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479076	116.098712	540	28	5	Potential nesting tree	No
Stag	06-12-2023	-32.469323	116.066550	540	50	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469931	116.066886	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467226	116.053698	540	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466298	116.055713	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.463412	116.059817	540	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.463759	116.057226	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.455188	116.060834	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464852	116.113106	540	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.461347	116.227633	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454949	116.212089	540	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455667	116.211655	540	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453958	116.208263	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458306	116.208540	540	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458065	116.208513	540	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456687	116.208527	540	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458719	116.208880	540	10	5	Potential nesting tree	No
Stag	31-08-2023	-32.459380	116.208793	540	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459625	116.208236	540	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459473	116.209777	540	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458650	116.211700	540	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457898	116.212998	540	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457612	116.213136	540	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457255	116.215495	540	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458203	116.215287	540	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457182	116.215269	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458272	116.214969	540	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459155	116.218545	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459313	116.217852	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488554	116.183088	540	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489164	116.183034	540	14	5	Potential nesting tree	No
Stag	11-09-2023	-32.489981	116.183098	540	6	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	30-10-2023	-32.476714	116.211749	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490463	116.063584	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490875	116.119467	540	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489941	116.115801	540	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493489	116.111987	540	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476716	116.091395	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476636	116.091221	540	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476573	116.089430	540	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472840	116.065154	540	14	5	Potential nesting tree	No
Stag	04-12-2023	-32.470200	116.114830	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470061	116.113207	540	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469948	116.113308	540	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.479488	116.102853	540	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.478785	116.104100	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480685	116.109225	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480260	116.109599	540	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478029	116.112463	540	14	5	Potential nesting tree	No
Stag	05-12-2023	-32.475538	116.122601	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475581	116.121140	540	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475902	116.121112	540	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475789	116.121240	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476204	116.122842	540	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476381	116.109826	540	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475012	116.108405	540	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475011	116.108988	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474571	116.107687	540	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492332	116.122360	540	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489084	116.096664	540	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490649	116.102697	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468904	116.136478	540	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469979	116.137557	540	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470258	116.138584	540	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468195	116.137292	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467620	116.141185	540	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470189	116.141262	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466363	116.136949	540	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472520	116.244957	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473301	116.245419	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476329	116.161632	540	18	5	Potential nesting tree	No
Stag	07-07-2023	-32.471776	116.244488	540	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471848	116.244027	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470411	116.244011	540	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.469150	116.244185	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491146	116.069653	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471907	116.242867	540	325	5	Potential nesting tree	No
Stag	02-11-2023	-32.442032	116.171812	540	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470713	116.207895	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470058	116.207045	540	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490579	116.062062	540	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490228	116.062082	540	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490404	116.062288	540	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490570	116.063215	540	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489652	116.063189	540	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490461	116.063583	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490759	116.070102	540	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490326	116.069758	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490603	116.069515	540	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490704	116.069419	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490697	116.069370	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489857	116.069154	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490761	116.069123	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489329	116.065199	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.484319	116.096223	540	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481751	116.098217	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482193	116.098000	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481988	116.097653	540	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.483261	116.104533	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482363	116.102997	540	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482181	116.102786	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482013	116.102450	540	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.485945	116.093064	540	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.481787	116.094955	540	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.490668	116.119974	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488964	116.113330	540	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.495162	116.110944	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496822	116.102403	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494379	116.099468	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494602	116.099028	540	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490771	116.106916	540	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.490917	116.107510	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461808	116.220162	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459166	116.220140	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458372	116.220131	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455395	116.216388	540	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460583	116.217057	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460492	116.215372	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459679	116.218312	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459845	116.218217	540	14	5	Potential nesting tree	No
Stag	01-09-2023	-32.459760	116.217748	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459697	116.215587	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459448	116.215735	540	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.459584	116.217304	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459620	116.218436	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468209	116.233743	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468704	116.233751	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469010	116.230649	540	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.469333	116.234193	540	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.471503	116.227292	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473033	116.118345	540	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470089	116.111947	540	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470449	116.111863	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469988	116.112333	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480681	116.103876	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480802	116.103880	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478327	116.103553	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478805	116.104815	540	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.480060	116.108317	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479362	116.107731	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478822	116.107596	540	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478699	116.107323	540	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478811	116.106768	540	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478921	116.106607	540	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475343	116.123012	540	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475320	116.122782	540	14	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474881	116.120895	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475047	116.122295	540	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474079	116.122929	540	14	5	Potential nesting tree	No
Stag	05-12-2023	-32.474386	116.122706	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474654	116.122872	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474785	116.121033	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474624	116.121817	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.481817	116.125903	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474984	116.112676	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474635	116.112153	540	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.488852	116.095632	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469072	116.137129	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468758	116.137646	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469542	116.137908	540	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469339	116.139893	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469179	116.139748	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468003	116.141358	540	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.465675	116.135761	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466911	116.138188	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475642	116.149163	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475757	116.144247	540	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475964	116.144724	540	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.480035	116.143707	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.495970	116.120582	540	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497245	116.119810	540	18	5	Potential nesting tree	No
Flooded gum (Eucalyptus rudis)	07-07-2023	-32.475283	116.165033	538	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451600	116.062757	538	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471994	116.173194	538	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469905	116.242374	538	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.455325	116.210241	538	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.487207	116.182903	538	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469726	116.225403	538	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469245	116.225364	538	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451317	116.061917	538	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476542	116.128886	538	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475628	116.128776	538	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.476971	116.135981	538	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479416	116.131668	538	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481888	116.129550	538	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.481815	116.130663	538	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489182	116.138205	538	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450436	116.077924	538	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450585	116.078146	538	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451115	116.075783	538	17	5	Potential nesting tree	No
Stag	26-08-2023	-32.454546	116.209251	535	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476978	116.128944	535	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473760	116.225519	535	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472280	116.227387	535	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.484567	116.105786	535	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481258	116.098647	535	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.497382	116.110546	535	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471932	116.173258	535	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453185	116.209970	535	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473626	116.225826	535	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473491	116.226440	535	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451742	116.061072	535	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451176	116.063039	535	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476342	116.133292	535	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475106	116.134381	535	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475096	116.134601	535	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479109	116.131969	535	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481753	116.130559	535	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489527	116.138212	535	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465468	116.231337	535	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.466685	116.230678	535	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467690	116.233913	535	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438137	116.171032	535	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476247	116.110801	535	25	5	Potential nesting tree	No
Stag	31-10-2023	-32.464678	116.221977	532	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450962	116.061484	532	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470379	116.226469	532	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483160	116.107030	532	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491583	116.110597	532	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472797	116.171917	532	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471500	116.244218	532	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.487103	116.182852	532	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489176	116.186656	532	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469294	116.225236	532	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469644	116.224978	532	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452488	116.060872	532	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476542	116.129049	532	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475266	116.127725	532	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476569	116.135389	532	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.481881	116.129510	532	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482602	116.129492	532	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450702	116.076355	532	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451130	116.075704	532	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489711	116.063523	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470837	116.064785	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474513	116.108502	530	22	5	Potential nesting tree	No
Stag	01-09-2023	-32.459962	116.216737	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453658	116.105027	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490026	116.066738	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476029	116.109447	530	28	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.474614	116.161794	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466043	116.057338	530	25	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472849	116.165407	530	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471857	116.243700	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457545	116.220721	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457461	116.221660	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456929	116.220497	530	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455653	116.219352	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455842	116.219594	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453526	116.216690	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460268	116.217228	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460308	116.215873	530	18	5	Potential nesting tree	No
Stag	01-09-2023	-32.460097	116.219028	530	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.466300	116.233244	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467487	116.234066	530	25	5	Potential nesting tree	No
Stag	11-09-2023	-32.478930	116.215395	530	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.478170	116.214971	530	25	5	Potential nesting tree	No
Stag	11-09-2023	-32.477724	116.214154	530	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.478393	116.214258	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480070	116.214149	530	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480357	116.211085	530	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480181	116.212067	530	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468676	116.209893	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468669	116.209691	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462782	116.226736	530	10	5	Potential nesting tree	No
Stag	31-10-2023	-32.464093	116.226054	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462797	116.225411	530	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.442111	116.170499	530	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.439937	116.169969	530	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438025	116.169768	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480577	116.086506	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480292	116.086940	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479757	116.086761	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479489	116.086799	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.477838	116.086866	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478514	116.088401	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478730	116.088886	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476184	116.087967	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471366	116.066161	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470132	116.065462	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436844	116.069089	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437216	116.069384	530	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437782	116.069880	530	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.437755	116.069679	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437537	116.070139	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437203	116.074491	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.436327	116.067386	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460982	116.098220	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460981	116.098239	530	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.490095	116.071764	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476217	116.109868	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476006	116.109121	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475875	116.109703	530	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474647	116.109578	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480044	116.095559	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479312	116.097265	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479003	116.098438	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478865	116.097323	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469495	116.067345	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469784	116.066980	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466881	116.059143	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466865	116.053348	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466569	116.055271	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466772	116.058460	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.455105	116.060499	530	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463496	116.105183	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463295	116.106582	530	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463582	116.105949	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464714	116.113420	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464390	116.113407	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453301	116.104848	530	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459872	116.104292	530	28	5	Potential nesting tree	No
Stag	25-08-2023	-32.455928	116.210828	530	9	5	Potential nesting tree	No
Stag	26-08-2023	-32.453252	116.210337	530	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.454361	116.209641	530	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453798	116.209600	530	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452979	116.209630	530	11	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	26-08-2023	-32.452736	116.209410	530	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457698	116.210248	530	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455871	116.210263	530	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456645	116.211653	530	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457050	116.213418	530	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457194	116.215519	530	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457740	116.214351	530	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458843	116.217506	530	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458849	116.218191	530	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489381	116.182762	530	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489916	116.183590	530	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476878	116.211971	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480507	116.210815	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469320	116.210291	530	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.468810	116.210134	530	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.469685	116.210494	530	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469299	116.210650	530	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469026	116.211296	530	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469280	116.208012	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489492	116.064417	530	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489784	116.068504	530	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491311	116.068446	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491921	116.068705	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488842	116.066506	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490492	116.066311	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483150	116.096902	530	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483931	116.097198	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482167	116.097517	530	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482230	116.099661	530	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481145	116.094801	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481243	116.094810	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490431	116.115143	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493459	116.112037	530	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477553	116.085698	530	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477047	116.082053	530	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476466	116.090563	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476314	116.090110	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476547	116.089836	530	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476216	116.089429	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470207	116.064705	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471013	116.064102	530	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471500	116.063897	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470527	116.061840	530	6	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472735	116.066255	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476752	116.139806	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472182	116.118137	530	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.472324	116.118210	530	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472611	116.118004	530	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471823	116.116444	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471986	116.116371	530	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470514	116.114835	530	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.469951	116.114672	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470523	116.112917	530	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.481329	116.104963	530	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480609	116.105231	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480230	116.104946	530	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478832	116.104422	530	17	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	05-12-2023	-32.478949	116.105769	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475608	116.121171	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475715	116.120453	530	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475785	116.121182	530	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476641	116.121633	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476583	116.121883	530	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476766	116.109655	530	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476557	116.109279	530	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475218	116.109782	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475196	116.109562	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475020	116.110456	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474804	116.109756	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490818	116.122218	530	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.490158	116.103488	530	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.493603	116.091448	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468783	116.136792	530	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468758	116.136514	530	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468975	116.136130	530	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468917	116.135918	530	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470003	116.137629	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469711	116.137727	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467558	116.140602	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469992	116.141430	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466549	116.134178	530	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475190	116.148914	530	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.474974	116.145350	530	12	5	Potential nesting tree	No
Stag	08-12-2023	-32.474701	116.146181	530	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479923	116.143244	530	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.479545	116.143517	530	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477651	116.144908	530	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477984	116.145677	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496569	116.119118	530	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471786	116.244409	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469511	116.243969	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.459692	116.226615	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458570	116.228341	530	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494786	116.098134	530	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490281	116.115173	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461551	116.220460	530	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469391	116.209352	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468549	116.209217	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470644	116.207509	530	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470342	116.207527	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470413	116.207666	530	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470351	116.208230	530	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470270	116.208175	530	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470168	116.208064	530	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490099	116.061885	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490197	116.061866	530	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490140	116.063124	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490729	116.063551	530	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490156	116.067323	530	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490690	116.069553	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491568	116.069749	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491290	116.069319	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490887	116.069487	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490394	116.069498	530	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	01-11-2023	-32.491069	116.069145	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489248	116.065067	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489010	116.064985	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490037	116.065520	530	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489266	116.065437	530	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489078	116.065653	530	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489458	116.065934	530	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490559	116.065666	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482535	116.096017	530	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.481541	116.097892	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481555	116.097900	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483491	116.104819	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482573	116.104682	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485569	116.092910	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485770	116.092928	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480887	116.094640	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490338	116.119076	530	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489193	116.114268	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488998	116.114290	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489211	116.113808	530	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489300	116.113806	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494678	116.111916	530	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.495006	116.111569	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498619	116.110545	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498324	116.109191	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.496894	116.102276	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494365	116.099362	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494638	116.098151	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494677	116.097258	530	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.491473	116.105976	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490772	116.107202	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490054	116.106825	530	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490077	116.106558	530	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460566	116.214992	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459708	116.217681	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.471052	116.226798	530	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.472491	116.118901	530	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.472357	116.116798	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471621	116.115634	530	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.469756	116.114080	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479860	116.103558	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478411	116.103172	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479760	116.108428	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479163	116.107610	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478893	116.107425	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.481805	116.126242	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476895	116.109673	530	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477115	116.110809	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475361	116.113361	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475372	116.112623	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493586	116.090767	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469111	116.137007	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469064	116.137519	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469356	116.137680	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469380	116.137807	530	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465441	116.135413	530	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475715	116.144150	530	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475958	116.144702	530	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479871	116.144440	530	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496869	116.119902	530	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478754	116.131802	528	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476406	116.130028	528	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490043	116.114483	528	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472382	116.244258	528	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473014	116.244222	528	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.454600	116.211512	528	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453845	116.209312	528	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455440	116.208964	528	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.455049	116.208978	528	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464689	116.222148	528	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452876	116.060482	528	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.477341	116.129341	528	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475802	116.132729	528	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476244	116.135131	528	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476485	116.135244	528	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478887	116.131369	528	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479590	116.129858	528	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469556	116.225645	528	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.450986	116.076064	525	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460330	116.215587	525	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479517	116.132165	525	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481256	116.130504	525	18	5	Potential nesting tree	No
Stag	30-10-2023	-32.477755	116.213790	525	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476107	116.088078	525	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471150	116.064985	525	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434608	116.069568	525	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467054	116.059806	525	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469912	116.238651	525	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472313	116.227218	525	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468400	116.222076	525	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489575	116.115017	525	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.495505	116.101187	525	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490512	116.109365	525	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.435250	116.074705	525	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435676	116.071267	525	18	5	Potential nesting tree	No
Stag	05-12-2023	-32.489128	116.072662	525	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478617	116.098709	525	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464674	116.058899	525	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466234	116.058807	525	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472006	116.172857	525	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489692	116.186114	525	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473583	116.226349	525	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470454	116.226499	525	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452651	116.060688	525	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452583	116.060962	525	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476996	116.129076	525	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476128	116.128247	525	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476085	116.132819	525	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478514	116.131977	525	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479045	116.132022	525	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489306	116.138141	525	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451109	116.075234	525	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475706	116.128064	525	27	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475867	116.160108	522	15	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488461	116.182559	522	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.466058	116.221074	522	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464936	116.221466	522	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.464332	116.221588	522	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471860	116.172935	522	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472220	116.171987	522	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472251	116.171980	522	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471491	116.172931	522	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489731	116.186586	522	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476576	116.129123	522	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477065	116.135705	522	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479693	116.132221	522	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489151	116.139013	522	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489124	116.185878	522	21	5	Potential nesting tree	No
Stag	01-11-2023	-32.464618	116.221756	522	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470623	116.064795	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469597	116.209782	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465947	116.055657	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480137	116.213014	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468784	116.223340	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490334	116.063084	520	30	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.473061	116.165014	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474805	116.165628	520	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.468997	116.242017	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.468999	116.243331	520	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457550	116.221133	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457039	116.221826	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461748	116.217978	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453618	116.216864	520	18	5	Potential nesting tree	No
Stag	01-09-2023	-32.460308	116.217812	520	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458137	116.217774	520	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.466333	116.231302	520	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469189	116.222674	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480435	116.211589	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480737	116.212225	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469319	116.209878	520	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.468712	116.209536	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463944	116.232249	520	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.462376	116.230773	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462784	116.223003	520	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463074	116.224444	520	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463170	116.224148	520	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.463150	116.222360	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463331	116.224501	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478904	116.086455	520	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.479052	116.087843	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.475605	116.088095	520	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.471790	116.065568	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470901	116.065253	520	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472548	116.066937	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493434	116.075047	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493501	116.074682	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493131	116.070480	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435243	116.070826	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.486873	116.098493	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.487424	116.098551	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476149	116.111458	520	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476279	116.110999	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476246	116.109447	520	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474566	116.108907	520	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474470	116.107973	520	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478579	116.098766	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469370	116.066800	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469265	116.066675	520	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.470060	116.066892	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.471967	116.066888	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466823	116.059895	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467438	116.053508	520	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.462596	116.059980	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464292	116.106175	520	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464719	116.114195	520	25	5	Potential nesting tree	No
Stag	08-12-2023	-32.464666	116.113547	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.450962	116.107716	520	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.469915	116.237472	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457324	116.214755	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456275	116.214990	520	11	5	Potential nesting tree	No
Stag	25-08-2023	-32.454160	116.211717	520	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454092	116.211828	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454025	116.210840	520	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.454914	116.211016	520	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454405	116.210608	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454023	116.210536	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454758	116.209792	520	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455004	116.209418	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453707	116.209537	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452861	116.209460	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453199	116.208760	520	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453773	116.208432	520	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455598	116.207688	520	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455752	116.207524	520	5	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457903	116.208106	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458239	116.208508	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458599	116.208733	520	9	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.458331	116.208783	520	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457180	116.209034	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.458838	116.208927	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459564	116.208704	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455748	116.210159	520	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459547	116.210073	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457075	116.211618	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457090	116.211590	520	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457946	116.212230	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457520	116.212038	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457421	116.211766	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457575	116.212820	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457671	116.213091	520	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458811	116.215566	520	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458770	116.214460	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459375	116.218777	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488633	116.184112	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489025	116.182823	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476776	116.211342	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476879	116.212071	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477014	116.212037	520	13	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	30-10-2023	-32.481101	116.210959	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480413	116.210896	520	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.480019	116.212865	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480702	116.212334	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.468606	116.210382	520	14	5	Potential nesting tree	No
Stag	30-10-2023	-32.469053	116.210452	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469270	116.211028	520	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469477	116.210891	520	13	5	Potential nesting tree	No
Stag	31-10-2023	-32.469391	116.211765	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469463	116.208789	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469182	116.207935	520	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469492	116.208168	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490043	116.064482	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489738	116.064497	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489315	116.064447	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489460	116.064106	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489889	116.064106	520	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490434	116.063820	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490079	116.063916	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489390	116.063530	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490509	116.063672	520	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490667	116.063628	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489881	116.067821	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490214	116.067965	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490721	116.067761	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.491225	116.068111	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.491499	116.068102	520	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.491647	116.068074	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490629	116.068119	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490491	116.068203	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489950	116.068548	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490329	116.068471	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491038	116.068388	520	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.491934	116.068496	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491613	116.068708	520	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491571	116.068972	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489869	116.067007	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490116	116.067122	520	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490549	116.066679	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490339	116.066745	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489367	116.066540	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489847	116.066600	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490124	116.066460	520	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490704	116.066549	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482672	116.096501	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483386	116.096428	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481510	116.097172	520	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482504	116.099394	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482392	116.099474	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482594	116.099620	520	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482646	116.100187	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482035	116.098843	520	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488079	116.094191	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488180	116.094340	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481164	116.094773	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491182	116.119815	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489588	116.115261	520	13	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493264	116.112193	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493776	116.111492	520	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477613	116.085394	520	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.478008	116.085214	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477182	116.082466	520	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476300	116.090770	520	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476709	116.090603	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476019	116.090302	520	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476392	116.090151	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476215	116.089046	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470491	116.064740	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470891	116.064312	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470893	116.062846	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470938	116.062134	520	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.472615	116.066079	520	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472628	116.066299	520	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472788	116.117798	520	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471800	116.116716	520	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471344	116.116750	520	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471162	116.116473	520	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471688	116.116499	520	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471797	116.116078	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471935	116.116174	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470683	116.114830	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470639	116.113262	520	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470166	116.112799	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469993	116.112792	520	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.481104	116.104717	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.481274	116.104952	520	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480714	116.104834	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480649	116.105035	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.480255	116.105110	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479328	116.102731	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479205	116.103095	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478985	116.104606	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478811	116.105765	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480210	116.109110	520	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479902	116.109401	520	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480151	116.109958	520	19	5	Potential nesting tree	No
Stag	05-12-2023	-32.479448	116.109541	520	17	5	Potential nesting tree	No
Stag	05-12-2023	-32.479467	116.109610	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475702	116.122226	520	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475864	116.120192	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475726	116.121931	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476113	116.122933	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476248	116.121605	520	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476799	116.121757	520	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.482151	116.125542	520	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475171	116.109291	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475241	116.108950	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474994	116.109472	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474826	116.109768	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474608	116.107682	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492742	116.093868	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493818	116.092821	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469148	116.136797	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470418	116.137556	520	11	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469892	116.137735	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470330	116.137888	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469916	116.141568	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466513	116.137001	520	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466462	116.136510	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466285	116.134220	520	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466651	116.136047	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471243	116.133795	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470794	116.133961	520	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.474832	116.145952	520	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475045	116.146573	520	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478333	116.142686	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478478	116.143129	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479400	116.143038	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.477386	116.144792	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472631	116.172406	520	16	5	Potential nesting tree	No
Stag	25-08-2023	-32.458296	116.227533	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472471	116.245846	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472795	116.244629	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472850	116.244402	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473148	116.245005	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475933	116.162812	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476418	116.161432	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475891	116.159748	520	20	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475901	116.160139	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475378	116.169971	520	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.475368	116.165899	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.474886	116.166025	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.469508	116.243932	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.470456	116.242596	520	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.458329	116.227402	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458229	116.227351	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472166	116.118665	520	14	5	Potential nesting tree	No
Stag	06-07-2023	-32.472517	116.170212	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473223	116.244693	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478863	116.106822	520	18	5	Potential nesting tree	No
Stag	26-08-2023	-32.452398	116.209153	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480026	116.213241	520	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.468657	116.209450	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469137	116.209083	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470632	116.207719	520	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470143	116.207661	520	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490486	116.063188	520	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490119	116.063371	520	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489552	116.067705	520	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490377	116.067227	520	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491592	116.070164	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491515	116.069730	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489802	116.064685	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489214	116.064974	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490155	116.065341	520	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.482991	116.096012	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482102	116.098344	520	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.481190	116.097746	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.483619	116.104817	520	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.483198	116.103871	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482133	116.102802	520	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.485924	116.093454	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.486012	116.093386	520	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.495319	116.109131	520	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.494774	116.098993	520	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.491322	116.106428	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.491046	116.106697	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490180	116.106928	520	25	5	Potential nesting tree	No
Stag	31-08-2023	-32.454718	116.208145	520	7	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458863	116.227482	520	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458704	116.228385	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461248	116.219221	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460909	116.220055	520	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457849	116.220587	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456707	116.220697	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456360	116.219859	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456146	116.219431	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454692	116.218165	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460814	116.218167	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460800	116.217787	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461123	116.218394	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461680	116.218311	520	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461591	116.218545	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460622	116.216693	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460637	116.216446	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460412	116.216348	520	12	5	Potential nesting tree	No
Stag	01-09-2023	-32.460482	116.217939	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460538	116.218582	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460405	116.219037	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459672	116.218327	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459625	116.215838	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.459464	116.215721	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458285	116.218330	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458215	116.217739	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458120	116.218085	520	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468292	116.229796	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468700	116.233944	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469433	116.233064	520	20	5	Potential nesting tree	No
Stag	02-09-2023	-32.469720	116.233047	520	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.472746	116.117225	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472211	116.116027	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470822	116.115301	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471936	116.115044	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470914	116.114274	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.469880	116.114199	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469967	116.114059	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470230	116.113776	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470447	116.112387	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479346	116.103261	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478376	116.103606	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480060	116.108361	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479681	116.108535	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479394	116.108372	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479146	116.107986	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478896	116.107734	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478819	116.107208	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478616	116.107447	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478571	116.107010	520	14	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475236	116.122886	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475276	116.121972	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475217	116.121163	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474658	116.123600	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474436	116.123170	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474222	116.122821	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474767	116.122684	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474760	116.122771	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474861	116.122465	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474903	116.121549	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474603	116.121948	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.480281	116.124172	520	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476807	116.110623	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477101	116.110021	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476747	116.109251	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476770	116.109253	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477192	116.110134	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477325	116.111462	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477662	116.110588	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477909	116.110758	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478004	116.110836	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475654	116.113004	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474731	116.112440	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474644	116.111553	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492152	116.122225	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490387	116.102469	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469233	116.137132	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468776	116.137840	520	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469138	116.138638	520	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469612	116.138592	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469657	116.140024	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469708	116.140074	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469113	116.139856	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.467875	116.137104	520	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.467846	116.137253	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468069	116.141423	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470080	116.140626	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470526	116.140855	520	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.465982	116.134430	520	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466013	116.135759	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471092	116.134652	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475432	116.148606	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476805	116.143576	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476539	116.143260	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476199	116.143564	520	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475803	116.144483	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475740	116.144921	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475793	116.145073	520	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.479862	116.144824	520	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.480002	116.144516	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479814	116.143988	520	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477514	116.146213	520	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497168	116.119931	520	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468249	116.232191	520	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473565	116.225647	519	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482047	116.129860	519	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476846	116.135130	519	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469508	116.225207	519	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473158	116.224832	519	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469015	116.224090	519	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472588	116.171932	519	19	5	Potential nesting tree	No
Stag	07-07-2023	-32.473220	116.245672	519	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454197	116.209306	519	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.488896	116.186175	519	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490204	116.184280	519	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473017	116.226991	519	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467443	116.221891	519	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.467217	116.221895	519	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451002	116.061569	519	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450847	116.062586	519	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479059	116.131013	519	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479005	116.131379	519	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479430	116.131693	519	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450604	116.062968	516	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475828	116.128762	516	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472296	116.171376	516	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475476	116.128020	516	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.488539	116.108131	516	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.490698	116.108681	516	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.476049	116.166010	516	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472866	116.172141	516	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472143	116.227602	516	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.470266	116.225040	516	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450980	116.062523	516	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451084	116.062686	516	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475809	116.128955	516	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475724	116.127979	516	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476925	116.133331	516	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477680	116.133361	516	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450371	116.078026	516	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450970	116.076612	516	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451217	116.075551	516	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465681	116.233319	516	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468795	116.222911	515	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457145	116.220997	515	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.452264	116.214602	515	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.458102	116.218538	515	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480249	116.211166	515	32	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489507	116.182741	515	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.479033	116.087555	515	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470891	116.066165	515	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470647	116.065892	515	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472532	116.067005	515	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463735	116.106197	515	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489886	116.062112	515	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490217	116.063397	515	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453945	116.210152	512	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476028	116.127557	512	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451495	116.061290	512	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.498732	116.112754	512	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489294	116.121354	512	18	5	Potential nesting tree	No
Stag	02-11-2023	-32.489354	116.120885	512	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475432	116.159386	512	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454423	116.210123	512	13	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	11-09-2023	-32.488759	116.186157	512	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476054	116.133181	512	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479555	116.132282	512	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489130	116.138419	512	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450125	116.075854	512	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450153	116.075940	512	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.462772	116.232368	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434921	116.065264	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489950	116.067143	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478426	116.214380	510	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457160	116.219915	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456759	116.220500	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456781	116.219667	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456781	116.218444	510	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.461884	116.218429	510	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.451130	116.213865	510	15	5	Potential nesting tree	No
Stag	01-09-2023	-32.460155	116.217534	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460340	116.215624	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459945	116.216022	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460110	116.217247	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455998	116.216667	510	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456399	116.217582	510	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467409	116.231587	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467682	116.229748	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478538	116.214205	510	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469458	116.209049	510	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464014	116.232442	510	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463239	116.232774	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463107	116.226253	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463459	116.225931	510	22	5	Potential nesting tree	No
Stag	01-11-2023	-32.461596	116.222977	510	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439562	116.171211	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.437884	116.169645	510	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479119	116.086881	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478808	116.087783	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470895	116.066017	510	25	5	Potential nesting tree	No
Stag	03-11-2023	-32.470663	116.065767	510	28	5	Potential nesting tree	No
Stag	03-11-2023	-32.471839	116.065505	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472498	116.067326	510	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.436420	116.070044	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.436983	116.069119	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437058	116.069163	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437435	116.069005	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437273	116.068906	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.494719	116.075279	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.493621	116.075178	510	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.435592	116.070630	510	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.435436	116.071053	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435585	116.071668	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434186	116.065217	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475930	116.109169	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475859	116.109355	510	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479644	116.095563	510	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469321	116.067048	510	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469651	116.067015	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.471514	116.067048	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467338	116.060299	510	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467352	116.059456	510	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.455999	116.060186	510	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.459984	116.071615	510	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463336	116.107215	510	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463285	116.105468	510	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451231	116.107202	510	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453417	116.104452	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453171	116.104398	510	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.459895	116.104338	510	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468873	116.136545	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454036	116.211602	510	9	5	Potential nesting tree	No
Stag	25-08-2023	-32.453954	116.211846	510	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.454667	116.210795	510	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454546	116.210526	510	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453555	116.209789	510	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.455733	116.209673	510	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455093	116.208661	510	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454527	116.208725	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453944	116.208768	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454387	116.208485	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453814	116.208391	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457993	116.208224	510	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.458488	116.208648	510	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456256	116.208766	510	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459666	116.208760	510	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.460171	116.209045	510	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460045	116.208537	510	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459775	116.208397	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458016	116.210121	510	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457478	116.211491	510	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457888	116.211672	510	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457492	116.212488	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457894	116.212564	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458414	116.215495	510	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458584	116.215058	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458782	116.215095	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458951	116.217722	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488655	116.183518	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488035	116.182808	510	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.488474	116.182605	510	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.489807	116.182851	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490018	116.183827	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476983	116.212023	510	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.479816	116.212940	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469039	116.210037	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468817	116.210080	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469719	116.208094	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469905	116.207687	510	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489700	116.064514	510	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490386	116.063918	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489391	116.063697	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490151	116.068408	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490818	116.068349	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491896	116.068294	510	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.492019	116.068765	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490709	116.068939	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490127	116.067149	510	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490885	116.066669	510	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490597	116.066414	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490387	116.066333	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483887	116.096449	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.484269	116.096568	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.482759	116.096925	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482898	116.097093	510	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.484047	116.097076	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481035	116.097322	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481393	116.097501	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481116	116.097588	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.480851	116.097546	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482321	116.098678	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482602	116.100007	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481727	116.098851	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481327	116.099024	510	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.488231	116.094370	510	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.481135	116.094797	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490947	116.119385	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490980	116.119174	510	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.492234	116.119899	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489630	116.115289	510	16	5	Potential nesting tree	No
Stag	02-11-2023	-32.493717	116.112453	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493470	116.111814	510	26	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493579	116.111198	510	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477892	116.084597	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477892	116.083262	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477702	116.082704	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.475992	116.090371	510	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476186	116.089412	510	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476191	116.089241	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471026	116.064637	510	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470940	116.064462	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471091	116.064216	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471195	116.063806	510	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471294	116.063825	510	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470695	116.062413	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470819	116.061988	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471268	116.062493	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472272	116.064351	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472570	116.118020	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472605	116.118019	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472196	116.116739	510	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471672	116.116820	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471845	116.116313	510	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471772	116.116254	510	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471987	116.116307	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471660	116.114785	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470055	116.114544	510	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470225	116.114712	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470620	116.114553	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470428	116.113202	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470147	116.112973	510	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.469939	116.112523	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470065	116.112453	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479243	116.109809	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480681	116.106293	510	22	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478207	116.112415	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475654	116.122384	510	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475592	116.122328	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475666	116.121092	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475800	116.120680	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476022	116.122629	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.476081	116.122765	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476132	116.120715	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476321	116.122324	510	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476446	116.109384	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475283	116.110286	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475287	116.109957	510	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475097	116.108503	510	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474854	116.109391	510	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491051	116.121851	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491193	116.121900	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.490606	116.122512	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491911	116.122285	510	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492386	116.122535	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489090	116.096947	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489808	116.103525	510	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.490384	116.103135	510	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490653	116.102696	510	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469089	116.136760	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469714	116.137352	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469765	116.137298	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469814	116.137536	510	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469947	116.137939	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470859	116.138125	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469834	116.138180	510	17	5	Potential nesting tree	No
Stag	07-12-2023	-32.469580	116.138089	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469792	116.138278	510	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469803	116.138296	510	16	5	Potential nesting tree	No
Stag	07-12-2023	-32.470038	116.138277	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470466	116.138368	510	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469996	116.138639	510	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468194	116.137400	510	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470365	116.141120	510	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469914	116.141039	510	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466569	116.137491	510	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466501	116.136662	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466850	116.134392	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466691	116.135990	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466733	116.137294	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471101	116.133873	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471291	116.133577	510	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471243	116.134640	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.475956	116.148889	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475441	116.148896	510	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475096	116.146262	510	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475432	116.147511	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479521	116.142874	510	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478392	116.142774	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478758	116.143081	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479302	116.143412	510	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478900	116.143309	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479432	116.143620	510	13	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479811	116.143090	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479586	116.143340	510	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.479924	116.143509	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477396	116.144021	510	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477511	116.145006	510	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477717	116.145082	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477846	116.145452	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496293	116.119817	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496512	116.119123	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.497263	116.118360	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475324	116.157009	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475360	116.165873	510	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475399	116.166046	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475147	116.166060	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471775	116.244395	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458429	116.228331	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471298	116.115463	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.468652	116.209237	510	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470399	116.208143	510	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490808	116.061851	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490375	116.062649	510	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489641	116.067534	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490620	116.067273	510	27	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.491180	116.069455	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490209	116.069436	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490849	116.069231	510	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.490993	116.069264	510	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491175	116.069139	510	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482232	116.098017	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494380	116.111759	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479496	116.095714	510	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479830	116.109235	510	17	5	Potential nesting tree	No
Stag	05-12-2023	-32.475925	116.120683	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476148	116.120200	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466746	116.137586	510	10	5	Potential nesting tree	No
Stag	26-08-2023	-32.459275	116.227764	510	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.461496	116.220031	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458470	116.219257	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457936	116.218895	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457788	116.218661	510	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455119	116.218414	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460851	116.218270	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461004	116.218034	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460698	116.218119	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460474	116.214998	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460549	116.219042	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456589	116.217714	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468136	116.230752	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468489	116.233771	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468715	116.231252	510	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.471207	116.226436	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472750	116.118383	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471724	116.116033	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471357	116.115876	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470469	116.114439	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470633	116.113830	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470516	116.113387	510	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480367	116.103392	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480976	116.104102	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478996	116.103937	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479022	116.104620	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478899	116.107132	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478991	116.107118	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479072	116.107177	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478925	116.106936	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478485	116.106640	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478723	116.106569	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474980	116.122015	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475030	116.122297	510	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474896	116.123005	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474838	116.122761	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474984	116.122757	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478775	116.130157	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477002	116.109938	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477397	116.111239	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477627	116.111338	510	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474932	116.112117	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474662	116.111518	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491567	116.121438	510	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.488873	116.095362	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469495	116.137430	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469215	116.137413	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468647	116.137407	510	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468904	116.137582	510	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468736	116.137851	510	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469340	116.138389	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469659	116.138957	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469718	116.140023	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469498	116.140032	510	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469407	116.140026	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469193	116.139617	510	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469265	116.139347	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467936	116.141541	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470032	116.140767	510	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466375	116.137504	510	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466190	116.136931	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466105	116.136155	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466148	116.134866	510	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.465801	116.133925	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465594	116.134462	510	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476256	116.144618	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476581	116.144143	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476730	116.143339	510	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479179	116.144501	510	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478123	116.146480	510	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.496114	116.120028	510	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496091	116.120323	510	14	5	Potential nesting tree	No
Stag	08-12-2023	-32.496912	116.119355	510	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.481991	116.129821	509	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472507	116.171951	509	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.469833	116.238596	509	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.486852	116.182678	509	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.473510	116.227067	509	15	5	Potential nesting tree	No
Stag	31-10-2023	-32.466101	116.221011	509	19	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489243	116.121380	509	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.488905	116.106251	509	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435992	116.071385	509	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.460337	116.098210	509	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460959	116.099624	509	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.460895	116.098479	509	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489474	116.074179	509	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466612	116.058087	509	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463568	116.110044	509	12	5	Potential nesting tree	No
Stag	05-07-2023	-32.469970	116.245004	509	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453328	116.209255	509	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455509	116.208908	509	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.450955	116.061722	509	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475738	116.130814	509	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.477240	116.133142	509	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476347	116.135245	509	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476511	116.134994	509	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479521	116.132467	509	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.494647	116.100979	509	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455121	116.210300	509	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465703	116.232601	509	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471378	116.115808	508	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470676	116.113642	508	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470204	116.113517	508	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490201	116.063167	506	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.464315	116.222033	506	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472880	116.244234	506	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454414	116.209267	506	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.475517	116.166112	506	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.454498	116.210436	506	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454399	116.210484	506	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.470258	116.226190	506	17	5	Potential nesting tree	No
Stag	03-11-2023	-32.451487	116.063007	506	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474826	116.134077	506	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479395	116.132021	506	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489392	116.138349	506	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450694	116.078383	506	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.450096	116.075418	506	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451033	116.076471	506	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472793	116.223907	506	12	5	Potential nesting tree	No
Stag	01-09-2023	-32.460200	116.217721	505	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459982	116.218872	505	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467925	116.233959	505	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480320	116.214066	505	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477883	116.213902	505	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.477680	116.213810	505	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468784	116.209805	505	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468676	116.209745	505	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468658	116.209972	505	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.462520	116.221953	505	50	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471091	116.064947	505	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.489872	116.071996	505	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475746	116.110733	505	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458553	116.214489	505	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491347	116.070344	505	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474636	116.111172	505	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435422	116.067534	503	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435789	116.066287	503	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460857	116.099911	503	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467242	116.059899	503	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.464248	116.057756	503	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466543	116.058908	503	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.464529	116.109188	503	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.465016	116.108969	503	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463605	116.113291	503	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463673	116.114028	503	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463832	116.113369	503	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453605	116.105296	503	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453029	116.209112	503	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.472747	116.226942	503	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450412	116.063121	503	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451891	116.062931	503	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.475153	116.130587	503	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476151	116.127389	503	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475606	116.128295	503	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475813	116.134901	503	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475851	116.135076	503	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476726	116.135890	503	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478948	116.131663	503	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489126	116.072584	503	15	5	Potential nesting tree	No
Stag	07-12-2023	-32.466145	116.053904	503	15	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	07-07-2023	-32.475799	116.165449	501	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458514	116.228501	501	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.490099	116.106325	500	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.475785	116.165926	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475438	116.109553	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464094	116.113751	500	28	5	Potential nesting tree	No
Stag	05-07-2023	-32.473102	116.245365	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.478838	116.213120	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458444	116.215710	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463916	116.226840	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457088	116.219539	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468968	116.210242	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490275	116.069022	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452130	116.106819	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.470667	116.067107	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455791	116.219817	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457294	116.220276	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.442128	116.170960	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437380	116.068973	500	25	5	Potential nesting tree	No
Stag	31-10-2023	-32.463509	116.227575	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471397	116.170822	500	30	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.474057	116.165552	500	25	5	Potential nesting tree	No
Stag	07-07-2023	-32.470997	116.240926	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469013	116.242057	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.468791	116.242908	500	50	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469944	116.242824	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457513	116.219456	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457021	116.218458	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456970	116.220783	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461730	116.217997	500	15	5	Potential nesting tree	No
Stag	01-09-2023	-32.460233	116.218661	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460072	116.215352	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460003	116.215955	500	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455462	116.216942	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.455815	116.217767	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458150	116.218102	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458174	116.218431	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467203	116.232268	500	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.467528	116.233270	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467793	116.233877	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.467889	116.230486	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468059	116.232096	500	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.468900	116.222653	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.480886	116.210874	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480122	116.211740	500	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.463818	116.232289	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461863	116.229686	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.463395	116.225764	500	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.463937	116.225372	500	25	5	Potential nesting tree	No
Stag	01-11-2023	-32.463989	116.225378	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.462754	116.225348	500	18	5	Potential nesting tree	No
Stag	01-11-2023	-32.462874	116.221843	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.442048	116.170953	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438809	116.169886	500	25	5	Potential nesting tree	No
Stag	02-11-2023	-32.440686	116.170178	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.477995	116.086373	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.478186	116.086490	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.480328	116.086193	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479651	116.086625	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479620	116.086933	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478429	116.087999	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470395	116.065619	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.471653	116.065112	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472971	116.066747	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.437503	116.069430	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434658	116.070861	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435448	116.071320	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.435445	116.071855	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.434151	116.065142	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.459498	116.098583	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.460852	116.098370	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.489709	116.071919	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.489662	116.072025	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475844	116.111152	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475770	116.110218	500	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.479693	116.095420	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479619	116.095904	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479491	116.095716	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479333	116.095746	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479709	116.097449	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.470047	116.067188	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.469257	116.066552	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467462	116.060594	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467244	116.059306	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466865	116.059352	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.463396	116.058135	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.463797	116.056684	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454690	116.058999	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454674	116.059618	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.455790	116.060682	500	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	07-12-2023	-32.459767	116.069537	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463295	116.105576	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464380	116.112344	500	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.451254	116.107133	500	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.451198	116.106745	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.459826	116.104420	500	28	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-07-2023	-32.470606	116.238917	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472447	116.170073	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	25-08-2023	-32.457881	116.227118	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.457829	116.227345	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.457922	116.228572	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.458148	116.228802	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458298	116.229000	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457409	116.207889	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457515	116.207383	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459053	116.209275	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.458995	116.209731	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456674	116.209712	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457716	116.210787	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457066	116.213728	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457506	116.213606	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458413	116.213674	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.456570	116.215016	500	12	5	Potential nesting tree	No
Stag	02-09-2023	-32.458647	116.216693	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459207	116.216214	500	25	5	Potential nesting tree	No
Stag	02-09-2023	-32.459072	116.216347	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456936	116.216340	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.456936	116.215983	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457868	116.216118	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458140	116.216102	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459150	116.215988	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458953	116.215741	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458710	116.215779	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458554	116.215806	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458250	116.215917	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457517	116.215729	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457372	116.215866	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458668	116.218785	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458762	116.218476	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458447	116.218277	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458509	116.218122	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458566	116.218104	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458635	116.218019	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458732	116.217803	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458679	116.217745	500	204	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.458713	116.217474	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458612	116.217368	500	20	5	Potential nesting tree	No
Stag	02-09-2023	-32.458433	116.217113	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458591	116.217196	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458582	116.217227	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458779	116.217033	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.477453	116.212827	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.465289	116.231446	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464785	116.231410	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.463675	116.227994	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464239	116.228000	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.461923	116.227906	500	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.464168	116.227120	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469765	116.241080	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469724	116.241521	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469763	116.241545	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469613	116.241752	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.469399	116.242821	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468876	116.241844	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.468260	116.242157	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.468118	116.241681	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467777	116.241321	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467680	116.241427	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467685	116.240715	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467946	116.240520	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467633	116.240494	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467685	116.239621	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467961	116.239467	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467841	116.238865	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.467805	116.238830	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467620	116.238867	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467454	116.238970	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.467220	116.237895	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.464579	116.235975	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.465699	116.236014	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.465938	116.236670	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488468	116.182833	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488353	116.182991	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488079	116.182780	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.488426	116.182540	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.441711	116.167176	500	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.440111	116.167657	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439355	116.168969	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438499	116.168983	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438164	116.168846	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.438014	116.168570	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.438655	116.169228	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.440187	116.169211	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.478374	116.086089	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.478547	116.086139	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479367	116.085588	500	16	5	Potential nesting tree	No
Stag	02-11-2023	-32.480564	116.083843	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.479931	116.084554	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480078	116.084476	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.480056	116.085223	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.479296	116.085375	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453089	116.065423	500	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452046	116.065581	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452323	116.065285	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453662	116.065194	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453951	116.065048	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.454083	116.065045	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.453117	116.065044	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452081	116.064976	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451537	116.064947	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451232	116.064975	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451489	116.064563	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451951	116.064766	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454616	116.064641	500	23	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452290	116.064581	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450522	116.064179	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450602	116.064223	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451051	116.064365	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452139	116.064341	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452076	116.064076	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452569	116.064207	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453044	116.064135	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.453521	116.064167	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.455507	116.063912	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.455008	116.063632	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454902	116.063737	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454634	116.063238	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454101	116.063154	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.454244	116.063300	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452516	116.063941	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452462	116.063988	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.451885	116.064004	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452609	116.063745	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.451052	116.063506	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450825	116.063562	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.450708	116.063307	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.452036	116.063242	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452102	116.063181	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.452262	116.063301	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473017	116.130243	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472983	116.130235	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473667	116.130383	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.473423	116.129162	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473648	116.128845	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473643	116.127977	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.473640	116.127790	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473668	116.126381	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473874	116.128526	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.473920	116.128521	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474185	116.127460	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474345	116.125310	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474376	116.127077	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474596	116.128811	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474639	116.128017	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474651	116.126935	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474818	116.127403	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474781	116.127657	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.474686	116.127962	500	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.474681	116.128241	500	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477127	116.136455	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477263	116.136032	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476725	116.136077	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476586	116.136066	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479762	116.131756	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480203	116.131816	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480293	116.131938	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479791	116.132176	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480298	116.132149	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480943	116.132225	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480234	116.132667	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480801	116.132653	500	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480934	116.132756	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478977	116.132590	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.478391	116.132434	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478381	116.132527	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.483599	116.132488	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.483115	116.131567	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481563	116.131626	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.481928	116.131316	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482331	116.131280	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.482364	116.131264	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.482806	116.130717	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480383	116.130541	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480796	116.129936	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480768	116.129901	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.480471	116.129667	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.479654	116.130054	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.489478	116.139091	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454314	116.076371	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.454243	116.076353	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.453895	116.076211	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453432	116.075984	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452824	116.078506	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453203	116.077523	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.453279	116.077355	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452894	116.076629	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452879	116.075997	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.452625	116.076348	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452102	116.075795	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452177	116.076524	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452231	116.076531	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.452113	116.076602	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.451966	116.076039	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451995	116.075988	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451872	116.075894	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451797	116.076385	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451778	116.076682	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.452047	116.077060	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451626	116.076651	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451304	116.076109	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451345	116.076145	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.451342	116.077272	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463899	116.107870	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464434	116.107775	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.465039	116.108101	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.464194	116.108157	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463780	116.108253	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.465009	116.108515	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463286	116.111718	500	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463442	116.111952	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463380	116.112279	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.463407	116.112857	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.462837	116.112470	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.462903	116.112965	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.462816	116.113113	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463282	116.113087	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.463996	116.113123	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.452646	116.107094	500	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	08-12-2023	-32.452522	116.106412	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453687	116.105702	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.453404	116.105225	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490182	116.064417	500	22	5	Potential nesting tree	No
Stag	25-08-2023	-32.454955	116.212629	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454714	116.211690	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.454631	116.210826	500	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454352	116.210660	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454062	116.210782	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453631	116.210628	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453599	116.210608	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453346	116.210396	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453301	116.209702	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.453361	116.209691	500	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453809	116.209737	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454015	116.209855	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454469	116.209826	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454886	116.209817	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455587	116.209401	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454590	116.209575	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.454660	116.209711	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453277	116.209504	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455344	116.208718	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.455106	116.208733	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453328	116.208729	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.453130	116.208888	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452932	116.208865	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452548	116.208880	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452334	116.209108	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452422	116.209037	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.452625	116.208968	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455639	116.208517	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454112	116.208361	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453879	116.208473	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.453745	116.208436	500	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.455061	116.207495	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456173	116.208504	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457100	116.208360	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456945	116.208466	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457664	116.208288	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457795	116.208324	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457562	116.208757	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457168	116.208610	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457001	116.208994	500	1	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457973	116.208784	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.459020	116.208837	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459624	116.208679	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459826	116.209027	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459793	116.208955	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460052	116.209020	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460129	116.209016	500	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459897	116.208661	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.459851	116.208592	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456232	116.210135	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459694	116.210157	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459149	116.210180	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457092	116.210337	500	10	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	01-09-2023	-32.456862	116.210381	500	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456708	116.210401	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456533	116.211665	500	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457730	116.211642	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457701	116.211712	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458094	116.212087	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457549	116.212161	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457334	116.212111	500	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458239	116.212524	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458286	116.212435	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458711	116.212431	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458780	116.212390	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458310	116.212908	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457468	116.215534	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458205	116.215614	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458718	116.215602	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458550	116.215355	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457210	116.215185	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458551	116.214486	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458642	116.214236	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458552	116.214252	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.457975	116.214121	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.457429	116.214292	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459160	116.218566	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.459312	116.218289	500	14	5	Potential nesting tree	No
Stag	02-09-2023	-32.459207	116.216834	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458916	116.218230	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458790	116.217186	500	20	5	Potential nesting tree	No
Stag	11-09-2023	-32.488159	116.183426	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488442	116.184097	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488581	116.183013	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.488626	116.182980	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489422	116.183084	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489251	116.182306	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489643	116.182744	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489472	116.183266	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.489672	116.183230	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.490074	116.183058	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476901	116.211576	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476850	116.211660	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.477165	116.212309	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.476917	116.212663	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.477125	116.212500	500	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.481960	116.210850	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480660	116.212465	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.480734	116.212166	500	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	30-10-2023	-32.469948	116.210246	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.468366	116.210258	500	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469088	116.210564	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469386	116.210504	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469496	116.210510	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469598	116.210392	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469352	116.208444	500	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469341	116.208410	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469157	116.207914	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469694	116.208020	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.469786	116.207687	500	14	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	31-10-2023	-32.469952	116.207738	500	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.469888	116.208056	500	13	5	Potential nesting tree	No
Stag	31-10-2023	-32.469917	116.208015	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470001	116.207845	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.470006	116.207417	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490166	116.064519	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489984	116.064473	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489852	116.064550	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489725	116.064491	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489528	116.064314	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489143	116.064400	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.489018	116.064508	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489222	116.064178	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.491349	116.064034	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490737	116.063850	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490417	116.063809	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489824	116.063800	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489517	116.063966	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490341	116.067960	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490462	116.067889	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490022	116.068403	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.491825	116.068623	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490716	116.068669	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489933	116.068846	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489828	116.068965	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490342	116.068942	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.491171	116.069009	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489086	116.067103	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489390	116.067127	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490361	116.067099	500	14	5	Potential nesting tree	No
Stag	01-11-2023	-32.491046	116.066764	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490682	116.066730	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490448	116.066847	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490444	116.066532	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489597	116.066250	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.489287	116.066226	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483980	116.096370	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.484169	116.096388	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.483686	116.096657	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482986	116.096788	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.482873	116.097253	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481814	116.097329	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481321	116.097274	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.481186	116.096399	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.481039	116.096467	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482615	116.099136	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482539	116.099753	500	7	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482431	116.099872	500	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482622	116.100230	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482209	116.100311	500	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482260	116.100028	500	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.482264	116.098816	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.482028	116.098724	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481836	116.099015	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481465	116.098957	500	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.487878	116.094595	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.487547	116.093880	500	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	02-11-2023	-32.487828	116.093039	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481986	116.095158	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481491	116.095082	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481324	116.095088	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.481262	116.095069	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491093	116.119256	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491203	116.119391	500	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.491183	116.119433	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.491405	116.119864	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.491680	116.119276	500	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.491664	116.119400	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490152	116.116215	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490404	116.115959	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.491210	116.116071	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490293	116.115613	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.490067	116.115568	500	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.489658	116.115635	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.489567	116.115526	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.494113	116.111900	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.493777	116.111779	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.493548	116.111019	500	8	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.477474	116.085897	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477846	116.085736	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.478054	116.084838	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477774	116.084644	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477847	116.083118	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477775	116.083024	500	23	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477584	116.082795	500	50	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477453	116.082738	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477181	116.082319	500	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.477110	116.082306	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476699	116.091255	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476673	116.091094	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476323	116.090731	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476482	116.090710	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476365	116.090569	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476098	116.090291	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476498	116.090182	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476224	116.089934	500	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.476478	116.089284	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476422	116.088962	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.476292	116.089021	500	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470630	116.064752	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470496	116.064765	500	23	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470434	116.064764	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470203	116.064768	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470523	116.064356	500	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470937	116.062824	500	11	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470794	116.062751	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470682	116.062522	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470707	116.062482	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470530	116.061822	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.470654	116.061920	500	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	03-11-2023	-32.470771	116.061924	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472090	116.064609	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472132	116.064605	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472674	116.066320	500	17	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	03-11-2023	-32.472195	116.067622	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476990	116.139155	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477070	116.139307	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.476920	116.139524	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471274	116.116598	500	17	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471061	116.116356	500	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471383	116.116217	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472163	116.116232	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471505	116.114908	500	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470122	116.114757	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471257	116.114581	500	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.481185	116.105029	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480124	116.105236	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480425	116.109246	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480262	116.108911	500	21	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480109	116.109193	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479628	116.109292	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479975	116.109485	500	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.480218	116.110079	500	21	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.479878	116.109670	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479712	116.109604	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479345	116.109848	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480653	116.106863	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480604	116.106665	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478076	116.112508	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475601	116.122122	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475611	116.121340	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475695	116.121005	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475928	116.120930	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475784	116.122105	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475867	116.122242	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476223	116.120609	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476467	116.121395	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476215	116.122166	500	19	5	Potential nesting tree	No
Stag	05-12-2023	-32.476467	116.122200	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.476813	116.121887	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476650	116.111228	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476677	116.110291	500	19	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.476629	116.109255	500	510	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476424	116.109016	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476506	116.109197	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476550	116.110294	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476443	116.110837	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.476434	116.111321	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475364	116.110735	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475363	116.110568	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475235	116.110211	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475181	116.109394	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475075	116.108861	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474892	116.110582	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474929	116.109585	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474761	116.109146	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474720	116.109055	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474884	116.108745	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474836	116.108020	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474793	116.107904	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474499	116.107674	500	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474587	116.107999	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474690	116.108140	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491282	116.122295	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491060	116.122236	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490651	116.122612	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491993	116.122377	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492162	116.122419	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488830	116.096437	500	11	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490303	116.103167	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490538	116.102898	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493747	116.093085	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493800	116.092942	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469967	116.137571	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469949	116.137807	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470115	116.137697	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.470730	116.137864	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470557	116.138094	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470421	116.138054	500	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469637	116.138332	500	14	5	Potential nesting tree	No
Stag	07-12-2023	-32.469967	116.138369	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470169	116.138351	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470290	116.138262	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470669	116.138347	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470721	116.138356	500	19	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470446	116.138675	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470379	116.138560	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467911	116.137553	500	9	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467532	116.140785	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469938	116.141382	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470158	116.141360	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469927	116.141165	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470050	116.141050	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466437	116.138058	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466569	116.137548	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466493	116.136393	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466487	116.135417	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466484	116.135410	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466633	116.135064	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466870	116.136550	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466825	116.136712	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466851	116.136746	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466623	116.136978	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466804	116.137201	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466909	116.137198	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466676	116.137289	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466992	116.137481	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466972	116.137716	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470668	116.133812	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470869	116.133882	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.471082	116.134539	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471348	116.134626	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470876	116.134815	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475779	116.149164	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.474848	116.148020	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475254	116.145547	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475049	116.145304	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.475175	116.145952	500	14	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475416	116.146455	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475336	116.146816	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475445	116.147214	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475310	116.147025	500	15	5	Potential nesting tree	No
Stag	08-12-2023	-32.475140	116.147239	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479072	116.142955	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478888	116.142707	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478773	116.142714	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478626	116.142743	500	13	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479406	116.143344	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479357	116.143832	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479219	116.143858	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479992	116.143234	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479766	116.143577	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479940	116.143557	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477414	116.144979	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477842	116.145454	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477518	116.145457	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477055	116.145368	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496132	116.119872	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496208	116.119895	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496689	116.118884	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496668	116.118791	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496575	116.118595	500	15	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.495561	116.118163	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471659	116.246080	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471609	116.246146	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471792	116.245554	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471565	116.245642	500	16	5	Potential nesting tree	No
Stag	05-07-2023	-32.470988	116.245555	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.470838	116.245538	500	16	5	Potential nesting tree	No
Stag	05-07-2023	-32.470271	116.245705	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.471228	116.245260	500	16	5	Potential nesting tree	No
Stag	05-07-2023	-32.472556	116.244958	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472319	116.244446	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472222	116.244593	500	12	5	Potential nesting tree	No
Stag	05-07-2023	-32.472482	116.244503	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472496	116.244506	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472832	116.244402	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473071	116.244567	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473082	116.244898	500	16	5	Potential nesting tree	No
Stag	05-07-2023	-32.472917	116.244814	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473225	116.245306	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473382	116.245313	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.476360	116.161730	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475359	116.154587	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475053	116.156563	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475270	116.156831	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475518	116.157646	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475667	116.158092	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475631	116.158341	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475505	116.158411	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475460	116.158770	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475791	116.158952	500	18	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475742	116.159408	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475807	116.159331	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475952	116.159206	500	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475880	116.159594	500	16	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.475996	116.160017	500	12	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.476010	116.160091	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.473077	116.171734	500	16	5	Potential nesting tree	No
Blackbutt (Eucalyptus patens)	06-07-2023	-32.472826	116.171391	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472688	116.171366	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.470847	116.171272	500	18	5	Potential nesting tree	No
Stag	06-07-2023	-32.472848	116.171513	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472934	116.171636	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472637	116.172337	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472522	116.172531	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.472157	116.172279	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.472245	116.172616	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471669	116.173362	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.471572	116.173172	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475204	116.169866	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.473001	116.168540	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.473302	116.168003	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470841	116.244915	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.471498	116.244875	500	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.471807	116.244609	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.471779	116.243985	500	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.471906	116.244040	500	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.472028	116.243930	500	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.471581	116.243927	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470440	116.243958	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.470459	116.244059	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469792	116.243936	500	16	5	Potential nesting tree	No
Stag	07-07-2023	-32.469239	116.244183	500	12	5	Potential nesting tree	No
Stag	07-07-2023	-32.473597	116.224445	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.473313	116.224580	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-07-2023	-32.473255	116.224462	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.472999	116.224588	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-07-2023	-32.469877	116.242766	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.458977	116.227389	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477140	116.138552	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477038	116.139108	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.477067	116.139428	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471663	116.118353	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471905	116.115233	500	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.475884	116.143901	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.472165	116.244591	500	14	5	Potential nesting tree	No
Stag	07-07-2023	-32.470693	116.241465	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-07-2023	-32.475462	116.161304	500	28	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	11-09-2023	-32.479283	116.213414	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.464212	116.232062	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.459458	116.216199	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.458971	116.217777	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477558	116.145450	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-07-2023	-32.473189	116.244788	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490056	116.062021	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-10-2023	-32.490101	116.062760	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490688	116.063177	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490812	116.063408	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489780	116.063288	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489374	116.067312	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489596	116.067568	500	25	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490155	116.067594	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490762	116.067222	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490524	116.067395	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490221	116.067455	500	27	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.490136	116.067397	500	30	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-10-2023	-32.489646	116.067510	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490894	116.069692	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490356	116.069185	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490448	116.069222	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490736	116.069111	500	25	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.488952	116.064774	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-11-2023	-32.489811	116.064711	500	20	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-11-2023	-32.486187	116.092709	500	25	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-11-2023	-32.439640	116.168891	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-11-2023	-32.490625	116.066447	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	03-11-2023	-32.471137	116.062891	500	10	5	Potential nesting tree	No
Stag	25-08-2023	-32.458536	116.227639	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459191	116.227516	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.459325	116.227720	500	10	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458722	116.228284	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.457676	116.224723	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461659	116.219815	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	26-08-2023	-32.461679	116.219520	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.461561	116.220103	500	18	5	Potential nesting tree	No
Stag	26-08-2023	-32.461202	116.221366	500	14	5	Potential nesting tree	No
Stag	26-08-2023	-32.461055	116.221292	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.460842	116.219439	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458834	116.219169	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458346	116.219100	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458330	116.219709	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458029	116.220219	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458037	116.220199	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	26-08-2023	-32.458125	116.219324	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457833	116.219235	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.457753	116.221628	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457796	116.221379	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457906	116.221037	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.457803	116.218995	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456625	116.219142	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456536	116.220046	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456685	116.220363	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456252	116.218492	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456175	116.218522	500	10	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.456195	116.219840	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456228	116.220372	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.456225	116.220470	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455878	116.219470	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455956	116.219400	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454832	116.218852	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.454804	116.218204	500	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	31-08-2023	-32.454672	116.218094	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.460927	116.218676	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.461001	116.218033	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455578	116.216912	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	31-08-2023	-32.455496	116.216872	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460625	116.219002	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460613	116.218591	500	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460709	116.218358	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460706	116.218164	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.460667	116.218096	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460754	116.217849	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460708	116.217827	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460450	116.215074	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460527	116.215541	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460321	116.215566	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460353	116.216195	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.460532	116.216847	500	16	5	Potential nesting tree	No
Stag	01-09-2023	-32.459724	116.218705	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459764	116.217575	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459733	116.216313	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459727	116.215643	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459547	116.215644	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459561	116.215800	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459572	116.215800	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459368	116.215685	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.459608	116.216512	500	18	5	Potential nesting tree	No
Stag	01-09-2023	-32.459433	116.216612	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456675	116.218149	500	24	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456605	116.217938	500	24	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456902	116.217244	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456947	116.217744	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.456788	116.217943	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.456866	116.218195	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457297	116.217400	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	01-09-2023	-32.457252	116.218193	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457671	116.217642	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457641	116.217392	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457883	116.216932	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457823	116.217673	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457747	116.218023	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.457750	116.218400	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	01-09-2023	-32.458294	116.218404	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468754	116.232440	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468604	116.233451	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.468692	116.232614	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.469531	116.232270	500	22	5	Potential nesting tree	No
Marri (Corymbia calophylla)	02-09-2023	-32.469698	116.234086	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	02-09-2023	-32.471814	116.226756	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472669	116.117275	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472688	116.117212	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.472446	116.116717	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.471729	116.115987	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471805	116.115621	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470273	116.115370	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470581	116.115239	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471459	116.115038	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471626	116.115126	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.471085	116.114400	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.470898	116.114091	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470765	116.114313	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470425	116.114499	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470087	116.113983	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470448	116.114022	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470441	116.114134	500	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470694	116.114070	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470600	116.113999	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470312	116.113694	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.469965	116.113585	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470404	116.112093	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470210	116.112195	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470144	116.112114	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.470211	116.112359	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479943	116.103535	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479703	116.103755	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479915	116.103728	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480074	116.103760	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	04-12-2023	-32.480040	116.103842	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480349	116.103576	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480631	116.103571	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480749	116.103448	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480859	116.103605	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.480378	116.103841	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479374	116.103245	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479039	116.103512	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.479017	116.103404	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478591	116.103332	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478864	116.103589	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478577	116.103795	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478773	116.104782	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	04-12-2023	-32.478600	116.104671	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479250	116.104902	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479284	116.104979	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479027	116.104945	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478900	116.104982	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479921	116.108362	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480131	116.108815	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480157	116.108847	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480629	116.108638	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.480539	116.108803	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479500	116.108504	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479613	116.108375	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479192	116.108184	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.479263	116.108174	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.479102	116.107897	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.478830	116.107825	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478615	116.107798	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479145	116.107452	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479095	116.107163	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479262	116.107236	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478813	116.106568	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.479076	116.106480	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478458	116.106198	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478454	116.106400	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478224	116.112570	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478134	116.112750	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478134	116.112797	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478129	116.113021	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475211	116.122969	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475271	116.122895	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475298	116.122650	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475449	116.122449	500	16	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475383	116.122505	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475375	116.122143	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.475468	116.122136	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475447	116.121856	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475440	116.121672	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475368	116.121084	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475233	116.120928	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475004	116.120885	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475012	116.121122	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474987	116.121225	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475195	116.121849	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475132	116.121815	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475084	116.122631	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475129	116.122698	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.475101	116.123154	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474664	116.123086	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474783	116.123356	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474869	116.123536	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474739	116.123756	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474554	116.123972	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474515	116.123181	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474259	116.123115	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474229	116.122967	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474460	116.123006	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474691	116.122909	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474976	116.122825	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474796	116.122202	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474762	116.122265	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474734	116.122084	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474792	116.122016	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474959	116.121646	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474593	116.121530	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474588	116.121781	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	05-12-2023	-32.474491	116.122005	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.474393	116.121828	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.482003	116.125854	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.482026	116.126148	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.482057	116.126493	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.482010	116.126750	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.482008	116.126898	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478973	116.129864	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	05-12-2023	-32.478901	116.130182	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477032	116.111707	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477010	116.109830	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477567	116.110525	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477684	116.110669	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477630	116.110710	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477741	116.111356	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477794	116.111085	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477878	116.110622	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477770	116.110511	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.478101	116.110541	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477941	116.110657	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.477314	116.111501	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.477158	116.112045	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475668	116.113250	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.475397	116.112582	500	14	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475524	116.112346	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475016	116.113328	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.475202	116.113441	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474972	116.112519	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474768	116.112410	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474887	116.112257	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.474881	116.112000	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.474734	116.112049	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491565	116.121528	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491730	116.121757	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491214	116.121232	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491290	116.121044	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491482	116.121043	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.491553	116.120677	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.491732	116.120999	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.492239	116.122002	500	12	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.491824	116.122214	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.488647	116.095684	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490256	116.102817	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-12-2023	-32.490261	116.102708	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.490483	116.102090	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493929	116.093138	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493645	116.092555	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	06-12-2023	-32.493705	116.091247	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.468826	116.137042	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469021	116.137109	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469081	116.136846	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469239	116.137627	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469495	116.138045	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469418	116.138034	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468962	116.138398	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469302	116.138340	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469137	116.138710	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469471	116.138634	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469654	116.138831	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469395	116.138929	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469604	116.139842	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.469389	116.140041	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469335	116.140017	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469293	116.139523	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469134	116.139314	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468006	116.137064	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467798	116.137230	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467645	116.137451	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467689	116.137501	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467705	116.137530	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.468063	116.141522	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467907	116.140945	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.467732	116.140550	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469988	116.140616	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.469983	116.140594	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470268	116.140530	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470513	116.140705	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470533	116.140973	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470381	116.141195	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470326	116.141067	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.470219	116.141082	500	20	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Marri (Corymbia calophylla)	07-12-2023	-32.470120	116.140856	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466306	116.137439	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466244	116.137298	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466216	116.136961	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466320	116.136866	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.466269	116.136011	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466330	116.135819	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466160	116.135048	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.466180	116.134988	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465507	116.134598	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.465996	116.135334	500	8	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465948	116.135888	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.465696	116.135781	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.471174	116.133787	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471351	116.133632	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	07-12-2023	-32.471012	116.134544	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.471061	116.134759	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475309	116.148997	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475331	116.148734	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	07-12-2023	-32.475099	116.147608	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476379	116.144235	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476965	116.143237	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476883	116.143317	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.476782	116.143270	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476657	116.143463	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476430	116.143351	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476191	116.143263	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476208	116.143481	500	16	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.476462	116.143554	500	14	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.476540	116.143581	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476033	116.143693	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475731	116.143472	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475883	116.143847	500	16	5	Potential nesting tree	No
Stag	08-12-2023	-32.475652	116.144449	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476136	116.144378	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475971	116.144824	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476159	116.144989	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.476030	116.144978	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.475983	116.145413	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.476390	116.145915	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.476502	116.145840	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479132	116.144202	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479082	116.144237	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478823	116.144061	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.479417	116.144527	500	22	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479681	116.144709	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479345	116.144728	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478954	116.144794	500	20	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479068	116.144913	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479332	116.145179	500	18	5	Potential nesting tree	No
Marri (Corymbia calophylla)	08-12-2023	-32.479658	116.144227	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479704	116.144220	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.479687	116.143755	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478323	116.146391	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.477496	116.146130	500	18	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478328	116.146264	500	16	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.478173	116.145713	500	18	5	Potential nesting tree	No

Tree taxa	Date	Latitude	Longitude	DBH (mm)	Height est. (m)	Bamford tree rank	Tree category	Signficant Tree
Jarrah (Eucalyptus marginata)	08-12-2023	-32.496325	116.120171	500	12	5	Potential nesting tree	No
Stag	08-12-2023	-32.497102	116.119862	500	12	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	08-12-2023	-32.497383	116.119722	500	14	5	Potential nesting tree	No
Stag	08-12-2023	-32.497244	116.119655	500	14	5	Potential nesting tree	No
Stag	08-12-2023	-32.497064	116.119747	500	14	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	30-10-2023	-32.469122	116.210199	500	17	5	Potential nesting tree	No
Jarrah (Eucalyptus marginata)	25-08-2023	-32.455952	116.211362	468	13	5	Potential nesting tree	No
Marri (Corymbia calophylla)	11-09-2023	-32.478276	116.215550	445	15	5	Potential nesting tree	No
Marri (Corymbia calophylla)	06-07-2023	-32.475251	116.169612	433	9	5	Potential nesting tree	No
Stag	01-11-2023	-32.464410	116.221968	353	6	5	Potential nesting tree	No



Making Sustainability Happen

Desktop Assessment Memo

Huntly Mine – Myara Region

Alcoa of Australia Ltd

181 - 205 Davy Road, Booragoon WA 6154,
Australia

Prepared by:

SLR Consulting Australia

Level 1, 500 Hay Street, Subiaco WA 6008,
Australia

SLR Project No.: 675.VX5890.00001

30 April 2024

Revision: 1.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	30 April 2024	L. Berry	E. Webb	E. Webb

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Alcoa of Australia Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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Appendices

Appendix A **Maps**

Appendix B **Literature Review Summary**

Appendix C **Fauna Desktop Assessment Results**

1.0 Introduction

1.1 The Project

Alcoa of Australia Ltd (Alcoa) commissioned SLR Consulting Australia Pty Ltd (SLR) to undertake a desktop assessment for terrestrial vertebrate fauna within 73 individual polygons (the Desktop Survey Area) covering 37.7 ha within the Huntly Mine Myara region (the Project). This desktop assessment is an addendum to a 2023 targeted significant fauna survey undertaken by SLR, which was for Alcoa's Mining Management Plan (MMP) assessment by the Mining Management Planning Liaison Group (MMPLG). The Desktop Survey Area is located approximately 20 km northeast of the Pinjarra townsite, in the Jarrah Forest bioregion of Western Australia (**Map 1**). All maps are provided in **Appendix A**.

1.2 Objective and Scope

The objective of the survey was to identify key fauna values within the Desktop Survey Area as part of the MMP assessment process for the Project. The scope of work comprised a desktop assessment of the Huntly Mine Myara region including an overview of terrestrial vertebrate fauna habitat, terrestrial vertebrate fauna inventory, and likelihood of significant species present.

2.0 Methods

2.1 Literature Review

The literature review considered a selection of relevant reports detailing assessments undertaken in the region that were either publicly available from sources such as the Index of Biodiversity Surveys for Assessments (IBSA) website, the EPA Consultation Hub, or internet searches, or provided by the client. These reports are listed below, summarised in **Appendix B**, and their locations in relation to the current Desktop Survey Area, as represented by their nearest point, are shown in **Map 2:**

- *Chuditch Pre-mine Survey, Myara* (Way, 2013), intersects the Desktop Survey Area.
- *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006), intersects the Desktop Survey Area.
- *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North* (GHD, 2021b), 1 km north of the Desktop Survey Area.
- *Black Cockatoo Habitat Assessment - Pinjarra Racecourse* (Harewood, 2019), 6 km west of the Desktop Survey Area.
- *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a), 8 km south of the Desktop Survey Area.
- *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment* (GHD, 2012), 10 km north of the Desktop Survey Area.
- *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)* (Harewood, 2017), 17.5 km south of the Desktop Survey Area.

2.2 Database Searches

Database searches were undertaken to compile a list of flora and fauna known to occur in the vicinity (i.e. within a 20 km radius) of the Desktop Survey Area and identify significant flora, fauna, and ecological communities with potential to occur within the Desktop Survey Area (**Table 1**).

Table 1: Database search details

Database name	Date received	Search target	Buffer around the Desktop Survey Area
Threatened and Priority Fauna database search (DBCA, 2023a)	08 June 2023	Threatened and Priority fauna	20 km
Protected Matters Search Tool (PMST) (DAWE, 2023)	14 July 2023	Threatened flora, fauna, and ecological communities	20 km
NatureMap (DBCA, 2023b)	07 June 2023	Fauna	20 km

2.3 Likelihood of Occurrence

Significant fauna taxa identified during the desktop assessment were assessed to determine the likelihood of their occurrence within the Desktop Survey Area before and after the field survey. The assessment used the likelihood of occurrence criteria presented in **Table 2**.

Taxa listed as Marine only under the EPBC Act were not considered to be significant taxa because the Marine listing does not constitute MNES under the EPBC Act. Additionally, erroneous records (i.e. records that occur well outside a taxon's known distribution) were excluded from consideration. Only taxa that have been recorded within the Desktop Survey Area or were assessed as having a high or medium likelihood of occurrence are discussed in detail.

Table 2: Likelihood of occurrence criteria

Rank	Criteria
Recorded	The taxon was recorded within the Desktop Survey Area during the current survey.
Previously Recorded	The taxon has been previously recorded within the Desktop Survey Area according to database search or literature review results.
High (Likely to occur)	The taxon has been recorded within the vicinity of the Desktop Survey Area more than once in the last 15 years and suitable habitat is present within the Desktop Survey Area.
Medium (May occur)	There are existing records of the taxon within the Desktop Survey Area, however the taxon has not been recorded within the Desktop Survey Area in the last 15 years or suitable habitat within the Desktop Survey Area is marginal or limited in extent.
Low (Unlikely to occur)	Suitable habitat is not present within the Desktop Survey Area, or the taxon is very infrequently recorded in the locality despite reasonable previous search effort, or the taxon is believed to be extinct or locally extinct.

2.4 Extrapolated Fauna Habitat

Fauna habitat mapping was extrapolated based on a combination of existing literature, vegetation mapping, and aerial imagery. Polygons were digitised using GIS software.

3.0 Results

3.1 Potential Fauna Assemblage

The database searches and literature review identified 218 terrestrial vertebrate fauna taxa occurring within the vicinity of the Desktop Survey Area, of which 36 are significant (Threatened or Priority):

- 156 birds, of which 31 are significant.
- 30 mammals, of which 12 are significant.
- 22 reptiles, of which 2 are significant.
- 10 amphibians, of which none are significant.

Key findings of the literature review are summarised in **Appendix B**, a complete list of fauna taxa recorded within the vicinity of the Desktop Survey Area is presented in **Appendix C**, and DBCA database search results are displayed in **Map 3**.

3.2 Significant Fauna

Thirteen significant fauna taxa were assessed as having a high likelihood of occurrence within the Desktop Survey Area:

- Woylie (*Bettongia penicillata ogilbyi*) - CR, EN (BC Act; EPBC Act).
- Numbat (*Myrmecobius fasciatus*) – EN (BC Act; EPBC Act).
- Baudin's Cockatoo (*Zanda baudinii*) – EN (BC Act; EPBC Act), recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).
- Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act), recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).
- Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – VU (BC Act; EPBC Act), recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).
- Chuditch (*Dasyurus geoffroii*) – VU (BC Act; EPBC Act), recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).
- Quokka (*Setonix brachyurus*) – VU (BC Act; EPBC Act), recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).
- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – CD (BC Act), recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).
- Quenda (*Isoodon fusciventer*) – P4 (DBCA), recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).
- Western Brush Wallaby (*Notamacropus irma*) – P4 (DBCA), recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).
- Western False Pipistrelle (*Falsistrellus mackenziei*) – P4 (DBCA).
- Dell's Ctenotus (*Ctenotus delli*) – P4 (DBCA).

- Peregrine Falcon (*Falco peregrinus*) – OS (DBCA).

Four significant fauna taxa were assessed as having a medium likelihood of occurring within the Desktop Survey Area:

- Noisy Scrubbird (*Atrichornis clamosus*) – EN (BC Act; EPBC Act).
- Malleefowl (*Leipoa ocellata*) – VU (BC Act; EPBC Act).
- Tammar Wallaby (*Notamacropus eugenii derbianus*) - P4 (DBCA).
- Southern Death Adder (*Acanthophis antarcticus*) – P4 (DBCA).

The complete results of the significant fauna likelihood of occurrence assessment including justification for the assessment outcome for each taxon is provided in **Table 4**.

3.3 Extrapolated Fauna Habitat

One fauna habitat, Jarrah-Marri Forest, is expected to occur within the Desktop Survey Area (**Map 4**). Jarrah-Marri Forest is described below in **Table 3**.

Table 3: Extrapolated fauna habitat expected to occur within the Desktop Survey Area

Fauna habitat	Total area, percentage of Desktop Survey Area	Habitat description
Jarrah-Marri Forest	37.7 ha, 100%	Undulating plains and hills over clay loam soils and laterite rock. Vegetation consists of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) open forest with patchy *Allocasuarina Fraseriana* over a mixed midstorey typically dominated by *Bossiaea aquifolium, Xanthorrhoea preissi,* and *Macrozamia fraseri*, over sedges and bracken. Disturbances consisted primarily of historic logging and bushfire. Microhabitats present within this habitat include hollows in trees and logs, leaf litter and woody debris. This habitat is core habitat Chuditch and supporting habitat for Woylie and Quokka. The canopy is core habitat for black cockatoos.

Table 4: Significant fauna likelihood of occurrence within the Desktop Survey Area

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
BIRDS						
Acanthizidae	*Aphelocephala leucopsis* Southern Whiteface	-	VU	Sparse open forest/woodland; inland scrubs e.g. mallee, mulga cypress pine; saltbush, dead trees, stumps, black box/lignum flats (Pizzey and Knight, 2001).	No nearby records identified.	Low No nearby records, and limited suitable habitat within the Desktop Survey Area.
Accipitridae	*Elanus scriptus* Letter-winged Kite	P4	-	Open country and grasslands of arid and semi-arid interior (Morcombe, 2003).	No DBCA records, one record from literature 10 km north of the Desktop Survey Area in 2011 (GHD, 2012).	Low No suitable habitat within the Desktop Survey Area.
Anatidae	*Oxyura australis* Blue-billed Duck	P4	-	Densely vegetated freshwater lakes, swamps, dams (Morcombe, 2003).	Eighteen DBCA records within 20 km of the Desktop Survey Area, including six records 13 km west of the Desktop Survey Area in 1991 (DBCA, 2023a).	Low No suitable habitat within the Desktop Survey Area.
Ardeidae	*Botaurus poiciloptilus* Australasian Bittern	EN	EN	Freshwater wetlands with heavy vegetation, shrubbery, reedbeds, sedges (Morcombe, 2003).	No nearby records identified.	Low No nearby records, limited suitable habitat within the Desktop Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Atrichornithidae	*Atrichornis clamosus* Noisy Scrubbird	EN	EN	Dense heaths, rushes, tall sedges, under stunted trees in coastal hills, coastal swamps (Morcombe, 2003).	One DBCA record 19 km south of the Desktop Survey Area, of which is a translocated individual (DBCA, 2023a).	Medium The Desktop Survey Area is outside the typical distribution of the taxon; however, species may occur due to translocations to the south of the Desktop Survey Area.
Cacatuidae	*Calyptorhynchus banksii naso* Forest Red-tailed Black Cockatoo	VU	VU	Tall eucalypt forest, woodland, feeds on seeds of large-fruited eucalypts (Morcombe, 2003).	352 DBCA records within 20 km of the Desktop Survey Area, including one record within 600 m east of the Desktop Survey Area in 2005 (DBCA, 2023a). Recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).	High Recent nearby records, suitable habitat present.
Cacatuidae	*Zanda baudinii* Baudin's Cockatoo	EN	EN	Forests, farm trees; feeds on Marri and wood-boring insects (Morcombe, 2003).	153 DBCA records within 20 km of the Desktop Survey Area, including 300 m west of the Desktop Survey Area in 2005 (DBCA, 2023a). Recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).	High Recent nearby records, suitable habitat present.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Cacatuidae	*Zanda latirostris* Carnaby's Cockatoo	EN	EN	Forests, woodlands, heathlands, farms; feeds on Banksias and Hakeas, pine plantations (Morcombe, 2003).	717 DBCA records within 20 km of the Desktop Survey Area, including three records within the Desktop Survey Area in 2007, 2008 and 2009 (DBCA, 2023a). Recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).	High Recent nearby records, suitable habitat present.
Cacatuidae	*Cacatua pastinator pastinator* Muir's Corella	CD	-	Wheat and sheep farming country, with remnant native forest, woodland, scrub, sandplain heath (Pizzey and Knight, 2001).	Two DBCA records 8 km north of the Desktop Survey Area (DBCA, 2023a).	Low Restricted to the surrounding areas of Lake Muir.
Charadriidae	*Charadrius leschenaultii* Greater Sand Plover	VU	VU, MI, MA	Tidal flats, beaches (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Charadriidae	*Charadrius mongolus* Lesser Sand Plover	EN	EN, MI, MA	Tidal flats (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Diomedeidae	*Diomedea exulans* Wandering Albatross	VU	VU, MI, MA	Breeds on South Georgia and sub-Antarctic Island of Indian Ocean with circumpolar distribution in Southern Ocean (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Diomedeidae	*Diomedea epomophora* Southern Royal Albatross	VU	VU, MI, MA	Breeds on NZ sub-Antarctic islands with circumpolar distribution in Southern Ocean south, rare off Southwestern Australia (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Diomedeidae	*Thalassarche impavida* Campbell Island Albatross	VU	VU, MI, MA	Oceanic (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Diomedeidae	*Thalassarche cauta steadi* White-capped Albatross	VU	VU, MI, MA	Inshore and offshore waters (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Diomedeidae	*Thalassarche melanophris* Black-browed Albatross	EN	VU, MI, MA	Oceanic (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Diomedeidae	*Diomedea sanfordi* Northern Royal Albatross	EN	EN, MI, MA	Breeds on Chatham Island, some NZ sub-Antarctic Islands and South Island, NZ with circumpolar distribution mostly in Pacific sector of Southern Ocean (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Diomedeidae	*Diomedea dabbenena* Tristan Albatross	CR	EN, MI, MA	Oceanic (Pizzey and Knight, 2001).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Diomedeidae	*Diomedea amsterdamensis* Amsterdam Albatross	CR	EN, MI, MA	Oceanic (Pizzey and Knight, 2001).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Falconidae	*Falco hypoleucos* Grey Falcon	VU	VU	Open plains with treed watercourses in arid inland (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Falconidae	*Falco peregrinus* Peregrine Falcon	OS	-	Most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species (Menkhorst et al., 2017).	Eleven DBCA records within 20 km of the Desktop Survey Area, including 7.2 km north of the Desktop Survey Area in 2010 (DBCA, 2023a).	High Records <10 km from the Desktop Survey Area and may use the Desktop Survey Area for hunting.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Laridae	*Sternula nereis* Fairy Tern	VU	VU	Coastal, bays, inlets, beaches, salt ponds and lakes (Morcombe, 2003).	Four DBCA records 17.6 km east of the Desktop Survey Area between 1990 to 1991 (DBCA, 2023a).	Low No suitable habitat within the Desktop Survey Area.
Megapodiidae	*Leipoa ocellata* Malleefowl	VU	VU	Unburned mallee and woodland with abundant litter and low scrub (Morcombe, 2003).	Eighteen DBCA records within 18 km of the Desktop Survey Area, including six records within the 500 m of the Desktop Survey Area as recently as 2004 (DBCA, 2023a).	Medium Species is typically considered locally extinct; however, records may be associated with translocations at the nearby Dryandra Woodland 67 km southeast of the Desktop Survey Area.
Procellariidae	*Macronectes halli* Northern Giant Petrel	MI	VU, MI, MA	Sheltered estuaries, salt marsh lagoons, salt lakes, salty edges of waterways, brackish pools, claypans (Morcombe, 2003).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Procellariidae	*Macronectes giganteus* Southern Giant Petrel	MI	EN, MI, MA	Southern oceans, bays, harbours (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Rostratulidae	*Rostratula australis* Australian Painted Snipe	EN	EN, MA (overfly marine area)	Well vegetated surrounds and shallows of wetlands (Morcombe, 2003).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Scolopacidae	*Tringa brevipes* Grey-tailed Tattler	MI, P4	MI, MA	Coastal, tidal flats, rocky shorelines (Menkhorst et al., 2017).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Desktop Survey Area.
Scolopacidae	*Calidris canutus* Red Knot	EN	EN, MI, MA (overfly marine area)	Coastal, extensive firm tidal flats (Menkhorst et al., 2017).	Two DBCA records 17.6 km west of the Desktop Survey Area in 1991 (DBCA, 2023a).	Low No suitable habitat within the Desktop Survey Area.
Scolopacidae	*Calidris ferruginea* Curlew Sandpiper	CR	CR, MI, MA (overfly marine area)	Inter-tidal mudflats of estuaries, lagoons, mangrove channels, dams, floodwaters, flooded saltbush surrounds of inland lakes (Morcombe, 2003).	Two DBCA records 17.6 km west of the Desktop Survey Area in 1991 (DBCA, 2023a).	Low No suitable habitat within the Desktop Survey Area.
Scolopacidae	*Calidris tenuirostris* Great Knot	CR	CR, MI, MA (overfly marine area)	Coastal, tidal flats, beaches (Menkhorst et al., 2017).	Four DBCA records 17.3 km west of the Desktop Survey Area between 1990 to 1991 (DBCA, 2023a).	Low No suitable habitat within the Desktop Survey Area.
Scolopacidae	Limosa lapponica menzbieri Bar-tailed Godwit	CR	CR	Coastal tidal flats (Menkhorst et al., 2017).	Two DBCA records 17.6 km west of the Desktop Survey Area in 1991 (DBCA, 2023a).	Low No suitable habitat within the Desktop Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
MAMMALS						
Dasyuridae	*Dasyurus geoffroii* Chuditch	VU	VU	Sclerophyll forest or drier woodland, heath, and mallee shrubland (Van Dyck and Strahan, 2008).	190 DBCA records within 20 km of the Desktop Survey Area, of which 31 are within 500 m of the Desktop Survey Area (DBCA, 2023a). Recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).	High Recent nearby records, suitable habitat present.
Dasyuridae	*Phascogale calura* Red-tailed Phascogale	CD	VU	Allocasuarina woodlands with hollow-containing eucalypts e.g. Eucalyptus wandoo and Gastrolobium spp.; prefers vegetation not burnt for at least 20 years (Van Dyck and Strahan, 2008).	No nearby records identified.	Low No nearby records.
Dasyuridae	*Phascogale tapoatafa wambenger* Wambenger Brush-tailed Phascogale	CD	-	Mature rough-barked trees, large logs, dead standing trees (Van Dyck and Strahan, 2008).	Twenty DBCA records within 20 km of the Desktop Survey Area, including 650 m south of the Desktop Survey Area in 2018 (DBCA, 2023a). Recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).	High Recent nearby records, suitable habitat present.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Macropodidae	*Setonix brachyurus* Quokka	VU	VU	Dense wet ground cover in forest or swampy flats (Van Dyck and Strahan, 2008).	Sixty-six DBCA records within 15 km of the Desktop Survey Area, including four records within the 500 m of the Desktop Survey Area in 2017 (DBCA, 2023a). Recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).	High Recent nearby records, suitable habitat present.
Macropodidae	*Notamacropus irma* Western Brush Wallaby	P4	-	Open forest and woodland, open seasonally wet flats (Van Dyck and Strahan, 2008).	Forty DBCA records within 20 km of the Desktop Survey Area, including one record 160 m from the Desktop Survey Area in 1999 (DBCA, 2023a). Recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).	High Recent nearby records, suitable habitat present.
Macropodidae	*Notamacropus eugenii derbianus* Tammar Wallaby	P4	-	Coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland (Van Dyck and Strahan, 2008).	One DBCA record 16 km northwest of the Desktop Survey Area in 2015 (DBCA, 2023a).	Medium Species is typically considered locally extinct; however, a known population occurs at the nearby Dryandra Woodland from which individuals may disperse.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Muridae	*Hydromys chrysogaster* Rakali	P4	-	Permanent fresh to brackish water bodies (Van Dyck and Strahan, 2008).	Seven DBCA records within 20 km of the Desktop Survey Area, including 12 km north of the Desktop Survey Area in 2014 (DBCA, 2023a).	Low Record <15 km from the Desktop Survey Area, No suitable habitat within the Desktop Survey Area.
Myrmecobiidae	*Myrmecobius fasciatus* Numbat, Walpurti	EN	EN	Jarrah forests, Wandoo woodlands; requires hollow logs and branches for shelter and termites for food (Van Dyck and Strahan, 2008).	Thirty-six records within 20 km of the Desktop Survey Area, including 5 km northwest of the Desktop Survey Area in 1997, and two records 12 km north in 2013 (DBCA, 2023a).	High Species is typically considered locally extinct; however, a known population occurs at the nearby Dryandra Woodland 67 km southeast of the Desktop Survey Area from which individuals may disperse.
Peramelidae	*Isoodon fusciventer* Quenda	P4	-	Sandy soils with dense heathy vegetation (Van Dyck and Strahan, 2008).	134 DBCA records within 20 km of the Desktop Survey Area, including one record within 300 m south of the Desktop Survey Area in 2012 (DBCA, 2023a). Recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).	High Recent nearby records, suitable habitat present.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Potoroidae	*Bettongia penicillata ogilbyi* Brush-tailed Bettong, Woylie	CR	EN	Areas dominated by Gastrolobium thickets (Van Dyck and Strahan, 2008).	Nine DBCA records within 11 km of the Desktop Survey Area, including one record within 80 m of the Desktop Survey Area in 2010 (DBCA, 2023a).	High Previously recorded within 80 m of the Desktop Survey Area, and suitable habitat within the Desktop Survey Area.
Pseudocheiridae	*Pseudocheirus occidentalis* Western Ringtail Possum	CR	CR	*Agonis* forest and woodland, Tuart Forest with *Agonis* mid storey (Van Dyck and Strahan, 2008).	Two DBCA records within 13 km of the Desktop Survey Area, including 11 km north in 1991 and 12.8 km south in 2020 (DBCA, 2023a).	Low Desktop Survey Area is outside of the taxon's distribution. Recent nearby records may be associated with nearby translocations at the Lane Poole Reserve and other sites.
Vespertilionidae	*Falsistrellus mackenziei* Western False Pipistrelle	P4	-	Mature Karri forests, wetter stands of Jarrah and Tuart, and woodlands on Swan Coastal Plain (Van Dyck and Strahan, 2008).	294 DBCA records within 20 km of the Desktop Survey Area, including within 500 m south in 2011 (DBCA, 2023a).	High Records within 500 m of the Desktop Survey Area, and suitable habitat within the Desktop Survey Area.
REPTILES						
Elapidae	*Acanthophis antarcticus* Southern Death Adder	P3	-	Habitats range from rainforest to shrublands and heath (Wilson and Swan, 2017).	Four DBCA records within 20 km of the Desktop Survey Area, including 8.2 km northeast in 1982 (DBCA, 2023a).	Medium Record <10 km from the Desktop Survey Area, and suitable habitat within the Desktop Survey Area.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Scincidae	*Ctenotus delli* Dell's Ctenotus	P4	-	Restricted to the Darling range; Jarrah and Marri woodlands over shrubs on lateritic, sandy, and clay soils (Wilson and Swan, 2021).	Thirteen DBCA records within 20 km of the Desktop Survey Area, including 1.6 km south in 2009 and 2010 (DBCA, 2023a).	High One record 1.6 km from the Desktop Survey Area, and suitable habitat within the Desktop Survey Area.

4.0 Discussion

4.1 High likelihood of occurrence within the Desktop Survey Area

Woylie (*Bettongia penicillata ogilbyi*) – CR (BC Act); EN (EPBC Act)

The Woylie is restricted to three small wheatbelt reserves in Western Australia: Dryandra Woodland, Tutanning Nature Reserve, and the Kingston/Perup Forest, all characterised by the presence thickets of the plant genus *Gastrolobium* (Van Dyck and Strahan, 2008). Fox predation is considered the driving factor in the Woylie's distribution contraction, with habitat destruction and disease also impacting populations to be rare and scattered (Van Dyck and Strahan, 2008). The Woylie primarily eats fungus and supplements its diet with seed kernels of the Desert Quandong (*Santalum acuminatum*), various tubers, bulbs, and invertebrates (Van Dyck and Strahan, 2008).

The Jarrah-Marri Forest habitat within the Desktop Survey Area constitutes core habitat for the Woylie because of its value for shelter and foraging.

Numbat (*Myrmecobius fasciatus*) – EN (BC Act; EPBC Act)

The Numbat is a small marsupial with a distinctive striped appearance that formerly occupied a range of habitats across the southern half of Australia (DBCA, 2017b). The Numbat is now restricted to a few populations of Jarrah Forest and Wandoo woodland. Fox predation has caused a significant decline for the species, bringing their total numbers to as low as a few hundred in the 1980s (Van Dyck and Strahan, 2008). Numbat activity changes throughout the year, corresponding to termite activity in the upper layer of the soil. In winter, Numbat activity peaks during the middle of the day, while in summer activity peaks during the morning and afternoon (Van Dyck and Strahan, 2008; DBCA, 2017a). Numbats feed near the cover of shrubs, hollows, and burrows, which they use as refuge from predators and as resting places during the day (DBCA, 2017b).

This taxon is typically considered locally extinct; however, a known population occurs at the nearby Dryandra Woodland located 67 km southeast of the Desktop Survey Area from which individuals may disperse. Jarrah-Marri Forest habitat constitutes core habitat for the taxon due to the presence of hollow logs and termites.

Baudin's Cockatoo (*Zanda baudinii*) – EN (BC Act; EPBC Act)

The Baudin's Cockatoo is distributed through the south-west WA from the northern Darling Range and adjacent far east of the Swan Coastal Plain (south of the Swan River), south to Bunbury and across to Albany (Johnstone and Kirkby, 2011). The taxon rarely occurs near coastal communities north of Mandurah, and rarely occurs north of the Swan River (Johnstone and Storr, 1998; Johnstone and Kirkby, 2008). The species forages primarily in eucalypt forest, where it feeds on Marri seeds, flowers, nectar, and buds. They also feed on a wide range of seeds of *Eucalyptus* spp., *Banksia* spp., *Hakea* spp., and *Pinus* spp., as well as fruiting apples and pears and beetle larvae from under the bark of trees (Johnstone and Storr, 1998; Johnstone and Kirkby, 2008). Baudin's Cockatoo forages at all levels of the forest from the canopy to the ground, often feeding in the understorey on proteaceous trees and shrubs (especially *Banksia*) and in orchard trees within the canopy and on fallen fruit.

The species can be cryptic due to its similarity in appearance to Carnaby's Cockatoos, and it can often be misidentified as such (Birdlife Australia, 2016). The Jarrah-Marri Forest habitat within the Desktop Survey Area constitutes core habitat for the Baudin's Cockatoo because of its value for breeding, roosting, and foraging. The taxon is likely to use the Desktop Survey Area for nesting and raising chicks in the breeding season and may use the habitat during the wintering season as core roosting and foraging habitat.

Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act)

Carnaby's Cockatoos nest in the hollows of a wide range of *Eucalyptus* trees, with a preference for smooth barked trees such as Salmon Gum (*E. salmonophloia*) and Wandoo (*E. wandoo*) but also rough barked *Eucalyptus* and *Corymbia* trees such as Red Morrell (*E. longicornis*), York Gum (*E. loxophleba*), Marri (*Corymbia calophylla*) and Tuart (*E. gomphocephala*) (Johnstone and Storr, 1998). Carnaby's Cockatoos feed on seeds, nuts, and flowers of a variety of native and exotic plants, including *Banksia* spp., Pine trees (*Pinus* sp.), Marri, Jarrah (*E. marginata*), *Grevillea* spp., *Allocasuarina* spp., and *Hakea* spp. (Shah, 2006).

The Jarrah-Marri Forest habitat within the Desktop Survey Area constitutes core habitat for the Carnaby's Cockatoo because of its value for breeding, roosting, and foraging. The taxon is likely to use the Desktop Survey Area for nesting and raising chicks in the breeding season and may occasion the habitat during the non-breeding season for roosting and foraging.

Forest Red-tailed Cockatoo (*Calyptorhynchus banksia naso*) – VU (BC Act; EPBC Act)

The Forest Red-tailed Black Cockatoo is distributed through the southwest of WA from Gingin through the Darling Ranges to the south-west from Bunbury to Albany. The Forest Red-tailed Black Cockatoo inhabits dense Jarrah, Karri (*E. diversicolor*), and Marri forests and feeds primarily on the fruit of Marri and Jarrah trees (Johnstone and Kirkby, 1999).

The Jarrah-Marri Forest habitat constitutes core habitat for the Forest Red-tailed Black Cockatoo because of its value for breeding, roosting, and foraging. The taxon is likely to use the Desktop Survey Area for nesting and raising chicks during the breeding season and may use the habitats during the wintering season as core roosting and foraging habitat.

Chuditch (*Dasyurus geoffroii*) – VU (BC Act; EPBC Act)

The Chuditch inhabits areas dominated by sclerophyll forest or drier woodland, heath, and mallee shrubland (Van Dyck and Strahan, 2008). The species is generally highly mobile and uses bush remnants as corridors (Woinarski, Burbidge and Harrison, 2014). The Chuditch is a largely nocturnal animal, feeding on a carnivorous diet of mammals, birds, lizards, and frogs. They have been recorded foraging during the day such as during the breeding season or when cold and wet weather restricts their nocturnal movements (Van Dyck and Strahan, 2008). Most diurnal denning sites in sclerophyll forest consist of hollow logs or earth burrows, although bandicoot nests and hollow tree bases may be used (Van Dyck and Strahan, 2008). The Chuditch was abundant prior to European settlement, and it is now largely restricted to the south-west of Western Australia, with small numbers in the Midwest, Wheatbelt and South Coast Regions (DBCA, 2017a).

The Jarrah-Marri Forest habitat constitutes core habitat for the Chuditch because of its value for denning and foraging. A breeding population of Chuditch was previously recorded in the northwest of the Desktop Survey Area (Way, 2013) and it is likely that this population continues to persist and use the Desktop Survey Area.

Quokka (*Setonix brachyurus*) – VU (BC Act; EPBC Act)

The Quokka is a small macropod found on two offshore islands (Rottnest and Bald Island) and several mainland sites in south-west Western Australia (Van Dyck and Strahan, 2008; DBCA, 2017a). The distribution of the Quokka is severely fragmented and there is little to no migration between populations. Mainland populations of the Quokka favour dense riparian vegetation; however, they also make use of heath and shrubland, swamp Peppermint, and swampy shrublands as well as Karri Forest regrowth (Van Dyck and Strahan, 2008; DBCA, 2017a). The populations of Quokkas on the mainland are largely restricted to areas of high rainfall of 1,000 mm or more (Van Dyck and Strahan, 2008).

The Jarrah-Marri habitat constitutes supporting habitat for the taxon. A breeding population of Quokka has previously been recorded in the northeast of the Desktop Survey Area (GHD, 2021b).

Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – CD (BC Act)

The Wambenger Brush-tailed Phascogale is a rat-sized, arboreal, carnivorous marsupial, characterised by a tuft of black hair on its tail (Van Dyck and Strahan, 2008). Typically, the species has been observed in dry sclerophyll forests and open woodlands containing hollow-bearing trees with a sparse ground cover. The distribution of the Wambenger Brush-tailed Phascogale is widespread but fragmented, stemming from habitat destruction and predation by cats and foxes (Van Dyck and Strahan, 2008). In the south-west of Australia, the species is thought to have declined within the last 10 years given the lower number of records despite an increase in survey effort (Van Dyck and Strahan, 2008).

The Jarrah-Marri Forest habitat constitutes core habitat for this species because of its value for shelter, foraging, and dispersal.

Quenda (*Isoodon fusciventer*) – P4 (DBCA)

Quenda are nocturnal and omnivorous, feeding on insects, spiders, worms, and plant roots and are typically found in dense vegetation, including wetland fringes, forest, woodland, shrub, and heath communities (Van Dyck and Strahan, 2008; DBCA, 2012). They are found only in the southwestern corner of Western Australia, where these regions generally display a combination of sandy soils with dense heathy vegetation in the lower stratum (Van Dyck and Strahan, 2008; DBCA, 2012).

The Jarrah-Marri Forest habitat constitutes core habitat for the taxon because of its value for shelter, foraging, and dispersal.

Western Brush Wallaby (*Notamacropus irma*) – P4 (DBCA)

The Western Brush Wallaby occurs in the south-west of Western Australia and closely resembles a larger kangaroo (Van Dyck and Strahan, 2008). Its preferred habitat consists of open forest or woodland, particularly favouring open and seasonally wet flats with low grasses and open scrubby thickets (Van Dyck and Strahan, 2008). The Western Brush Wallaby was a common species during the early days of settlement, however, ongoing clearing and fragmentation of bushland in the Wheatbelt as well as the dramatic increase in fox numbers within the south-west of Western Australia has led to this species' decline (Van Dyck and Strahan, 2008).

The Jarrah-Marri Forest habitat constitutes core habitat for the taxon because of its value for foraging and dispersal.

Western False Pipistrelle (*Falsistrellus mackenziei*) – P4 (DBCA)

The Western False Pipistrelle is endemic to the south-western region of Western Australia, making use of high rainfall forests dominated by Jarrah, Karri, Marri, and Tuart. The species is a specialist of tall mature forest, foraging within the canopy and roosting in tree hollows (Van Dyck and Strahan, 2008).

This taxon is widely documented within the area and the Desktop Survey Area contains core Jarrah-Marri Forest habitat which provides high value foraging habitat and roost sites which are associated with hollows in *Eucalyptus* (Baker and Gynther, 2023).

Dell's Ctenotus (*Ctenotus delli*) – P4 (DBCA)

Dell's Ctenotus is endemic to the north Darling Range, south-western Australia, inhabiting dry sclerophyll forest on stony hills and ranges (Cogger, 2014).

This taxon may use the Jarrah-Marri Forest with lateritic clay substrate within the Desktop Survey Area which provides suitable foraging and breeding habitats.

Peregrine Falcon (*Falco peregrinus*) – OS (DBCA)

The Peregrine Falcon is an uncommon but wide-ranging bird across Australia (Barrett *et al.*, 2003). It occurs along rivers and ranges as well as wooded watercourses and lakes. It nests primarily on cliffs, granite outcrops and quarries, although is also known to occupy existing raptor and corvid stick nests (Menkhorst *et al.*, 2017). The diet of the Peregrine Falcon has been well studied and primarily includes flocking species such as parrots, pigeons and on the east coast, European Starlings (Olsen and Fuentes, 2008).

This taxon has been previously recorded within the region flying over similar Jarrah-Marri Forest (GHD, 2021a). In the absence of cliff ledges, Peregrine Falcons will use trees for nesting (Morcombe, 2003). The Jarrah-Marri Forest within the Desktop Survey Area and surrounds may provide suitable nesting and hunting habitat to support this species.

4.2 Medium likelihood of occurrence within the Desktop Survey Area

Noisy Scrubbird (*Atrichornis clamosus*) – EN (BC Act; EPBC Act)

The Noisy Scrubbird is restricted to coastal areas from Two Peoples Bay Nature Reserve to Cheyne Beach, Bald Island where it inhabits dense thickets of stunted *Eucalyptus*, Tea-tree, *Banksia*, She-oak, rush, saw-sedge, and tall grasses (Pizzey and Knight, 2001). Previously thought to be extinct due to fire and clearing of habitat, management of the species has increased the population and allowed breeding populations to become established in areas of nearby suitable habitat.

The Desktop Survey Area is outside of the typical distribution of this species; however, translocation of this species occurred between 1998 and 2003 just over 20 km from the Desktop Survey Area (DBCA, 2023c). Males defend long term territories and females will return to nest sites each year, and dispersal is usually undertaken by sub-adults seeking unoccupied territories (Higgins, Peter and Steele, 2001). Translocated individuals are also likely to disperse to establish territories.

Malleefowl (*Leipoa ocellata*) – VU (BC Act; EPBC Act)

The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee or *Acacia*. A sandy substrate and abundance of leaf litter are required for breeding (Department of the Environment and Energy, 2018). Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where habitats tend to be thicker and there is an abundance of food plants. Much of the best habitat for Malleefowl has already been cleared or has been modified by grazing via Sheep, Cattle, Rabbits, and Goats (Benshemesh, 2007). The species nests in large mounds of dirt and leaf litter, up to five metres wide and one metre tall (Menkhorst et al., 2017).

Malleefowl have been recorded within 500 m of the Desktop Survey Area (DBCA, 2023a). These records may be associated with translocations at the nearby Dryandra Woodland located 67 km southeast of the Desktop Survey Area. The Jarrah-Marri Forest habitat has the potential to support this species, though no evidence of foraging or nesting was recorded during the survey. Malleefowl are often cryptic and nest in areas of dense shrubland, making detection of the species difficult without LiDAR mapping of potential nesting mounds.

Tammar Wallaby (*Notamacropus eugenii derbianus*) - P4 (DBCA)

The Tammar Wallaby is a nocturnal and herbivorous species, once widespread from Kalbarri to Esperance. Tammar Wallaby numbers have been reduced by clearing for wheat farming, however, reintroductions accompanied by Fox control have allowed some mainland

populations to increase in size (Van Dyck and Strahan, 2008; DBCA, 2012b). Tammar Wallabies use dense vegetation for shelter and open grassy areas for feeding, and typically inhabit coastal scrub heath, dry sclerophyll forest, and thickets in mallee and woodland (Van Dyck and Strahan, 2008; DBCA, 2012b).

The Tammar Wallaby is typically considered locally extinct; however, a known population occurs at the nearby Dryandra Woodland located 67 km southeast of the Desktop Survey Area from which individuals may disperse. The Jarrah-Marri Forest within the Desktop Survey Area provides areas of open woodland for foraging.

Southern Death Adder (*Acanthophis antarcticus*) – P4 (DBCA)

The Southern Death Adder is found in Southwest and South Australia to Eastern and Central Queensland where, due to habitat destruction and altered fire regimes, populations are in decline (Cogger, 2014; Wilson and Swan, 2017). Habitats range from rainforest to shrublands and heath (Wilson and Swan, 2017).

The Desktop Survey Area falls within distribution of the Southern Death Adder and microhabitats within the Jarrah-Marri habitat has the potential to be used by the taxon for shelter and hunting.

5.0 Conclusion

One fauna habitat, the Jarrah-Marri Forest, is expected to occur within the Desktop Survey Area. The Jarrah-Marri Forest provides value for targeted taxa as core habitat for Chuditch and Woylie, and as supporting habitat for the Quokka. This habitat is typical of the Jarrah Forest region and are widespread outside of the Desktop Survey Area.

Thirteen significant fauna taxa were assessed as having a high likelihood of occurrence within the Survey Area:

- Woylie (*Bettongia penicillata ogilbyi*) - CR, EN (BC Act; EPBC Act).
- Numbat (*Myrmecobius fasciatus*) – EN (BC Act; EPBC Act).
- Baudin's Cockatoo (*Zanda baudinii*) – EN (BC Act; EPBC Act).
- Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act).
- Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – VU (BC Act; EPBC Act).
- Chuditch (*Dasyurus geoffroii*) – VU (BC Act; EPBC Act).
- Quokka (*Setonix brachyurus*) – VU (BC Act; EPBC Act).
- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – CD (BC Act).
- Quenda (*Isoodon fusciventer*) – P4 (DBCA).
- Western Brush Wallaby (*Notamacropus irma*) – P4 (DBCA).
- Western False Pipistrelle (*Falsistrellus mackenziei*) – P4 (DBCA).
- Dell's Ctenotus (*Ctenotus delli*) – P4 (DBCA).
- Peregrine Falcon (*Falco peregrinus*) – OS (DBCA).

Four significant fauna taxa were assessed as having a medium likelihood of occurrence within the Survey Area:

- Noisy Scrubbird (*Atrichornis clamosus*) – EN (BC Act; EPBC Act).
- Malleefowl (*Leipoa ocellata*) – VU (BC Act; EPBC Act).
- Tammar Wallaby (*Notamacropus eugenii derbianus*) - P4 (DBCA).
- Southern Death Adder (*Acanthophis antarcticus*) – P4 (DBCA).

A further 28 significant fauna taxa were assessed as having have a low likelihood of occurring within the Desktop Survey Area.

6.0 References

Baker, A.M. and Gynther, I.C. (2023) *Strahan's Mammals of Australia*. 4th edn. Wahroonga, Australia: Reed New Holland Publishers.

Barrett, G. *et al.* (2003) *The new atlas of Australian birds*. Melbourne, Australia: Royal Australasian Ornithologists Union.

Benshemesh, J. (2007) *National recovery plan for malleefowl Leipoa ocellata*. Adelaide, Australia.

Birdlife Australia (2016) *Identifying Southwest Black-Cockatoos*. Perth, Australia.

Cogger, H.G. (2014) *Reptiles and amphibians of Australia*. 7th edn. Melbourne, Australia: CSIRO Publishing.

DAWE (2023) *Protected Matters Search Tool*. Available at: https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool.

DBCA (2012a) *Fauna Profile - Quenda Isoodon obesulus*, *2012*. Available at: https://www.dpaw.wa.gov.au/images/documents/conservation-management/pests-diseases/quenda_2012.pdf.

DBCA (2012b) *Fauna Profile - Tammar Wallaby notamacropus eugenii*. Available at: https://www.dpaw.wa.gov.au/images/documents/conservation-management/pests-diseases/tammar-wallaby_2012.pdf.

DBCA (2017a) *Fauna Profile - Chuditch Dasyurus geoffroii*. Available at: http://www.dbca.wa.gov.au.

DBCA (2017b) *Fauna Profile - Numbat Myrmecobius fasciatus*, *2017*. Available at: https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/animal_profiles/numbat_fauna_profile.pdf.

DBCA (2017c) *Fauna Profile - Quokka Setonix brachyurus*, *2017*. Available at: https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/animal_profiles/quokka_fauna_profile.pdf.

DBCA (2023a) *DBCA Threatened and Priority Fauna Database request (Custom Search)*.

DBCA (2023b) *NatureMap Database Search*. Perth, Australia.

Department of the Environment and Energy (2018) *Leipoa ocellata - Malleefowl*. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=934.

Van Dyck, S. and Strahan, R. (2008) *The mammals of Australia*. 3rd edn. Sydney, Australia: New Holland Publishers.

Environmental Management and Research Consultants (2006) *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region*.

GHD (2012) *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment*.

GHD (2021a) *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine-Holyoake*.

GHD (2021b) *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine-Myara North*.

Harewood, G. (2017) *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)*.

Harewood, G. (2019) *Black Cockatoo Habitat Assessment - Pinjarra Racecourse*.

Higgins, P.J., Peter, J.M. and Steele, W.K. (2001) *Handbook of Australian, New Zealand and Antarctic Birds. Volume 5 - Tyrant-flycatchers to Chats*. Melbourne: Oxford University Press.

Johnstone, R.E. and Kirkby, T. (1999) 'Food of the forest red-tailed black cockatoo Calyptorhynchus banksii naso in south-west Western Australia', *Western Australian Naturalist*, 22, pp. 167–177.

Johnstone, R.E. and Kirkby, T. (2011) *Carnaby's Black Cockatoo (Calyptorhynchus latirostris), Baudin's Black Cockatoo (Calyptorhynchus baudinii) and the Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso) on the Swan Coastal Plain (Lancelin–Dunsborough), Western Australia*. Perth, Australia.

Johnstone, R.E. and Storr, G.M. (1998) *Handbook of Western Australian birds*. Edited by D. Louise. Perth, Australia: Western Australian Museum.

Menkhorst, P. *et al.* (2017) *The Australian Bird Guide*. Australia: CSIRO Publishing.

Morcombe, M. (2003) *Field Guide to Australian Birds*. Archerfield: Steve Parish Publishing Pty Ltd.

Olsen, J. and Fuentes, E. (2008) 'Dietary shifts based upon prey availability in Peregrine Falcons and Australian Hobbies breeding near Canberra, Australia', *Journal of Raptor Research*, 42, pp. 125–137.

Pizzey, G. and Knight, F. (2001) *Field Guide to Birds of Australia*. Pymble, Australia: HarperCollins Australia.

Shah, B. (2006) *Conservation of Carnaby's Black Cockatoo on the Swan Coastal Carnaby's plain, Western Australia*. Perth, Australia.

SLR Consulting (2024) *Targeted Chuditch, Quokka, and Woylie Survey, Huntly Mine - Myara Region*.

Way, S. (2013) *Chuditch Pre-mine Survey, Myara*.

Wilson, S. and Swan, G. (2017) *A complete guide to reptiles of Australia*. 5th edn. New Holland Publishers.

Wilson, S. and Swan, G. (2021) *A complete guide to reptiles of Australia*. 6th edn. New Holland Publishers.

Woinarski, J., Burbidge, A. and Harrison, P. (2014) *The action plan for Australian mammals 2012*. CSIRO Publishing.

7.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time and we will make a $10 donation to our 2023 Charity Partner - Lifeline, for every completed form.

Appendix A Maps

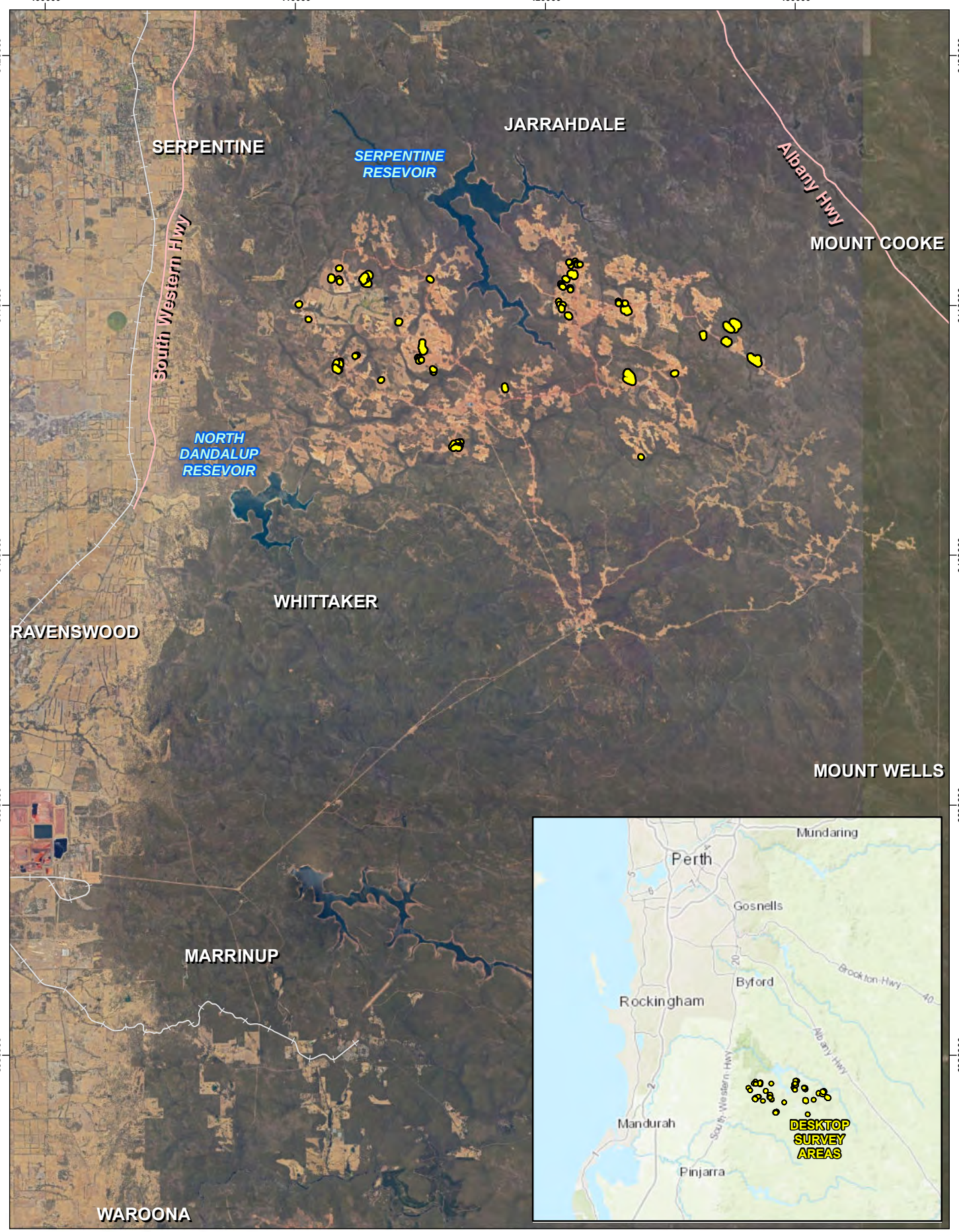
Desktop Assessment Memo

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

30 April 2024



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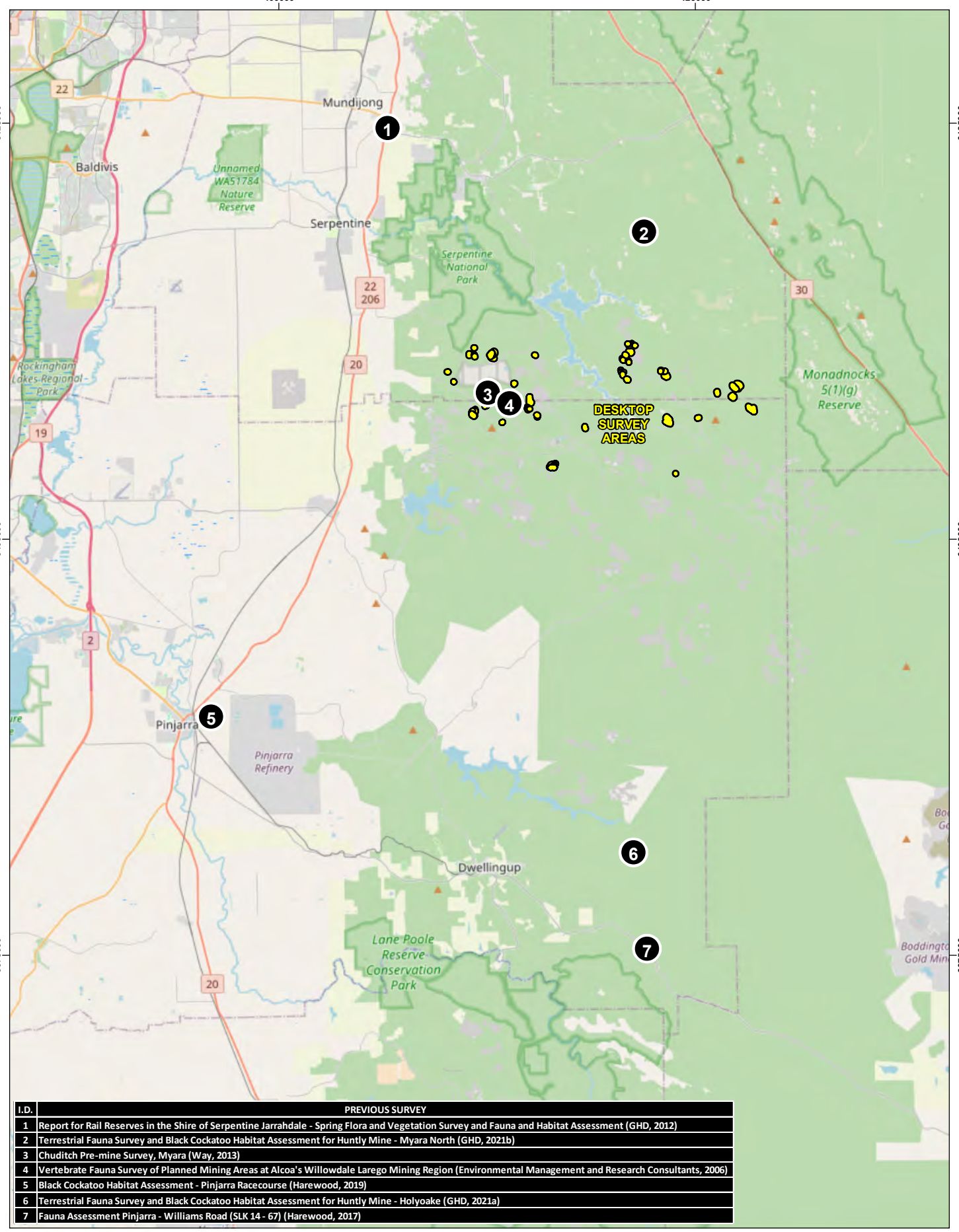
Desktop Survey Memo Huntly Mine

Myara Region

Desktop Survey Area

MAP 1

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I.D.	PREVIOUS SURVEY
1	Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment (GHD, 2012)
2	Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North (GHD, 2021b)
3	Chuditch Pre-mine Survey, Myara (Way, 2013)
4	Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region (Environmental Management and Research Consultants, 2006)
5	Black Cockatoo Habitat Assessment - Pinjarra Racecourse (Harewood, 2019)
6	Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake (GHD, 2021a)
7	Fauna Assessment Pinjarra - Williams Road (SLK 14 - 67) (Harewood, 2017)

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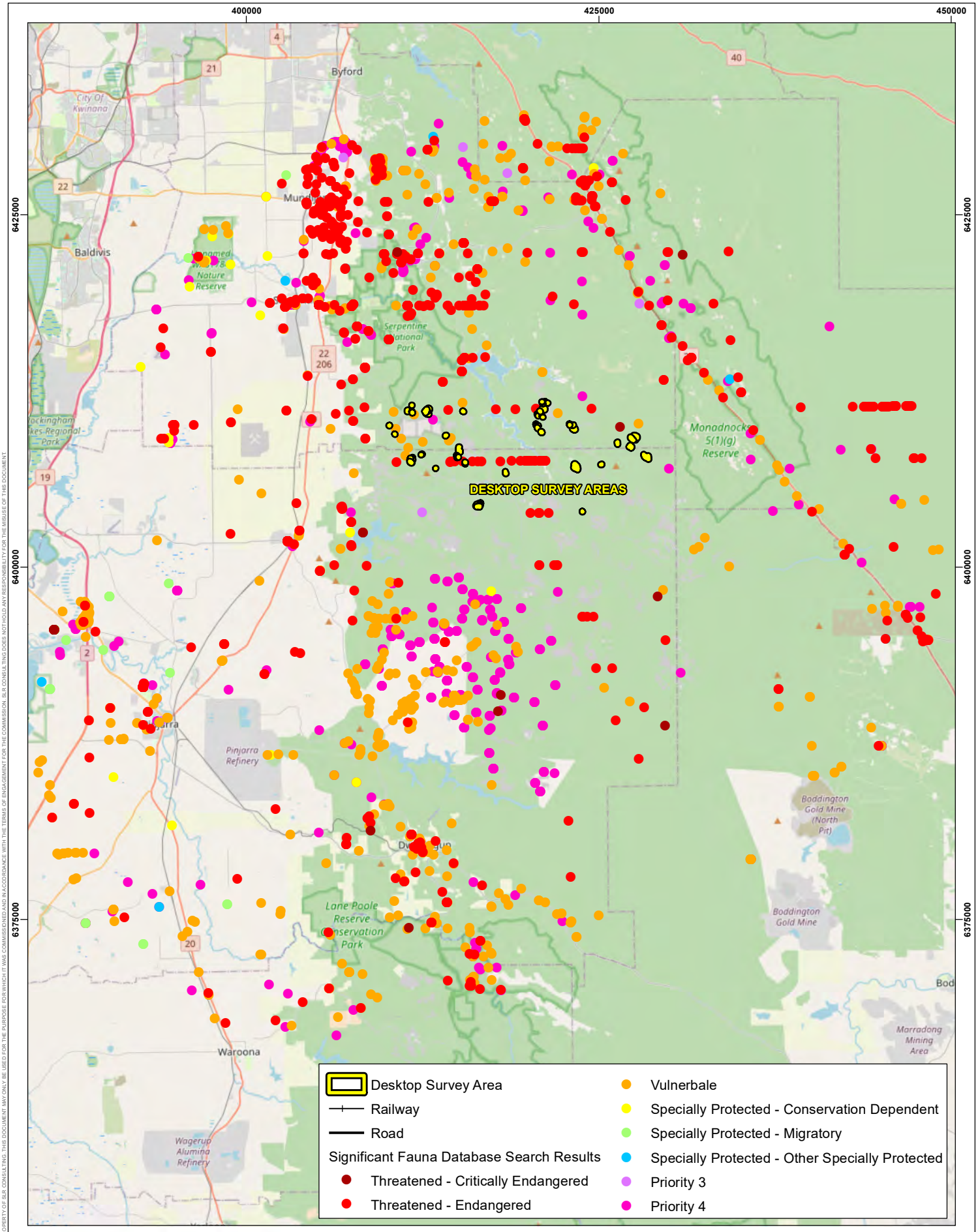
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Desktop Survey Memo Huntly Mine
Myara Region

Previous Surveys in the Locality
MAP 2

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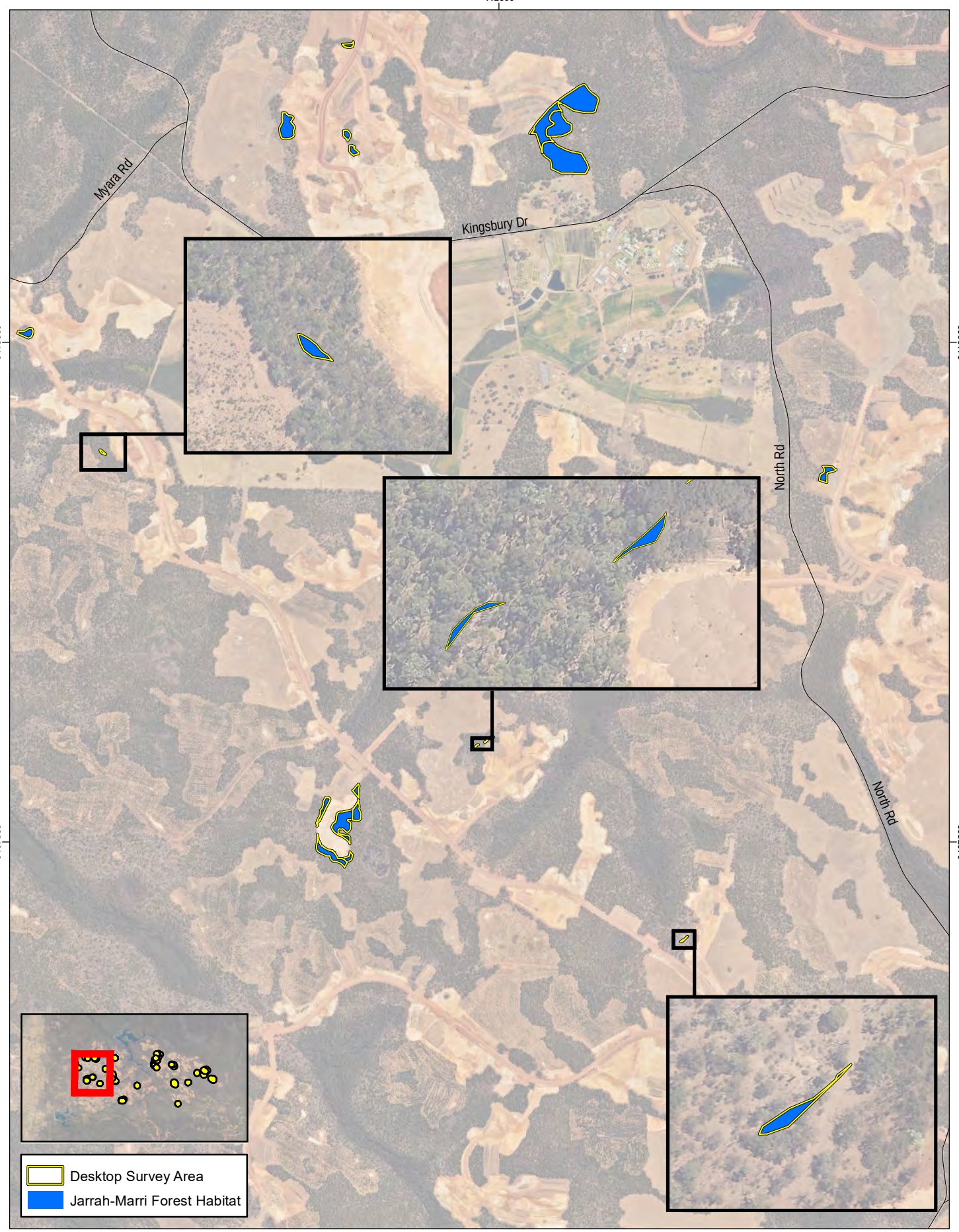
Myara Region

Significant Fauna Database Search Results

MAP 3

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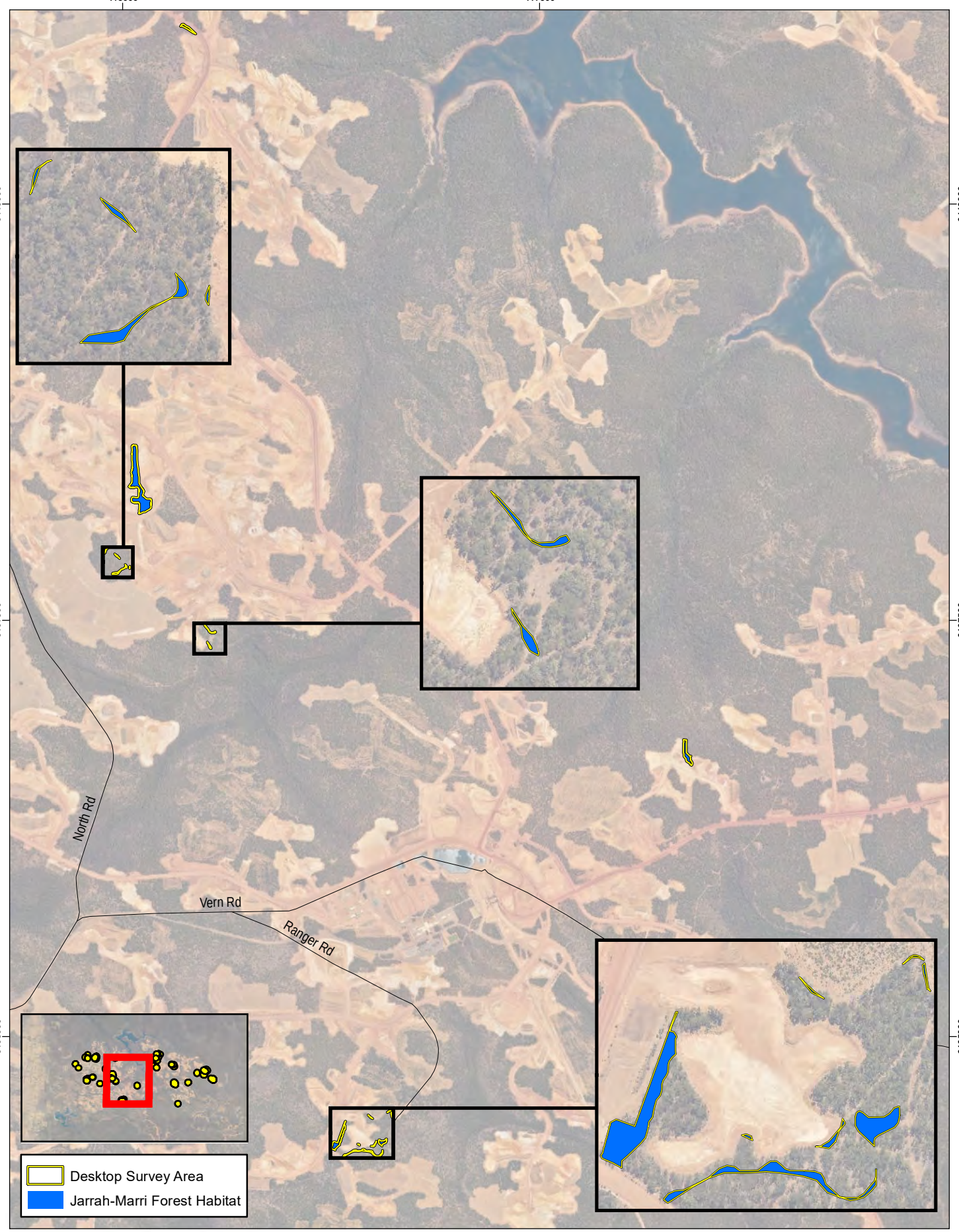
Myara Region

Extrapolated Fauna Habitat

MAP 4A

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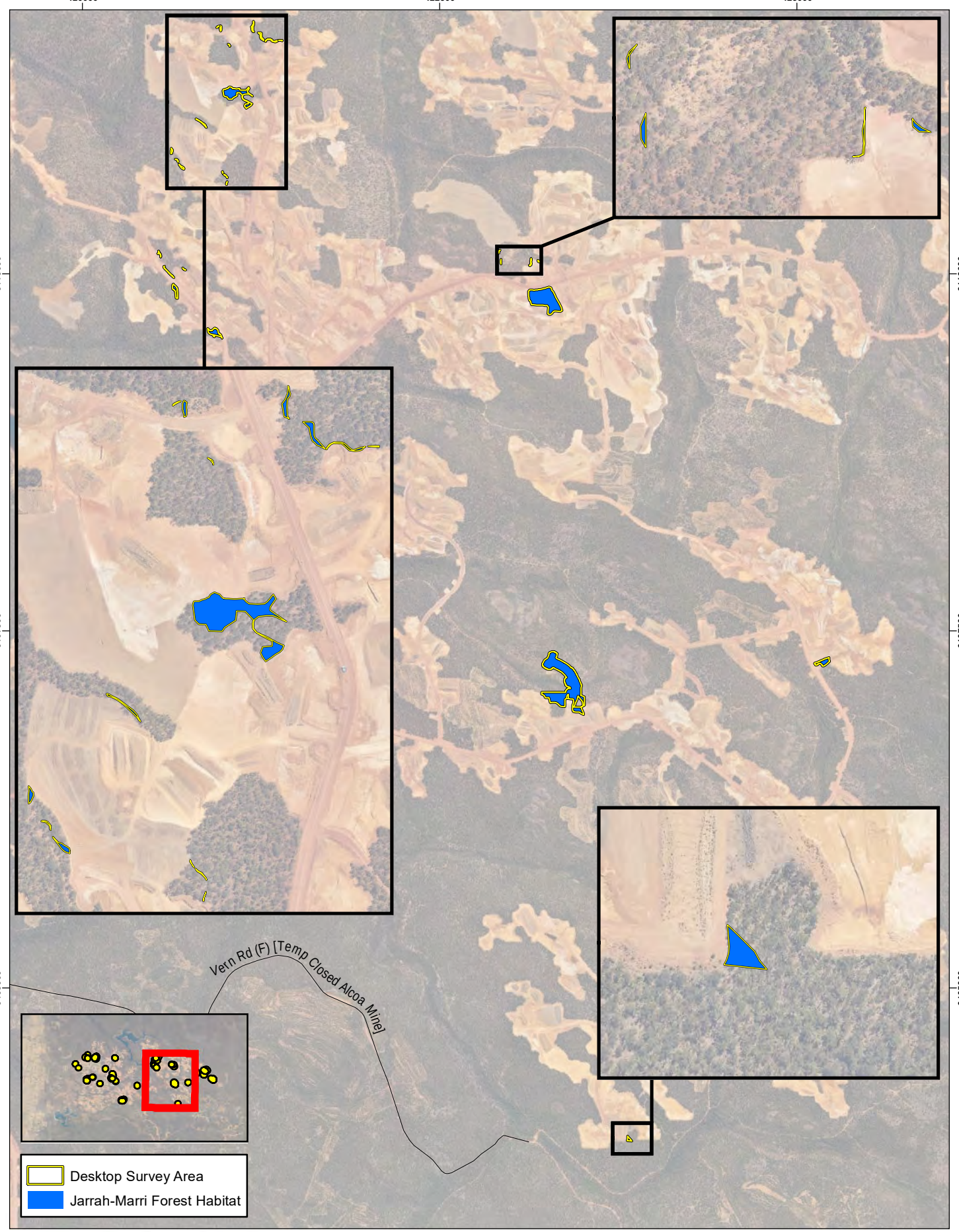
Myara Region

Extrapolated Fauna Habitat

MAP 4B

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Desktop Survey Memo Huntly Mine

Myara Region

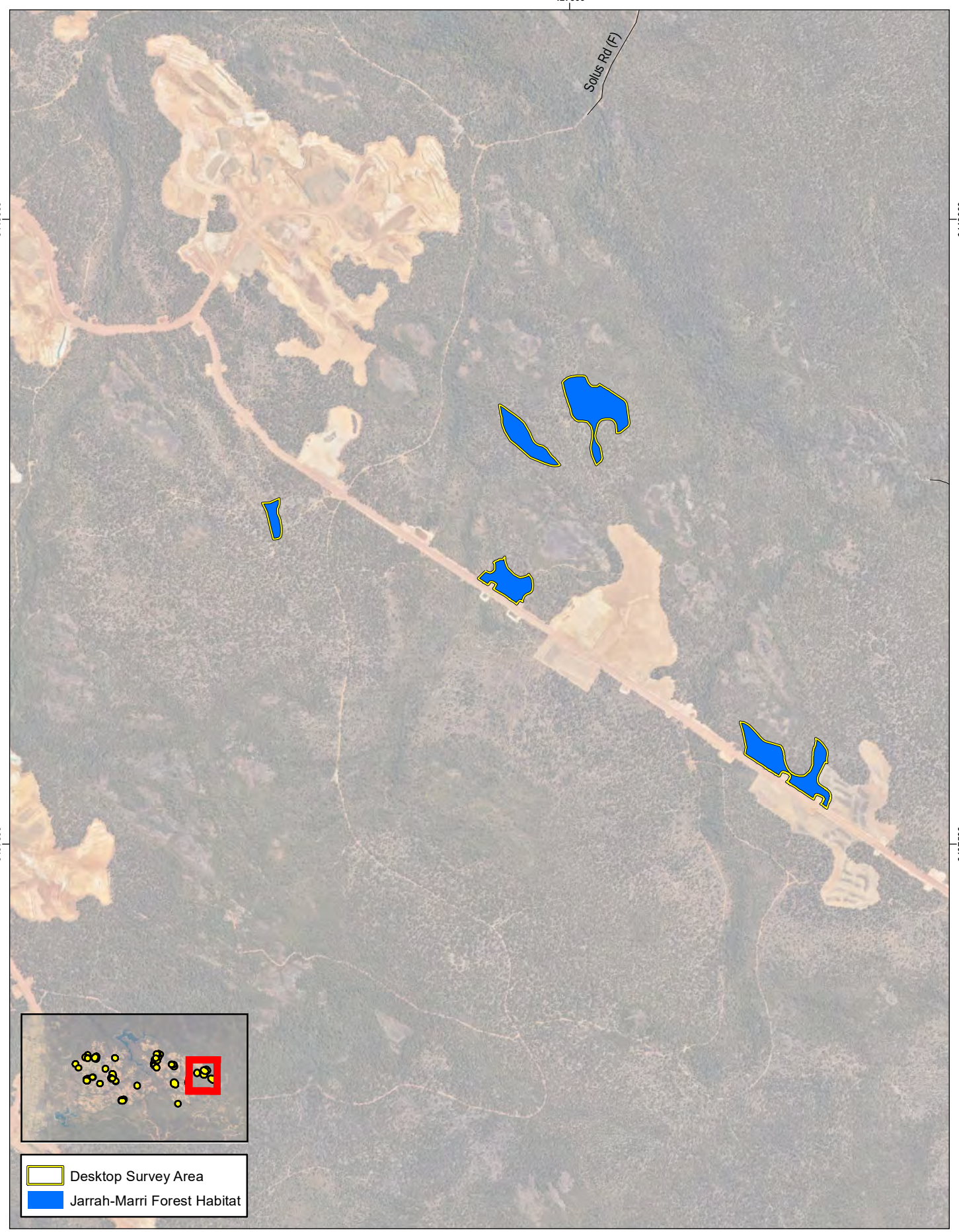
Extrapolated Fauna Habitat

MAP 4C

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Desktop Survey Memo Huntly Mine

Myara Region

Extrapolated Fauna Habitat

MAP 4D

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Appendix B Literature Review Summary

Desktop Assessment Memo

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

30 April 2024

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Lit A	*Chuditch Pre-mine Survey, Myara* (Way, 2013)	Overlaps Survey Area	March – April 2013	Targeted Chuditch Survey	• Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act	Two fauna habitats were identified: • Jarrah forest • Drainage line
Lit B	*Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006)	Overlaps Survey Area	1996-2006	Long Term Fauna Monitoring Program	• Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act • Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Noisy Scrubbird (*Atrichornis clamosus)* – Listed as Endangered under the BC Act and EPBC Act	No fauna habitats were recorded.
Lit C	*Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North* (GHD, 2021b)	1 km north of Survey Area	August 2021	Targeted Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo, Chuditch, Quokka, and other Priority species	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act	Eight fauna habitats were identified: • Jarrah-Marri forest • Bullich forest • Granite outcrop • Blackbutt forest • Flooded Gum woodland • Melaleuca dampland • Mine rehabilitation • Pine plantation

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
					• Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act • Peregrine Falcon (*Falco peregrinus*) – Listed as Special Protection under the BC Act • Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Listed as Conservation Dependent By DBCA • Masked Owl Southwest (*Tyto novaehollandiae*) – Listed as Priority 3 by the DBCA • Western False Pipistrelle (*Falsistrellus mackenziei*) - Listed as Priority 3 by the DBCA • Southern Death Adder (*Acanthophis antarcticus*) – Listed as Priority 3 by the DBCA • Rakali (*Hydromys chrysogaster*) – Listed as Priority 4 by the DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Lit D	*Black Cockatoo Habitat Assessment - Pinjarra Racecourse* (Harewood, 2019)	6 km west of the Survey Area	2019	Targeted Black Cockatoo Habitat Assessment	• Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act	No fauna habitats were identified. However, 34 habitat trees consisting of Flooded Gum, Tuart, Marri and introduced eucalypts were identified.
Lit E	*Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a)	8 km south of the Survey Area	August 2021	Targeted Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo, Chuditch, Quokka, Carters's Freshwater Mussel, and other Priority species	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act • Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act • Peregrine Falcon (*Falco peregrinus*) – Listed as Special Protection under the BC Act • Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Listed as	Seven fauna habitats were identified: • Bullich forest • Granite outcrop • Blackbutt forest • Flooded Gum woodland • Jarrah-Marri forest • Mine rehabilitation • Pine plantation

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
					Conservation Dependent By DBCA • Western False Pipistrelle (*Falsistrellus mackenziei*) - Listed as Priority 3 by the DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	
Lit F	*Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment* (GHD, 2012)	10 km north of the Survey Area	November 2011	Level 1 Fauna and Habitat Assessment	• Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Letter-winged kite (*Elanus scriptus*) – Listed as Priority 4 the DBCA	Five fauna habitats were identified: • Melaleuca wetlands • Swampland • Jarrah/Marri forest • *Banksia*/*Allocasuarina* woodlands • Dense shrublands on clay flats

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Lit G	*Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67) (Harewood, 2017)*	17.5 km south of Survey Area	August 2011	Basic Fauna Assessment and Black Cockatoo Habitat Assessment	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda laitrostris*) - Listed as Endangered under the BC Act and EPBC Act • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	Four fauna habitats were identified: • Remnant native vegetation • Plantations • Existing cleared areas • River and ephemeral streams

Appendix C Fauna Desktop Assessment Results

Desktop Assessment Memo

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

30 April 2024

Conservation Status:
State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation, Commonwealth - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.
Database:
NM - NatureMap, PMST - EPBC Protected Matters Search Tool, DBCA - DBCA Threatened and Priority Fauna database search, 2023 Survey – Recorded during the 2023 targeted significant fauna survey (SLR Consulting, 2024).
Literature:
A - *Chuditch Pre-mine Survey, Myara* (Way, 2013)
B - *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006)
C - *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North* (GHD, 2021b)
D - *Black Cockatoo Habitat Assessment - Pinjarra Racecourse* (Harewood, 2019)
E - *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a)
F - *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment* (GHD, 2012)
G - *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)* (Harewood, 2017)

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Amphibians															
Limnodynastidae	*Heleioporus albopunctatus*	Western Spotted Frog								x					
	Heleioporus eyrei	Moaning Frog								x	x		x		
	Heleioporus inornatus	Whooping Frog								x					
Myobatrachidae	*Crinia georgiana*	Quacking Frog						x		x	x		x	x	x
	Crinia glauerti	Clicking Frog						x		x			x	x	x
	Crinia insignifera	Squelching Froglet													x
	Crinia pseudinsignifera	Bleating Froglet								x	x		x		x
	Geocrinia leai	Ticking Frog								x	x		x		
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog						x		x	x		x		x
	Litoria moorei	Motorbike Frog											x		
Birds															
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill, Broad-tailed Thornbill						x		x	x		x		x

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Acanthiza chrysorrhoa	Yellow-rumped Thornbill								x	x		x		x
	Acanthiza inornata	Western Thornbill						x		x	x				x
	Aphelocephala leucopsis	Southern Whiteface		VU		x									
	Gerygone fusca	Western Gerygone						x		x					x
	Sericornis maculatus	Spotted Scrubwren						x		x	x		x		x
	Smicrornis brevirostris	Weebill						x		x			x	x	x
Accipitridae	*Accipiter cirrocephalus*	Collared Sparrowhawk								x			x		
	Accipiter fasciatus	Brown Goshawk		MA						x	x				
	Aquila audax	Wedge-tailed Eagle								x	x		x	x	x
	Elanus scriptus	Letter-winged Kite	P4											x	
	Haliastur sphenurus	Whistling Kite		MA						x			x	x	
	Hieraaetus morphnoides	Little Eagle								x					
	Lophoictinia isura	Square-tailed Kite						x		x					
	Milvus migrans	Black Kite												x	
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar									x		x		x
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra						x		x	x		x	x	x
	Todiramphus sanctus	Sacred Kingfisher		MA						x	x		x	x	
Anatidae	*Anas superciliosa*	Pacific Black Duck						x		x	x		x		x
	Chenonetta jubata	Australian Wood Duck, Wood Duck, Maned Duck									x		x		x
	Cygnus atratus	Black Swan											x		
	Oxyura australis	Blue-billed Duck	P4		x		x								
	Tadorna tadornoides	Australian Shelduck, Mountain Duck								x					x
Apodidae	*Apus pacificus*	Pacific Swift, Fork-tailed Swift	MI	MI, MA		x									
Ardeidae	*Botaurus poiciloptilus*	Australasian Bittern	EN	EN		x									

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Artamidae	*Artamus cinereus*	Black-faced Woodswallow									x				
	Artamus cyanopterus	Dusky Woodswallow						x		x	x				x
	Cracticus nigrogularis	Pied Butcherbird											x		
	Cracticus torquatus	Grey Butcherbird									x		x	x	x
	Gymnorhina tibicen	Australian Magpie								x	x		x	x	x
	Strepera versicolor	Grey Currawong						x		x	x		x		x
Atrichornithidae	*Atrichornis clamosus*	Noisy Scrubbird	EN	EN	x	x	x			x					
Cacatuidae	*Cacatua pastinator pastinator*	Muir's Corella	CD		x		x								
	Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	x	x	x	x		x	x	x	x	x	x
	Eolophus roseicapilla	Galah									x			x	
	Zanda baudinii	Baudin's Cockatoo	EN	EN	x	x	x	x		x	x		x	x	x
	Zanda latirostris	Carnaby's Cockatoo	EN	EN	x	x	x	x			x		x		x
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike		MA				x		x	x		x	x	x
Casuariidae	*Dromaius novaehollandiae*	Emu						x		x	x		x		x
Charadriidae	*Charadrius leschenaultii*	Greater Sand Plover	VU	VU, MI, MA	x	x									
	Charadrius mongolus	Lesser Sand Plover	EN	EN, MI, MA		x									
	Pluvialis fulva	Pacific Golden Plover	MI	MI, MA	x	x									
	Pluvialis squatarola	Grey Plover	MI	VU, MI, MA	x		x								
	Vanellus tricolor	Banded Lapwing									x				
Climacteridae	*Climacteris rufus*	Rufous Treecreeper						x		x	x		x		
Columbidae	*Columba livia*	Domestic Pigeon, Rock Dove												x	
	Phaps chalcoptera	Common Bronzewing								x				x	x
	Phaps elegans	Brush Bronzewing						x		x	x				
	Spilopelia chinensis	Spotted Turtle Dove												x	

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Spilopelia senegalensis	Laughing Turtle Dove												x	
Corvidae	*Corvus bennetti*	Little Crow									x				
	Corvus coronoides	Australian Raven						x		x			x	x	x
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo		MA				x		x	x				x
	Chalcites basalis	Horsfield's Bronze Cuckoo		MA						x			x		
	Chalcites lucidus	Shining Bronze Cuckoo		MA						x	x				
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird									x				
Diomedeidae	*Diomedea amsterdamensis*	Amsterdam Albatross	CR	EN, MI, MA		x									
	Diomedea dabbenena	Tristan Albatross	CR	EN, MI, MA		x									
	Diomedea epomophora	Southern Royal Albatross	VU			x									
	Diomedea exulans	Wandering Albatross	VU	VU, MI, MA		x									
	Diomedea sanfordi	Northern Royal Albatross	EN	EN, MI, MA		x									
	Thalassarche cauta steadi	White-capped Albatross	VU	VU, MI, MA		x									
	Thalassarche impavida	Campbell Island Albatross	VU	VU, MI, MA		x									
	Thalassarche melanophris	Black-browed Albatross	EN	VU, MI, MA		x									
Estrildidae	*Stagonopleura oculata*	Red-eared Firetail								x	x				
Falconidae	*Falco cenchroides*	Nankeen Kestrel		MA										x	
	Falco hypoleucos	Grey Falcon	VU	VU		x									
	Falco peregrinus	Peregrine Falcon	OS		x		x				x		x		
Hirundinidae	*Hirundo neoxena*	Welcome Swallow		MA											x
	Petrochelidon ariel	Fairy Martin									x		x	x	
	Petrochelidon nigricans	Tree Martin		MA						x	x		x		
Laridae	*Anous stolidus*	Common Noddy, Brown Noddy	MI	MI, MA		x									
	Hydroprogne caspia	Caspian Tern	MI	MI, MA	x		x								
	Sternula nereis nereis	Fairy Tern	VU	VU	x	x	x								

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Thalasseus bergii	Greater Crested Tern, Crested Tern	MI	MI, MA	x		x								
Locustellidae	*Cincloramphus cruralis*	Brown Songlark									x		x		
	Cincloramphus mathewsi	Rufous Songlark											x		
Maluridae	*Malurus elegans*	Red-winged Fairywren						x		x	x		x		
	Malurus leucopterus	White-winged Fairywren											x		
	Malurus pulcherrimus	Blue-breasted Fairywren											x		
	Malurus splendens	Splendid Fairywren								x	x		x	x	x
	Stipiturus malachurus	Southern Emu-wren									x				
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU	x	x	x								
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill						x		x	x		x		x
	Anthochaera carunculata	Red Wattlebird								x	x		x	x	x
	Anthochaera lunulata	Western Little Wattlebird, Western Wattlebird						x		x	x		x		x
	Gavicalis virescens	Singing Honeyeater								x	x			x	
	Lichmera indistincta	Brown Honeyeater								x	x		x	x	x
	Melithreptus brevirostris	Brown-headed Honeyeater								x	x		x		
	Melithreptus chloropsis	Western White-naped Honeyeater								x	x		x		x
	Phylidonyris niger	White-cheeked Honeyeater								x			x	x	
	Phylidonyris novaehollandiae	New Holland Honeyeater						x		x	x		x	x	x
	Ptilotula ornata	Yellow-plumed Honeyeater											x		
Meropidae	*Merops ornatus*	Rainbow Bee-eater		MA						x	x		x		
Monarchidae	*Grallina cyanoleuca*	Magpie-lark		MA							x		x	x	

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Myiagra inquieta	Restless Flycatcher								x	x		x		
Motacillidae	*Anthus australis australis*	Australian Pipit		MA						x					
	Motacilla cinerea	Grey Wagtail	MI	MI, MA		x									
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella								x			x		
Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush								x			x		
	Pachycephala fuliginosa	Western Whistler						x		x	x		x		x
	Pachycephala rufiventris	Rufous Whistler						x		x				x	
Pandionidae	*Pandion haliaetus*	Osprey	MI	MI, MA	x	x	x								
	Pardalotus punctatus	Spotted Pardalote						x		x	x				x
	Pardalotus striatus	Striated Pardalote						x		x	x				x
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin						x		x	x		x		
	Microeca fascinans	Jacky Winter												x	
	Petroica boodang	Scarlet Robin						x		x	x		x		
	Quoyornis georgianus	White-breasted Robin						x		x	x		x		
Podargidae	*Podargus strigoides*	Tawny Frogmouth						x		x	x				x
Pomatostomidae	*Pomatostomus superciliosus*	White-browed Babbler											x		
Procellariidae	*Macronectes giganteus*	Southern Giant Petrel	MI	EN, MI, MA		x									
	Macronectes halli	Northern Giant Petrel	MI	VU, MI, MA		x									
	Pachyptila turtur subantarctica	Fairy Prion		VU		x									
Psittaculidae	*Barnardius zonarius*	Australian Ringneck						x		x	x		x	x	x
	Neophema elegans	Elegant Parrot									x		x		
	Parvipsitta porphyrocephala	Purple-crowned Lorikeet								x	x		x		
	Platycercus icterotis	Western Rosella						x		x	x		x		
	Polytelis anthopeplus	Regent Parrot											x		

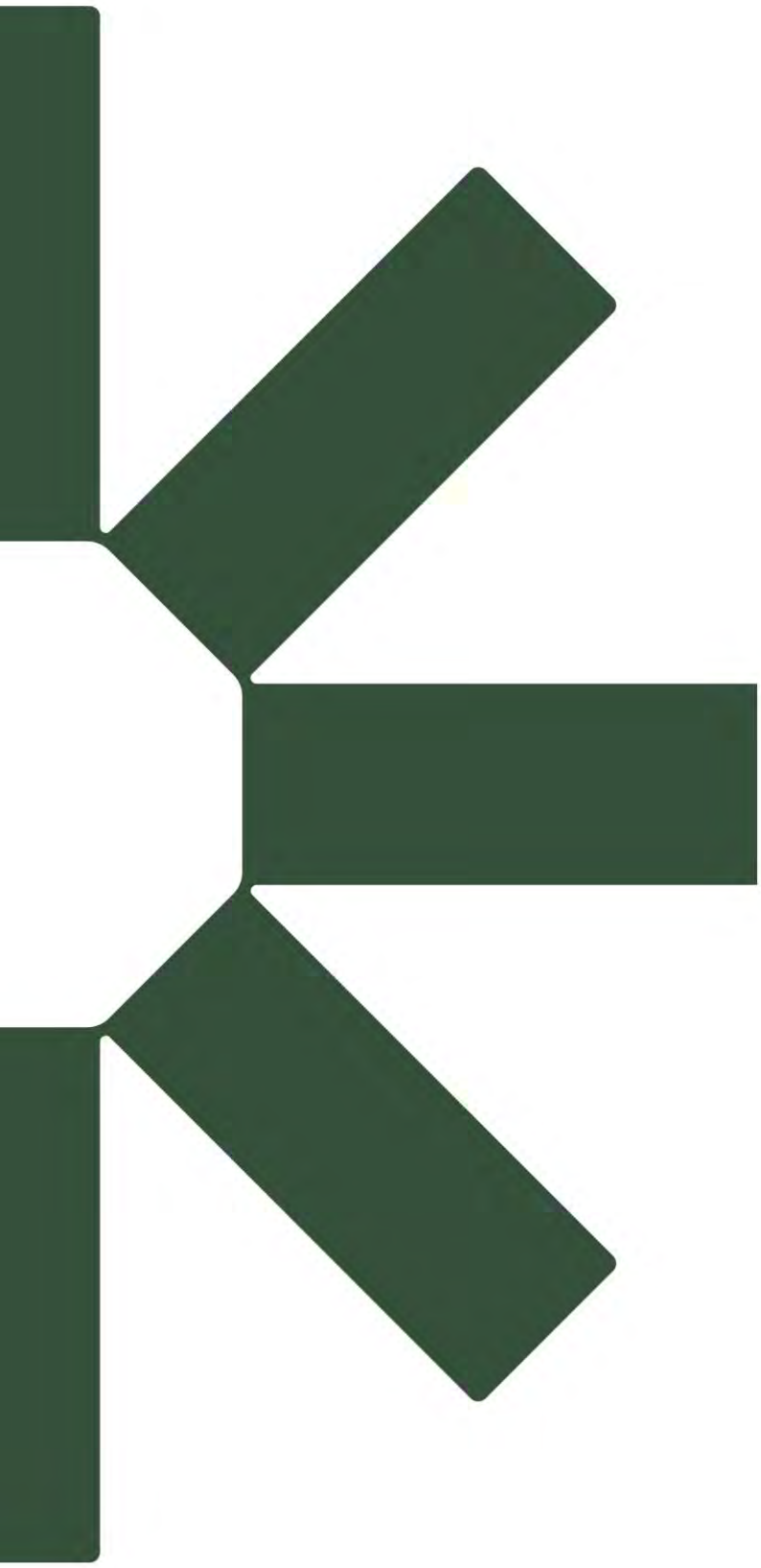
Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Psittacula krameri	Rose-ringed Parakeet, Indian Ringnecked Parrot								x					
	Purpureicephalus spurius	Red-capped Parrot								x	x		x	x	x
	Trichoglossus moluccanus	Rainbow Lorikeet									x			x	
Rallidae	*Fulica atra*	Eurasian Coot									x				x
	Hypotaenidia philippensis	Buff-banded Rail		MA									x		
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail						x		x	x		x		x
	Rhipidura leucophrys	Willie Wagtail								x				x	
Rostratulidae	*Rostratula australis*	Australian Painted Snipe	EN	EN, MA		x									
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI	MI, MA	x	x	x								
	Arenaria interpres	Ruddy Turnstone	MI	VU, MI, MA		x									
	Calidris acuminata	Sharp-tailed Sandpiper	MI	VU, MI, MA	x	x	x								
	Calidris alba	Sanderling	MI	MI, MA	x	x									
	Calidris canutus	Red Knot	EN	VU, MI, MA	x	x	x								
	Calidris falcinellus	Broad-billed Sandpiper	MI	MI, MA		x									
	Calidris ferruginea	Curlew Sandpiper	CR	CR, MI, MA	x	x	x								
	Calidris melanotos	Pectoral Sandpiper	MI	MI, MA		x									
	Calidris pugnax	Ruff	MI	MI, MA (as P. pugnax)		x									
	Calidris ruficollis	Red-necked Stint	MI	MI, MA	x	x	x								
	Calidris subminuta	Long-toed Stint	MI	MI, MA	x	x	x								
	Calidris tenuirostris	Great Knot	CR	VU, MI, MA	x	x	x								
	Gallinago megala	Swinhoe's Snipe	MI	MI, MA		x									
	Gallinago stenura	Pin-tailed Snipe	MI	MI, MA		x									

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Limosa lapponica	Bar-tailed Godwit	MI (*L. l. bauerii* VU; *L. l. menzbieri* CR)	MI, MA (*L. lapponica bauerii Chris. Is.* EN; *L. lapponica menzbieri* EN)	x	x	x								
	Limosa limosa	Black-tailed Godwit	MI	EN, MI, MA	x	x	x								
	Numenius madagascariensis	Far Eastern Curlew, Eastern Curlew	CR	CR, MI, MA	x	x									
	Numenius minutus	Little Curlew	MI	MI, MA		x									
	Numenius phaeopus	Whimbrel	MI	MI, MA		x									
	Tringa brevipes	Grey-tailed Tattler	MI, P4	MI, MA		x									
	Tringa glareola	Wood Sandpiper	MI	MI, MA	x	x	x								
	Tringa nebularia	Common Greenshank	MI	EN, MI, MA	x	x	x								
	Tringa stagnatilis	Marsh Sandpiper	MI	MI, MA	x	x									
	Tringa totanus	Common Redshank	MI	MI, MA		x									
Strigidae	*Ninox boobook*	Boobook Owl		MA						x	x		x		x
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	MI	MI, MA	x		x								
	Threskiornis spinicollis	Straw-necked Ibis		MA							x			x	
Turnicidae	*Turnix varius*	Painted Button-quail						x		x	x		x		
Tytonidae	*Tyto javanica*	Eastern Barn Owl											x		
Tytonidae	*Tyto novaehollandiae*	Australian Masked Owl, Masked Owl	P3								x				
Zosteropidae	*Zosterops lateralis*	Grey-breasted White-eye, Silvereye		MA						x	x		x		x
Mammals															
Burramyidae	*Cercartetus concinnus*	Western Pygmy-possum, Mundarda											x		
Canidae	*Canis familiaris**	Dingo / Dog												x	
	*Vulpes vulpes**	Red Fox						x			x			x	

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Dasyuridae	*Antechinus flavipes leucogaster*	Yellow-footed Antechinus, Mardo						x			x		x		
	Dasyurus geoffroii fortis	Western Quoll, Chuditch	VU	VU	x	x	x	x	x		x		x		
	Phascogale calura	Red-tailed Phascogale	CD	VU		x									
	Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		x		x	x			x		x		
	Sminthopsis gilberti	Gilbert's Dunnart									x		x		
Felidae	*Felis catus**	Cat									x		x	x	x
Leporidae	*Oryctolagus cuniculus**	Rabbit						x			x		x	x	
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo						x			x		x	x	x
	Notamacropus eugenii derbianus	Tammar Wallaby	P4		x		x								
	Notamacropus irma	Western Brush Wallaby	P4		x		x	x			x		x	x	x
	Setonix brachyurus	Quokka	VU	VU	x	x	x	x			x		x		
Molossidae	*Austronomus australis*	White-striped Free-tailed Bat									x		x		
	Ozimops kitcheneri	Western Free-tailed Bat									x		x		
Muridae	*Hydromys chrysogaster*	Water Rat, Rakali	P4		x		x				x				
	*Mus musculus**	House Mouse									x				
	*Rattus rattus**	Black Rat						x			x		x		
Myrmecobiidae	*Myrmecobius fasciatus fasciatus*	Numbat, Walpurti	EN	EN	x	x	x								
Peramelidae	*Isoodon fusciventer*	Quenda	P4		x		x	x			x		x	x	
Phalangeridae	*Trichosurus vulpecula hypoleucus*	Common Brushtail Possum, Koomal									x		x		
Potoroidae	*Bettongia penicillata ogilbyi*	Brush-tailed Bettong, Woylie	CR	EN	x	x	x								
Pseudocheiridae	*Pseudocheirus occidentalis*	Western Ringtail Possum	CR	CE	x	x	x								

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Suidae	*Sus scrofa**	Pig						x			x		x		x
Tachyglossidae	*Tachyglossus aculeatus acanthion*	Short-beaked Echidna						x			x		x		x
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat									x		x		
	Chalinolobus morio	Chocolate Wattled Bat									x		x		
	Falsistrellus mackenziei	Western False Pipiistrelle	P4		x		x				x		x		
	Vespadelus regulus	Southern Forest Bat									x		x		
Reptiles															
Agamidae	*Ctenophorus ornatus*	Ornate Crevice Dragon								x	x				
	Pogona minor	Dwarf Bearded Dragon								x	x		x	x	
Carphodactylidae	*Underwoodisaurus milii*	Southern Barking Gecko						x		x			x		
Diplodactylidae	*Diplodactylus lateroides*	Speckled Stone Gecko									x				
	Diplodactylus polyophthalmus	Spotted Sandplain Gecko								x					
Elapidae	*Acanthophis antarcticus*	Southern Death Adder	P3		x		x				x				
	Notechis scutatus	Tiger Snake								x	x		x		
	Pseudonaja affinis	Dugite						x		x			x	x	
	Suta nigriceps	Mitchell's Short-tailed Snake									x		x		
Gekkonidae	*Christinus marmoratus*	Marbled Gecko						x			x				
Pygopodidae	*Aprasia pulchella*	Pretty Worm-lizard						x		x	x				
	Delma fraseri	Fraser's Delma											x		
Pythonidae	*Morelia spilota*	Carpet Python								x	x		x		
Scincidae	*Acritoscincus trilineatus*	Western Three-lined Skink								x	x		x		
	Cryptoblepharus buchananii	Buchanan's Snake-eyed Skink						x			x			x	

Family	Scientific name	Common name	Conservation status		Database			2023 Survey	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Cryptoblepharus plagiocephalus	Péron's Snake-eyed Skink								x					
	Ctenotus delli	Dell's Ctenotus	P4		x		x			x					
	Ctenotus labillardieri							x		x	x		x		
	Egernia kingii	King's Skink						x		x	x				
	Egernia napoleonis	South-western Crevice-skink						x		x	x		x		
	Hemiergis initialis initialis	Southwestern Earless Snake								x	x		x		
	Lerista distinguenda	Dwarf Four-toed Slider								x	x		x		
	Lerista microtis microtis	Southwestern Slider								x					
	Menetia greyii	Common Dwarf Skink								x	x		x		
	Morethia obscura	Shrubland Morethia Skink								x	x		x		
	Tiliqua rugosa	Bobtail						x		x	x		x	x	
Typhlopidae	*Anilios australis*	Southern Blind Snake								x	x		x		
Varanidae	*Varanus gouldii*	Bungarra Or Sand Goanna						x		x	x		x		
	Varanus rosenbergi	Heath Goanna								x	x		x	x	x
	Varanus tristis	Racehorse Goanna									x				



Making Sustainability Happen

Targeted Chuditch, Quokka, and Woylie Survey

Huntly Mine – Myara Region

Alcoa of Australia Ltd

181 - 205 Davy Road, Booragoon WA 6154, Australia

Prepared by:

SLR Consulting Australia

Level 1, 500 Hay Street, Subiaco WA 6008, Australia

SLR Project No.: 675.VX5890.00001

17 June 2024

Revision: 2.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	16 April 2024	P. Dean S. Girando	E. Webb	E. Webb
01	17 June 2024	K. Griffith	E. Webb	E. Webb

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Alcoa of Australia Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

Alcoa of Australia Ltd commissioned SLR Consulting Australia Pty Ltd to undertake a fauna desktop assessment and targeted Chuditch (*Dasyurus geoffroii*), Quokka (*Setonix brachyurus*), and Woylie (*Bettongia penicillata*) survey for the Huntly Mine Myara region as part of its Mining and Management Program assessment by the Mining and Management Program Liaison Group. The survey was undertaken within a defined area that consists of approximately 1,240 individual polygons (the Survey Area) that covers 928.6 hectares and is located approximately 20 km northeast of the Pinjarra townsite, in the Jarrah Forest bioregion of Western Australia.

The objective of the survey was to identify key fauna values targeting Chuditch, Quokka, and Woylie within the Survey Area as part of the MMP assessment process.

The targeted fauna survey used a variety of detection methods including camera trapping, spotlighting, active searches, and opportunistic observations. Fauna habitat mapping was based on a combination of field observations, vegetation mapping, fauna habitat assessment data, and aerial imagery.

Two naturally occurring fauna habitats were mapped within the Survey Area; Jarrah-Marri Forest and Drainage Line. The Drainage Line habitat provides the most value for targeted taxa as it is core habitat for Chuditch, Quokka, and Woylie. The Jarrah-Marri Forest also provides value for targeted taxa as core habitat for Chuditch and Woylie, and as supporting habitat for the Quokka. These habitats are typical of the Jarrah Forest region and are widespread outside of the Survey Area. A third habitat type, Rehabilitation, was mapped within the Survey Area but currently provides negligible value for targeted taxa because it is still young and occupied by seedlings. It is likely that the value of this habitat will increase with age as vegetation matures.

Two targeted taxa were recorded during the survey; the Chuditch was recorded 52 times and spot analysis identified a minimum of 14 individuals occurring within the Survey Area. The Quokka was recorded 18 times and was detected within both the Jarrah-Marri Forest and Drainage Line habitats via camera trapping. The Woylie was not detected during the current survey; however, it has previously been recorded within 80 m of the Survey Area.

In addition to the two targeted fauna taxa, six significant taxa were recorded during the fauna survey in Jarrah-Marri Forest and Drainage Line habitats:

- Baudin's Cockatoo (*Zanda baudinii*).
- Carnaby's Cockatoo (*Zanda latirostris*).
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*).
- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*).
- Quenda (*Isoodon fusciventer*).
- Western Brush Wallaby (*Notamacropus irma*).

A further five significant fauna taxa were assessed as having a high likelihood, three significant fauna taxa were assessed as having a medium likelihood, and 29 significant fauna taxa were assessed as having have a low likelihood of occurring within the Survey Area.

Five introduced taxa were recorded during the survey: Laughing Kookaburra (*Dacelo novaeguineae*), Red Fox (*Vulpes vulpes*), Rabbit (*Oryctolagus cuniculus*), Black Rat (*Rattus rattus*), and Pig (*Sus scrofa*).

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Acronyms and Abbreviations

°C	Degree Celsius
BC Act	*Biodiversity Conservation Act 2016*
BoM	Bureau of Meteorology
CR	Critically Endangered
DAWE	Department of Agriculture Water and Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEE	Department of the Environment and Energy
Desktop Study Area	The area that was studied during the desktop assessment encompassing the Survey Area and surrounds
DMIRS	Department of Mines, Industry Regulation and Safety
DoE	Department of the Environment
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning, Lands and Heritage
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection Biodiversity and Conservation Act 1999*
ESA	Environmentally Sensitive Area
GIS	Geographic Information System
GPS	Global Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
km	Kilometres
Lat	Latitude
Long	Longitude
m	Metres
MA	Marine
mm	Millimetres
MMP	Mining and Management Program
MMPLG	Mining and Management Planning Liaison Group
MNES	Matters of National Environmental Significance

OS	Other Specially Protected Fauna
P	Priority
PMST	Protected Matters Search Tool
Alcoa	Alcoa of Australia Ltd
SLR	SLR Consulting Australia
Survey Area	The area that was surveyed
T	Threatened
TEC	Threatened Ecological Community
VU	Vulnerable
WA	Western Australia
WAM	Western Australian Museum

1.0 Introduction

1.1 The Project

Alcoa of Australia Ltd (Alcoa) commissioned SLR Consulting Australia Pty Ltd (SLR) to undertake a fauna desktop assessment and targeted Chuditch (*Dasyurus geoffroi*), Quokka (*Setonix brachyurus*), and Woylie (*Bettongia penicillata*) survey for the Huntly Mine Myara region (the Project) as part of its Mining and Management Program (MMP) assessment by the Mining and Management Planning Liaison Group (MMPLG). The survey was undertaken within a defined area that consists of approximately 1,240 individual polygons (the Survey Area) that covers 928.6 hectares and is located approximately 20 km northeast of the Pinjarra townsite, in the Jarrah Forest bioregion of Western Australia (**Map 1**). All maps are provided in **Appendix A**.

1.2 Objective and Scope

The objective of the survey was to identify key fauna values targeting Chuditch, Quokka, and Woylie within the Survey Area as part of the MMP assessment process for the Project. The following scope of work was completed:

- A desktop assessment of the Huntly Mine Myara region including an overview of fauna habitat, inventory, and likelihood of species present and background environmental information.
- A targeted survey for Chuditch, Quokka, and Woylie.
- A technical biological report.

2.0 Background

2.1 Statutory and Regulatory Framework

Western Australian fauna is governed by the following legislative measures:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). (Commonwealth of Australia, 1999).
- *Biodiversity Conservation Act 2016* (WA) (BC Act) (Government of Western Australia, 2016).
- *Environmental Protection Act 1986* (WA) (EP Act) (Government of Western Australia, 1986).

In addition to these legislative measures, the following non-legislative lists are considered on a case-by-case basis:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora, and ecological communities.
- Recognition of locally significant populations by DBCA.

The EIA process is supported by guidance documents published by the Environmental Protection Authority (EPA), DBCA and the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

Western Australia

- *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (Environmental Protection Authority, 2020).
- *Environmental Factor Guideline – Terrestrial Fauna* (EPA, 2016).

Commonwealth

- *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (DoE, 2013).
- *Survey guidelines for Australia's threatened mammals* (DSEWPaC, 2011).

2.2 Existing Environment

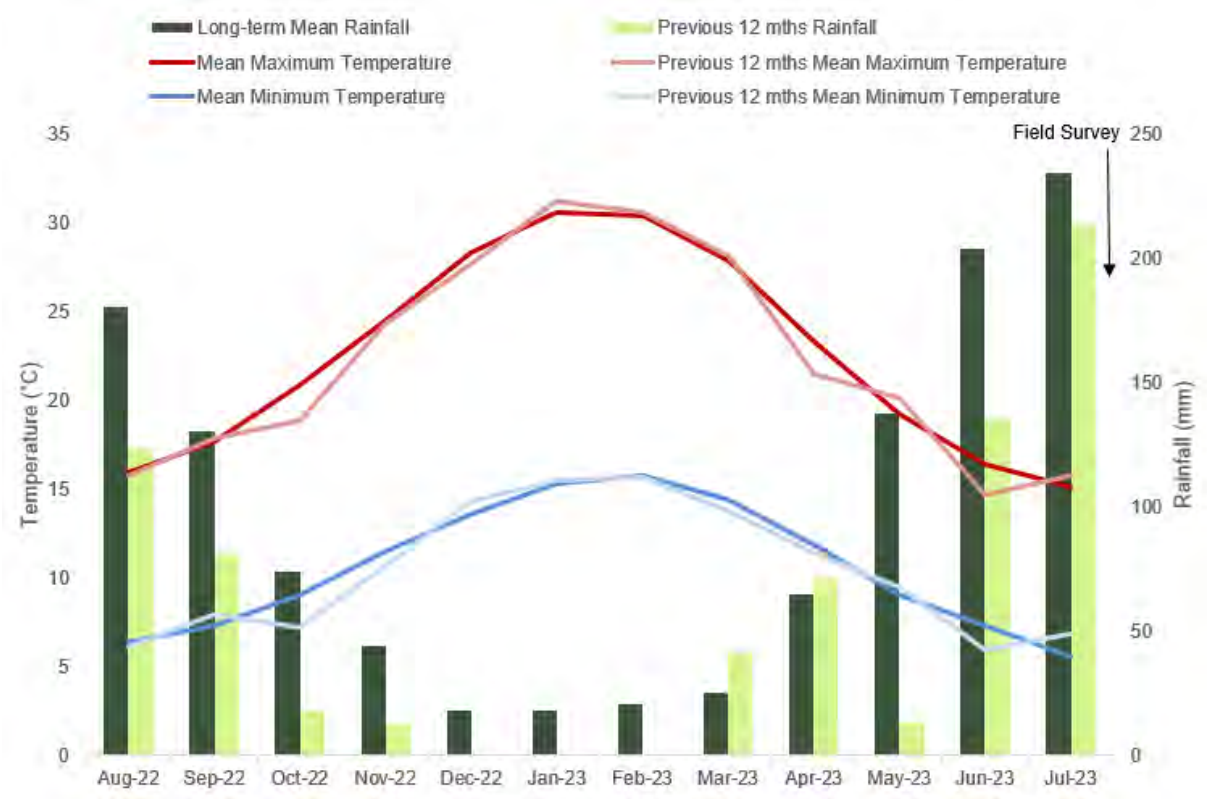
2.2.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a complete dataset is Karnet Weather Station (Station 9111), located within site, approximately 0.3 km from the closest polygon of the Survey Area.

Climate statistics were calculated using data from the most current climate normal, which is defined as a 30-year interval where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate (BoM, 2007).

The long-term (1965 to 2024) mean minimum temperature for Karnet Weather Station ranges from 6.3˚C (July) to 15.8˚C (February) and the long-term mean maximum temperature ranges from 15.1˚C (July) to 30.6˚C (January) (BoM, 2024) (**Graph 1**).

The Karnet Weather Station recorded 710.4 mm of rainfall in the 12 months prior to the survey (August 2022 to July 2023), which is 410 mm below the long-term (1964 to 2024) average of 1120.4 mm (BoM, 2024). In the three months prior to the survey (May 2023 to July 2023), 362.5 mm of rainfall was recorded, which is 213.7 mm below the long-term average of 576.2 mm for the same period (BoM, 2024). Rainfall data from 2023 was the lowest recorded within the 60 years of rainfall data from Karnet Weather Station.



Graph 1: Climate summary of Karnet Weather Station

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (DEE, 2016). The Survey Area occurs within the Jarrah Forest bioregion and the Northern Jarrah Forest (JAF01) subregion.

The Northern Jarrah Forest subregion overlays Archaean granite and metamorphic rocks with an average elevation of 300 m, capped by extensive lateritic duricrust and interrupted by later drainage and dissected by occasional granite hills. In the east the laterite becomes greatly separated until it compresses isolated remnants. Vegetation comprises of Jarrah-Marri Forest in the west with Bullich and Blackbutt in the valleys grading to Wandoo and Marri woodlands in the east with Powder bark on breakaways. A common understorey of heath is found on granite rocks in the north and east forests and woodlands. The lower slopes, where rapid changes in the site conditions occur, support most of the diversity in the communities. The subregional area is 2,255,904 ha (Williams and Mitchell, 2001).

2.2.3 Soil Landscape Mapping

Soil landscape mapping of Western Australia consists of a compilation of various surveys at different scales varying between 1:20,000 and 1:3,000,000 (DPIRD, 2022). The mapping comprises a nested hierarchy of levels, with each level a subdivision of the preceding level. Soil landscape mapping provides an indication of potential vegetation types and fauna habitats within the Survey Area and has been described below to the highest level of detail available for the Survey Area.

The Survey Area occurs across five soil landscape subsystems and seven soil landscape phases (**Table 1**; **Map 2**).

Table 1: Soil landscape systems within the Survey Area

Subsystem or phase		Description	Area and percentage within Survey Area
Name	Code		
Cooke Subsystem	255DpCO	Crests and upper slopes dominated by granite outcrop and very shallow yellow duplex soils, and yellow and brown massive earths	178.5 ha 19.2%
Dwellingup Subsystem	255DpDW	Divides, lower to upper slopes and hillcrests. Duplex sandy gravels and loamy gravels with minor areas of shallow gravels, deep sandy gravels, yellow deep sands, and yellow and pale deep sands, often gravelly	557.5 ha 60.0 %
Hester Subsystem	255DpHR	Ridges and hill crests on laterite and gneiss, relief 5-40 m, slopes 5-15%. Soils are sandy gravels, loamy gravels, and loamy earths	10.7 ha 1.2 %
Yarragil Subsystem	255DpYG	Shallow, narrow, upper valleys of the deeply dissected Murray, Bindoon, and Helena units. Alluvial, clay and loam soils, moderately well drained, often gravelly, with some sands and loams. Salt prone. Woodland of *E. wandoo, E. accedens*	106.1 ha 11.4 %
Yarragil DpYGh Phase	255DpYGh	Very gentle to moderately inclined (<20%) concave valley sideslopes. Moderately well drained yellow duplex soils and yellow and brown massive earths	24.7 ha 2.7 %
Yarragil Swamp Phase	255DpYGsw	Level to very gently inclined valley floors. Swampy river flats and terraces in granitic rocks; loamy and sandy duplex, wet soils, non-cracking clays, and loams	2.9 ha 0.3 %
Murray Subsystem	255MvMY	Deeply incised valley of the Murray River; red and yellow earths and minor duplex soils; occasional rock outcrops; narrow sandy terrace	39.5 ha 4.3 %
Murray Valleys DR1 Phase	255MvDR1	Gentle to moderate slopes of scarp face (5-25%) with red and yellow gradational earths and duplex soils with variable depth and common rock outcrop	4.1 ha 0.4 %
Forrestfield disturbed land, mine phase	213FoX_MINE	Mine. Disturbed land.	0.7 ha 0.08 %
Forrestfield F1a Phase	213Fo__F1a	1-15% lower slopes with well drained shallow to moderately deep, very gravelly acidic yellow duplex soils and common laterite	0.5 ha 0.06 %
Forrestfield F2a Phase	213Fo__F2a	Low slopes and foot slopes up to 5-10% with well drained shallow to moderately deep, very gravelly acidic yellow duplex soils and common laterite	2.0 ha 0.2 %
Forrestfield F4 Phase	213Fo__F4	Low slopes and foot slopes up to 5-10% with well drained shallow to moderately deep, very gravelly acidic yellow duplex soils and common laterite	1.4 ha 0.15 %
Total area and percentage within Survey Area			**928.6 ha 100.00%**

2.2.4 Hydrography

A total of three hydrographic features intersect the southern polygons of the Survey Area along the proposed conveyor line. A total of 21 named hydrographical features occur within a 5 km radius of the Survey Area. Hydrographic features intersecting and occurring within the vicinity of the Survey Area are listed below in **Table 2**, and shown in **Map 3**) (DWER, 2018).

Table 2: Hydrographic features in the vicinity of the Survey Area

Feature name	Feature type	Distance from Survey Area
Barritt Brook	Major Tributary	0.5 km north
Big Brook	Major River	80 m north
Cameron East	Minor Tributary	7.8 km south-southeast
Cameron West	Minor Tributary	8.1 km south-southeast
Conjurunup Creek	Significant Stream	Intersects southern polygon of the Survey Area
Cornish Gully	Minor Tributary	3.4 km northwest
Dirk Brook	Significant Stream	57 m northwest
Karnet Brook	Significant Stream	3.5 km northwest
Marrinup Brook	Minor River	4.5 km south
Myara Brook	Major Tributary	3 km west
Nambeelup Brook	Significant Stream	5.1 km west
North Dandalup Dam	Infrastructure	1 km west
North Dandalup Dam Spillway	Infrastructure	4.4 km west
North Dandalup Reservoir	Minor River	4.5 km west
North Dandalup River	Minor River	Intersects southern polygon of the Survey Area
South Dandalup River	Major River	Intersects southern polygon of the Survey Area
Oakley Brook	Major Tributary	0.3 km south
O'Neil Brook	Major Tributary	1.5 km south-southeast
Serpentine Pipehead Dam	Mainstream	2.7 km north
Serpentine Reservoir	Mainstream	0.9 km north
Serpentine River	Mainstream	0.2 km east
South Dandalup Dam	Infrastructure	0.5 km south
South Dandalup Pipehead	Major River	3.7 km west
South Dandalup Reservoir	Major River	0.8 km south

2.2.5 Pre-European Vegetation

The major source of data for pre-European vegetation mapping in Western Australia is the published and unpublished mapping of J. S. Beard at 1:250,000 scale. These vegetation types were later refined by Shepherd, Beeston, and Hopkins (2002), resulting in 819 Vegetation Association-level units, and a subsequent reclassification resulted in the creation of over 2,175 finer-scale System Associations (Beard *et al.*, 2013). Two System Associations are mapped within the Survey Area (**Map 4**):

- WEST DARLING_3: Comprises Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*).
- WEST DARLING_4: Comprises Jarrah, Marri, and Wandoo; *Eucalyptus marginata*, *Corymbia calophylla*, and *Eucalyptus wandoo*.

2.2.6 Conservation Areas

Conservation areas consist of areas protected for the purpose of conservation, including but not limited to National Parks, Nature Reserves, Conservation Parks, and Regional Parks. The Survey Area intersects three conservation areas (DBCA, 2023a, 2023b) which are listed below and shown in **Map 5**:

- Jarrahdale State Forest, intersects the northern portion of the Survey Area and is vested under Conservation Commission of WA.
- Marrinup State Forest, intersects the southern portion of the Survey Area and is vested under Conservation Commission of WA.
- Dwellingup State Forest, intersects the southern portion of the Survey Area and is vested under Conservation Commission of WA.

Additionally, Serpentine National Park is located 0.8 km north of the Survey Area and is vested under Conservation Commission of WA.

2.2.7 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs), or significant wetlands. The Survey Area does intersect six mapped ESAs, all of which are geomorphic wetlands (DWER, 2021). There are 79 ESAs within a 5 km radius of the Survey Area, comprising:

- 62 geomorphic wetlands.
- Nine Threatened flora.
- One TEC.
- Three areas on the Register of National Estate, two of which are also geomorphic wetlands.

ESAs are shown in **Map 5**.

2.2.8 Land Use

No pastoral leases apply to the Survey Area. The Survey Area is under one mining tenement, Alcoa of Australia Ltd (AML7000001) (DMIRS, 2024).

3.0 Methods

The surveys documented in this report were undertaken in accordance with relevant EPA and DCCEEW guidelines (see **Section 2.1**).

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds (the Desktop Study Area) was compiled prior to the field survey. The literature review considered a selection of relevant reports detailing assessments undertaken in the region that were either publicly available from sources such as the Index of Biodiversity Surveys for Assessments (IBSA) website, the EPA Consultation Hub, or internet searches, or provided by Alcoa. These reports are listed below, summarised in **Appendix B**, and their locations in relation to the current Survey Area, as represented by their nearest point, are shown in **Map 6**:

- *Chuditch Pre-mine Survey, Myara* (Way, 2013), intersects the Survey Area.
- *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006), intersects the Survey Area.
- *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North* (GHD, 2021b), 1 km north of the Survey Area.
- *Black Cockatoo Habitat Assessment - Pinjarra Racecourse* (Harewood, 2019), 6 km west of the Survey Area.
- *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a), 8 km south of the Survey Area.
- *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment* (GHD, 2012), 10 km north of the Survey Area.
- *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)* (Harewood, 2017), 17.5 km south of the Survey Area.

3.1.2 Database Searches

Database searches were undertaken to compile a list of flora and fauna known to occur in the Desktop Study Area and identify significant flora, fauna, and ecological communities with potential to occur within the Survey Area (**Table 3**).

Table 3: Database search details

Database name	Date received	Search target	Buffer around the Survey Area
Threatened and Priority Fauna database search (DBCA, 2023c)	08 June 2023	Threatened and Priority fauna	20 km
Protected Matters Search Tool (PMST) (DCCEEW, 2023)	14 July 2023	Threatened flora, fauna, and ecological communities	20 km
NatureMap (DBCA, 2023d)	07 June 2023	Fauna	20 km

3.1.3 Likelihood of Occurrence

Significant fauna taxa identified during the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area before and after the field survey. The assessment used the likelihood of occurrence criteria presented in **Table 4**.

Taxa listed as Marine only under the EPBC Act were not considered to be significant taxa because the Marine listing does not constitute MNES under the EPBC Act. Additionally, erroneous records (i.e. records that occur well outside a taxon's known distribution) were excluded from consideration. Only taxa that have been recorded within the Survey Area or were assessed as having a high or medium likelihood of occurrence are discussed in detail.

Table 4: Likelihood of occurrence criteria

Rank	Criteria
Recorded	The taxon was recorded within the Survey Area during the current survey.
Previously Recorded	The taxon has been previously recorded within the Survey Area according to database search or literature review results.
High (Likely to occur)	The taxon has been recorded within the Desktop Study Area more than once in the last 15 years and suitable habitat is present within the Survey Area.
Medium (May occur)	There are existing records of the taxon within the Desktop Study Area, however the taxon has not been recorded within the Desktop Study Area in the last 15 years or suitable habitat within the Survey Area is marginal or limited in extent.
Low (Unlikely to occur)	Suitable habitat is not present within the Survey Area, or the taxon is very infrequently recorded in the locality despite reasonable previous search effort, or the taxon is believed to be extinct or locally extinct.

3.2 Field Surveys

3.2.1 Survey Timing

The field surveys were undertaken across two field trips as shown in **Table 5**.

Table 5: Survey timing

Survey trip	Tasks completed	Dates	Person field days
1	Active searches, deployment of camera traps, habitat assessment, spotlighting.	22nd August – 26th August 2023	20
2	Collection of camera traps	9th September – 11th September 2023	10

3.2.2 Field Personnel and Licences

Details of field personnel, including their level of experience and role for each field trip are detailed in **Table 6**. Fieldwork was completed under Fauna Taking (Biological Assessment) License – Regulation 27 (08-005511-1) (**Appendix C**).

Table 6: Field personnel

Personnel	Experience	Role	Trips
Dr Michael Lohr	11 years	Principal Zoologist	1 and 2

Personnel	Experience	Role	Trips
Evan Webb	7 years	Associate Zoologist	1 and 2
Poppy Walker	5 years	Senior Zoologist	1 and 2
Lewis Berry	2 years	Ecologist	1 and 2

3.2.3 Habitat Assessment and Mapping

Habitat assessments were undertaken in representative areas of fauna habitat within the Survey Area to record habitat values. A habitat assessment was recorded at each camera trap site, and two additional standalone habitat assessments were recorded. Habitat assessment locations are shown in **Map 7**.

The following information was collected at each habitat assessment locations using a GPS-enabled handheld device:

- Site photo.
- Landform.
- Soil type and colour.
- Rock types, surface stone cover, and size classes.
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, and water sources.
- Habitat quality, fire history, and evidence of disturbance.
- General description of vegetation structure.

Fauna habitat mapping was based on a combination of field observations, habitat assessment data, aerial imagery, and vegetation mapping (Mattiske and Havel, 1998). Polygons were digitised using GIS software.

3.2.4 Camera Traps

A total of 80 motion sensitive camera traps were deployed during the field survey. Each camera trap was deployed for a minimum of 16 nights and total survey effort consisted of 1,413 trap nights. Cameras were placed in areas of suitable habitat for target taxa (Chuditch, Quokka, and Woylie) and non-target taxa (Wambenger Brush-tailed Phascogale, Quenda, and Western Brush Wallaby) and were baited with universal bait (rolled oats, peanut butter, and sardines) and chopped apples. Camera trap locations are shown in **Map 7**.

3.2.4.1 Chuditch Spot Analysis

Unique spot patterns of Chuditch were used to determine the number of individuals recorded by camera trap. Photographs where Chuditch spot patterns were clearly visible were examined and distinguishable groupings of spots were noted. Where possible, new individuals were differentiated from recaptures.

3.2.5 Spotlighting

Spotlighting was undertaken on two nights during the field survey. Spotlighting commenced approximately one hour after sunset and consisted of traversing areas of suitable habitat, generally near stream crossings, on foot for a duration of two hours. A total of 16 person hours was completed during the field survey. Spotlighting was also undertaken opportunistically from the vehicle while

travelling to and from the spotlighting location. Spotlighting was undertaken at the following locations (**Map 7**):

- 5890-CAM-11-PW
- 5890-CAM-13-PW
- 5890-CAM-51-EW/5890-CAM-65-EW
- 5890-CAM-68-EW

3.2.6 Opportunistic Observations

Opportunistic observations of fauna were recorded throughout the Survey Area, including primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings, remains).

3.2.7 Active Searches

Untimed active searches were undertaken at each camera trap site. These searches included flipping rocks and logs and raking leaf litter in search of direct sightings, scats, tracks, and other traces of fauna, with a particular focus on Chuditch (scats, dens in hollow logs or burrows), Quokka (scats, runnels in sedges), Woylie (scats, diggings, nests), and Numbat (scats, diggings).

3.3 Limitations

Limitations and constraints of the fauna survey are detailed below in **Table 7**.

Table 7: Limitations and constraints associated with the survey

Variable	Degree of limitation	Potential constraints on survey outcomes
Availability of data and information	No	Sufficient data and information, including regional and local contextual information, was available to complete the scope of the survey.
Competency and experience of the survey team	No	The survey was undertaken by a team with extensive experience undertaking similar scopes within the bioregion. • Principal Zoologist Dr Michael Lohr – 11 years' experience. • Associate Zoologist Evan Webb – 7 years' experience. • Senior Zoologist Poppy Walker – 5 years' experience. • Ecologist Lewis Berry – 2 years' experience.
The proportion of fauna identified, recorded, or collected	No	All targeted fauna taxa were able to be identified to species level with a high degree of confidence.
Scope of the survey	No	The scope of the survey was limited to terrestrial vertebrate fauna targeting threatened marsupials. No further exclusions were made within this group.
Adequacy of the survey intensity and proportion of survey achieved	No	Sufficient time and effort were allocated to the survey given the size and complexity of the Survey Area and the expected level of survey intensity.
Access problems	Partial	The majority of the Survey Area was sufficiently accessed by vehicle and on foot. Due to logistical constraints, a 62.9 ha portion of the Survey Area consisting of thin linear polygons along the conveyor belt was not surveyed.

Variable	Degree of limitation	Potential constraints on survey outcomes
Timing and season	No	Targeted Chuditch, Quokka, and Woylie surveys can be undertaken at any time of year.
Disturbance that may have affected the results of survey	No	Areas of disturbance associated with mining activities, historical logging, and bushfires were present within the Survey Area but were not a limitation on the results of the survey.
Problems with data and analysis, including sampling biases	No	Survey effort for significant fauna taxa was concentrated in preferred habitats. This may introduce bias where the use of non-preferred habitat is underrepresented, however, this is not considered a limitation on the survey outcomes.

4.0 Results

4.1 Desktop Assessment

The database searches and literature review identified 218 terrestrial vertebrate fauna taxa occurring within the Desktop Study Area, of which 36 are significant (Threatened or Priority):

- 156 birds, of which 31 are significant.
- 30 mammals, of which 12 are significant.
- 22 reptiles, of which 2 are significant.
- 10 amphibians, of which none are significant.

Key findings of the literature review are summarised in **Appendix B**, a complete list of fauna taxa recorded within the Desktop Study Area is presented in **Appendix D**, and DBCA database search results are displayed in **Map 8**.

4.2 Fauna Habitat

Three fauna habitats (excluding cleared and unsurveyed areas) were identified and mapped within the Survey Area. Fauna habitats are presented in **Map 9**, described below in **Table 8**, and site sheets for each habitat assessment are provided in **Appendix E**. Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding.

Table 8: Fauna habitats recorded within the Survey Area

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Jarrah-Marri Forest	849.8 ha, 91.5%	Undulating plains and hills over clay loam soils and laterite rock. Vegetation consists of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) open forest with patchy *Allocasuarina Fraseriana* over a mixed midstorey typically dominated by *Bossiaea aquifolium, Xanthorrhoea preissi,* and *Macrozamia fraseri*, over sedges and bracken. Disturbances consisted primarily of historic logging and bushfire. Microhabitats present within this habitat include hollows in trees and logs, leaf litter and woody debris. This habitat is core habitat Chuditch and supporting habitat for Woylie and Quokka. The canopy is core habitat for black cockatoos.	
Drainage Line	15.6 ha, 1.7%	Areas of drainage over clay loam soils, often with thin channels of surface water present. Vegetation consists of a closed mosaic upperstorey of Bullich (*E. megacarpa*), Blackbutt (*E. patens*), and Flooded Gum (*E. rudis*), forest over a closed mixed shrubland of *Melaleuca* sp., *B. aquifolium*, and other *Myrtaceae* sp. and *Acacia* sp., over tall sedgeland. This habitat typically had low levels of disturbance. Microhabitats present within this habitat include tree and log hollows, woody debris, peeling bark and leaf litter. Drainage Line habitat is core habitat Chuditch, Woylie, and Quokka, and the canopy constitutes core habitat for black cockatoos. This habitat is analogous to Blackbutt, Bullich, and Flooded Gum fauna habitats recorded by GHD (2021b, 2021a).	

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Rehabilitation	0.3 ha, 0.03%	Former mine pits that have been ripped and replanted, currently occupied by seedlings.	
Unsurveyed	62.9 ha, 6.7%	Unsurveyed portion of Survey Area along conveyor belt corridor.	
Cleared	<0.01 ha, <0.01%	Cleared land for existing tracks/roads. Low/negligible fauna habitat value.	
Total	**928.6 ha, 100%**		

4.3 Recorded Fauna

The basic terrestrial vertebrate fauna survey recorded 61 fauna taxa from 38 families, comprising three amphibian taxa, 35 bird taxa, 13 mammal taxa, and 10 reptile taxa. Of the taxa recorded, eight were significant (see **Section 4.4**). Five introduced taxa were recorded, the Laughing Kookaburra (*Dacelo novaeguineae*), Red Fox (*Vulpes vulpes*), Rabbit (*Oryctolagus cuniculus*), Black Rat (*Rattus rattus*), and Pig (*Sus scrofa*).

An inventory of fauna recorded during the field survey is provided below in **Table 9**.

Table 9: Fauna recorded within the Survey Area

Family	Scientific Name	Common Name	Conservation Status		Call	Camera trap	Digging	Foraging evidence	Scat	Sighting	Sighting - overhead	Total
			State	Common wealth								
Amphibians												
Myobatrachidae	*Crinia georgiana*	Quacking Frog	-	-	1							**1**
Myobatrachidae	*Crinia glauerti*	Clicking Frog	-	-	2							**2**
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog	-	-						1		**1**
Birds												
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill	-	-						1		**1**
Acanthizidae	*Acanthiza inornata*	Western Thornbill	-	-		2				2		**4**
Acanthizidae	*Gerygone fusca*	Western Gerygone	-	-	4							**4**
Acanthizidae	*Sericornis maculatus*	Spotted Scrubwren	-	-		7						**7**
Acanthizidae	*Smicrornis brevirostris*	Weebill	-	-	2							**2**
Accipitridae	*Lophoictinia isura*	Square-tailed Kite	-	-							1	**1**
Alcedinidae	**Dacelo novaeguineae*	Laughing Kookaburra	-	-	1							**1**
Anatidae	*Anas superciliosa*	Pacific Black Duck	-	-						2		**2**
Artamidae	*Artamus cyanopterus*	Dusky Woodswallow	-	-						1		**1**
Artamidae	*Strepera versicolor*	Grey Currawong	-	-		14				4		**18**
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU				13	3	78	16	**110**
Cacatuidae	*Zanda baudinii*	Baudin's Cockatoo	EN	EN				2				**2**
Cacatuidae	*Zanda latirostris*	Carnaby's Cockatoo	EN	EN						40	10	**50**
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike	-	MA						2		**2**
Casuariidae	*Dromaius novaehollandiae*	Emu	-	-		2				1		**3**
Climacteridae	*Climacteris rufus*	Rufous Treecreeper	-	-	1							**1**
Columbidae	*Phaps elegans*	Brush Bronzewing	-	-		2						**2**
Corvidae	*Corvus coronoides*	Australian Raven	-	-	2	16						**18**
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	-	MA	1	1						**2**
Maluridae	*Malurus elegans*	Red-winged Fairywren	-	-		22						**22**

Family	Scientific Name	Common Name	Conservation Status		Call	Camera trap	Digging	Foraging evidence	Scat	Sighting	Sighting - overhead	Total
			State	Common wealth								
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill	-	-		1				2		**3**
Meliphagidae	*Anthochaera lunulata*	Western Wattlebird	-	-	1							**1**
Meliphagidae	*Phylidonyris novaehollandiae*	New Holland Honeyeater	-	-						1		**1**
Pachycephalidae	*Pachycephala fuliginosa*	Western Whistler	-	-						1		**1**
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler	-	-	1							**1**
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote	-	-		1						**1**
Pardalotidae	*Pardalotus striatus*	Striated Pardalote	-	-	2							**2**
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin	-	-		4						**4**
Petroicidae	*Petroica boodang*	Scarlet Robin	-	-		1				1		**2**
Petroicidae	*Quoyornis georgianus*	White-breasted Robin	-	-		1						**1**
Podargidae	*Podargus strigoides*	Tawny Frogmouth	-	-						1		**1**
Psittaculidae	*Barnardius zonarius*	Australian Ringneck	-	-						2		**2**
Psittaculidae	*Platycercus icterotis*	Western Rosella	-	-						1		**1**
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	-	-	1	1						**2**
Turnicidae	*Turnix varius*	Painted Buttonquail	-	-		5						**5**
Mammals												
Canidae	**Vulpes vulpes*	Red Fox	-	-		1						**1**
Dasyuridae	*Antechinus flavipes leucogaster*	Yellow-footed Antechinus, Mardo	-	-		563						**563**
Dasyuridae	*Dasyurus geoffroii*	Chuditch	VU	VU		52						**52**
Dasyuridae	*Phascogale tapoatafa wambenger*	Wambenger Brush-tailed Phascogale	CD	-		24						**24**
Leporidae	**Oryctolagus cuniculus*	Rabbit	-	-		3						**3**
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo	-	-		24				1		**25**
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4	-		27				8		**35**
Macropodidae	*Setonix brachyurus*	Quokka	VU	VU		18						**18**
Muridae	**Rattus rattus*	Black Rat	-	-		8						**8**
Peramelidae	*Isoodon fusciventer*	Quenda	P4	-		55	1					**56**

Family	Scientific Name	Common Name	Conservation Status		Call	Camera trap	Digging	Foraging evidence	Scat	Sighting	Sighting - overhead	Total
			State	Common wealth								
Phalangeridae	*Trichosurus vulpecula hypoleucus*	Common Brushtail Possum, Koomal	-	-		2						**2**
Suidae	**Sus scrofa*	Pig	-	-		5	2		5			**12**
Tachyglossidae	*Tachyglossus aculeatus acanthion*	Short-beaked Echidna	-	-		31			3			**34**
Reptiles												
Carphodactylidae	*Underwoodisaurus milii*	Southern Barking Gecko	-	-						5		**5**
Elapidae	*Pseudonaja affinis*	Dugite	-	-		1						**1**
Gekkonidae	*Christinus marmoratus*	Marbled Gecko	-	-						2		**2**
Pygopodidae	*Aprasia pulchella*	Pretty Worm-lizard	-	-						1		**1**
Scincidae	*Cryptoblepharus buchananii*	Buchanan's Snake-eyed Skink	-	-		5				3		**8**
Scincidae	*Ctenotus labillardieri*	Red-legged Ctenotus	-	-						1		**1**
Scincidae	*Egernia kingii*	King's Skink	-	-		13						**13**
Scincidae	*Egernia napoleonis*	South-western Crevice-skink	-	-		41						**41**
Scincidae	*Tiliqua rugosa*	Bobtail	-	-		3				1		**4**
Varanidae	*Varanus gouldii*	Bungarra or Sand Goanna	-	-						1		**1**

* = introduced species

4.4 Significant Fauna

Eight significant fauna taxa were recorded within the Survey Area during the field survey. These are listed below, and locations are presented in **Map 9** and **Appendix F**:

- Baudin's Cockatoo (*Zanda baudinii*) – EN (BC Act; EPBC Act), recorded two times within Jarrah-Marri Forest and Drainage Line habitats.
- Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act), recorded 50 times within Jarrah-Marri Forest and Drainage Line habitats.
- Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – VU (BC Act; EPBC Act), recorded 110 times within Jarrah-Marri Forest and Drainage Line habitats.
- Chuditch (*Dasyurus geoffroii*) – VU (BC Act; EPBC Act), recorded 52 times at 18 different locations within Jarrah-Marri Forest habitat (**Figure 1**). Spot analysis identified a minimum of 14 individuals occurring within the Survey Area. Chuditch spot analysis is presented in **Appendix G**.
- Quokka (*Setonix brachyurus*) – VU (BC Act; EPBC Act), recorded 18 times at six different locations within Jarrah-Marri Forest and Drainage Line habitats (**Figure 2**).
- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – CD (BC Act), recorded 24 times within Jarrah-Marri Forest habitat.
- Quenda (*Isoodon fusciventer*) – P4 (DBCA), recorded 56 times within Jarrah-Marri Forest habitat.
- Western Brush Wallaby (*Notamacropus irma*) – P4 (DBCA), recorded 35 times within Jarrah-Marri Forest habitat.

Five significant fauna taxa were assessed as having a high likelihood of occurrence within the Survey Area:

- Woylie (*Bettongia penicillata ogilbyi*) - CR, EN (BC Act; EPBC Act).
- Numbat (*Myrmecobius fasciatus*) – EN (BC Act; EPBC Act).
- Peregrine Falcon (*Falco peregrinus*) – OS (DBCA).
- Western False Pipistrelle (*Falsistrellus mackenziei*) – P4 (DBCA).
- Dell's Ctenotus (*Ctenotus delli*) – P4 (DBCA).

Three significant fauna taxa were assessed as having a medium likelihood of occurring within the Survey Area:

- Malleefowl (*Leipoa ocellata*) – VU (BC Act; EPBC Act).
- Rakali *(Hydromys chrysogaster*) – P4 (DBCA).
- Southern Death Adder (*Acanthophis antarcticus*) – P4 (DBCA).

The complete results of the significant fauna likelihood of occurrence assessment including justification for the assessment outcome for each taxon is provided in **Table 10**.



Figure 1: Chuditch recorded by camera trap 5890-CAM-36-EW within Jarrah-Marri Forest (-32.4526566, 116.0859871).



Figure 2: Quokka recorded by camera trap 5937-CAM-13-PW within Blackbutt Forest (-32.47335379, 116.1646422).

Table 10: Significant fauna likelihood of occurrence within the Survey Area

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Birds						
Acanthizidae	*Aphelocephala leucopsis* Southern Whiteface	-	VU	Sparse open forest/woodland; inland scrubs e.g. mallee, mulga cypress pine; saltbush, dead trees, stumps, black box/lignum flats (Pizzey and Knight, 2001).	No nearby records identified.	Low No nearby records and limited suitable habitat within the Survey Area.
Accipitridae	*Elanus scriptus* Letter-winged Kite	P4	-	Open country and grasslands of arid and semi-arid interior (Morcombe, 2003).	No DBCA records, one record from literature 10 km north of the Survey Area in 2011 (GHD, 2012).	Low No suitable habitat within the Survey Area.
Anatidae	*Oxyura australis* Blue-billed Duck	P4	-	Densely vegetated freshwater lakes, swamps, dams (Morcombe, 2003).	Eighteen DBCA records within 20 km of the Survey Area, including six records 13 km west of the Survey Area in 1991 (DBCA, 2023c).	Low No suitable habitat within the Survey Area.
Ardeidae	*Botaurus poiciloptilus* Australasian Bittern	EN	EN	Freshwater wetlands with heavy vegetation, shrubbery, reedbeds, sedges (Morcombe, 2003).	No nearby records identified.	Low No nearby records, limited suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Atrichornithidae	*Atrichornis clamosus* Noisy Scrubbird	EN	EN	Dense heaths, rushes, tall sedges, under stunted trees in coastal hills, coastal swamps (Morcombe, 2003).	One undated historical DBCA record 19 km south of the Survey Area (DBCA, 2023c).	Low No recent nearby records and limited suitable habitat within the Survey Area. Individuals were translocated to the northern Jarrah forest in 1997 – 2003 but are now considered locally extinct (GHD, 2021b, 2021a).
Cacatuidae	*Calyptorhynchus banksii naso* Forest Red-tailed Black Cockatoo	VU	VU	Tall eucalypt forest, woodland, feeds on seeds of large-fruited eucalypts (Morcombe, 2003).	352 DBCA records within 20 km of the Survey Area, including one record within 600 m east of the Survey Area in 2005 (DBCA, 2023c).	Recorded Recorded during the current survey.
Cacatuidae	*Zanda baudinii* Baudin's Cockatoo	EN	EN	Forests, farm trees; feeds on Marri and wood-boring insects (Morcombe, 2003).	153 DBCA records within 20 km of the Survey Area, including 300 m west of the Survey Area in 2005 (DBCA, 2023c).	Recorded Recorded during the current survey.
Cacatuidae	*Zanda latirostris* Carnaby's Cockatoo	EN	EN	Forests, woodlands, heathlands, farms; feeds on Banksias and Hakeas, pine plantations (Morcombe, 2003).	717 DBCA records within 20 km of the Survey Area, including three records within the Survey Area in 2007, 2008 and 2009 (DBCA, 2023c).	Recorded Recorded during the current survey.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Cacatuidae	*Cacatua pastinator pastinator* Muir's Corella	CD	-	Wheat and sheep farming country, with remnant native forest, woodland, scrub, sandplain heath (Pizzey and Knight, 2001).	Two DBCA records 8 km north of the Survey Area (DBCA, 2023c).	Low Restricted to the surrounding areas of Lake Muir.
Charadriidae	*Charadrius leschenaultii* Greater Sand Plover	VU	VU, MI, MA	Tidal flats, beaches (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Charadriidae	*Charadrius mongolus* Lesser Sand Plover	EN	EN, MI, MA	Tidal flats (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Diomedeidae	*Diomedea exulans* Wandering Albatross	VU	VU, MI, MA	Breeds on South Georgia and sub-Antarctic Island of Indian Ocean with circumpolar distribution in Southern Ocean (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Diomedeidae	*Diomedea epomophora* Southern Royal Albatross	VU	VU, MI, MA	Breeds on NZ sub-Antarctic islands with circumpolar distribution in Southern Ocean south, rare off Southwestern Australia (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Diomedeidae	*Thalassarche impavida* Campbell Island Albatross	VU	VU, MI, MA	Oceanic (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Diomedeidae	*Thalassarche cauta steadi* White-capped Albatross	VU	VU, MI, MA	Inshore and offshore waters (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Diomedeidae	*Thalassarche melanophris* Black-browed Albatross	EN	VU, MI, MA	Oceanic (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Diomedeidae	*Diomedea sanfordi* Northern Royal Albatross	EN	EN, MI, MA	Breeds on Chatham Island, some NZ sub-Antarctic Islands and South Island, NZ with circumpolar distribution mostly in Pacific sector of Southern Ocean (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Diomedeidae	*Diomedea dabbenena* Tristan Albatross	CR	EN, MI, MA	Oceanic (Pizzey and Knight, 2001).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Diomedeidae	*Diomedea amsterdamensis* Amsterdam Albatross	CR	EN, MI, MA	Oceanic (Pizzey and Knight, 2001).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Falconidae	*Falco hypoleucos* Grey Falcon	VU	VU	Open plains with treed watercourses in arid inland (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Falconidae	*Falco peregrinus* Peregrine Falcon	OS	-	Most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species (Menkhorst *et al.*, 2019).	Eleven DBCA records within 20 km of the Survey Area, including 7.2 km north of the Survey Area in 2010 (DBCA, 2023c).	High Records <10 km from the Survey Area and may use the Survey Area for hunting.
Laridae	*Sternula nereis* Fairy Tern	VU	VU	Coastal, bays, inlets, beaches, salt ponds and lakes (Morcombe, 2003).	Four DBCA records 17.6 km east of the Survey Area between 1990 to 1991 (DBCA, 2023c).	Low No suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Megapodiidae	*Leipoa ocellata* Malleefowl	VU	VU	Unburned mallee and woodland with abundant litter and low scrub (Morcombe, 2003).	Eighteen DBCA records within 18 km of the Survey Area, including a 2018 sighting of an individual 7 km east of the Survey Area, and six records within the 500 m of the Survey Area as recently as 2004 (DBCA, 2023c).	Medium Outside known distribution, however, taxon has been sighted near the Survey Area. Furthermore, individuals were translocated to the nearby Dryandra Woodland, 67 km southeast of the Survey Area, within the last five years (Traill, 2019).
Procellariidae	*Macronectes halli* Northern Giant Petrel	MI	VU, MI, MA	Sheltered estuaries, salt marsh lagoons, salt lakes, salty edges of waterways, brackish pools, claypans (Morcombe, 2003).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Procellariidae	*Macronectes giganteus* Southern Giant Petrel	MI	EN, MI, MA	Southern oceans, bays, harbours (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Rostratulidae	*Rostratula australis* Australian Painted Snipe	EN	EN, MA	Well vegetated surrounds and shallows of wetlands (Morcombe, 2003).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Scolopacidae	*Tringa brevipes* Grey-tailed Tattler	MI, P4	MI, MA	Coastal, tidal flats, rocky shorelines (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Scolopacidae	*Calidris canutus* Red Knot	EN	EN, MI, MA	Coastal, extensive firm tidal flats (Menkhorst *et al.*, 2019).	Two DBCA records 17.6 km west of the Survey Area in 1991 (DBCA, 2023c).	Low No suitable habitat within the Survey Area.
Scolopacidae	*Calidris ferruginea* Curlew Sandpiper	CR	CR, MI, MA	Inter-tidal mudflats of estuaries, lagoons, mangrove channels, dams, floodwaters, flooded saltbush surrounds of inland lakes (Morcombe, 2003).	Two DBCA records 17.6 km west of the Survey Area in 1991 (DBCA, 2023c).	Low No suitable habitat within the Survey Area.
Scolopacidae	*Calidris tenuirostris* Great Knot	CR	CR, MI, MA	Coastal, tidal flats, beaches (Menkhorst *et al.*, 2019).	Four DBCA records 17.3 km west of the Survey Area between 1990 to 1991 (DBCA, 2023c).	Low No suitable habitat within the Survey Area.
Scolopacidae	*Limosa lapponica menzbieri* Bar-tailed Godwit	CR	CR	Coastal tidal flats (Menkhorst *et al.*, 2019).	Two DBCA records 17.6 km west of the Survey Area in 1991 (DBCA, 2023c).	Low No suitable habitat within the Survey Area.
Mammals						
Dasyuridae	*Dasyurus geoffroii* Chuditch	VU	VU	Sclerophyll forest or drier woodland, heath, and mallee shrubland (Van Dyck and Strahan, 2008).	190 DBCA records within 20 km of the Survey Area, of which 31 are within 500 m of the Survey Area (DBCA, 2023c).	Recorded Recorded during the current survey.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Dasyuridae	*Phascogale calura* Red-tailed Phascogale	CD	VU	Allocasuarina woodlands with hollow-containing eucalypts e.g. *Eucalyptus wandoo* and *Gastrolobium* spp.; prefers vegetation not burnt for at least 20 years (Van Dyck and Strahan, 2008).	No nearby records identified.	Low No nearby records.
Dasyuridae	*Phascogale tapoatafa wambenger* Wambenger Brush-tailed Phascogale	CD	-	Mature rough-barked trees, large logs, dead standing trees (Van Dyck and Strahan, 2008).	Twenty DBCA records within 20 km of the Survey Area, including 650 m south of the Survey Area in 2018 (DBCA, 2023c).	Recorded Recorded during the current survey.
Macropodidae	*Setonix brachyurus* Quokka	VU	VU	Dense wet ground cover in forest or swampy flats (Van Dyck and Strahan, 2008).	Sixty-six DBCA records within 15 km of the Survey Area, including four records within the 500 m of the Survey Area in 2017 (DBCA, 2023c).	Recorded Recorded during the current survey.
Macropodidae	*Notamacropus irma* Western Brush Wallaby	P4	-	Open forest and woodland, open seasonally wet flats (Van Dyck and Strahan, 2008).	Forty DBCA records within 20 km of the Survey Area, including one record 160 m from the Survey Area in 1999 (DBCA, 2023c).	Recorded Recorded during the current survey.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Macropodidae	*Notamacropus eugenii derbianus* Tammar Wallaby	P4	-	Coastal scrub, heath, dry sclerophyll forest and thickets in mallee and woodland (Van Dyck and Strahan, 2008).	One DBCA record 20 km northwest of the Survey Area in 2015 (DBCA, 2023c).	Low Infrequently recorded in the locality despite reasonable previous search effort.
Muridae	*Hydromys chrysogaster* Rakali	P4	-	Permanent fresh to brackish water bodies (Van Dyck and Strahan, 2008).	Seven DBCA records within 20 km of the Survey Area, including 12 km north of the Survey Area in 2014 (DBCA, 2023c).	Medium Recorded less than 15 km from the Survey Area, limited habitat within the Survey Area.
Myrmecobiidae	*Myrmecobius fasciatus* Numbat, Walpurti	EN	EN	Jarrah forests, Wandoo woodlands; requires hollow logs and branches for shelter and termites for food (Van Dyck and Strahan, 2008).	Thirty-six records within 20 km of the Survey Area, including 5 km northwest of the Survey Area in 1997, and two records 14 km north in 2013 (DBCA, 2023c).	High Several recent, nearby records and suitable habitat within the Survey Area. While only known from two naturally occurring populations located at Dryandra Woodland and Perup Nature Reserve, Numbats appear capable of dispersing away from sites where they have been released (DSEWPaC, 2011). Dryandra Woodland is 67 km southeast of the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Peramelidae	*Isoodon fusciventer* Quenda	P4	-	Sandy soils with dense heathy vegetation (Van Dyck and Strahan, 2008).	134 DBCA records within 20 km of the Survey Area, including one record within 300 m south of the Survey Area in 2012 (DBCA, 2023c).	Recorded Recorded during the current survey.
Potoroidae	*Bettongia penicillata ogilbyi* Brush-tailed Bettong, Woylie	CR	EN	Areas dominated by *Gastrolobium* thickets (Van Dyck and Strahan, 2008).	Nine DBCA records within 11 km of the Survey Area, including one record within 80 m of the Survey Area in 2010 (DBCA, 2023c).	High Previously recorded within 80 m of the Survey Area, and suitable habitat within the Survey Area.
Pseudocheiridae	*Pseudocheirus occidentalis* Western Ringtail Possum	CR	CR	*Agonis* forest and woodland, Tuart Forest with *Agonis* mid storey (Van Dyck and Strahan, 2008).	Two DBCA records within 13 km of the Survey Area, including 11 km north in 1991 and 12.8 km south in 2020 (DBCA, 2023c).	Low Survey Area is outside of the taxon's distribution. Recent nearby records may be associated with nearby translocations at the Lane Poole Reserve and other sites.
Vespertilionidae	*Falsistrellus mackenziei* Western False Pipistrelle	P4	-	Mature Karri forests, wetter stands of Jarrah and Tuart, and woodlands on Swan Coastal Plain (Van Dyck and Strahan, 2008).	294 DBCA records within 20 km of the Survey Area, including within 500 m south in 2011 (DBCA, 2023c).	High Records within 500 m of the Survey Area, and suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Reptiles						
Elapidae	*Acanthophis antarcticus* Southern Death Adder	P3	-	Habitats range from rainforest to shrublands and heath (Wilson and Swan, 2021).	Four DBCA records within 20 km of the Survey Area, including 8.2 km northeast in 1982 (DBCA, 2023c).	Medium Record <10 km from the Survey Area, and suitable habitat within the Survey Area.
Scincidae	*Ctenotus delli* Dell's Ctenotus	P4	-	Restricted to the Darling range; Jarrah and Marri woodlands over shrubs on lateritic, sandy, and clay soils (Wilson and Swan, 2021).	Thirteen DBCA records within 20 km of the Survey Area, including 1.6 km south in 2009 and 2010 (DBCA, 2023c).	High One record 1.6 km from the Survey Area, and suitable habitat within the Survey Area.

5.0 Discussion

5.1 Fauna Habitat

The two naturally occurring fauna habitats recorded within the Survey Area, Jarrah-Marri Forest, and Drainage Line, are typical of the Jarrah Forest bioregion. These habitats are consistent with the habitats previously recorded in studies in the region (**Appendix B**) and extend outside the Survey Area to form larger ecosystems which are widespread within the surrounding region. Connectivity at a regional level is relatively intact, as the Survey Area occurs within a landscape that retains large areas of natural vegetation. At a local level, habitats within and surround the immediate vicinity of the Survey Area are fragmented due to mining activities. More than 218.2 ha (23.5%) of the Survey Area consists of patches of remnant vegetation that have been cleared on all sides and lack connectivity to the broader region.

The Drainage Line habitat provides the most value to significant fauna and the overall fauna assemblage within the Survey Area. It is core habitat for all three targeted fauna taxa and often has surface water present which is a vital resource for the local fauna assemblage. A wide variety of fauna taxa will use this habitat as a dispersal corridor due to the linear nature of the habitat and the presence of dense understory vegetation. Drainage Lines require relatively uninterrupted connectivity to allow fauna movement and dispersal, therefore, the Drainage Line habitat within the Survey Area is important to maintain this ecosystem function.

Both habitats contain tree hollows and hollow logs which are important microhabitats for hollow-dependent species. Hollow logs are often used by Chuditch for denning. The canopy of both habitats comprises valuable foraging and roosting habitat for birds such as black cockatoos, and the multitude of microhabitats (leaf litter, hummocks, woody debris, logs, and stones) provide refuge and feeding opportunities for a wide array of fauna species, particularly herpetofauna and small mammals.

The Rehabilitation habitat currently provides little to no habitat value for targeted fauna taxa because it is still young and occupied by seedlings. It is restricted to areas adjacent to mining activities within and near the Survey Area. It is likely that the value of this habitat will increase with age as vegetation matures.

5.2 Significant Fauna

5.2.1 Recorded within the Survey Area

Baudin's Cockatoo (*Zanda baudinii*) – EN (BC Act; EPBC Act)

The Baudin's Cockatoo is distributed through the south-west WA from the northern Darling Range and adjacent far east of the Swan Coastal Plain (south of the Swan River), south to Bunbury and across to Albany (Johnstone and Kirkby, 2011). The taxon rarely occurs near coastal communities north of Mandurah, and rarely occurs north of the Swan River (Johnstone and Storr, 1998; Johnstone and Kirkby, 2008). The species forages primarily in eucalypt forest, where it feeds on Marri seeds, flowers, nectar, and buds. They also feed on a wide range of seeds of *Eucalyptus* spp., *Banksia* spp., *Hakea* spp., and *Pinus* spp., as well as fruiting apples and pears and beetle larvae from under the bark of trees (Johnstone and Storr, 1998; Johnstone and Kirkby, 2008). Baudin's Cockatoo forages at all levels of the forest from the canopy to the ground, often feeding in the understorey on proteaceous trees and shrubs (especially *Banksia*) and in orchard trees within the canopy and on fallen fruit.

Secondary evidence of Baudin's Cockatoo was recorded during the survey, however direct sightings did not occur. The species can be cryptic due to its similarity in appearance to Carnaby's Cockatoos, and it can often be misidentified as such (Birdlife Australia, 2016). Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the Baudin's Cockatoo because of their value for breeding, roosting, and foraging. The taxon is likely to use the Survey Area for nesting and raising chicks in the breeding season and may use the habitats during the wintering season as core roosting and foraging habitat.

Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act)

Carnaby's Cockatoos nest in the hollows of a wide range of *Eucalyptus* trees, with a preference for smooth barked trees such as Salmon Gum (*E. salmonophloia*) and Wandoo (*E. wandoo*) but also rough barked *Eucalyptus* and *Corymbia* trees such as Red Morrell (*E. longicornis*), York Gum (*E. loxophleba*), Marri (*Corymbia calophylla*) and Tuart (*E. gomphocephala*) (Johnstone and Storr, 1998). Carnaby's Cockatoos feed on seeds, nuts, and flowers of a variety of native and exotic plants, including *Banksia* spp., Pine trees (*Pinus* spp.), Marri, Jarrah (*E. marginata*), *Grevillea* spp., *Allocasuarina* spp., and *Hakea* spp. (Shah, 2006).

The Carnaby's Cockatoo was recorded within the Survey Area during the survey, often in large flocks of up to 40 individuals at a time. Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the Carnaby's Cockatoo because of their value for breeding, roosting, and foraging. The taxon is likely to use the Survey Area for nesting and raising chicks in the breeding season and may occasion the habitats during the non-breeding season for roosting and foraging.

Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – VU (BC Act; EPBC Act)

The Forest Red-tailed Black Cockatoo is distributed through the southwest of WA from Gingin through the Darling Ranges to the south-west from Bunbury to Albany. The Forest Red-tailed Black Cockatoo inhabits dense Jarrah, Karri (*E. diversicolor*), and Marri forests and feeds primarily on the fruit of Marri and Jarrah trees (Johnstone and Kirkby, 1999).

The Forest Red-tailed Black Cockatoo was recorded in large numbers within the Survey Area, where it uses Jarrah-Marri Forest and Drainage Line habitats for foraging and roosting. Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the Forest Red-tailed Black Cockatoo because of their value for breeding, roosting, and foraging. The taxon is likely to use the Survey Area for nesting and raising chicks during the breeding season and may use the habitats during the wintering season as core roosting and foraging habitat.

Chuditch (*Dasyurus geoffroii*) – VU (BC Act; EPBC Act)

The Chuditch inhabits areas dominated by sclerophyll forest or drier woodland, heath, and mallee shrubland (Van Dyck and Strahan, 2008). The species is generally highly mobile and uses bush remnants as corridors (Woinarski, Burbidge and Harrison, 2012). The Chuditch is a largely nocturnal animal, feeding on a carnivorous diet of mammals, birds, lizards, and frogs. They have been recorded foraging during the day such as during the breeding season or when cold and wet weather restricts their nocturnal movements (Van Dyck and Strahan, 2008). Most diurnal denning sites in sclerophyll forest consist of hollow logs or earth burrows, although Quenda nests and hollow tree bases may be used (Van Dyck and Strahan, 2008). The Chuditch was abundant prior to European settlement, and it is now largely restricted to the south-west of Western Australia, with small numbers in the Midwest, Wheatbelt and South Coast Regions (DBCA, 2017a).

The Chuditch was recorded by camera trap during the current survey, primarily within the Jarrah-Marri Forest habitat. Chuditch records were relatively evenly spread throughout the Survey Area. Of the 18 camera locations at which Chuditch was recorded, one camera (5890-CAM-36-EW) recorded three individuals, two cameras (5890-CAM-59-EW and 5890-CAM-75-EW) recorded two individuals, and the remaining 15 cameras recorded one individual each.

The Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the Chuditch because of their value for denning and foraging. The Drainage Line habitat is of particular importance as it provides water sources and dispersal corridors. A breeding population of Chuditch was previously recorded in the northwest of the Survey Area (Way, 2013) and it is likely that this population continues to persist.

Quokka (*Setonix brachyurus*) – VU (BC Act; EPBC Act)

The Quokka is a small macropod found on two offshore islands (Rottnest and Bald Island) and several mainland sites in south-west Western Australia (Van Dyck and Strahan, 2008; DBCA, 2017a). The distribution of the Quokka is severely fragmented and there is little to no migration between populations. Mainland populations of the Quokka favour dense riparian vegetation; however, they also make use of heath and shrubland, swamp Peppermint, and swampy shrublands as well as Karri Forest regrowth (Van Dyck and Strahan, 2008; DBCA, 2017a). The populations of Quokkas on the

mainland are largely restricted to areas of high rainfall of 1,000 mm or more (Van Dyck and Strahan, 2008).

The Quokka was recorded during the survey by camera trap within the Drainage Line and Jarrah-Marri Forest habitats. The Drainage Line habitat constitutes core habitat for the Quokka due to the dense understorey vegetation. The Jarrah-Marri habitat constitutes supporting habitat for the taxon. A breeding population of Quokka has previously been recorded in the northeast of the Survey Area (GHD, 2021b) and it is likely that the individuals recorded during the current survey are part of the same population.

Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – CD (BC Act)

The Wambenger Brush-tailed Phascogale is a rat-sized, arboreal, carnivorous marsupial, characterised by a tuft of black hair on its tail (Van Dyck and Strahan, 2008). Typically, the species has been observed in dry sclerophyll forests and open woodlands containing hollow-bearing trees with a sparse ground cover. The distribution of the Wambenger Brush-tailed Phascogale is widespread but fragmented, stemming from habitat destruction and predation by cats and foxes (Van Dyck and Strahan, 2008). In the south-west of Australia, the species is thought to have declined within the last 10 years given the lower number of records despite an increase in survey effort (Van Dyck and Strahan, 2008).

The Wambenger Brush-tailed Phascogale was recorded during survey the by camera trap within the Jarrah-Marri Forest habitat. The Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for this species because of their value for shelter, foraging, and dispersal.

Quenda (*Isoodon fusciventer*) – P4 (DBCA)

Quenda are nocturnal and omnivorous, feeding on insects, spiders, worms, and plant roots and are typically found in dense vegetation, including wetland fringes, forest, woodland, shrub, and heath communities (Van Dyck and Strahan, 2008; DBCA, 2012). They are found only in the southwestern corner of Western Australia, where these regions generally display a combination of sandy soils with dense heathy vegetation in the lower stratum (Van Dyck and Strahan, 2008; DBCA, 2012).

The Quenda was recorded during the survey by camera trap and diggings. Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the taxon because of their value for shelter, foraging, and dispersal. The Drainage Line habitat is of particular importance as provides water sources and dense understorey for shelter.

Western Brush Wallaby (*Notamacropus irma*) – P4 (DBCA)

The Western Brush Wallaby occurs in the south-west of Western Australia and closely resembles a larger kangaroo (Van Dyck and Strahan, 2008). Its preferred habitat consists of open forest or woodland, particularly favouring open and seasonally wet flats with low grasses and open scrubby thickets (Van Dyck and Strahan, 2008). The Western Brush Wallaby was a common species during the early days of settlement, however, ongoing clearing and fragmentation of bushland in the Wheatbelt as well as the dramatic increase in fox numbers within the south-west of Western Australia has led to this species' decline (Van Dyck and Strahan, 2008).

The Western Brush Wallaby was recorded during the survey by both camera trap and direct sighting. Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the taxon because of their value for foraging and dispersal. The Drainage Line habitat is of particular importance as the taxon may rely on the seasonal wet flats within this habitat for the grasses and scrubby thickets for foraging and shelter.

5.2.2 High likelihood of occurrence within the Survey Area

Woylie (*Bettongia penicillata ogilbyi*) – CR (BC Act); EN (EPBC Act)

The Woylie is known primarily from three remnant populations at Dryandra Woodland, Tutanning Nature Reserve, and the Kingston/Perup Forest, all characterised by the presence thickets of the plant genus *Gastrolobium* (Van Dyck and Strahan, 2008). Fox predation is considered the driving factor in the Woylie's distribution contraction, with habitat destruction and disease also impacting populations to be rare and scattered (Van Dyck and Strahan, 2008). The Woylie primarily eats fungus and supplements its diet with seed kernels of the Desert Quandong (*Santalum acuminatum*), various tubers, bulbs, and invertebrates (Van Dyck and Strahan, 2008).

Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the Woylie because of their value for shelter and foraging. The Drainage Line habitat is of particular significance to the taxon as this habitat contains valuable water sources and dense thickets which provide refuge from predators.

Numbat (*Myrmecobius fasciatus*) – EN (BC Act; EPBC Act)

The Numbat is a small marsupial with a distinctive striped appearance that formerly occupied a range of habitats across the southern half of Australia (DBCA, 2017b). The Numbat is now restricted to a few populations of Jarrah Forest and Wandoo woodland. Fox predation has caused a significant decline for the species, bringing their total numbers to as low as a few hundred in the 1980s (Van Dyck and Strahan, 2008). Numbat activity changes throughout the year, corresponding to termite activity in the upper layer of the soil. In winter, Numbat activity peaks during the middle of the day, while in summer activity peaks during the morning and afternoon (Van Dyck and Strahan, 2008; DBCA, 2017a). Numbats feed near the cover of shrubs, hollows, and burrows, which they use as refuge from predators and as resting places during the day (DBCA, 2017b).

A known population of Numbat occurs at Dryandra Woodland, located 67 km southeast of the Survey Area and, more importantly, Numbats have been recorded near the Survey Area and in vegetation that maintains connectivity to the Survey Area as recently as 2013. Numbats also appear to capable of dispersing away from sites where they have been released (DSEWPaC, 2011). Jarrah-Marri Forest habitat constitutes core habitat for the taxon due to the presence of hollow logs and termites.

Peregrine Falcon (*Falco peregrinus*) – OS (DBCA)

The Peregrine Falcon is an uncommon but wide-ranging bird across Australia (Barrett *et al.*, 2003). It occurs along rivers and ranges as well as wooded watercourses and lakes. It nests primarily on cliffs, granite outcrops and quarries, although is also known to occupy existing raptor and corvid stick nests (Menkhorst *et al.*, 2019). The diet of the Peregrine Falcon has been well studied and primarily includes flocking species such as parrots, pigeons and on the east coast, European Starlings (Olsen and Fuentes, 2008).

Peregrine Falcon was not observed during the survey; however, this species has been previously recorded within the region flying over similar Jarrah-Marri Forest (GHD, 2021a). In the absence of cliff ledges, Peregrine Falcons will use trees for nesting (Morcombe, 2003). The Jarrah-Marri Forest within the Survey Area and surrounds may provide suitable nesting and hunting habitat to support this species.

Western False Pipistrelle (*Falsistrellus mackenziei*) – P4 (DBCA)

The Western False Pipistrelle is endemic to the south-western region of Western Australia, making use of high rainfall forests dominated by Jarrah, Karri, Marri, and Tuart. The species is a specialist of tall mature forest, foraging within the canopy and roosting in tree hollows (Van Dyck and Strahan, 2008).

Western False Pipistrelle was not targeted during the surveys and so presence was not detected; however, this taxon is widely documented within the area and the Survey Area contains core Jarrah-Marri Forest and Drainage Line habitat which provides high value foraging habitat and roost sites which are associated with hollows in *Eucalyptus* (Baker and Gynther, 2023).

Dell's Ctenotus (*Ctenotus delli*) – P4 (DBCA)

Dell's Ctenotus is endemic to the north Darling Range, south-western Australia, inhabiting dry sclerophyll forest on stony hills and ranges (Cogger, 2014).

This taxon may use the Jarrah-Marri Forest with lateritic clay substrate within the Survey Area which provides suitable foraging and breeding habitats.

5.2.3 Medium likelihood of occurrence within the Survey Area

Malleefowl (*Leipoa ocellata*) – VU (BC Act; EPBC Act)

The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee or *Acacia*. A sandy substrate and abundance of leaf litter are required for breeding (DEE, 2018). Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where habitats tend to be thicker and there is an abundance of food plants. Much of

the best habitat for Malleefowl has already been cleared or has been modified by grazing via Sheep, Cattle, Rabbits, and Goats (Benshemesh, 2007). The species nests in large mounds of dirt and leaf litter, up to five metres wide and one metre tall (Menkhorst *et al.*, 2019).

A Malleefowl was sighted 7 km east of the Survey Area in 2018, and six sightings were recorded within 500 m of the Survey Area as recently as 2004 (DBCA, 2023c). Furthermore, individuals were translocated to the nearby Dryandra Woodland, 67 km southeast of the Survey Area, within the last five years (Traill, 2019). The Jarrah-Marri Forest and Drainage Line habitats have the potential to support this species, though no evidence of foraging or nesting was recorded during the survey. Malleefowl are often cryptic and nest in areas of dense shrubland, making detection of the species difficult without LiDAR mapping of potential nesting mounds.

Rakali (*Hydromys chrysogaster*) - P4 (DBCA)

The Rakali (also known as the Water Rat) is a native rodent species that lives in burrows on the banks of rivers, lakes, and estuaries and is an opportunistic predator feeding on aquatic insects, fish, crustaceans, mussels, snails, frogs, birds' eggs, and water birds (Atkinson, Lund, and Morris, 2008). The species can be found in permanent water systems in Australia, New Guinea, and offshore islands, with a home range of approximately 19 ha in coastal wetlands and streams of south-western Australia, individuals will establish sedentary territories where resident male and female ranges will overlap (Van Dyck and Strahan, 2008).

This taxon may use Drainage Line habitat within the Survey Area. Drainage Line habitat constitutes core habitat for this species and the habitat within the survey area is important for connectivity.

Southern Death Adder (*Acanthophis antarcticus*) – P4 (DBCA)

The Southern Death Adder is found in Southwest and South Australia to Eastern and Central Queensland where, due to habitat destruction and altered fire regimes, populations are in decline (Cogger, 2014; Wilson and Swan, 2021). Habitats range from rainforest to shrublands and heath (Wilson and Swan, 2021).

The Survey Area falls within distribution of the Southern Death Adder and microhabitats within the Jarrah-Marri Forest and Drainage Line habitats have the potential to be used by the taxon for shelter and hunting.

6.0 Conclusion

Two naturally occurring fauna habitats were mapped within the Survey Area; Jarrah-Marri Forest and Drainage Line. The Drainage Line habitat provides the most value for targeted taxa as it is core habitat for Chuditch, Quokka, and Woylie. The Jarrah-Marri Forest also provides value for targeted taxa as core habitat for Chuditch and Woylie, and as supporting habitat for the Quokka. These habitats are typical of the Jarrah Forest region and are widespread outside of the Survey Area. A third habitat type, Rehabilitation, was mapped within the Survey Area but currently provides negligible value for targeted taxa because it is still young and occupied by seedlings. It is likely that the value of this habitat will increase with age as vegetation matures.

Two targeted taxa were recorded during the survey:

- The Chuditch was recorded 52 times and spot analysis identified a minimum of 14 individuals occurring within the Survey Area. The taxon was recorded in both the Jarrah-Marri Forest and Drainage Line habitats via camera trapping.
- The Quokka was recorded 18 times and was detected within both the Jarrah-Marri Forest and Drainage Line habitats via camera trapping.

The Woylie was not detected during the current survey; however, it has previously been recorded within 80 m of the Survey Area in 2010.

In addition to the two targeted fauna taxa, six significant taxa were recorded during the fauna survey within the Jarrah-Marri Forest and Drainage Line habitats:

- Baudin's Cockatoo – EN (BC Act; EPBC Act).
- Carnaby's Cockatoo – EN (BC Act; EPBC Act).
- Forest Red-tailed Cockatoo – VU (BC Act; EPBC Act).
- Wambenger Brush-tailed Phascogale – CD (BC Act).
- Quenda – P4 (DBCA).
- Western Brush Wallaby – P4 (DBCA).

A further five significant fauna taxa were assessed as having a high likelihood, three significant fauna taxa were assessed as having a medium likelihood, and 29 significant fauna taxa were assessed as having have a low likelihood of occurring within the Survey Area.

Five introduced taxa were recorded during the survey: Laughing Kookaburra (*Dacelo novaeguineae*), Red Fox (*Vulpes vulpes*), Rabbit (*Oryctolagus cuniculus*), Black Rat (*Rattus rattus*), and Pig (*Sus scrofa*).

7.0 References

Atkinson, C., Lund, M. and Morris, K. (2008) 'BiblioRakali: the Australian water rat, Hydromys chrysogaster Geoffroy, 1804 (Muridae: Hydromyinae), a subject-specific bibliography', *Conservation Science W. Aust*, 7(1), pp. 65–71.

Baker, A.M. and Gynther, I.C. (2023) *Strahan's Mammals of Australia*. 4th edn. Wahroonga, Australia: Reed New Holland Publishers.

Barrett, G. *et al.* (2003) *The new atlas of Australian birds*. Melbourne, Australia: Royal Australasian Ornithologists Union.

Beard, J.S. *et al.* (2013) 'The vegetation of Western Australia at the 1:3,000,000 scale. Explanatory memoir. Second edition', *Conservation Science W. Aust.*, 9(1), pp. 1–152.

Benshemesh, J. (2007) *National recovery plan for malleefowl Leipoa ocellata*. Adelaide, Australia. Available at: http://www.environment.gov.au/system/files/resources/dd346674-08ab-403d-8c11-5b88e8247e8f/files/malleefowl.pdf.

Birdlife Australia (2016) *Identifying Southwest Black-Cockatoos*. Perth, Australia.

BoM (2007) *About Climate Statistics*. Available at: http://www.bom.gov.au.

BoM (2024) *Climate Data Online*. Available at: http://www.bom.gov.au.

Cogger, H.G. (2014) *Reptiles and amphibians of Australia*. 7th edn. Melbourne, Australia: CSIRO Publishing.

Commonwealth of Australia (1999) *Environment Protection and Biodiversity Conservation Act 1999*. Australia. Available at: www.legislation.gov.au.

DBCA (2017a) *Fauna Profile - Chuditch Dasyurus geoffroii*. Available at: http://www.dbca.wa.gov.au.

DBCA (2017b) *Fauna Profile - Numbat Myrmecobius fasciatus*. Available at: https://www.dpaw.wa.gov.au/.

DBCA (2023a) *DBCA - Lands of Interest (DBCA-012)*. Available at: https://catalogue.data.wa.gov.au.

DBCA (2023b) *DBCA - Legislated Lands and Waters (DBCA-011)*. Available at: https://catalogue.data.wa.gov.au.

DBCA (2023c) *DBCA Threatened and Priority Fauna Database request (Custom Search)*.

DBCA (2023d) *NatureMap Database Search*. Perth, Australia.

DBCA (2012a) *Fauna Profile - Quenda Isoodon obesulus*. Available at: www.dpaw.wa.gov.au.

DBCA (2017b) *Fauna Profile - Quokka Setonix brachyurus*. Available at: https://www.dpaw.wa.gov.au/.

DCCEEW (2023) *Protected Matters Search Tool*. Available at: https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool.

DEE (2016) *Interim Biogeographic Regionalisation for Australia, Version 7*. Canberra, Australia. Available at: www.environment.gov.au.

DEE (2018) *Leipoa ocellata - Malleefowl*. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=934.

DMIRS (2024) *Mining Tenements (DMIRS-003)*. Available at: https://catalogue.data.wa.gov.au/.

DoE (2013) *Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.environment.gov.au.

DPIRD (2022) *Soil Landscape Mapping - Best Available (DPIRD-027)*. Perth, Australia. Available at: https://catalogue.data.wa.gov.au.

DSEWPaC (2011) *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.dcceew.gov.au.

DWER (2018) *Hydrography, Linear (Hierarchy) (DWER-031)*. Perth, Australia: Landgate. Available at: https://catalogue.data.wa.gov.au.

DWER (2021) *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*. Available at: https://catalogue.data.wa.gov.au/.

Van Dyck, S. and Strahan, R. (2008) *The mammals of Australia*. 3rd edn. Sydney, Australia: New Holland Publishers.

Environmental Management and Research Consultants (2006) *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region*.

Environmental Protection Authority (2020) *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*. Perth, Australia. Available at: https://www.epa.wa.gov.au/policies-guidance/technical-guidance-terrestrial-vertebrate-fauna-surveys-environmental-impact.

EPA (2016) *Environmental Factor Guideline - Terrestrial Fauna*. Perth. Available at: https://www.epa.wa.gov.au.

GHD (2012) *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment*.

GHD (2021a) *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine-Holyoake*.

GHD (2021b) *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine-Myara North*.

Government of Western Australia (1986) *Environmental Protection Act 1986*. Available at: www.legislation.wa.gov.au.

Government of Western Australia (2016) *Biodiversity Conservation Act 2016*. Available at: www.legislation.wa.gov.au.

Harewood, G. (2017) *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)*.

Harewood, G. (2019) *Black Cockatoo Habitat Assessment - Pinjarra Racecourse*.

Johnstone, R.E. and Kirkby, T. (1999) 'Food of the forest red-tailed black cockatoo Calyptorhynchus banksii naso in south-west Western Australia', *Western Australian Naturalist*, 22, pp. 167–177.

Johnstone, R.E. and Kirkby, T. (2011) *Carnaby's Black Cockatoo (Calyptorhynchus latirostris), Baudin's Black Cockatoo (Calyptorhynchus baudinii) and the Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso) on the Swan Coastal Plain (Lancelin–Dunsborough), Western Australia*. Perth, Australia.

Johnstone, R.E. and Storr, G.M. (1998) *Handbook of Western Australian birds*. Edited by D. Louise. Perth, Australia: Western Australian Museum.

Mattiske, E. and Havel, J. (1998) *Vegetation Mapping in the South West of Western Australia and Regional Forest Agreement vegetation complexes. Map sheets for Pemberton, Collie, Pinjarra, Busselton- Margaret River, Mt Barker, and Perth, Western Australia. Scale 1:250,000*. Perth, Western Australia, Western Australia.

Menkhorst, P. *et al.* (2019) *The Australian Bird Guide*. Revised Edition. Melbourne, Australia: CSIRO Publishing.

Morcombe, M. (2003) *Field Guide to Australian Birds*. Archerfield: Steve Parish Publishing Pty Ltd.

Olsen, J. and Fuentes, E. (2008) 'Dietary shifts based upon prey availability in Peregrine Falcons and Australian Hobbies breeding near Canberra, Australia', *Journal of Raptor Research*, 42, pp. 125–137.

Pizzey, G. and Knight, F. (2001) *Field Guide to Birds of Australia*. Pymble, Australia: HarperCollins Australia.

Shah, B. (2006) *Conservation of Carnaby's Black Cockatoo on the Swan Coastal Carnaby's plain, Western Australia*. Perth, Australia.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J. (2002) *Native vegetation in Western Australia: Extent, type and status. Resource Management Technical Report 249*. Perth, Australia. Available at: https://library.dpird.wa.gov.au.

Traill, M. (2019) 'Malleefowl land in Dryandra', *Narrogin Observer*. Available at: https://www.narroginobserver.com.au.

Way, S. (2013) *Chuditch Pre-mine Survey, Myara*.

Williams, K. and Mitchell, D. (2001) *Jarrah Forest 1 (JF1 – Northern Jarrah Forest subregion)*. Perth, Australia.

Wilson, S. and Swan, G. (2021) *A complete guide to reptiles of Australia*. 6th edn. New Holland Publishers.

Woinarski, J., Burbidge, A. and Harrison, P. (2012) *The action plan for Australian mammals 2012*. CSIRO Publishing.

8.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients.
Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time, and we will make a $10 donation to our 2023 Charity Partner - Lifeline, for every completed form.

Appendix A Maps

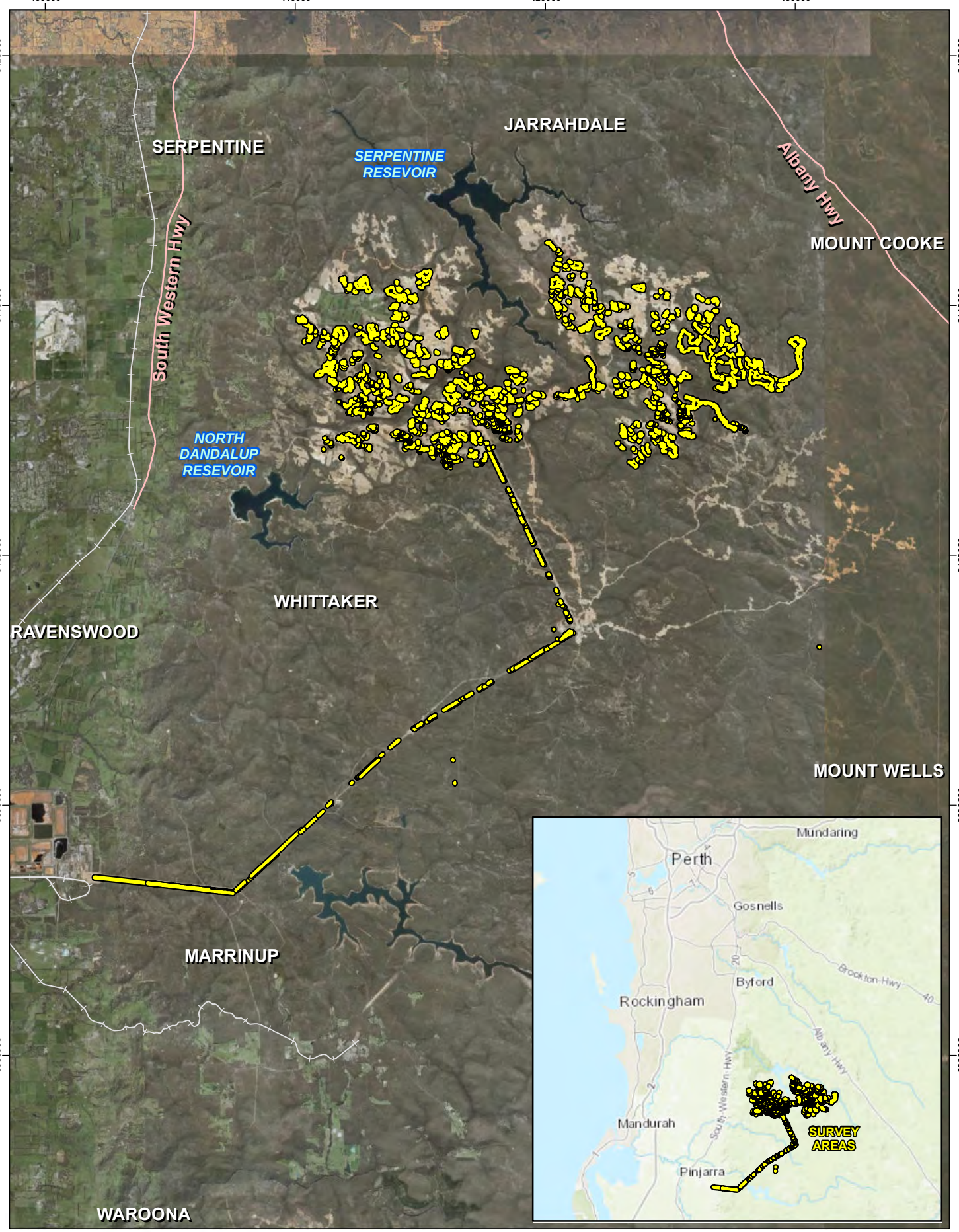
Targeted Chuditch, Quokka, and Woylie Survey

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024



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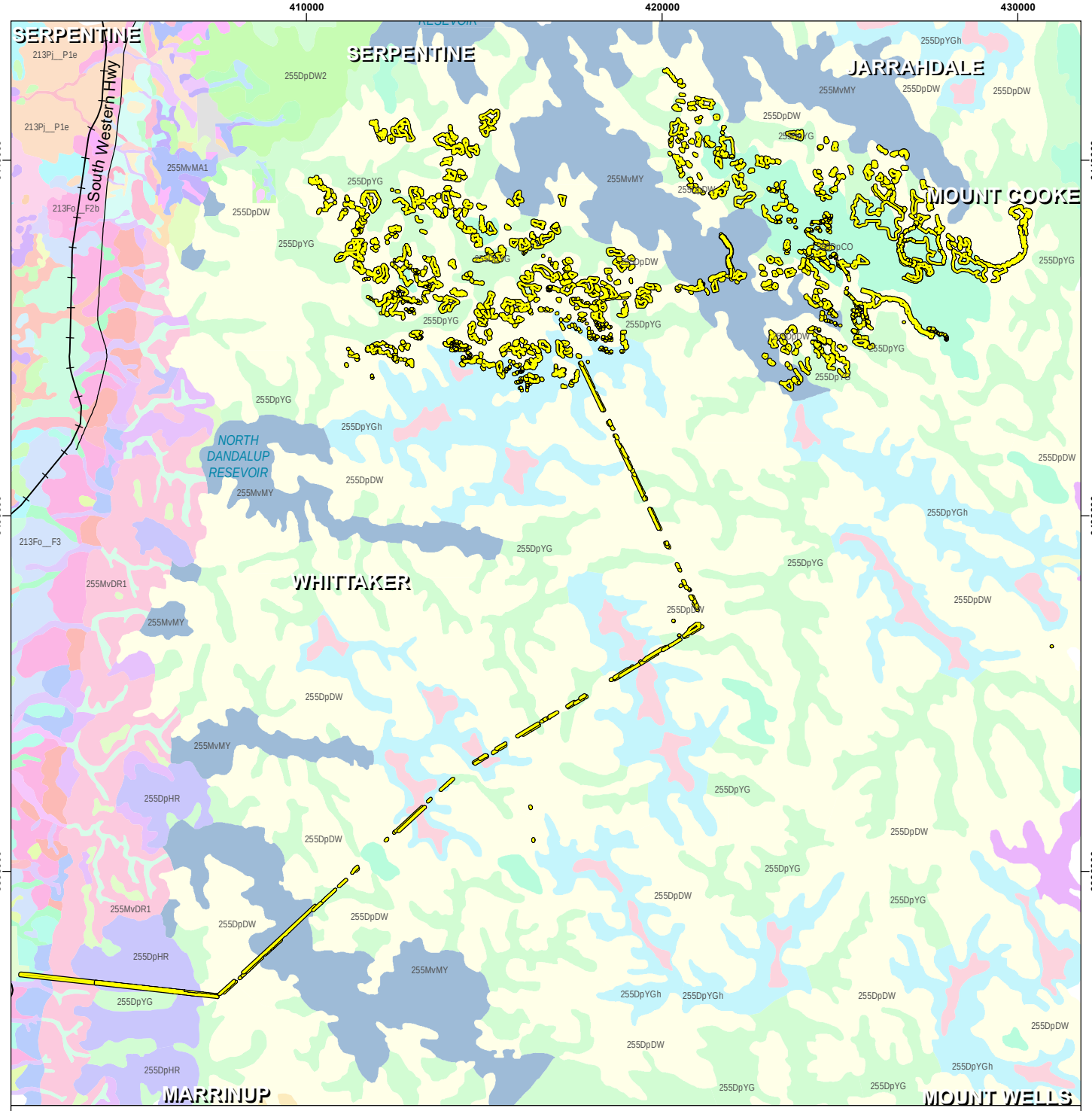
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Area

MAP 1

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Railway	213Fo__F1b	213Fo__Ff7	213Pj__P1e	255DpPNh	255MvBG1	255MvMM2	
Road	213Fo__F2a	213Fo__Ff9	213Pj__P3	255DpPNsw	255MvDR1	255MvMY	
Soil Landscape Mapping	213Fo__F2b	213PjSWP10	213Pj__P7	255DpYG	255MvDR2	255MvMY1	
212Bs__B1	213Fo__F2c	213PjSWP6a	213Pj__P8	255DpYG1	255MvDR3	255MvMY2	
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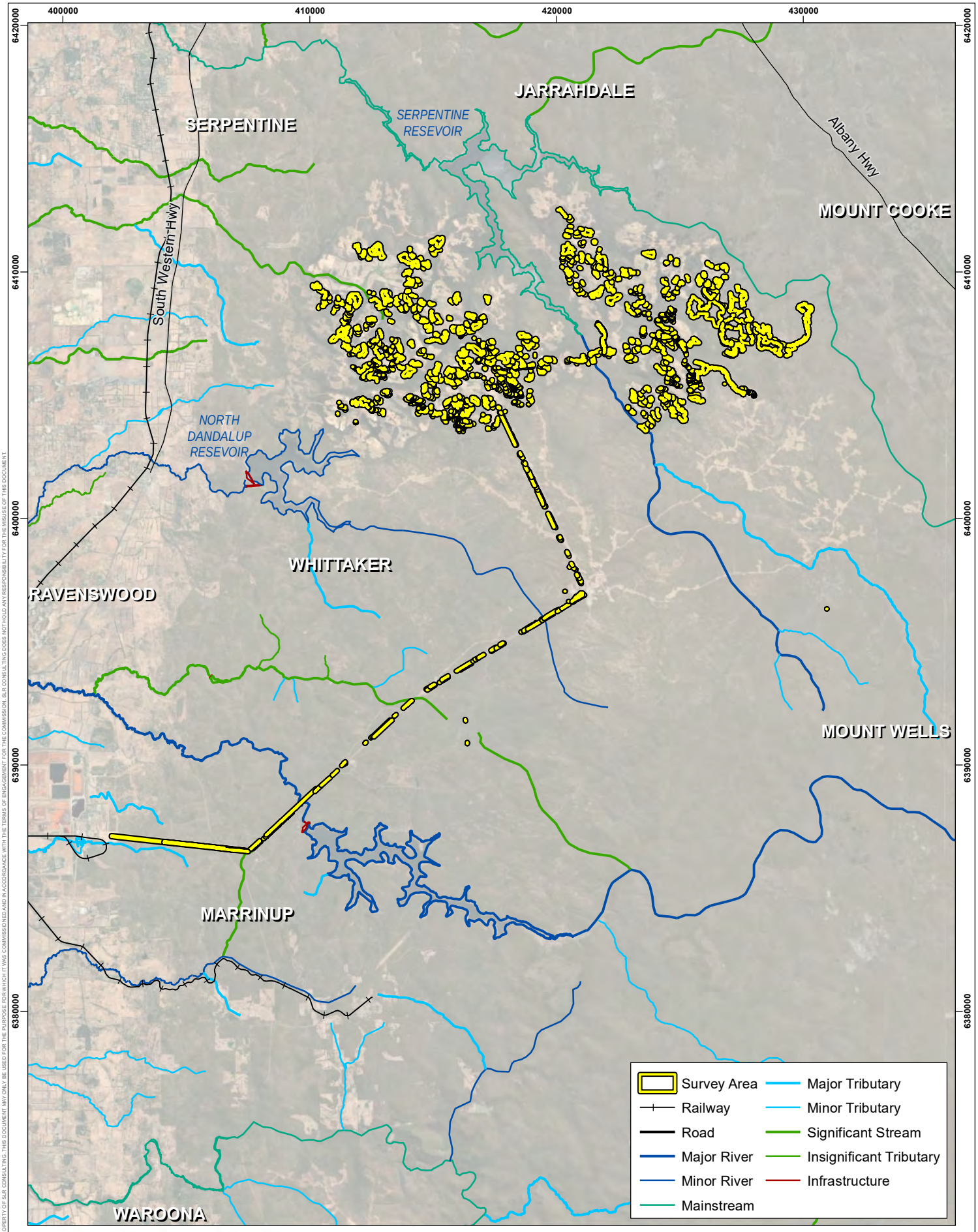
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Soil Landscape Mapping
MAP 2

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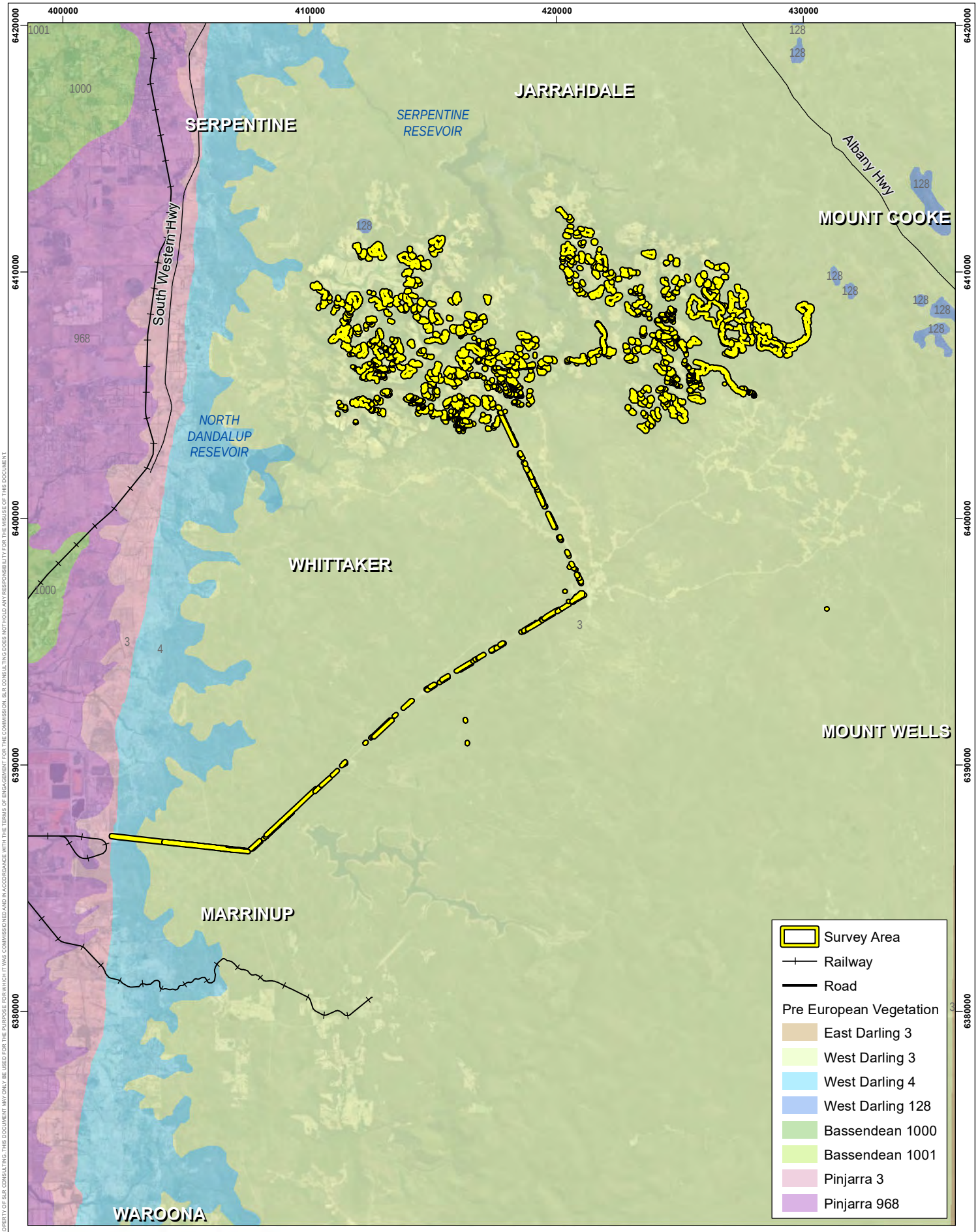
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Hydrography

MAP 3

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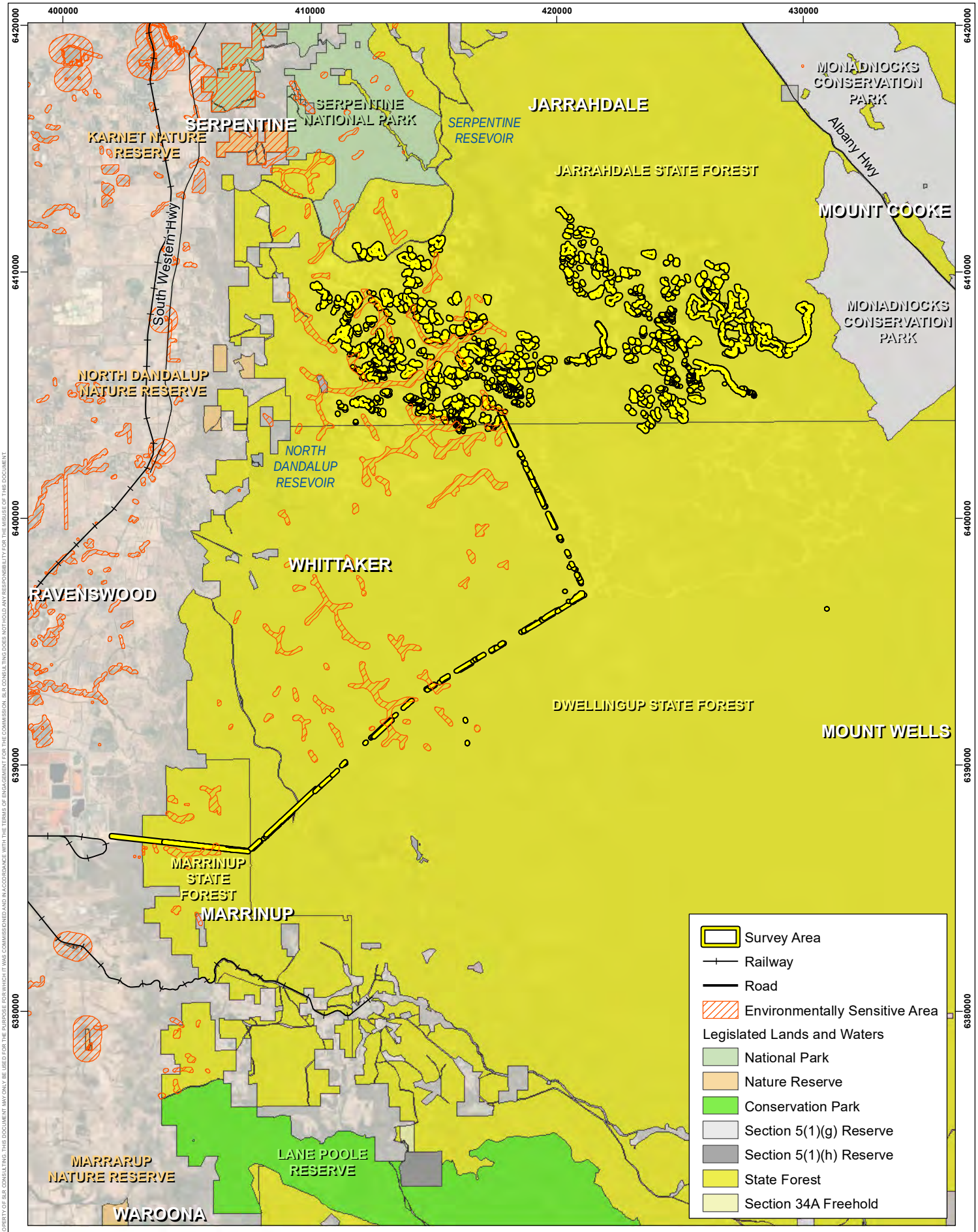
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Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Pre European Vegetation
MAP 4

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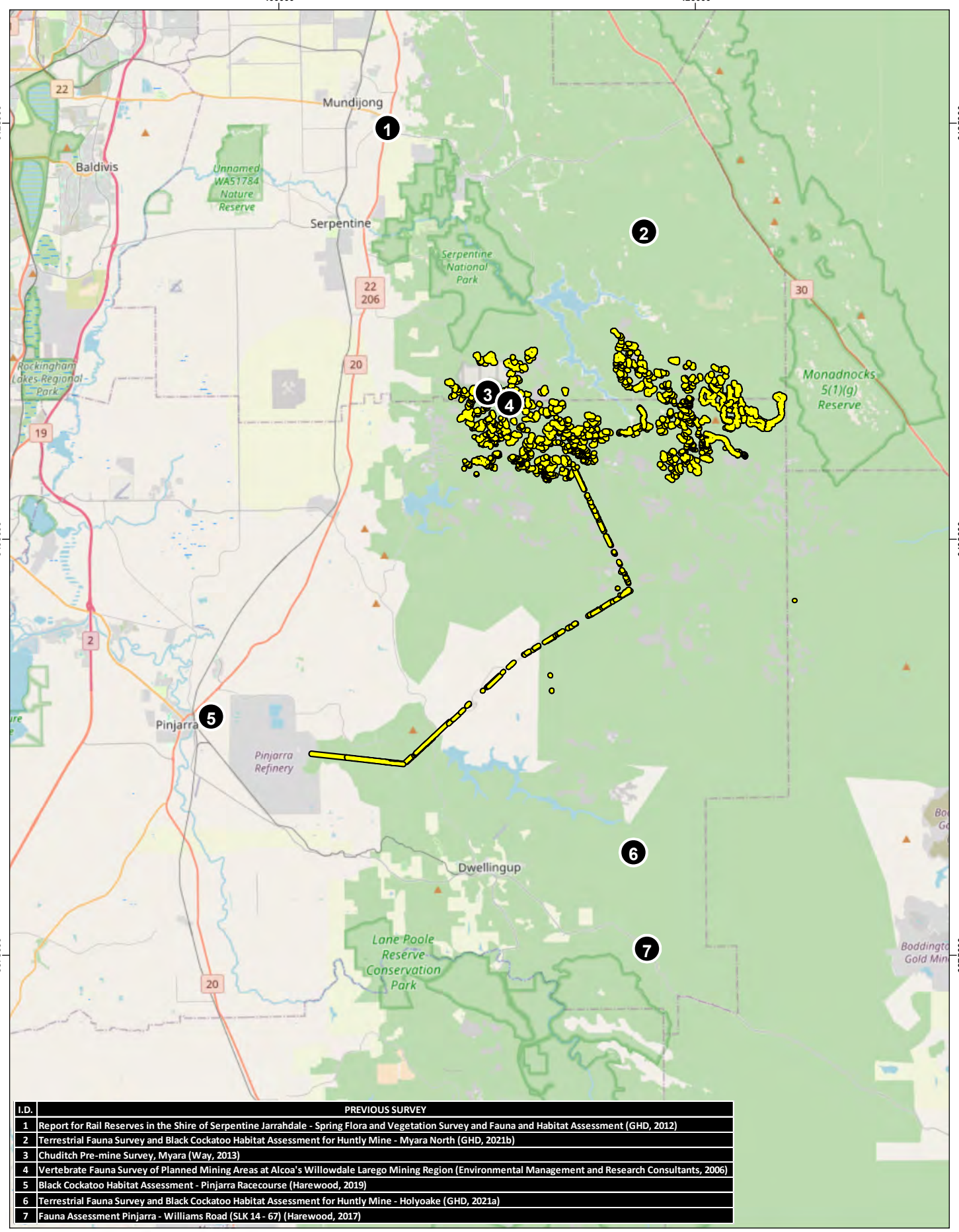
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Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Conservation and Environmentally Sensitive Areas

MAP 5

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I.D.	PREVIOUS SURVEY
1	Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment (GHD, 2012)
2	Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North (GHD, 2021b)
3	Chuditch Pre-mine Survey, Myara (Way, 2013)
4	Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region (Environmental Management and Research Consultants, 2006)
5	Black Cockatoo Habitat Assessment - Pinjarra Racecourse (Harewood, 2019)
6	Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake (GHD, 2021a)
7	Fauna Assessment Pinjarra - Williams Road (SLK 14 - 67) (Harewood, 2017)

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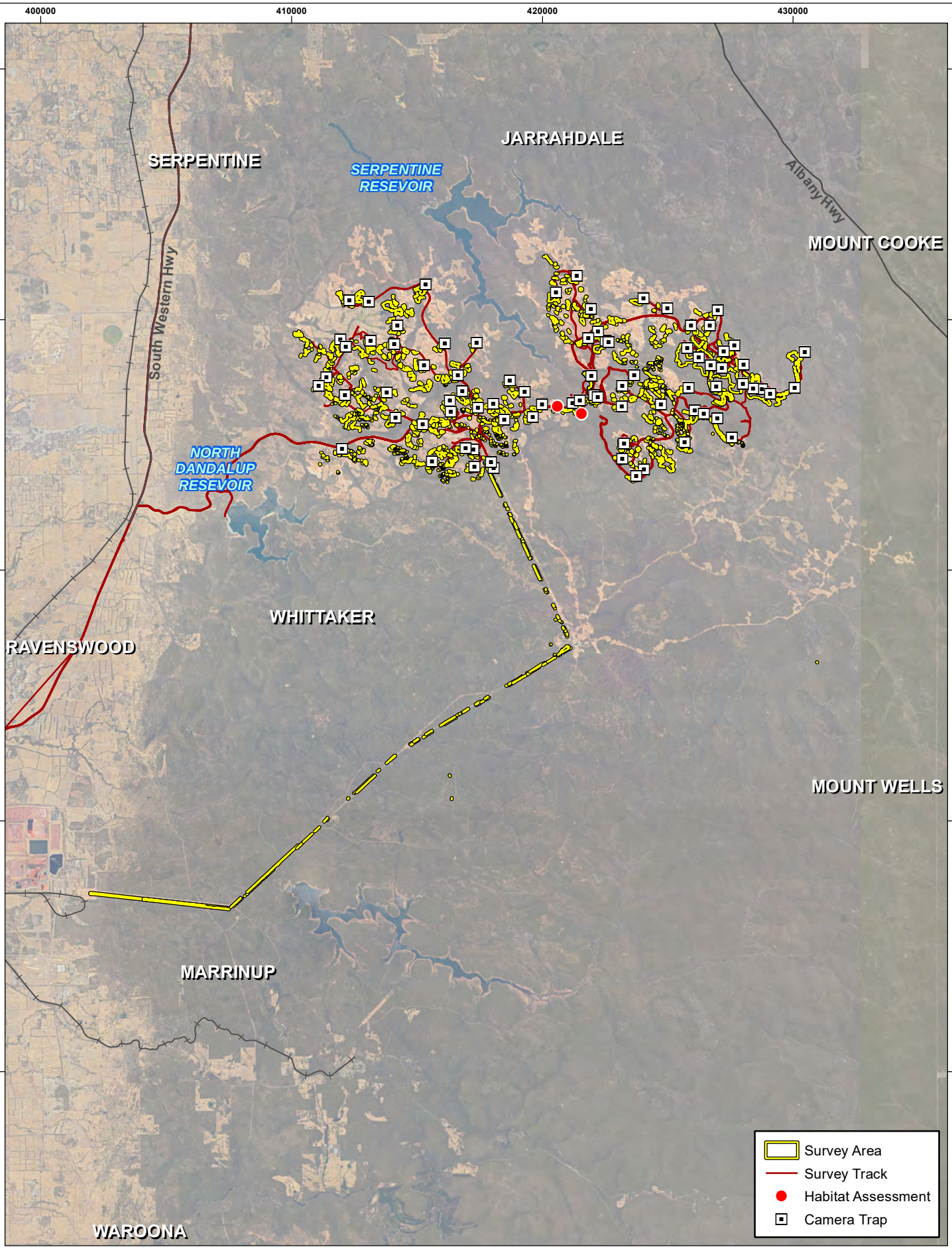
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Previous Surveys in the Locality
MAP 6

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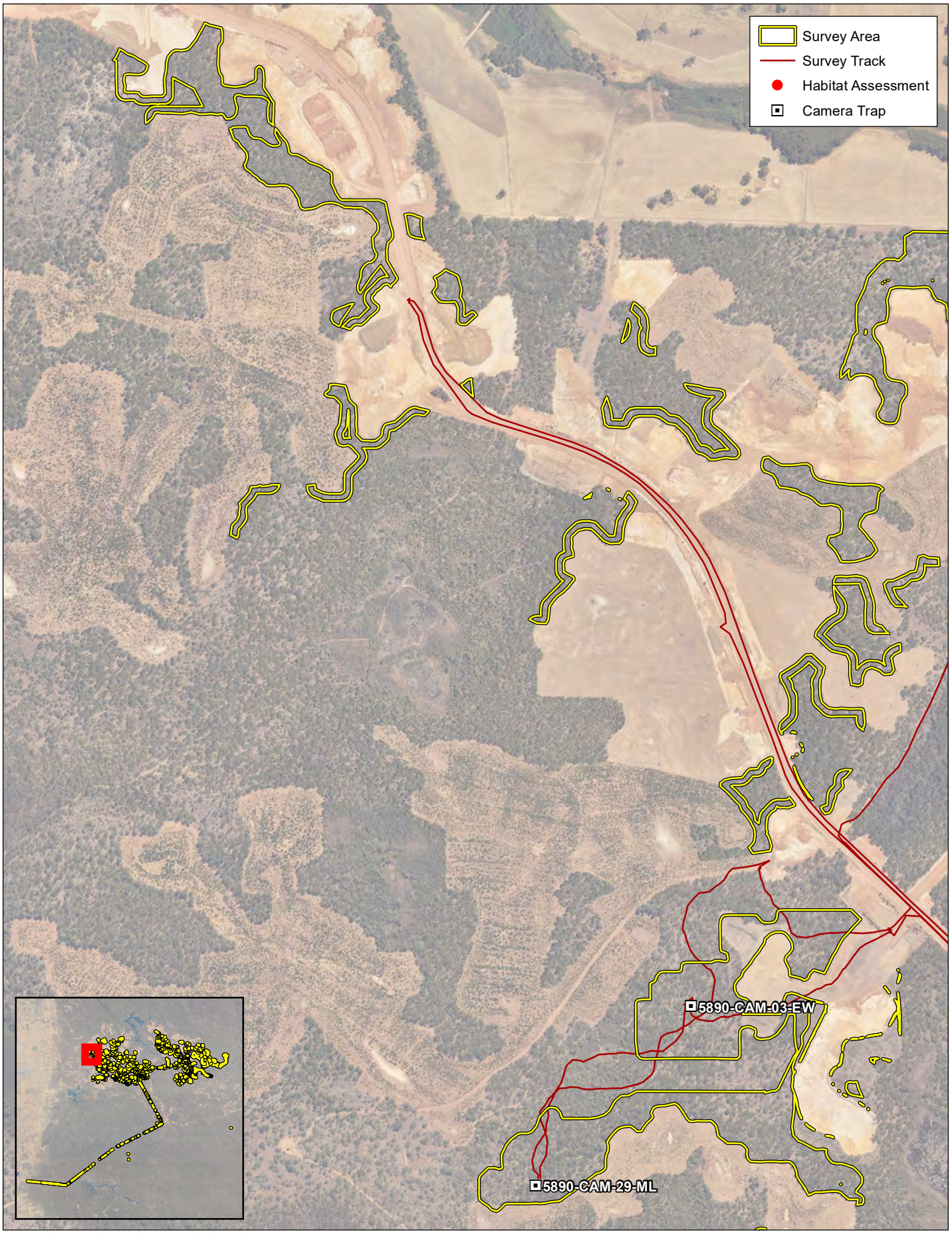
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-1

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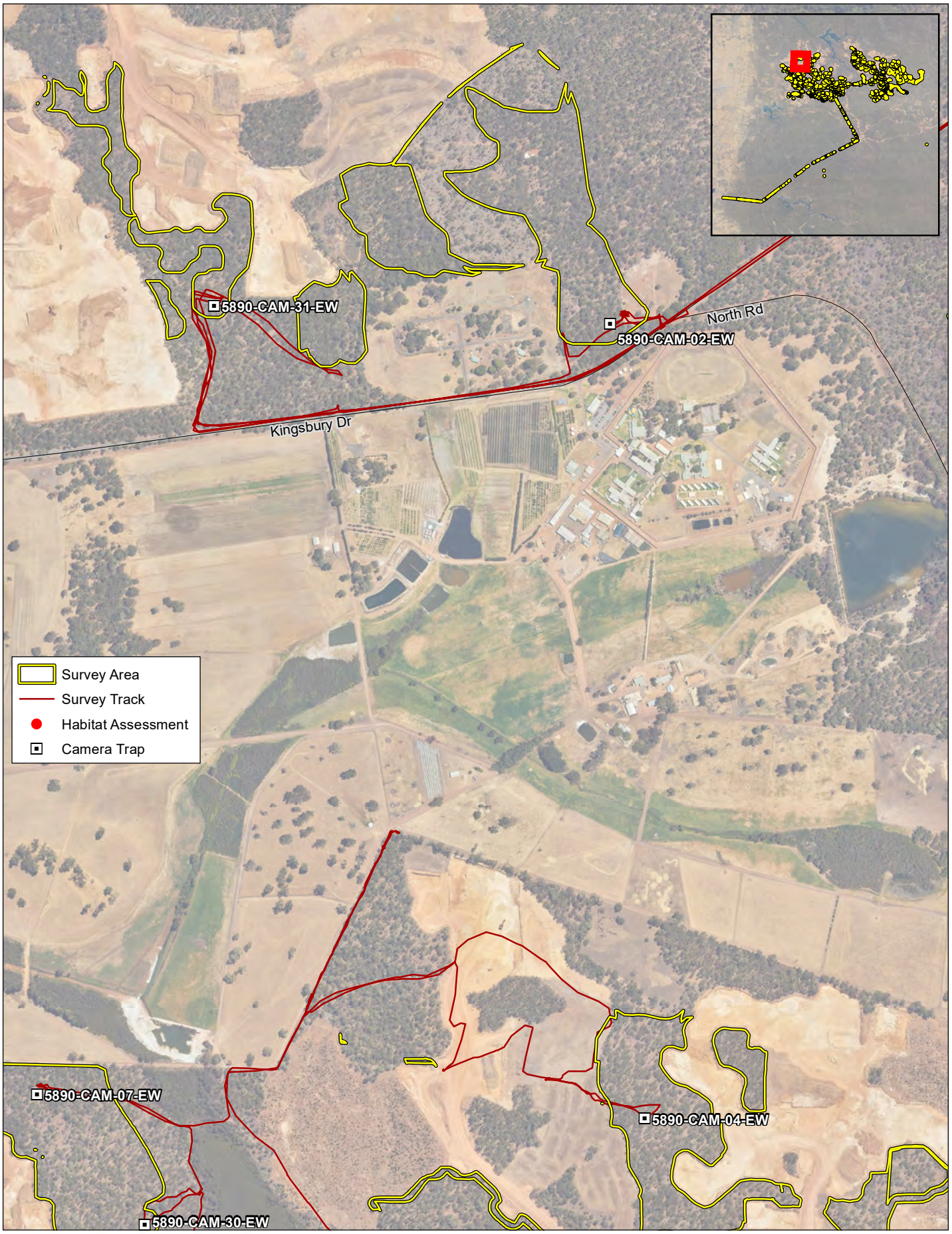
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-2

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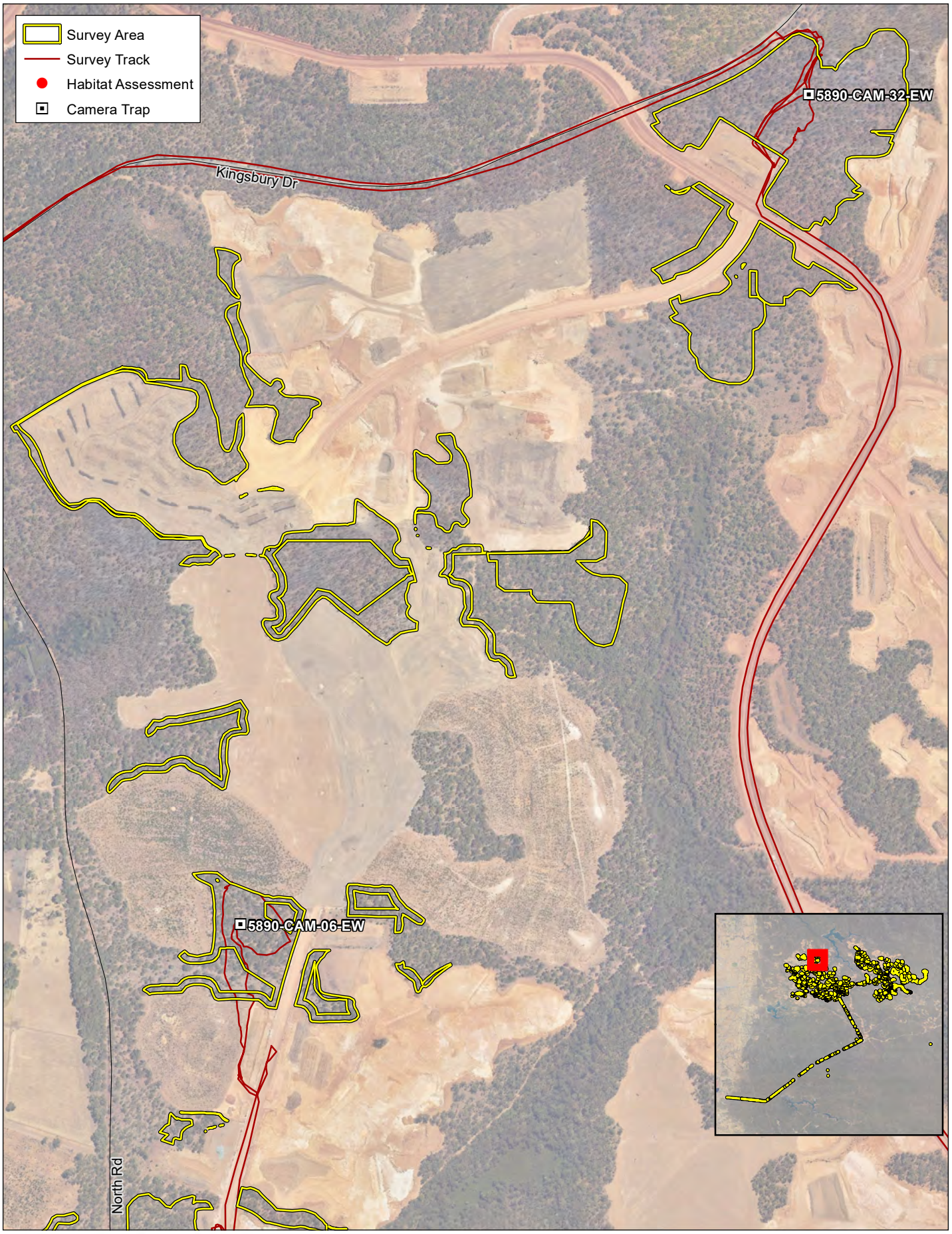
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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort
MAP 7-3

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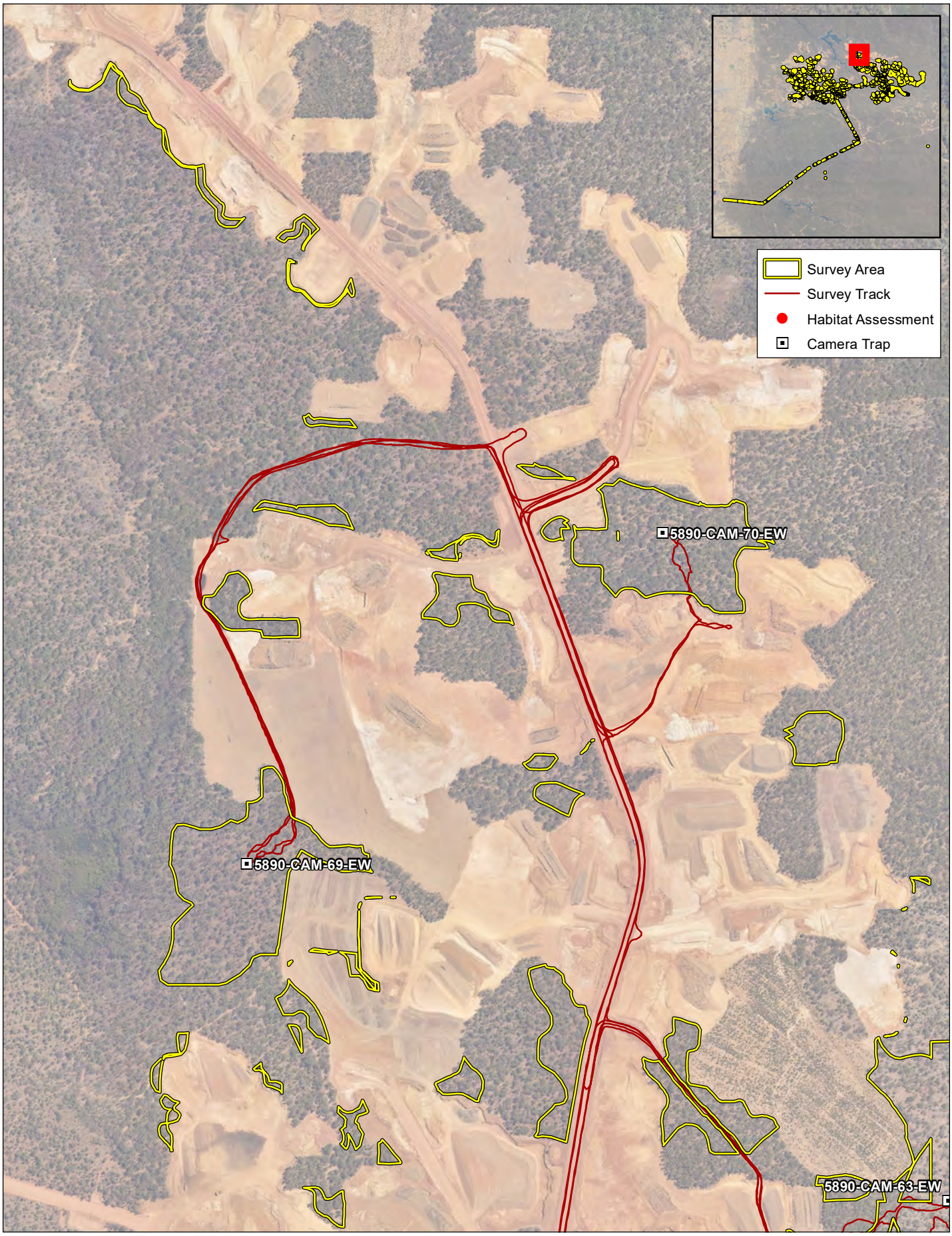
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-4

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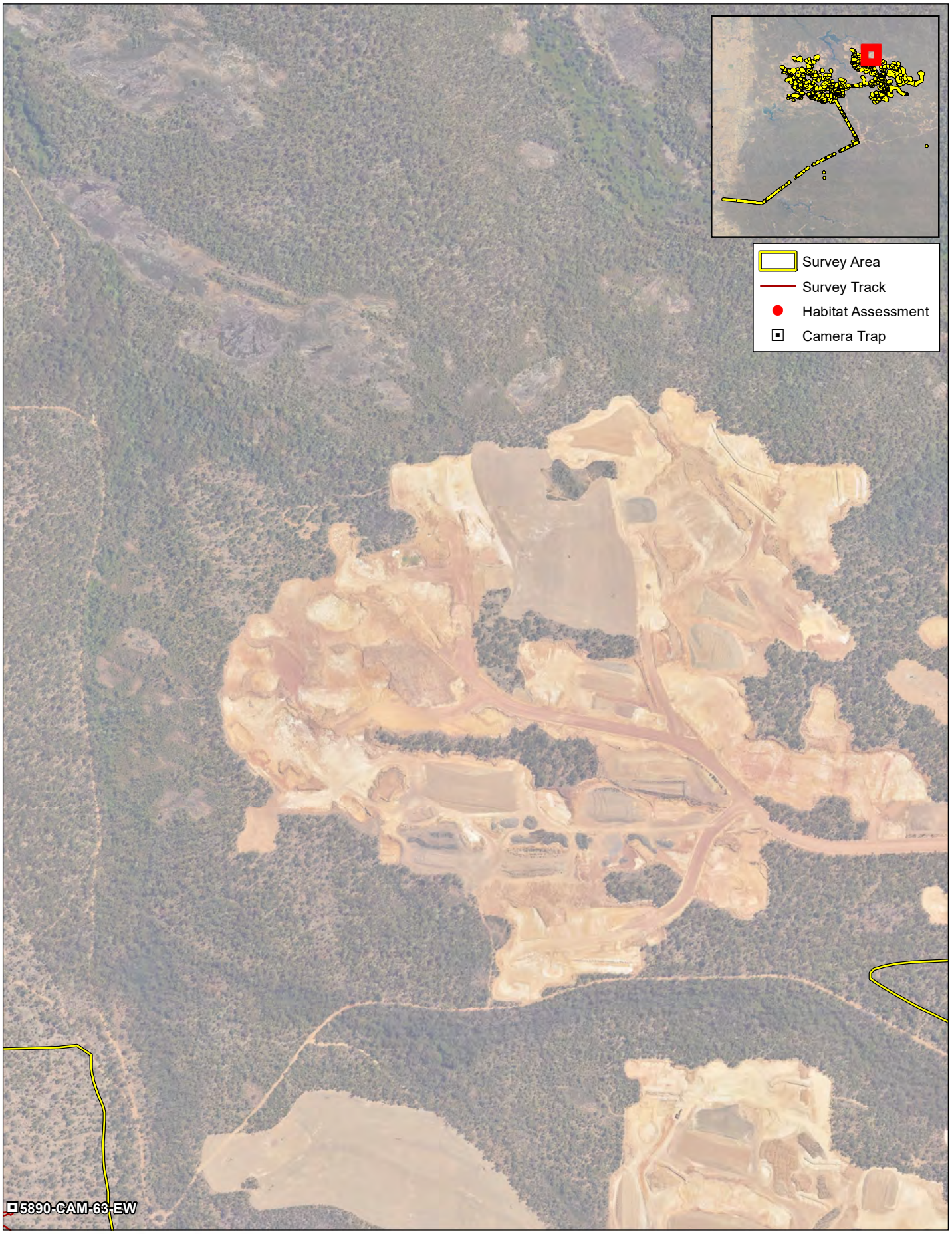
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-5

C:\GIS\Jobs\360\675.VX5890.00001 - Myara and Larego Surveys, Alcoa\Figures_MyaraCQW\675-VX5890-0001_MCQW_M07-5 Survey Effort_240614.mxd



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Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-6

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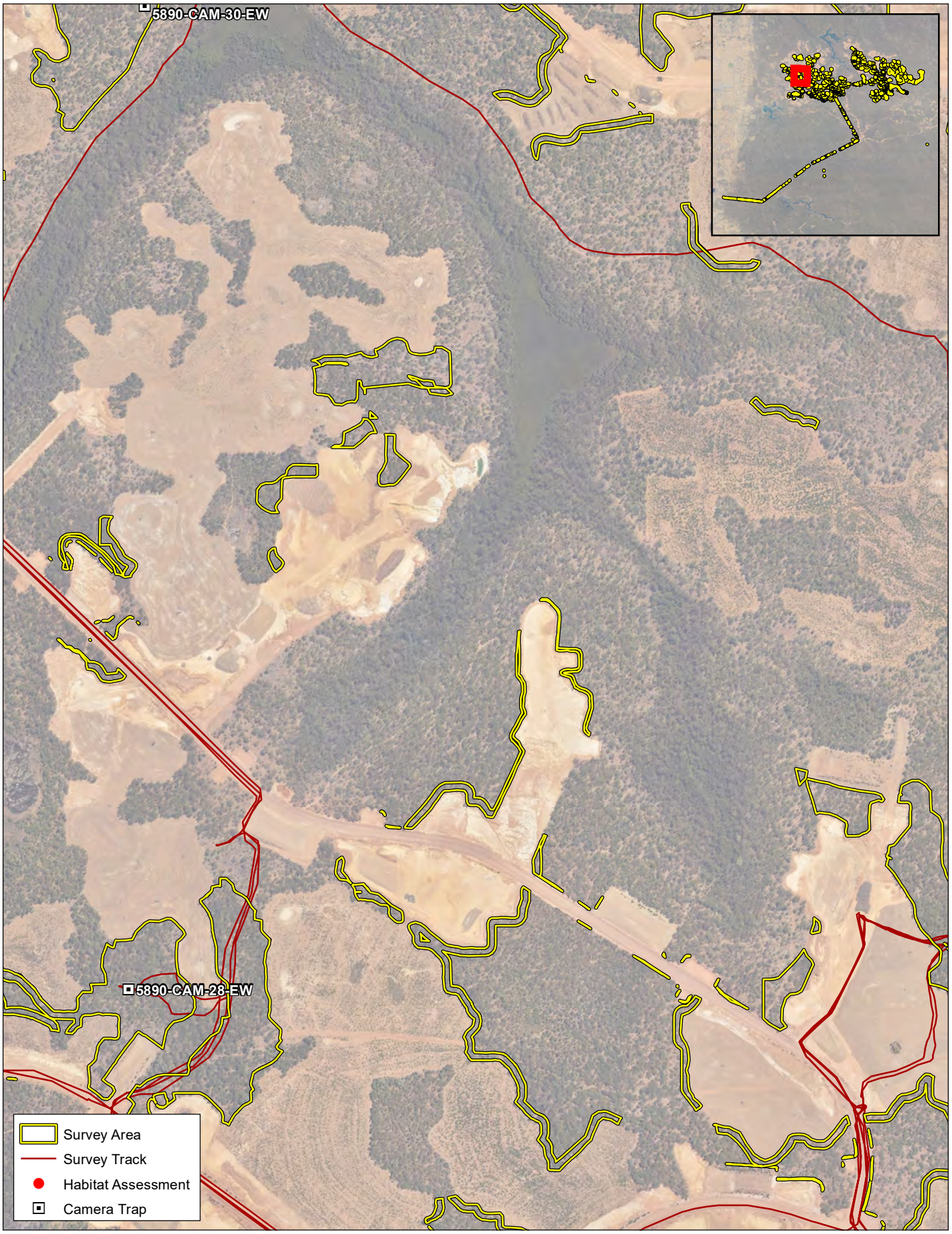
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Drawn By	: Environmaps
Reviewed By	: PD

Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort
MAP 7-7

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Alcoa

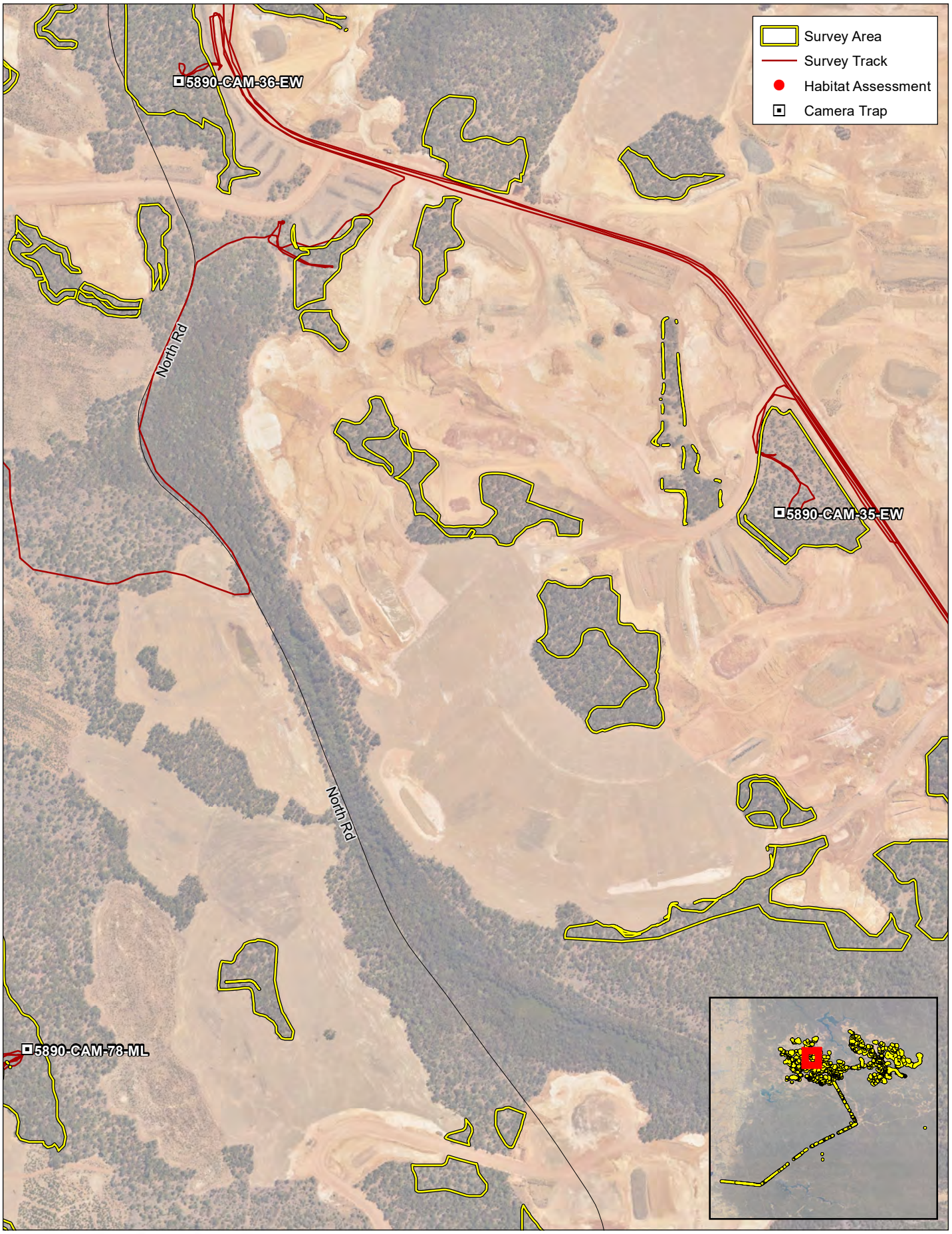
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-8

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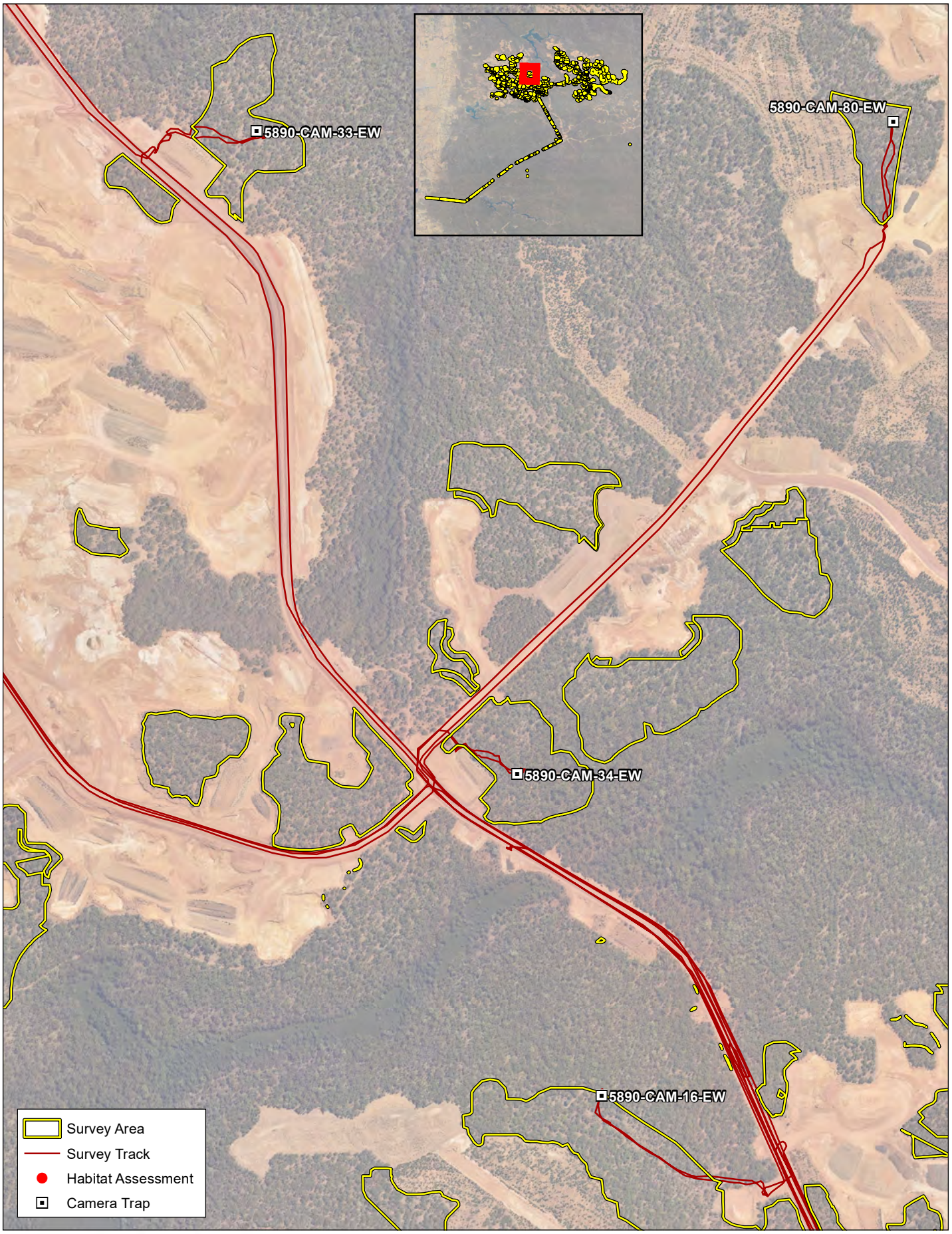
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-9

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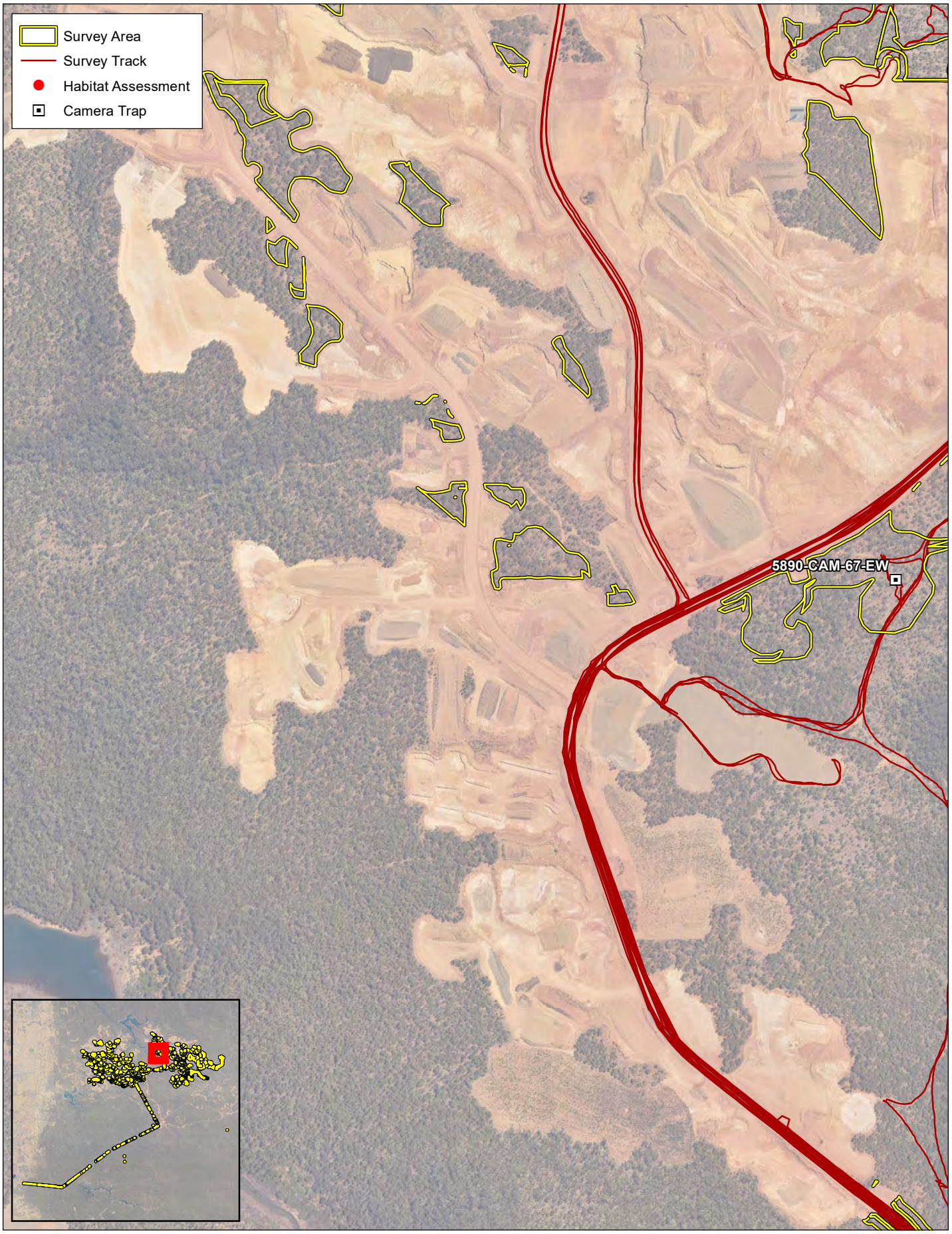
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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort
MAP 7-10

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Alcoa

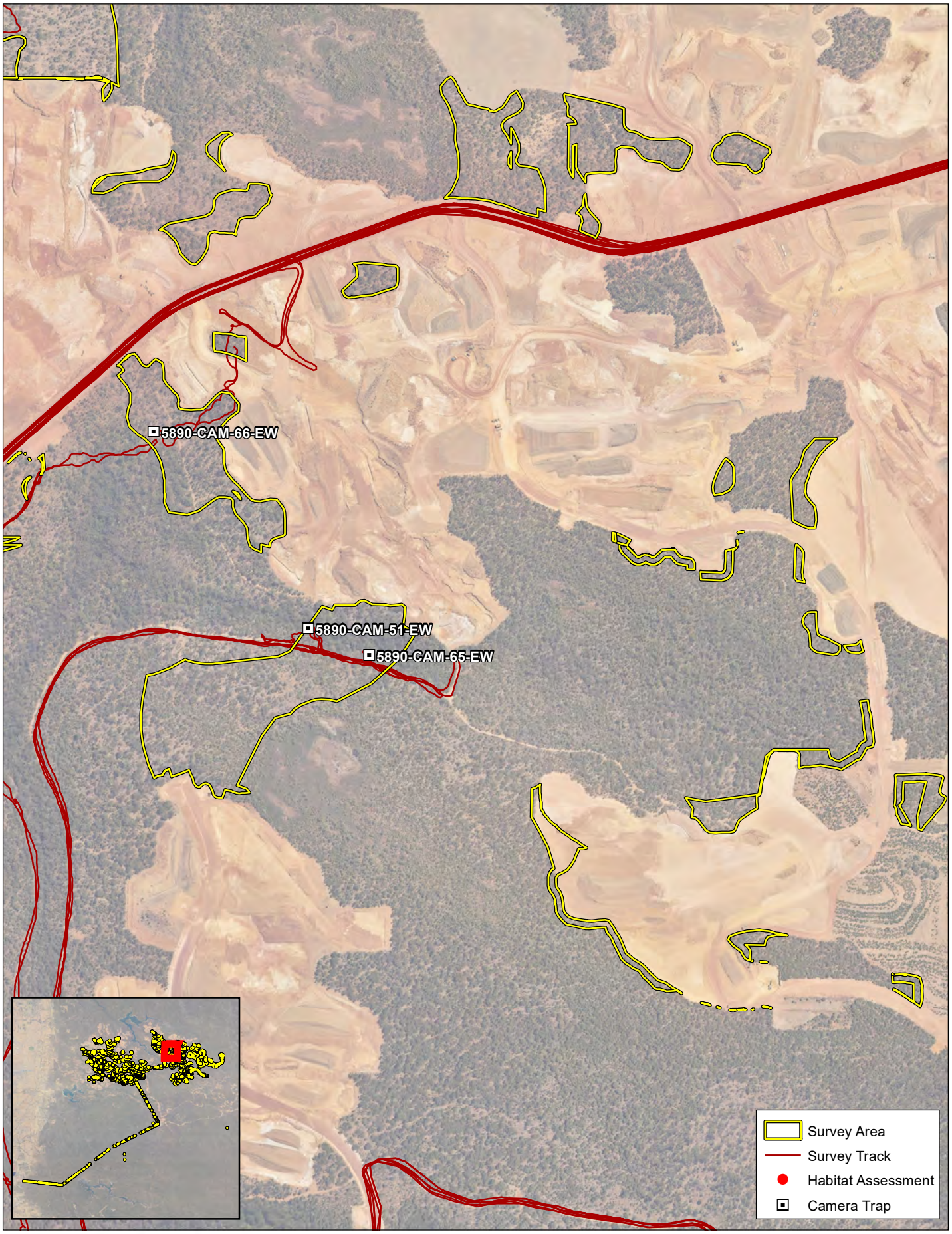
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Survey Effort

MAP 7-11

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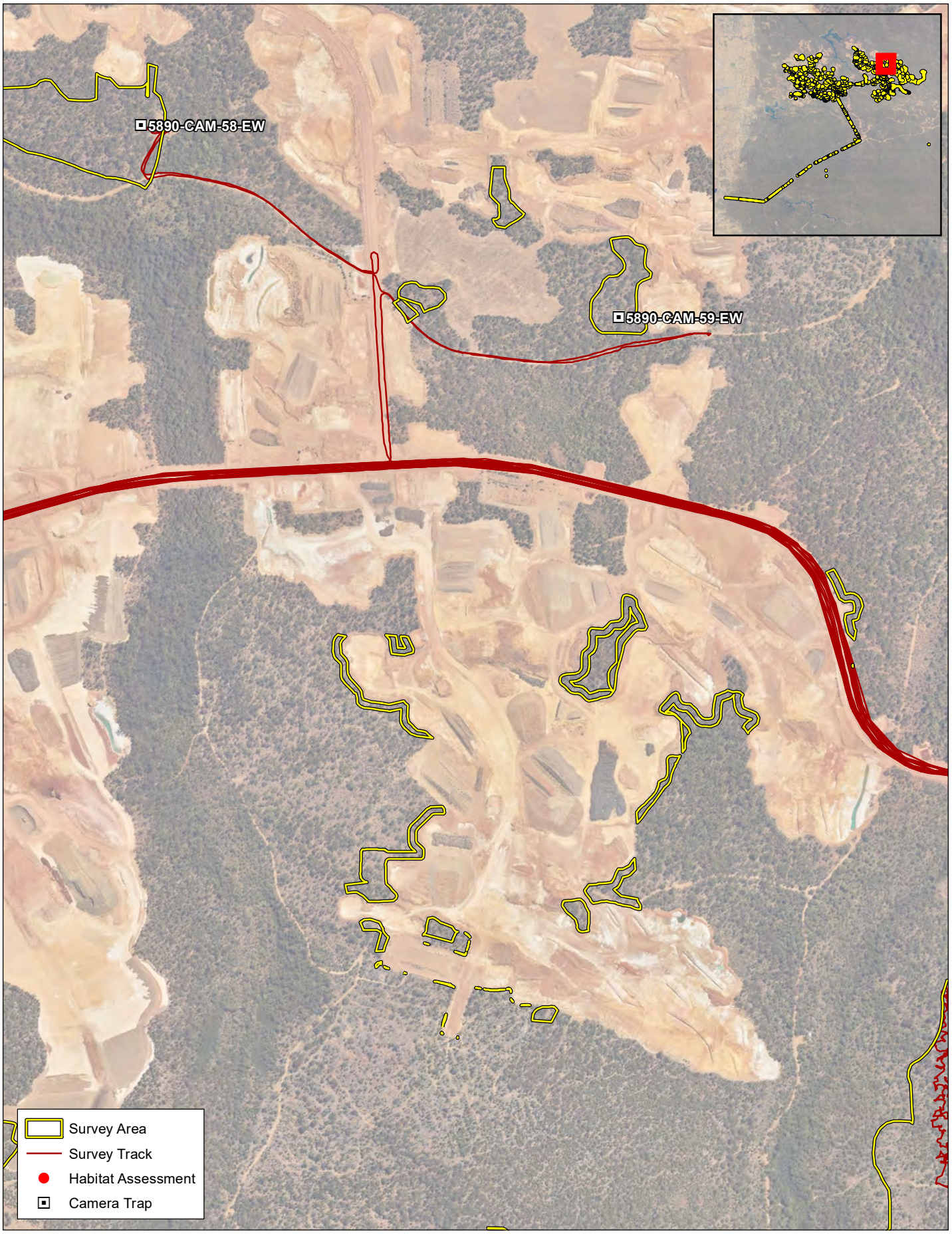
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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort
MAP 7-12

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Alcoa

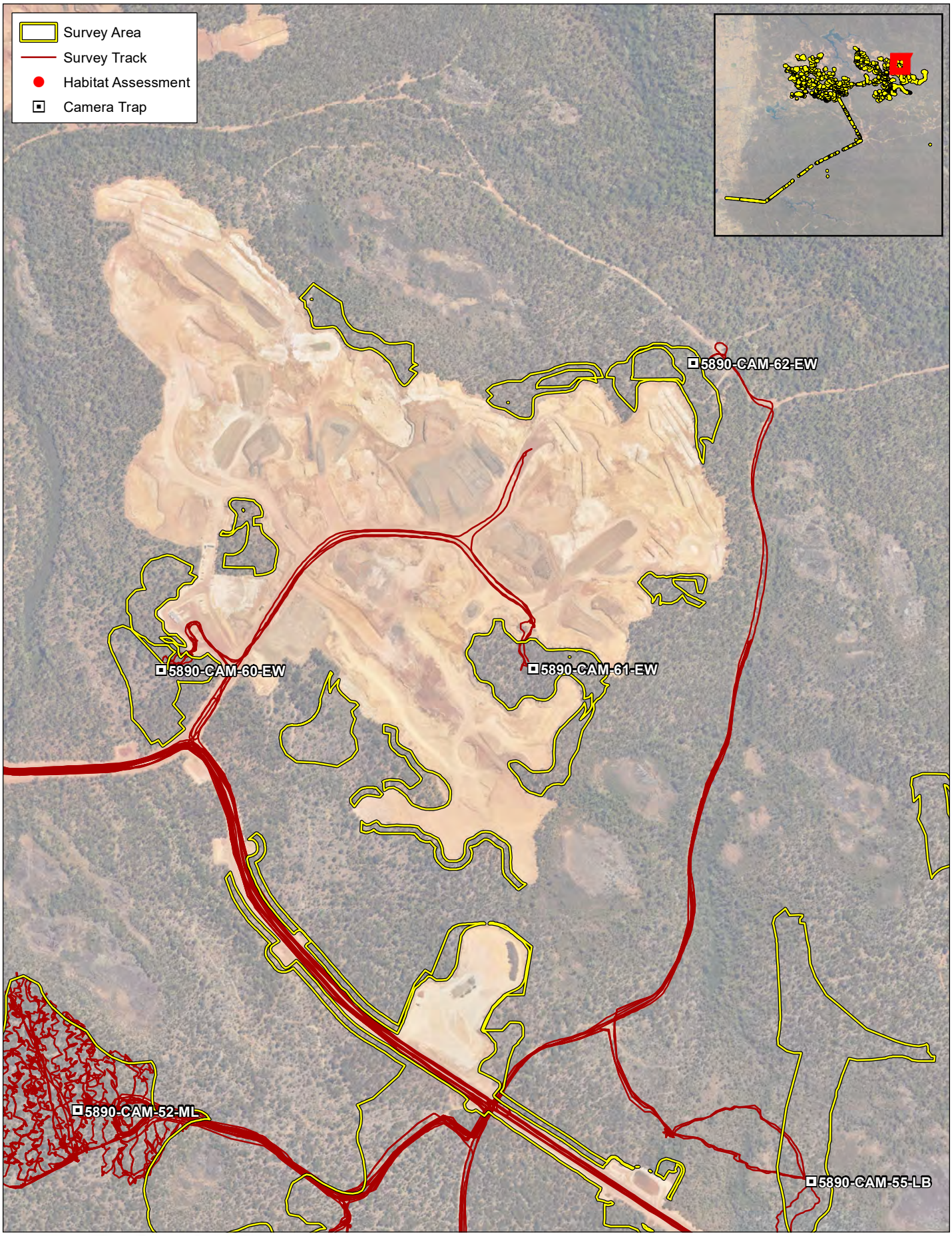
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-13

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Survey Effort

MAP 7-14

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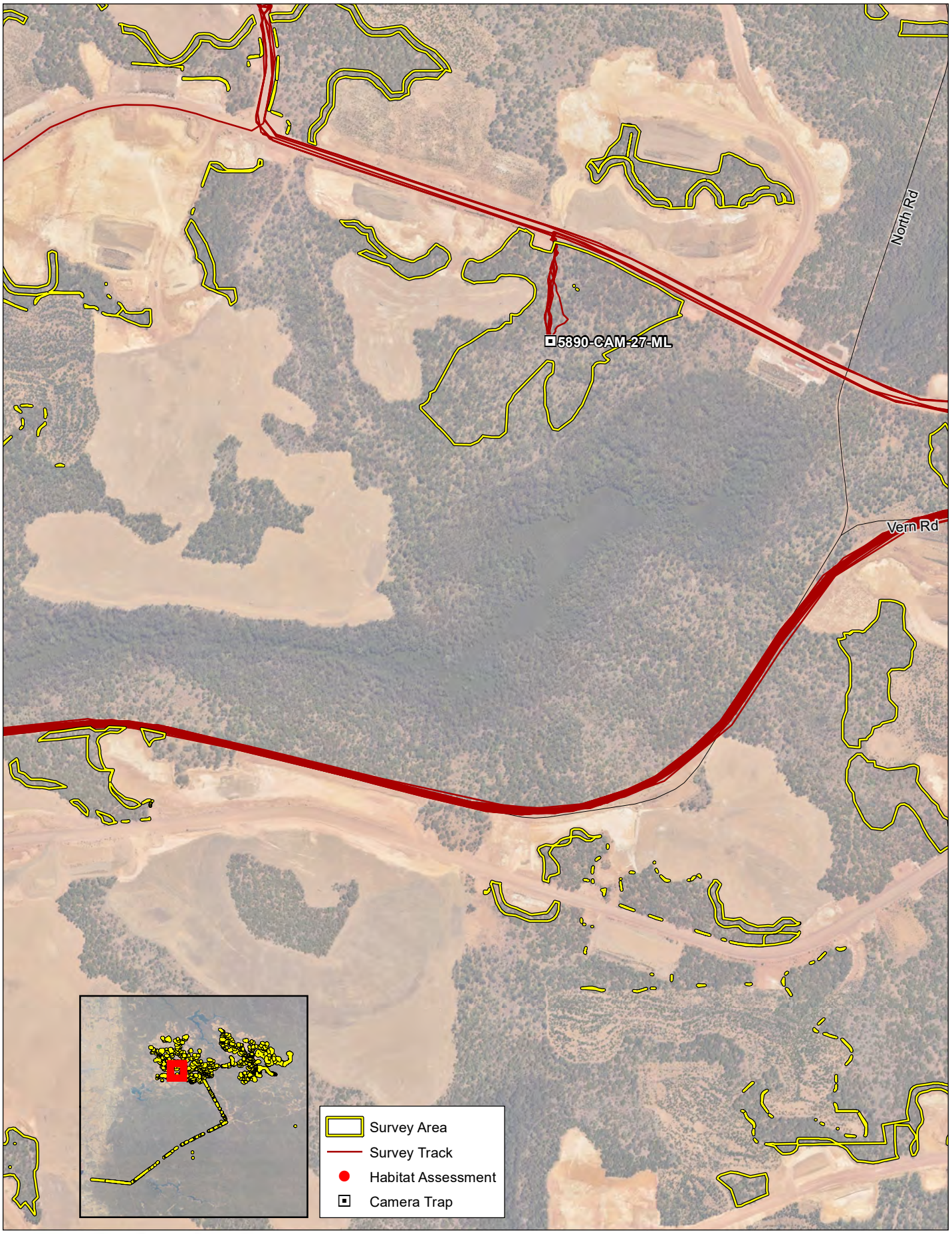
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-15

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Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-16

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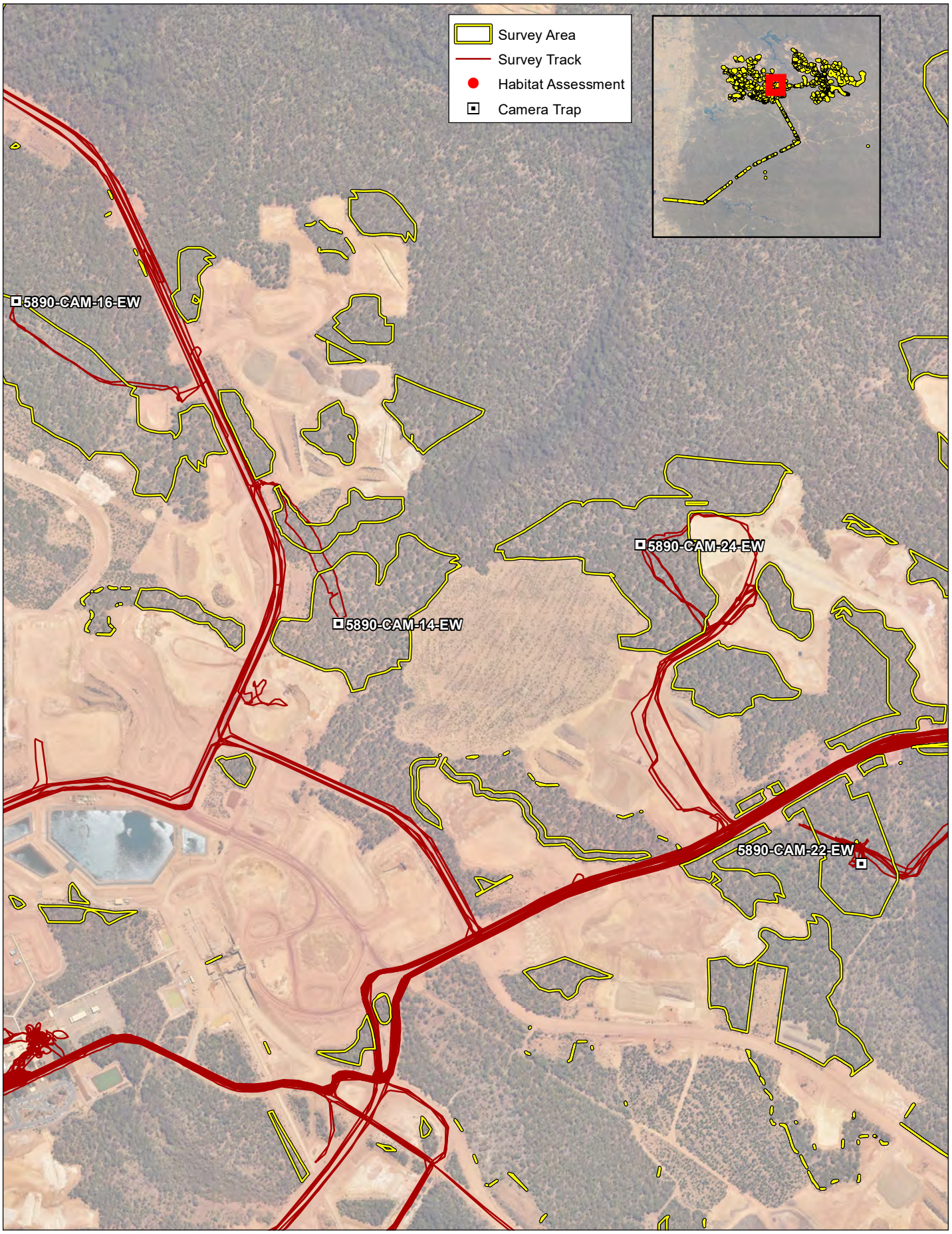
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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort
MAP 7-17

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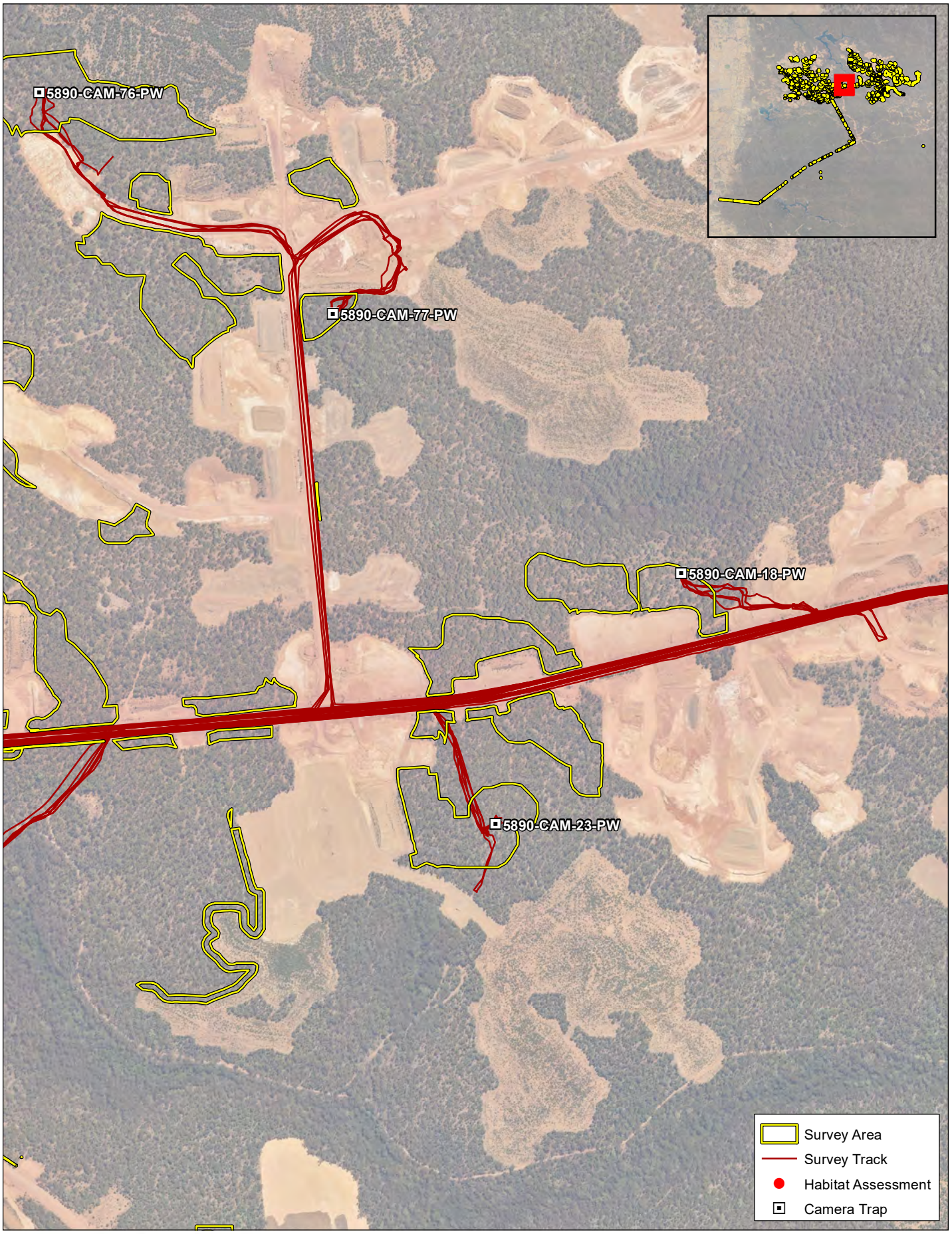
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-18

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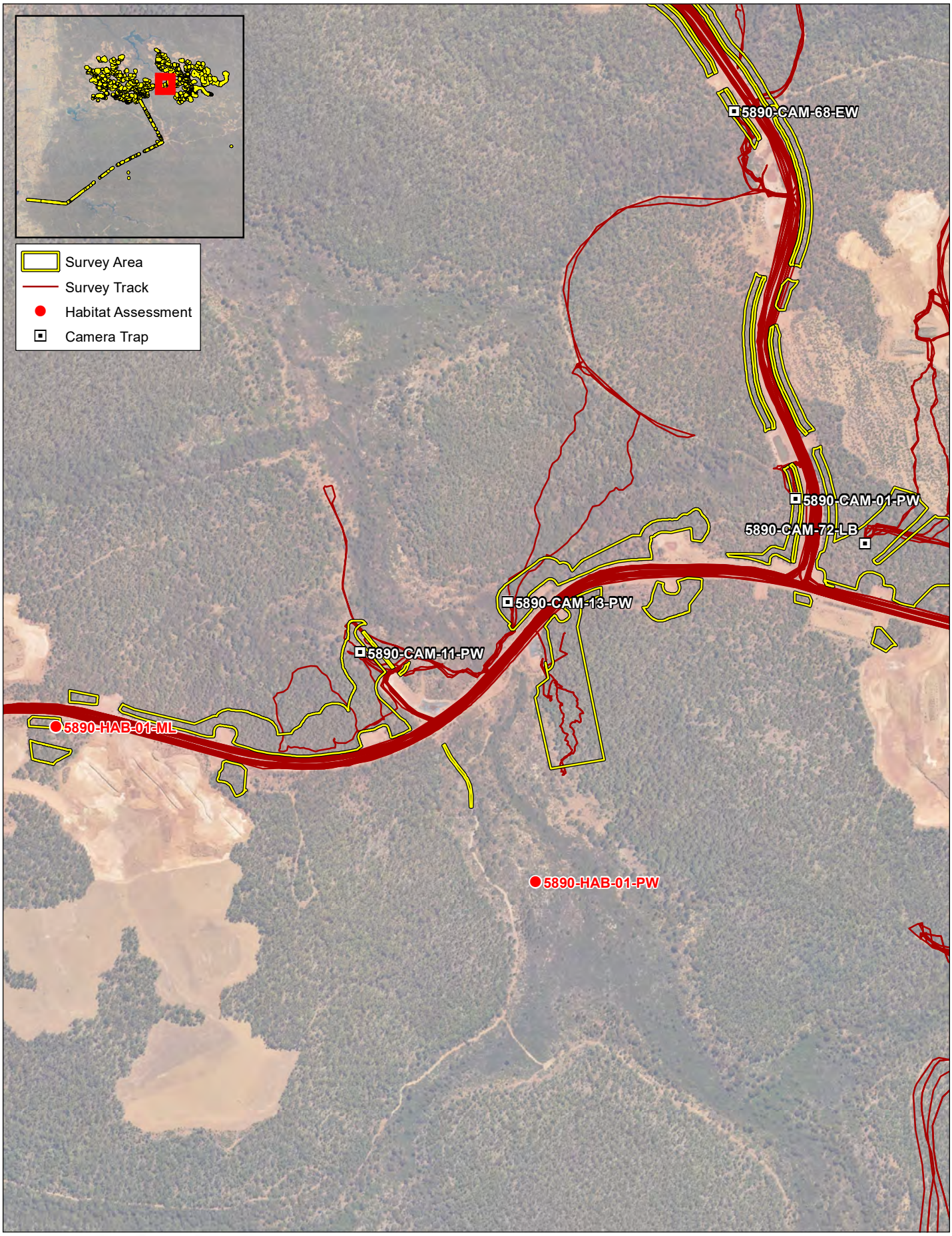
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-19

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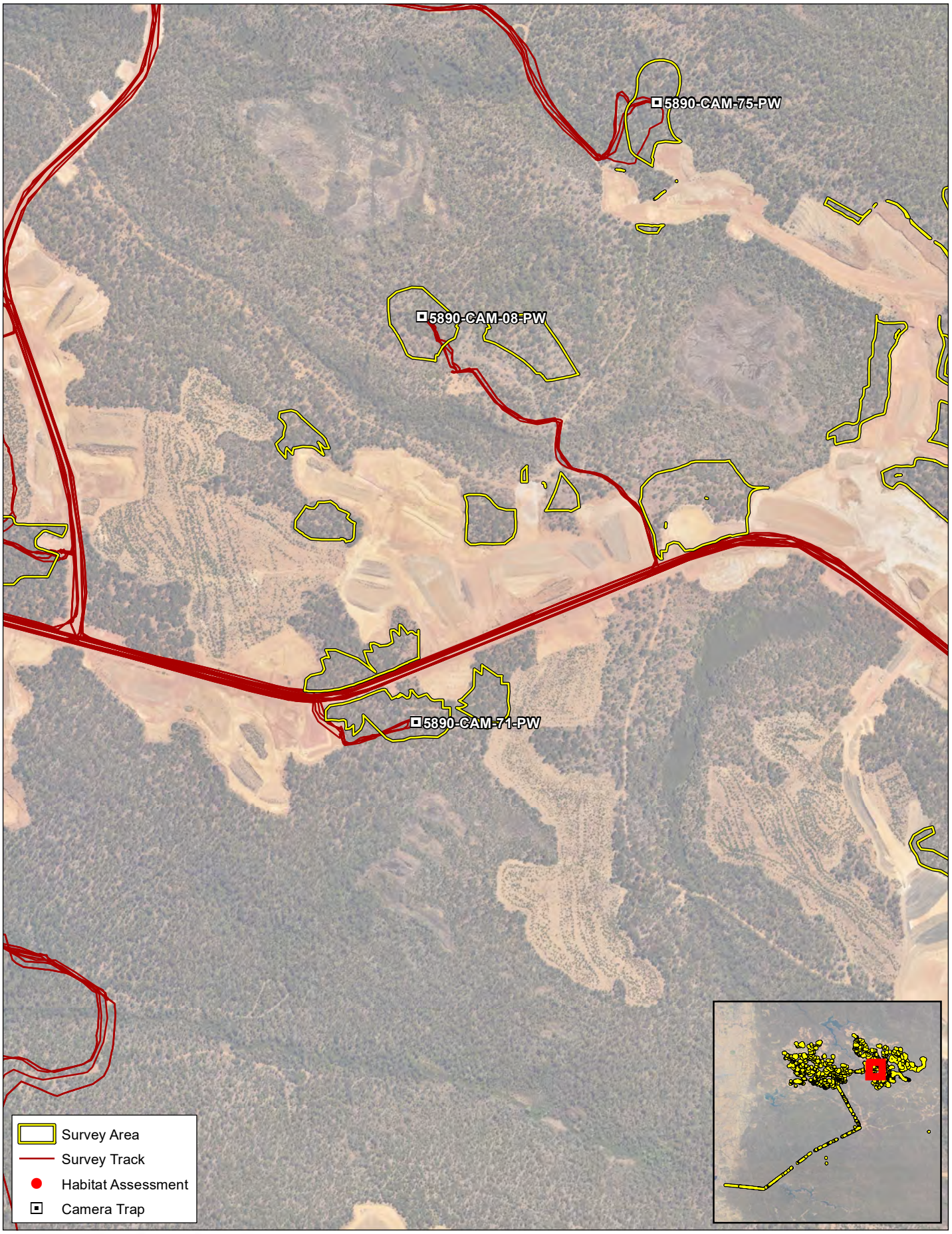
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-20

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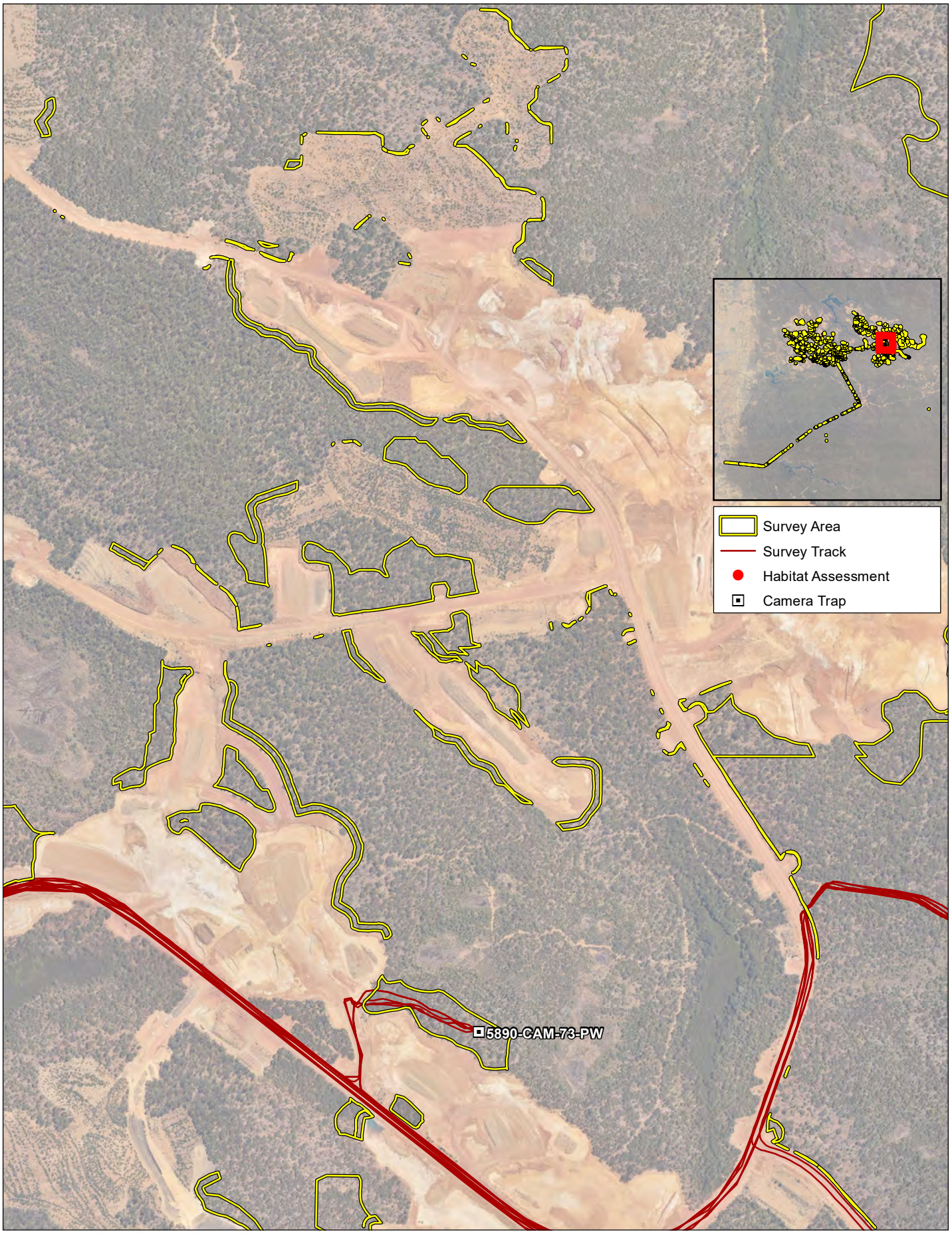
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-21

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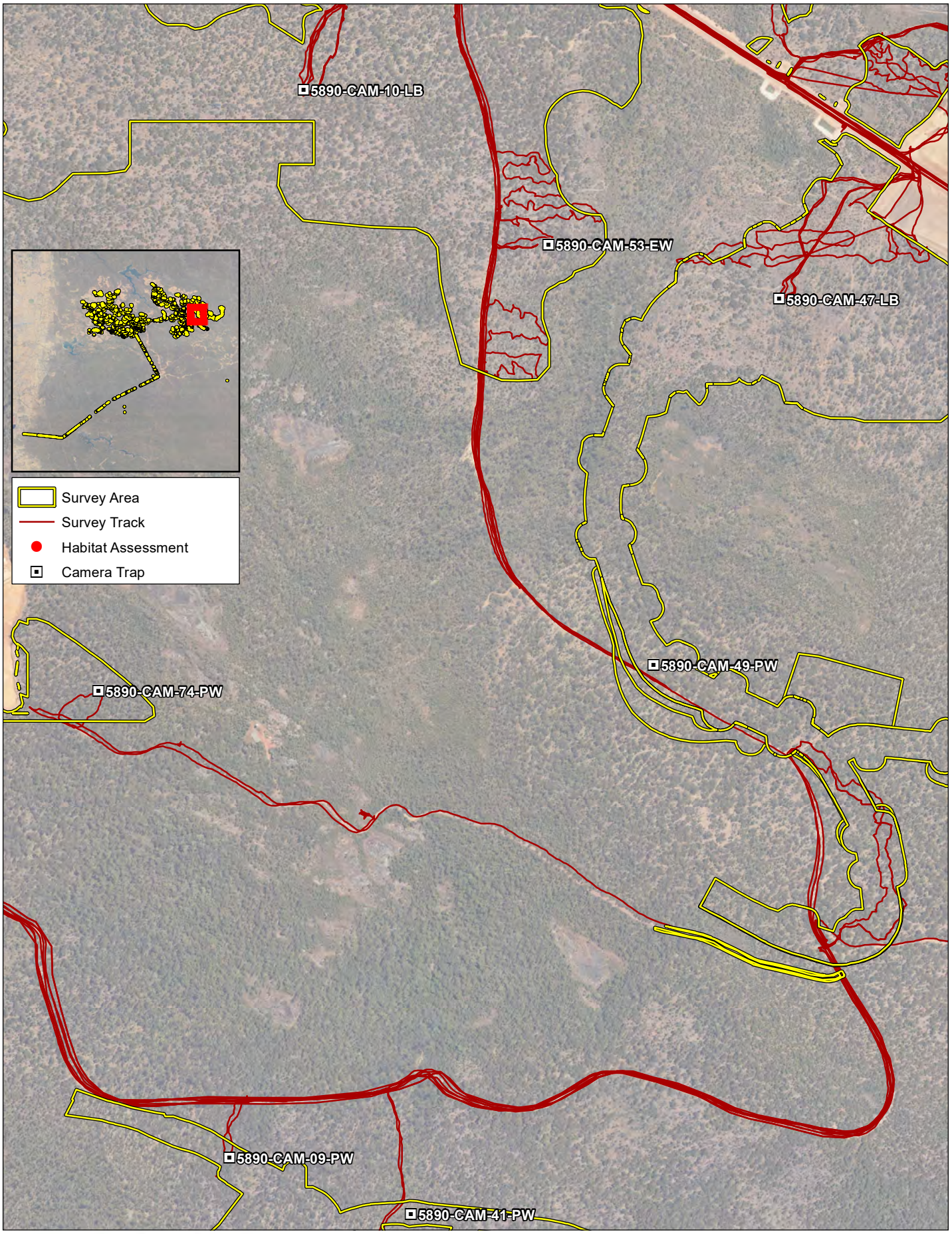
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-22

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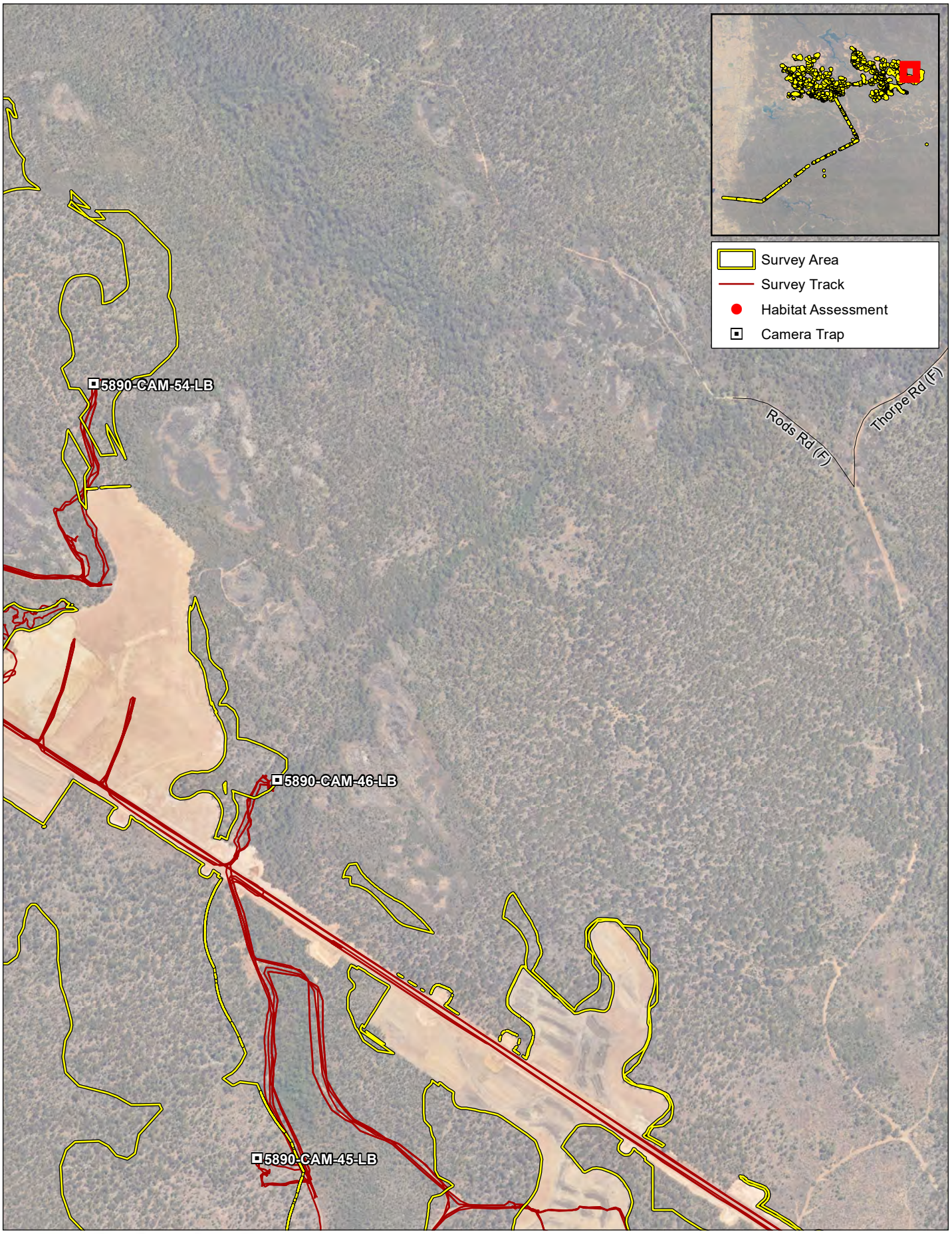
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-23

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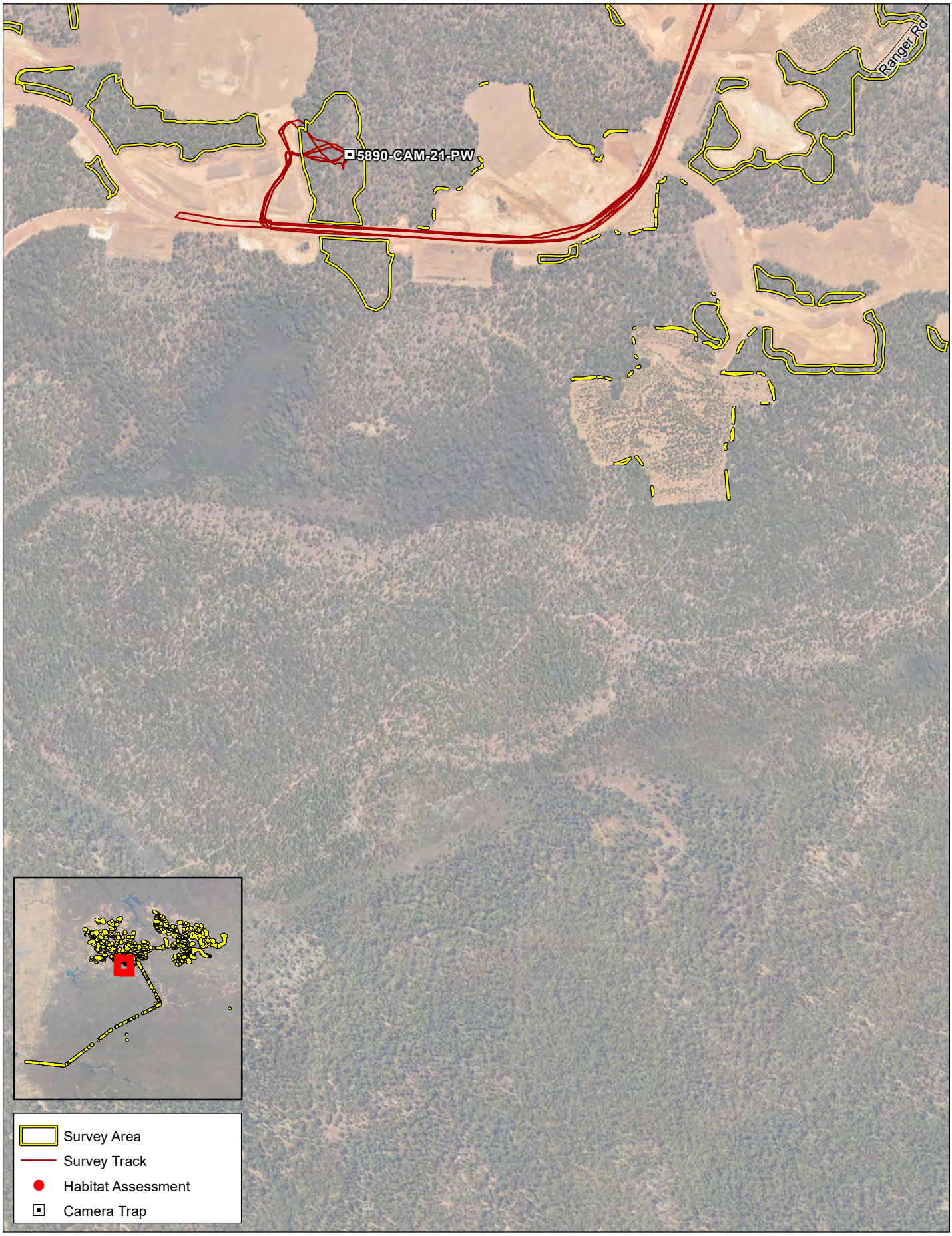
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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort
MAP 7-24

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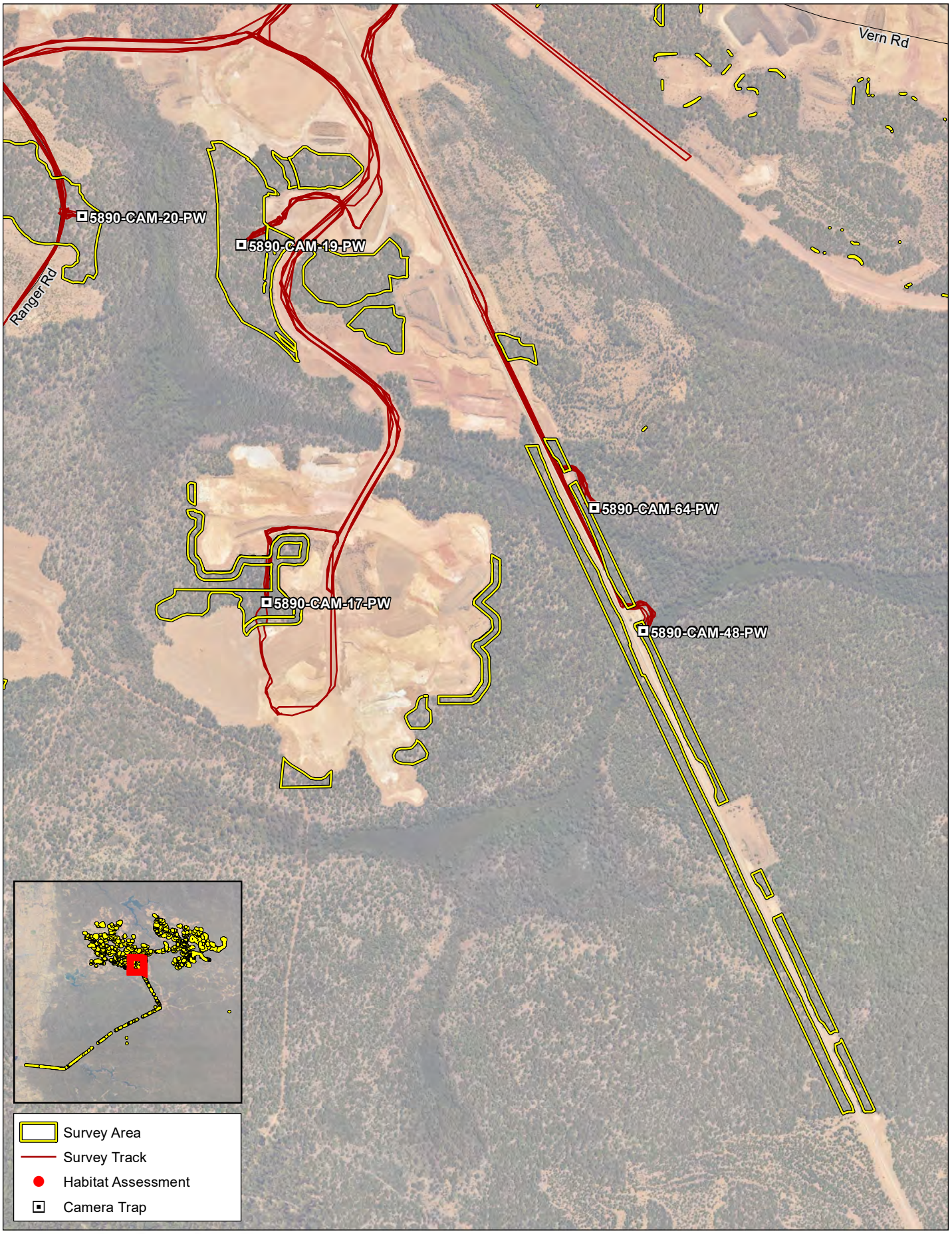
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-25

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Reviewed By	: PD

Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-26

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Reviewed By	: PD

Alcoa

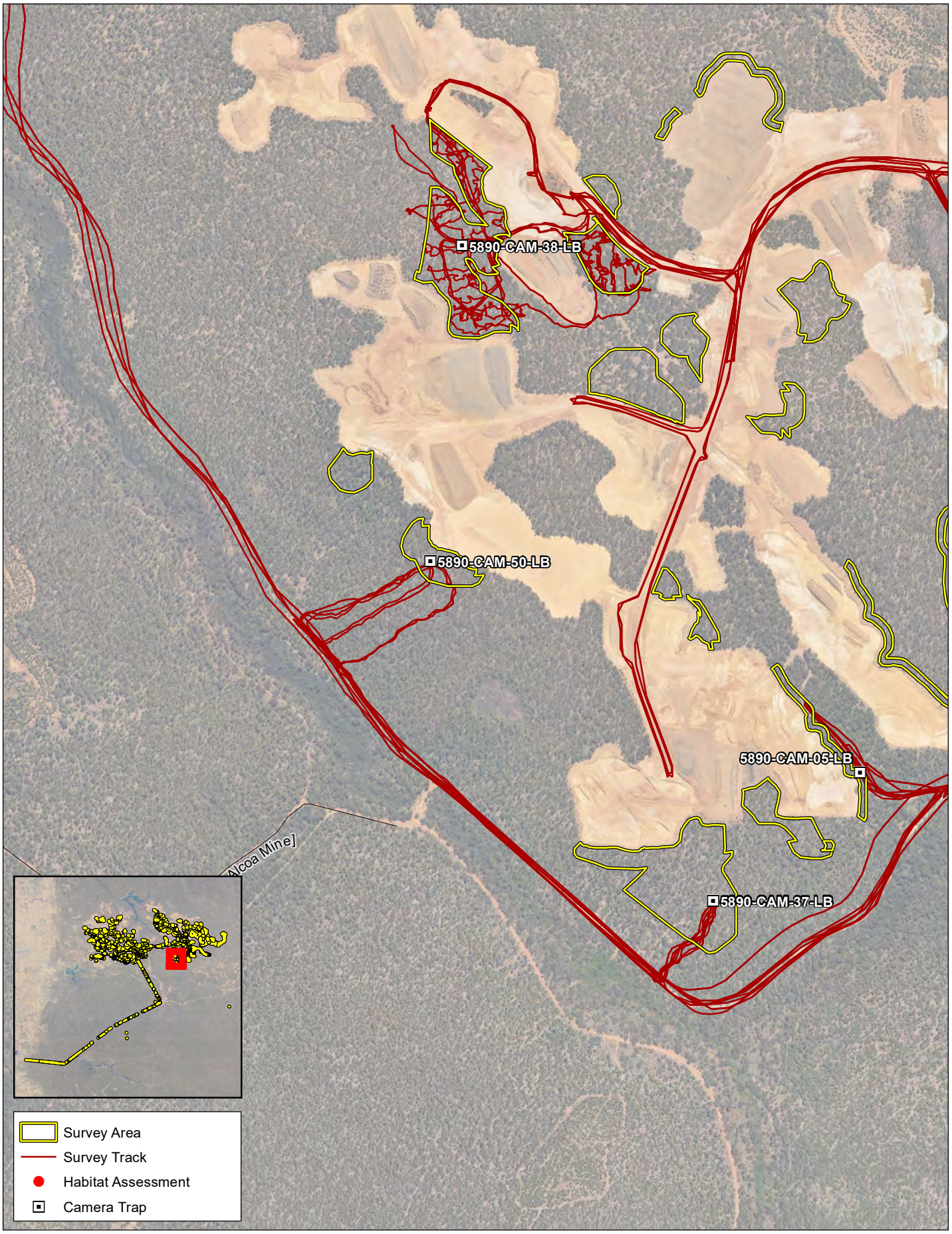
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-27

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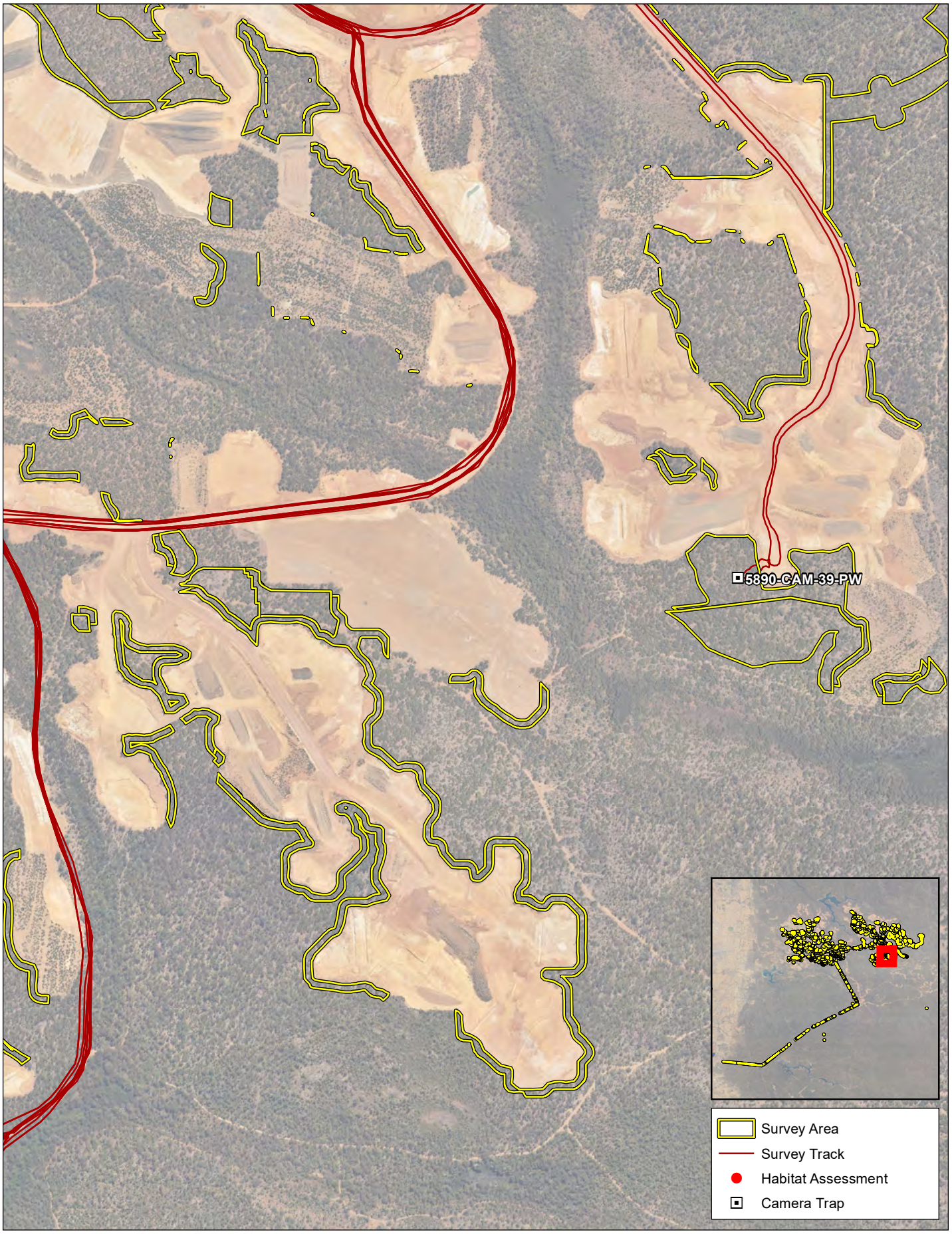
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-28

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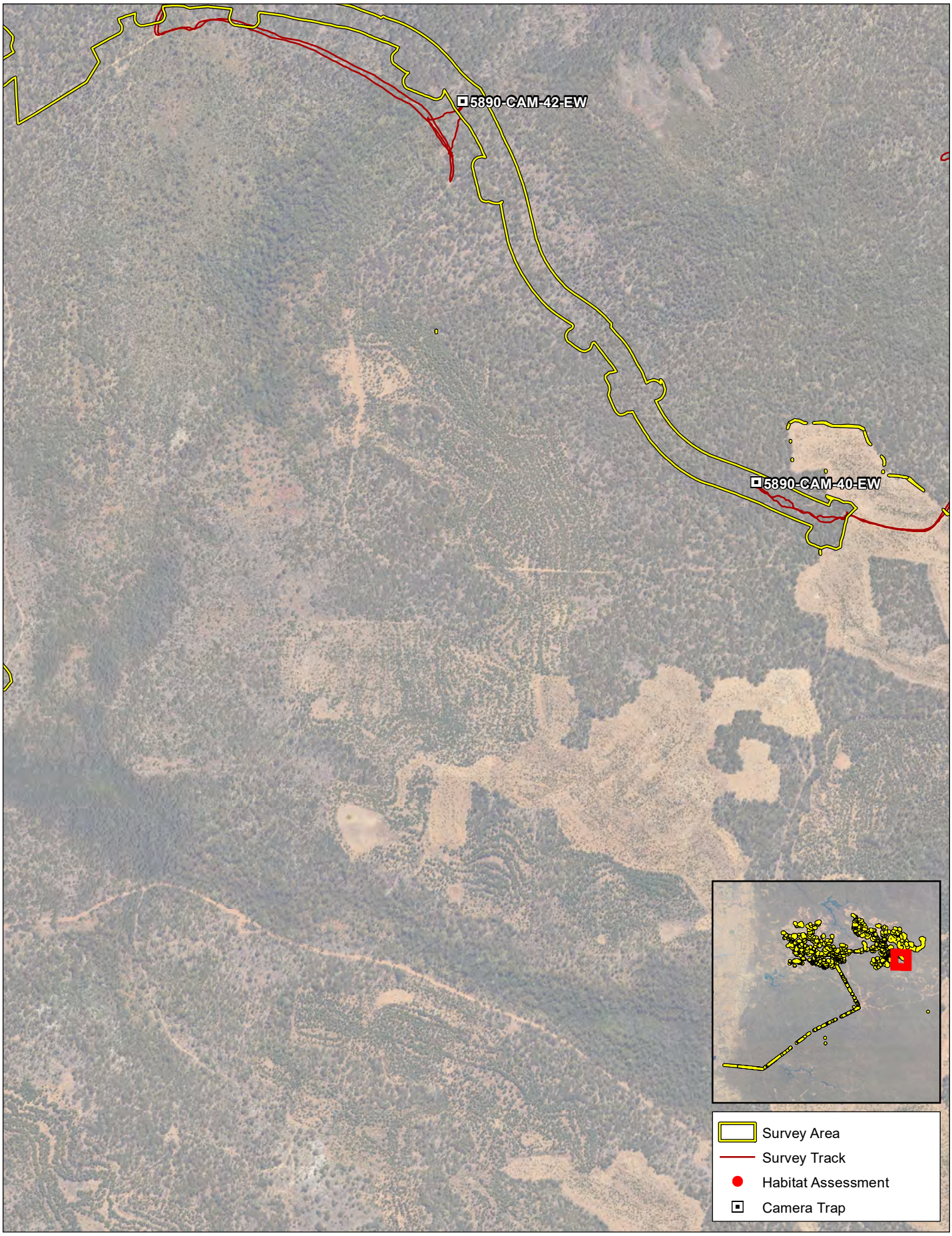
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-29

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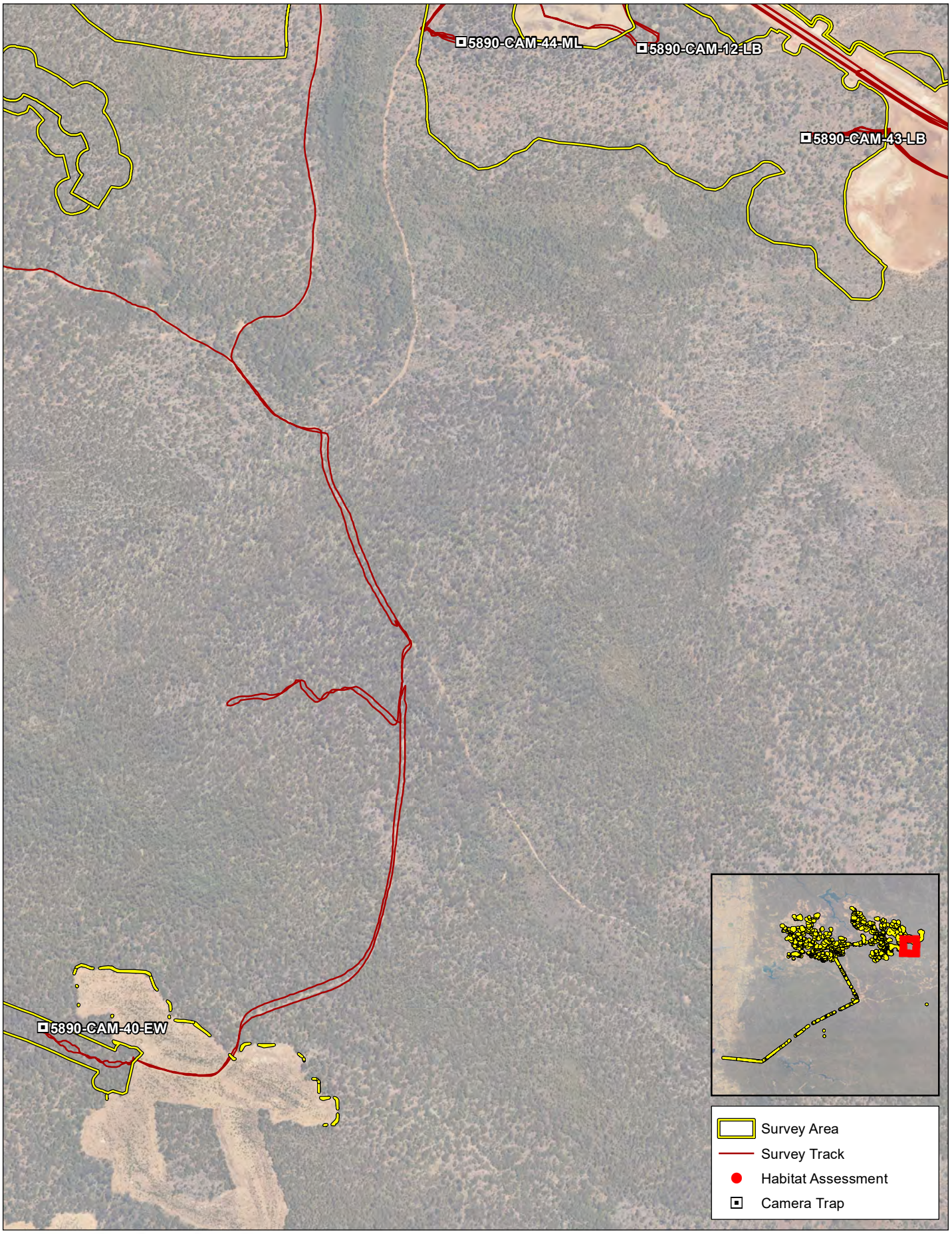
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Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-30

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Alcoa

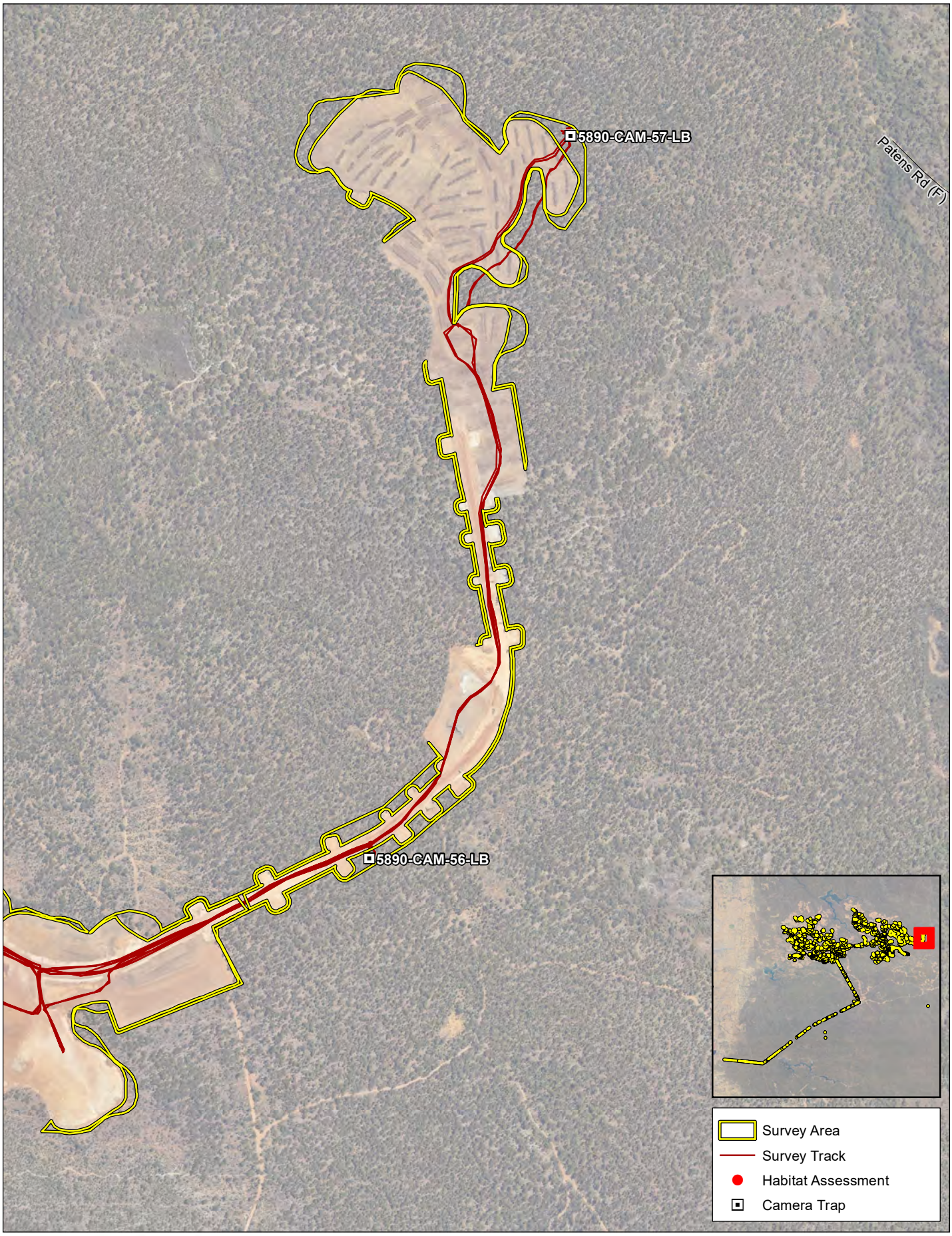
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-31

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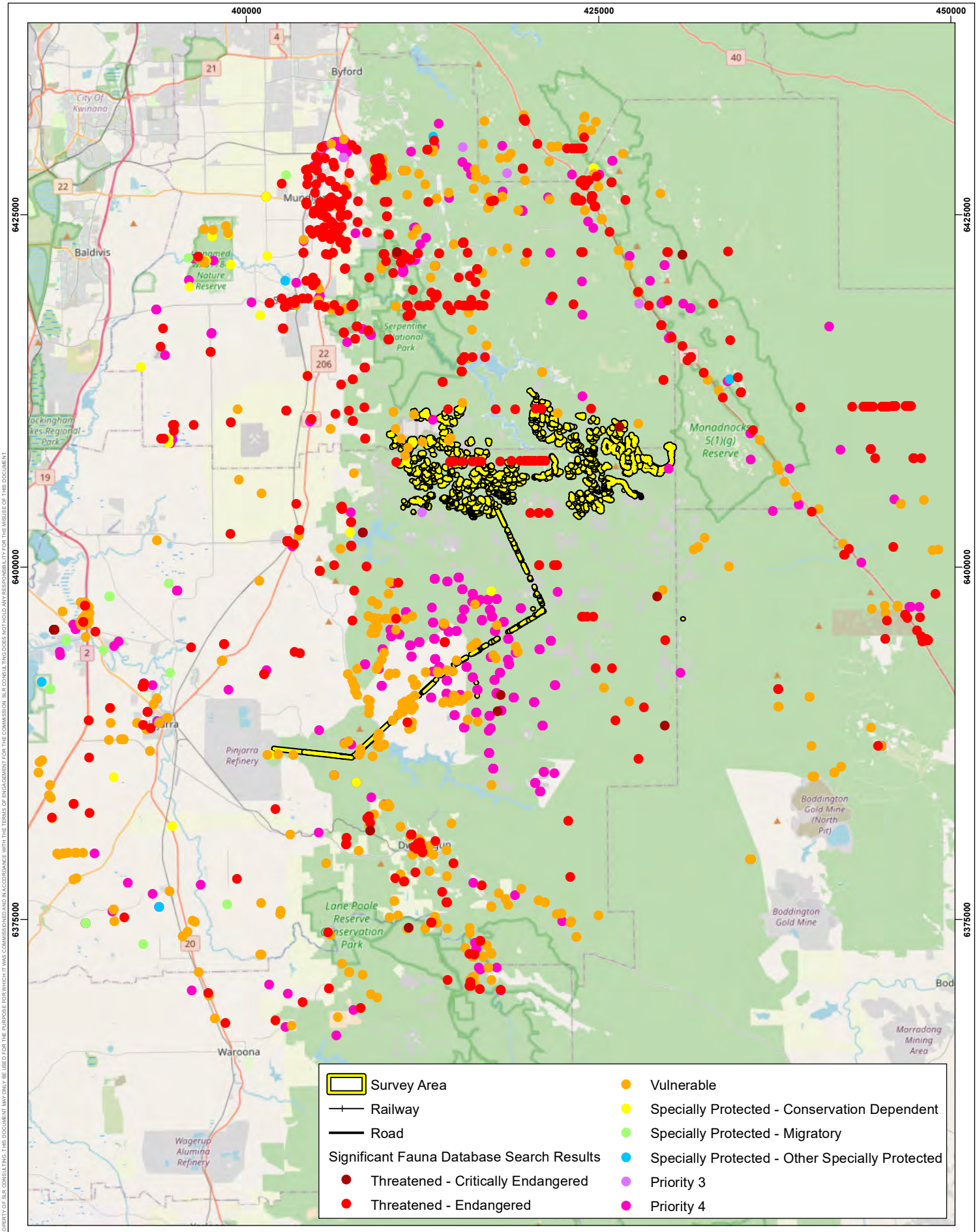
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Survey Effort

MAP 7-32

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N 0 3.75 7.5 15 km

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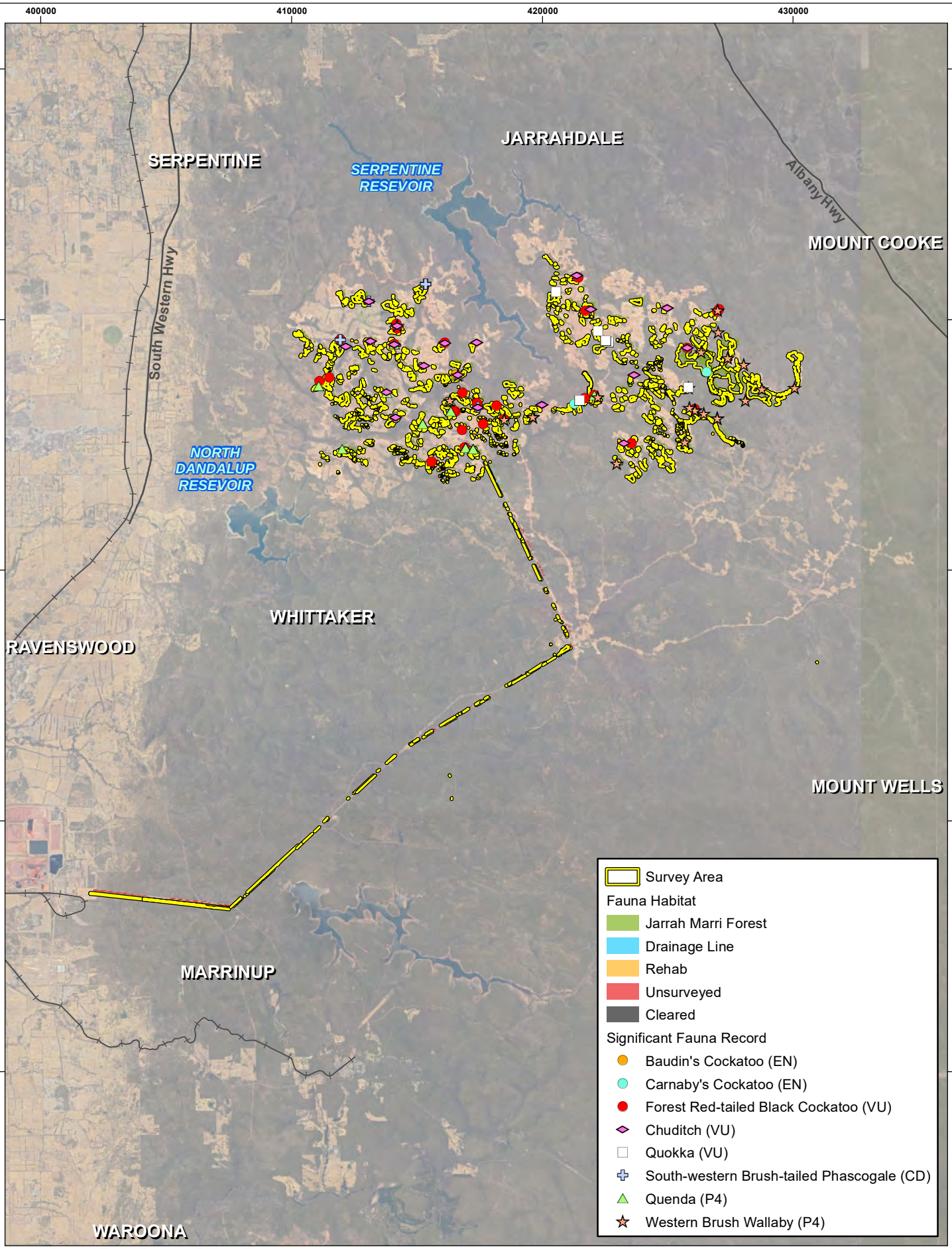
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Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Significant Fauna Database Search Results MAP 8

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N 0 2.5 5 10 km

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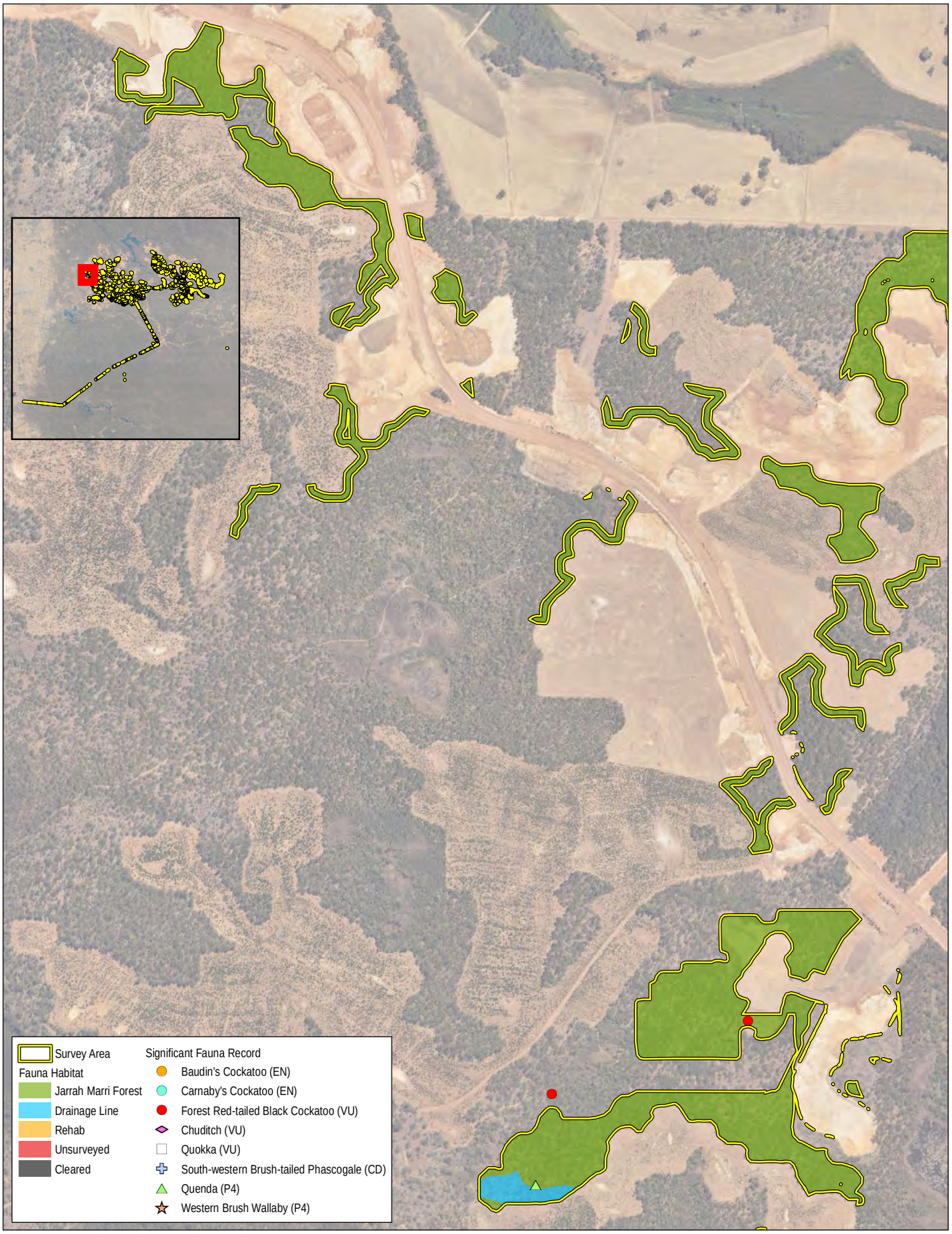
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records

MAP 9-1

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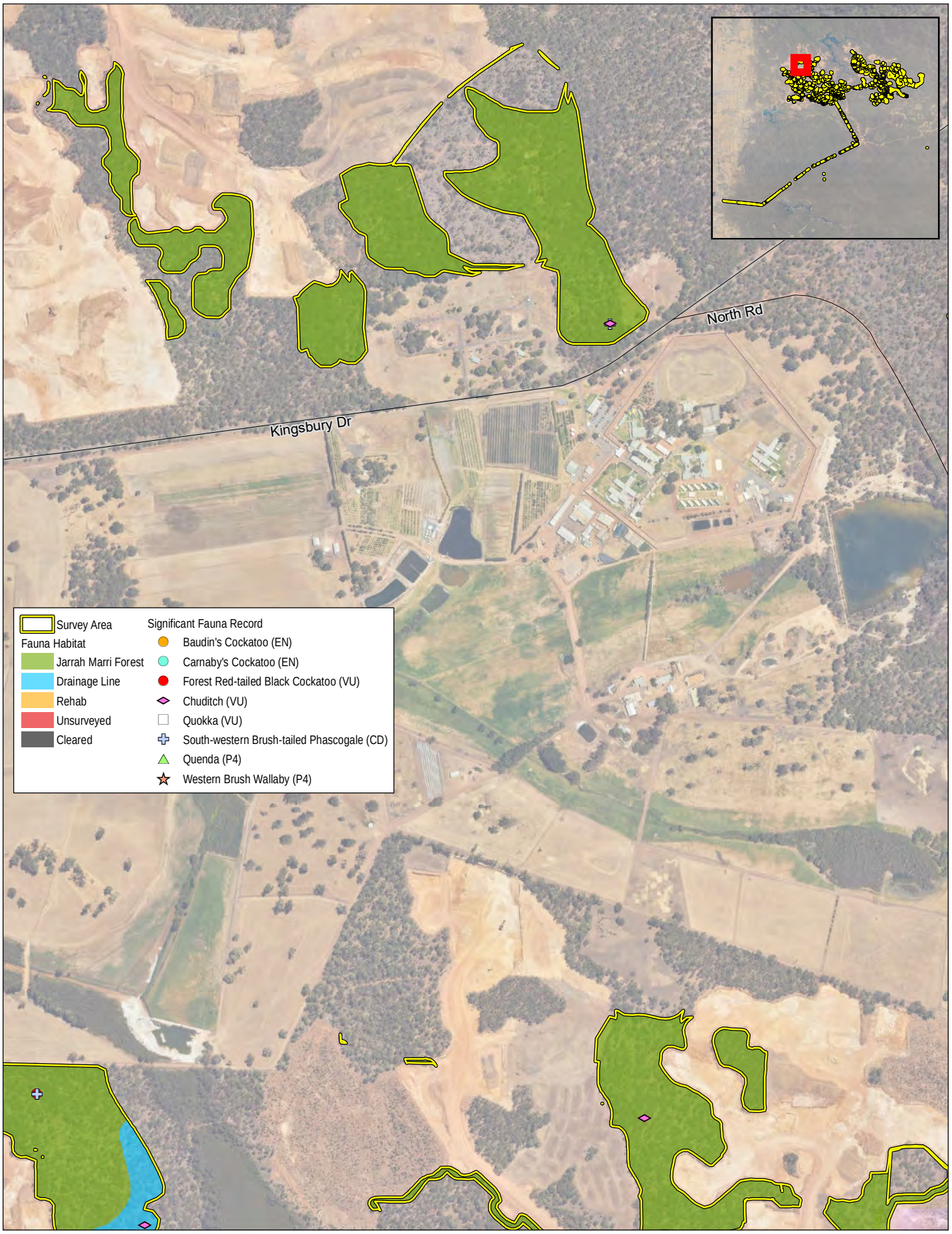
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Date Drawn : 7/06/2024
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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records
MAP 9-2

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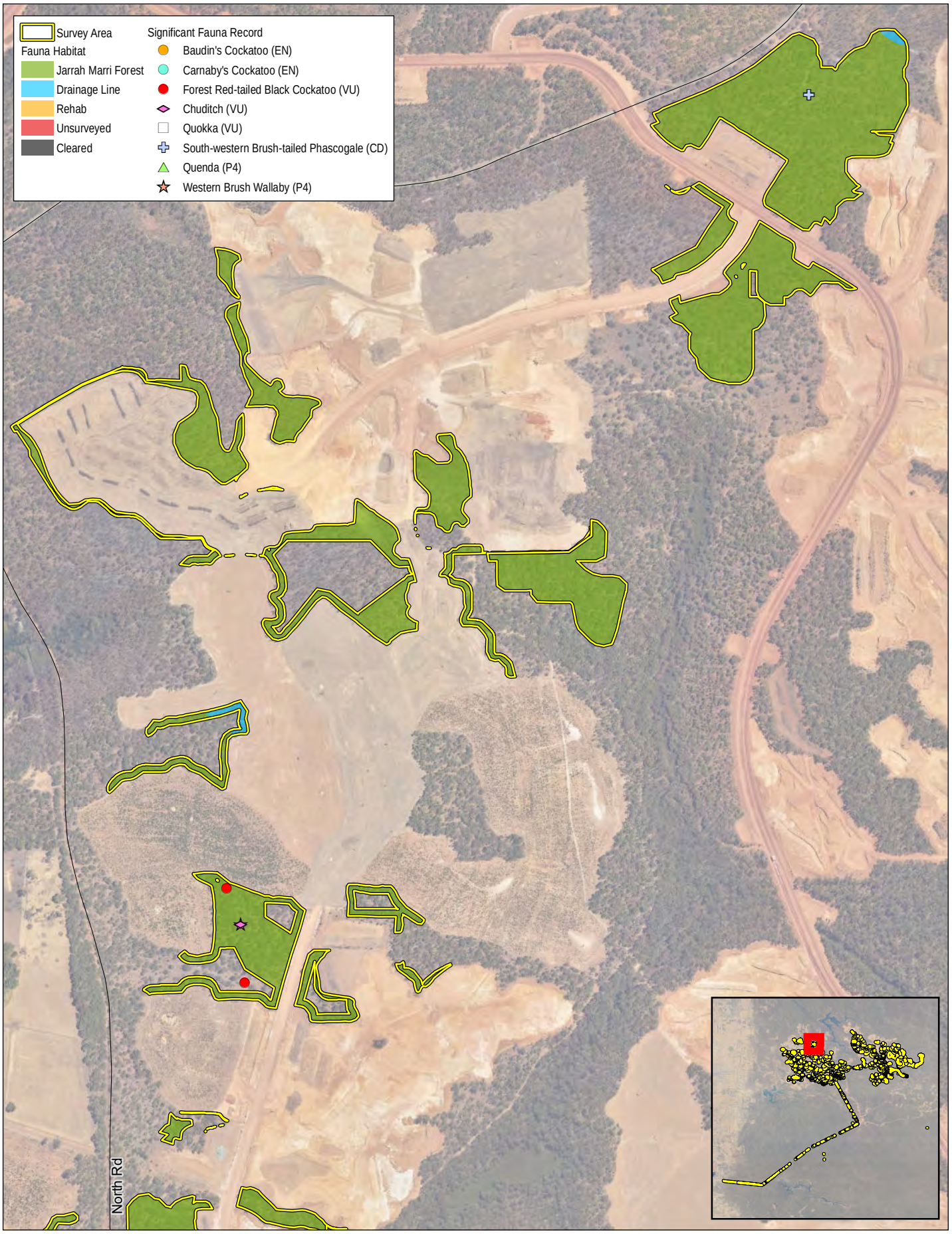
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records

MAP 9-3

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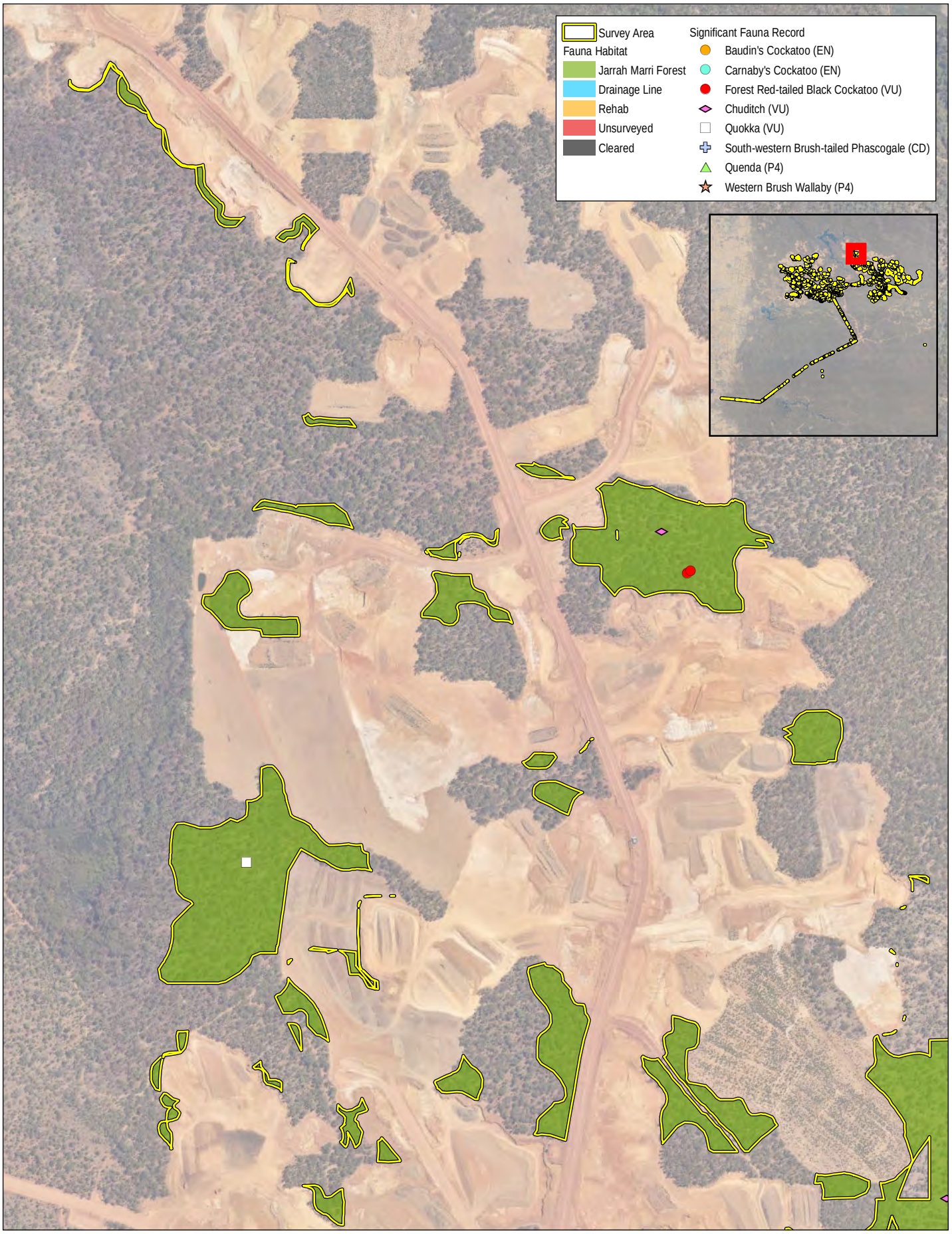
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Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records MAP 9-4

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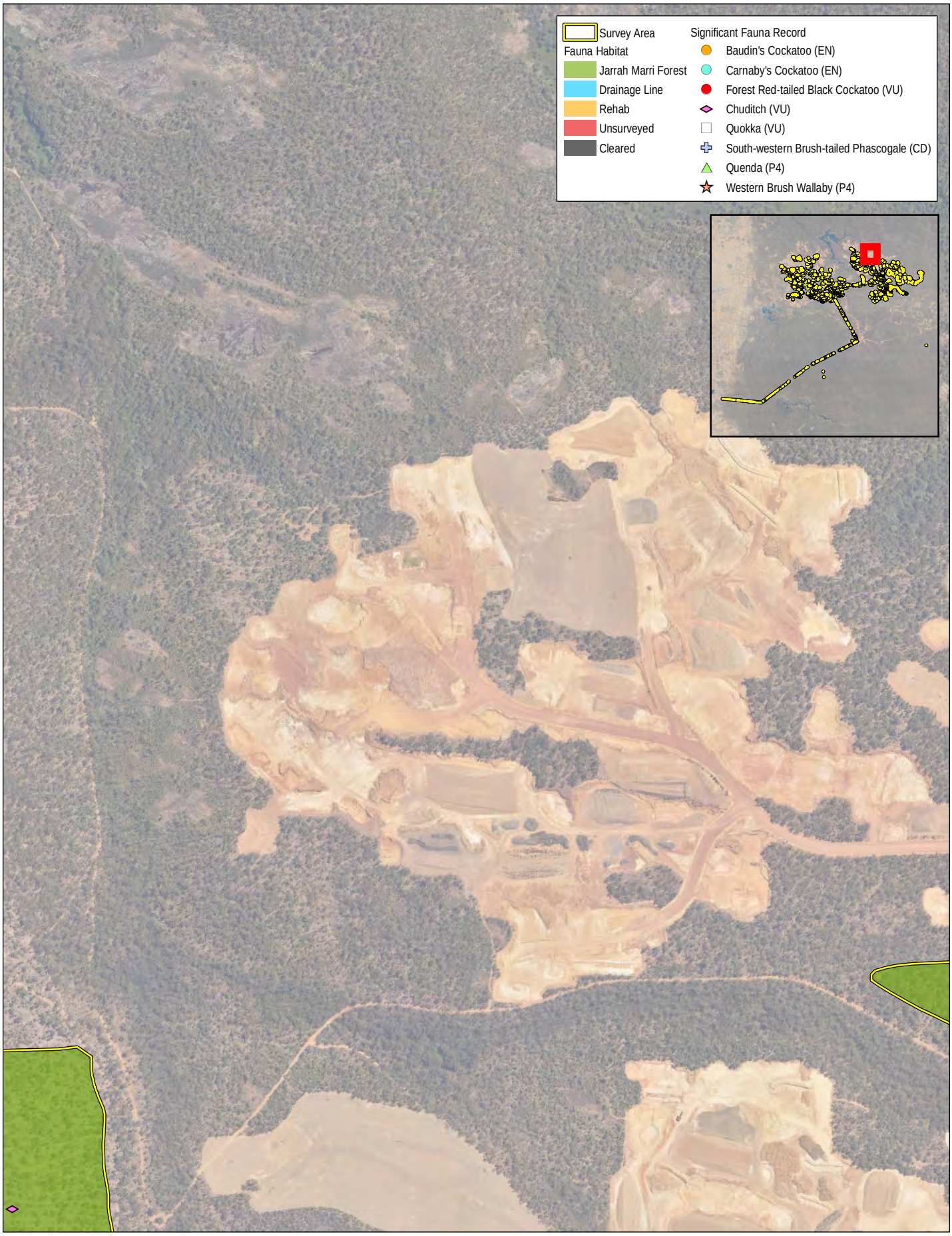
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records

MAP 9-5

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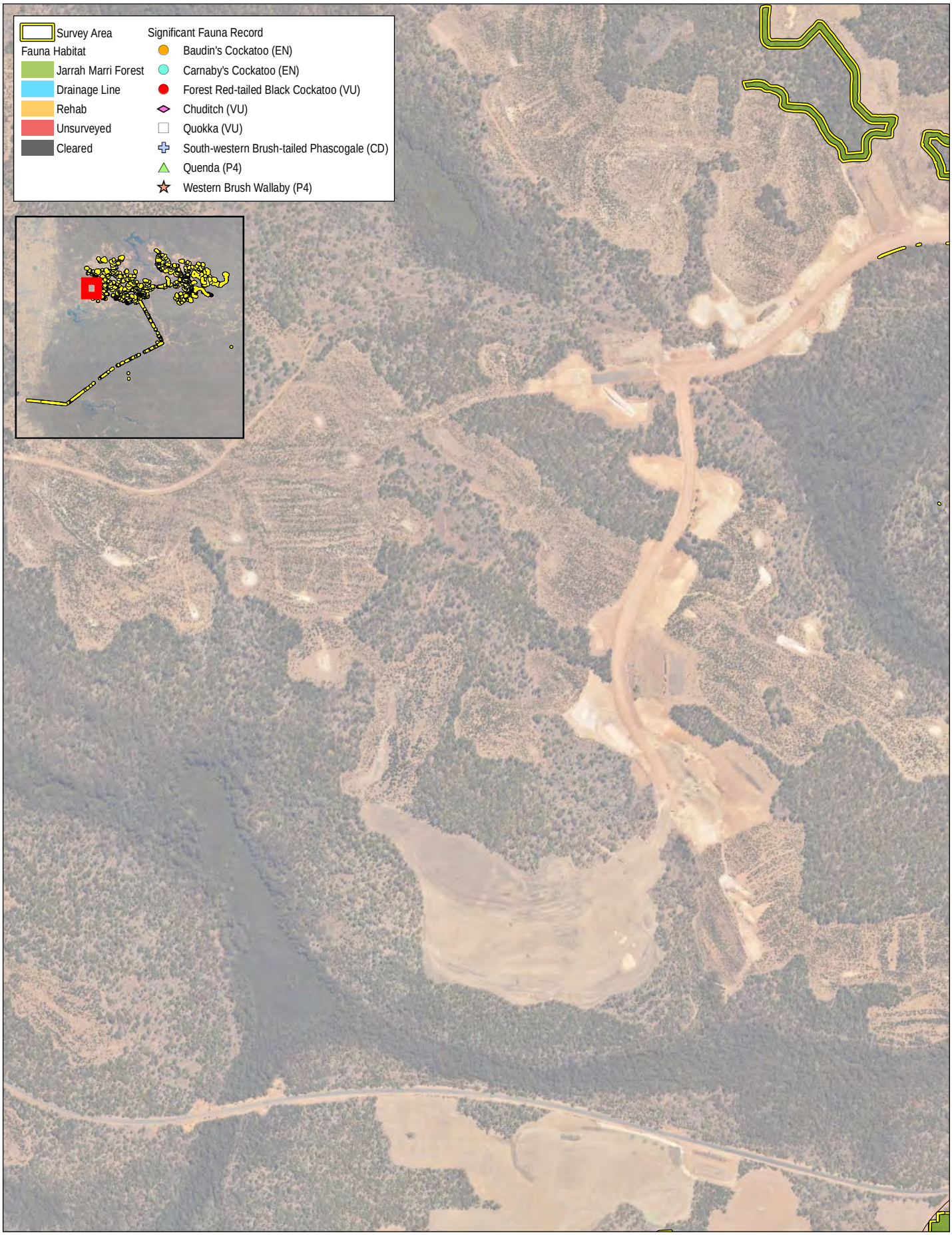
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Drawn By	: Environmaps
Reviewed By	: PD

Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records MAP 9-6

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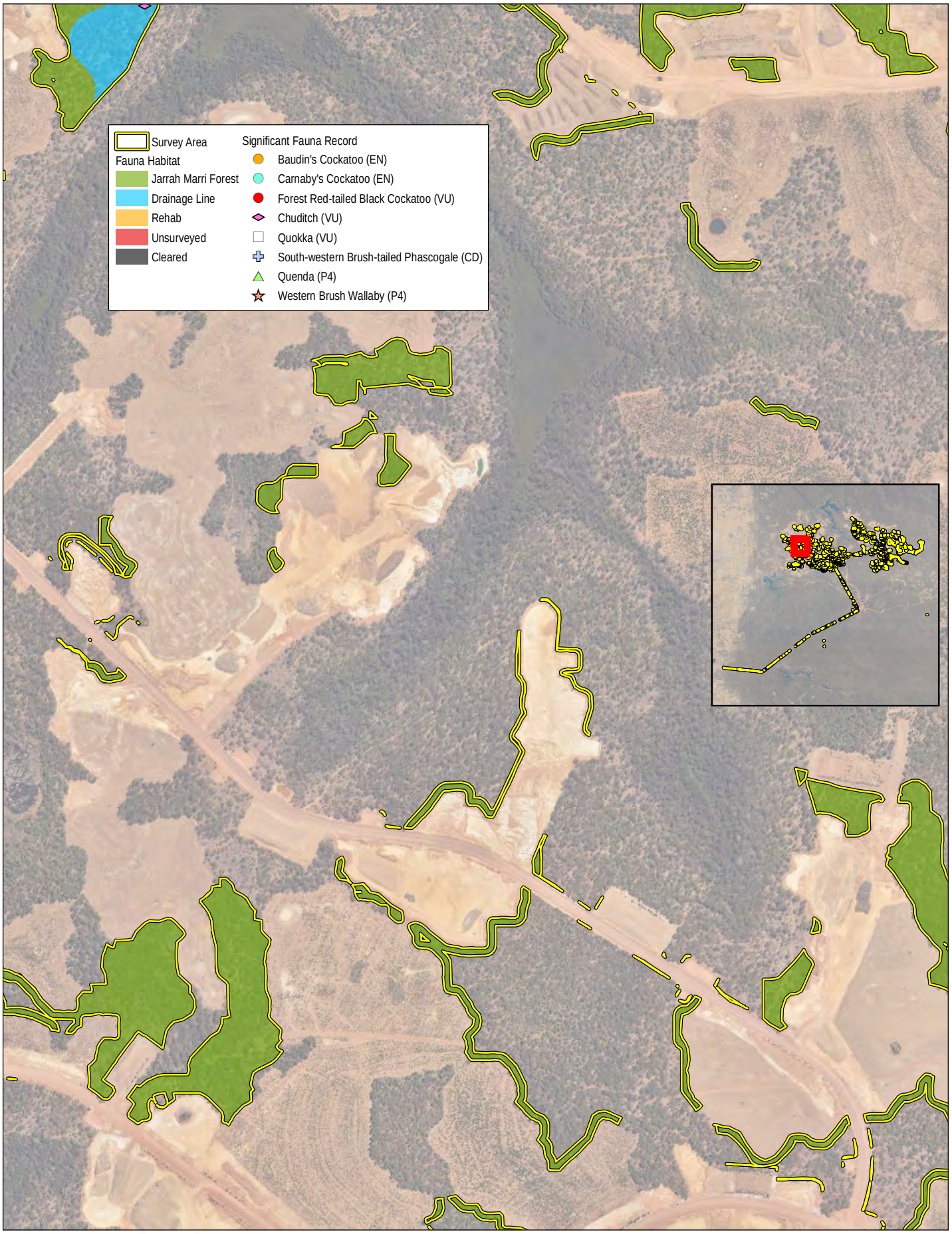
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Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records MAP 9-7

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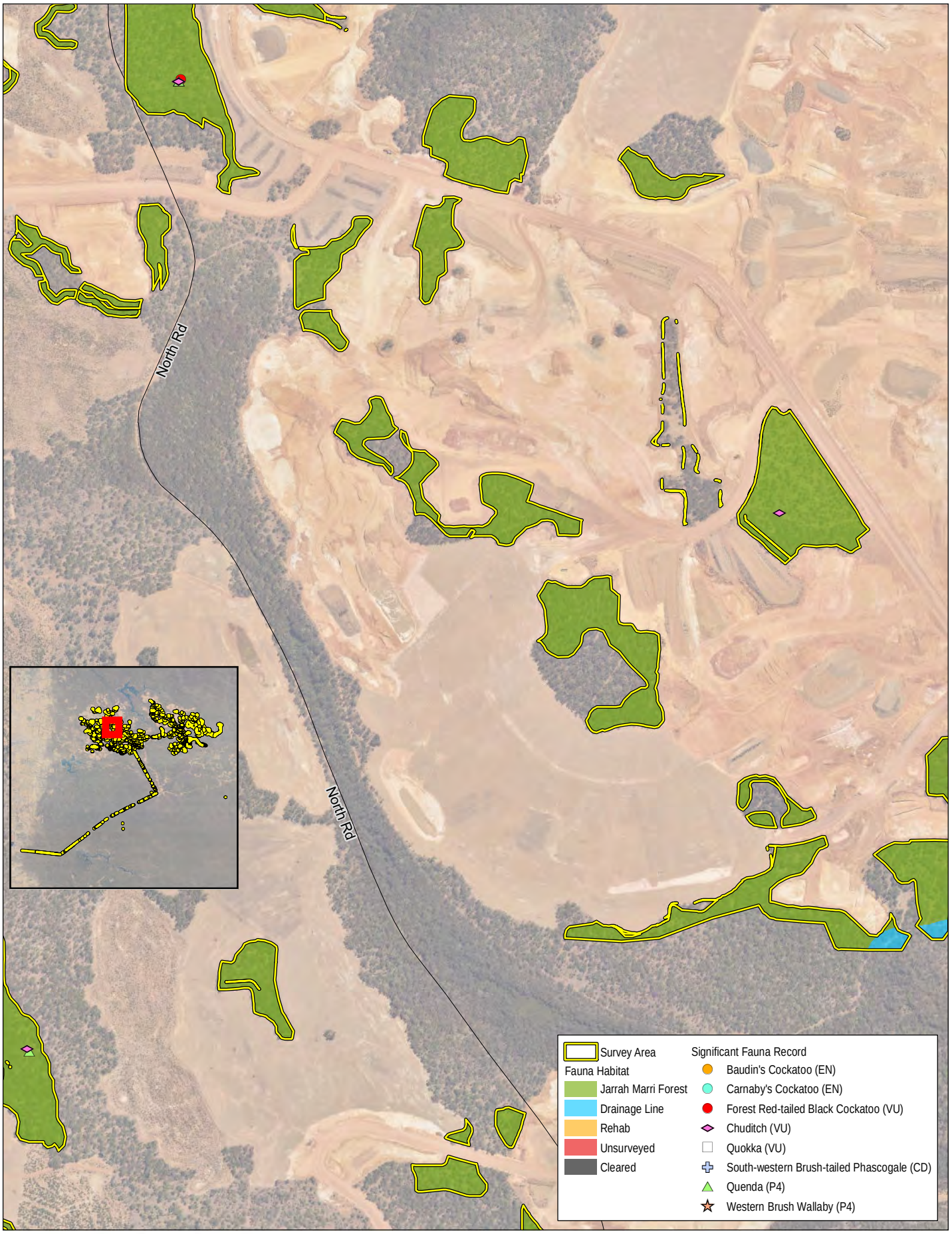
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Date Drawn	: 7/06/2024
Drawn By	: Environmaps
Reviewed By	: PD

Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records MAP 9-8

C:\GIS\Jobs\360\675.VX5890.00001 - Myara and Larego Surveys, Alcoa\Figures_MyaraCQW\675-VX5890-0001_MCQW_M09-8 Fauna Habitat and Significant Fauna Records_240607.mxd



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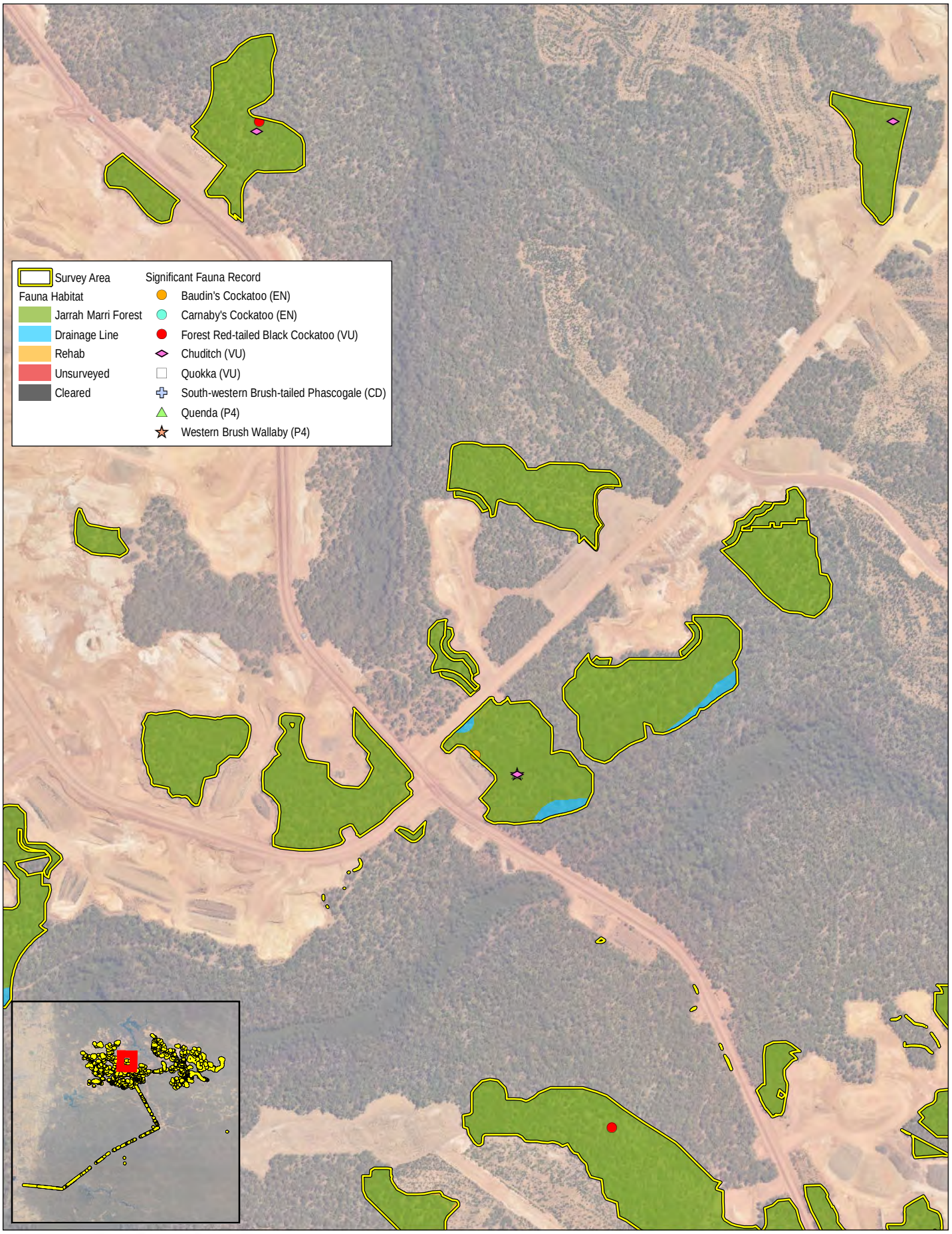
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Drawn By	: Environmaps
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Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records MAP 9-9

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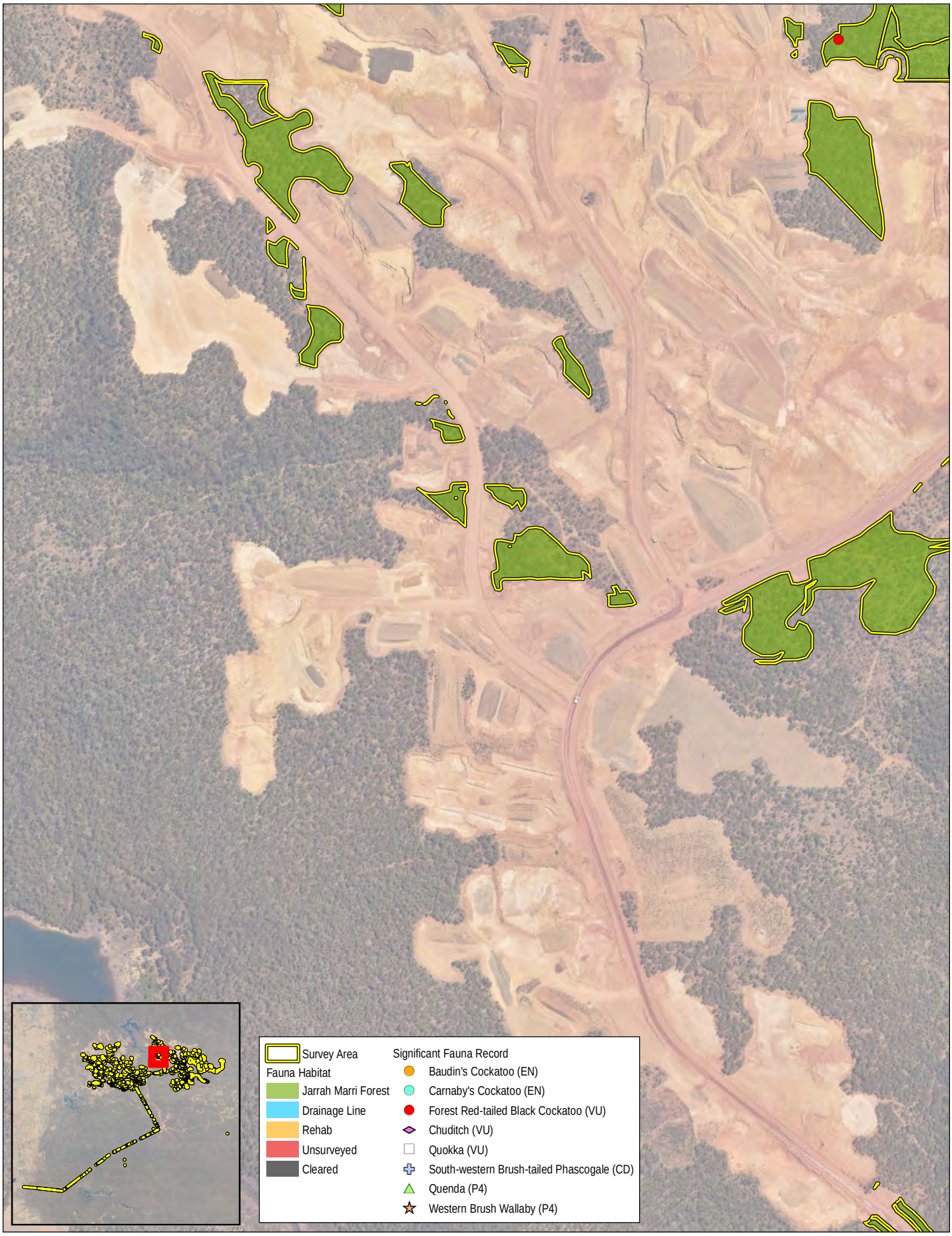
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Fauna Habitat and Significant Fauna Records MAP 9-10

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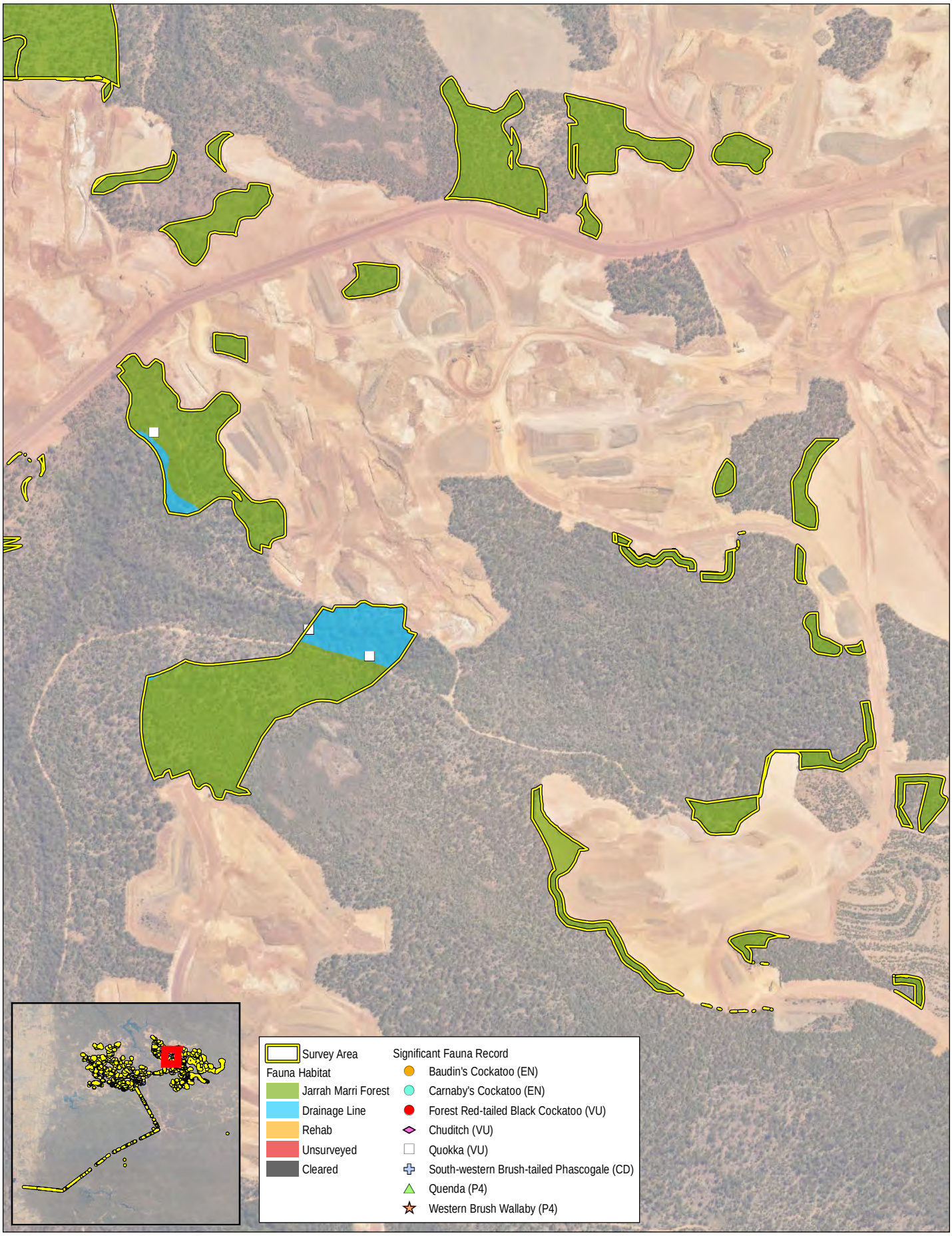
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Fauna Habitat and Significant Fauna Records
MAP 9-11

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Reviewed By	: PD

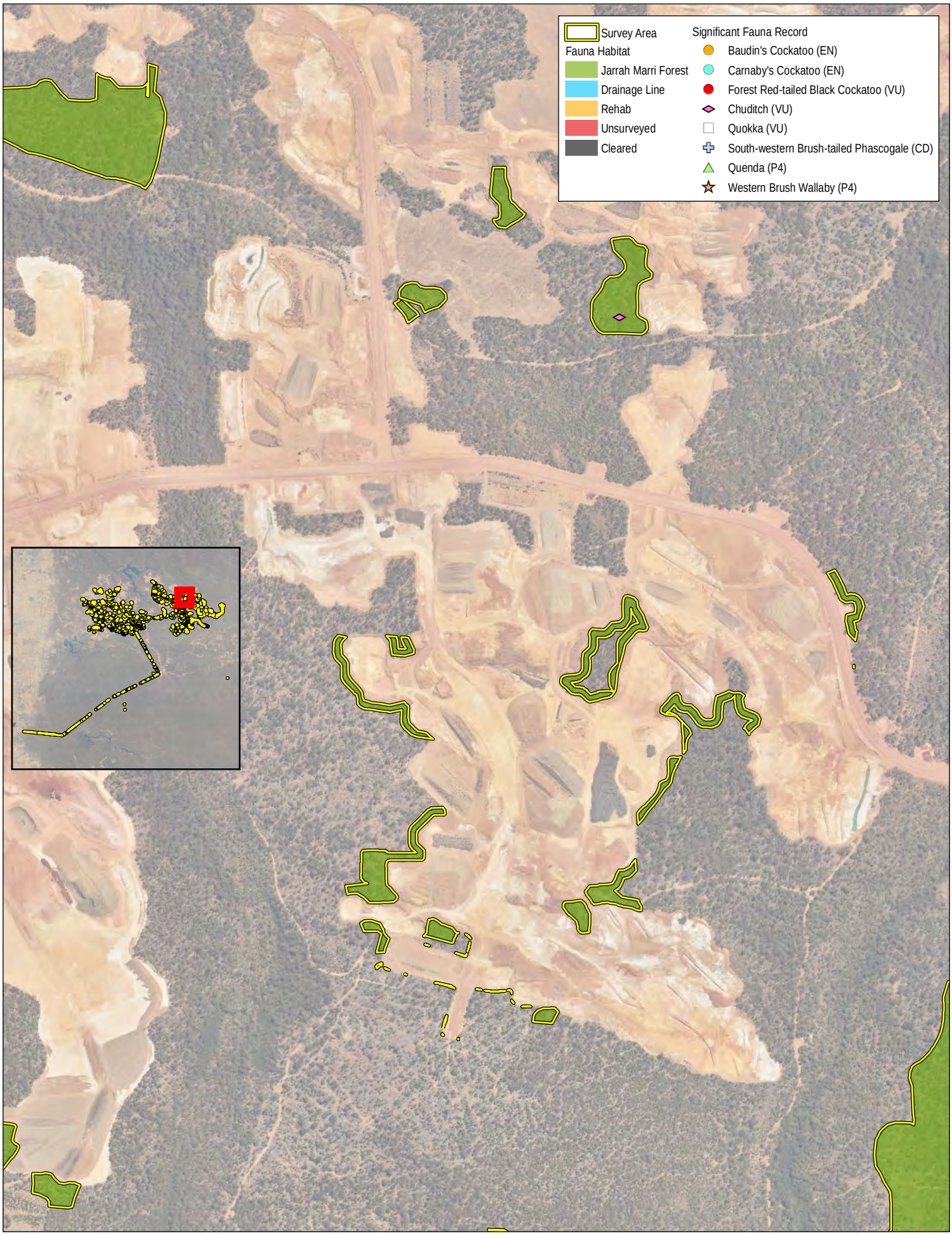
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Fauna Habitat and Significant Fauna Records

MAP 9-12

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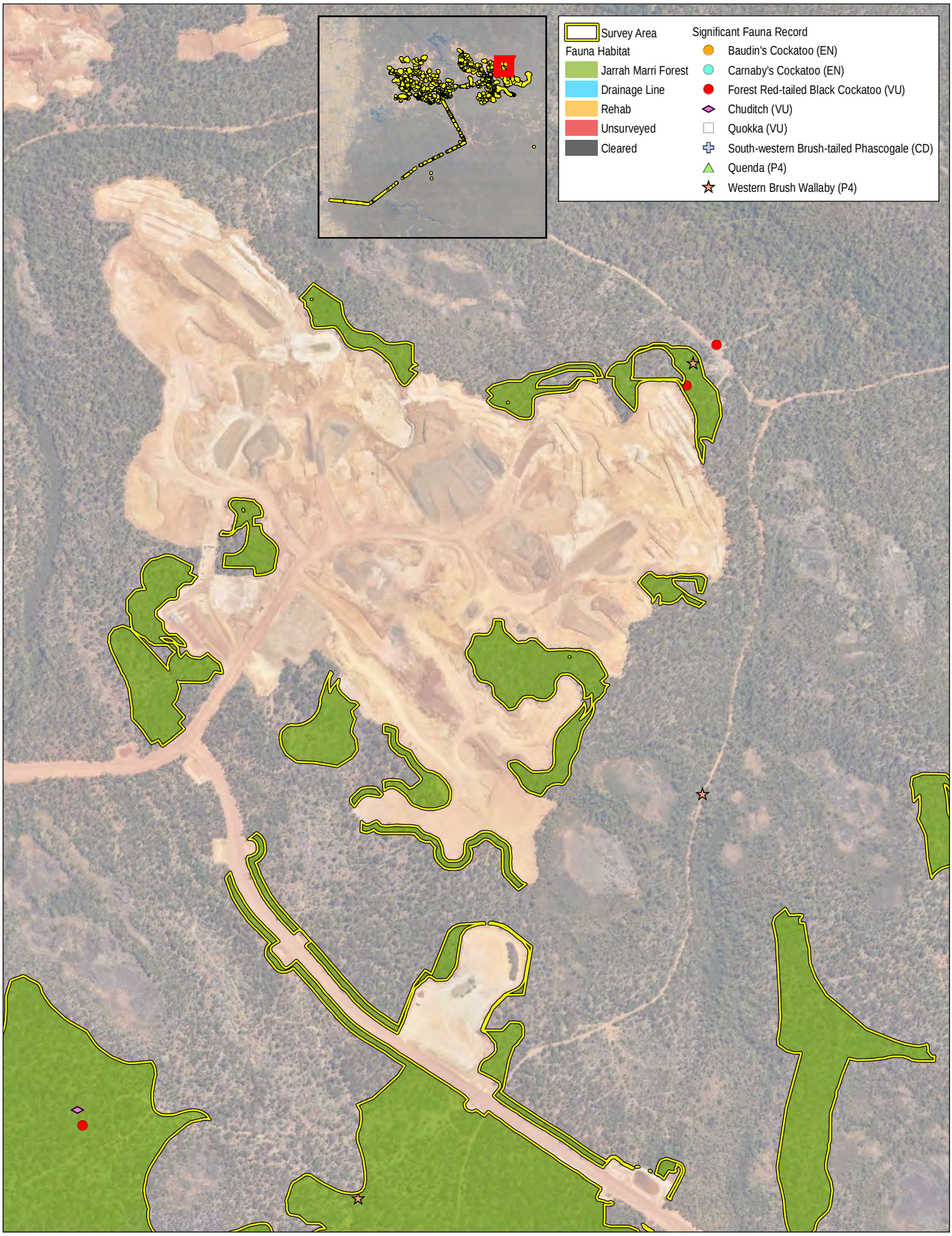
Alcoa

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Fauna Habitat and Significant Fauna Records

MAP 9-13

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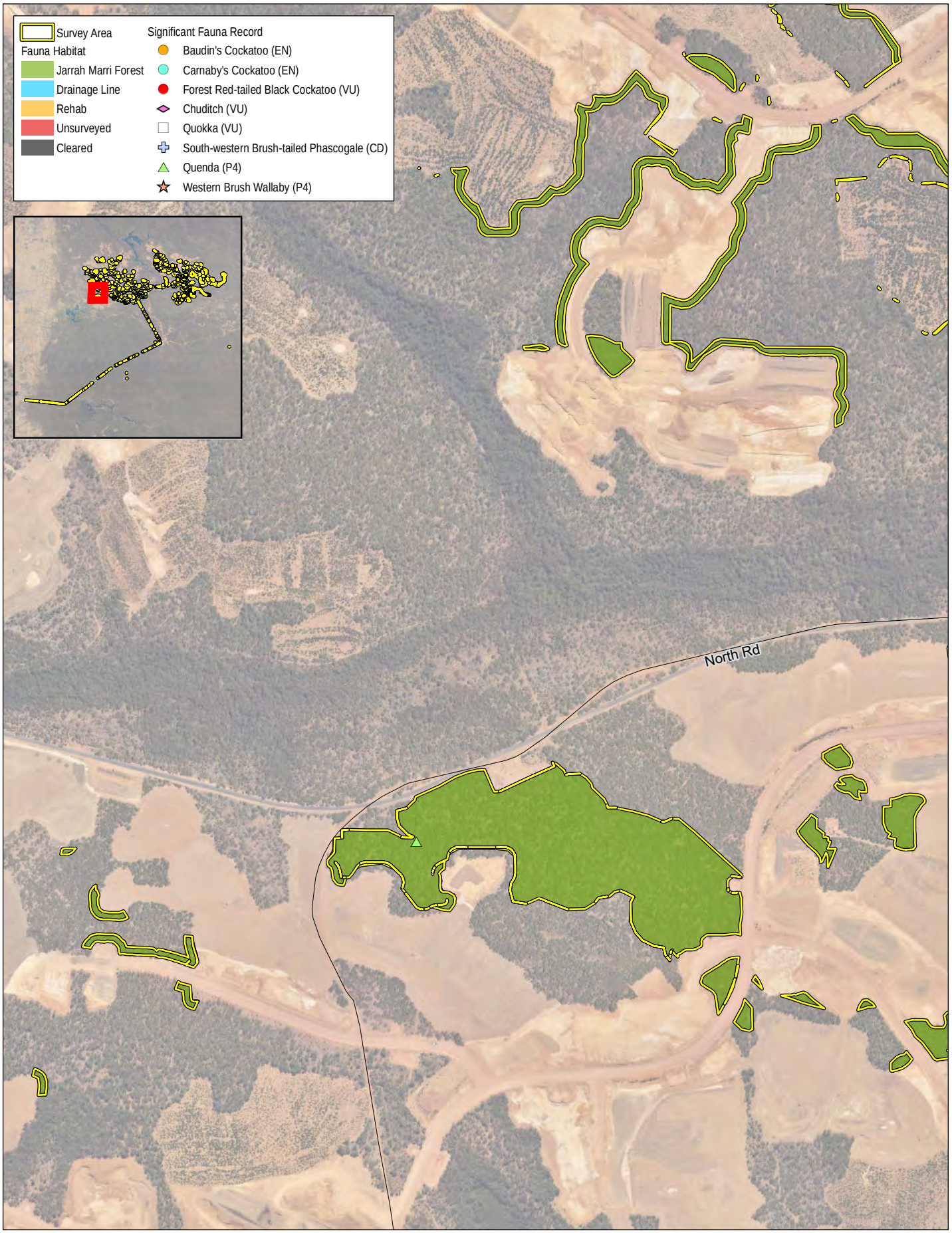
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Fauna Habitat and Significant Fauna Records MAP 9-14

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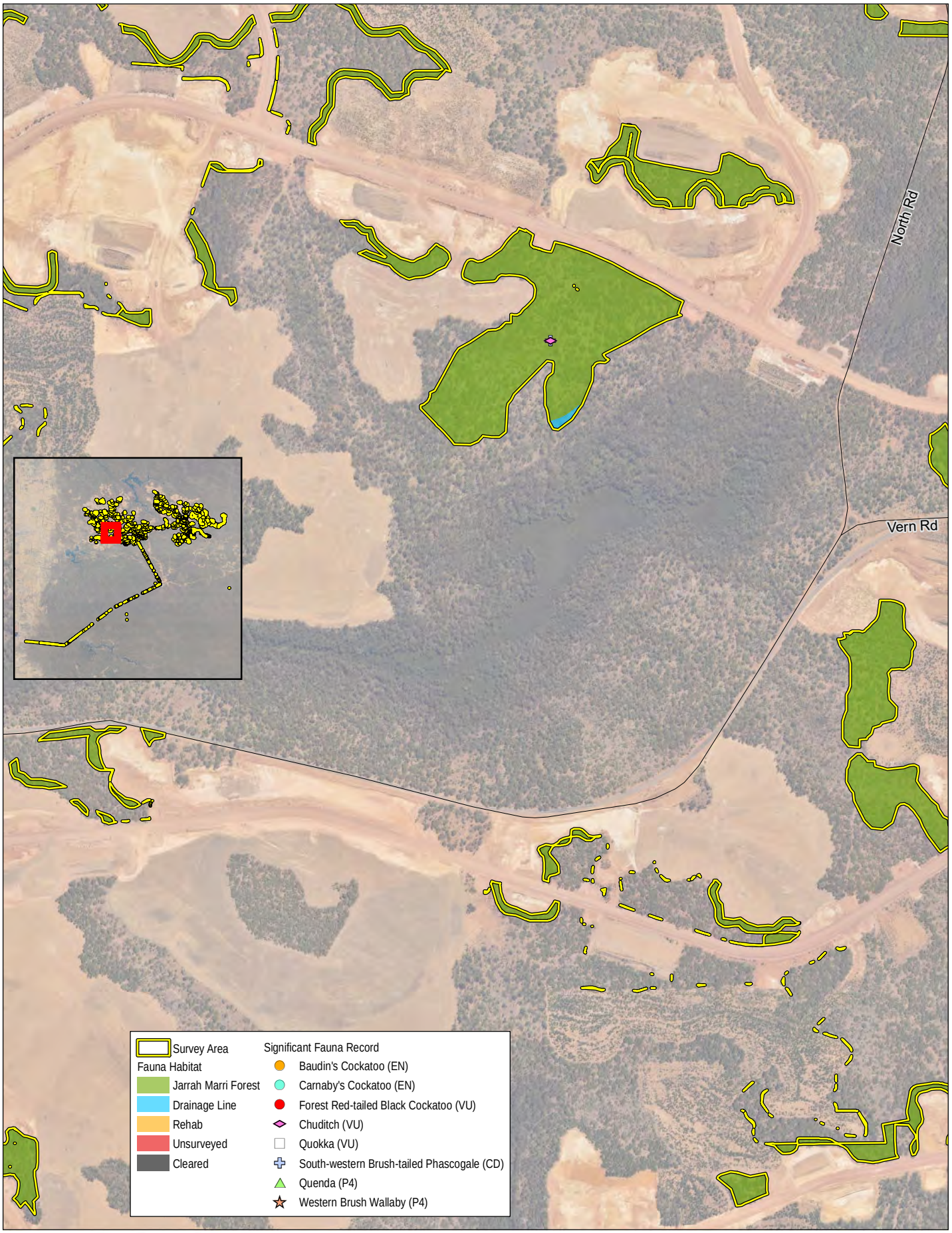
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Fauna Habitat and Significant Fauna Records

MAP 9-15

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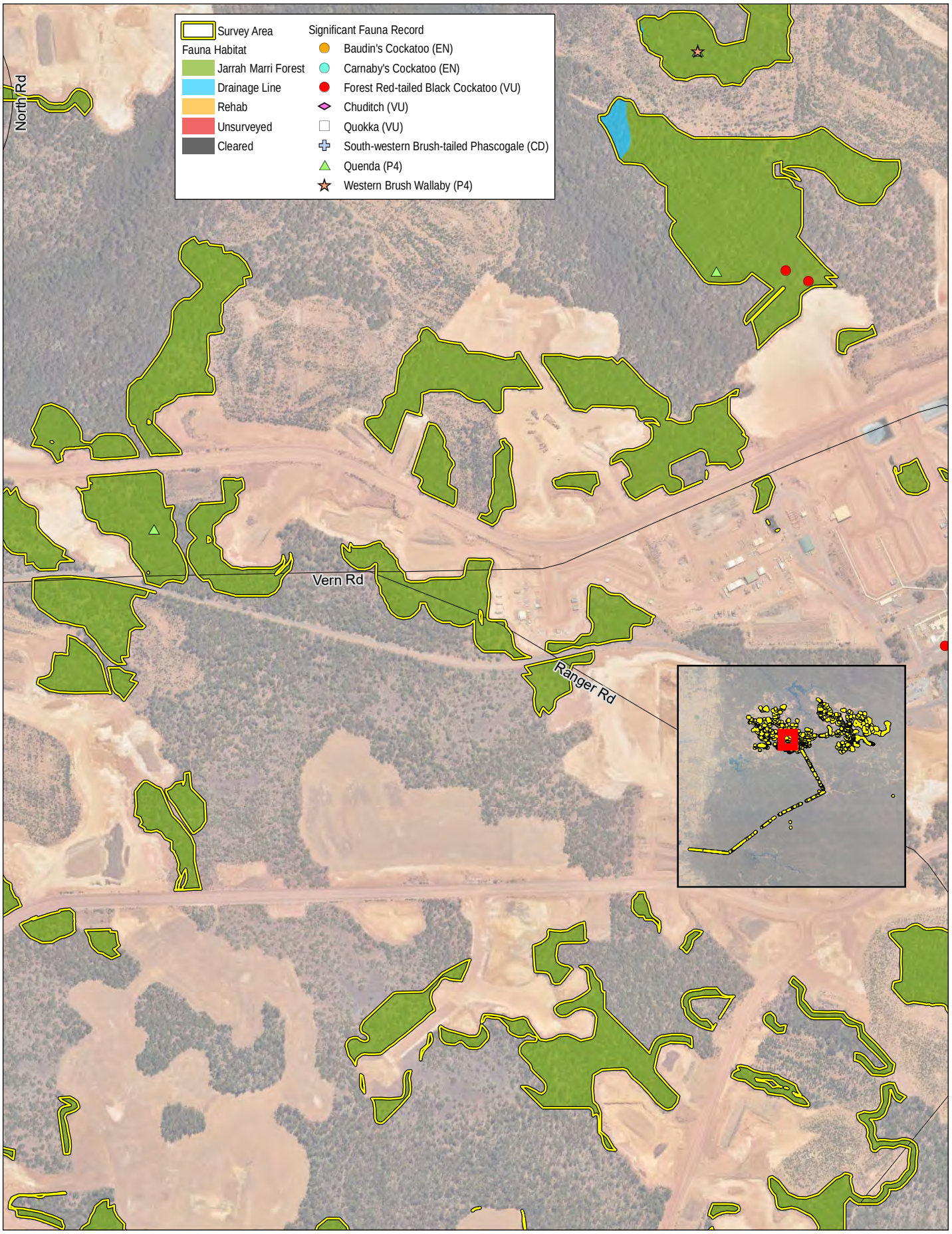
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Fauna Habitat and Significant Fauna Records MAP 9-16

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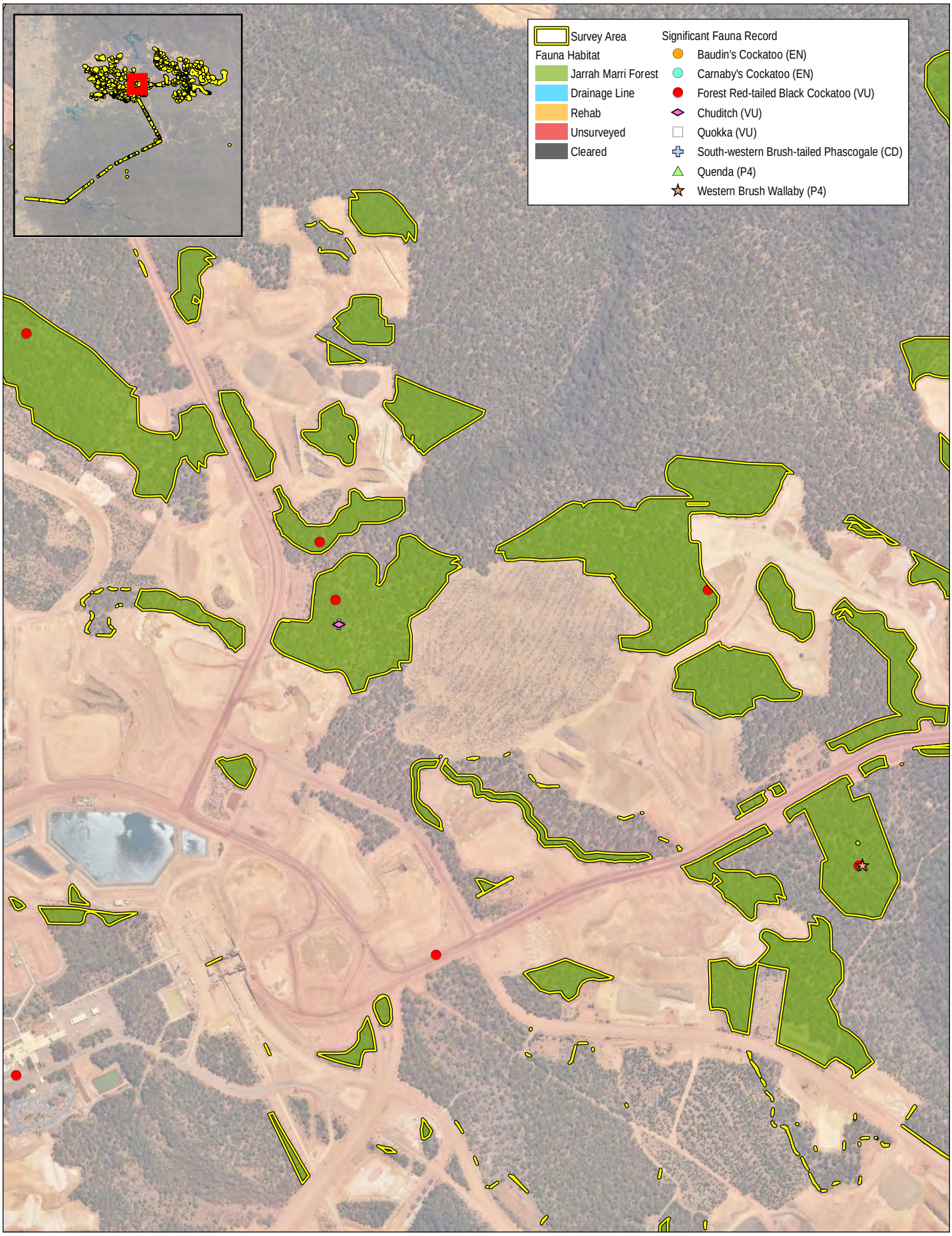
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Fauna Habitat and Significant Fauna Records

MAP 9-17

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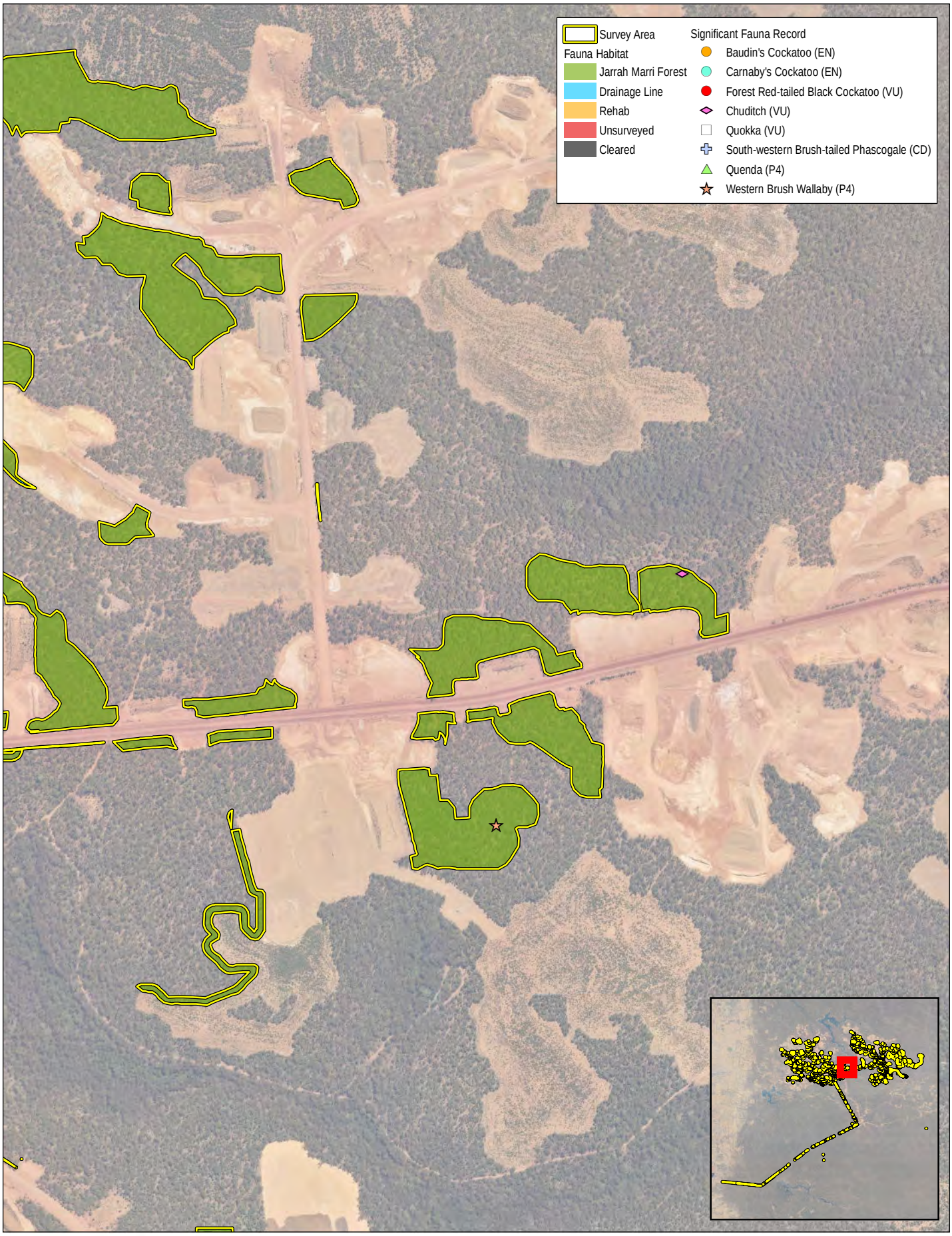
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Fauna Habitat and Significant Fauna Records

MAP 9-18

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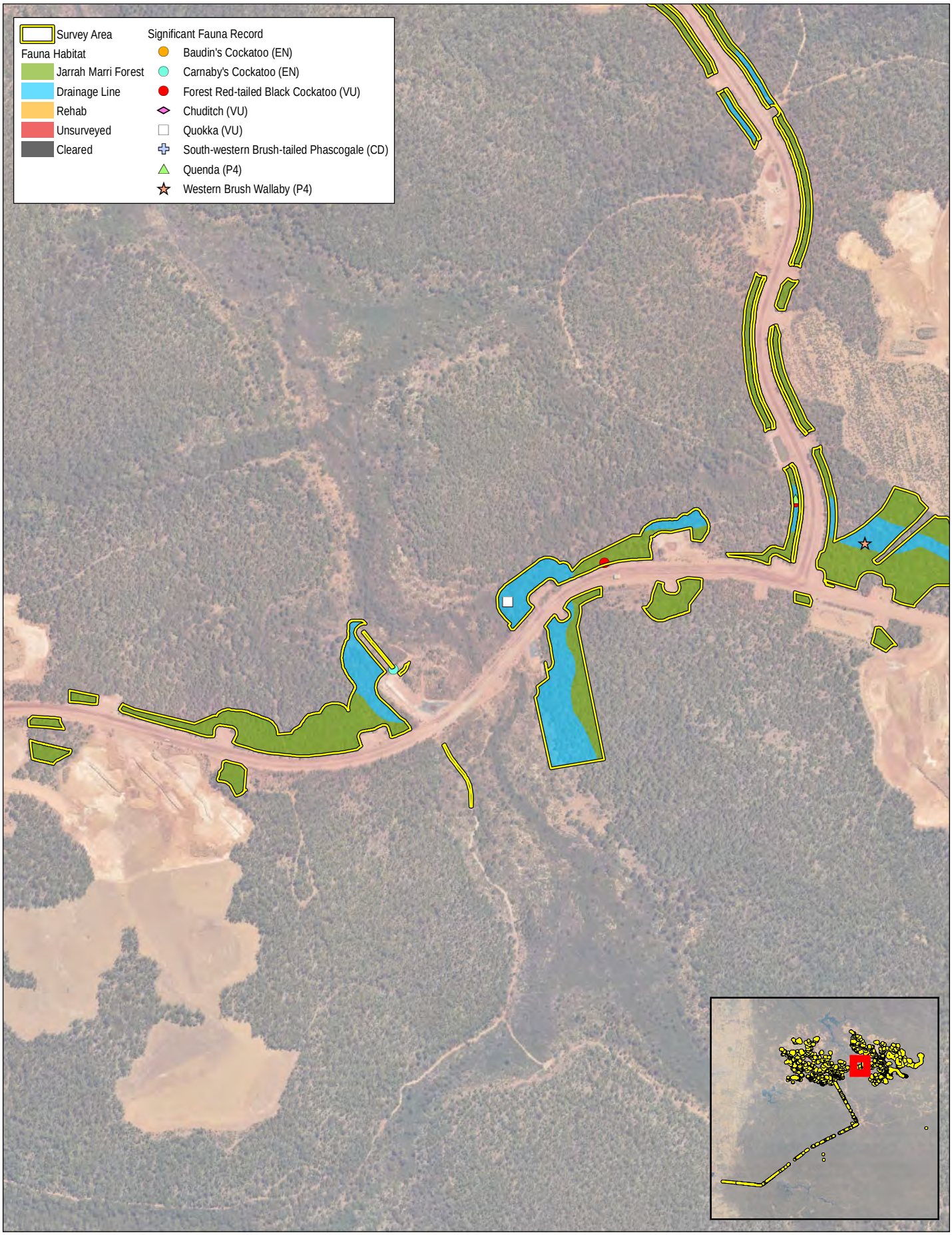
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Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records

MAP 9-19

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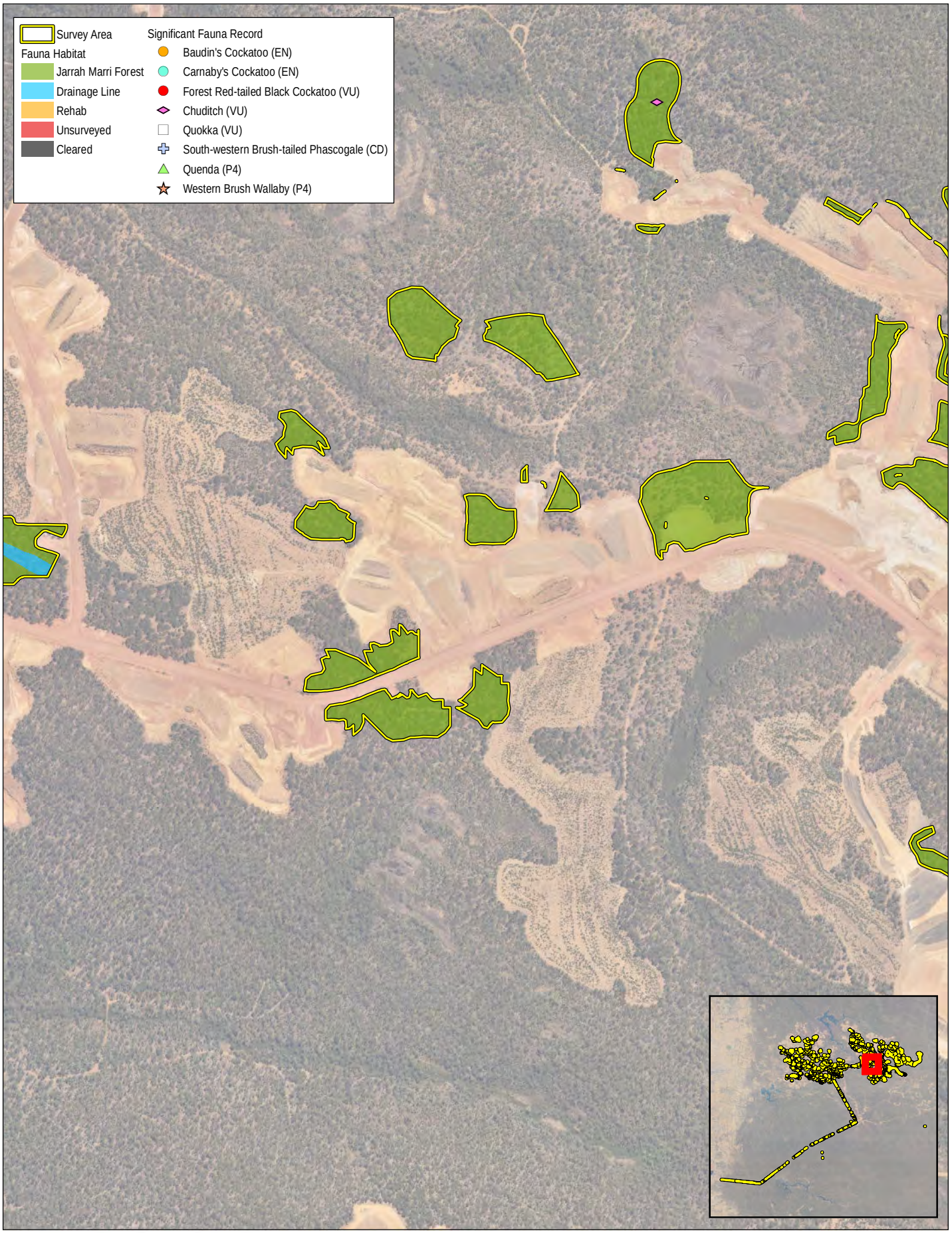
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Fauna Habitat and Significant Fauna Records MAP 9-20

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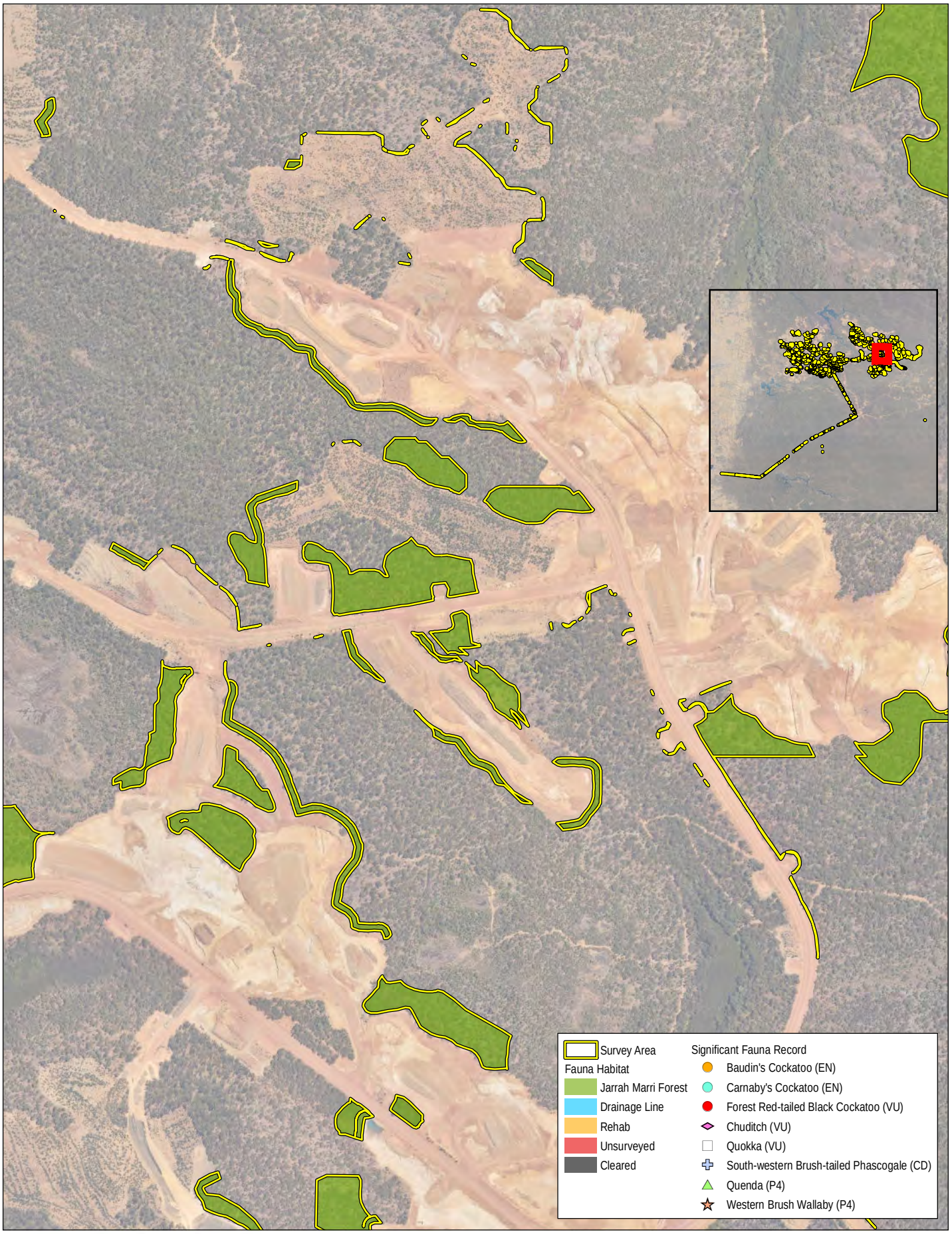
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Fauna Habitat and Significant Fauna Records

MAP 9-21

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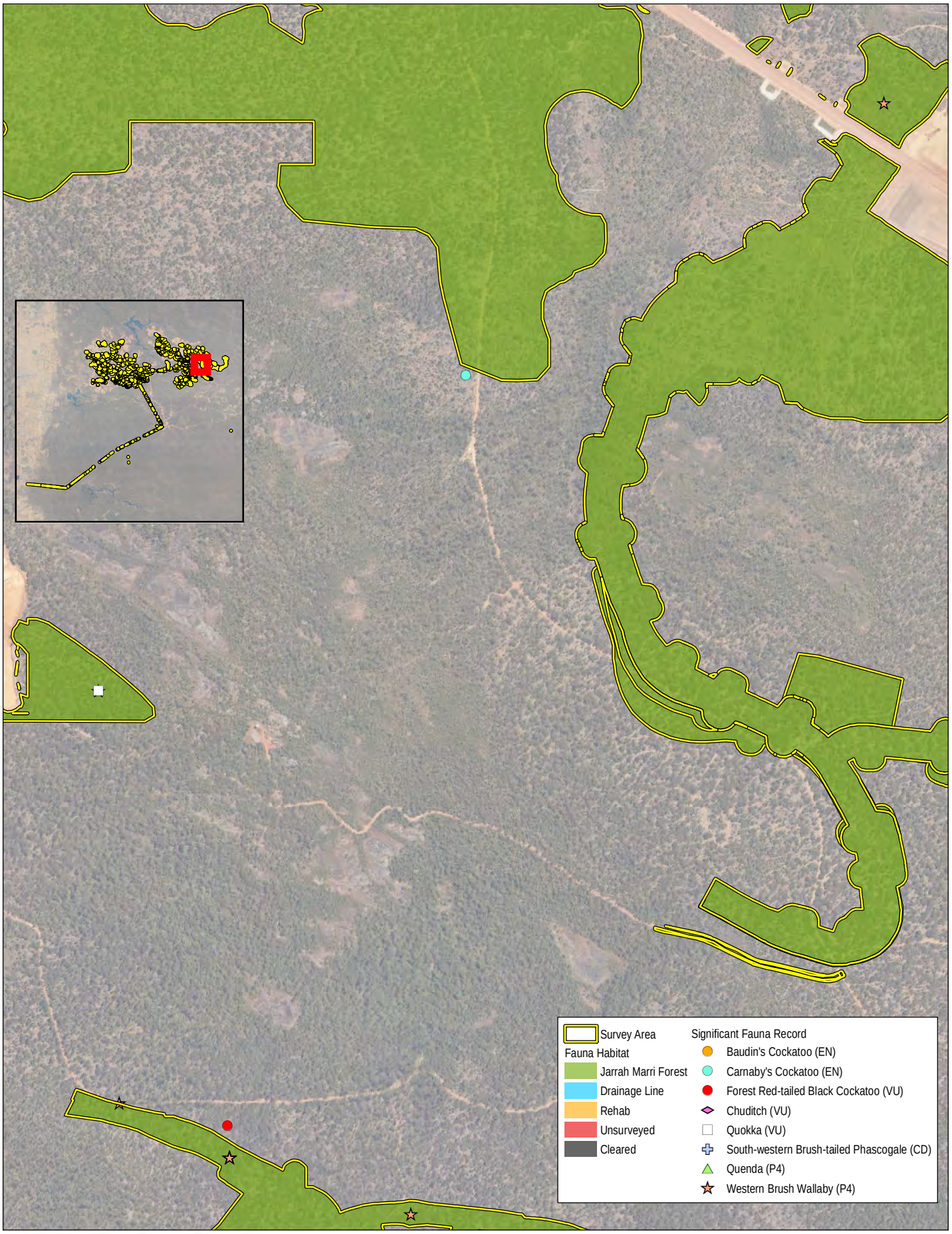
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Fauna Habitat and Significant Fauna Records
MAP 9-22

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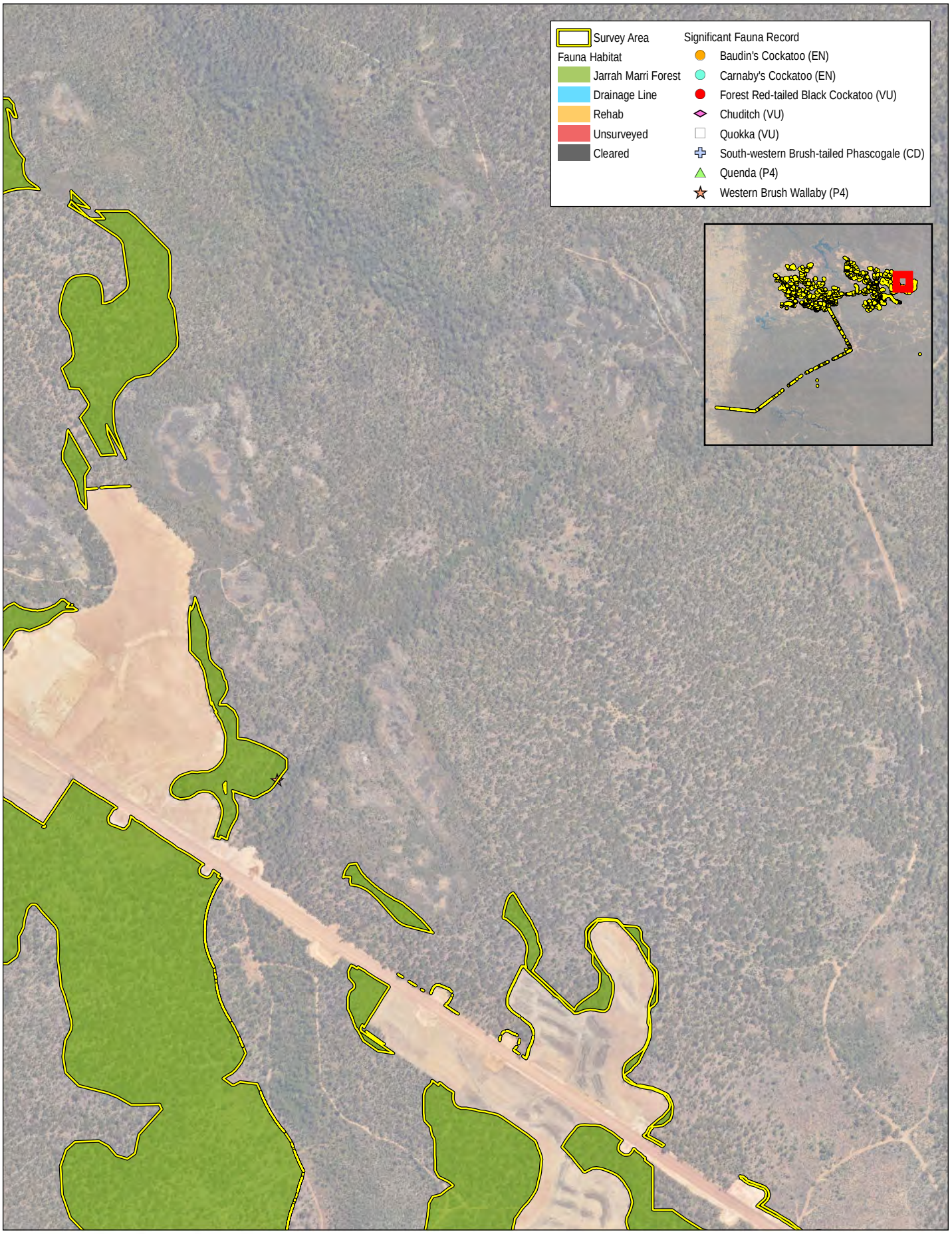
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Fauna Habitat and Significant Fauna Records MAP 9-23

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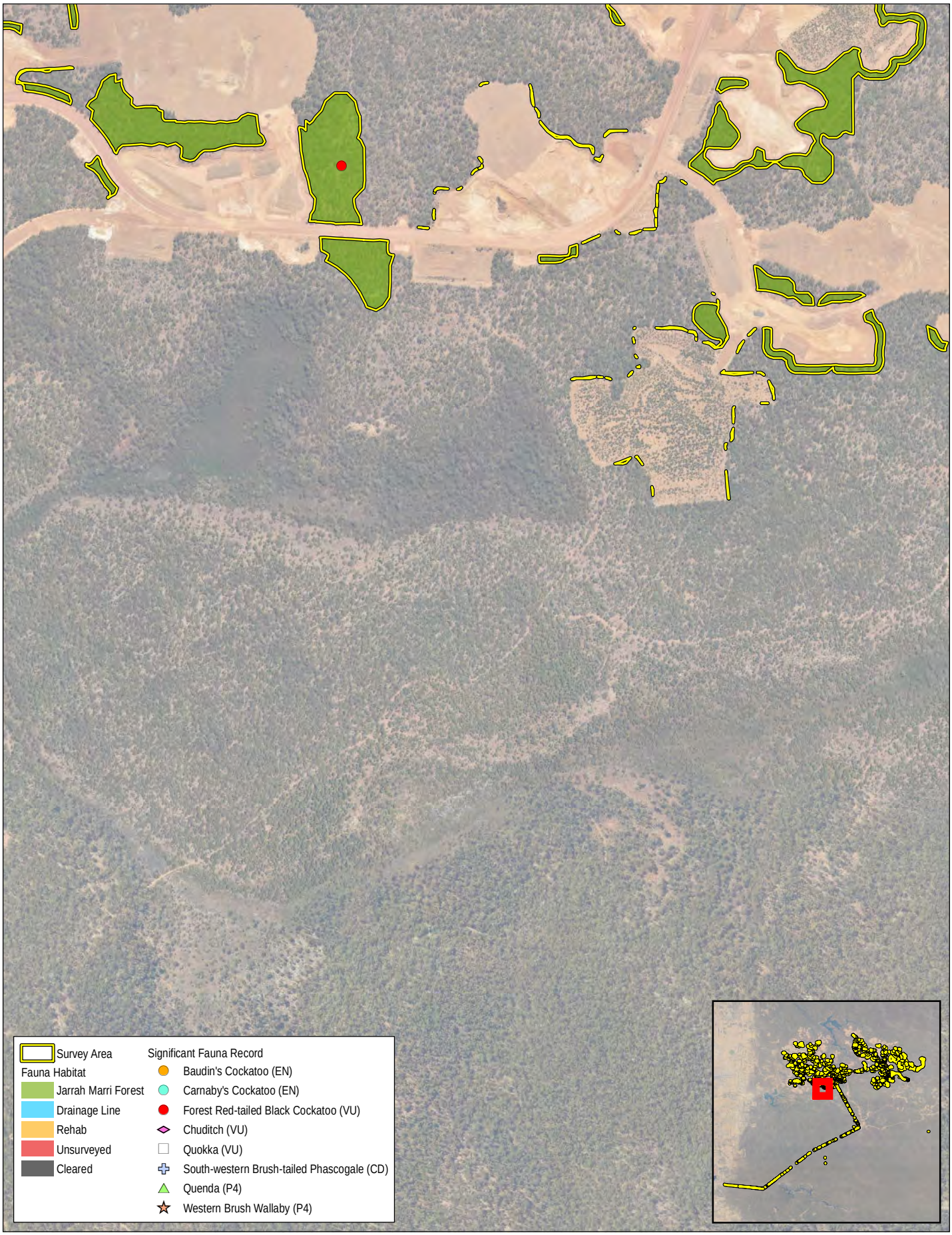
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Fauna Habitat and Significant Fauna Records MAP 9-24

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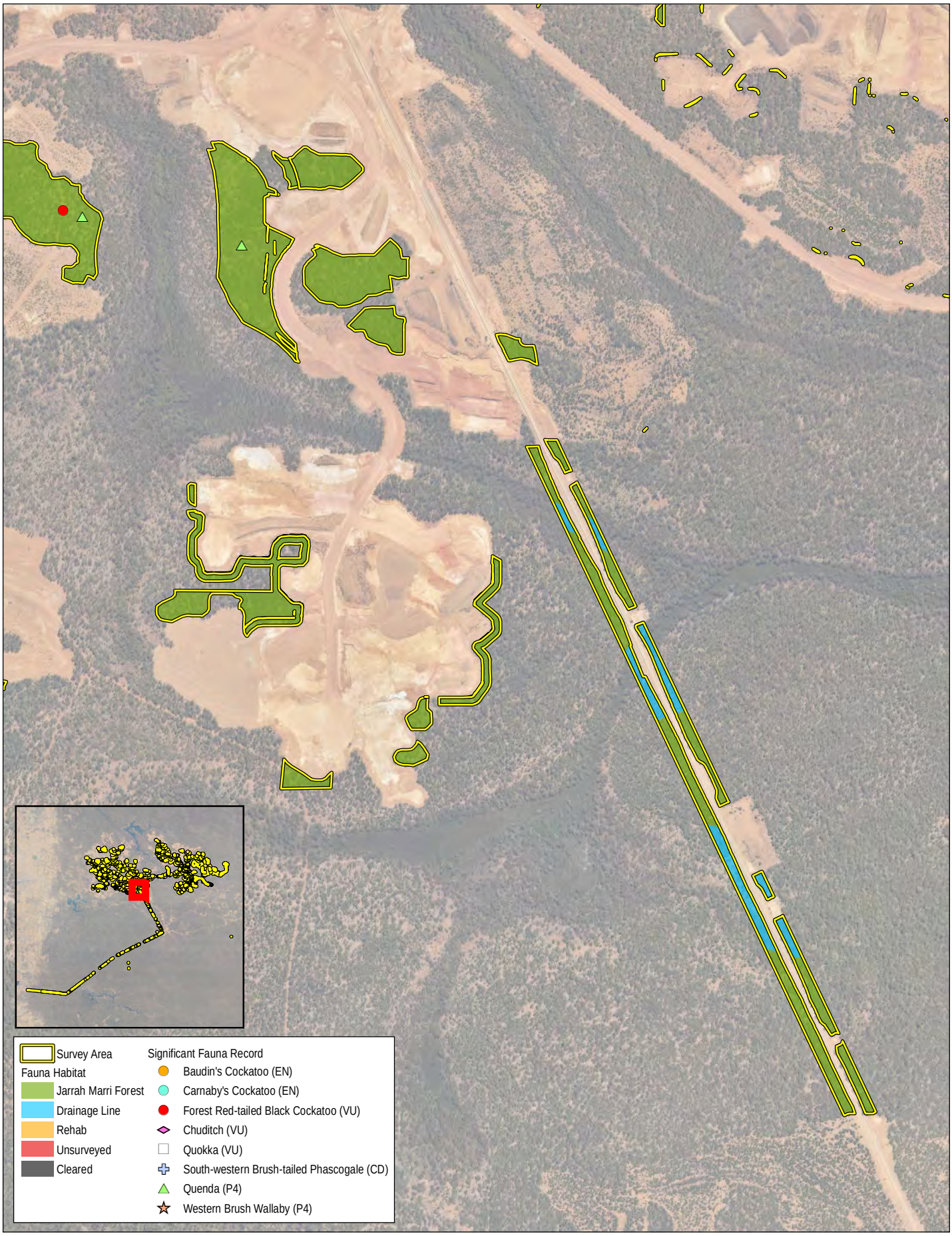
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Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records

MAP 9-25

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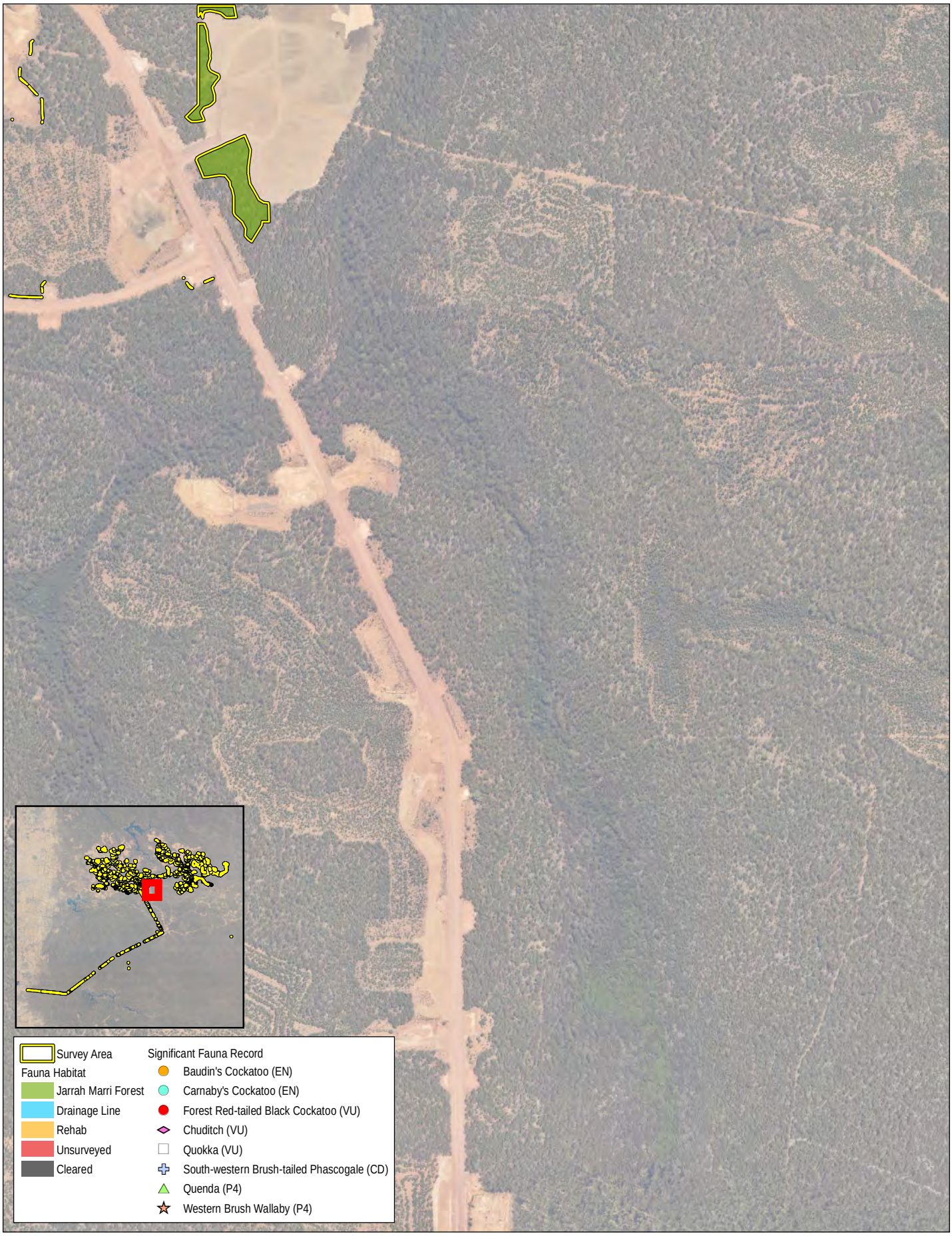
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Fauna Habitat and Significant Fauna Records MAP 9-26

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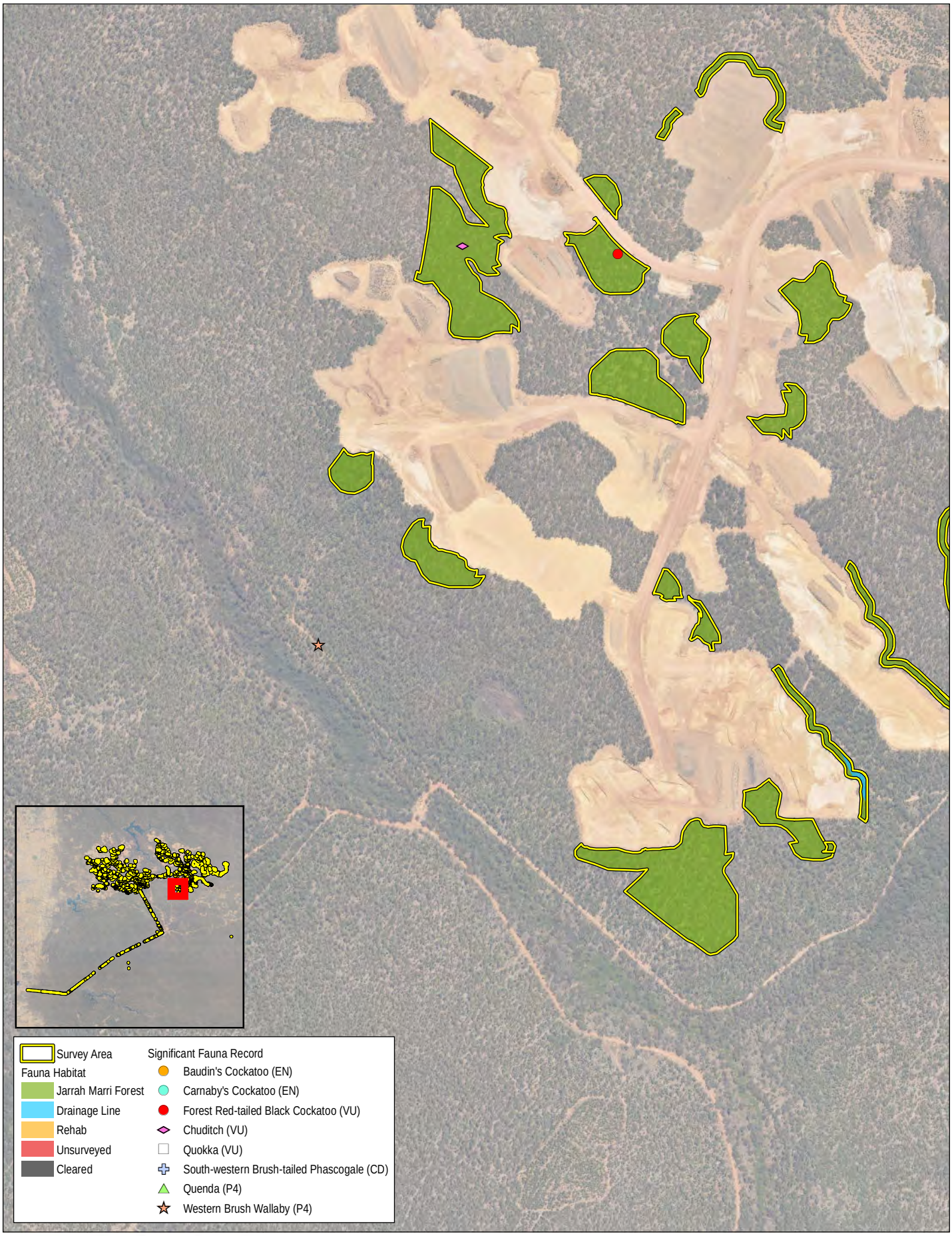
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Fauna Habitat and Significant Fauna Records MAP 9-27

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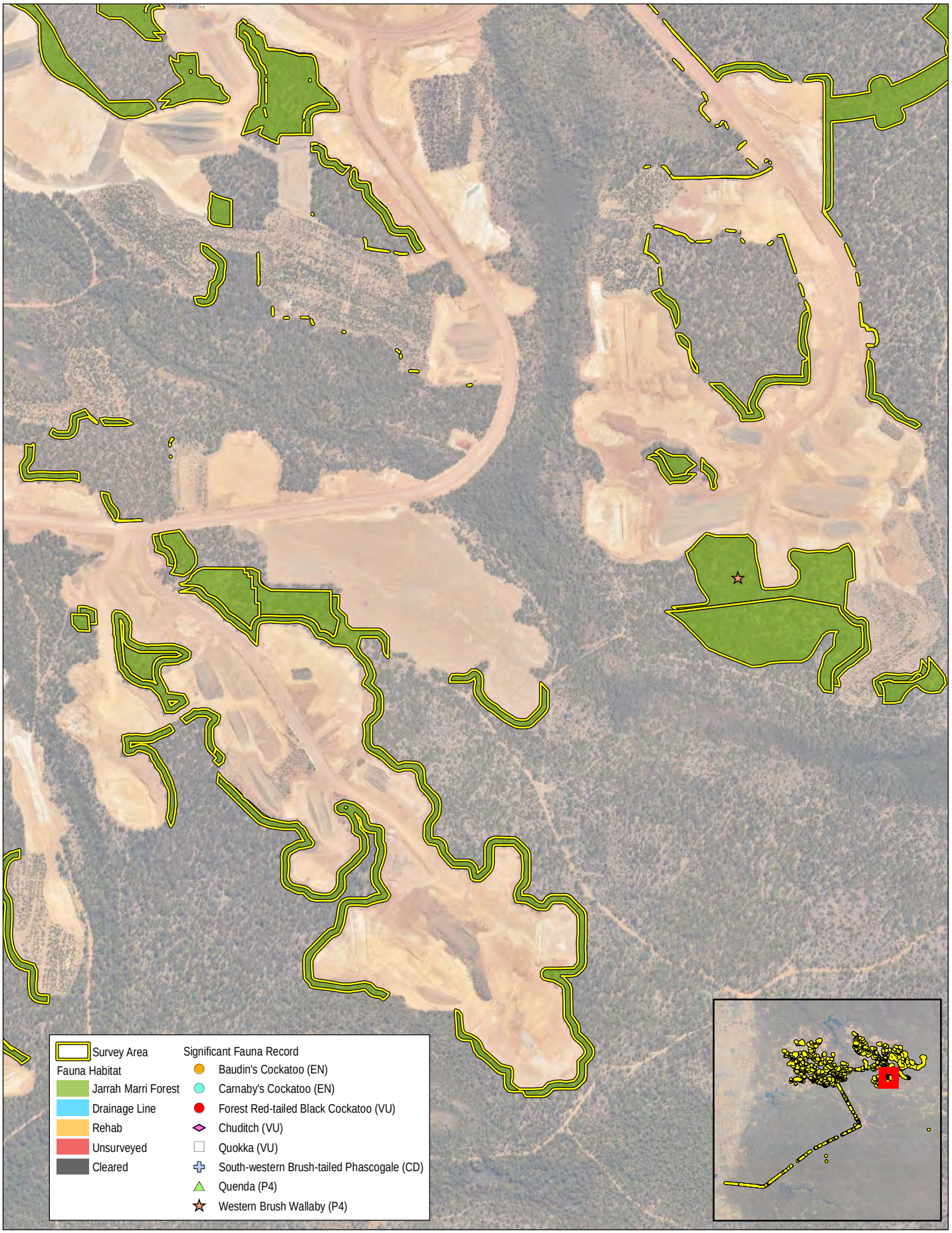
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Fauna Habitat and Significant Fauna Records MAP 9-28

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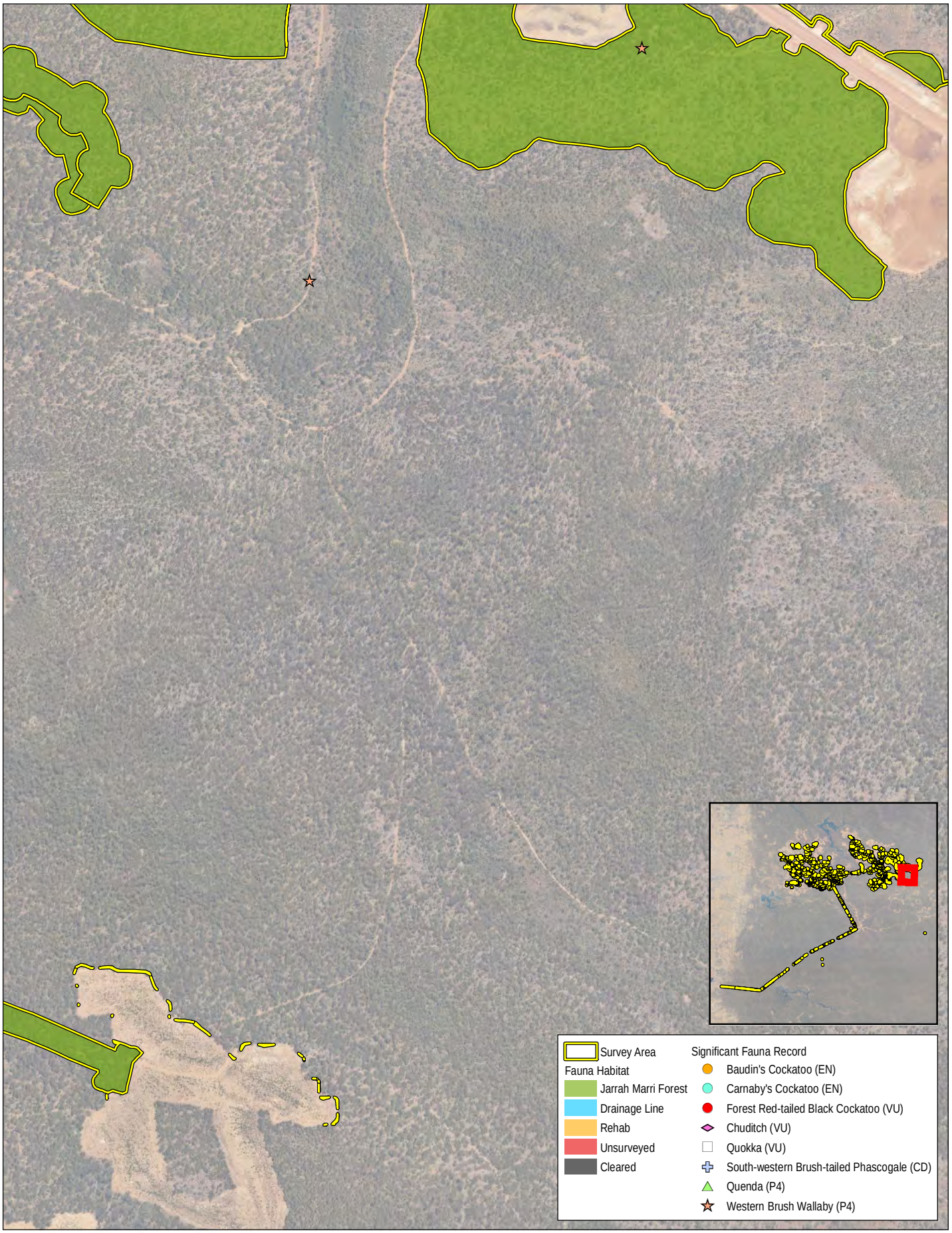
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Fauna Habitat and Significant Fauna Records MAP 9-29

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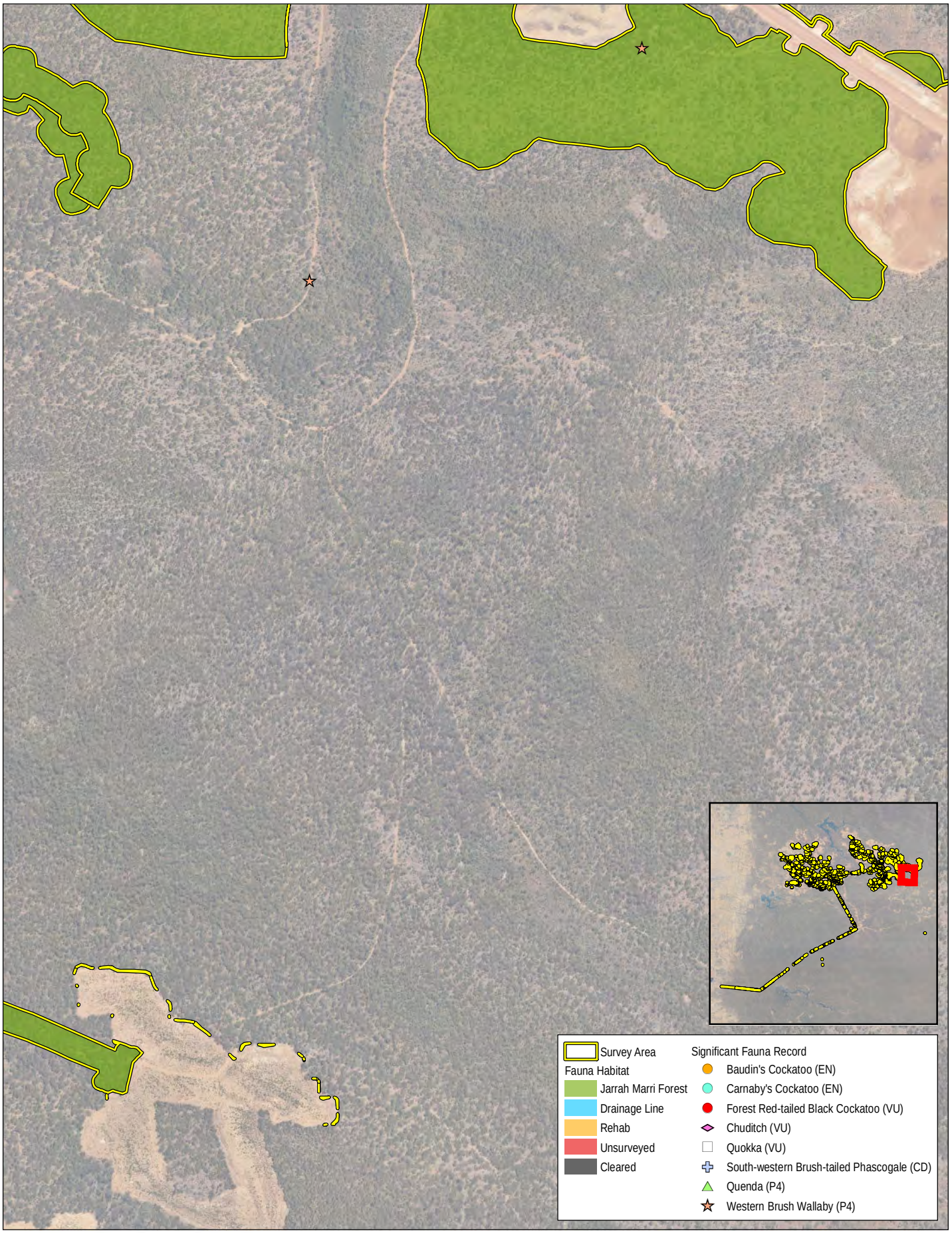
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Fauna Habitat and Significant Fauna Records MAP 9-30

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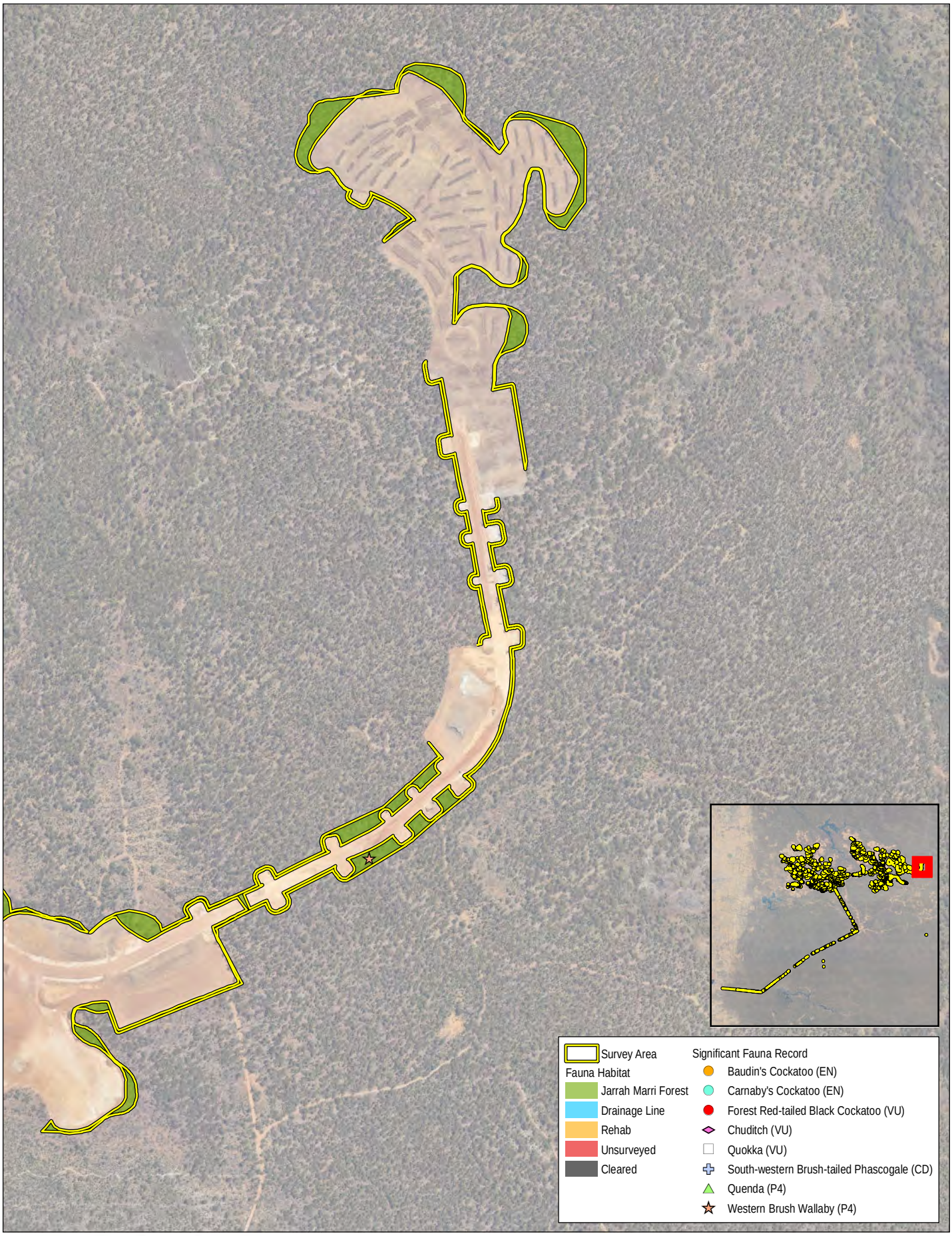
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Fauna Habitat and Significant Fauna Records MAP 9-31

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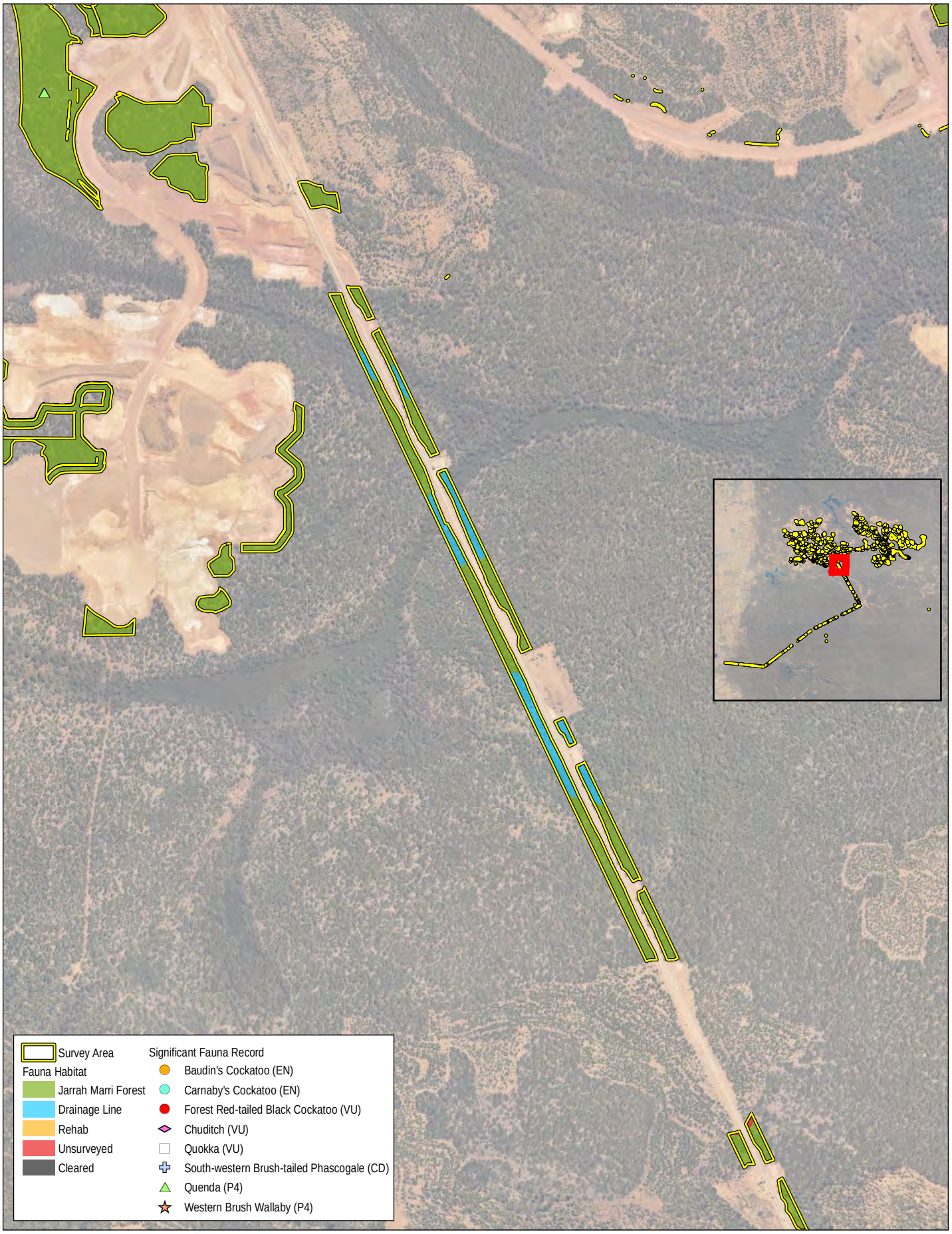
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Fauna Habitat and Significant Fauna Records

MAP 9-32

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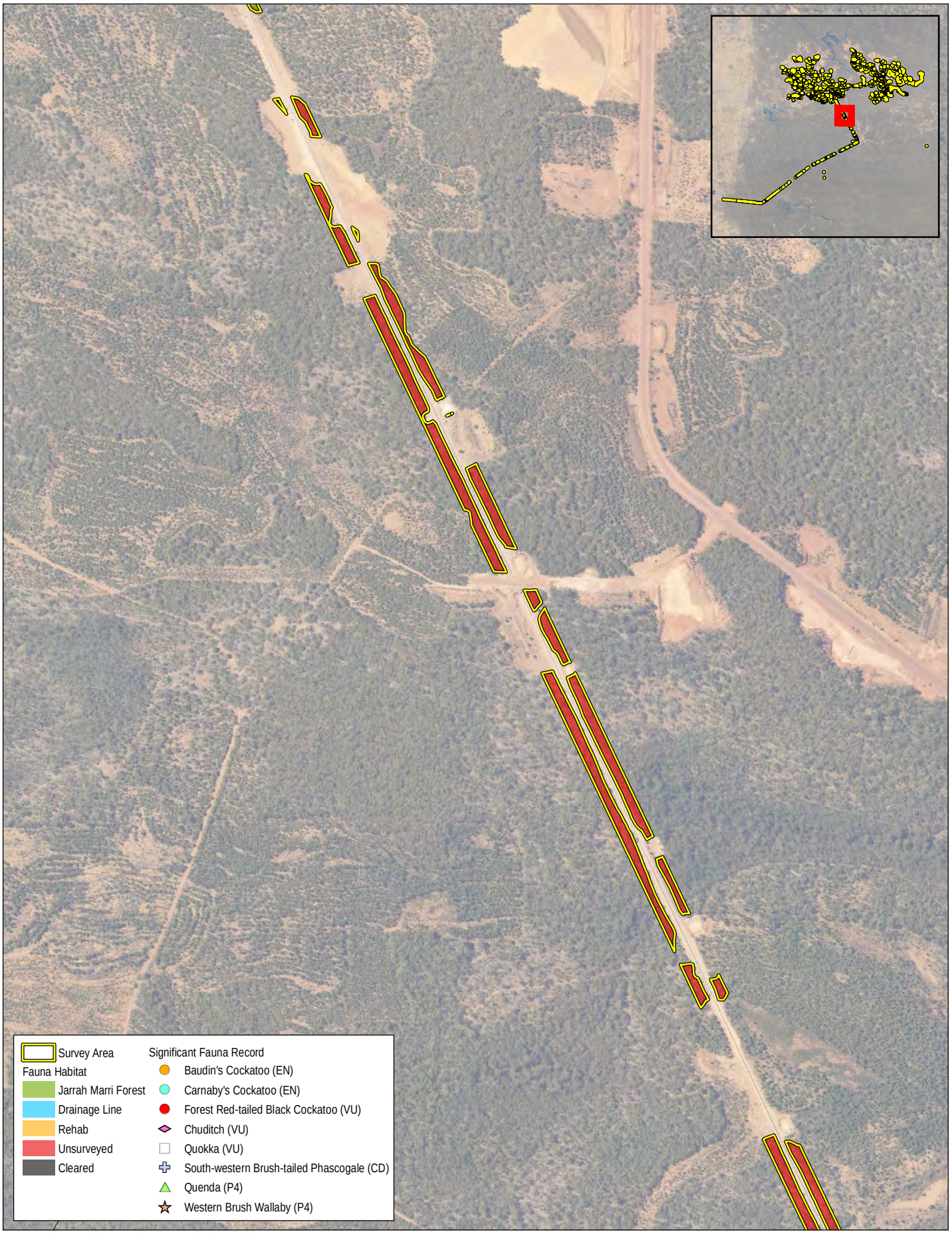
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Fauna Habitat and Significant Fauna Records MAP 9-33

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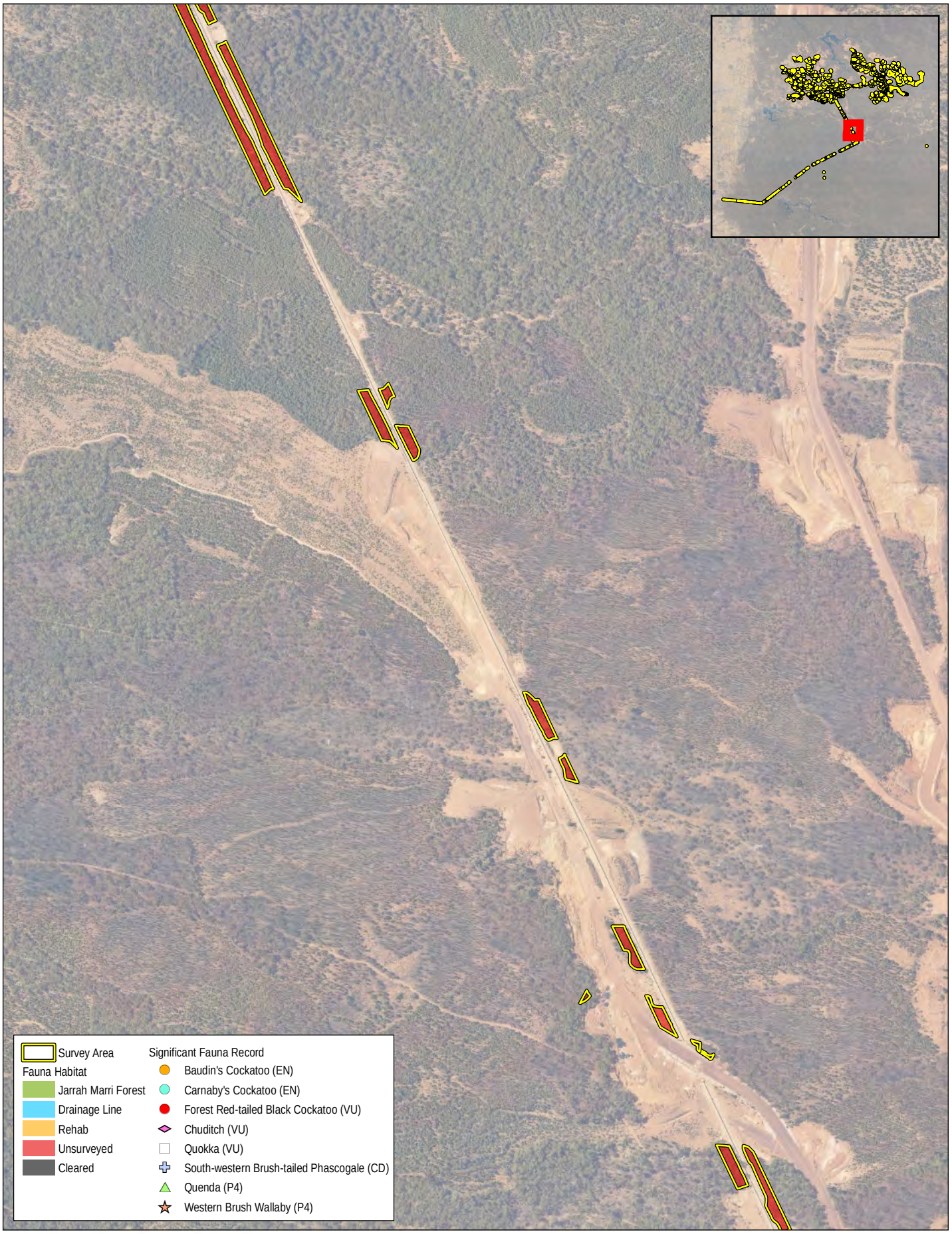
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Fauna Habitat and Significant Fauna Records MAP 9-34

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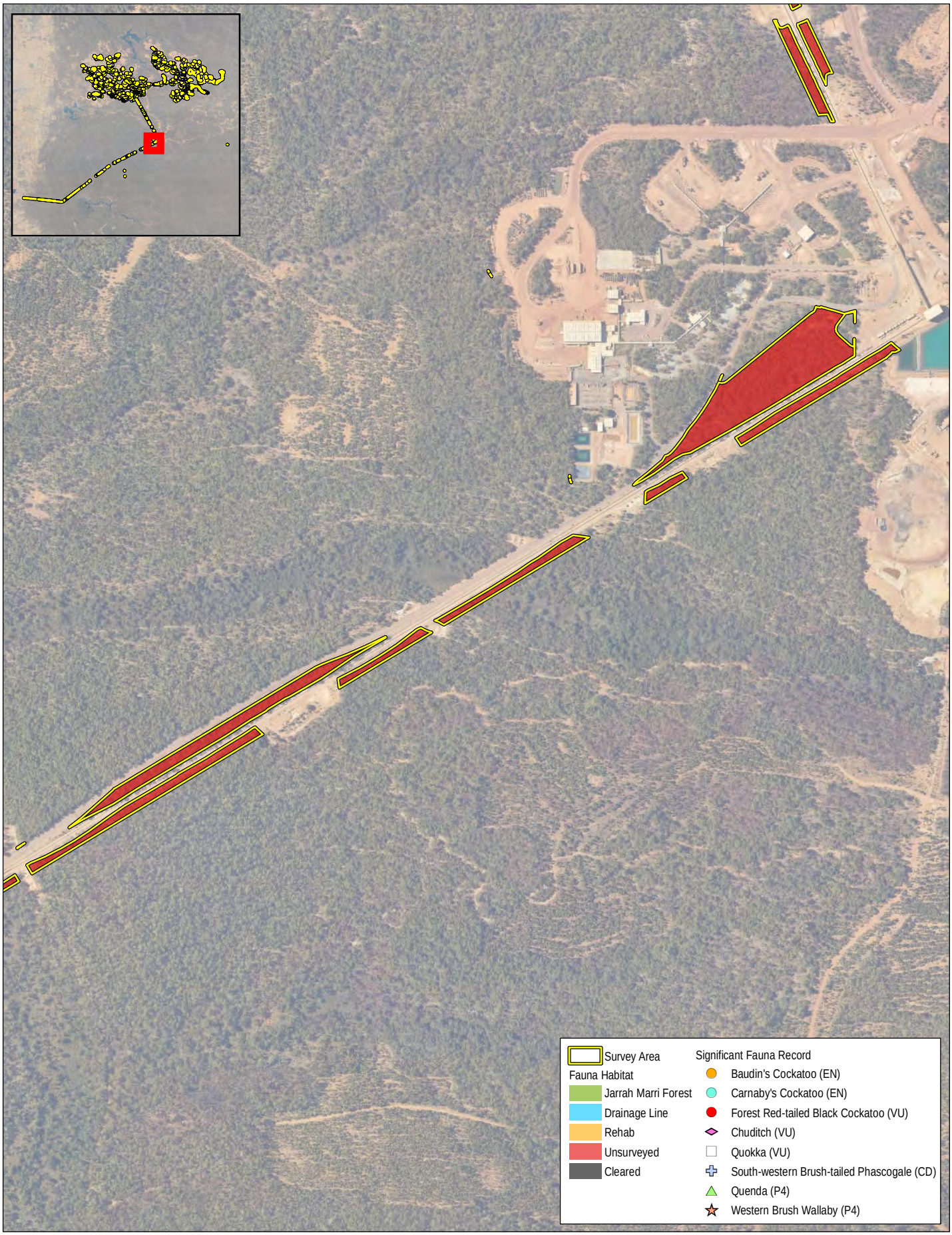
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Fauna Habitat and Significant Fauna Records MAP 9-35

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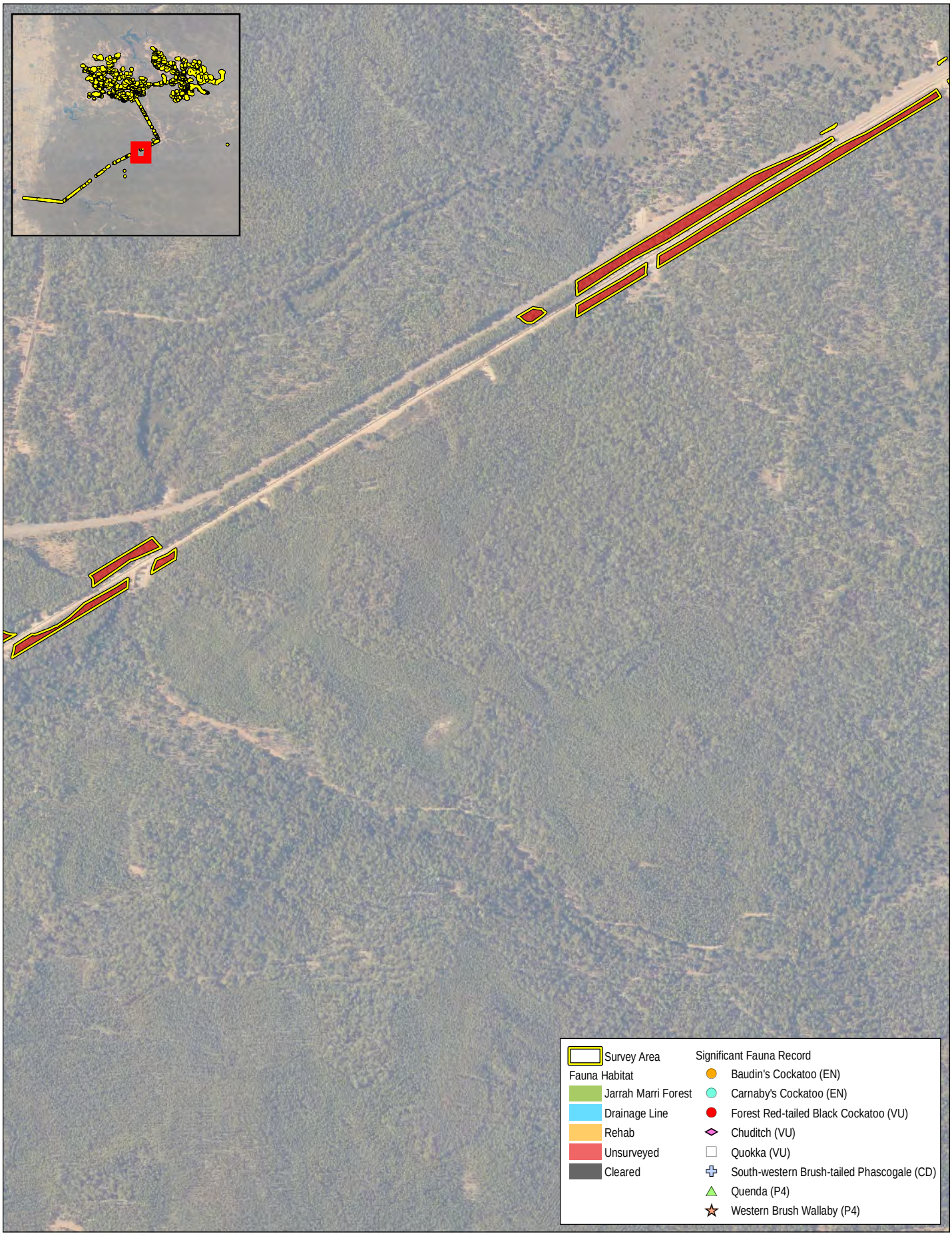
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Fauna Habitat and Significant Fauna Records MAP 9-36

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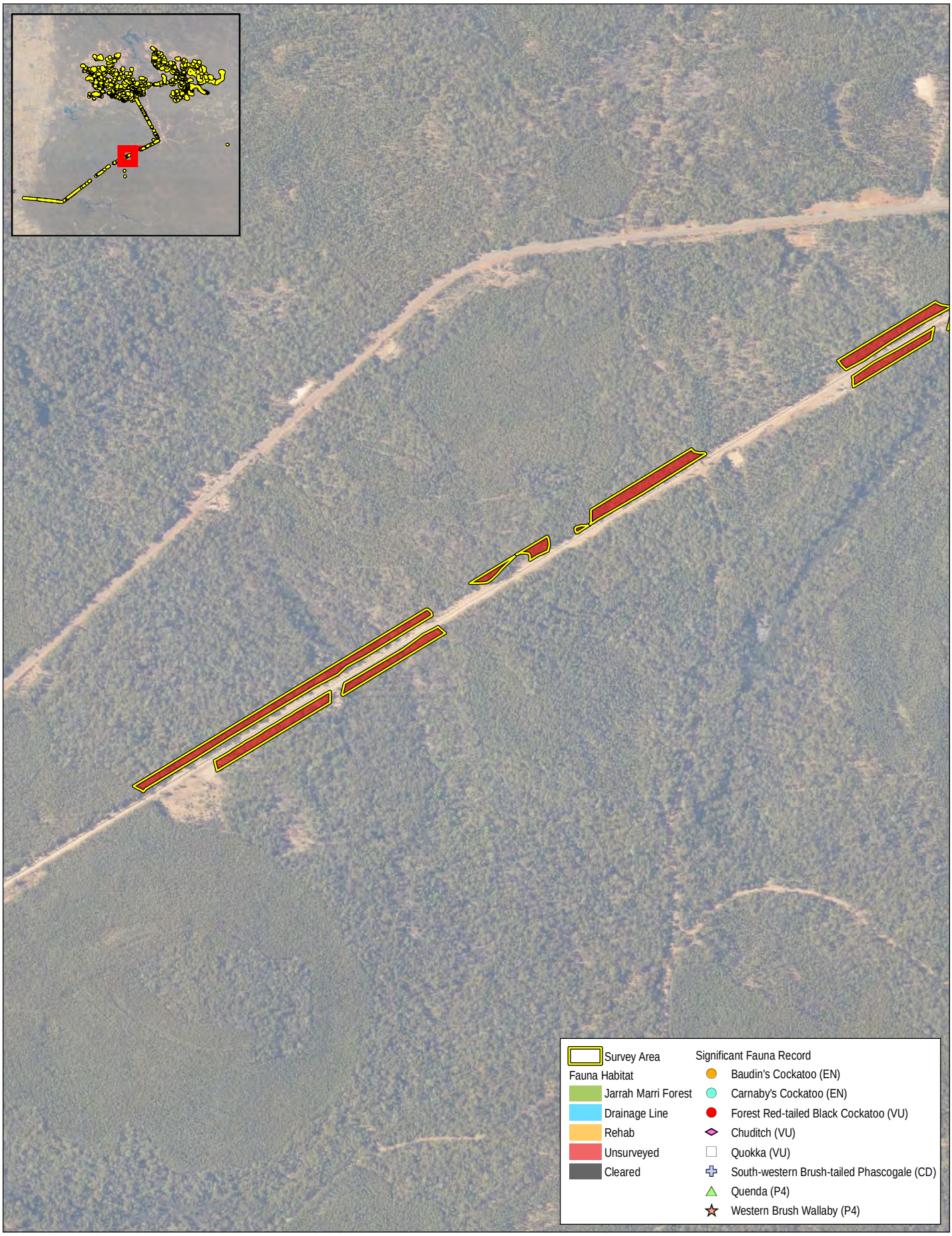
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Fauna Habitat and Significant Fauna Records MAP 9-37

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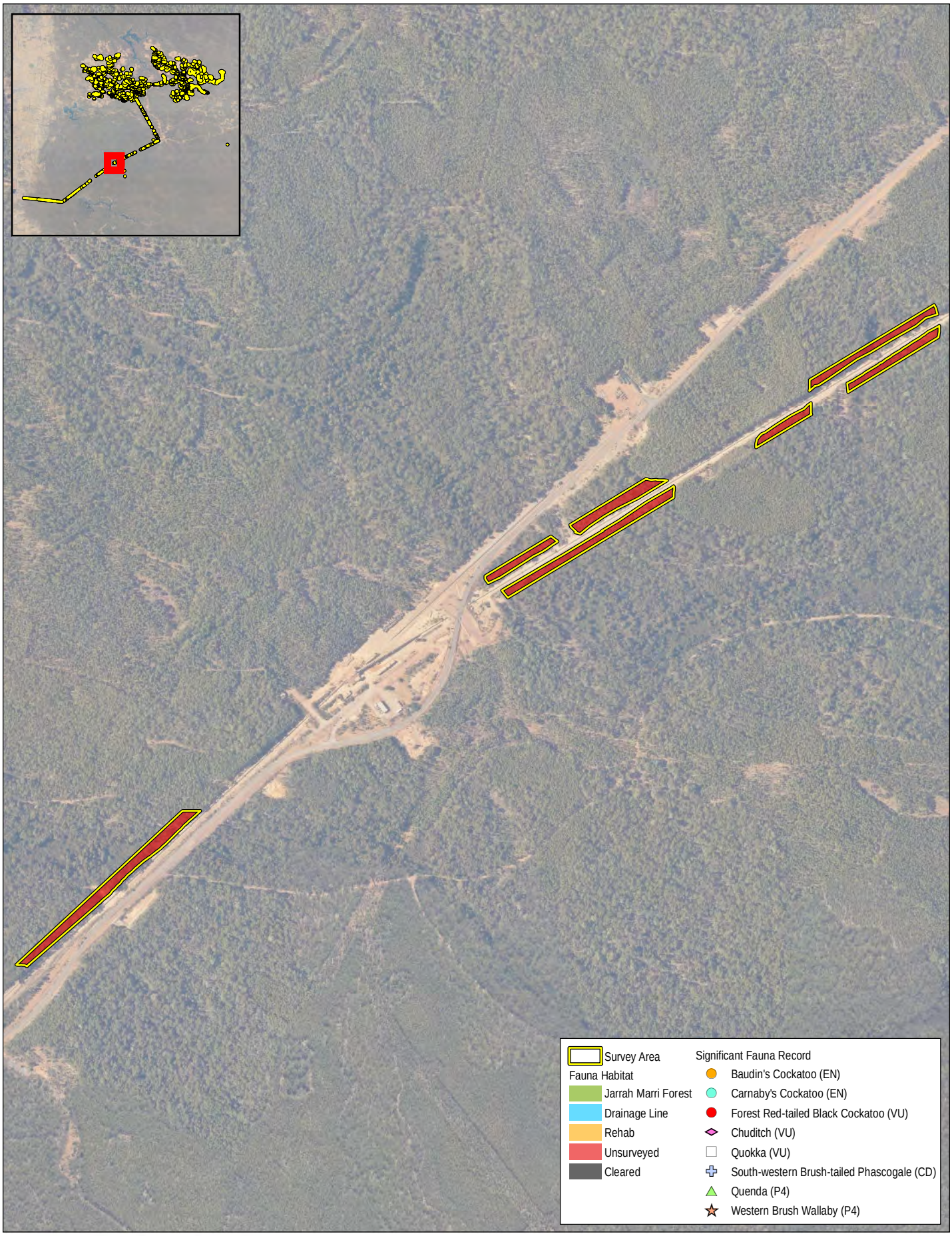
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Fauna Habitat and Significant Fauna Records MAP 9-38

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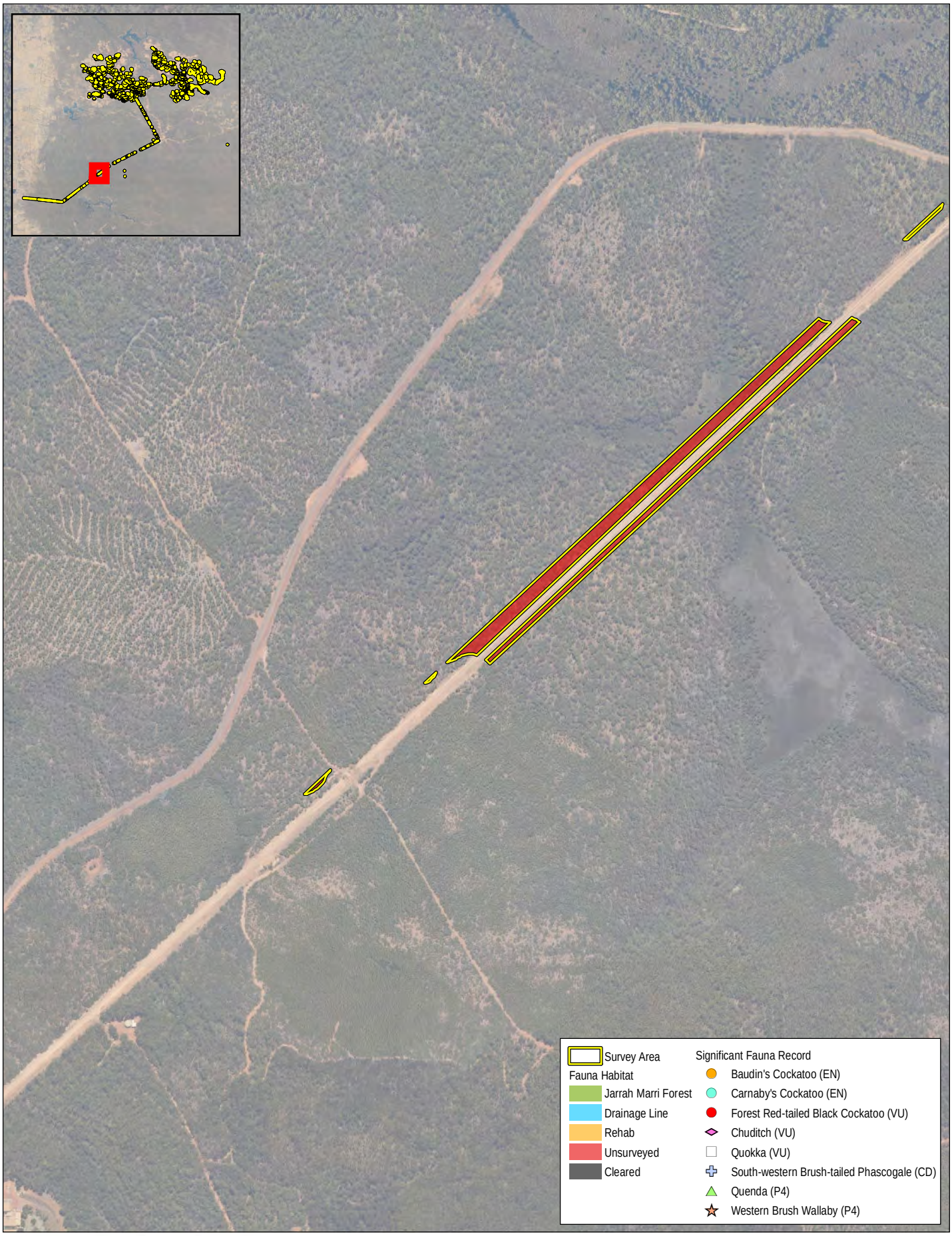
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Fauna Habitat and Significant Fauna Records MAP 9-39

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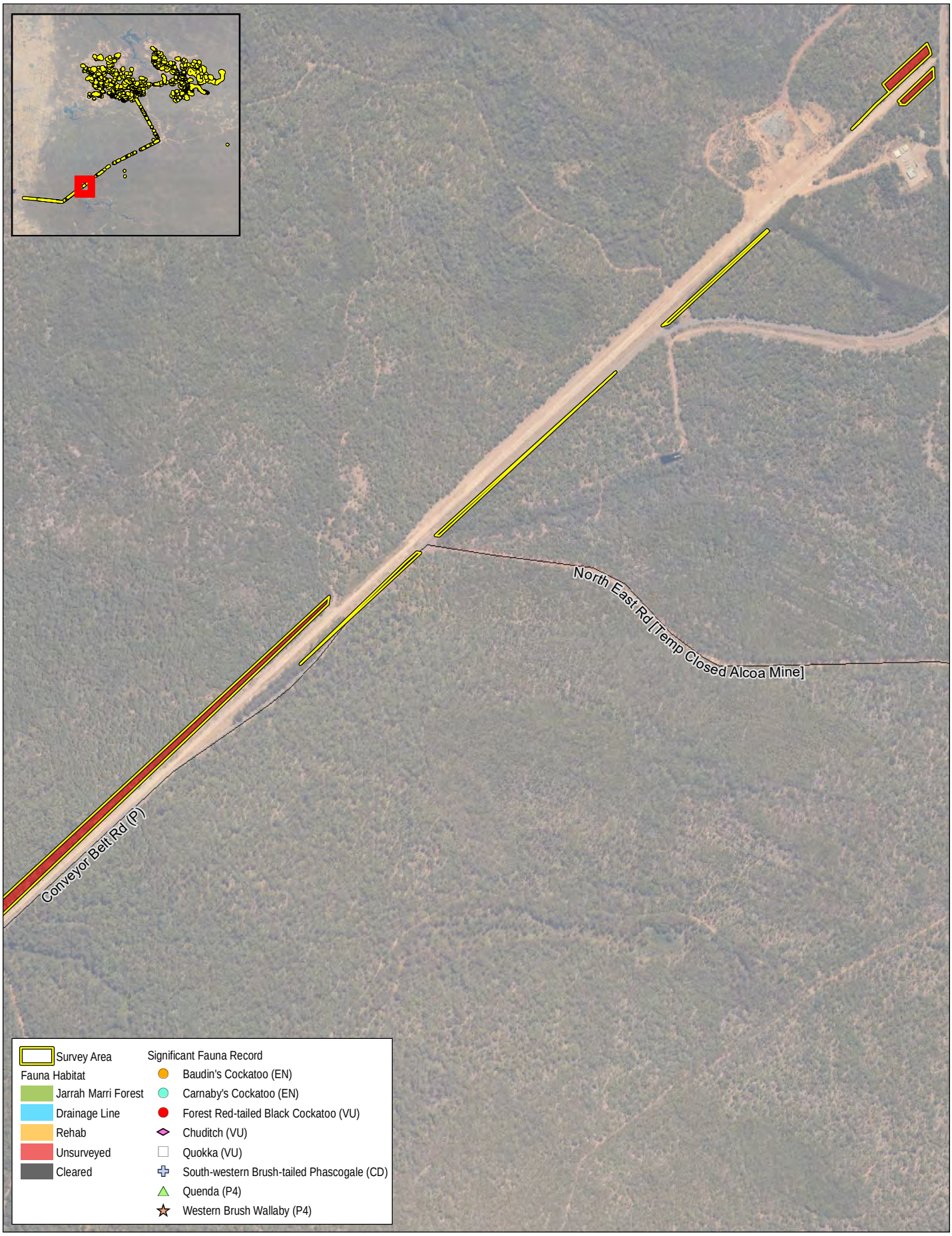
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Fauna Habitat and Significant Fauna Records MAP 9-40

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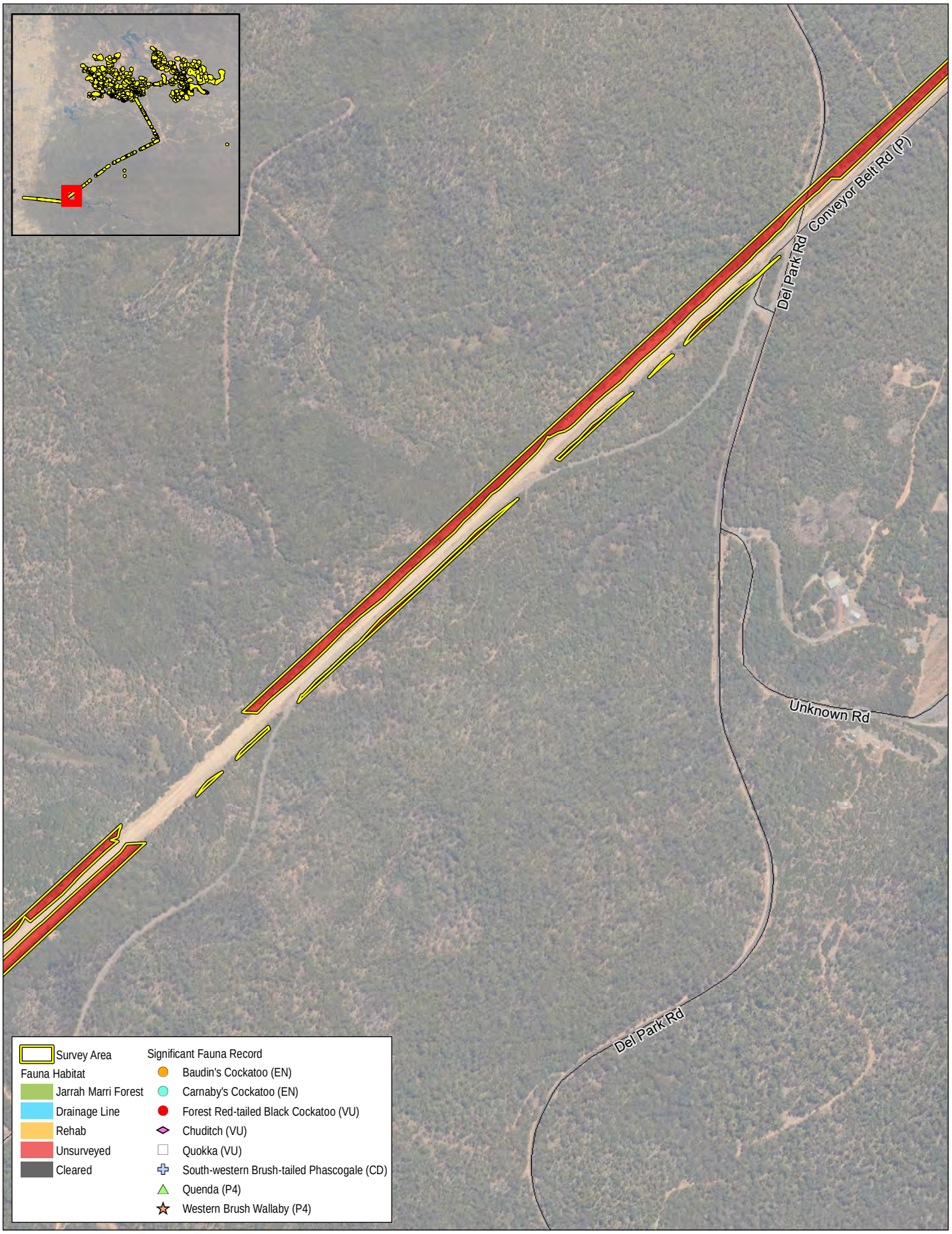
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Fauna Habitat and Significant Fauna Records MAP 9-41

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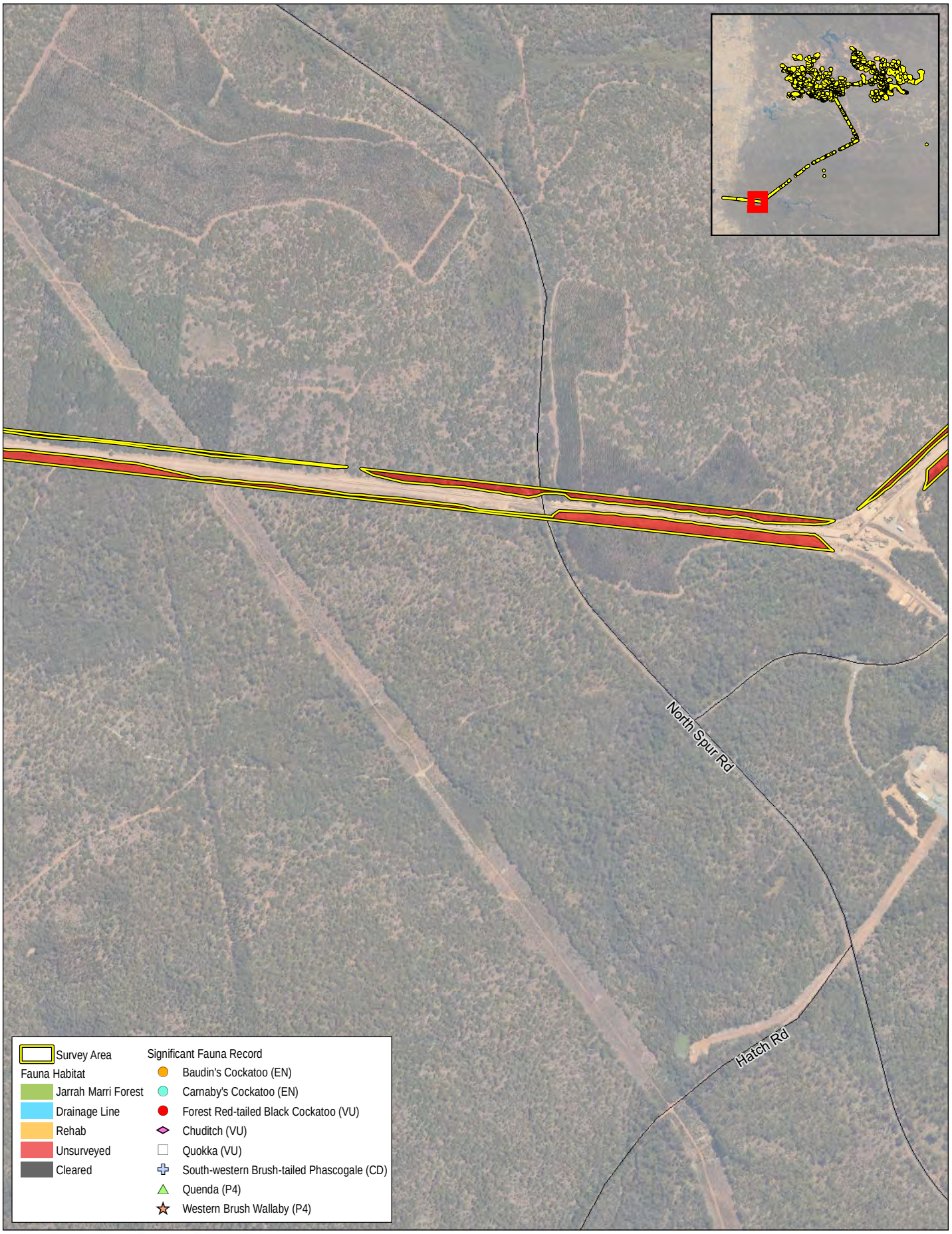
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Fauna Habitat and Significant Fauna Records MAP 9-42

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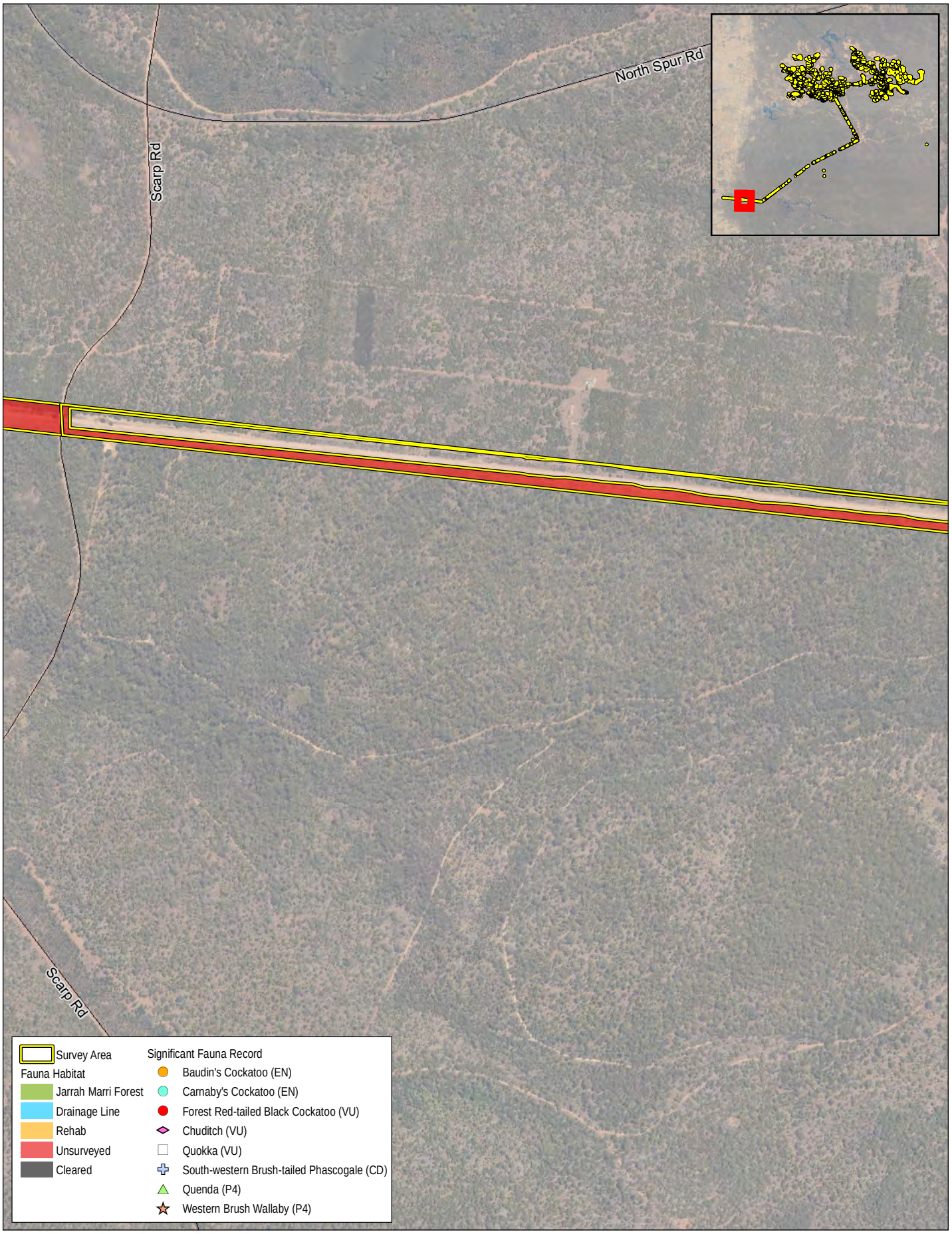
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Fauna Habitat and Significant Fauna Records MAP 9-43

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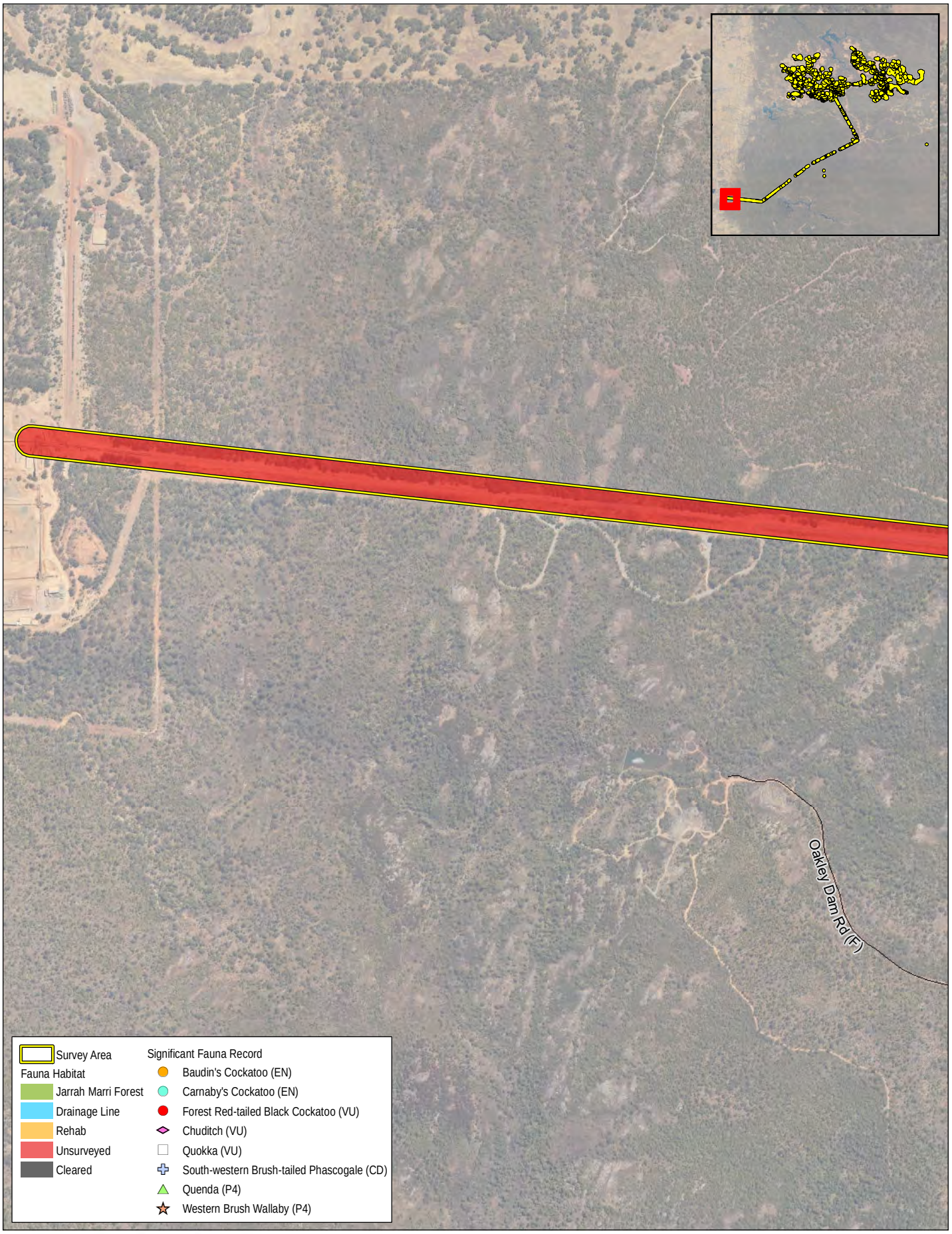
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Drawn By	: Environmaps
Reviewed By	: PD

Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records MAP 9-44

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Coordinate System: GDA 1994 MGA Zone 50 @ A4

Scale	: 1:10,000 @ A4
Project Number	: 675.VX5890.00001
Date Drawn	: 7/06/2024
Drawn By	: Environmaps
Reviewed By	: PD

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Targeted Chuditch, Quokka, and Woylie Surveys Huntly Mine – Myara Region

Fauna Habitat and Significant Fauna Records MAP 9-45

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Appendix B Literature Review Summary

Targeted Chuditch, Quokka, and Woylie Survey

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Lit A	*Chuditch Pre-mine Survey, Myara* (Way, 2013)	Overlaps Survey Area	March – April 2013	Targeted Chuditch Survey	• Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act	Two fauna habitats were identified: • Jarrah forest • Drainage line
Lit B	*Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006)	Overlaps Survey Area	1996-2006	Long Term Fauna Monitoring Program	• Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act • Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Noisy Scrubbird (*Atrichornis clamosus)* – Listed as Endangered under the BC Act and EPBC Act	No fauna habitats were recorded.
Lit C	*Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North* (GHD, 2021b)	1 km north of Survey Area	August 2021	Targeted Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo, Chuditch, Quokka, and other Priority species	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act	Eight fauna habitats were identified: • Jarrah-Marri forest • Bullich forest • Granite outcrop • Blackbutt forest • Flooded Gum woodland • Melaleuca dampland • Mine rehabilitation • Pine plantation

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
					• Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act • Peregrine Falcon (*Falco peregrinus*) – Listed as Special Protection under the BC Act • Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Listed as Conservation Dependent By DBCA • Masked Owl Southwest (*Tyto novaehollandiae*) – Listed as Priority 3 by the DBCA • Western False Pipistrelle (*Falsistrellus mackenziei*) - Listed as Priority 3 by the DBCA • Southern Death Adder (*Acanthophis antarcticus*) – Listed as Priority 3 by the DBCA • Rakali (*Hydromys chrysogaster*) – Listed as Priority 4 by the DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Lit D	*Black Cockatoo Habitat Assessment - Pinjarra Racecourse* (Harewood, 2019)	6 km west of the Survey Area	2019	Targeted Black Cockatoo Habitat Assessment	• Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act	No fauna habitats were identified. However, 34 habitat trees consisting of Flooded Gum, Tuart, Marri and introduced eucalypts were identified.
Lit E	*Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a)	8 km south of the Survey Area	August 2021	Targeted Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo, Chuditch, Quokka, Carters's Freshwater Mussel, and other Priority species	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act • Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act • Peregrine Falcon (*Falco peregrinus*) – Listed as Special Protection under the BC Act • Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Listed as	Seven fauna habitats were identified: • Bullich forest • Granite outcrop • Blackbutt forest • Flooded Gum woodland • Jarrah-Marri forest • Mine rehabilitation • Pine plantation

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
					Conservation Dependent By DBCA • Western False Pipistrelle (*Falsistrellus mackenziei*) - Listed as Priority 3 by the DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	
Lit F	*Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment* (GHD, 2012)	10 km north of the Survey Area	November 2011	Level 1 Fauna and Habitat Assessment	• Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Letter-winged kite (*Elanus scriptus*) – Listed as Priority 4 the DBCA	Five fauna habitats were identified: • Melaleuca wetlands • Swampland • Jarrah/Marri forest • *Banksia*/*Allocasuarina* woodlands • Dense shrublands on clay flats

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Lit G	*Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67) (Harewood, 2017)*	17.5 km south of Survey Area	August 2011	Basic Fauna Assessment and Black Cockatoo Habitat Assessment	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda laitrostris*) - Listed as Endangered under the BC Act and EPBC Act • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	Four fauna habitats were identified: • Remnant native vegetation • Plantations • Existing cleared areas • River and ephemeral streams

Appendix C Licences and Permits

Targeted Chuditch, Quokka, and Woylie Survey

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

DEPARTMENT OF PARKS AND WILDLIFE

Department of Parks and Wildlife

Enquiries: 17 DICK PERRY AVE, KENSINGTON, WESTERN AUSTRALIA
Telephone: 08 9219 9000
Facsimile: 08 9219 8242
Web Site: https://wildlifelicensing.dpaw.wa.gov.au
Correspondance: **Locked Bag 30**
Bentley Delivery Centre WA 6983

Wildlife Conservation Act 1950

REGULATION 17

Fauna taking (scientific or other purposes) licence (Fauna taking (scientific or other purposes) licence)

The undermentioned person may take fauna for research or other scientific purposes and where authorised, keep it in captivity, subject to the following and attached conditions, which may be added to, suspended or otherwise varied as considered fit.

Director General

Conditions

1 The licensee must comply with the provisions of the Wildlife Conservation Act 1950, Wildlife Conservation Regulations 1970 and any Notices in force under this legislation.

2 The licensee shall take fauna only in the manner stated on the endorsed Regulation 17 licence application form and endorsed related correspondence.

3 Unless specifically authorised in the conditions of this Licence or otherwise in writing by the Director General, species of fauna declared as likely to become extinct, rare or otherwise in need of special protection shall not be taken.

4 Any by-catch of fauna, which is declared to be rare, likely to become extinct, or otherwise in need of special protection shall be released immediately at the point of capture. Where such fauna taken under this licence is injured or deceased, the licensee shall contact the Department's Wildlife Licensing Section for advice on disposal. Records must be kept of any such fauna so captured and details are to be included in the report required under further condition below.

5 Any interaction involving Gazetted Threatened Fauna that may be harmful to the fauna and/or invasive may require approval from the Commonwealth Department of the Environment ph 02 6274 1111. Interaction with such species is controlled by the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 and Environment Protection and Biodiversity Conservation Regulations 2000 as well as the Wildlife Conservation Act 1950 and Wildlife Conservation Regulations 1970.

6 No fauna shall be taken in areas where it would impinge on pre-existing scientific research programs.

7 Except in the case of approved lethal traps, the licensee shall ensure that measures are taken in the capture and handling of fauna to prevent injury or mortality resulting from that capture or handling. Where traps or other mechanical means or devices are used to capture fauna these shall be deployed so as to prevent exposure of trapped animals to ants and debilitating weather conditions and inspected at regular intervals throughout each day of their use. At the conclusion of research all markers used, and signs and structures erected by the licensee shall be removed and the environment returned to its original condition.

8 Not more than ten specimens of any one protected species of fauna shall be taken and removed from any location less than 20km apart. Where exceptional circumstances make it necessary to take a larger number of specimens from a particular location in order to obtain adequate statistical data, the collector must proceed with circumspection and justify their actions to the Director General in advance.

9 The licensee shall not release any fauna or their progeny in any area where it does not naturally occur, nor hand such fauna over to any other person or authority unless approved by the Director General, nor dispose of the remains of such fauna in any manner likely to confuse the natural or present day distribution of the species.

10 Bioprospecting involving the removal of sample aquatic and terrestrial organisms for chemical extraction and bioactivity screening shall not be conducted without specific written approval by the Director General.

11 No fauna is to be taken from any CALM land, as defined in the Conservation and Land Management Regulations 2002, without prior written approval of the Director General. No fauna is to be taken from any public land without the prior written approval of the Government Authority managing that land.

12 The licensee must not enter upon any private property or pastoral lease for the purposes of this licence, nor take any fauna from any private land or pastoral lease without the prior consent in writing of the owner or occupier. Similarly, in the case of Aboriginal lands, the licensee must not enter upon or take fauna from such lands without the written approval of the Department of Aboriginal Affairs and/or the relevant native title holders or applicants.

13 Copies of this licence and any written approval or consent required by conditions of this licence must be carried by the licensee and any person/s authorised under the licence at all times when conducting activities relevant to the licence

Department of Parks and Wildlife

Enquiries: 17 DICK PERRY AVE, KENSINGTON, WESTERN AUSTRALIA
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Correspondance: **Locked Bag 30**
Bentley Delivery Centre WA 6983

and must be presented to an authorised officer of the Department upon request.

14 All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this licence shall be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range shall upon request be donated to the Western Australian Museum.

15 To prevent any unnecessary collecting in this State, all specimens and material taken and retained under the authority of this license shall, upon request, be loaned to the Western Australian Museum. Any unused portion or portions of any specimen collected under the authority of this license shall be offered to the Western Australian Museum for inclusion in its collection or made available to other scientific workers if so required.

16 Within one month of the expiration of this licence, the holder shall submit an electronic return into the department's Wildlife Licensing System, detailing the locality, site, geocode, date and number of each species of fauna captured, sighted or vouchered during the currency of the licence. A copy of any paper, report or thesis resulting from the research shall upon completion be lodged with the Director General.

Purpose

TFA 2324-0024 & BA27000875

Authorised Person

Surname	**Given name(s)**
Walker	Christina
Crossley	Lachlan
Girando	Simon
Geidans	Lukas
Li	Yanlin
Berry	Lewis
Lohr	Michael
Hickling	Alex
Fintan	Angel
Constanza	Lutz
Hill	Chloe

Date of Issue 10/07/2023
Valid From 10/07/2023
Date of Expiry 10/07/2023

Licensee: Mr Evan Nicholas Webb
Address PO Box 14
West Perth WA 6872
Australia

Issued by a Wildlife Licensing Officer of the Department of Parks and Wildlife under delegation from the Minister for Environment pursuant to section 133(1) of the Conservation and Land Management Act 1984.

Appendix D Fauna Desktop Assessment Results

Targeted Chuditch, Quokka, and Woylie Survey

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

Conservation Status:
State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation, Commonwealth - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.
Database:
NM - NatureMap, PMST - EPBC Protected Matters Search Tool, DBCA - DBCA Threatened and Priority Fauna database search, Field - Recorded during the current field survey.
Literature:
A - *Chuditch Pre-mine Survey, Myara* (Way, 2013)
B - *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006)
C - *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North* (GHD, 2021b)
D - *Black Cockatoo Habitat Assessment - Pinjarra Racecourse* (Harewood, 2019)
E - *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a)
F - *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment* (GHD, 2012)
G - *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)* (Harewood, 2017)

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Amphibians															
Limnodynastidae	*Heleioporus albopunctatus*	Western Spotted Frog								x					
	Heleioporus eyrei	Moaning Frog								x	x		x		
	Heleioporus inornatus	Whooping Frog								x					
Myobatrachidae	*Crinia georgiana*	Quacking Frog						x		x	x		x	x	x
	Crinia glauerti	Clicking Frog						x		x			x	x	x
	Crinia insignifera	Squelching Froglet													x
	Crinia pseudinsignifera	Bleating Froglet								x	x		x		x
	Geocrinia leai	Ticking Frog								x	x		x		
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog						x		x	x		x		x
	Litoria moorei	Motorbike Frog											x		
Birds															
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill, Broad-tailed Thornbill						x		x	x		x		x
	Acanthiza chrysorrhoa	Yellow-rumped Thornbill								x	x		x		x

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Acanthiza inornata	Western Thornbill						x		x	x				x
	Aphelocephala leucopsis	Southern Whiteface		VU		x									
	Gerygone fusca	Western Gerygone						x		x					x
	Sericornis maculatus	Spotted Scrubwren						x		x	x		x		x
	Smicrornis brevirostris	Weebill						x		x			x	x	x
Accipitridae	*Accipiter cirrocephalus*	Collared Sparrowhawk								x			x		
	Accipiter fasciatus	Brown Goshawk		MA						x	x				
	Aquila audax	Wedge-tailed Eagle								x	x		x	x	x
	Elanus scriptus	Letter-winged Kite	P4											x	
	Haliastur sphenurus	Whistling Kite		MA						x			x	x	
	Hieraaetus morphnoides	Little Eagle								x					
	Lophoictinia isura	Square-tailed Kite						x		x					
	Milvus migrans	Black Kite												x	
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar									x		x		x
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra						x		x	x		x	x	x
	Todiramphus sanctus	Sacred Kingfisher		MA						x	x		x	x	
Anatidae	*Anas superciliosa*	Pacific Black Duck						x		x	x		x		x
	Chenonetta jubata	Australian Wood Duck, Wood Duck, Maned Duck									x		x		x
	Cygnus atratus	Black Swan											x		
	Oxyura australis	Blue-billed Duck	P4		x		x								
	Tadorna tadornoides	Australian Shelduck, Mountain Duck								x					x
Apodidae	*Apus pacificus*	Pacific Swift, Fork-tailed Swift	MI	MI, MA		x									
Ardeidae	*Botaurus poiciloptilus*	Australasian Bittern	EN	EN		x									
Artamidae	*Artamus cinereus*	Black-faced Woodswallow									x				
	Artamus cyanopterus	Dusky Woodswallow						x		x	x				x
	Cracticus nigrogularis	Pied Butcherbird											x		

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Cracticus torquatus	Grey Butcherbird									x		x	x	x
	Gymnorhina tibicen	Australian Magpie								x	x		x	x	x
	Strepera versicolor	Grey Currawong						x		x	x		x		x
Atrichornithidae	*Atrichornis clamosus*	Noisy Scrubbird	EN	EN	x	x	x			x					
Cacatuidae	*Cacatua pastinator pastinator*	Muir's Corella	CD		x		x								
	Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	x	x	x	x		x	x	x	x	x	x
	Eolophus roseicapilla	Galah									x			x	
	Zanda baudinii	Baudin's Cockatoo	EN	EN	x	x	x	x		x	x		x	x	x
	Zanda latirostris	Carnaby's Cockatoo	EN	EN	x	x	x	x			x		x		x
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike		MA				x		x	x		x	x	x
Casuariidae	*Dromaius novaehollandiae*	Emu						x		x	x		x		x
Charadriidae	*Charadrius leschenaultii*	Greater Sand Plover	VU	VU, MI, MA	x	x									
	Charadrius mongolus	Lesser Sand Plover	EN	EN, MI, MA		x									
	Pluvialis fulva	Pacific Golden Plover	MI	MI, MA	x	x									
	Pluvialis squatarola	Grey Plover	MI	VU, MI, MA	x		x								
	Vanellus tricolor	Banded Lapwing									x				
Climacteridae	*Climacteris rufus*	Rufous Treecreeper						x		x	x		x		
Columbidae	*Columba livia*	Domestic Pigeon, Rock Dove												x	
	Phaps chalcoptera	Common Bronzewing								x				x	x
	Phaps elegans	Brush Bronzewing						x		x	x				
	Spilopelia chinensis	Spotted Turtle Dove												x	
	Spilopelia senegalensis	Laughing Turtle Dove												x	
Corvidae	*Corvus bennetti*	Little Crow									x				
	Corvus coronoides	Australian Raven						x		x			x	x	x
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo		MA				x		x	x				x

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Chalcites basalis	Horsfield's Bronze Cuckoo		MA						x			x		
	Chalcites lucidus	Shining Bronze Cuckoo		MA						x	x				
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird									x				
Diomedeidae	*Diomedea amsterdamensis*	Amsterdam Albatross	CR	EN, MI, MA		x									
	Diomedea dabbenena	Tristan Albatross	CR	EN, MI, MA		x									
	Diomedea epomophora	Southern Royal Albatross	VU			x									
	Diomedea exulans	Wandering Albatross	VU	VU, MI, MA		x									
	Diomedea sanfordi	Northern Royal Albatross	EN	EN, MI, MA		x									
	Thalassarche cauta steadi	White-capped Albatross	VU	VU, MI, MA		x									
	Thalassarche impavida	Campbell Island Albatross	VU	VU, MI, MA		x									
	Thalassarche melanophris	Black-browed Albatross	EN	VU, MI, MA		x									
Estrildidae	*Stagonopleura oculata*	Red-eared Firetail								x	x				
Falconidae	*Falco cenchroides*	Nankeen Kestrel		MA										x	
	Falco hypoleucos	Grey Falcon	VU	VU		x									
	Falco peregrinus	Peregrine Falcon	OS		x		x				x		x		
Hirundinidae	*Hirundo neoxena*	Welcome Swallow		MA											x
	Petrochelidon ariel	Fairy Martin									x		x	x	
	Petrochelidon nigricans	Tree Martin		MA						x	x		x		
Laridae	*Anous stolidus*	Common Noddy, Brown Noddy	MI	MI, MA		x									
	Hydroprogne caspia	Caspian Tern	MI	MI, MA	x		x								
	Sternula nereis nereis	Fairy Tern	VU	VU	x	x	x								
	Thalasseus bergii	Greater Crested Tern, Crested Tern	MI	MI, MA	x		x								
Locustellidae	*Cincloramphus cruralis*	Brown Songlark									x		x		
	Cincloramphus mathewsi	Rufous Songlark											x		
Maluridae	*Malurus elegans*	Red-winged Fairywren						x		x	x		x		

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Malurus leucopterus	White-winged Fairywren											x		
	Malurus pulcherrimus	Blue-breasted Fairywren											x		
	Malurus splendens	Splendid Fairywren								x	x		x	x	x
	Stipiturus malachurus	Southern Emu-wren									x				
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU	x	x	x								
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill						x		x	x		x		x
	Anthochaera carunculata	Red Wattlebird								x	x		x	x	x
	Anthochaera lunulata	Western Little Wattlebird, Western Wattlebird						x		x	x		x		x
	Gavicalis virescens	Singing Honeyeater								x	x			x	
	Lichmera indistincta	Brown Honeyeater								x	x		x	x	x
	Melithreptus brevirostris	Brown-headed Honeyeater								x	x		x		
	Melithreptus chloropsis	Western White-naped Honeyeater								x	x		x		x
	Phylidonyris niger	White-cheeked Honeyeater								x			x	x	
	Phylidonyris novaehollandiae	New Holland Honeyeater						x		x	x		x	x	x
	Ptilotula ornata	Yellow-plumed Honeyeater											x		
Meropidae	*Merops ornatus*	Rainbow Bee-eater		MA						x	x		x		
Monarchidae	*Grallina cyanoleuca*	Magpie-lark		MA							x		x	x	
	Myiagra inquieta	Restless Flycatcher								x	x		x		
Motacillidae	*Anthus australis australis*	Australian Pipit		MA						x					
	Motacilla cinerea	Grey Wagtail	MI	MI, MA		x									
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella								x			x		
Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush								x			x		

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Pachycephala fuliginosa	Western Whistler						x		x	x		x		x
	Pachycephala rufiventris	Rufous Whistler						x		x				x	
Pandionidae	*Pandion haliaetus*	Osprey	MI	MI, MA	x	x	x								
	Pardalotus punctatus	Spotted Pardalote						x		x	x				x
	Pardalotus striatus	Striated Pardalote						x		x	x				x
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin						x		x	x		x		
	Microeca fascinans	Jacky Winter												x	
	Petroica boodang	Scarlet Robin						x		x	x		x		
	Quoyornis georgianus	White-breasted Robin						x		x	x		x		
Podargidae	*Podargus strigoides*	Tawny Frogmouth						x		x	x				x
Pomatostomidae	*Pomatostomus superciliosus*	White-browed Babbler											x		
Procellariidae	*Macronectes giganteus*	Southern Giant Petrel	MI	EN, MI, MA		x									
	Macronectes halli	Northern Giant Petrel	MI	VU, MI, MA		x									
	Pachyptila turtur subantarctica	Fairy Prion		VU		x									
Psittaculidae	*Barnardius zonarius*	Australian Ringneck						x		x	x		x	x	x
	Neophema elegans	Elegant Parrot									x		x		
	Parvipsitta porphyrocephala	Purple-crowned Lorikeet								x	x		x		
	Platycercus icterotis	Western Rosella						x		x	x		x		
	Polytelis anthopeplus	Regent Parrot											x		
	Psittacula krameri	Rose-ringed Parakeet, Indian Ringnecked Parrot								x					
	Purpureicephalus spurius	Red-capped Parrot								x	x		x	x	x
	Trichoglossus moluccanus	Rainbow Lorikeet									x			x	
Rallidae	*Fulica atra*	Eurasian Coot									x				x
	Hypotaenidia philippensis	Buff-banded Rail		MA									x		
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail						x		x	x		x		x
	Rhipidura leucophrys	Willie Wagtail								x				x	

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Rostratulidae	*Rostratula australis*	Australian Painted Snipe	EN	EN, MA		x									
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI	MI, MA	x	x	x								
	Arenaria interpres	Ruddy Turnstone	MI	VU, MI, MA		x									
	Calidris acuminata	Sharp-tailed Sandpiper	MI	VU, MI, MA	x	x	x								
	Calidris alba	Sanderling	MI	MI, MA	x	x									
	Calidris canutus	Red Knot	EN	VU, MI, MA	x	x	x								
	Calidris falcinellus	Broad-billed Sandpiper	MI	MI, MA		x									
	Calidris ferruginea	Curlew Sandpiper	CR	CR, MI, MA	x	x	x								
	Calidris melanotos	Pectoral Sandpiper	MI	MI, MA		x									
	Calidris pugnax	Ruff	MI	MI, MA (as P. pugnax)		x									
	Calidris ruficollis	Red-necked Stint	MI	MI, MA	x	x	x								
	Calidris subminuta	Long-toed Stint	MI	MI, MA	x	x	x								
	Calidris tenuirostris	Great Knot	CR	VU, MI, MA	x	x	x								
	Gallinago megala	Swinhoe's Snipe	MI	MI, MA		x									
	Gallinago stenura	Pin-tailed Snipe	MI	MI, MA		x									
	Limosa lapponica	Bar-tailed Godwit	MI (*L. l. bauerii* VU; *L. l. menzbieri* CR)	MI, MA (*L. lapponica bauerii Chris. ls.* EN; *L. lapponica menzbieri* EN)	x	x	x								
	Limosa limosa	Black-tailed Godwit	MI	EN, MI, MA	x	x	x								
	Numenius madagascariensis	Far Eastern Curlew, Eastern Curlew	CR	CR, MI, MA	x	x									
	Numenius minutus	Little Curlew	MI	MI, MA		x									
	Numenius phaeopus	Whimbrel	MI	MI, MA		x									
	Tringa brevipes	Grey-tailed Tattler	MI, P4	MI, MA		x									
	Tringa glareola	Wood Sandpiper	MI	MI, MA	x	x	x								
	Tringa nebularia	Common Greenshank	MI	EN, MI, MA	x	x	x								

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Tringa stagnatilis	Marsh Sandpiper	MI	MI, MA	x	x									
	Tringa totanus	Common Redshank	MI	MI, MA		x									
Strigidae	*Ninox boobook*	Boobook Owl		MA						x	x		x		x
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	MI	MI, MA	x		x								
	Threskiornis spinicollis	Straw-necked Ibis		MA							x			x	
Turnicidae	*Turnix varius*	Painted Button-quail						x		x	x		x		
Tytonidae	*Tyto javanica*	Eastern Barn Owl											x		
Tytonidae	*Tyto novaehollandiae*	Australian Masked Owl, Masked Owl	P3								x				
Zosteropidae	*Zosterops lateralis*	Grey-breasted White-eye, Silvereye		MA						x	x		x		x
Mammals															
Burramyidae	*Cercartetus concinnus*	Western Pygmy-possum, Mundarda											x		
Canidae	*Canis familiaris**	Dingo / Dog												x	
	*Vulpes vulpes**	Red Fox						x			x			x	
Dasyuridae	*Antechinus flavipes leucogaster*	Yellow-footed Antechinus, Mardo						x			x		x		
	Dasyurus geoffroii fortis	Western Quoll, Chuditch	VU	VU	x	x	x	x	x		x		x		
	Phascogale calura	Red-tailed Phascogale	CD	VU		x									
	Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		x		x	x			x		x		
	Sminthopsis gilberti	Gilbert's Dunnart									x		x		
Felidae	*Felis catus**	Cat									x		x	x	x
Leporidae	*Oryctolagus cuniculus**	Rabbit						x			x		x	x	
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo						x			x		x	x	x
	Notamacropus eugenii derbianus	Tammar Wallaby	P4		x		x								
	Notamacropus irma	Western Brush Wallaby	P4		x		x	x			x		x	x	x
	Setonix brachyurus	Quokka	VU	VU	x	x	x	x			x		x		

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Molossidae	*Austronomus australis*	White-striped Free-tailed Bat									x		x		
	Ozimops kitcheneri	Western Free-tailed Bat									x		x		
Muridae	*Hydromys chrysogaster*	Water Rat, Rakali	P4		x		x				x				
	*Mus musculus**	House Mouse									x				
	*Rattus rattus**	Black Rat						x			x		x		
Myrmecobiidae	*Myrmecobius fasciatus fasciatus*	Numbat, Walpurti	EN	EN	x	x	x								
Peramelidae	*Isoodon fusciventer*	Quenda	P4		x		x	x			x		x	x	
Phalangeridae	*Trichosurus vulpecula hypoleucus*	Common Brushtail Possum, Koomal									x		x		
Potoroidae	*Bettongia penicillata ogilbyi*	Brush-tailed Bettong, Woylie	CR	EN	x	x	x								
Pseudocheiridae	*Pseudocheirus occidentalis*	Western Ringtail Possum	CR	CE	x	x	x								
Suidae	*Sus scrofa**	Pig						x			x		x		x
Tachyglossidae	*Tachyglossus aculeatus acanthion*	Short-beaked Echidna						x			x		x		x
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat									x		x		
	Chalinolobus morio	Chocolate Wattled Bat									x		x		
	Falsistrellus mackenziei	Western False Pipiistrelle	P4		x		x				x		x		
	Vespadelus regulus	Southern Forest Bat									x		x		
Reptiles															
Agamidae	*Ctenophorus ornatus*	Ornate Crevice Dragon								x	x				
	Pogona minor	Dwarf Bearded Dragon								x	x		x	x	
Carphodactylidae	*Underwoodisaurus milii*	Southern Barking Gecko						x		x			x		
Diplodactylidae	*Diplodactylus lateroides*	Speckled Stone Gecko									x				
	Diplodactylus polyophthalmus	Spotted Sandplain Gecko								x					
Elapidae	*Acanthophis antarcticus*	Southern Death Adder	P3		x		x				x				

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Notechis scutatus	Tiger Snake								x	x		x		
	Pseudonaja affinis	Dugite						x		x			x	x	
	Suta nigriceps	Mitchell's Short-tailed Snake									x		x		
Gekkonidae	*Christinus marmoratus*	Marbled Gecko						x			x				
Pygopodidae	*Aprasia pulchella*	Pretty Worm-lizard						x		x	x				
	Delma fraseri	Fraser's Delma											x		
Pythonidae	*Morelia spilota*	Carpet Python								x	x		x		
Scincidae	*Acritoscincus trilineatus*	Western Three-lined Skink								x	x		x		
	Cryptoblepharus buchananii	Buchanan's Snake-eyed Skink						x			x			x	
	Cryptoblepharus plagiocephalus	Péron's Snake-eyed Skink								x					
	Ctenotus delli	Dell's Ctenotus	P4		x		x			x					
	Ctenotus labillardieri							x		x	x		x		
	Egernia kingii	King's Skink						x		x	x				
	Egernia napoleonis	South-western Crevice-skink						x		x	x		x		
	Hemiergis initialis initialis	Southwestern Earless Snake								x	x		x		
	Lerista distinguenda	Dwarf Four-toed Slider								x	x		x		
	Lerista microtis microtis	Southwestern Slider								x					
	Menetia greyii	Common Dwarf Skink								x	x		x		
	Morethia obscura	Shrubland Morethia Skink								x	x		x		
	Tiliqua rugosa	Bobtail						x		x	x		x	x	
Typhlopidae	*Anilios australis*	Southern Blind Snake								x	x		x		
Varanidae	*Varanus gouldii*	Bungarra Or Sand Goanna						x		x	x		x		
	Varanus rosenbergi	Heath Goanna								x	x		x	x	x

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Varanus tristis	Racehorse Goanna									x				

Appendix E Fauna Site Sheets

Targeted Chuditch, Quokka, and Woylie Survey

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

5890-CAM-01-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 422074		**Northing**	6406992
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Brown,Grey,Red				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Infrastructure,Vehicle tracks				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Blackbutt*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Xanthorrhoea*		
Ground stratum	Mid (0.5-1 m)	Isolated ferns (<0.25%)	*Macrozamia*		



Fulcrum photo ID 7763c684-3f09-483b-9308-7ed4f34e6457,f4fbe3bd-2cbb-4ae4-

5890-CAM-02-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 413083		**Northing**	6410728
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Rock crevices,Woody debris	
Disturbance	Clearing,Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri, Allocasuarina*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Bossiaea, other mixed shrubs*		
Ground stratum	Mid (0.5-1 m)	Open rushland and/or sedgeland (20-50%)			



Fulcrum photo ID 969b2df8-5ae7-4c91-8161-ac1854f4342b

5890-CAM-03-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 411385		**Northing**	6407715
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Brown,Grey				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Marri, Allocasuarina*	
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)		*Acacia*	
Ground stratum	Mid (0.5-1 m)	Open rushland and/or sedgeland (20-50%)			



Fulcrum photo ID	75cb86b2-ae83-4407-9afe-fdc151663124

5890-CAM-04-EW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 413151		**Northing**	6409147
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Marri*	
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)		*Macrozamia*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	b52add55-4874-4587-8d85-4a2cc3347e3a

5890-CAM-05-LB

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	424048	**Northing**	6404024
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	None	
Aspect	Negligible		**Surface stone cover**		
Soil type	Loam		**Surface stone size classes present**		
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Leaf litter,Woody debris	
Disturbance	Clearing				
Introduced fauna	None observed		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Banksia, Xanthorrhoea*		
Ground stratum	Tall (1-2 m)	Open hummock grassland (20-50%)	*Mixed shrubs*		



Fulcrum photo ID	2de007f4-e2be-4cb2-94ec-12502df16039

5890-CAM-06-EW

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	414210	**Northing**	6409754
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Closed forest (>80%)	*Allocasuarina, Jarrah, Marri*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Banksia grandis, Bossiaea*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	6305a349-6f7e-4cfa-8182-8d51c4d918d8,3f2bcdc3-6cce-4e94-

5890-CAM-07-EW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 411944		**Northing**	6409195

Landform and Soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Laterite
Aspect	South	**Surface stone cover**	5 - 25%
Soil type	Loam	**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)
Soil colour	Black,Brown		
Condition		**Habitat Features**	
Quality	Very good	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Vehicle tracks		
Introduced fauna	None observed	**Ground Cover**	76-100%

Vegetation			
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Allocasuarina, Marri, Jarrah*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Macrozamia, small shrubs*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	



Fulcrum photo ID	a1604d4d-ead6-4cf1-a440-09a3b2ae91b5,d7417fd6-ce81-404b-

5890-CAM-08-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 423192		**Northing**	6407353

Landform and Soil		**Rock**	
Landform	Mid slope	**Rock type/s**	None
Aspect	South	**Surface stone cover**	
Soil type	Sandy loam	**Surface stone size classes present**	
Soil colour	Brown,Grey		
Condition		**Habitat Features**	
Quality	Good	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Hollows - logs,Hollows - trees,Logs > 10 cm,Peeling bark,Woody debris
Disturbance			
Introduced fauna	Pig	**Ground Cover**	76-100%

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Banksia, Allocasuarina*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Bossiaea, Banksia, Xanthorrhoea*
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges, low isolated Macrozamia*



Fulcrum photo ID	45864b57-4fbc-404d-8ed0-2dc8a6b8de1c,1bd0e07e-5c2c-4390-

5890-CAM-09-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 426085		**Northing**	6406367
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Jarrah, Allocasuarina, Marri*	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Bossiaea*	
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)		*Sedges, Macrozamia*	



Fulcrum photo ID	8eac1abc-6534-4b8d-b257-2aab28ca6f8d,8540bb23-b941-4b92-

5890-CAM-10-LB

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 426232		**Northing**	6408492
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Peeling bark,Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Jarrah, Banksia*	
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		*Xanthorrhoea*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Macrozamia, mixed shrubs*	



Fulcrum photo ID	dad909c7-e775-47cd-95f7-768c9eb6ff82

5890-CAM-11-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 421209		**Northing**	6406687
Landform and Soil			**Rock**		
Landform	Lower slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Brown,Red				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**		
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - trees,Leaf litter,Logs > 10 cm,Woody debris	
Disturbance	Clearing,Vehicle tracks				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)		*Jarrah*	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Banksia*	
Ground stratum	Low (>0.5 m)	Isolated rushes and/or sedges (<0.25%)		*Sedges*	



Fulcrum photo ID bb53f659-785a-4df8-b37f-5ba78ceb002c,dccdfc14-3d71-469f-8103-

5890-CAM-12-LB

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 428759		**Northing**	6407237
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	Clearing				
Introduced fauna			**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)		*Jarrah, Allocasuarina*	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Banksia, Allocasuarina*	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		*Acacia, sedges, low banksia, mixed shrubs*	



Fulcrum photo ID 5b36e529-d23b-4fdc-8883-d38b4c6f083a,6641ae96-f273-4e17-

5890-CAM-13-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 421502		**Northing**	6406787
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**		
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - trees,Leaf litter,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Blackbutt*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Mixed shrubs, Hakea*		
Ground stratum	Absent				



Fulcrum photo ID 19d76158-a665-48e7-a6e8-69c238d6c40e,79ec3599-ef49-4f68-

5890-CAM-14-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 417439		**Northing**	6406496
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Marri, Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Macrozamia, Bossiaea*		
Ground stratum	Mid (0.5-1 m)	Sparse fernland (0.25-20%)	*Bracken*		



Fulcrum photo ID 3f98271c-ddd4-4ec6-8625-f6dddaa4df10,be1bf458-3290-426c-

5890-CAM-15-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 416306		**Northing**	6406784
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Litter				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Xanthorrhoea, Bossiaea*		
Ground stratum	Low (>0.5 m)	Isolated rushes and/or sedges (<0.25%)	*Sedges, isolated low Macrozamia*		



Fulcrum photo ID aadb96d9-b5ed-44a3-a9bf-6d99432db1db,65a21858-2f19-4ac3-

5890-CAM-16-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 416798		**Northing**	6407138
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Marri, Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Xanthorrhoea, Macrozamia, mixed shrubs*		
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID dab0d5a5-244a-4429-9954-6861d79d2211,691eaf4a-dfa5-42de-

5890-CAM-17-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 417303		**Northing**	6404120
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	South		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Brown,Yellow				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Allocasuarina, Banksia*	
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Banksia, Bossiaea*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedges, Macrozamia*	



Fulcrum photo ID a22099a2-77d3-4c3a-ba31-3072b07e537a,5023e02a-a199-40ac-

5890-CAM-18-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 419986		**Northing**	6406608
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Brown,Red				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Clearing, Infrastructure, Vehicle tracks				
Introduced fauna	Pig		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)		*Jarrah*	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Xanthorrhoea, Bossiaea*	
Ground stratum	Tall (1-2 m)	Open fernland (20-50%)		*Macrozamia, Bracken*	



Fulcrum photo ID f00650af-e562-48d5-8126-4433d53a0b11,42a85249-b518-4ce8-

5890-CAM-19-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 417253		**Northing**	6404832
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northwest		**Surface stone cover**	50 - 75%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Clearing,Vehicle tracks				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri, Allocasuarina*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Xanthorrhoea, Bossiaea*		
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)	*Macrozamia, mixed shrubs, isolated low sedges*		



Fulcrum photo ID ceafc228-2d38-4d22-9dda-87456772c709,e139000f-1f24-4fc5-

5890-CAM-20-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 416936		**Northing**	6404889
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	75 - 100%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Marri, Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Xanthorrhoea*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges, Macrozamia*		



Fulcrum photo ID 98012f3c-36f6-4d3e-a3cc-d865473e82e7,5f25b753-6fdb-4e40-9f1a-

5890-CAM-21-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 415598		**Northing**	6404340
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Litter,Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri, Banksia*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Xanthorrhoea, Banksia, Bossiaea*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges*		



Fulcrum photo ID 7993b8eb-936e-4c52-9eaf-8df942c587a1,660bd39e-b090-4271-

5890-CAM-22-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 418479		**Northing**	6406018
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri, Banksia grandis*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Acacia, Bossiaea, Bracken*		
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID 5bc59be0-50b1-4519-82fd-9e0d60feb79a

5890-CAM-23-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 419617		**Northing**	6406108
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Banksia*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Acacia*		
Ground stratum	Mid (0.5-1 m)	Sparse fernland (0.25-20%)	*Bracken, Macrozamia*		



Fulcrum photo ID f5e746bf-a1fb-4501-8868-5053e7d4cc9a,3eb24fbf-20ee-4f91-a715-

5890-CAM-24-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 418039		**Northing**	6406653
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite,None	
Aspect	Northwest		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Acacia, Bossiaea, Macrozamia, Xanthorrhoea, Bracken*		
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID c9001425-5821-4262-b090-0b830142a881

5890-CAM-25-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 416342		**Northing**	6406347
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Marri*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Bossiaea, Xanthorrhoea*		
Ground stratum	Low (>0.5 m)	Isolated rushes and/or sedges (<0.25%)	*Sedges, low sparse Macrozamia, low sparse mixed shrubs*		



Fulcrum photo ID 7c6de4b4-4b66-4eba-a5eb-8ce55c12ab71,b6179da9-ffc2-4500-

5890-CAM-26-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 412014		**Northing**	6404851
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	25 - 50%	
Soil type	Loam		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Xanthorrhoea, mixed shrubs*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Mixed shrubs, Bracken*		



Fulcrum photo ID 62447c7c-a2fe-4214-a989-9a80c97f89ef,2094f766-3e3d-4435-

5890-CAM-27-ML

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 414147		**Northing**	6406080
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Marri, Allocasuarina*	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Xanthorrhoea, sparse Acacia*	
Ground stratum	Low (>0.5 m)	Sparse tussock grassland (0.25-20%)		*Sedges*	



Fulcrum photo ID	4babd54f-5e2d-470f-b430-0051d54f948f,b6906bb5-1683-4b80-

5890-CAM-28-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 412126		**Northing**	6406980
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Marri, Allocasuarina*	
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Banksia grandis*	
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	304cca3c-2cbf-4bb5-8c15-fd5eb6a01f3d

5890-CAM-29-ML

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 411076		**Northing**	6407358
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	None	
Aspect	Southwest		**Surface stone cover**		
Soil type	Loam		**Surface stone size classes present**		
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	None observed				
Introduced fauna	Pig		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Jarrah, Allocasuarina*	
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)		*Banksia grandis, Woody Pear*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedges and Xanthorrhoea*	



Fulcrum photo ID 92fe33a8-bbc0-4bb6-997d-bfc44ebe9657,7bba9027-85fa-46fd-

5890-CAM-30-EW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 412158		**Northing**	6408936
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	25 - 50%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Marri, Allocasuarina, Bullich*	
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)		*Xanthorrhoea, Macrozamia, Banksia grandis*	
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID 36169c64-862f-46cf-ae0b-d7a351aaf256

5890-CAM-31-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 412295		**Northing**	6410764
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Allocasuarina, Jarrah, Marri*		
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*Myrtaceae shrubs*		
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	cb1fe5b7-0af4-4cd3-9d5d-17c1eff9231b

5890-CAM-32-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 415341		**Northing**	6411406
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Marri, Jarrah*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*Banksia sessilis*		
Ground stratum	Mid (0.5-1 m)	Open rushland and/or sedgeland (20-50%)			



Fulcrum photo ID	0b07ea2b-ad2c-4a9c-833d-50c3fff369de

5890-CAM-33-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	416112	**Northing**	6409057
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	

Vegetation			
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Macrozamia, Xanthorrhoea, Bracken*
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)	



Fulcrum photo ID	3bd1e218-6305-403a-8cf7-c4836dcd2ee5

5890-CAM-34-EW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	416630	**Northing**	6407778
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	

Vegetation			
Upper stratum	Tall (>30 m)	Open forest (50-80%)	*Marri, Jarrah*
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Xanthorrhoea, Macrozamia*
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	



Fulcrum photo ID	c46cbd3f-b2d6-40c1-ad83-6e0f4d942f13,26df2056-2030-4776-88df-

5890-CAM-35-EW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 415285		**Northing**	6408162
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Clearing,Vehicle tracks				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Marri, Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Acacia, Macrozamia, Bossiaea*		
Ground stratum	Mid (0.5-1 m)	Sparse fernland (0.25-20%)	*Bracken*		



Fulcrum photo ID	854aa245-f405-41b0-8eee-80baffc5910a,363a5ea6-c76b-451b-

5890-CAM-36-EW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 414091		**Northing**	6409021
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Tall (>30 m)	Open forest (50-80%)	*Jarrah, Marri*		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Banksia grandis*		
Ground stratum	Mid (0.5-1 m)	Open fernland (20-50%)	*Bracken*		



Fulcrum photo ID	f95c592e-5016-4136-b7fe-48f8413c9e48,c35d1c8d-71ef-4f94-98dd-

5890-CAM-37-LB

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 423756		**Northing**	6403770
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	South		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Orange				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**		
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Banksia, Xanthorrhoea*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Mixed shrubs*		



Fulcrum photo ID	ea83a00a-e4b7-4894-b42a-9c3d549a4ca9

5890-CAM-38-LB

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 423256		**Northing**	6405073
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	None	
Aspect	Negligible		**Surface stone cover**		
Soil type	Sandy loam		**Surface stone size classes present**		
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	Clearing				
Introduced fauna			**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Jarrah, Banksia*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Mixed shrubs*		



Fulcrum photo ID	dd751155-9d7e-402f-85c6-64025933a29d

5890-CAM-39-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 425674		**Northing**	6405102
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Jarrah, Marri*	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Bossiaea, mixed shrubs*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedges, low Macrozamia*	



Fulcrum photo ID 600eb4d8-3130-419b-a819-5e22b7900d79,c19f79ca-c3fd-4a0f-

5890-CAM-40-EW

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 427568		**Northing**	6405288
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northwest		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Jarrah, Marri, Allocasuarina, Banksia grandis*	
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)		*Bossiaea*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID 7c611136-f4d4-4ce3-8ca0-e6901d8ddd04

5890-CAM-41-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 426446		**Northing**	6406254
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	Laterite	
Aspect	South		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Brown,Orange				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Marri, Allocasuarina*		
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)	*Mixed shrubs, Banksia, Bossiaea, Xanthorrhoea*		
Ground stratum	Absent				



Fulcrum photo ID 1f34b905-e757-40b1-a38d-0f1e996c2248,426715fa-0da2-4cd7-

5890-CAM-42-EW

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 426984		**Northing**	6406045
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	0 - 5%	
Soil type	Clay loam		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Marri, Jarrah*		
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*Bossiaea, Xanthorrhoea, other mixed shrubs*		
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)			



Fulcrum photo ID bf84367a-0bcb-459c-b038-be583d080904

5890-CAM-43-LB

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 429086		**Northing**	6407057
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Peeling bark,Woody debris	
Disturbance	Clearing				
Introduced fauna			**Ground Cover**		
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Banksia*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Low Banksia, sedges*		



Fulcrum photo ID a4c15c2c-d300-42a7-821e-82fefca1a456

5890-CAM-44-ML

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 428400		**Northing**	6407249
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northwest		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**		
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Allocasuarina*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Banksia grandis, Grevillea, Hibbertia, Xanthorrhoea*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges, prostrate Banksia, mixed low shrubs*		



Fulcrum photo ID 9d94cc3d-33c1-41df-ad12-ef9a62309037,bc189d67-f8fd-4eac-94e3-

5890-CAM-45-LB

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	427995	**Northing**	6407445
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Peeling bark	
Disturbance	Clearing				
Introduced fauna			**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Xanthorrhoea*		
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Low Banksia, sedges*		



Fulcrum photo ID	b7555f84-72fc-4a07-ae19-af1e85020849

5890-CAM-46-LB

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	428035	**Northing**	6408197
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	None	
Aspect	East		**Surface stone cover**		
Soil type	Sandy loam		**Surface stone size classes present**		
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Present	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	None observed				
Introduced fauna			**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Closed shrubland and/or heathland (>80%)	*Gastropodium*		
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Sedges, mixed shrubs*		



Fulcrum photo ID	4081cb6b-0af8-4504-a44b-a7f7f11964ec

5890-CAM-47-LB

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 427178		**Northing**	6408075
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Exfoliating rock,Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	Clearing				
Introduced fauna			**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah, Allocasuarina*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Allocasuarina, Xanthorrhoea*		
Ground stratum	Low (>0.5 m)	Rushland and/or sedgeland (50-80%)	*Grevillea*		



Fulcrum photo ID	1c2d6583-6461-4db3-9f6e-e96f9e09dda7

5890-CAM-48-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 418052		**Northing**	6404063
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	50 - 75%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	Infrastructure				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah, Eucalyptus rudis*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*Mixed shrubs*		
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*Mixed*		



Fulcrum photo ID	b9c64bc0-5ab0-4f3a-8012-53e1aeb71ee5,ee8acffb-6be1-4b73-

5890-CAM-49-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 426929		**Northing**	6407348
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah, Marri, Banksia*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Xanthorrhoea, mixed shrubs*		
Ground stratum	Low (>0.5 m)	Isolated rushes and/or sedges (<0.25%)	*Sedges, low isolated Macrozamia*		



Fulcrum photo ID 1bc7eb7e-a4b3-40d8-99ab-0c160553203d,5c49a7c5-7f3e-40fe-

5890-CAM-50-LB

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 423194		**Northing**	6404446
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Rock crevices,Woody debris	
Disturbance	Clearing				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Gastrolopium, Jarrah, Banksia*		
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Mixed shrubs*		



Fulcrum photo ID 3017fda8-3c2a-45fe-8540-a6e7c7d40115

5890-CAM-51-EW

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	422527	**Northing**	6409154
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	None	
Aspect	Northeast		**Surface stone cover**		
Soil type	Clay loam		**Surface stone size classes present**		
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Bullich, Marri, Jarrah*	
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)		*Melaleuca and other Myrtaceae sp,*	
Ground stratum	Tall (1-2 m)	Rushland and/or sedgeland (50-80%)			



Fulcrum photo ID 902db352-5d59-4dd4-9a5b-2ecdacc1ccc1

5890-CAM-52-ML

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	425776	**Northing**	6408886
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Peeling bark,Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Jarrah*	
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)		*Gastrolibia, Jarrah, Xanthorrhoea*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Mixed shrubs*	



Fulcrum photo ID 54ff9002-5c16-4dd3-a678-da8dbc40af73,c3d72fb0-51e9-4deb-bfff-

5890-CAM-53-EW

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	426719	**Northing**	6408184
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Grey				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Allocasuarina, Banksia grandis*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Myrtaceae, Gastrolobium, Kingia*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	aa4a04d3-1d8c-46d3-8e65-fa998b54a502

5890-CAM-54-LB

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	427670	**Northing**	6408985
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	0 - 5%	
Soil type	Sand		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Xanthorrhoea, Jarrah*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges, mixed shrubs, Macrozamia*		



Fulcrum photo ID	47c2585f-b5db-496f-b7b7-8470f7cbb6ae

5890-CAM-55-LB

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 427233		**Northing**	6408745
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*Xanthorrhoea, Bossiaea*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Macrozamia, mixed shrubs*		



Fulcrum photo ID	11ce7f26-c5cd-463a-ba29-2061165a18bf

5890-CAM-56-LB

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 430071		**Northing**	6407275
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	Clearing,Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**		
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Jarrah*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges, low Banksia*		



Fulcrum photo ID	877724e5-600a-4421-982c-16aea780643a

5890-CAM-57-LB

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 430472		**Northing**	6408711
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Rocks (20 - 60 cm)	
Soil colour	Brown,Orange				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance	Clearing				
Introduced fauna	None observed		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Banksia grandis, Macrozamia*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges, low Banksia, mix low shrubs*		



Fulcrum photo ID 0539fe77-7044-4a25-a77f-f8609b9701b6

5890-CAM-58-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 424039		**Northing**	6410846
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Allocasuarina, Jarrah, Marri, Banksia sessilis, B. grandis*		
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Myrtaceae, other mixed shrubs*		
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID 15f94c0e-7c52-4623-9592-b49e527059e7,954d4f3a-69ad-42a3-

5890-CAM-59-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	424989	**Northing**	6410464
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Allocasuarina, Marri, Jarrah, Banksia grandis*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Mixed shrubs, Myrtaceae, Hakea, Macrozamia*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	fc9b10fa-a390-4e57-ac51-4e85a68cf76f

5890-CAM-60-EW

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	425941	**Northing**	6409761
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	South		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Marri, Allocasuarina*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Xanthorrhoea, Macrozamia*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	9143e45f-3ea8-4d43-bdcd-9ab7617e2cb9

5890-CAM-61-EW

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 426681		**Northing**	6409764
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	Granite,Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Marri, Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Acacia, Xanthorrhoea*		
Ground stratum	Mid (0.5-1 m)	Open rushland and/or sedgeland (20-50%)	*Sedges and Banksia groundcover*		



Fulcrum photo ID 5f1ea2c7-a400-4ab1-b8e7-c8d9ce0b26f1

5890-CAM-62-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 426998		**Northing**	6410371
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Banksia grandis*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Acacia, Bossiaea, Xanthorrhoea, Macrozamia*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID 5cac0509-dc98-4491-a1cc-f06aab794a24

5890-CAM-63-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 421939		**Northing**	6410430
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	50 - 75%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Brown,Grey				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Clearing,Vehicle tracks				
Introduced fauna	Pig		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah, Marri, Allocasuarina*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Banksia sessilis, Hakea*		
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID 15158e27-e2dd-4dc5-a2d6-75219a7fed01

5890-CAM-64-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 417955		**Northing**	6404309
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	50 - 75%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Infrastructure				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah, Eucalyptus rudis*		
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*Acacia, banksia, Xanthorrhoea*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges*		



Fulcrum photo ID 54aad59d-d420-4bfc-972c-c3f69fbc4ff3,2c7f432e-89c4-46bf-a9ea-

5890-CAM-65-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 422649		**Northing**	6409101
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	Laterite	
Aspect	Northwest		**Surface stone cover**	0 - 5%	
Soil type	Clay loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Brown,Red				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Bullich, Marri*		
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*Xanthorrhoea, Bracken, mixed shrubs*		
Ground stratum	Tall (1-2 m)	Rushland and/or sedgeland (50-80%)			



Fulcrum photo ID	3137beae-0c26-40ff-82e7-35df654e0112

5890-CAM-66-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 422220		**Northing**	6409545
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Allocasuarina, Marri, Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Xanthorrhoea, mixed shrubs*		
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	67cbeda9-79dc-4b95-a9e8-20f858353a31

5890-CAM-67-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 421841		**Northing**	6409254
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	South		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Marri, Jarrah, Allocasuarina*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Xanthorrhoea*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	245def45-420d-4631-89ce-cab10b15fe02

5890-CAM-68-EW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 421952		**Northing**	6407763
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	None	
Aspect	Southwest		**Surface stone cover**		
Soil type	Clay loam		**Surface stone size classes present**		
Soil colour	Brown,Red				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Marri, Jarrah*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*Acacia, Hakea, Xanthorrhoea, Bossiaea, Myrtaceae*		
Ground stratum	Tall (1-2 m)	Rushland and/or sedgeland (50-80%)			



Fulcrum photo ID	5c651e6a-c770-4942-b000-917ba9ec0f0a,b45481df-0ff8-4f61-ac63-

5890-CAM-69-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 420546		**Northing**	6411099
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Marri, Banksia grandis*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Xanthorrhoea, Macrozamia*		
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	9241922b-40d9-4b55-bab8-542844dfef7f

5890-CAM-70-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 421371		**Northing**	6411757
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Marri, Banksia grandis*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Xanthorrhoea, Macrozamia, Bossiaea*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	9f182e93-572b-44da-b184-9a986d066f64

5890-CAM-71-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 423180		**Northing**	6406547
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	None	
Aspect	South		**Surface stone cover**		
Soil type	Sandy loam		**Surface stone size classes present**		
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah, Allocasuarina, Banksia*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Xanthorrhoea, Acacia, mixed shrubs*		
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Sedges, low isolated Macrozamia*		



Fulcrum photo ID 19eb0125-56d0-4cf9-85e5-c49e58340e0a,91d40a8d-3a53-4604-

5890-CAM-72-LB

Project:	5890				
Date	25-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 422212		**Northing**	6406903
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Peeling bark,Woody debris	
Disturbance	Clearing,Erosion				
Introduced fauna	Pig,None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Jarrah*		
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)			



Fulcrum photo ID 892eb777-d953-4e7b-9a23-d60c28b59dfd

5890-CAM-73-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 424726		**Northing**	6406616
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Big Rocks (60 cm - 2 m)	
Soil colour	Brown,Grey				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - trees,Leaf litter,Logs > 10 cm,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Xanthorrhoea, mixed shrubs*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges*		



Fulcrum photo ID 6285a4a1-8273-410a-b346-10fee934ccd0,9a12e905-55e9-46e4-

5890-CAM-74-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 425824		**Northing**	6407296
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*Xanthorrhoea, Bossiaea, mixed shrubs*		
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*Hibbertia, Macrozamia*		



Fulcrum photo ID 4122824c-de8e-4ad6-9581-e06f5ddf3e3b,392bedf8-e959-47ec-

5890-CAM-75-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 423659		**Northing**	6407780
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	50 - 75%	
Soil type	Sand		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Brown,Yellow				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - trees,Leaf litter,Logs > 10 cm,Woody debris	
Disturbance	Clearing,Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)		*Allocasuarina, Jarrah, Banksia*	
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)		*Bossiaea, Banksia, mixed shrubs*	
Ground stratum	Low (>0.5 m)	Isolated rushes and/or sedges (<0.25%)		*Sedges*	



Fulcrum photo ID 2531df38-0311-4099-8cfe-7e8b14684e56,89089b33-7982-4036-

5890-CAM-76-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 418709		**Northing**	6407565
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, banksia*	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Bossiaea*	
Ground stratum	Mid (0.5-1 m)	Sparse fernland (0.25-20%)		*Macrozamia, Bracken, low isolated sedges*	



Fulcrum photo ID c1b20fc4-ef28-46dd-bd40-1155608e34bf,66eb64c7-5374-425c-

5890-CAM-77-PW

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 419294		**Northing**	6407124
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Marri*	
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)		*Mixed shrubs*	
Ground stratum	Mid (0.5-1 m)	Open fernland (20-50%)		*Ferns, Macrozamia*	



Fulcrum photo ID ac39f65f-2bc2-4430-83c1-5b413257478d,d28fd9c8-99fc-4715-b99b-

5890-CAM-78-ML

Project:	5890				
Date	23-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 413790		**Northing**	6407095
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	None observed		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Closed forest (>80%)		*Jarrah, Marri*	
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)		*Banksia grandis, Macrozamia*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedges*	



Fulcrum photo ID 325f3ec9-ff18-404a-9b17-af8bd914ebde,7d994e1e-fe42-468f-9758-

5890-CAM-79-PW

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 415224		**Northing**	6405833
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Northwest		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Bossiaea*		
Ground stratum	Mid (0.5-1 m)	Sparse fernland (0.25-20%)	*Macrozamia, low sparse sedges*		



Fulcrum photo ID 29f5f5b8-487e-4945-9910-71834c7f5c4a,736a9741-6f33-4edd-

5890-CAM-80-EW

Project:	5890				
Date	24-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 417378		**Northing**	6409077
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm)	
Soil colour	Black,Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs,Hollows - trees,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Marri*		
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Banksia grandis, Macrozamia, Persoonia*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID 8ddfd16f-cc2b-4183-9da3-90d45e10d4b0

5890-HAB-01-ML

Project:	5890				
Date	22-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 420605		**Northing**	6406539
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	0 - 5%	
Soil type	Clay loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - trees,Leaf litter,Peeling bark,Woody debris	
Disturbance					
Introduced fauna	Pig		**Ground Cover**		
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri*		
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*Acacia, Banksia, Bracken*		
Ground stratum	Absent				



Fulcrum photo ID	eeebf140-9355-48c3-869d-82bc34b7cd85

5890-HAB-01-PW

Project:	5890				
Date	6-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 421558		**Northing**	6406231
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy clay		**Surface stone size classes present**	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter,Woody debris	
Disturbance	None observed				
Introduced fauna	Pig,Rabbit		**Ground Cover**	<10%	
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Blackbutt*		
Mid stratum	Mid (1-2 m)	Closed shrubland and/or heathland (>80%)	*Banksia*		
Ground stratum	Absent				



Fulcrum photo ID	e90fdcb9-6b2d-4ff0-a4f9-5eca7ec052ec,8da1576f-c061-45f7-a7cc-

Appendix F Significant Fauna Records

Targeted Chuditch, Quokka, and Woylie Survey

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Zanda baudinii	Baudin's Cockatoo	EN	EN	1	23-08-2023	-32.4637	116.1120	Foraging evidence
Zanda baudinii	Baudin's Cockatoo	EN	EN	1	24-08-2023	-32.4521	116.1758	Foraging evidence
Zanda latirostris	Carnaby's Cockatoo	EN	EN	40	26-08-2023	-32.4635	116.2185	Sighting
Zanda latirostris	Carnaby's Cockatoo	EN	EN	10	10-09-2023	-32.4746	116.1622	Sighting - overhead
Dasyurus geoffroii	Chuditch	VU	VU	1	02-09-2023	-32.4889	116.1832	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	03-09-2023	-32.4700	116.0826	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	02-09-2023	-32.4405	116.1696	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	03-09-2023	-32.4405	116.1696	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	25-08-2023	-32.4749	116.1485	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	25-08-2023	-32.4749	116.1485	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	25-08-2023	-32.4749	116.1485	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	26-08-2023	-32.4749	116.1485	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	31-08-2023	-32.4749	116.1485	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	03-09-2023	-32.4285	116.1637	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	04-09-2023	-32.4285	116.1637	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	07-09-2023	-32.4285	116.1637	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	08-09-2023	-32.4605	116.0986	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	29-08-2023	-32.4533	116.0654	Camera trap

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Dasyurus geoffroii	Chuditch	VU	VU	1	30-08-2023	-32.4533	116.0654	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	27-08-2023	-32.4514	116.0760	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	27-08-2023	-32.4514	116.0760	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	28-08-2023	-32.4514	116.0760	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	29-08-2023	-32.4514	116.0760	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	07-09-2023	-32.4404	116.2020	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	09-09-2023	-32.4404	116.2020	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	09-09-2023	-32.4404	116.2020	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	01-09-2023	-32.4646	116.1877	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	02-09-2023	-32.4646	116.1877	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	05-09-2023	-32.4646	116.1877	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	01-09-2023	-32.4524	116.1210	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	06-09-2023	-32.4524	116.1210	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	22-08-2023	-32.4527	116.0860	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	22-08-2023	-32.4527	116.0860	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	23-08-2023	-32.4527	116.0860	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	23-08-2023	-32.4527	116.0860	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	23-08-2023	-32.4527	116.0860	Camera trap

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Dasyurus geoffroii	Chuditch	VU	VU	1	24-08-2023	-32.4527	116.0860	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	04-09-2023	-32.4525	116.1075	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	27-08-2023	-32.4372	116.0754	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	28-08-2023	-32.4372	116.0754	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	23-08-2023	-32.4461	116.0873	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	23-08-2023	-32.4461	116.0873	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	24-08-2023	-32.4461	116.0873	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	26-08-2023	-32.4461	116.0873	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	30-08-2023	-32.4461	116.0873	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	30-08-2023	-32.4757	116.1214	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	30-08-2023	-32.4757	116.1214	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	02-09-2023	-32.4757	116.1214	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	28-08-2023	-32.4547	116.2103	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	29-08-2023	-32.4547	116.2103	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	29-08-2023	-32.4547	116.2103	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	04-09-2023	-32.4547	116.2103	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	24-08-2023	-32.4641	116.1129	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	25-08-2023	-32.4641	116.1129	Camera trap

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Dasyurus geoffroii	Chuditch	VU	VU	1	01-09-2023	-32.4792	116.0863	Camera trap
Dasyurus geoffroii	Chuditch	VU	VU	1	01-09-2023	-32.4792	116.0863	Camera trap
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	30	22-08-2023	-32.4509	116.0631	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	11	22-08-2023	-32.4526	116.0860	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	9	22-08-2023	-32.4658	116.0541	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	8	22-08-2023	-32.4772	116.1116	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	7	22-08-2023	-32.4952	116.1014	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	7	22-08-2023	-32.4900	116.1155	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	6	23-08-2023	-32.4727	116.1667	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	4	23-08-2023	-32.4751	116.1292	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	4	23-08-2023	-32.4816	116.1234	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	3	23-08-2023	-32.4471	116.0874	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	23-08-2023	-32.4837	116.1145	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	23-08-2023	-32.4769	116.2133	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4716	116.1707	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4801	116.1323	Scat
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4801	116.1323	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4523	116.1075	Scat

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4454	116.0870	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4704	116.1148	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4752	116.1213	Scat
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	23-08-2023	-32.4742	116.1210	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	24-08-2023	-32.4418	116.2233	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	24-08-2023	-32.4411	116.2239	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	24-08-2023	-32.4414	116.1673	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	24-08-2023	-32.4293	116.1642	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	24-08-2023	-32.4292	116.1643	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	26-08-2023	-32.4550	116.2104	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	09-09-2023	-32.4645	116.0583	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	10-09-2023	-32.4770	116.1112	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	11-09-2023	-32.4891	116.1864	Foraging evidence
Setonix brachyurus	Quokka	VU	VU	6	30-08-2023	-32.4526	116.1770	Camera trap
Setonix brachyurus	Quokka	VU	VU	3	02-09-2023	-32.4526	116.1770	Camera trap
Setonix brachyurus	Quokka	VU	VU	3	03-09-2023	-32.4526	116.1770	Camera trap
Setonix brachyurus	Quokka	VU	VU	3	10-09-2023	-32.4691	116.2107	Camera trap
Setonix brachyurus	Quokka	VU	VU	2	08-09-2023	-32.4485	116.1725	Camera trap

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Setonix brachyurus	Quokka	VU	VU	2	26-08-2023	-32.4521	116.1757	Camera trap
Setonix brachyurus	Quokka	VU	VU	2	29-08-2023	-32.4521	116.1757	Camera trap
Setonix brachyurus	Quokka	VU	VU	2	29-08-2023	-32.4521	116.1757	Camera trap
Setonix brachyurus	Quokka	VU	VU	2	30-08-2023	-32.4521	116.1757	Camera trap
Setonix brachyurus	Quokka	VU	VU	2	31-08-2023	-32.4521	116.1757	Camera trap
Setonix brachyurus	Quokka	VU	VU	1	02-09-2023	-32.4521	116.1757	Camera trap
Setonix brachyurus	Quokka	VU	VU	1	08-09-2023	-32.4521	116.1757	Camera trap
Setonix brachyurus	Quokka	VU	VU	1	25-08-2023	-32.4344	116.1548	Camera trap
Setonix brachyurus	Quokka	VU	VU	1	26-08-2023	-32.4734	116.1646	Camera trap
Setonix brachyurus	Quokka	VU	VU	1	26-08-2023	-32.4734	116.1646	Camera trap
Setonix brachyurus	Quokka	VU	VU	1	27-08-2023	-32.4734	116.1646	Camera trap
Setonix brachyurus	Quokka	VU	VU	1	30-08-2023	-32.4734	116.1646	Camera trap
Setonix brachyurus	Quokka	VU	VU	1	09-09-2023	-32.4734	116.1646	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	23-08-2023	-32.4312	116.0995	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	24-08-2023	-32.4312	116.0995	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	25-08-2023	-32.4312	116.0995	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	26-08-2023	-32.4372	116.0754	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	27-08-2023	-32.4372	116.0754	Camera trap

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	28-08-2023	-32.4312	116.0995	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	29-08-2023	-32.4312	116.0995	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	01-09-2023	-32.4312	116.0995	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	04-09-2023	-32.4312	116.0995	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	06-09-2023	-32.4509	116.0631	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	08-09-2023	-32.4509	116.0631	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	08-09-2023	-32.4312	116.0995	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	09-09-2023	-32.4509	116.0631	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	09-09-2023	-32.4792	116.0863	Camera trap
Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		1	09-09-2023	-32.4757	116.1214	Camera trap
Isoodon fusciventer	Quenda	P4		1	22-08-2023	-32.4700	116.0826	Digging
Isoodon fusciventer	Quenda	P4		1	24-08-2023	-32.4730	116.1093	Camera trap
Isoodon fusciventer	Quenda	P4		1	25-08-2023	-32.4730	116.1093	Camera trap
Isoodon fusciventer	Quenda	P4		1	25-08-2023	-32.4769	116.1097	Camera trap
Isoodon fusciventer	Quenda	P4		1	26-08-2023	-32.4769	116.1097	Camera trap
Isoodon fusciventer	Quenda	P4		1	26-08-2023	-32.4901	116.1159	Camera trap
Isoodon fusciventer	Quenda	P4		1	26-08-2023	-32.4815	116.0978	Camera trap
Isoodon fusciventer	Quenda	P4		1	26-08-2023	-32.4527	116.0860	Camera trap

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Isoodon fusciventer	Quenda	P4		1	26-08-2023	-32.4716	116.1707	Camera trap
Isoodon fusciventer	Quenda	P4		1	26-08-2023	-32.4674	116.0538	Camera trap
Isoodon fusciventer	Quenda	P4		1	27-08-2023	-32.4815	116.0978	Camera trap
Isoodon fusciventer	Quenda	P4		1	27-08-2023	-32.4801	116.1324	Camera trap
Isoodon fusciventer	Quenda	P4		1	27-08-2023	-32.4730	116.1093	Camera trap
Isoodon fusciventer	Quenda	P4		1	28-08-2023	-32.4730	116.1093	Camera trap
Isoodon fusciventer	Quenda	P4		1	28-08-2023	-32.4801	116.1324	Camera trap
Isoodon fusciventer	Quenda	P4		1	28-08-2023	-32.4815	116.0978	Camera trap
Isoodon fusciventer	Quenda	P4		1	28-08-2023	-32.4527	116.0860	Camera trap
Isoodon fusciventer	Quenda	P4		1	29-08-2023	-32.4674	116.0538	Camera trap
Isoodon fusciventer	Quenda	P4		1	30-08-2023	-32.4815	116.0978	Camera trap
Isoodon fusciventer	Quenda	P4		1	30-08-2023	-32.4901	116.1159	Camera trap
Isoodon fusciventer	Quenda	P4		1	31-08-2023	-32.4901	116.1159	Camera trap
Isoodon fusciventer	Quenda	P4		1	31-08-2023	-32.4730	116.1093	Camera trap
Isoodon fusciventer	Quenda	P4		1	31-08-2023	-32.4907	116.1192	Camera trap
Isoodon fusciventer	Quenda	P4		1	01-09-2023	-32.4907	116.1192	Camera trap
Isoodon fusciventer	Quenda	P4		4	01-09-2023	-32.4901	116.1159	Camera trap
Isoodon fusciventer	Quenda	P4		3	02-09-2023	-32.4901	116.1159	Camera trap

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Isoodon fusciventer	Quenda	P4		3	02-09-2023	-32.4907	116.1192	Camera trap
Isoodon fusciventer	Quenda	P4		2	03-09-2023	-32.4907	116.1192	Camera trap
Isoodon fusciventer	Quenda	P4		2	03-09-2023	-32.4901	116.0635	Camera trap
Isoodon fusciventer	Quenda	P4		1	03-09-2023	-32.4641	116.1129	Camera trap
Isoodon fusciventer	Quenda	P4		1	04-09-2023	-32.4801	116.1324	Camera trap
Isoodon fusciventer	Quenda	P4		1	04-09-2023	-32.4815	116.0978	Camera trap
Isoodon fusciventer	Quenda	P4		1	04-09-2023	-32.4527	116.0860	Camera trap
Isoodon fusciventer	Quenda	P4		1	05-09-2023	-32.4730	116.1093	Camera trap
Isoodon fusciventer	Quenda	P4		1	05-08-2023	-32.4901	116.1159	Camera trap
Isoodon fusciventer	Quenda	P4		1	06-09-2023	-32.4815	116.0978	Camera trap
Isoodon fusciventer	Quenda	P4		1	08-09-2023	-32.4907	116.1192	Camera trap
Isoodon fusciventer	Quenda	P4		1	09-09-2023	-32.4901	116.0635	Camera trap
Isoodon fusciventer	Quenda	P4		1	09-09-2023	-32.4730	116.1093	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		3	24-08-2023	-32.4641	116.1129	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		3	24-08-2023	-32.4461	116.0873	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		2	24-08-2023	-32.4695	116.2559	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		2	24-08-2023	-32.4491	116.2235	Sighting
Notamacropus irma	Western Brush Wallaby	P4		2	25-08-2023	-32.4739	116.2348	Sighting

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Notamacropus irma	Western Brush Wallaby	P4		1	25-08-2023	-32.4586	116.2274	Sighting
Notamacropus irma	Western Brush Wallaby	P4		1	25-08-2023	-32.4563	116.2162	Sighting
Notamacropus irma	Western Brush Wallaby	P4		1	25-08-2023	-32.4804	116.2229	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	25-08-2023	-32.4801	116.1324	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	25-08-2023	-32.4785	116.2172	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	26-08-2023	-32.4730	116.1093	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	26-08-2023	-32.4414	116.2234	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	27-08-2023	-32.4775	116.2134	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	28-08-2023	-32.4775	116.2134	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	28-08-2023	-32.4698	116.2419	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	29-08-2023	-32.4888	116.2089	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	29-08-2023	-32.4691	116.2107	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	30-08-2023	-32.4775	116.2134	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	31-08-2023	-32.4775	116.2134	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	03-09-2023	-32.4775	116.2134	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	04-09-2023	-32.4724	116.1722	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	05-09-2023	-32.4611	116.2343	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	06-09-2023	-32.4793	116.1445	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	08-09-2023	-32.4804	116.2229	Camera trap

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Notamacropus irma	Western Brush Wallaby	P4		1	09-09-2023	-32.4775	116.2134	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	10-09-2023	-32.4793	116.1445	Camera trap
Notamacropus irma	Western Brush Wallaby	P4		1	11-09-2023	-32.4961	116.1801	Sighting
Notamacropus irma	Western Brush Wallaby	P4		1	11-09-2023	-32.4765	116.2110	Sighting

Appendix G Chuditch Spot Analysis

Targeted Chuditch, Quokka, and Woylie Survey

Huntly Mine – Myara Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

Chuditch Spot Analysis 2023

675.VX5890.00001 Huntly Mine – Myara Region

1: DOT TO DOT

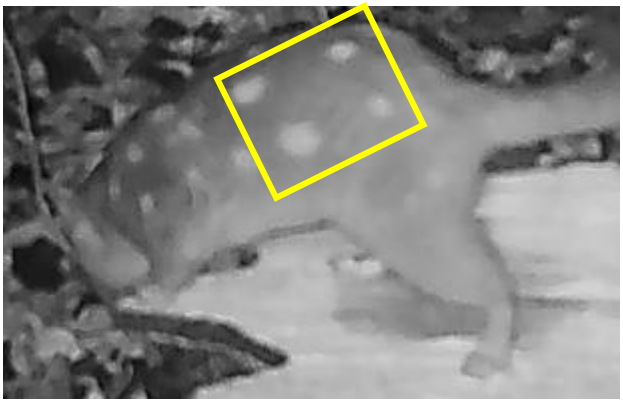
Three spots L hind quarter, two lines of spots R hind quarter. Site 5890-CAM-63-EW.

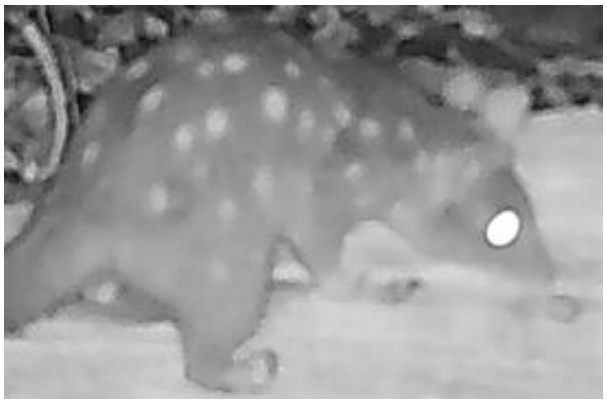


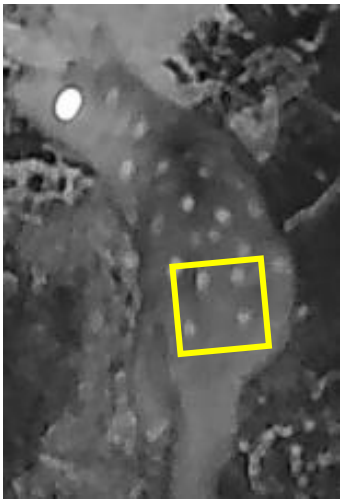


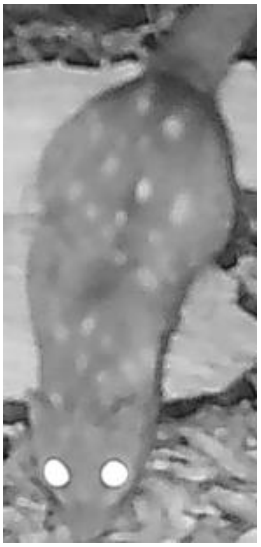
2: SQUARE BUM

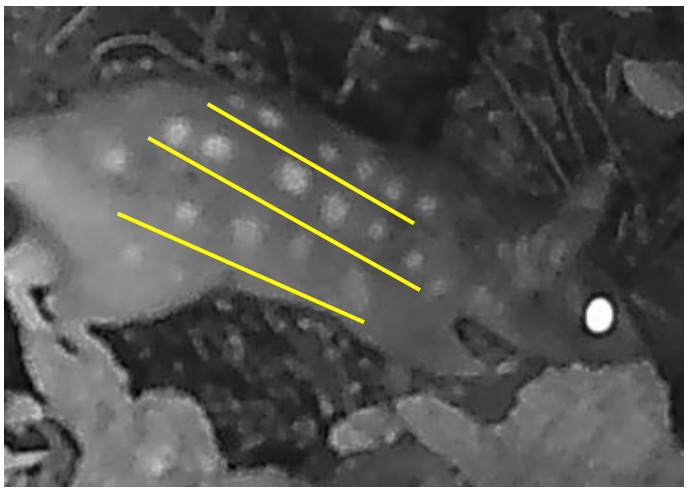
Square of four spots on L hind quarter and square of four spots on bum, three lines of spots down R side. Sites 5890-CAM-04-EW and 5890-CAM-06-EW.





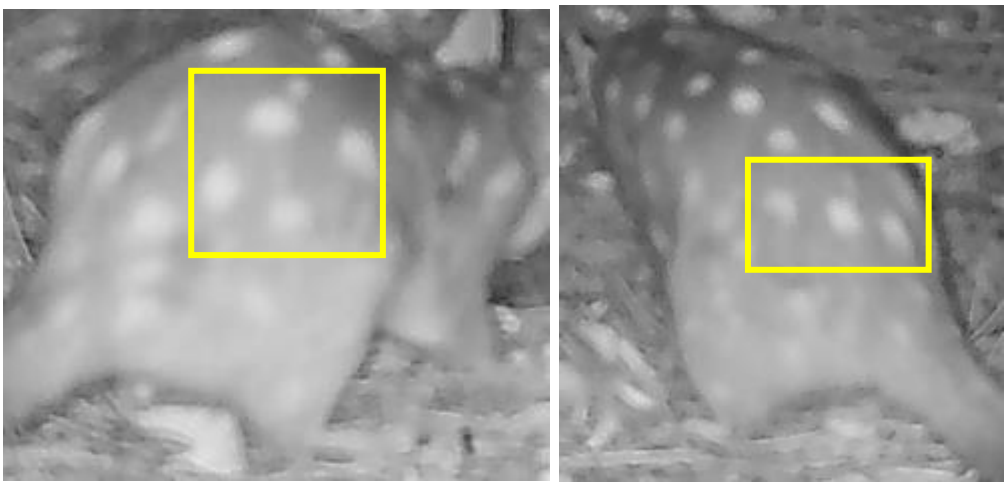






3: FOUR DICE

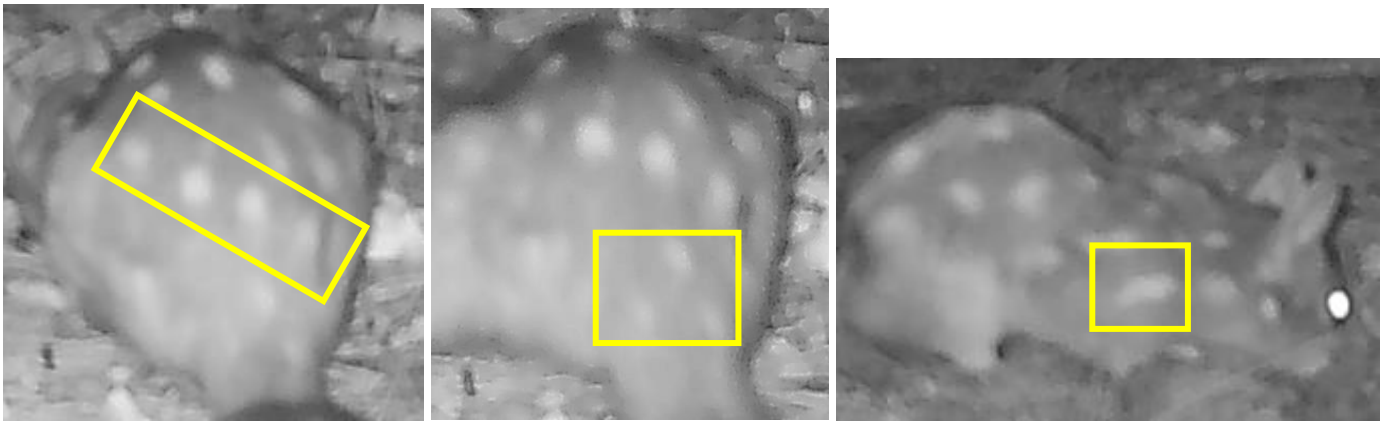
Square of spots R hind quarter, line of three spots on bum. Site 5890-CAM-59-EW.



4: SPOT THE DIFFERENCE

Four dice spots on R hind quarter, line of four spots across bum, triangle of spots base of tail, smudged spot on R shoulder. Site 5890-CAM-59-EW.

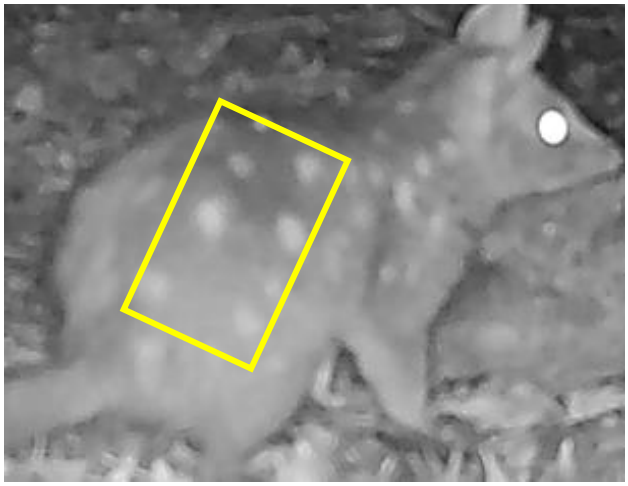


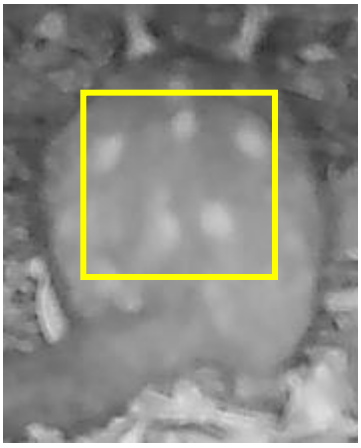


5: PENTAGON BUM

Six dice spots on R hind quarter, four dice spots on L hind quarter, five spots on bum. Site 5937-CAM-18-PW.

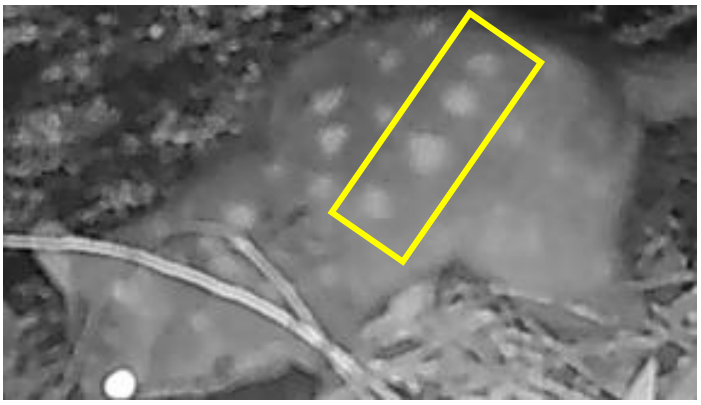






6: SPOT-IFY

Four spot line L hind quarter. Site 5890-CAM-70-EW.



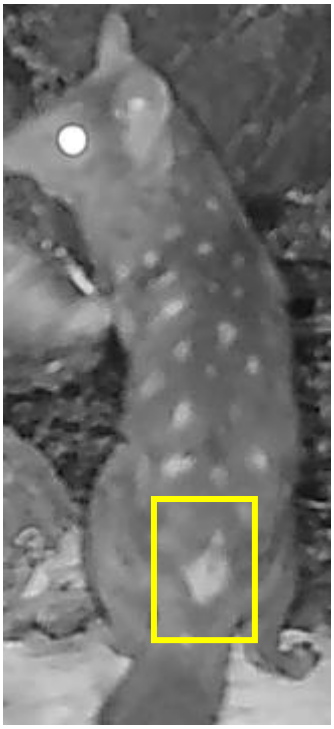




7: DIAMOND BUM

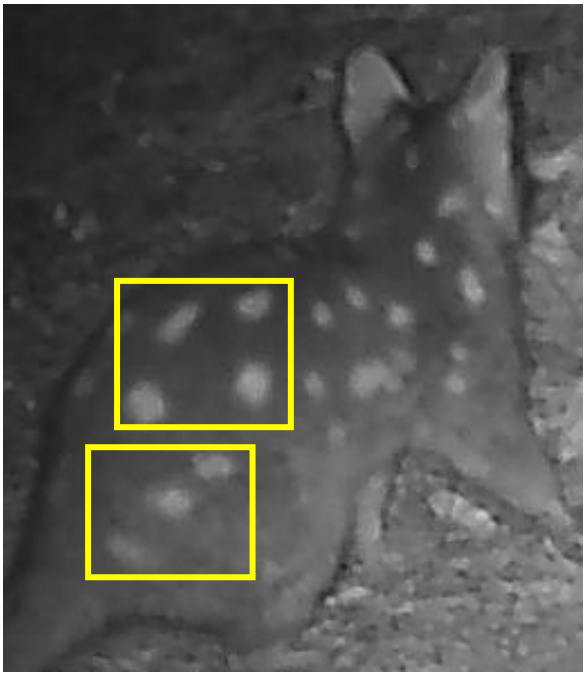
Five dice spots L side, diamond spot at base of tail. Site 5890-CAM-30-EW.



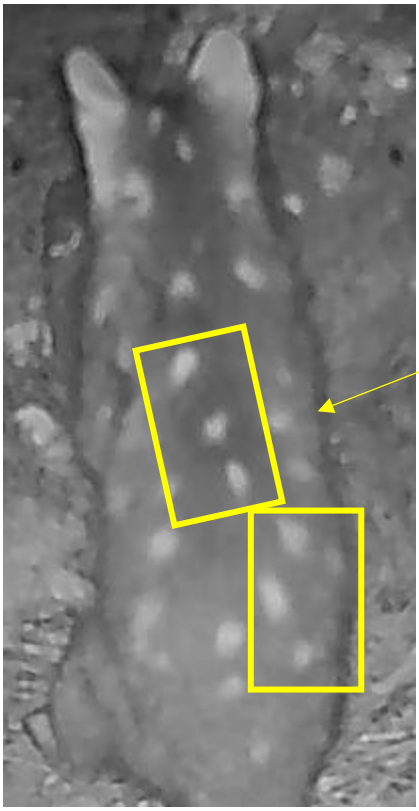


8: PAWPRINT

Four dice spots and three dice spots L hind quarter, pawprint spots R side, line of three spots on back. Site 5890-CAM-75-PW.

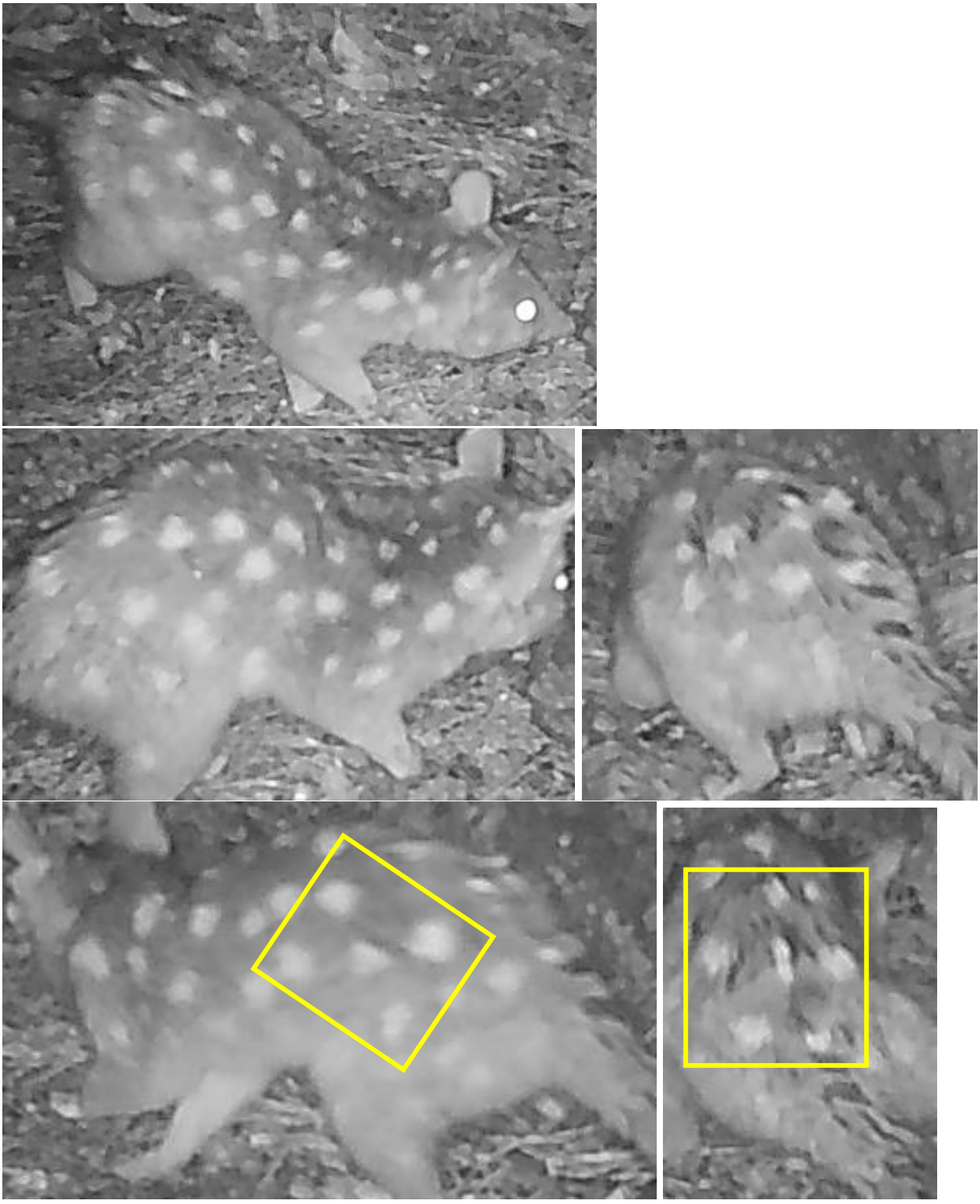






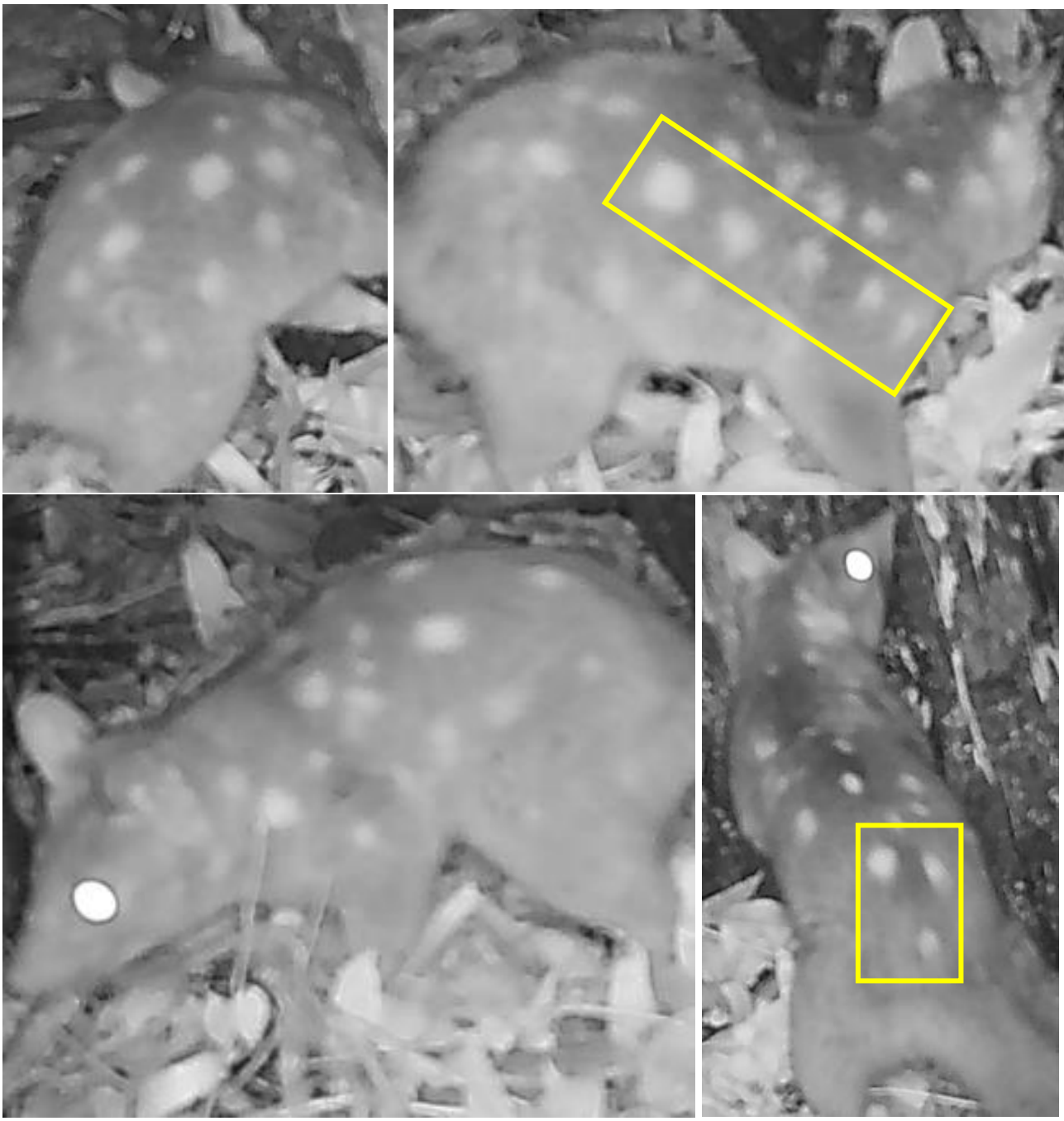
9: SPOT FUZZ

Very spotty younger individual, large five dice on L hind quarter, pentagon of large spots on bum. Site 5890-CAM-75-PW.



10: BOWLING BALL BUM

Line of five spots on R side, three bowling ball spots on bum. Site 5890-CAM-36-EW.



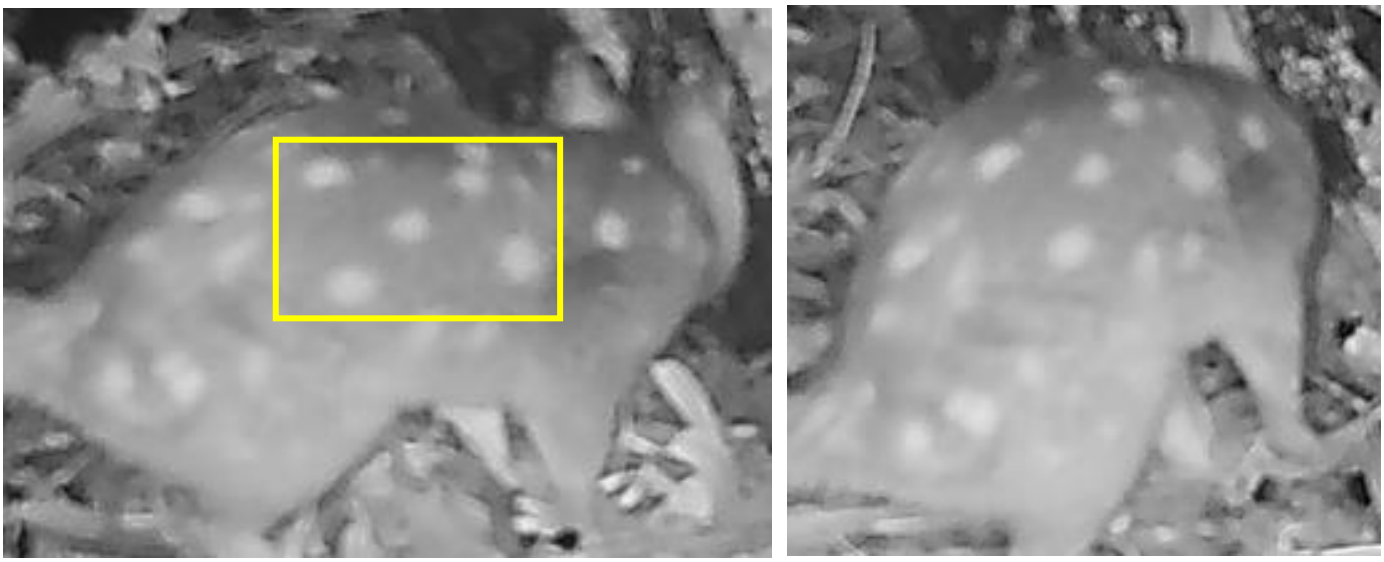
11: THREE DICE

Three dice spots R hind quarter. Site 5890-CAM-36-EW.



12: FIVE-A-SIDE

Five dice spots R side. Site 5890-CAM-36-EW.



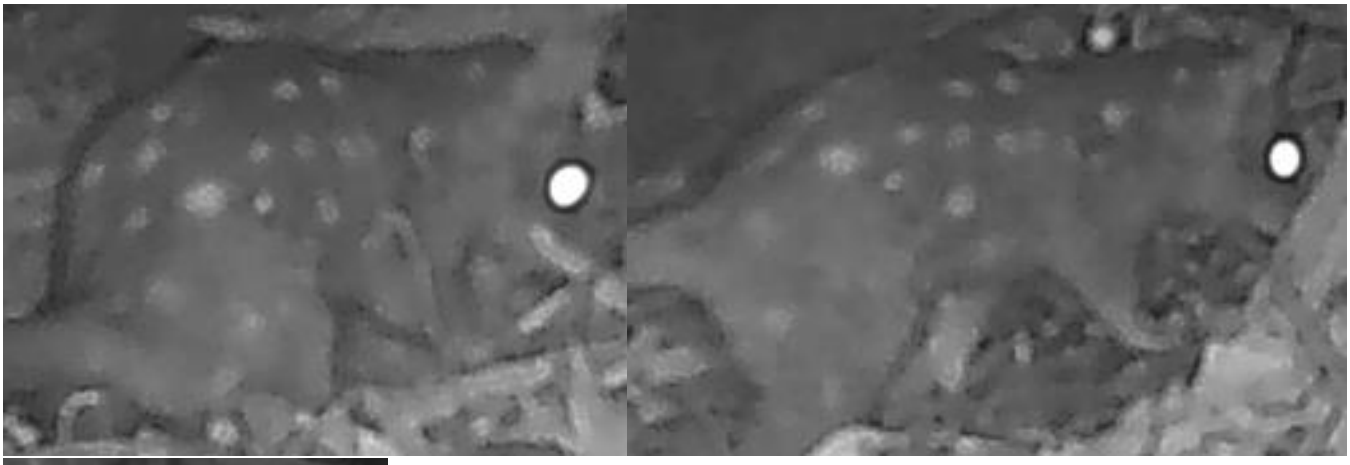
13: **TRIANGLE BUM**

Three dice spots R hind quarter, triangle of spots base of tail, very spotty. Site 5890-CAM-02-EW.



14: SPOTICUS

Very spotty, images not clear. Site 5890-CAM-14-EW.

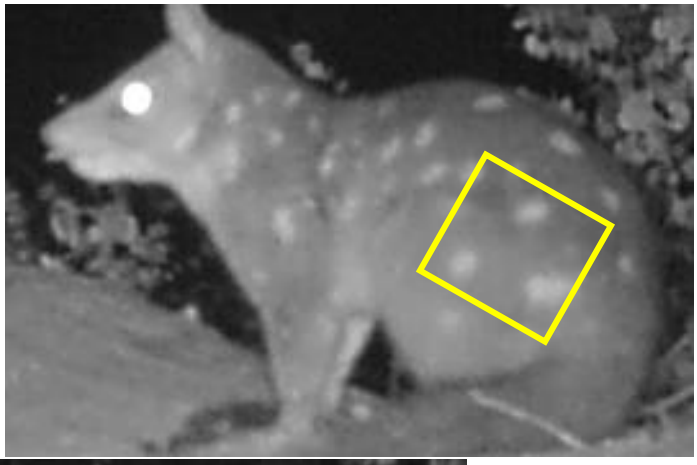


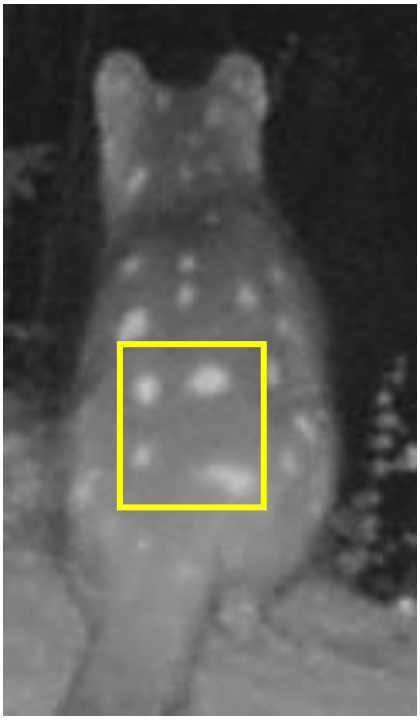


15: SWEET SPOT

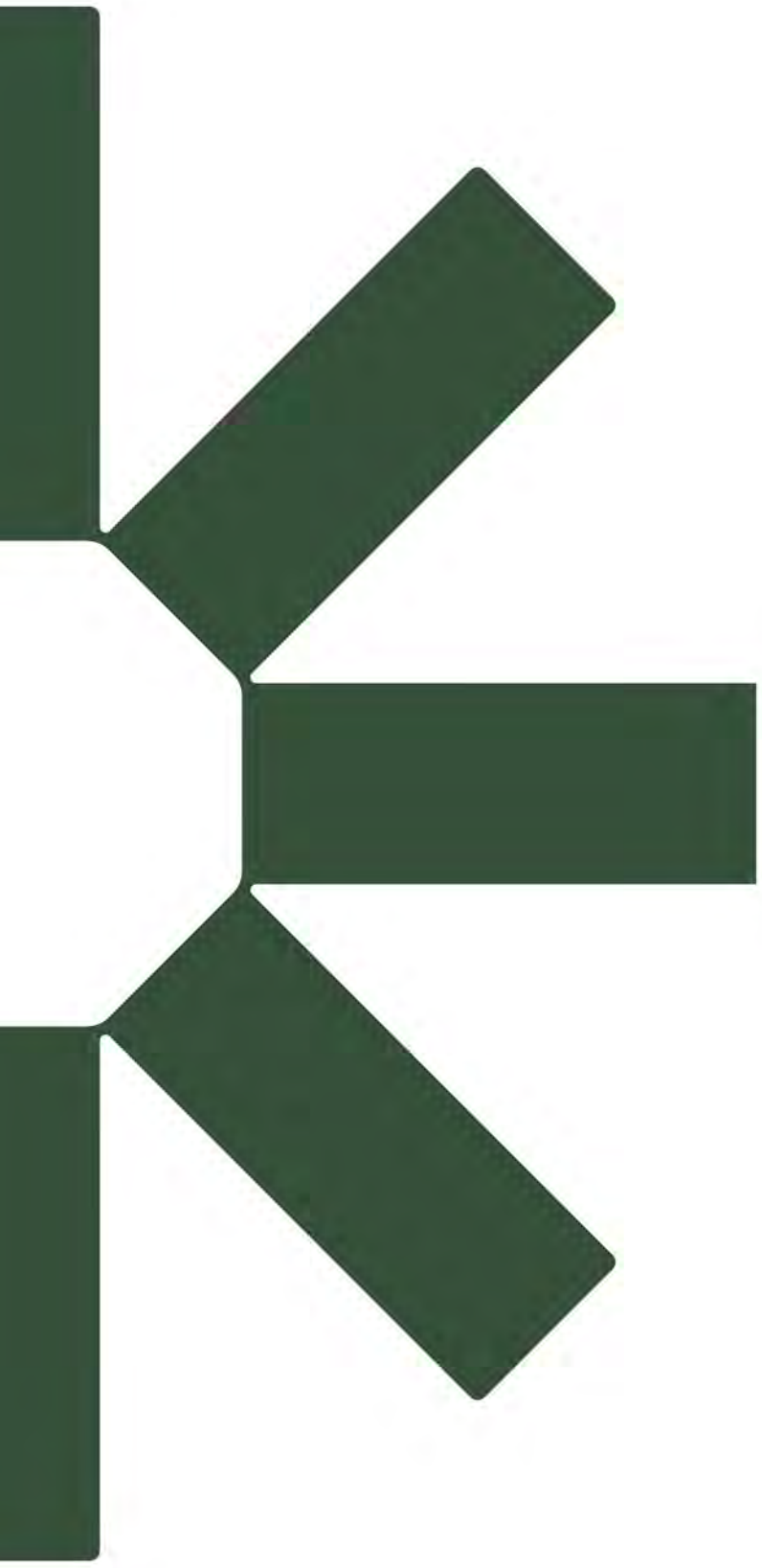
Triangle of spots L hind quarter, four dice spots on bum. Site 5937-CAM-78-ML.











Making Sustainability Happen

Targeted Chuditch, Quokka, and Woylie Survey

Willowdale Mine – Larego Region

Alcoa of Australia Ltd

181 - 205 Davy Road, Booragoon WA 6154,
Australia

Prepared by:

SLR Consulting Australia

Level 1, 500 Hay Street, Subiaco WA 6008,
Australia

SLR Project No.: 675.VX5890.00001

17 June 2024

Revision: 2.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	19 April 2024	P. Dean S. Girando	E. Webb	E. Webb
2.0	17 June 2024	K. Griffith	E. Webb	E. Webb

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Alcoa of Australia Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

Alcoa of Australia Ltd commissioned SLR Consulting Australia Pty Ltd to undertake a fauna desktop assessment and targeted Chuditch (*Dasyurus geoffroi*), Quokka (*Setonix brachyurus*), and Woylie (*Bettongia penicillata*) survey for the Willowdale Mine Larego region as part of its Mining and Management Plan assessment by the Mining and Management Program Liaison Group. The survey was undertaken within a defined area that consists of approximately 35 individual polygons (the Survey Area) that cover 451.8 hectares and is located approximately 15 km southeast of the Waroona townsite, in the Jarrah Forest bioregion of Western Australia.

The objective of the survey was to identify key fauna values targeting Chuditch, Quokka, and Woylie within the Survey Area as part of the MMP assessment process.

The targeted fauna survey used a variety of detection methods including camera trapping, spotlighting, active searches, and opportunistic observations. Fauna habitat mapping was based on a combination of field observations, vegetation mapping, fauna habitat assessment data, and aerial imagery.

Two fauna habitats were mapped within the Survey Area, Jarrah-Marri Forest, and Drainage Line habitats. The Drainage Line habitat provides the most value for the targeted taxa as it is core habitat for the Chuditch, Quokka, and Woylie. The Jarrah-Marri Forest also provides value for targeted taxa as core habitat for the Chuditch and Woylie and supporting habitat for the Quokka.

One targeted taxon was recorded during the survey; secondary evidence of Chuditch was recorded in the form of scat within the Jarrah-Marri Forest. The Quokka and Woylie were not recorded during the current survey; however, they have previously been recorded within 200 m and 40 m of the Survey Area respectively.

In addition to the targeted fauna taxa, four significant taxa were recorded during the fauna survey:

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*).
- Baudin's Cockatoo (*Zanda baudinii*).
- Western Brush Wallaby (*Notamacropus irma*).
- Rakali (*Hydromys chrysogaster*).

A further seven significant fauna taxa were assessed as having a high likelihood and six significant fauna taxa were assessed as having a medium likelihood, and 15 significant fauna taxa were assessed as having have a low likelihood of occurring within the Survey Area.

Three introduced taxa were recorded during the survey: Pig (*Sus scrofa*), Cat (*Felinus catus*) and Black Rat (*Rattus rattus*).

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Acronyms and Abbreviations

°C	Degree Celsius
BC Act	*Biodiversity Conservation Act 2016*
BoM	Bureau of Meteorology
CR	Critically Endangered
DAWE	Department of Agriculture Water and Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEE	Department of the Environment and Energy
Desktop Study Area	The area that was studied during the desktop assessment encompassing the Survey Area and surrounds
DMIRS	Department of Mines, Industry Regulation and Safety
DoE	Department of the Environment
DPIRD	Department of Primary Industries and Regional Development
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection Biodiversity and Conservation Act 1999*
ESA	Environmentally Sensitive Area
GIS	Geographic Information System
GPS	Global Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
km	Kilometres
Lat	Latitude
Long	Longitude
m	Metres
MA	Marine
MI	Migratory
mm	Millimetres
MMP	Mining and Management Program
MMPLG	Mining and Management Planning Liaison Group
MNES	Matters of National Environmental Significance

OS	Other Specially Protected Fauna
P	Priority
PMST	Protected Matters Search Tool
Alcoa	Alcoa of Australia Ltd
SLR	SLR Consulting Australia
Survey Area	The area that was surveyed
T	Threatened
TEC	Threatened Ecological Community
VU	Vulnerable
WA	Western Australia
WAM	Western Australian Museum

1.0 Introduction

1.1 The Project

Alcoa of Australia Ltd (Alcoa) commissioned SLR Consulting Australia Pty Ltd (SLR) to undertake a fauna desktop assessment and targeted Chuditch (*Dasyurus geoffroii*), Quokka (*Setonix brachyurus*), and Woylie (*Bettongia penicillata*) survey for the Willowdale Mine Larego region (the Project) as part of its Mining and Management Program (MMP) assessment by the Mining and Management Planning Liaison Group (MMPLG). The survey was undertaken within a defined area that consists of approximately 35 individual polygons (the Survey Area) that cover 451.8 hectares and is located approximately 15 km southeast of the Waroona townsite, in the Jarrah Forest bioregion of Western Australia (**Map 1**). All maps are provided in **Appendix A**.

1.2 Objective and Scope

The objective of the survey was to identify key fauna values targeting Chuditch, Quokka, and Woylie within the Survey Area as part of the MMP assessment process for the Project. The following scope of work was completed:

- A desktop assessment of the Willowdale Mine Larego region including an overview of fauna habitat, inventory of likely species present and background environmental information.
- A targeted survey for Chuditch, Quokka, and Woylie.
- A technical biological report.

2.0 Background

2.1 Statutory and Regulatory Framework

Western Australian fauna is governed by the following legislative measures:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). (Commonwealth of Australia, 1999).
- *Biodiversity Conservation Act 2016* (WA) (BC Act) (Government of Western Australia, 2016).
- *Environmental Protection Act 1986* (WA) (EP Act) (Government of Western Australia, 1986).

In addition to these legislative measures, the following non-legislative lists are considered on a case-by-case basis:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora, and ecological communities.
- Recognition of locally significant populations by DBCA.

The EIA process is supported by guidance documents published by the Environmental Protection Authority (EPA), DBCA and the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

Western Australia

- *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020).
- *Environmental Factor Guideline – Terrestrial Fauna* (EPA, 2016).

Commonwealth

- *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (DoE, 2013).
- *Survey guidelines for Australia's threatened mammals* (DSEWPaC, 2011).

2.2 Existing Environment

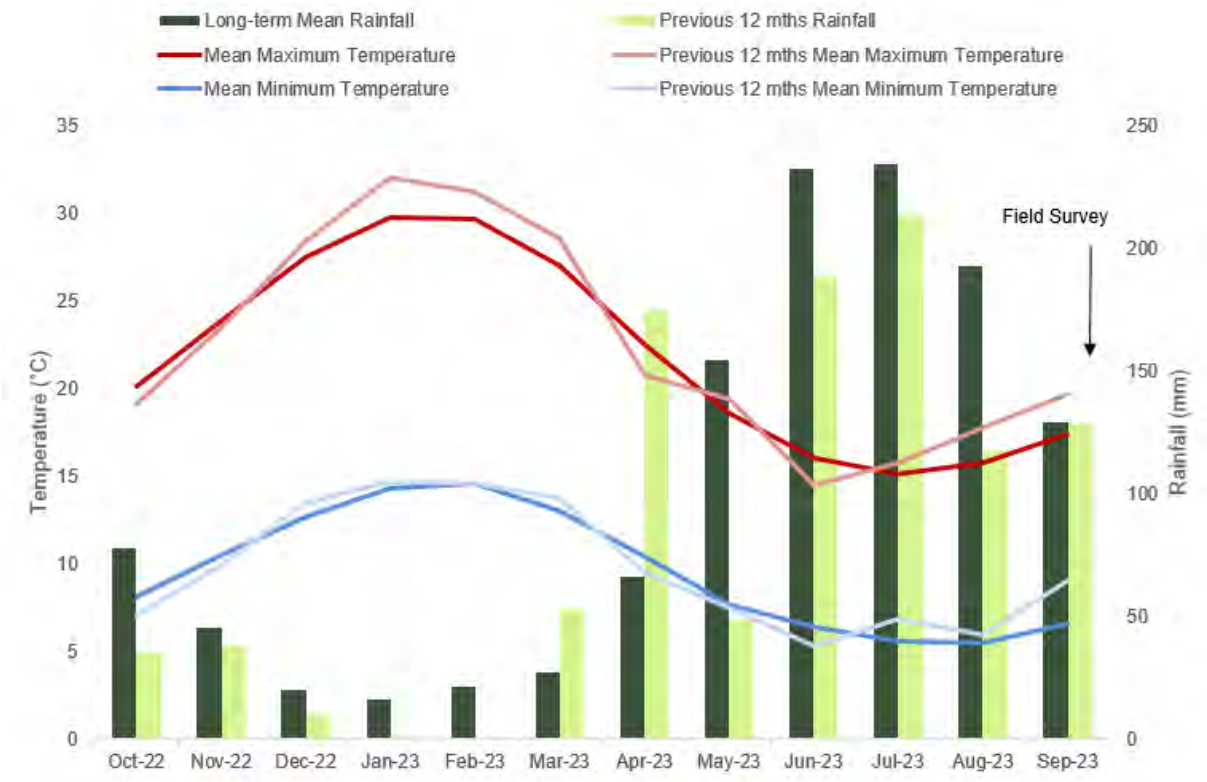
2.2.1 Climate

The closest long-term Bureau of Meteorology (BoM) weather station with a complete dataset is Dwellingup Weather Station (Station 9538), located approximately 17.1 km southwest of the Survey Area.

Climate statistics were calculated using data from the most current climate normal, which is defined as a 30-year interval where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate (BoM, 2007).

The long-term (1957 to 2024) mean minimum temperature for Dwellingup Weather Station ranges from 5.5˚C (August) to 14.6˚C (February) and the long-term mean maximum temperature ranges from 15.1˚C (July) to 39.8˚C (January) (BoM, 2024) (**Graph 1**).

The Dwellingup Weather Station recorded 1009 mm of rainfall in the 12 months prior to the survey (October 2022 to September 2023), which is 209.3 mm below the long-term (1934 to 2023) average of 1218.3 mm (BoM, 2024). In the three months prior to the survey (July 2023 to September 2023), 459.4 mm of rainfall was recorded, which is 97.5 mm below the long-term average of 556.9 mm for the same period (BoM, 2024).



Graph 1: Climate summary of Dwellingup Weather Station

2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (DEE, 2016). The Survey Area occurs within the Jarrah Forest bioregion and the Northern Jarrah Forest (JAF01) subregion.

The Northern Jarrah Forest subregion overlays Archaean granite and metamorphic rocks with an average elevation of 300 m, capped by extensive lateritic duricrust and interrupted by later drainage and dissected by occasional granite hills. In the east the laterite becomes greatly separated until it compresses isolated remnants. Vegetation comprises of Jarrah-Marri Forest in the west with Bullich and Blackbutt in the valleys grading to Wandoo and Marri woodlands in the east with Powder bark on breakaways. A common understorey of heath is found on granite rocks in the north and east forests and woodlands. The lower slopes, where rapid changes in the site conditions occur, support most of the diversity in the communities. The subregional area is 2,255,904 ha (Williams and Mitchell, 2001).

2.2.3 Soil Landscape Mapping

Soil landscape mapping of Western Australia consists of a compilation of various surveys at different scales varying between 1:20,000 and 1:3,000,000 (DPIRD, 2022). The mapping comprises a nested hierarchy of levels, with each level a subdivision of the preceding level. Soil landscape mapping provides an indication of potential vegetation types and fauna

habitats within the Survey Area and has been described below to the highest level of detail available for the Survey Area.

The Survey Area occurs within one soil landscape system, the Darling Plateau System (255Dp) comprising of lateritic plateau, duplex sandy gravels, loamy gravels, wet soils, Jarrah-Marri-Wandoo forest and woodland.

The Survey Area occurs across four soil landscape subsystems and two soil landscape phases (**Table 1**; **Map 2**).

Table 1: Soil landscape subsystems and phases within the Survey Area

Subsystem or phase		Description	Area (ha) and percentage within Survey Area
Name	Code		
Dwellingup Subsystem	255DpDW	Divides, lower to upper slopes and hillcrests. Duplex sandy gravels and loamy gravels with minor areas of shallow gravels, deep sandy gravels, yellow deep sands, and yellow and pale deep sands, often gravelly	364.0 ha (80.6%)
Hester Subsystem	255DpHR	Ridges and hill crests on laterite and gneiss, relief 5-40 m, slopes 5-15%. Soils are sandy gravels, loamy gravels, and loamy earths	3.9 ha (0.9%)
Mornington Hill Subsystem	255DpMH	Low hills on laterite overlying granite, relief 40-80 m, slope5-20%. Soils are sandy and loamy gravels with some deep sands and loamy earths	23.6 ha (5.2%)
Yarragil DpYGh phase	255DpYGh	Very gentle to moderately inclined (<20%) concave valley sideslopes. Moderately well drained yellow duplex soils and yellow and brown massive earths	20.2 ha (4.5%)
Yarragil subsystem	255DpYG	Shallow, narrow, upper valleys of the deeply dissected Murray, Bindoon, and Helena units. Alluvial, clay and loam soils, moderately well drained, often gravelly, with some sands and loams. Salt prone. Woodland of *E. wandoo*, *E. accedens*	39.0 ha (8.6%)
Yarragil Swamp phase	255DpYGsw	Level to very gently inclined valley floors. Swampy river flats and terraces in granitic rocks; loamy and sandy duplex, wet soils, non-cracking clays, and loams	1.0 ha (0.2%)
Total area and percentage within Survey Area			**451.8 ha (100%)**

2.2.4 Hydrography

A total of two hydrographic features intersect the Survey Area, and a total of nine hydrographical features occur within a 5 km radius of the Survey Area are described in **Table 2** and shown in **Map 3** (DWER, 2018).

Table 2: Hydrographic features in the vicinity of the Survey Area

Hydrographical feature	Description	
Bancell Brook	Significant Stream	4 km west
Clarke Brooke	Significant Stream	5 km southwest

Hydrographical feature	Description	
Harvey River	Mainstream	Intersects two polygons in the west of the Survey Area
Logue Brook	Minor River	3.0 km southwest
Logue Brook Dam	Water Supply Reservoir	2.9 km west
Samson Brook Dam – Lake Kabbanup	Water Supply Reservoir	3.4 km north
Samson Brook	Signification stream	0.4 km north
Unnamed Significant Stream	Significant stream	3.7 km northwest
Unnamed Tributary	Major tributary	Intersects the eastern polygon of the Survey Area
Unnamed Tributary	Minor tributary	5.5 km west
Unnamed Tributary	Minor tributary	4.0 km west

2.2.5 Pre-European Vegetation

The major source of data for pre-European vegetation mapping in Western Australia is the published and unpublished mapping of J. S. Beard at 1:250,000 scale. These vegetation types were later refined by Shepherd, Beeston, and Hopkins (2002), resulting in 819 Vegetation Association-level units, and a subsequent reclassification resulted in the creation of over 2,175 finer-scale System Associations (Beard *et al.*, 2013). The Survey Area occurs within one System Association, WEST DARLING_3, which comprises Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) (**Map 4**).

2.2.6 Conservation Areas

Conservation areas consist of areas protected for the purpose of conservation, including but not limited to National Parks, Nature Reserves, Conservation Parks, and Regional Parks. The Survey Area occurs within the Dwellingup State Forest which is vested under Conservation Commission of WA (DBCA, 2023a, 2023b) and shown in **Map 5**.

2.2.7 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs), or significant wetlands. The Survey Area does not intersect any mapped ESAs (DWER, 2021). There are nine Swan Coastal Plain wetland ESAs within a 5 km radius of the Survey Area. ESAs are shown in **Map 5**.

2.2.8 Land Use

No pastoral leases apply to the Survey Area. The Survey Area is under one mining tenement, Alcoa of Australia Ltd (AML7000001) (DMIRS, 2024). Three pending exploration licences also intersect the Survey Area:

- Eastern Goldfields Exploration Pty Ltd E7002338.
- G E Resources Pty Ltd E7005390.
- G E Resources Pty Ltd E7005543.

3.0 Methods

The surveys documented in this report were undertaken in accordance with relevant EPA and DCCEEW guidelines (see **Section 2.1**).

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds (the Desktop Study Area) was compiled prior to the field survey. The literature review considered a selection of relevant reports detailing assessments undertaken in the region that were either publicly available from sources such as the Index of Biodiversity Surveys for Assessments (IBSA) website, the EPA Consultation Hub, or internet searches, or provided by Alcoa. These reports are listed below, summarised in **Appendix B**, and their locations in relation to the current Survey Area, as represented by their nearest point, are shown in **Map 6**:

- *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)* (Harewood, 2017), 14 km north of the Survey Area.
- *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a), 18 km north of the Survey Area.
- *Black Cockatoo Habitat Assessment – Pinjarra Racecourse* (Harewood, 2019), 30 km north of the Survey Area.
- *Chuditch Pre-mine Survey, Myara* (Way, 2013), 43 km north of the Survey Area.
- *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006), 43 km north of the Survey Area.
- *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North* (GHD, 2021b), 54 km north of the Survey Area.
- *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment* (GHD, 2012), 60 km north of the Survey Area.

3.1.2 Database Searches

Database searches were undertaken to compile a list of fauna known to occur in the Desktop Study Area and identify significant fauna with potential to occur within the Survey Area (**Table 3**).

Table 3: Database search details

Database name	Date received	Search target	Buffer around the Survey Area
Threatened and Priority Fauna database search (DBCA, 2023c)	08 June 2023	Threatened and Priority fauna	20 km
Protected Matters Search Tool (PMST) (DCCEEW, 2023)	14 July 2023	Threatened flora, fauna, and ecological communities	20 km

Database name	Date received	Search target	Buffer around the Survey Area
NatureMap (DBCA, 2023d)	07 June 2023	Fauna	20 km

3.1.3 Likelihood of Occurrence

Significant fauna taxa identified during the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area before and after the field survey. The assessment used the likelihood of occurrence criteria presented in **Table 4**.

Taxa listed as Marine only under the EPBC Act were not considered to be significant taxa because the Marine listing does not constitute MNES under the EPBC Act. Additionally, erroneous records (i.e. records that occur well outside a taxon's known distribution) were excluded from consideration. Only taxa that have been recorded within the Survey Area or were assessed as having a high or medium likelihood of occurrence are discussed in detail.

Table 4: Likelihood of occurrence criteria

Rank	Criteria
Recorded	The taxon was recorded within the Survey Area during the current survey.
Previously Recorded	The taxon has been previously recorded within the Survey Area according to database search or literature review results.
High (Likely to occur)	The taxon has been recorded within the Desktop Study Area more than once in the last in the last 15 years and suitable habitat is present within the Survey Area.
Medium (May occur)	There are existing records of the taxon within the Desktop Study Area, however the taxon has not been recorded within the Desktop Study Area in the last 15 years or suitable habitat within the Survey Area is marginal or limited in extent.
Low (Unlikely to occur)	Suitable habitat is not present within the Survey Area, or the taxon is very infrequently recorded in the locality despite reasonable previous search effort, or the taxon is believed to be extinct or locally extinct.

3.2 Field Survey

3.2.1 Survey Timing

The field surveys were undertaken across two field trips as shown in **Table 5**.

Table 5: Survey timing

Survey trip	Tasks completed	Dates	Person field days
1	Active searches, deployment of camera traps, habitat assessment, spotlighting.	13th October – 16th October 2023	16
2	Collection of camera traps	7th November – 8th November 2023	4

3.2.2 Field Personnel and Licences

Details of field personnel, including their level of experience and role for each field trip are detailed in **Table 6**. Fieldwork was completed under Fauna Taking (Biological Assessment) License – Regulation 27 (08-005511-1) (**Appendix C**).

Table 6: Field personnel

Personnel	Experience	Role	Trips
Dr Michael Lohr	11 years	Principal Zoologist	1
Evan Webb	7 years	Associate Zoologist	1 and 2
Poppy Walker	5 years	Senior Zoologist	2
Lewis Berry	2 years	Ecologist	1
Datta Li	2 years	Zoologist	1

3.2.3 Habitat Assessment and Mapping

Habitat assessments were undertaken in representative areas of fauna habitat within the Survey Area to record habitat values. A habitat assessment was recorded at each camera trap site, and two additional standalone habitat assessments were recorded. Habitat assessment locations are shown in **Map 7**.

The following information was collected at each habitat assessment locations using a GPS-enabled handheld device:

- Site photo.
- Landform.
- Soil type and colour.
- Rock types, surface stone cover, and size classes.
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, and water sources.
- Habitat quality, fire history, and evidence of disturbance.
- General description of vegetation structure.

Fauna habitat mapping was based on a combination of field observations, habitat assessment data, aerial imagery, and vegetation mapping. Polygons were digitised using GIS software.

3.2.4 Camera Traps

A total of 45 motion sensitive camera traps were deployed during the field survey. Each camera trap was deployed for a minimum of 23 nights and total survey effort consisted of 1,119 trap nights. Cameras were placed in areas of suitable habitat for (Chuditch, Quokka, and Woylie) and non-target taxa (Wambenger Brush-tailed Phascogale, Quenda, and Western Brush Wallaby) and were baited with universal bait (rolled oats, peanut butter, and sardines) and chopped apples. Camera trap locations are shown in **Map 7**.

3.2.5 Spotlighting

Spotlighting was undertaken on two nights during the field survey. Spotlighting commenced approximately one hour after sunset and consisted of traversing areas of suitable habitat, generally near stream crossings, on foot for a duration of two hours. A total of 16 person

hours was completed during the field survey. Spotlighting was also undertaken opportunistically from the vehicle while travelling to and from the spotlighting location. Spotlighting was undertaken at the following locations (**Map 7**):

- 5890-CAM-02-EW
- 5890-CAM-20-EW
- 5890-CAM-21-EW
- 5890-CAM-44-EW

3.2.6 Opportunistic Observations

Opportunistic observations of fauna were recorded throughout the Survey Area, including primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings, remains).

3.2.7 Active Searches

Untimed active searches were undertaken at each camera trap site. These searches included flipping rocks and logs and raking leaf litter in search of direct sightings, scats, tracks, and other traces of fauna, with a particular focus on Chuditch (scats, dens in hollow logs or burrows), Quokka (scats, runnels in sedges), Woylie (scats, diggings, nests), Numbat (scats, diggings), and Western Ringtail Possums (dreys, scats).

3.3 Limitations

Limitations and constraints of the fauna survey are detailed below in **Table 7**.

Table 7: Limitations and constraints associated with the survey

Variable	Degree of limitation	Potential constraints on survey outcomes
Availability of data and information	No	Sufficient data and information, including regional and local contextual information, was available to complete the scope of the survey.
Competency and experience of the survey team	No	The survey was undertaken by a team with extensive experience undertaking similar scopes within the bioregion. • Principal Zoologist Dr Michael Lohr – 11 years' experience. • Associate Zoologist Evan Webb – 7 years' experience. • Senior Zoologist Poppy Walker – 5 years' experience. • Zoologist Datta Li – 2 years' experience. • Ecologist Lewis Berry – 2 years' experience.
The proportion of fauna identified, recorded, or collected	No	All targeted fauna taxa were able to be identified to species level with a high degree of confidence.
Scope of the survey	No	The scope of the survey was limited to terrestrial vertebrate fauna targeting threatened marsupials. No further exclusions were made within this group.
Adequacy of the survey intensity and proportion of survey achieved	No	Sufficient time and effort were allocated to the survey given the size and complexity of the Survey Area and the expected level of survey intensity.

Variable	Degree of limitation	Potential constraints on survey outcomes
Access problems	No	The Survey Area was sufficiently accessed by vehicle and on foot.
Timing and season	No	Targeted Chuditch, Quokka, and Woylie surveys can be undertaken at any time of year.
Disturbance that may have affected the results of survey	No	Areas of disturbance associated with mining activities and bushfires were present within the Survey Area but were not a limitation on the results of the survey.
Problems with data and analysis, including sampling biases	No	Survey effort for significant fauna taxa was concentrated in preferred habitats. This may introduce bias where the use of non-preferred habitat is underrepresented, however, this is not considered a limitation on the survey outcomes.

4.0 Results

4.1 Desktop Assessment

The database searches and literature review identified 189 terrestrial vertebrate fauna taxa occurring within the Desktop Study Area, of which 33 are significant (Threatened or Priority):

- 126 birds, of which 19 are significant.
- 28 mammals, of which 10 are significant.
- 25 reptiles, of which 4 are significant.
- 10 amphibians, of which none are significant.

Key findings of the literature review are summarised in **Appendix B**, a complete list of fauna taxa recorded within the Desktop Study Area is presented in **Appendix D**, and DBCA database search results are displayed in **Map 8**.

4.2 Fauna Habitat

Two fauna habitats (excluding cleared areas) were identified and mapped within the Survey Area. Fauna habitats are presented in **Map 9**, described below in **Table 8**, and site sheets for each habitat assessment are provided in **Appendix E**. Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding.

Table 8: Fauna habitats recorded within the Survey Area

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Jarrah-Marri Forest	439.2 ha, 97.2%	Undulating plains and hills over clay loam soils and laterite rock. Vegetation consists of Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) open forest with patchy *Allocasuarina Fraseriana* over a mixed midstorey typically dominated by *Bossiaea aquifolium, Xanthorrhoea preissi,* and *Macrozamia fraseri*, over sedges and bracken. Disturbances consisted primarily of historic logging and bushfire. Microhabitats present within this habitat include hollows in trees and logs, leaf litter and woody debris. This habitat is core habitat Chuditch and supporting habitat for Woylie and Quokka. The canopy is core habitat for black cockatoos.	
Drainage Line	12.7 ha, 2.8%	Areas of drainage over clay loam soils, often with thin channels of surface water present. Vegetation consists of a closed mosaic upperstorey of Bullich (*E. megacarpa*), Blackbutt (*E. patens*), and Flooded Gum (*E. rudis*), forest over a closed mixed shrubland of *Melaleuca* sp., *B. aquifolium*, and other *Myrtaceae* sp. and *Acacia* sp., over tall sedgeland. This habitat typically had low levels of disturbance. Microhabitats present within this habitat include tree and log hollows, woody debris, peeling bark and leaf litter. Drainage Line habitat is core habitat Chuditch, Woylie, and Quokka and the canopy constitutes core habitat for black cockatoos. This habitat is analogous to Blackbutt, Bullich, and Flooded Gum fauna habitats recorded by GHD (2021b, 2021a).	
Total	**451.8 ha, 100%**		

4.3 Recorded Fauna

The basic terrestrial vertebrate fauna survey recorded 30 fauna taxa from 19 families, comprising three amphibian taxa, 12 bird taxa, 10 mammal taxa, and five reptile taxa. Of the taxa recorded, five were significant (see **Section 4.4**). Three introduced taxa were recorded, the Cat (*Felis catus*), Black Rat (*Rattus rattus*), and Pig (*Sus scrofa*).

An inventory of fauna recorded during the field survey is provided below in **Table 9**.

Table 9: Fauna recorded within the Survey Area

Family	Scientific Name	Common Name	Conservation Status		Call	Camera Trap	Capture	Feather	Foraging evidence	Scat	Sighting	Sighting - overhead	Total
			State	Common wealth									
Amphibians													
Limnodynastidae	*Heleioporus inornatus*	Whooping Frog	-	-							1		**1**
Myobatrachidae	*Crinia georgiana*	Quacking Frog	-	-	7						1		**8**
Myobatrachidae	*Crinia glauerti*	Clicking Frog	-	-	10						1		**11**
Birds													
Acanthizidae	*Gerygone fusca*	Western Gerygone	-	-	1								**1**
Acanthizidae	*Sericornis maculatus*	Spotted Scrubwren	-	-		7							**7**
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU				3	2		12	3	**20**
Cacatuidae	*Zanda baudinii*	Baudin's Cockatoo	EN	EN					1				**1**
Columbidae	*Phaps elegans*	Brush Bronzewing	-	-		3							**3**
Maluridae	*Malurus elegans*	Red-winged Fairywren	-	-		26							**26**
Maluridae	*Malurus splendens*	Splendid Fairywren	-	-		1							**1**
Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush	-	-	1								**1**
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin	-	-		1							**1**
Petroicidae	*Quoyornis georgianus*	White-breasted Robin	-	-		5							**5**
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	-	-		2							**2**
Strigidae	*Ninox boobook*	Boobook Owl	-	MA	1								**1**
Mammals													
Dasyuridae	*Antechinus flavipes leucogaster*	Mardo	-	-		78							**78**
Dasyuridae	*Dasyurus geoffroii*	Chuditch	VU	VU						1			**1**
Felidae	**Felis catus*	Cat	-	-		1							**1**

Family	Scientific Name	Common Name	Conservation Status		Call	Camera Trap	Capture	Feather	Foraging evidence	Scat	Sighting	Sighting - overhead	Total
			State	Common wealth									
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo	-	-		10							**10**
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4	-		26					3		**29**
Muridae	*Hydromys chrysogaster*	Rakali	P4	-		1							**1**
Muridae	**Rattus rattus*	Black Rat	-	-		70							**70**
Phalangeridae	*Trichosurus vulpecula hypoleucus*	Common Brushtail Possum	-	-		1							**1**
Suidae	**Sus scrofa*	Pig	-	-		16					1		**17**
Tachyglossidae	*Tachyglossus aculeatus acanthion*	Short-beaked Echidna	-	-		17							**17**
Reptiles													
Scincidae	*Egernia napoleonis*	South-western Crevice-skink	-	-		93	1				2		**96**
Scincidae	*Lissolepis luctuosa*	Western Swamp Skink	-	-		1					1		**2**
Scincidae	*Morethia obscura*	Shrubland Morethia Skink	-	-			1						**1**
Scincidae	*Tiliqua rugosa*	Bobtail	-	-		51							**51**
Varanidae	*Varanus gouldii*	Bungarra	-	-		1					1		**2**

* = introduced species

4.4 Significant Fauna

Five significant fauna taxa were recorded within the Survey Area during the field survey. These are listed below, and locations are presented in **Map 9** and **Appendix F**:

- Baudin's Cockatoo (*Zanda baudinii*) – EN (BC Act; EPBC Act), recorded once within Jarrah-Marri Forest habitat.
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – VU (BC Act; EPBC Act), recorded 20 times within Jarrah-Marri Forest and Drainage Line habitats.
- Chuditch (*Dasyurus geoffroii*) – VU (BC Act; EPBC Act), recorded once within Jarrah-Marri Forest habitat (**Figure 1**).
- Rakali (*Hydromys chrysogaster*) – P4 (DBCA), recorded once within Drainage Line habitat (**Figure 2**).
- Western Brush Wallaby (*Notamacropus irma*) – P4 (DBCA), recorded 29 times within Jarrah-Marri Forest and Drainage Line habitats (**Figure 3**).

Seven significant fauna taxa were assessed as having a high likelihood of occurring within the Survey Area:

- Woylie (*Bettongia penicillata ogilbyi*) – CR (BC Act); EN (EPBC Act)
- Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act).
- Quokka (*Setonix brachyurus*) – VU (BC Act; EPBC Act)
- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – CD (BC Act).
- Quenda (*Isoodon fusciventer*) – P4 (DBCA).
- Western False Pipistrelle (*Falsistrellus mackenziei*) – P4 (DBCA).
- Dell's Ctenotus (*Ctenotus delli*) – P4 (DBCA).

Six significant fauna taxa were assessed as having a medium likelihood of occurring within the Survey Area:

- Western Ringtail Possum (*Pseudocheirus occidentalis*) – CR (BC Act; EPBC Act).
- Australasian Bittern (*Botaurus poiciloptilus*) – EN (BC Act).
- Malleefowl (*Leipoa ocellata*) – VU (BC Act; EPBC Act).
- Peregrine Falcon (*Falco peregrinus*) – OS (BC Act).
- Woma Python (*Aspidites ramsayi*) – P1 (DBCA).
- Southern Death Adder (*Acanthophis antarcticus*) – P4 (DBCA).

The complete results of the significant fauna likelihood of occurrence assessment including justification for the assessment outcome for each taxon is provided in **Table 10**.



Figure 1: Chuditch scat recorded within Jarrah-Marri Forest (-32.9758445, 116.0860574)



Figure 2: Rakali recorded by camera trap 5890-CAM-07-EW within Drainage Line habitat (-32.9941287, 116.0524062).



Figure 3: Western Brush Wallaby recorded by camera trap 5870-CAM-12-LB within Jarrah-Marri Forest (-32.97344506, 116.0826827).

Table 10: Significant fauna likelihood of occurrence within the Survey Area

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Birds						
Acanthizidae	*Aphelocephala leucopsis* Southern Whiteface	-	VU	Sparse open forest/woodland; inland scrubs e.g. mallee, mulga cypress pine; saltbush, dead trees, stumps, black box/lignum flats (Pizzey and Knight, 2001).	No nearby records identified.	Low No nearby records and limited suitable habitat within the Survey Area.
Accipitridae	*Elanus scriptus* Letter-winged Kite	P4	-	Open country and grasslands of arid and semi-arid interior (Pizzey and Knight, 2001).	No DBCA records, one record from literature 60 km north of the Survey Area in 2011 (GHD, 2012).	Low No suitable habitat within the Survey Area.
Anatidae	*Oxyura australis* Blue-billed Duck	P4	-	Densely vegetated freshwater lakes, swamps, dams (Morcombe, 2003).	Five DBCA records within 20 km of the Survey Area. Including 15.8 km southwest of the Survey Area in 2013 (DBCA, 2023c).	Low No suitable habitat within the Survey Area.
Ardeidae	*Botaurus poiciloptilus* Australasian Bittern	EN	EN	Freshwater wetlands with heavy vegetation, shrubbery, reedbeds, sedges (Morcombe, 2003).	Two DBCA records within 20 km of the Survey Area, including 5.8 km north in 2017 (DBCA, 2023c).	Medium One record 5.8 km from the Survey Area, limited suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Atrichornithidae	*Atrichornis clamosus* Noisy Scrubbird	EN	EN	Dense heaths, rushes, tall sedges, under stunted trees in coastal hills, coastal swamps (Morcombe, 2003).	Forty-four DBCA records within 20 km of the Survey Area, including eight records within the 1 km of the Survey Area as recent as 2007, many of which are translocated individuals (DBCA, 2023c).	Low No nearby records within the last 15 years and limited suitable habitat within the Survey Area. Individuals were translocated to the northern Jarrah forest in 1997 – 2003 but are now considered locally extinct (GHD, 2021b, 2021a).
Cacatuidae	*Calyptorhynchus banksii naso* Forest Red-tailed Black Cockatoo	VU	VU	Tall eucalypt forest, woodland, feeds on seeds of large-fruited eucalypts (Menkhorst *et al.*, 2019).	Eighty-five DBCA records within 20 km of the Survey Area, including two records within 1 km of the Survey Area as recent as 2018 (DBCA, 2023c).	Recorded Recorded during the current survey.
Cacatuidae	*Zanda baudinii* Baudin's Cockatoo	EN	EN	Forests, farm trees; feeds on Marri and wood-boring insects (Morcombe, 2003).	Fifty DBCA records within 20 km of the Survey Area, including two records within 1 km of the Survey Area as recent as 2002 (DBCA, 2023c).	Recorded Recorded during the current survey.
Cacatuidae	*Zanda latirostris* Carnaby's Cockatoo	EN	EN	Forests, woodlands, heathlands, farms; feeds on Banksias and Hakeas, pine plantations (Morcombe, 2003).	Forty-eight DBCA records within 20 km of the Survey Area, including three records within 1 km of the Survey Area as recent as 2007 (DBCA, 2023c).	High Nearby records, and suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Charadriidae	*Charadrius leschenaultia* Greater Sand Plover	VU	VU, MI, MA	Tidal flats, beaches .	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Charadriidae	*Thinornis cucullatus* Hooded Dotterel	P4	MA	Beaches, margins of inland salt lakes (Menkhorst *et al.*, 2019).	No DBCA or literature records, one Naturemap record within 20 km of the Survey Area (DBCA, 2023d).	Low One NatureMap record, and no suitable habitat within the Survey Area.
Falconidae	*Falco hypoleucos* Grey Falcon	VU	VU	Open plains with treed watercourses in arid inland (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Falconidae	*Falco peregrinus* Peregrine Falcon	OS	-	Most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species (Menkhorst *et al.*, 2019).	Two DBCA records within 20 km of the Survey Area, including 15 km south of the Survey Area in 2007 (DBCA, 2023c).	Medium Records <15 km from the Survey Area and may use the Survey Area for hunting.
Laridae	*Sternula nereis* Fairy Tern	VU	VU	Coastal, bays, inlets, beaches, salt ponds and lakes (Morcombe, 2003).	No nearby records identified.	Low No suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Megapodiidae	*Leipoa ocellata* Malleefowl	VU	VU	Unburned mallee and woodland with abundant litter and low scrub (Morcombe, 2003).	Two DBCA records within 20 km of the Survey Area, including 17.6 km north of the Survey Area in 2014 (DBCA, 2023c).	Medium Outside known distribution, however, taxon has been sighted near the Survey Area. Furthermore, individuals were translocated to the nearby Dryandra Woodland, 79 km east-northeast of the Survey Area, within the last five years (Traill, 2019).
Rostratulidae	*Rostratula australis* Australian Painted Snipe	EN	EN, MA	Well vegetated surrounds and shallows of wetlands (Morcombe, 2003).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Scolopacidae	*Calidris canutus* Red Knot	EN	EN, MI, MA	Coastal, extensive firm tidal flats (Menkhorst *et al.*, 2019).	No nearby records identified.	Low No nearby records, and no suitable habitat within the Survey Area.
Scolopacidae	*Calidris ferruginea* Curlew Sandpiper	CR	-	Inter-tidal mudflats of estuaries, lagoons, mangrove channels, dams, floodwaters, flooded saltbush surrounds of inland lakes (Morcombe, 2003).	No nearby records identified from the database searches or literature.	Low No nearby records, and no suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Scolopacidae	*Numenius madagascariensis* Eastern Curlew	CR	CR, MI, MA	Coastal, tidal flats (Menkhorst *et al.*, 2019).	No nearby records identified from the database searches or literature.	Low No nearby records, and no suitable habitat within the Survey Area.
Tytonidae	*Tyto novaehollandiae* Australian Masked Owl	P3	-	Forests and woodlands with hollow bearing large old trees; roosts in tree hollows, foliage, and caves (Menkhorst *et al.*, 2019).	One DBCA record 13.6 km north of the Survey Area in 1971 (DBCA, 2023c).	Low No recent nearby records, suitable habitat within the Survey Area.
Mammals						
Dasyuridae	*Dasyurus geoffroii* Chuditch	VU	VU	Sclerophyll forest or drier woodland, heath, and mallee shrubland (Van Dyck and Strahan, 2008).	Eighty-eight DBCA records within 20 km of the Survey Area, and one record 1.7 km northeast from the Survey Area (DBCA, 2023c).	Recorded Recorded during the current survey.
Dasyuridae	*Phascogale tapoatafa wambenger* Wambenger Brush-tailed Phascogale	CD	-	Mature rough-barked trees, large logs, dead standing trees (Van Dyck and Strahan, 2008).	Seventeen DBCA records within 20 km of the Survey Area, including one 13.1 km southwest of the Survey Area in 2022 (DBCA, 2023c).	High Recorded <15 km and suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Macropodidae	*Setonix brachyurus* Quokka	VU	VU	Dense wet ground cover in forest or swampy flats (Van Dyck and Strahan, 2008).	Twenty-six DBCA records within 20 km of the Survey Area, including one record within 200 m of the Survey Area in 2016 (DBCA, 2023c).	High Recorded 200 m from the Survey Area, and suitable habitat within the Survey Area.
Macropodidae	*Notamacropus irma* Western Brush Wallaby	P4	-	Open forest and woodland, open seasonally wet flats (Van Dyck and Strahan, 2008).	Nineteen DBCA records within 20 km of the Survey Area, including 14.8 km north in 2006 (DBCA, 2023c).	Recorded Recorded during the current survey.
Muridae	*Hydromys chrysogaster* Rakali	P4	-	Permanent fresh to brackish water bodies (Van Dyck and Strahan, 2008).	Seven DBCA records within 20 km of the Survey Area, including one within 15.6 km north of the Survey Area in 2018 (DBCA, 2023c).	Recorded Recorded during the current survey.
Myrmecobiidae	*Myrmecobius fasciatus fasciatus* Numbat, Walpurti	EN	EN	Jarrah forests, Wandoo woodlands; requires hollow logs and branches for shelter and termites for food (Van Dyck and Strahan, 2008).	Two historic records from 1980 and 1954 within 20 km of the Survey Area.	Low No nearby recent records.
Peramelidae	*Isoodon fusciventer* Quenda	P4	-	Sandy soils with dense heathy vegetation (Van Dyck and Strahan, 2008).	Sixty-four DBCA records within 20 km of the Survey area, including records within 1.6 km of the Survey Area in 1995 (DBCA, 2023c).	High Nearby records, and suitable habitat within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Potoroidae	*Bettongia penicillata ogilbyi* Brush-tailed Bettong, Woylie	CR	EN	Areas dominated by *Gastrolobium* thickets (Van Dyck and Strahan, 2008).	Thirty-nine DBCA records within 20 km of the Survey Area, including 10 records within 500 m of the Survey Area as recent as 2004 (DBCA, 2023c).	High Recorded <500m from the Survey Area, and suitable habitat within the Survey Area.
Pseudocheiridae	*Pseudocheirus occidentalis* Western Ringtail Possum	CR	CR	*Agonis* forest and woodland, Tuart Forest with *Agonis* mid storey, and Jarrah, Marri and Wandoo woodlands (Van Dyck and Strahan, 2008).	Seventeen DBCA records within 18 km of the Survey Area, including 9.2 km north of the Survey Area in 2020 (DBCA, 2023c).	Medium Survey Area is outside of the taxon's distribution. Nearby records may be associated with translocations at the Lane Poole Reserve and other sites.
Vespertilionidae	*Falsistrellus mackenziei* Western False Pipistrelle	P4	-	Mature Karri forests, wetter stands of Jarrah and Tuart, and woodlands on Swan Coastal Plain (Van Dyck and Strahan, 2008).	Four DBCA records within 15 km of the Survey Area, including two 8.8 km northwest of the Survey Area in 2013 (DBCA, 2023c).	High Records <9 km from the Survey Area, and suitable habitat within the Survey Area.
Reptiles						
Elapidae	*Acanthophis antarcticus* Southern Death Adder	P3	-	Habitats range from rainforest to shrublands and heath (Wilson and Swan, 2021).	One record 55 km north of the Survey Area in 2021 (GHD, 2021b).	Medium No nearby records, however, species is cryptic and suitable habitat present within the Survey Area.

Family	Scientific Name and Common Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Common wealth			
Pythonidae	*Aspidites ramsayi* Woma Python	P1 (SW subpop.)	-	Woodlands, heaths and shrublands, often with spinifex. Shelters mainly in abandoned monitor and mammal burrows and in soil cracks (Wilson and Swan, 2021).	One DBCA record 10.3 km northwest of the Survey Area in 2020 (DBCA, 2023c).	Medium One record <15 km from the Survey Area, limited suitable habitat within the Survey Area.
Scincidae	*Ctenotus delli* Dell's Ctenotus	P4	-	Restricted to the Darling range; Jarrah and Marri woodlands over shrubs on lateritic, sandy, and clay soils (Wilson and Swan, 2021).	Three DBCA records within 15 km of the Survey Area, including 11.6 km east of the Survey Area in 1981 (DBCA, 2023c).	High Recorded <15 km from the Survey Area, and suitable habitat within the Survey Area.
Scincidae	*Ctenotus ora* Coastal Plain Skink	P3	-	Open eucalypt woodland over *Banksia* and low vegetation on sandy coastal plain and coastal dunes south of Perth, from Pinjarra south to Yallingup Brook (Wilson and Swan, 2021).	One DBCA record 15 km west of the Survey Area in 2014 (DBCA, 2023c).	Low No suitable habitat.

5.0 Discussion

5.1 Fauna Habitat

The two fauna habitats, Jarrah-Marri Forest and Drainage Line recorded within the Survey Area, are typical of the Jarrah Forest bioregion. These habitats are consistent with the habitats previously recorded in studies in the region (**Appendix B**) and extend outside the Survey Area to form larger ecosystems which are widespread within the surrounding region. Overall connectivity at a regional level is relatively intact, as the Survey Area occurs within a landscape that retains large areas of natural vegetation. At a local level, habitats within and surround the immediate vicinity of the Survey Area are fragmented due to mining activities.

The Drainage Line habitat provides the most value to significant fauna and the overall fauna assemblage within the Survey Area. It is core habitat for all three targeted fauna taxa and often has surface water present which is a vital resource for the local fauna assemblage. A wide variety of fauna taxa will use this habitat as a dispersal corridor due the linear nature of the habitat and the presence of dense understory vegetation. Drainage Lines require relatively uninterrupted connectivity to allow fauna movement and dispersal, therefore, the Drainage Line habitat within the Survey Area is important to maintain this ecosystem function.

The Jarrah-Marri Forest habitat is relatively widespread and abundant at a regional scale. It is core habitat for the Chuditch and Woylie, and supporting habitat for the Quokka which tends to occupy dense understorey vegetation associated with wet areas such as Drainage Line habitat.

Both habitats contain tree hollows and hollow logs which are important microhabitats for hollow-dependent species. Hollow logs are often used by Chuditch for denning. The canopy of both habitats comprises valuable foraging and roosting habitat for birds such as black cockatoos, and the multitude of microhabitats (leaf litter, hummocks, woody debris, logs, and stones) provide refuge and feeding opportunities for a wide array of fauna species, particularly herpetofauna and small mammals.

5.2 Significant Fauna

5.2.1 Recorded within the Survey Area

Baudin's Cockatoo (*Zanda baudinii*) – EN (BC Act; EPBC Act)

The Baudin's Cockatoo is distributed through the south-west WA from the northern Darling Range and adjacent far east of the Swan Coastal Plain (south of the Swan River), south to Bunbury and across to Albany (Johnstone and Kirkby, 2011). The taxon rarely occurs near coastal communities north of Mandurah, and rarely occurs north of the Swan River (Johnstone and Storr, 1998; Johnstone and Kirkby, 2008). The species forages primarily in eucalypt forest, where it feeds on Marri seeds, flowers, nectar, and buds. They also feed on a wide range of seeds of *Eucalyptus* spp., *Banksia* spp., *Hakea* spp., and *Pinus* spp., as well as fruiting apples and pears and beetle larvae from under the bark of trees (Johnstone and Storr, 1998; Johnstone and Kirkby, 2008). Baudin's Cockatoo forages at all levels of the forest from the canopy to the ground, often feeding in the understorey on proteaceous trees and shrubs (especially *Banksia*) and in orchard trees within the canopy and on fallen fruit.

Secondary evidence of Baudin's Cockatoo was recorded during the survey, however direct sightings did not occur. The species can be cryptic due to its similarity in appearance to Carnaby's Cockatoos, and it can often be misidentified as such (Birdlife Australia, 2016). Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the Baudin's Cockatoo because of their value for breeding, roosting, and foraging.

The taxon is likely to use the Survey Area for nesting and raising chicks in the breeding season and may use the habitats during the wintering season as core roosting and foraging habitat.

Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) - VU (BC Act; EPBC Act)

The Forest Red-tailed Black Cockatoo is distributed through the south-west of WA from Gingin through the Darling Ranges to the south-west from Bunbury to Albany. The Forest Red-tailed Black Cockatoo inhabits dense Jarrah, Karri (*E. diversicolor*), and Marri forests and feeds primarily on the fruit of Marri and Jarrah trees (Johnstone and Kirkby, 1999).

The Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the Forest Red-tailed Black Cockatoo because of their value for breeding, roosting, and foraging. The taxon is likely to use the Survey Area for nesting and raising chicks during the breeding season and may use the habitats during the wintering season as core roosting and foraging habitat.

Chuditch (*Dasyurus geoffroii*) – VU (BC Act; EPBC Act)

The Chuditch inhabits areas dominated by sclerophyll forest or drier woodland, heath, and mallee shrubland (Van Dyck and Strahan, 2008). The species is generally highly mobile and uses bush remnants as corridors (Woinarski, Burbidge and Harrison, 2012). The Chuditch is a largely nocturnal animal, feeding on a carnivorous diet of mammals, birds, lizards, and frogs. They have been recorded foraging during the day such as during the breeding season or when cold and wet weather restricts their nocturnal movements (Van Dyck and Strahan, 2008). Most diurnal denning sites in sclerophyll forest consist of hollow logs or earth burrows, although Quenda nests and hollow tree bases may be used (Van Dyck and Strahan, 2008). The Chuditch was abundant prior to European settlement, and it is now largely restricted to the south-west of Western Australia, with small numbers in the Midwest, Wheatbelt and South Coast Regions (DBCA, 2017a).

The Chuditch was recorded via secondary evidence in the form of scat. The Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the Chuditch because of their value for denning and foraging. The Drainage Line habitat is of particular importance as it provides water sources and dispersal corridors. Population numbers may be low and dispersed through the widespread Jarrah-Marri Forest making detection difficult.

Rakali (*Hydromys chrysogaster*) - P4 (DBCA)

The Rakali (also known as the Water Rat) is a native rodent species that lives in burrows on the banks of rivers, lakes, and estuaries and is an opportunistic predator feeding on aquatic insects, fish, crustaceans, mussels, snails, frogs, birds' eggs, and water birds (Atkinson, Lund, and Morris, 2008). The species can be found in permanent water systems in Australia, New Guinea, and offshore islands, with a home range of approximately 19 ha in coastal wetlands and streams of south-western Australia, individuals will establish sedentary territories where resident male and female ranges will overlap (Van Dyck and Strahan, 2008).

The Rakali was detected by camera trap within the Drainage Line habitat within the Survey Area. Drainage Line habitat constitutes core habitat for this species and the habitat within the survey area is important for connectivity.

Western Brush Wallaby (*Notamacropus irma*) – P4 (DBCA)

The Western Brush Wallaby occurs in the south-west of Western Australia and closely resembles a larger kangaroo (Van Dyck and Strahan, 2008). Its preferred habitat consists of open forest or woodland, particularly favouring open and seasonally wet flats with low grasses and open scrubby thickets (Van Dyck and Strahan, 2008). The Western Brush Wallaby was a common species during the early days of settlement, however, ongoing

clearing and fragmentation of bushland in the Wheatbelt as well as the dramatic increase in fox numbers within the south-west of Western Australia has led to this species' decline (Van Dyck and Strahan, 2008).

The Western Brush Wallaby was recorded during the survey by both camera trap and direct sighting. Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the taxon because of their value for foraging and dispersal. The Drainage Line habitat is of particular importance as the taxon may rely on the seasonal wet flats within this habitat for the grasses and scrubby thickets for foraging and shelter.

5.2.2 High likelihood of occurrence within the Survey Area

Woylie (*Bettongia penicillata ogilbyi*) – CR (BC Act); EN (EPBC Act)

The Woylie is restricted to three small wheatbelt reserves in Western Australia: Dryandra Woodland, Tutanning Nature Reserve, and the Kingston/Perup Forest, all characterised by the presence thickets of the plant genus *Gastrolobium* (Van Dyck and Strahan, 2008). Fox predation is considered the driving factor in the Woylie's distribution contraction, with habitat destruction and disease also impacting populations to be rare and scattered (Van Dyck and Strahan, 2008). The Woylie primarily eats fungus and supplements its diet with seed kernels of the Desert Quandong (*Santalum acuminatum*), various tubers, bulbs, and invertebrates (Van Dyck and Strahan, 2008).

Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the Woylie because of their value for shelter and foraging. The Drainage Line habitat is of particular significance to the taxon as this habitat contains valuable water sources and dense thickets which provide refuge from predators.

Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act; EPBC Act)

Carnaby's Cockatoos nest in the hollows of a wide range of *Eucalyptus* trees, with a preference for smooth barked trees such as Salmon Gum (*E. salmonophloia*) and Wandoo (*E. wandoo*) but also rough barked *Eucalyptus* and *Corymbia* trees such as Red Morrell (*E. longicornis*), York Gum (*E. loxophleba*), Marri (*Corymbia calophylla*) and Tuart (*E. gomphocephala*) (Johnstone and Storr, 1998). Carnaby's Cockatoos feed on seeds, nuts, and flowers of a variety of native and exotic plants, including *Banksia* spp., Pine trees (*Pinus* sp.), Marri, Jarrah (*E. marginata*), *Grevillea* spp., *Allocasuarina* spp., and *Hakea* spp. (Shah, 2006).

The Jarrah-Marri Forest within the Survey Area provides core foraging, roosting and nesting habitat which may be used by this taxon. Recent previous studies have recorded foraging and unconfirmed breeding of this taxon in similar Jarrah-Marri Forest north of the Survey Area.

Quokka (*Setonix brachyurus*) – VU (BC Act; EPBC Act)

The Quokka is a small macropod found on two offshore islands (Rottnest and Bald Island) and several mainland sites in south-west Western Australia (Van Dyck and Strahan, 2008; DBCA, 2017a). The distribution of the Quokka is severely fragmented and there is little to no migration between populations. Mainland populations of the Quokka favour dense riparian vegetation; however, they also make use of heath and shrubland, swamp Peppermint, and swampy shrublands as well as Karri Forest regrowth (Van Dyck and Strahan, 2008; DBCA, 2017a). The populations of Quokkas on the mainland are largely restricted to areas of high rainfall of 1,000 mm or more (Van Dyck and Strahan, 2008).

The Drainage Line habitat constitutes core habitat for the Quokka due to the dense understorey vegetation. The Jarrah-Marri habitat constitutes supporting habitat for the taxon. A recent survey has recorded this taxon within Drainage Line habitat north of the Survey Area (GHD, 2021a). The Drainage Line habitat is limited in extent within the Survey Area

and extends outside the Survey Area, therefore it is possible that the taxon is present within the area but was not detected at camera trap locations during the survey.

Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – CD (BC Act)

The Wambenger Brush-tailed Phascogale is a rat-sized, arboreal, carnivorous marsupial, characterised by a tuft of black hair on its tail (Van Dyck and Strahan, 2008). Typically, the species has been observed in dry sclerophyll forests and open woodlands containing hollow-bearing trees with a sparse ground cover. The distribution of the Wambenger Brush-tailed Phascogale is widespread but fragmented, stemming from habitat destruction and predation by cats and foxes (Van Dyck and Strahan, 2008). In the south-west of Australia, the species is thought to have declined within the last 10 years given the lower number of records despite an increase in survey effort (Van Dyck and Strahan, 2008).

Wambenger Brush-tailed Phascogale was not recorded during the survey. The taxon has been recorded within 100 m of the Survey Area (DBCA, 2023c) and recent surveys in the region detected the species via trapping and camera trapping in nearby Jarrah-Marri Forest (GHD, 2021a). The Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for this species because of their value for shelter, foraging, and dispersal.

Quenda (*Isoodon fusciventer*) – P4 (DBCA)

Quenda are nocturnal and omnivorous, feeding on insects, spiders, worms, and plant roots and are typically found in dense vegetation, including wetland fringes, forest, woodland, shrub, and heath communities (Van Dyck and Strahan, 2008; DBCA, 2012). They are found only in the southwestern corner of Western Australia, where these regions generally display a combination of sandy soils with dense heathy vegetation in the lower stratum (Van Dyck and Strahan, 2008; DBCA, 2012).

Within the Survey Area, the Jarrah-Marri Forest and Drainage Line habitats constitute core habitat for the taxon because of their value for shelter, foraging, and dispersal. The Drainage Line habitat is of particular importance as provides water sources and dense understorey for shelter.

Western False Pipistrelle (*Falsistrellus mackenziei*) – P4 (DBCA)

The Western False Pipistrelle is endemic to the south-western region of Western Australia, making use of high rainfall forests dominated by Jarrah, Karri, Marri, and Tuart. The species is a specialist of tall mature forest, foraging within the canopy and roosting in tree hollows (Van Dyck and Strahan, 2008).

Western False Pipistrelle was not targeted during the surveys and so presence was not detected; however, this taxon is widely documented within the area and the Survey Area contains core Jarrah-Marri Forest and Drainage Line habitat which provides high value foraging habitat and roost sites which are associated with hollows in *Eucalyptus* (Baker and Gynther, 2023).

Dell's Ctenotus (*Ctenotus delli*) – P4 (DBCA)

Dell's Ctenotus is endemic to the north Darling Range, south-western Australia, inhabiting dry sclerophyll forest on stony hills and ranges (Cogger, 2014).

This taxon may use the Jarrah-Marri Forest with lateritic clay substrate within the Survey Area which provides suitable foraging and breeding habitats.

5.2.3 Medium likelihood of occurrence within the Survey Area

Western Ringtail Possum (*Pseudocheirus occidentalis*) – CR (BC Act; EPBC Act)

The Western Ringtail Possum is found in the South-West, particularly around Busselton, largely in areas of Peppermint (*Agonis flexuosa*) or Tuart *(Eucalyptus gomphocephla*) forest, generally with a Peppermint midstory (Van Dyck and Strahan, 2008). The species is nocturnal, and typically feeds on the leaves of Peppermint or Eucalypt trees. In coastal Peppermint habitat, Western Ringtail Possums constructs dreys anywhere from the upper canopy to the understory, which are used as rest sites during the day. Coastal populations are under immediate threat from habitat loss and fragmentation and recent research from Jarrah Forest sites indicates that increasing fire intensity at the local scale and fox predation are also impacting the species (Van Dyck and Strahan, 2008).

The Western Ringtail Possum has been recorded within the Desktop Study Area and may occur within the Survey Area. Records range between 1997 and 2020 due to multiple translocations occurring at Lane Poole Reserve (17 km north of the Survey Area), Yalgorup National Reserve (37 km northwest of the Survey Area), and Leschenault Peninsula (41 km southwest of the Survey Area) between 1991 and 2004. Due to predation, disease, habitat destruction by fires and limited post-translocation monitoring data, translocated populations were unstable with numbers considered to be low and undetectable. The Survey Area has the potential to support this taxon as Jarrah-Marri Forest constitutes core habitat for inland populations where Peppermint and Tuart is absent.

Australasian Bittern (*Botaurus poiciloptilus*) – EN (BC Act)

The Australasian Bittern is a secretive bird with a distinct booming call that nests and forages within dense wetland vegetation (Johnstone and Storr, 1998). In Western Australia, the Australasian Bittern was formerly widespread throughout the southwest, however this range has declined. It is now considered that the Australasian Bittern only occurs in select habitats, including the western coastal plain between Lancelin and Busselton, the southern coastal region from Augusta to the east of Albany and inland to some wetlands in the Jarrah Forest belt with small, isolated populations in swamps from west of Esperance eastwards to near Cape Arid (Marchant and Higgins, 1990). The main cause of this decline is thought to be wetland drainage and degradation.

Although the Australasian Bittern typically occurs in swamps, the taxon was recorded 5.8 km north of the Survey Area in 2017 in Drainage Line habitat that appears to be similar to that which occurs within the Survey Area. Therefore, the Drainage Line habitat constitutes potential habitat for the taxon.

Malleefowl (*Leipoa ocellata*) – VU (BC Act; EPBC Act)

The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee or *Acacia*. A sandy substrate and abundance of leaf litter are required for breeding (DEE, 2018). Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where habitats tend to be thicker and there is an abundance of food plants. Much of the best habitat for Malleefowl has already been cleared or has been modified by grazing via Sheep, Cattle, Rabbits, and Goats (Benshemesh, 2007). The species nests in large mounds of dirt and leaf litter, up to five metres wide and one metre tall (Menkhorst *et al.*, 2019).

Malleefowl was sighted 17.6 km from the Survey Area in 2014 (DBCA, 2023c) Furthermore, individuals were translocated to the nearby Dryandra Woodland, 79 km east-northeast of the Survey Area, within the last five years (Traill, 2019). The Jarrah-Marri Forest and Drainage Line habitats have the potential to support this species, though no evidence of foraging or nesting was recorded during the survey. Malleefowl are often cryptic and nest in areas of dense shrubland, making detection of the species difficult without LiDAR mapping of potential nesting mounds.

Peregrine Falcon (*Falco peregrinus*) – OS (DBCA)

The Peregrine Falcon is an uncommon but wide-ranging bird across Australia (Barrett *et al.*, 2003). It occurs along rivers and ranges as well as wooded watercourses and lakes. It nests primarily on cliffs, granite outcrops and quarries, although is also known to occupy existing raptor and corvid stick nests (Menkhorst *et al.*, 2019). The diet of the Peregrine Falcon has been well studied and primarily includes flocking species such as parrots, pigeons and on the east coast, European Starlings (Olsen and Fuentes, 2008).

Peregrine Falcon was not observed during the survey; however, this species has been previously recorded within the region flying over similar Jarrah-Marri Forest (GHD, 2021a). In the absence of cliff ledges, Peregrine Falcons will use trees for nesting (Morcombe, 2003). The Jarrah-Marri Forest within the Survey Area and surrounds may provide suitable nesting and hunting habitat to support this species.

Woma Python (*Aspidites ramsayi*) – P1 (DBCA)

The Woma Python is a nocturnal, terrestrial snake that inhabits woodland, heaths, and shrublands, often with spinifex. It shelters in hollow logs, abandoned monitor and mammal burrows, and soil cracks (Wilson and Swan, 2021). It is usually restricted to arid and dry inland areas, however there is an isolated population in south-western Australia (Cogger, 2014).

Within the Survey Area, both the Jarrah-Marri Forest and Drainage Line habitats provide suitable resources for hunting and shelter.

Southern Death Adder (*Acanthophis antarcticus*) – P4 (DBCA)

The Southern Death Adder is found in Southwest and South Australia to Eastern and Central Queensland where, due to habitat destruction and altered fire regimes, populations are in decline (Cogger, 2014; Wilson and Swan, 2021). Habitats range from rainforest to shrublands and heath (Wilson and Swan, 2021).

The Survey Area falls within distribution of the Southern Death Adder and microhabitats within the Jarrah-Marri Forest and Drainage Line habitats have the potential to be used by the taxon for shelter and hunting.

6.0 Conclusion

Two fauna habitats were mapped within the Survey Area, Jarrah-Marri Forest, and Drainage Line habitats. The Drainage Line habitat provides the most value for the targeted taxa as it is core habitat for the Chuditch, Quokka, and Woylie. The Jarrah-Marri Forest also provides value for targeted taxa as core habitat for the Chuditch and Woylie and supporting habitat for the Quokka.

One targeted taxon was recorded during the survey; secondary evidence of Chuditch was recorded in the form of scat within the Jarrah-Marri Forest. The Quokka and Woylie were not recorded during the current survey however, they have previously been recorded within 200 m and 40 m of the Survey Area respectively.

In addition to the targeted fauna taxa, four significant taxa were recorded during the fauna survey:

- Forest Red-tailed Black Cockatoo– VU (EPBC; BC Act).
- Baudin's Cockatoo – EN (EPBC; BC Act).
- Western Brush Wallaby – P4 (DBCA).
- Rakali – P4 (DBCA).

A further seven significant fauna taxa were assessed as having a high likelihood and six significant fauna taxa were assessed as having a medium, and 15 significant fauna taxa were assessed as having have a low likelihood of occurring within the Survey Area.

Three introduced taxa were recorded during the survey: Pig (*Sus scrofa*), Cat (*Felis catus*) and Black Rat (*Rattus rattus*).

7.0 References

Atkinson, C., Lund, M. and Morris, K. (2008) 'BiblioRakali: the Australian water rat, Hydromys chrysogaster Geoffroy, 1804 (Muridae: Hydromyinae), a subject-specific bibliography', *Conservation Science W. Aust*, 7(1), pp. 65–71.

Baker, A.M. and Gynther, I.C. (2023) *Strahan's Mammals of Australia*. 4th edn. Wahroonga, Australia: Reed New Holland Publishers.

Barrett, G. *et al.* (2003) *The new atlas of Australian birds*. Melbourne, Australia: Royal Australasian Ornithologists Union.

Beard, J.S. *et al.* (2013) 'The vegetation of Western Australia at the 1:3,000,000 scale. Explanatory memoir. Second edition', *Conservation Science W. Aust.*, 9(1), pp. 1–152.

Benshemesh, J. (2007) *National recovery plan for malleefowl Leipoa ocellata*. Adelaide, Australia.

Birdlife Australia (2016) *Identifying Southwest Black-Cockatoos*. Perth, Australia.

BoM (2007) *About Climate Statistics*. Available at: http://www.bom.gov.au.

BoM (2024) *Climate Data Online*. Available at: http://www.bom.gov.au.

Cogger, H.G. (2014) *Reptiles and amphibians of Australia*. 7th edn. Melbourne, Australia: CSIRO Publishing.

Commonwealth of Australia (1999) *Environment Protection and Biodiversity Conservation Act 1999*. Australia. Available at: www.legislation.gov.au.

DBCA (2012) *Fauna Profile - Quenda Isoodon obesulus*. Available at: www.dpaw.wa.gov.au.

DBCA (2017a) *Fauna Profile - Chuditch Dasyurus geoffroii*. Available at: http://www.dbca.wa.gov.au.

DBCA (2017b) *Fauna Profile - Quokka Setonix brachyurus*. Available at: https://www.dpaw.wa.gov.au/.

DBCA (2023a) *DBCA - Lands of Interest (DBCA-012)*. Available at: https://catalogue.data.wa.gov.au.

DBCA (2023b) *DBCA - Legislated Lands and Waters (DBCA-011)*. Available at: https://catalogue.data.wa.gov.au.

DBCA (2023c) *DBCA Threatened and Priority Fauna Database request (Custom Search)*.

DBCA (2023d) *NatureMap Database Search*. Perth, Australia.

DCCEEW (2023) *Protected Matters Search Tool*. Available at: https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool.

DEE (2016) *Interim Biogeographic Regionalisation for Australia, Version 7*. Canberra, Australia. Available at: www.environment.gov.au.

DEE (2018) *Leipoa ocellata - Malleefowl*. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=934.

DMIRS (2024) *Mining Tenements (DMIRS-003)*. Available at: https://catalogue.data.wa.gov.au/.

DoE (2013) *Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.environment.gov.au.

DPIRD (2022) *Soil Landscape Mapping - Best Available (DPIRD-027)*. Perth, Australia. Available at: https://catalogue.data.wa.gov.au.

DSEWPaC (2011) *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.dcceew.gov.au.

DWER (2018) *Hydrography, Linear (Hierarchy) (DWER-031)*. Perth, Australia: Landgate. Available at: https://catalogue.data.wa.gov.au.

DWER (2021) *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*. Available at: https://catalogue.data.wa.gov.au/.

Van Dyck, S. and Strahan, R. (2008) *The mammals of Australia*. 3rd edn. Sydney, Australia: New Holland Publishers.

Environmental Management and Research Consultants (2006) *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region*.

EPA (2016) *Environmental Factor Guideline - Terrestrial Fauna*. Perth. Available at: https://www.epa.wa.gov.au.

EPA (2020) *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment*. Available at: https://www.epa.wa.gov.au.

GHD (2012) *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment*.

GHD (2021a) *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine-Holyoake*.

GHD (2021b) *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine-Myara North*.

Government of Western Australia (1986) *Environmental Protection Act 1986*. Available at: www.legislation.wa.gov.au.

Government of Western Australia (2016) *Biodiversity Conservation Act 2016*. Available at: www.legislation.wa.gov.au.

Harewood, G. (2017) *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)*.

Harewood, G. (2019) *Black Cockatoo Habitat Assessment - Pinjarra Racecourse*.

Johnstone, R.E. and Kirkby, T. (1999) 'Food of the forest red-tailed black cockatoo Calyptorhynchus banksii naso in south-west Western Australia', *Western Australian Naturalist*, 22, pp. 167–177.

Johnstone, R.E. and Kirkby, T. (2011) *Carnaby's Black Cockatoo (Calyptorhynchus latirostris), Baudin's Black Cockatoo (Calyptorhynchus baudinii) and the Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso) on the Swan Coastal Plain (Lancelin–Dunsborough), Western Australia*. Perth, Australia.

Johnstone, R.E. and Storr, G.M. (1998) *Handbook of Western Australian birds*. Edited by D. Louise. Perth, Australia: Western Australian Museum.

Marchant, S. and Higgins, P.J. (1990) *Handbook of Australian, New Zealand and Antarctic Birds. Volume 1 - Ratites to Ducks*. Melbourne: Oxford University Press.

Menkhorst, P. *et al.* (2019) *The Australian Bird Guide*. Revised Edition. Melbourne, Australia: CSIRO Publishing.

Morcombe, M. (2003) *Field Guide to Australian Birds*. Archerfield: Steve Parish Publishing Pty Ltd.

Olsen, J. and Fuentes, E. (2008) 'Dietary shifts based upon prey availability in Peregrine Falcons and Australian Hobbies breeding near Canberra, Australia', *Journal of Raptor Research*, 42, pp. 125–137.

Pizzey, G. and Knight, F. (2001) *Field Guide to Birds of Australia*. Pymble, Australia: HarperCollins Australia.

Shah, B. (2006) *Conservation of Carnaby's Black Cockatoo on the Swan Coastal Carnaby's plain, Western Australia*. Perth, Australia.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J. (2002) *Native vegetation in Western Australia: Extent, type and status. Resource Management Technical Report 249*. Perth, Australia. Available at: https://library.dpird.wa.gov.au.

Traill, M. (2019) 'Malleefowl land in Dryandra', *Narrogin Observer*. Available at: https://www.narroginobserver.com.au.

Way, S. (2013) *Chuditch Pre-mine Survey, Myara* .

Williams, K. and Mitchell, D. (2001) *Jarrah Forest 1 (JF1 – Northern Jarrah Forest subregion)*. Perth, Australia.

Wilson, S. and Swan, G. (2021) *A complete guide to reptiles of Australia*. 6th edn. New Holland Publishers.

Woinarski, J., Burbidge, A. and Harrison, P. (2012) *The action plan for Australian mammals 2012*. CSIRO Publishing.

8.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

To achieve this, your feedback on the team's performance, deliverables and service are valuable and SLR welcome all feedback via https://www.slrconsulting.com/en/feedback. We recognise the value of your time, and we will make a $10 donation to our 2023 Charity Partner - Lifeline, for every completed form.

Appendix A Maps

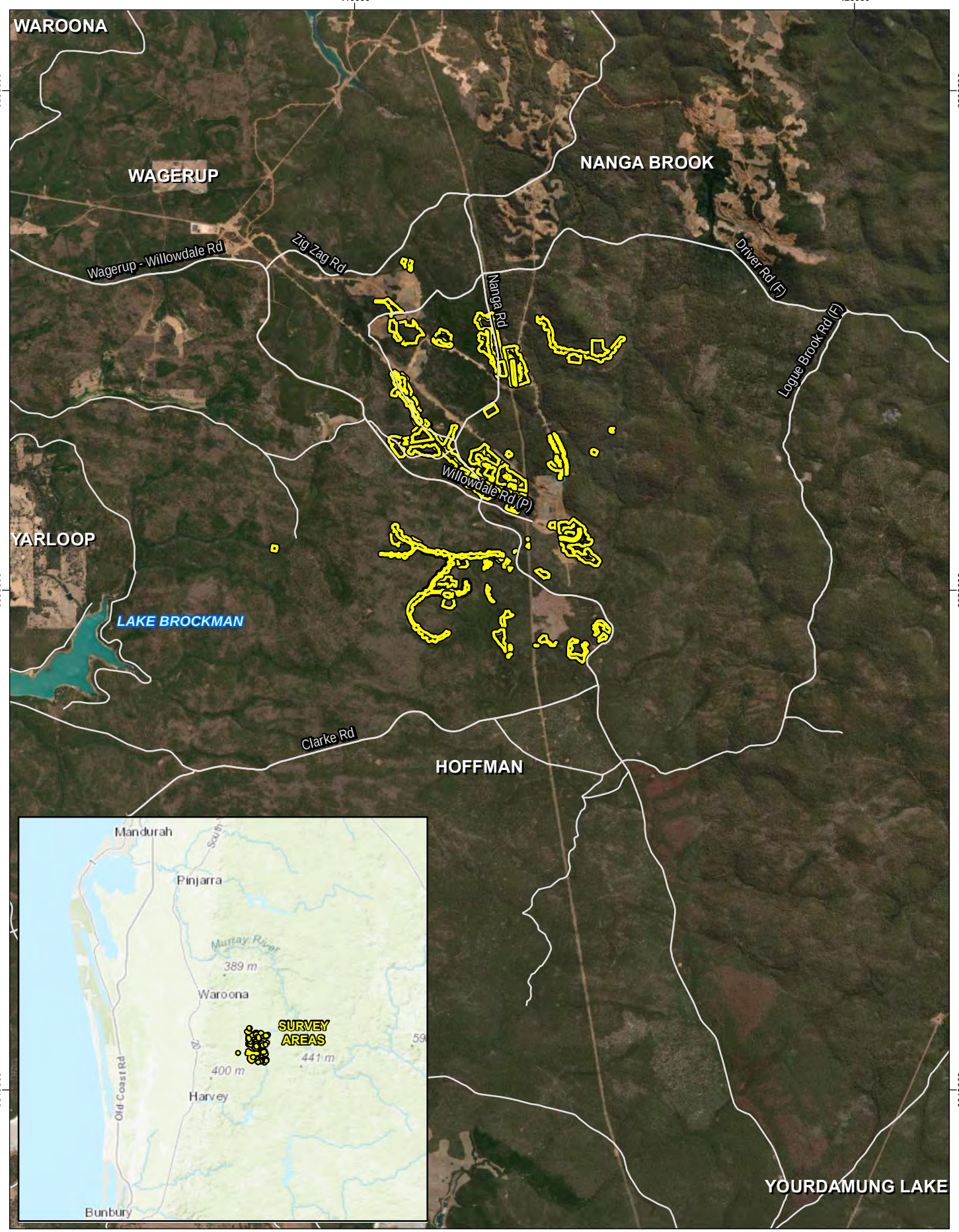
Targeted Chuditch, Quokka, and Woylie Survey

Willowdale Mine – Larego Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024



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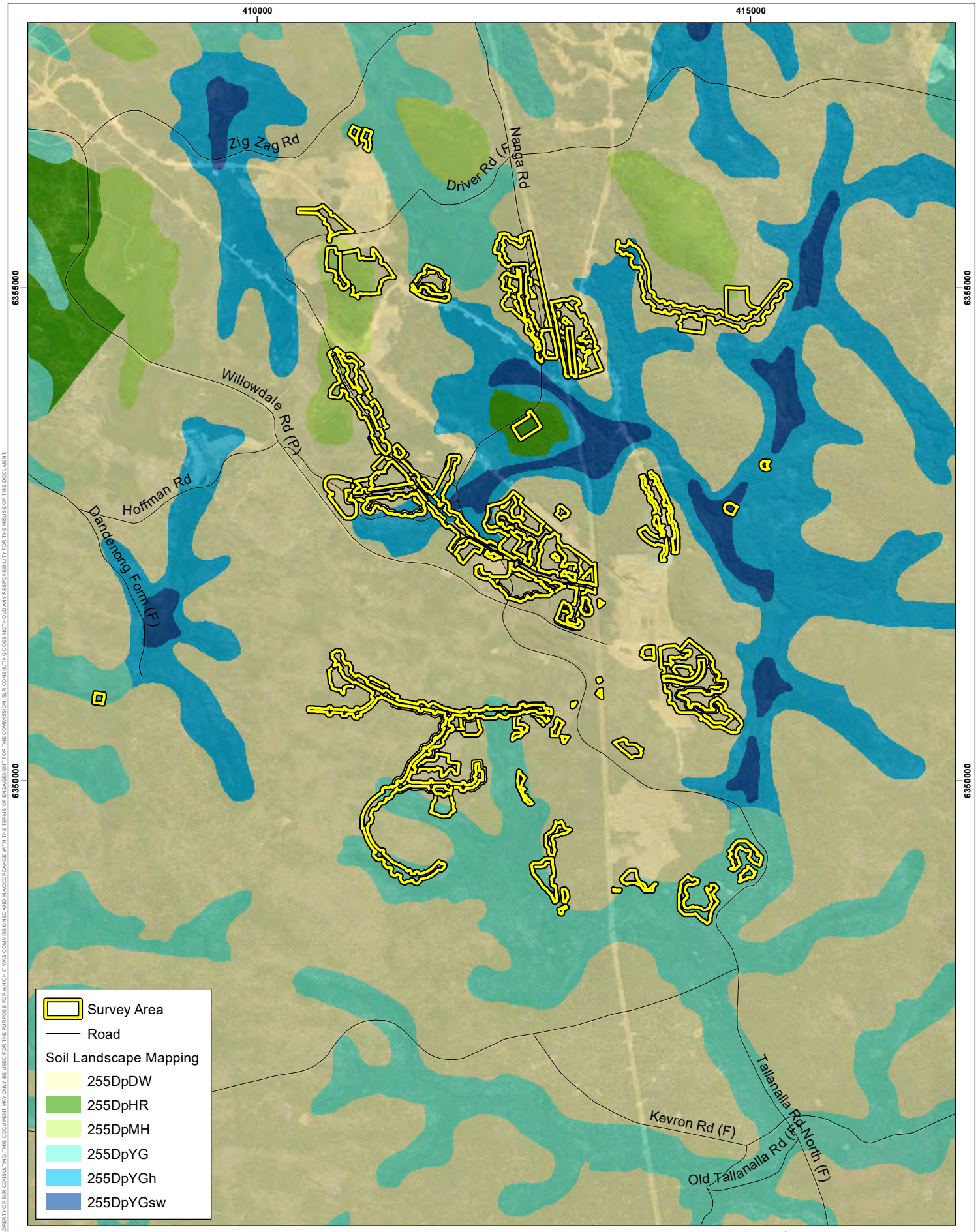
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Survey Area

MAP 1

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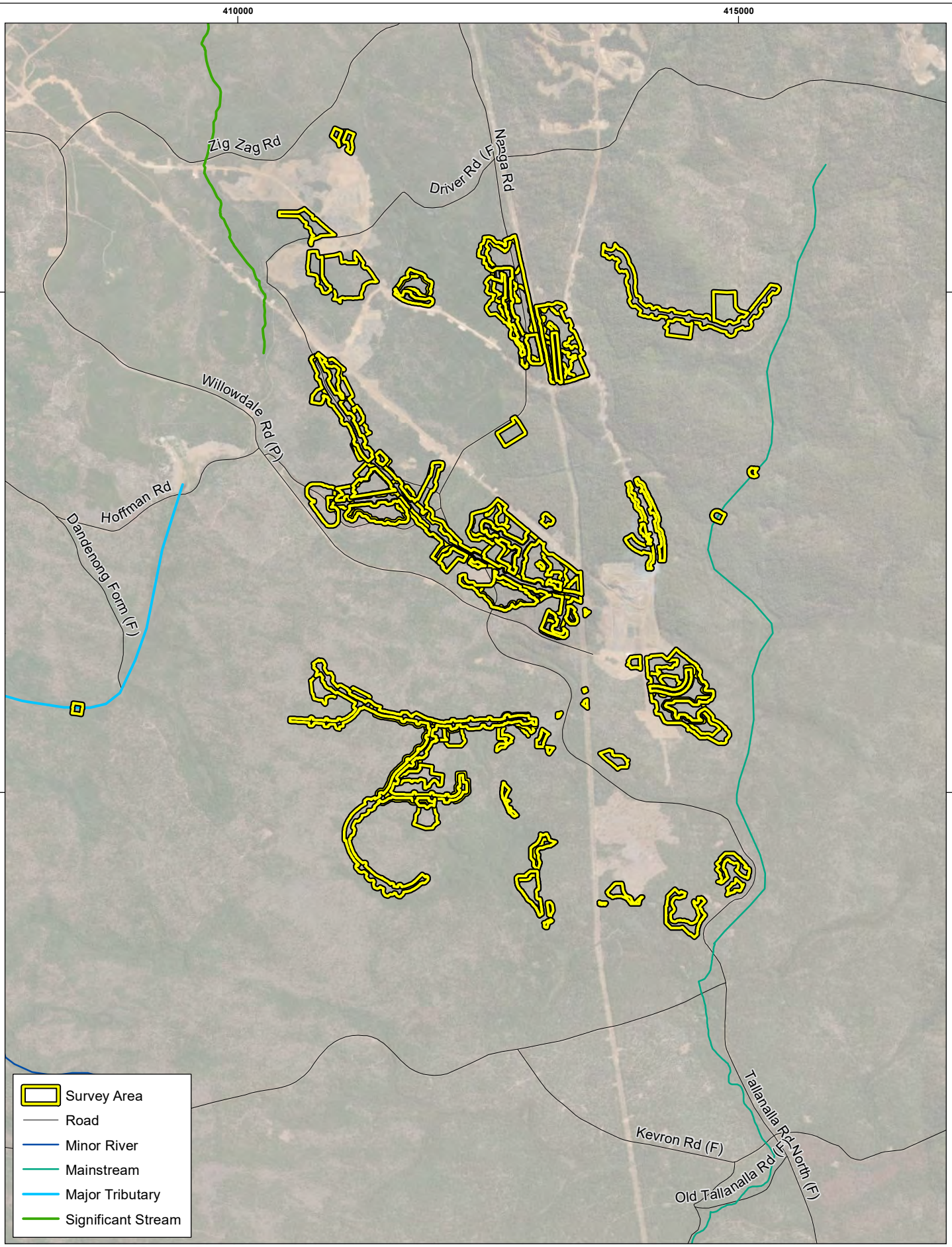
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Alcoa
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Larego Region

Soil Landscape Mapping
MAP 2

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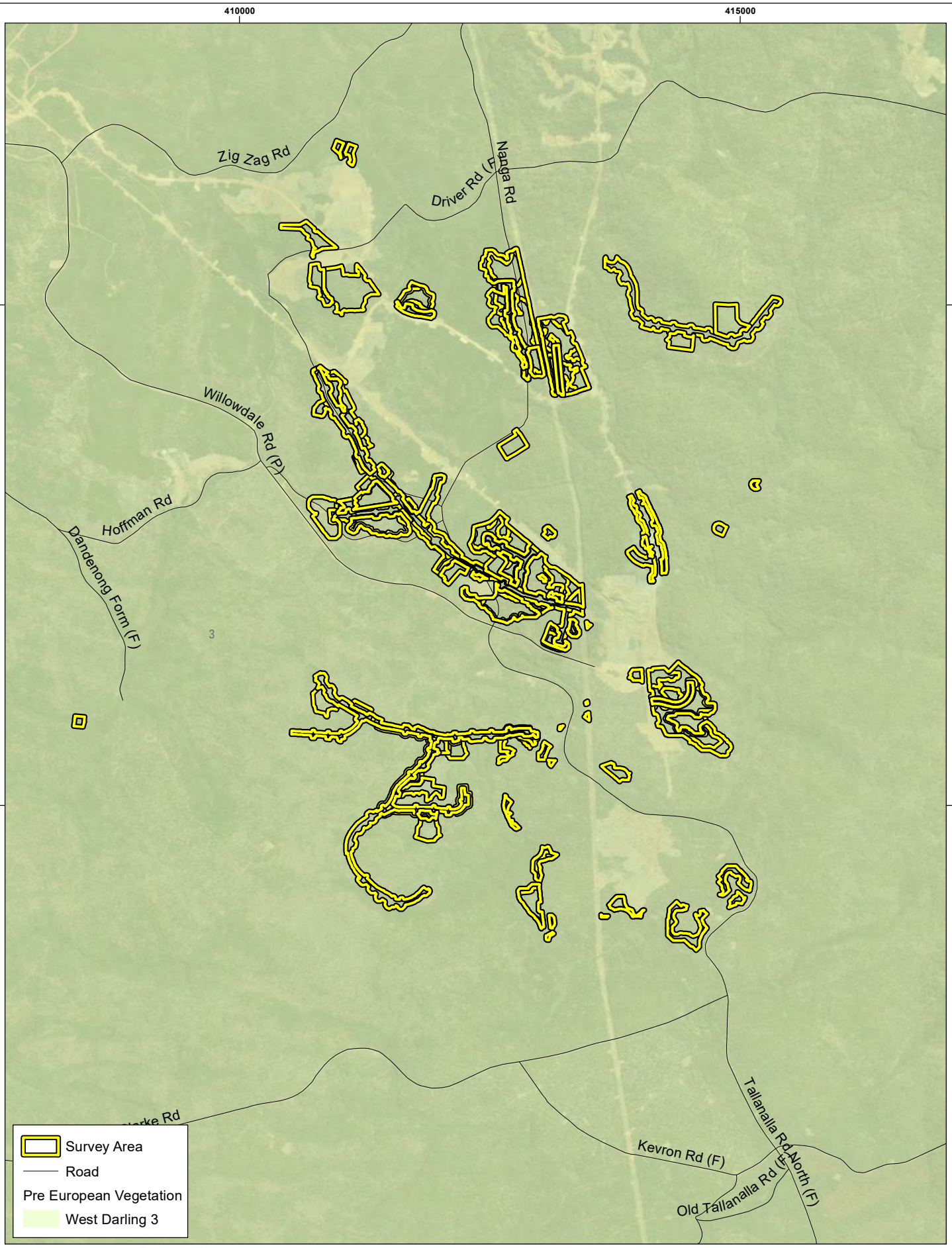
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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine
Larego Region

Hydrography
MAP 3

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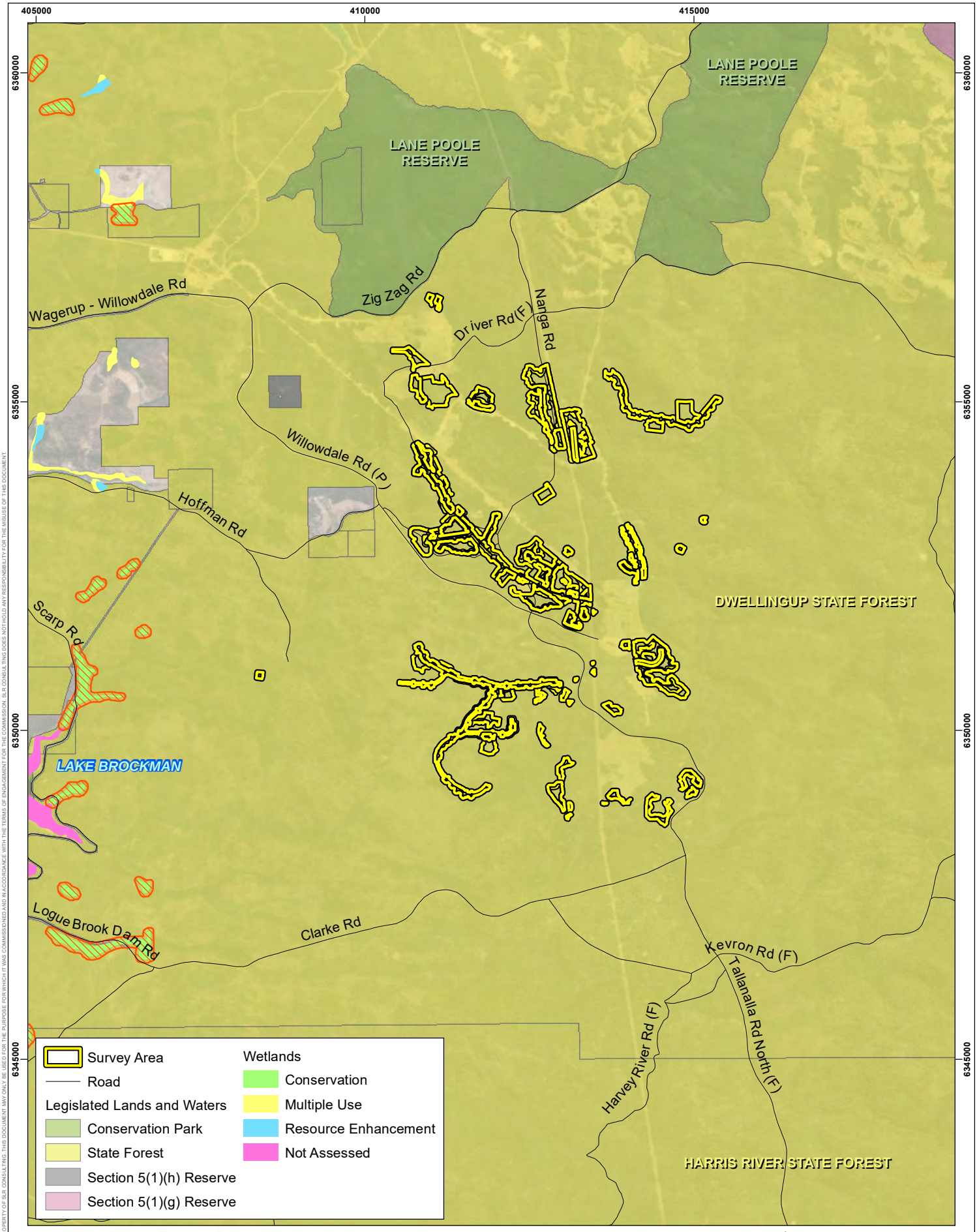
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Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine
Larego Region

Pre-European Vegetation
MAP 4

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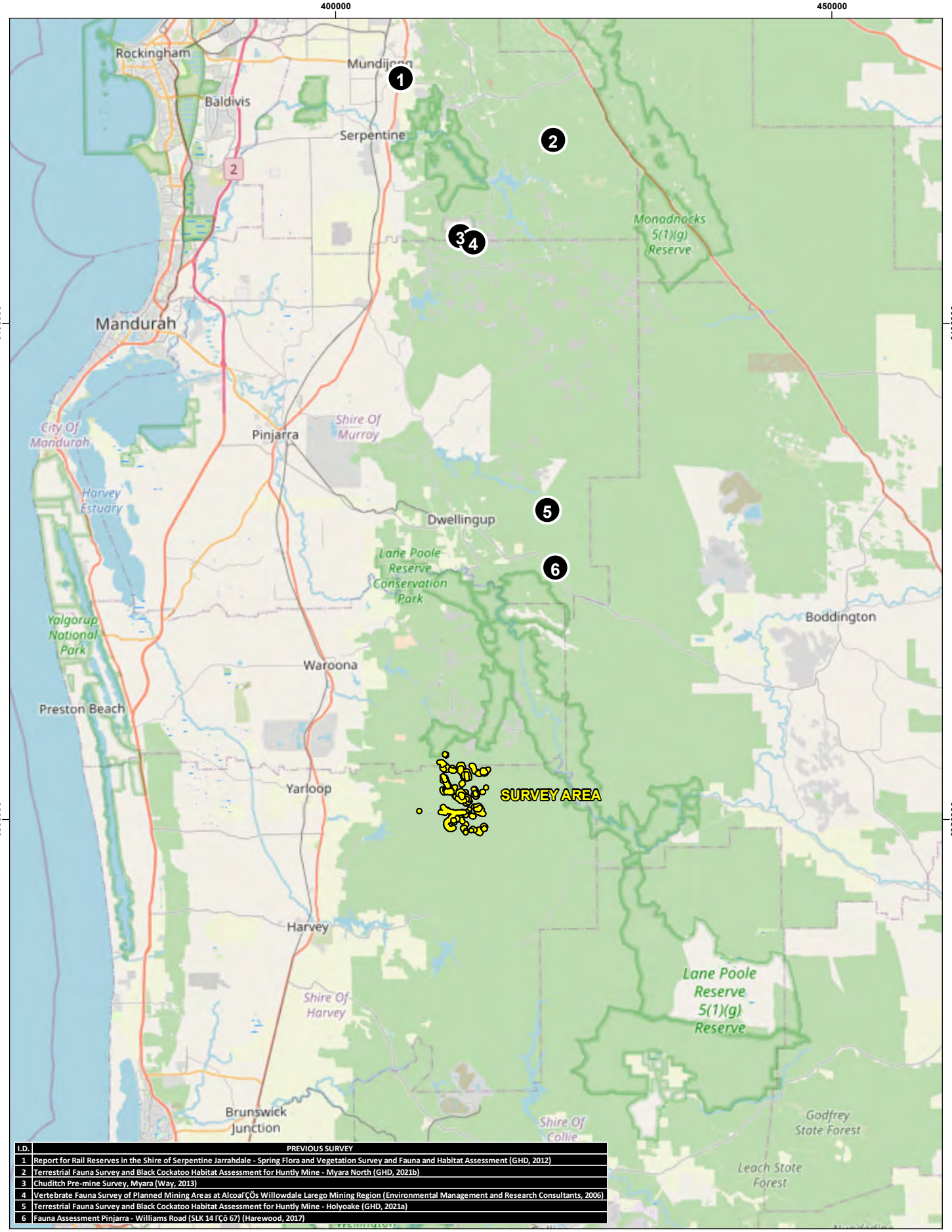
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Larego Region
Conservation and Environmentally Sensitive Areas
MAP 5

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I.D.	PREVIOUS SURVEY
1	Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment (GHD, 2012)
2	Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North (GHD, 2021b)
3	Chuditch Pre-mine Survey, Myara (Way, 2013)
4	Vertebrate Fauna Survey of Planned Mining Areas at AlcoaÇÖs Willowdale Larego Mining Region (Environmental Management and Research Consultants, 2006)
5	Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake (GHD, 2021a)
6	Fauna Assessment Pinjarra - Williams Road (SLK 14 ÇÔ 67) (Harewood, 2017)

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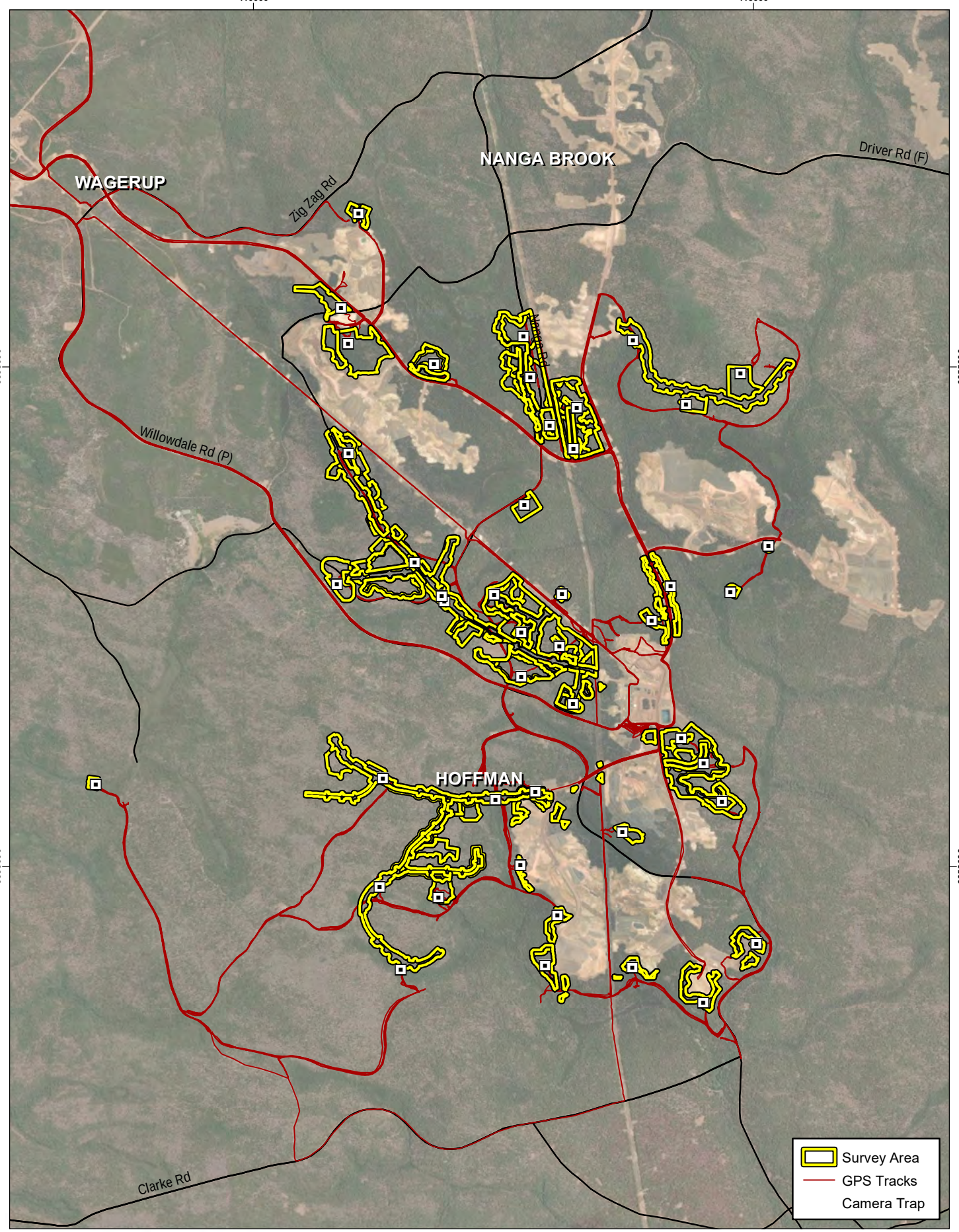
Previous Surveys in the Locality

MAP 6

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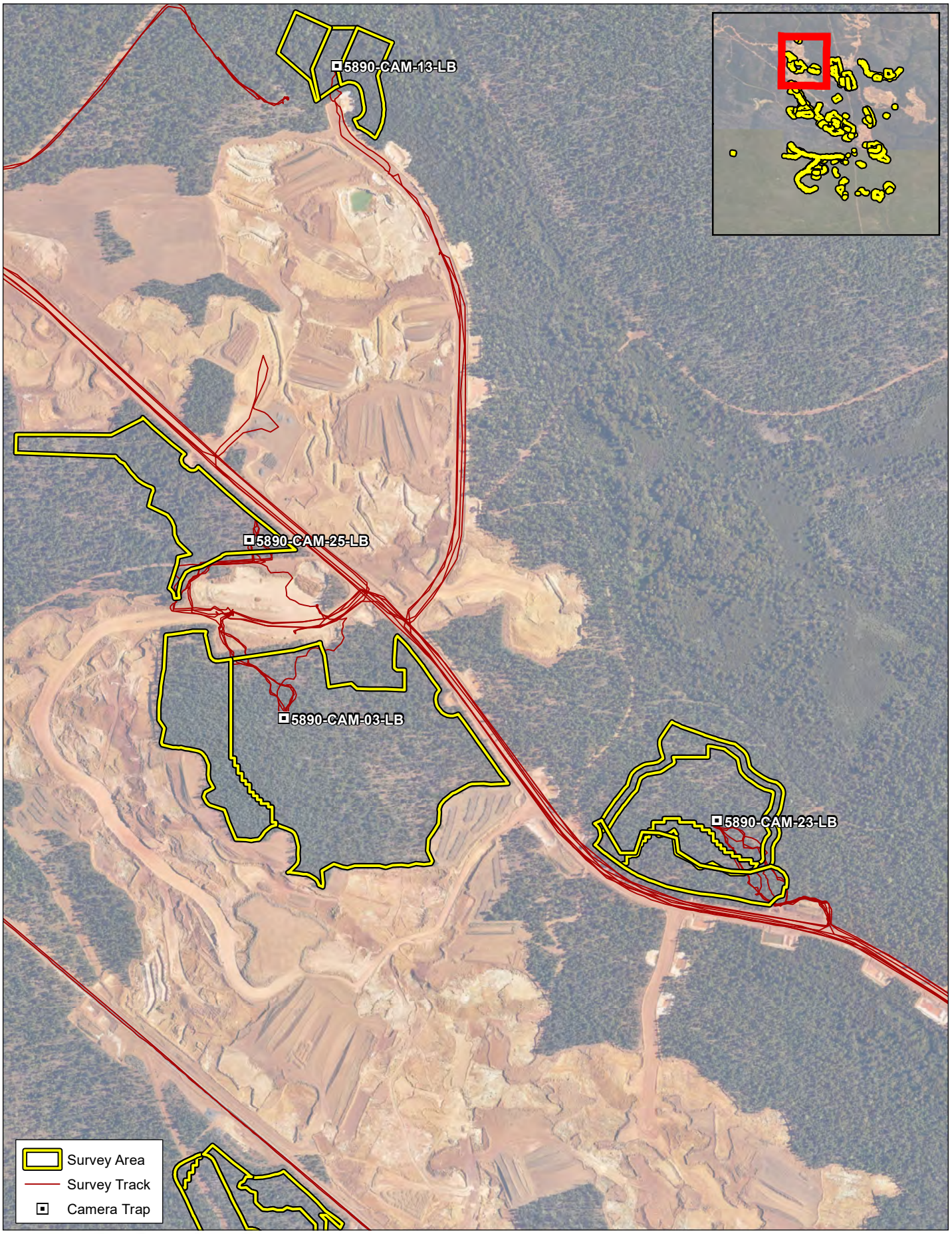
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Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine Larego Region

Survey Effort
MAP 7-1

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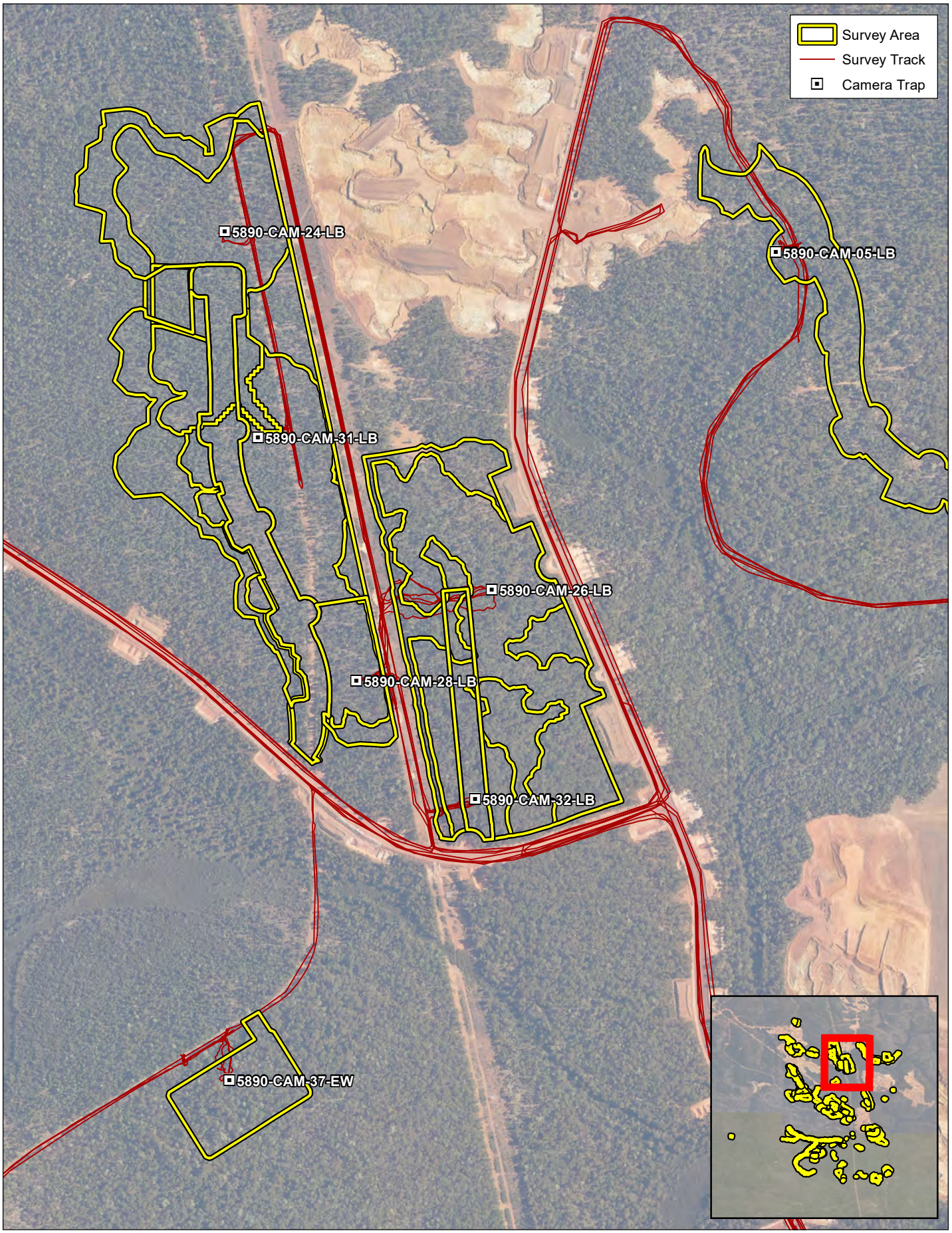
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Alcoa
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Larego Region

Survey Effort
MAP 7-2

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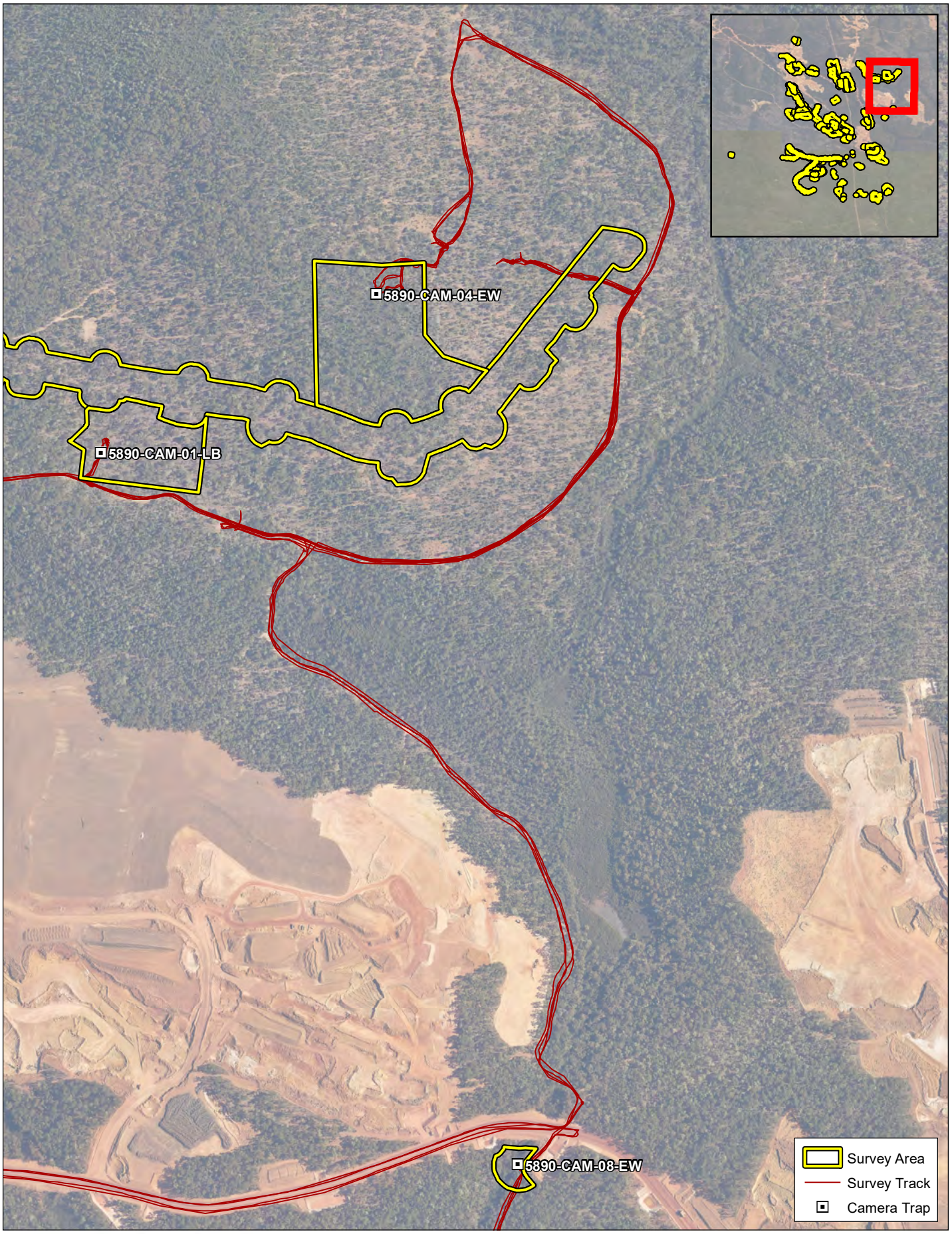
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Larego Region

Survey Effort
MAP 7-3

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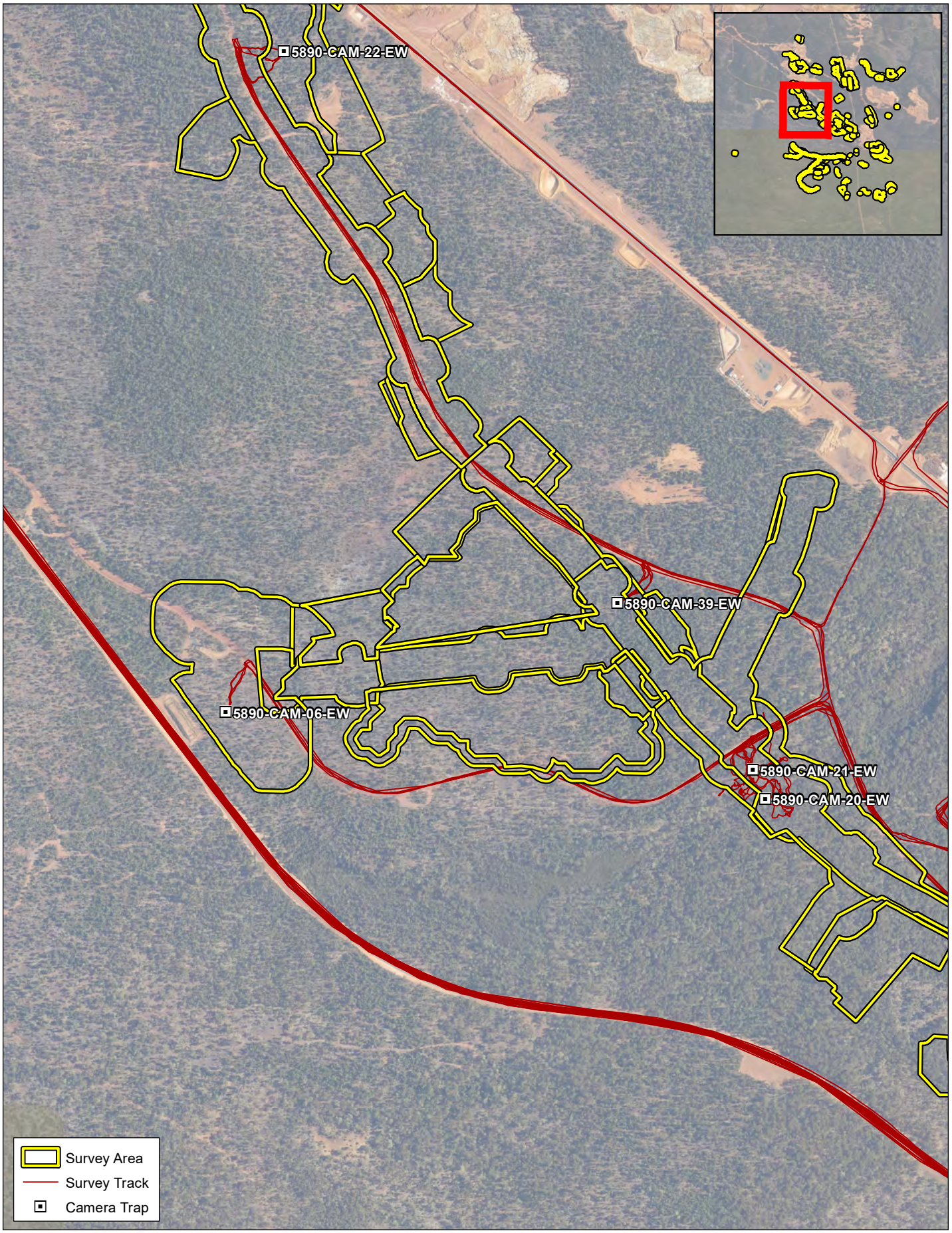
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Survey Effort
MAP 7-4

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Alcoa

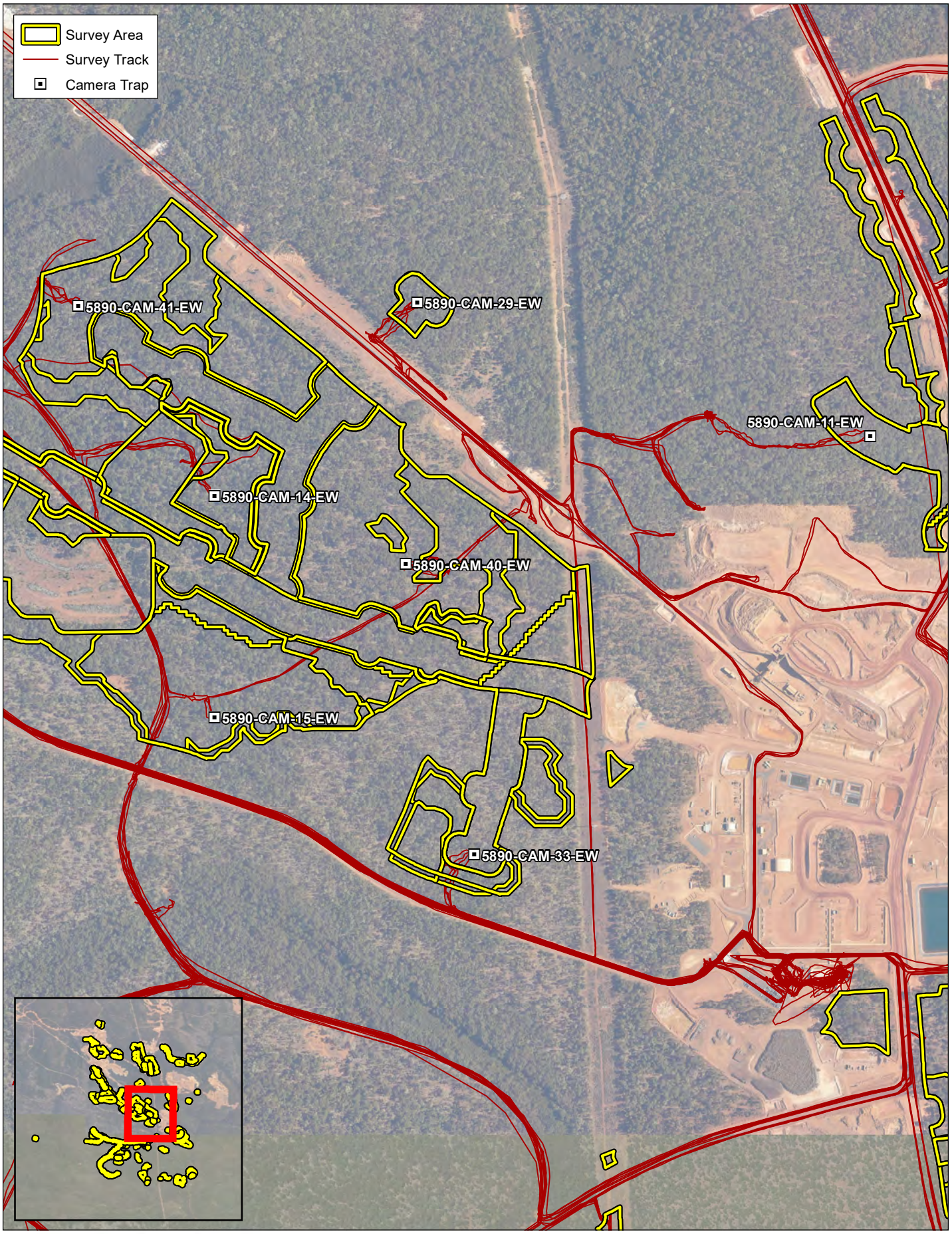
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Survey Effort

MAP 7-5

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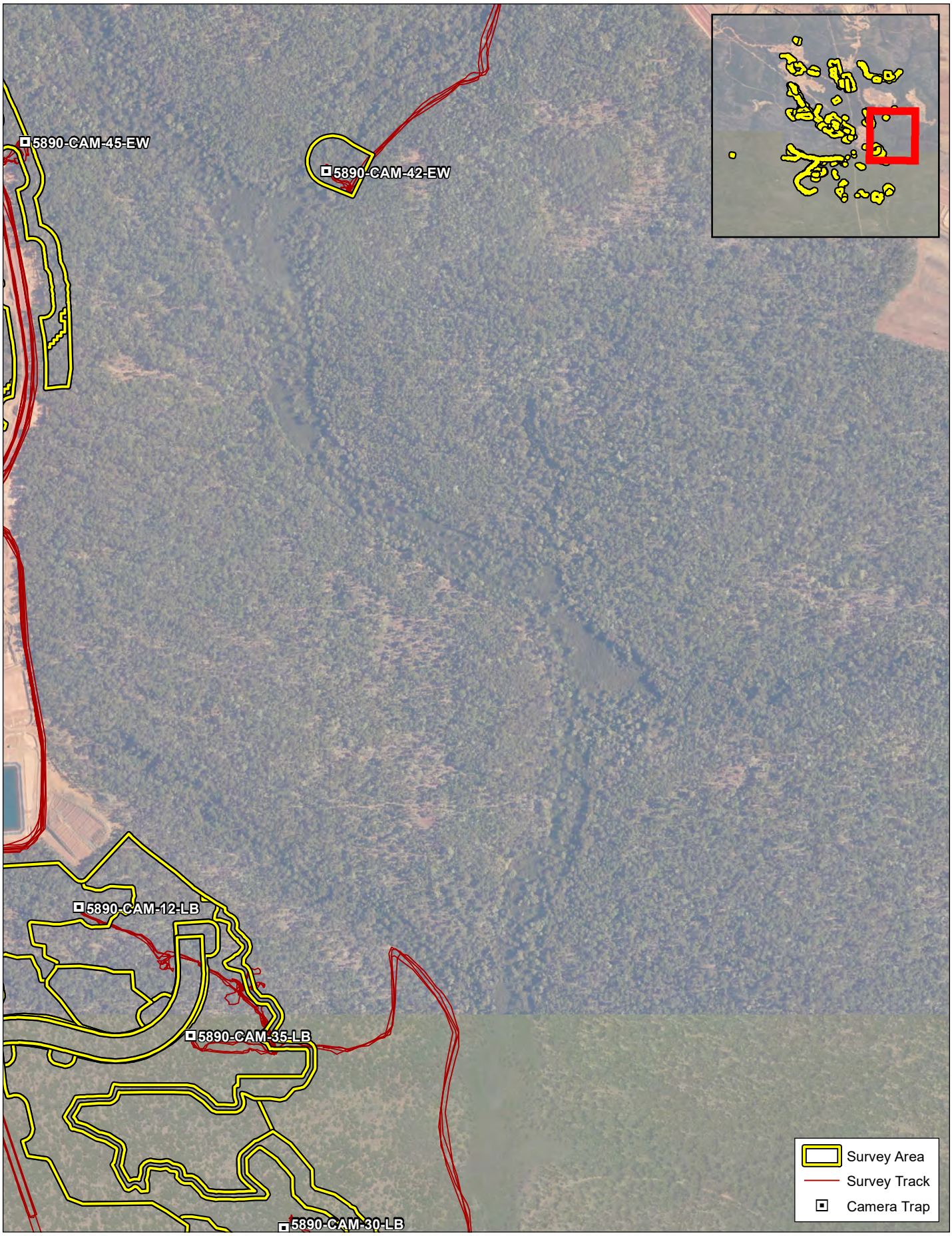
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Alcoa
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Larego Region

Survey Effort
MAP 7-6

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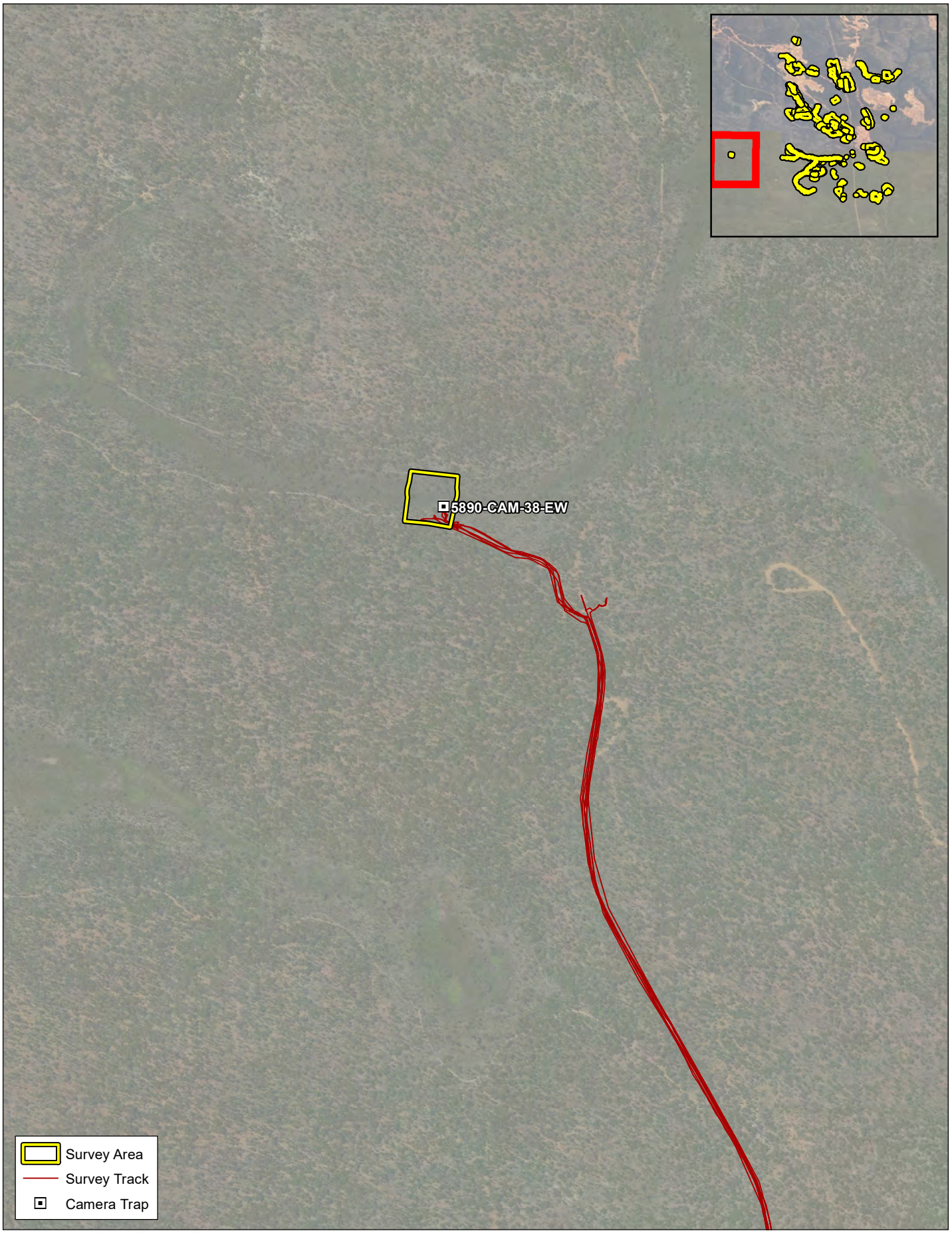
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Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine Larego Region

Survey Effort

MAP 7-7

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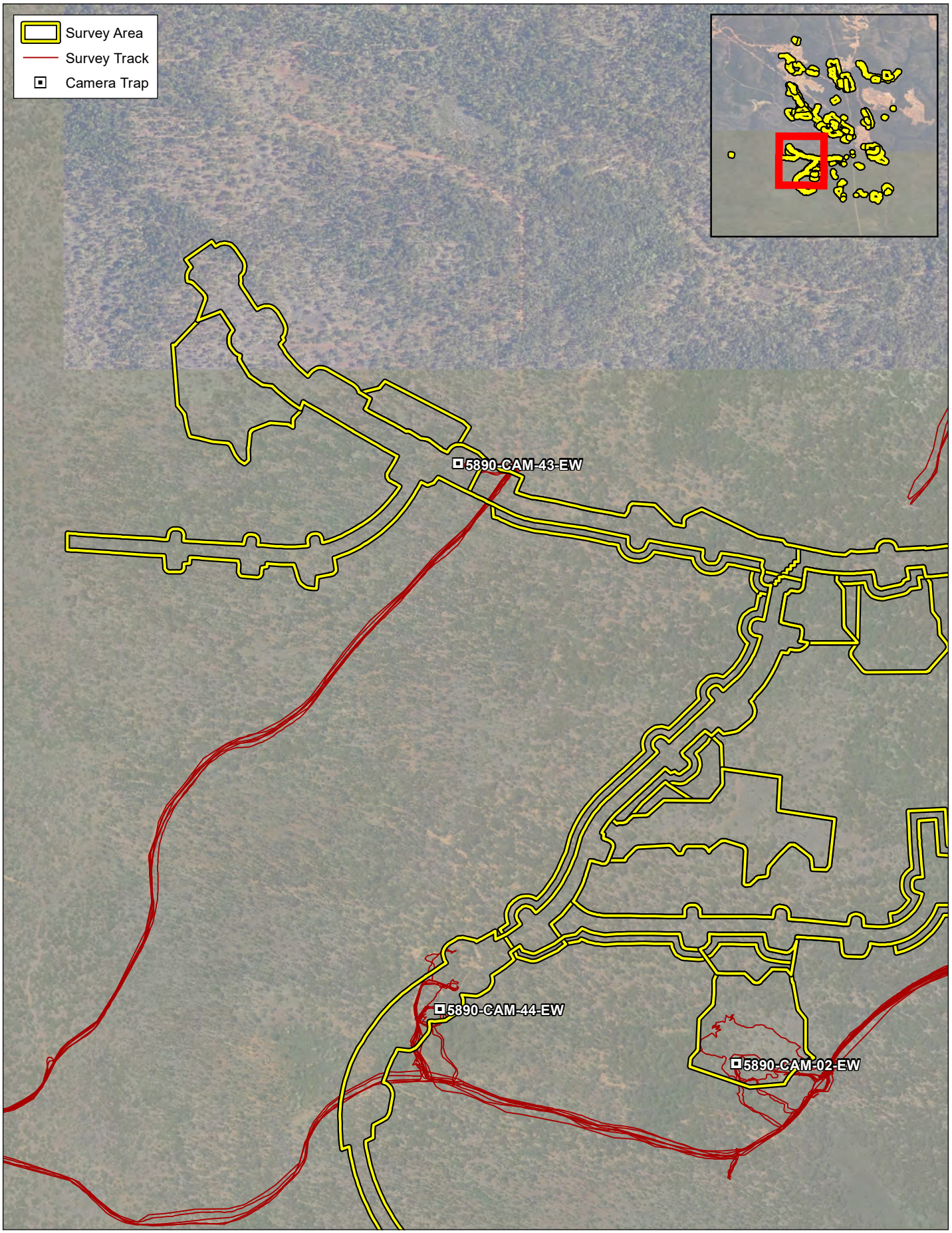
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine Larego Region

Survey Effort

MAP 7-8

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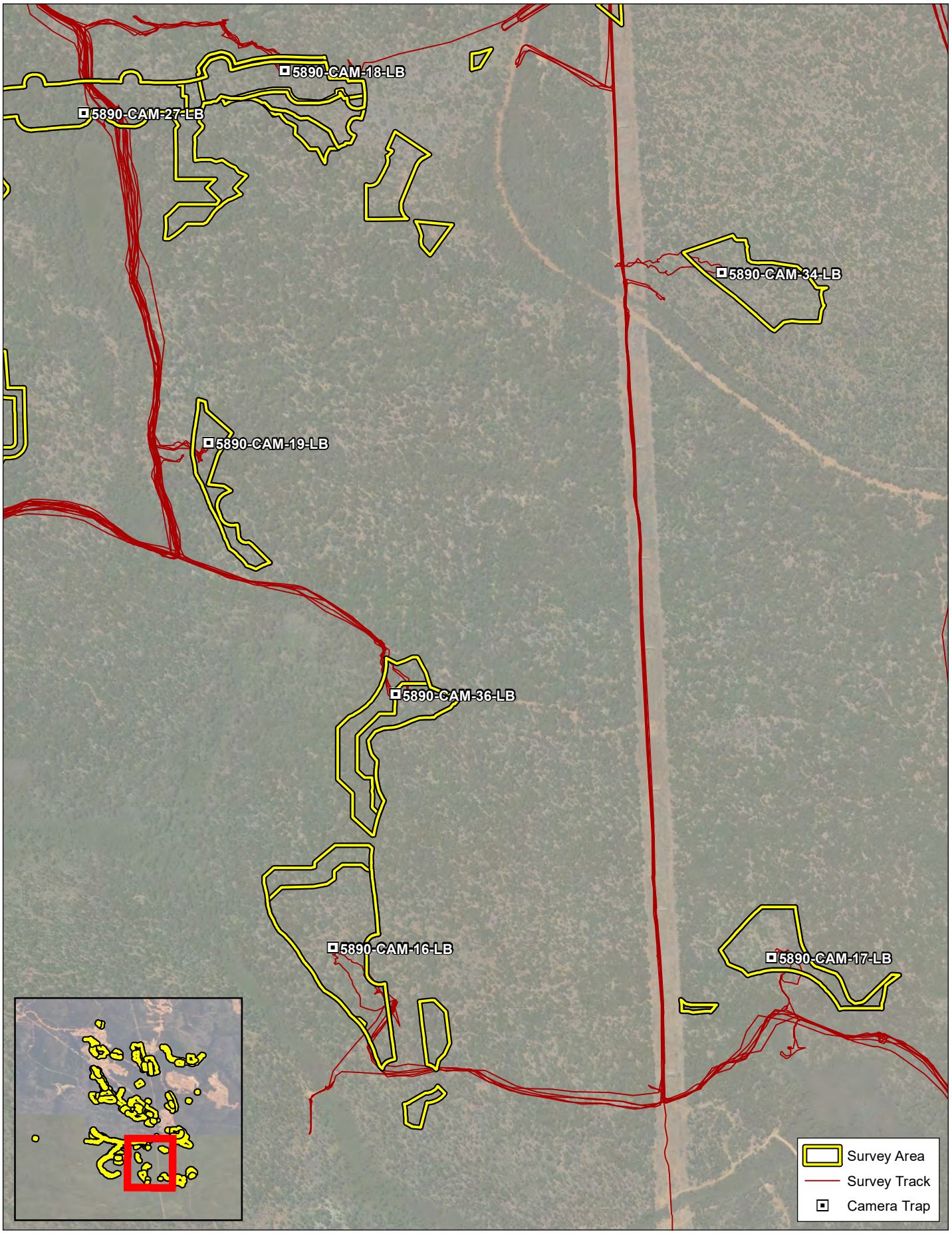
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Survey Effort

MAP 7-9

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Reviewed By	: PD

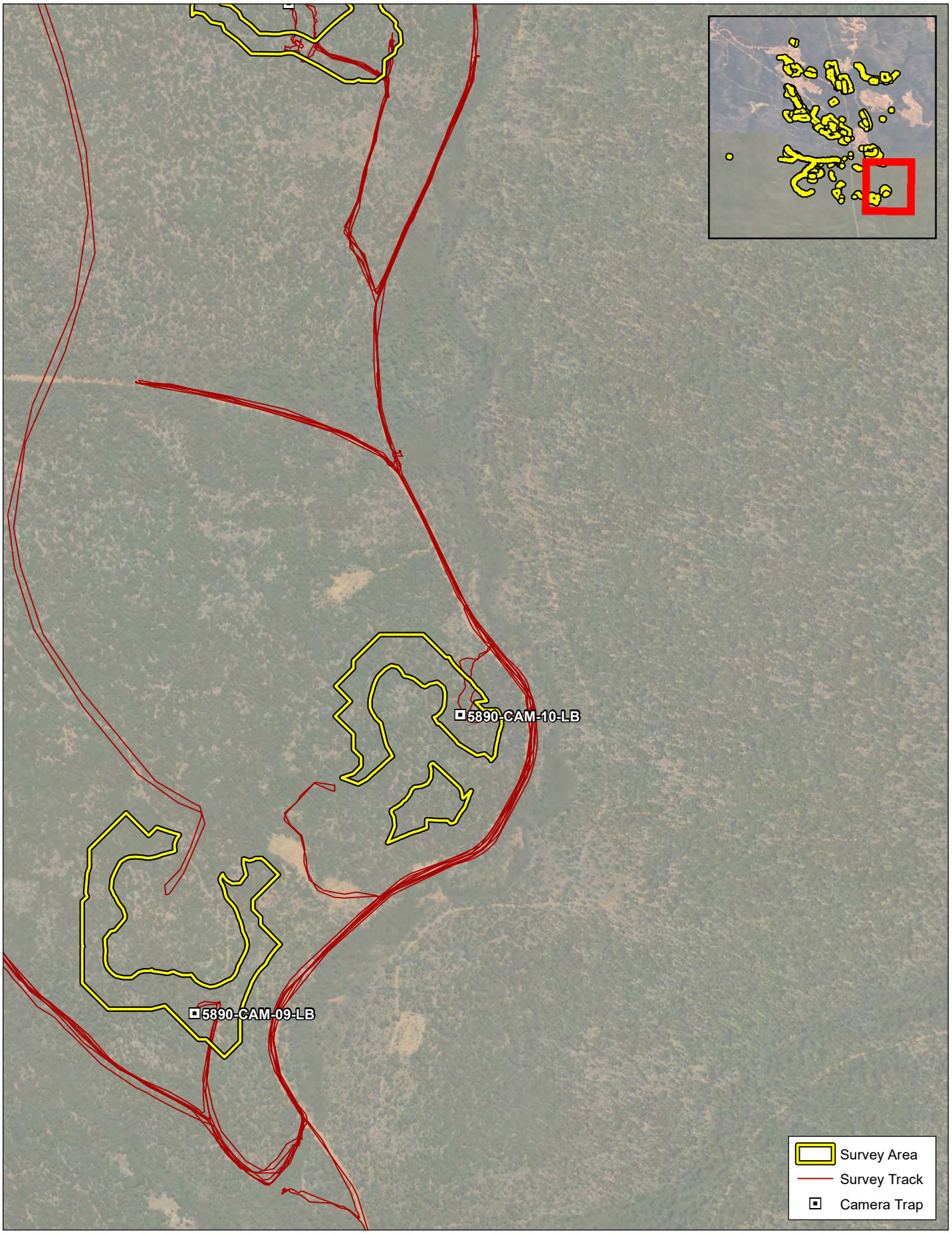
Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine Larego Region

Survey Effort

MAP 7-10

C:\GIS\Jobs\360\675.VX5890.00001 - Myara and Larego Surveys, Alcoa\Figures_LaregoCQW\675-VX5890-0001_LCQW_M07-10 Survey Effort_240614.mxd



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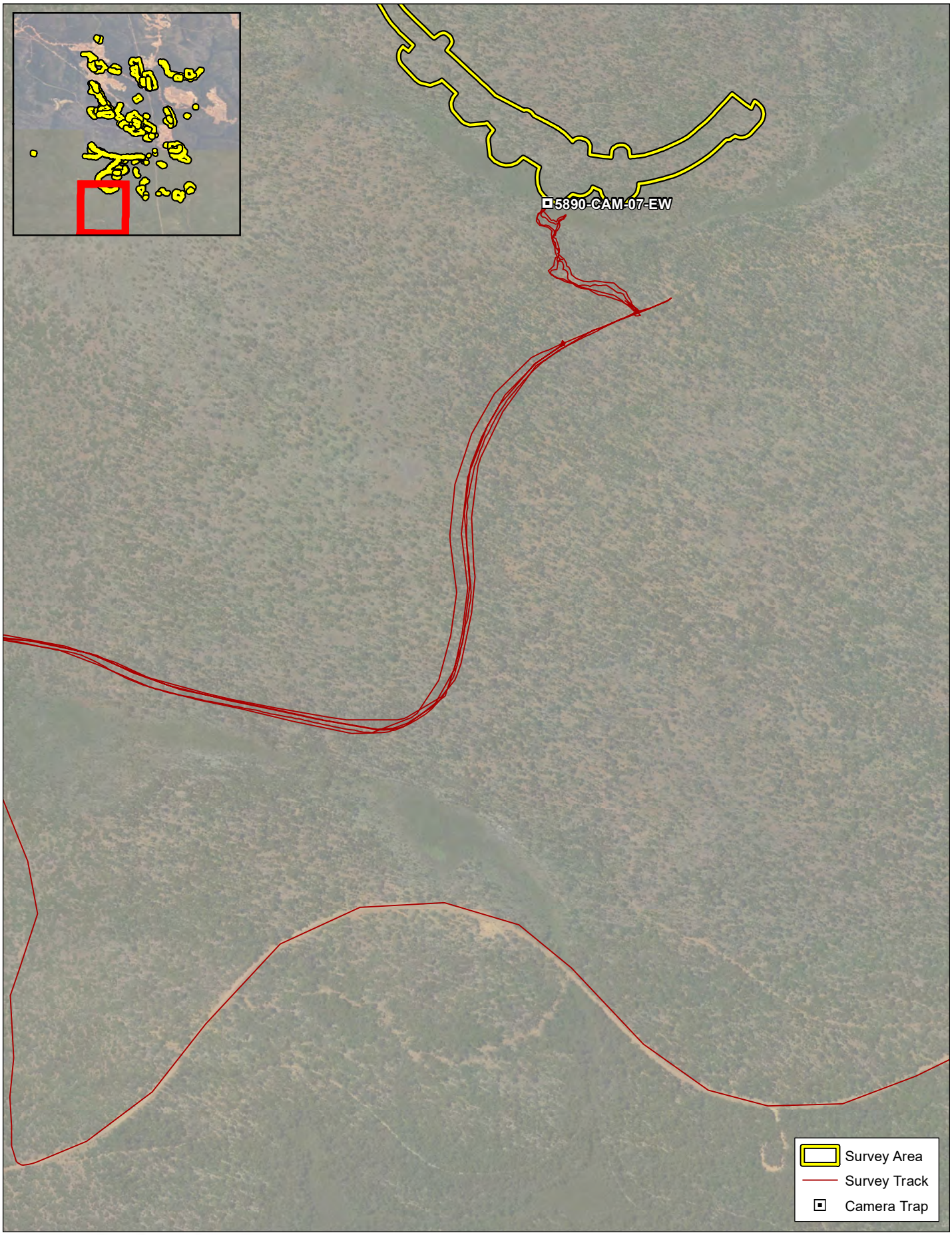
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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine Larego Region

Survey Effort
MAP 7-11

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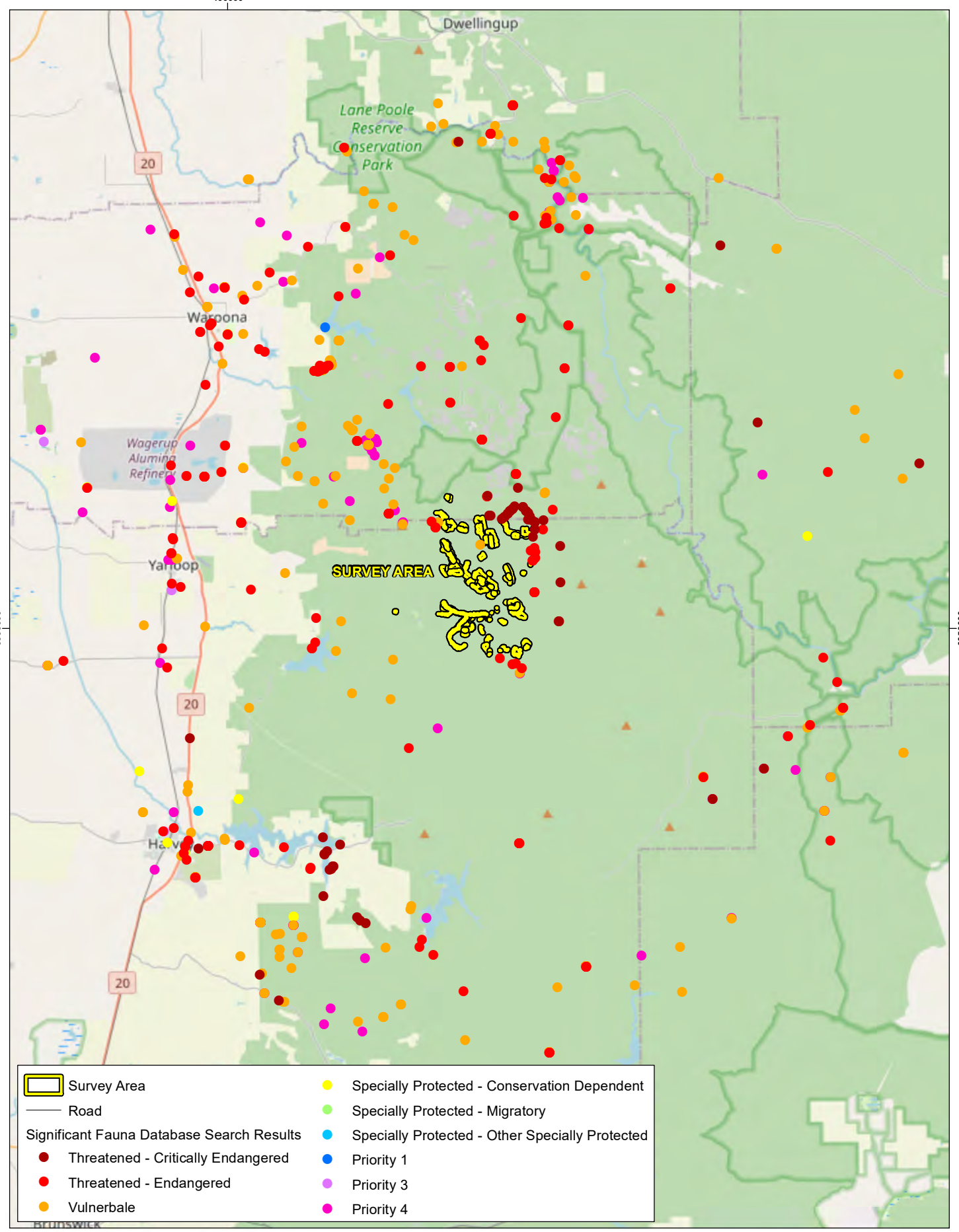
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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine
Larego Region

Survey Effort
MAP 7-12

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Alcoa

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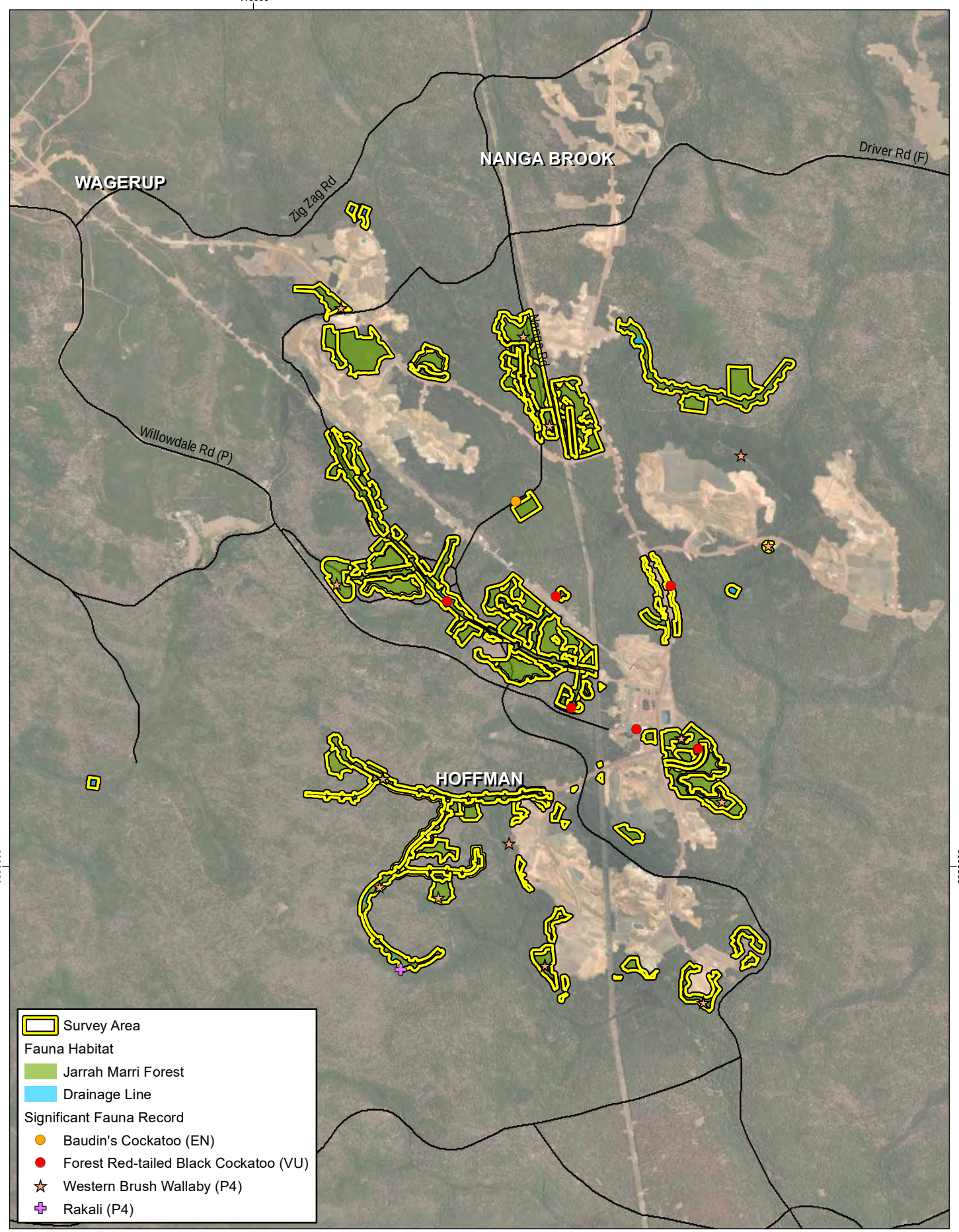
Larego Region

Significant Fauna Database Search Results

MAP 8

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Alcoa

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Larego Region

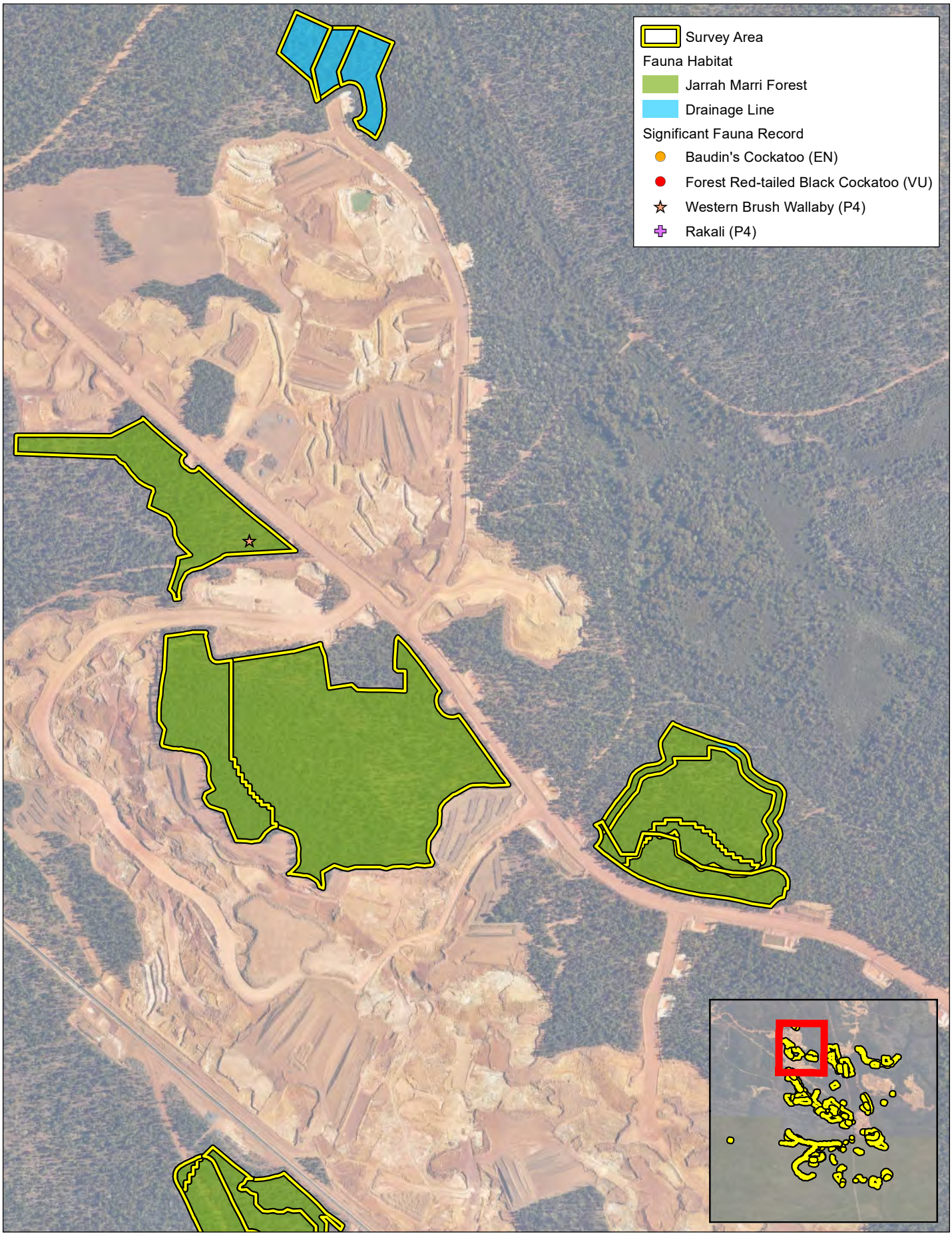
Fauna Habitat and Significant Fauna Records

MAP 9-1

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Date Drawn	: 7/06/2024
Drawn By	: Environmaps
Reviewed By	: PD

Alcoa

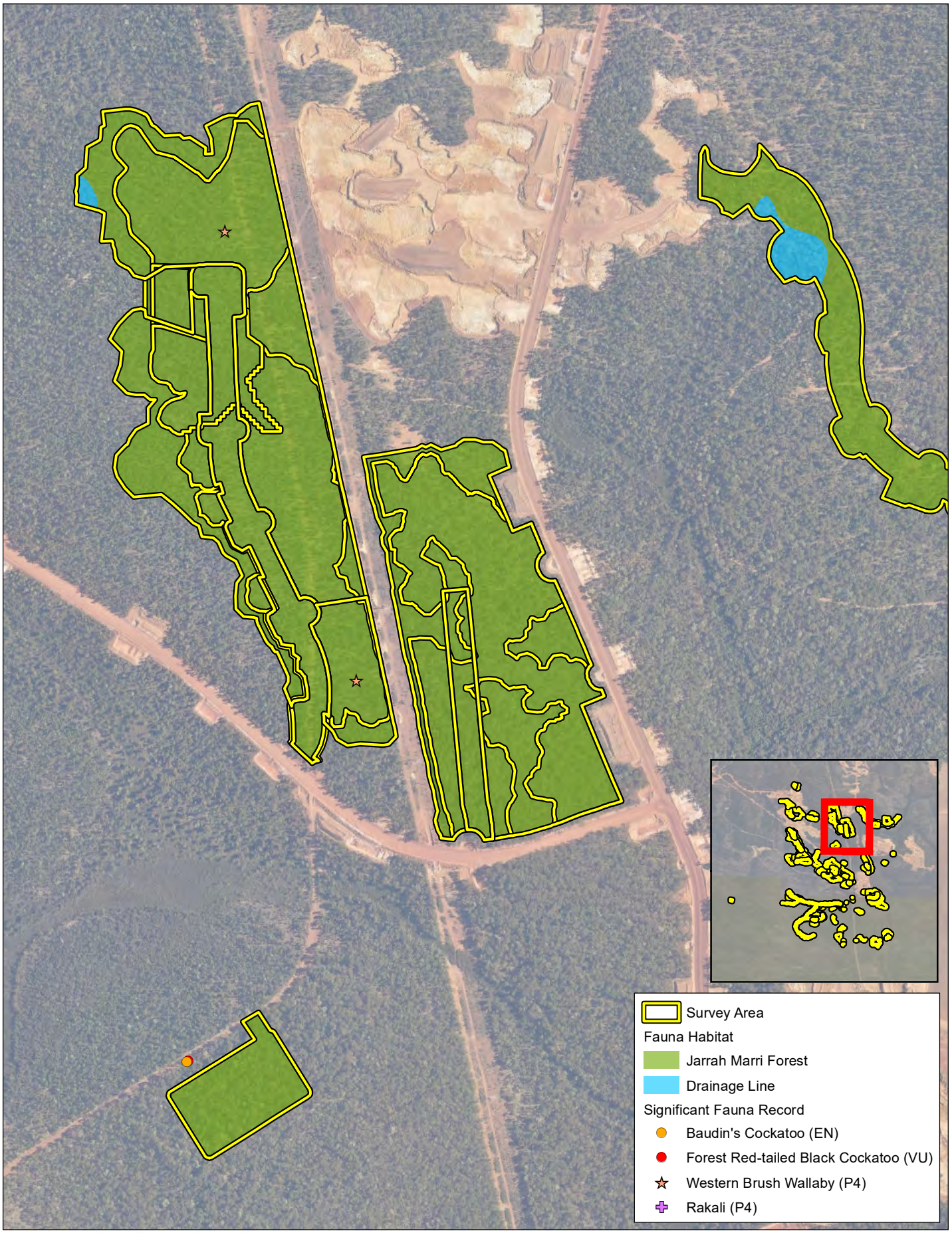
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Fauna Habitat and Significant Fauna Records

MAP 9-2

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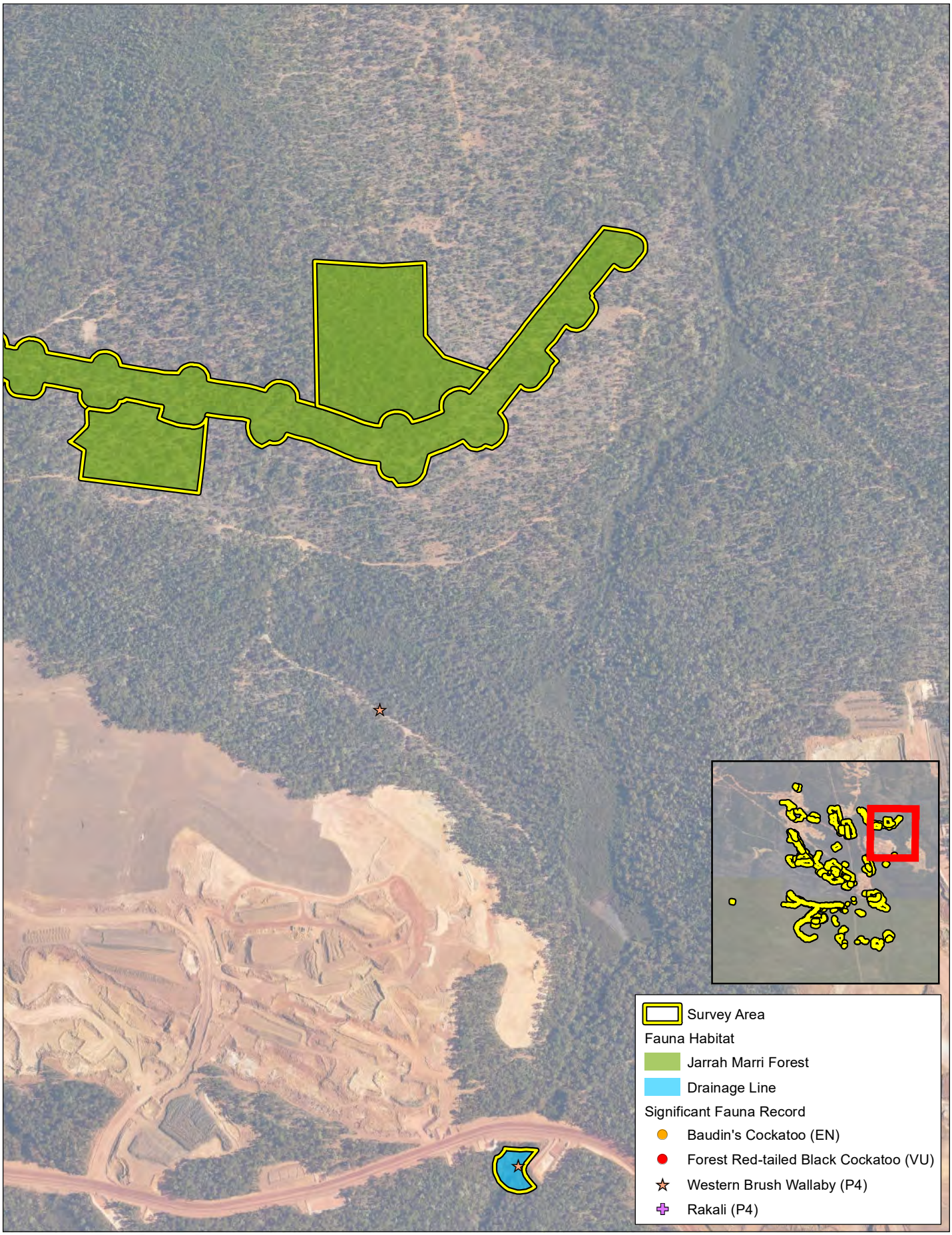
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Fauna Habitat and Significant Fauna Records

MAP 9-3

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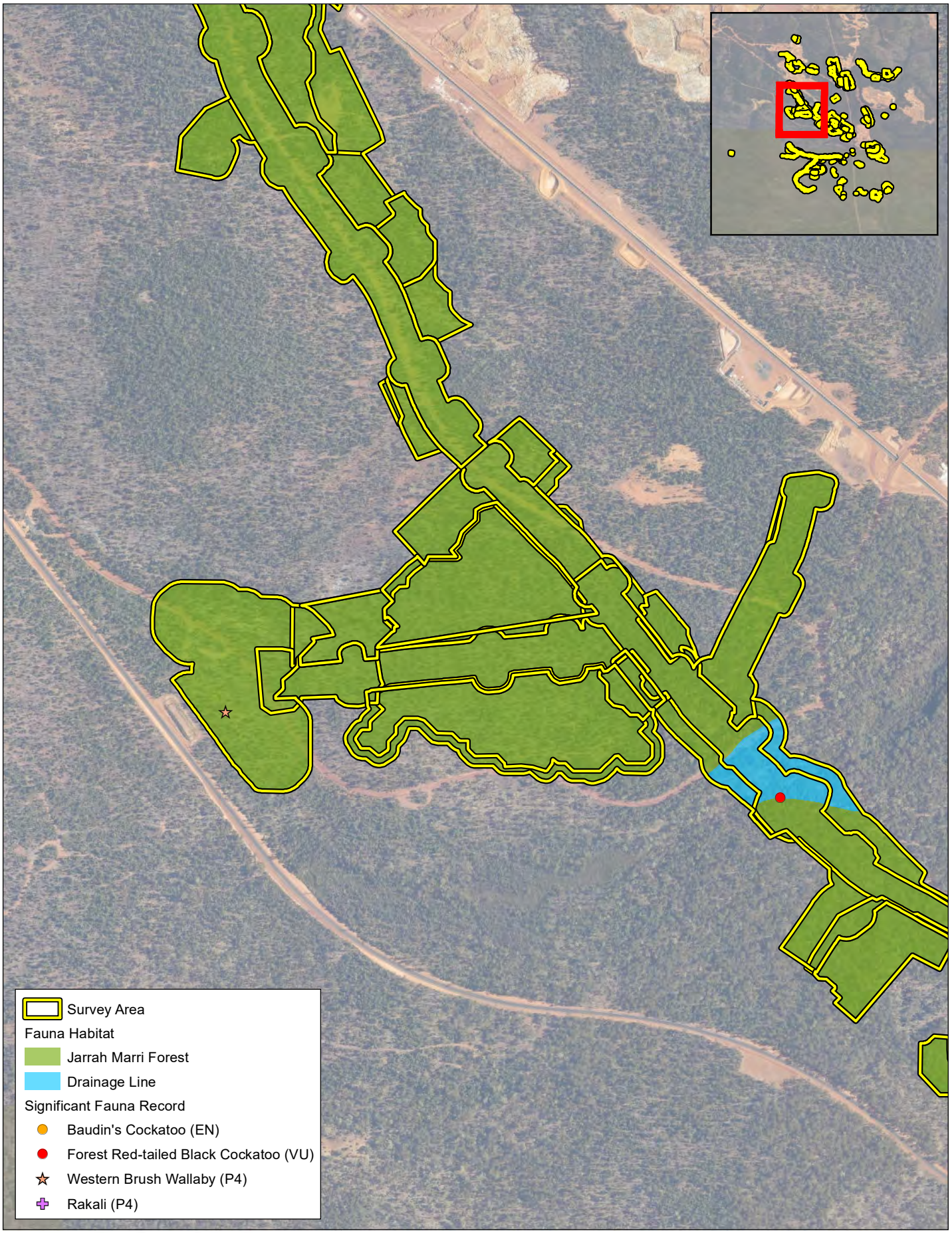
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Fauna Habitat and Significant Fauna Records

MAP 9-4

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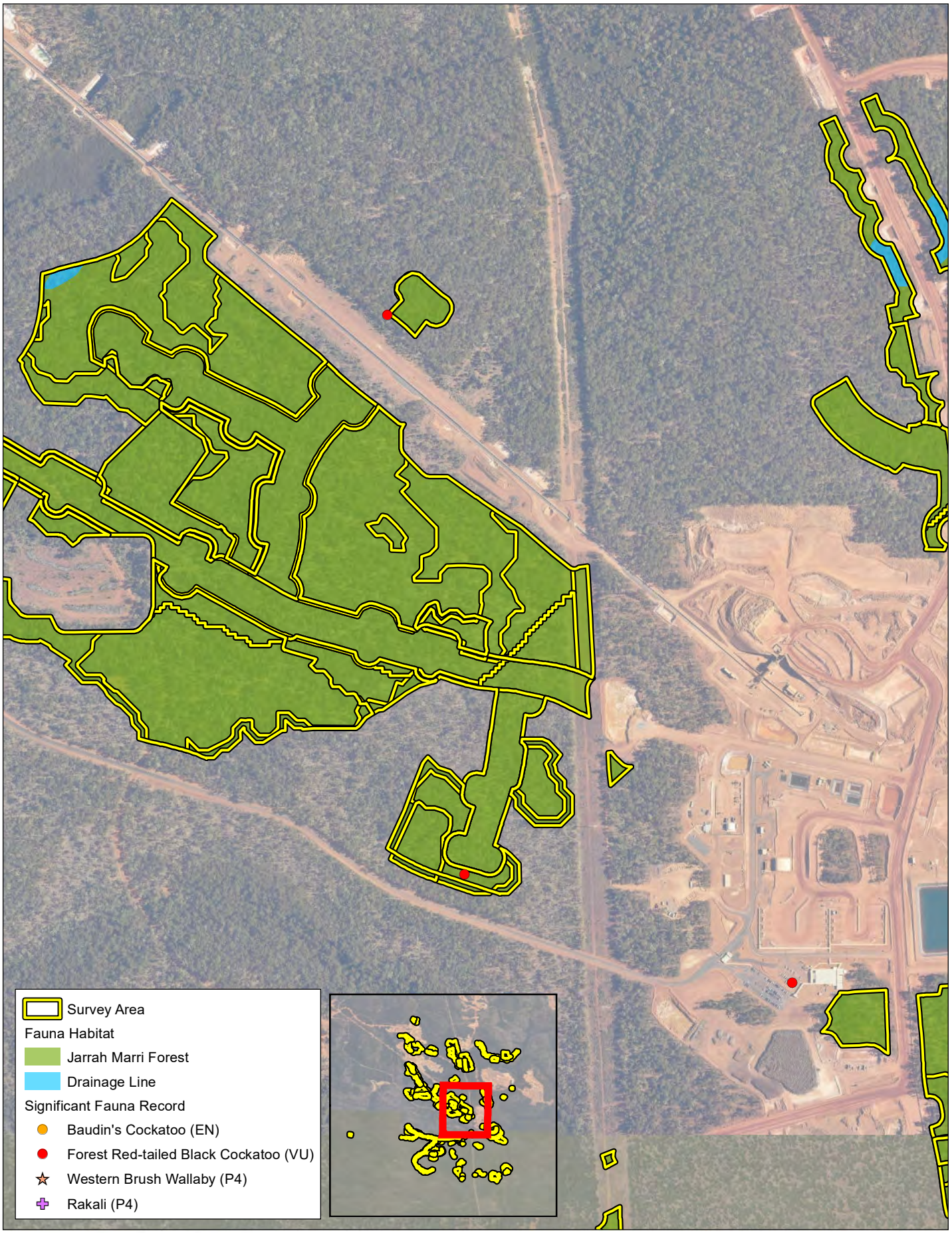
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Fauna Habitat and Significant Fauna Records

MAP 9-5

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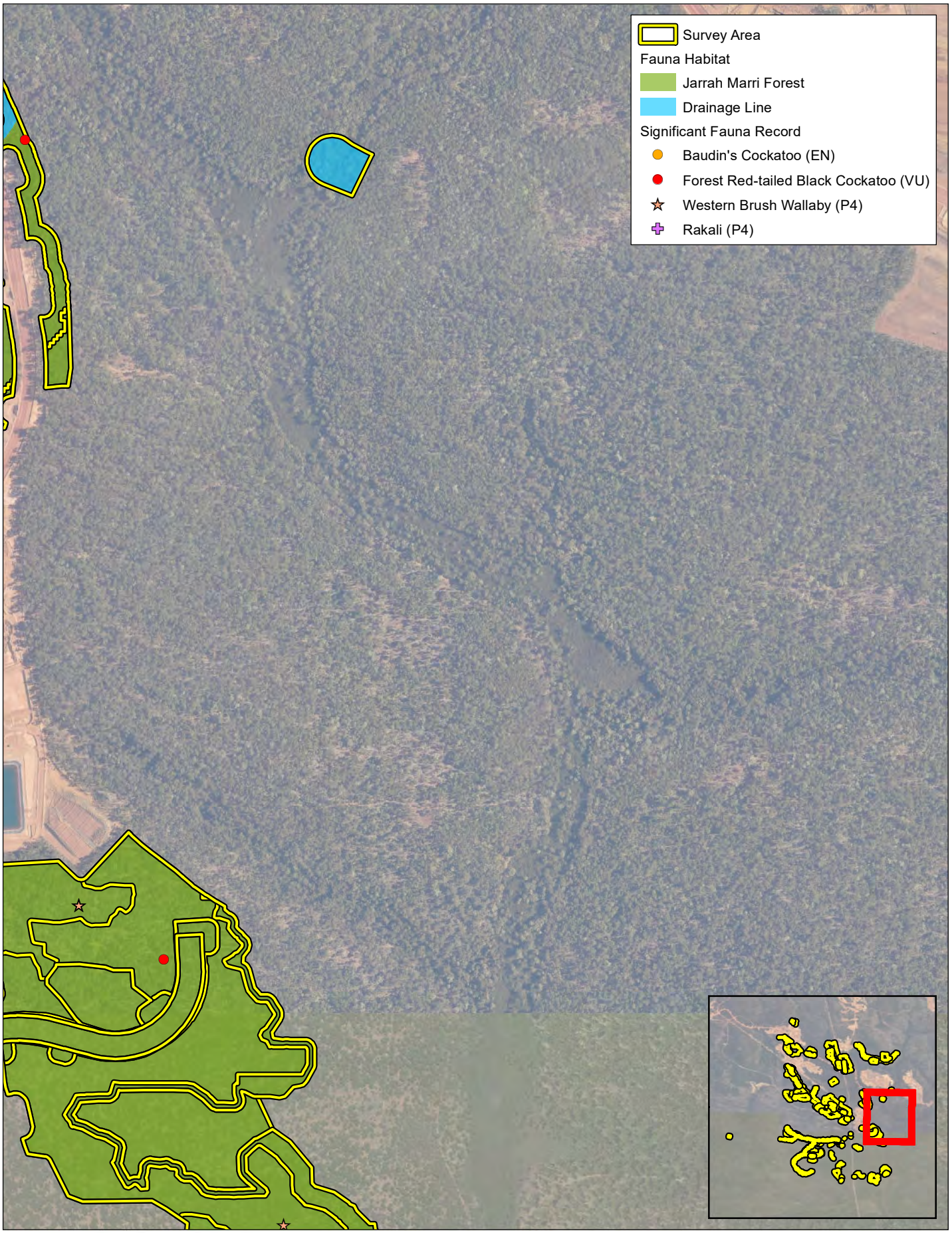
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Fauna Habitat and Significant Fauna Records

MAP 9-6

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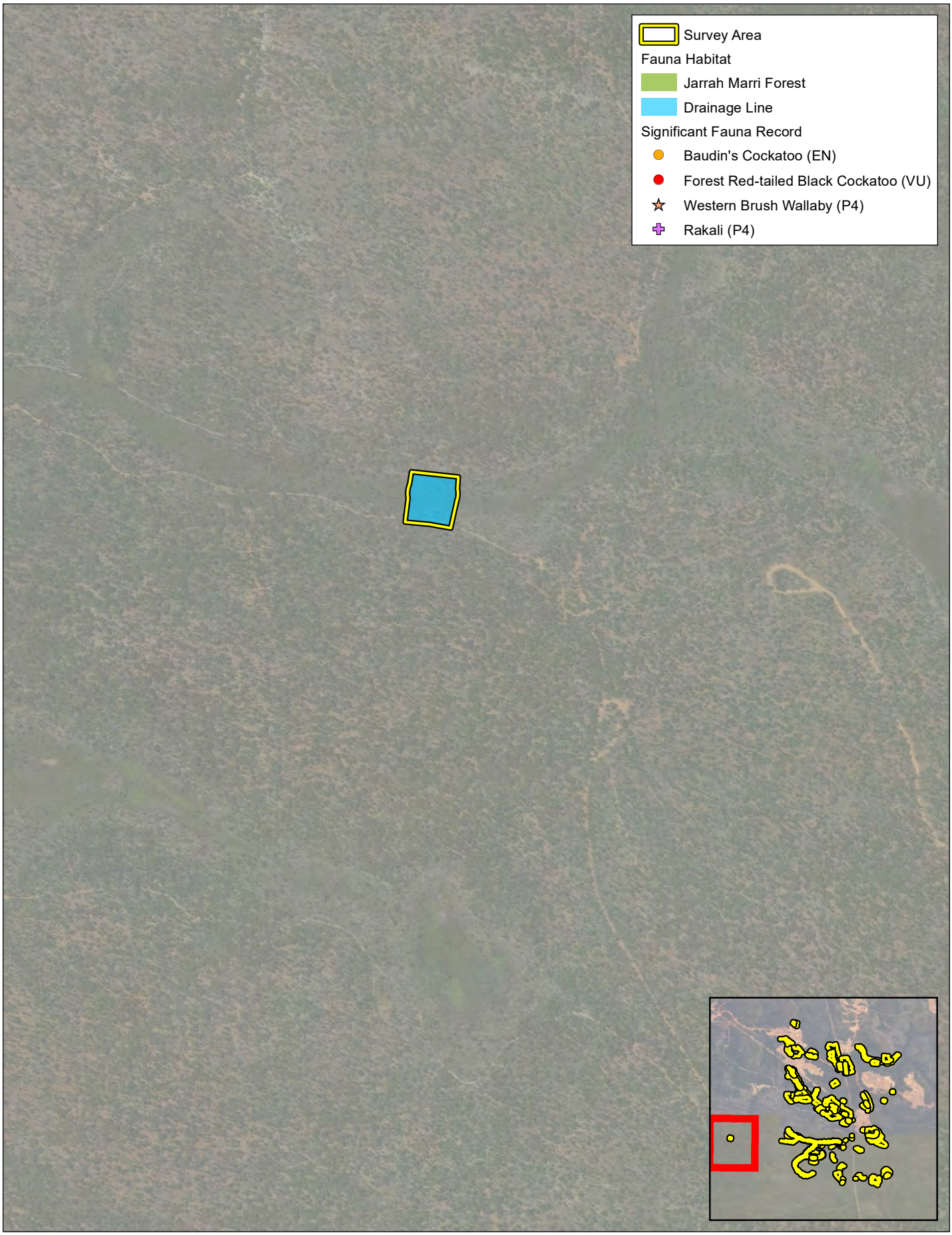
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Date Drawn	: 7/06/2024
Drawn By	: Environmaps
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Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine
Larego Region
Fauna Habitat and Significant Fauna Records
MAP 9-7

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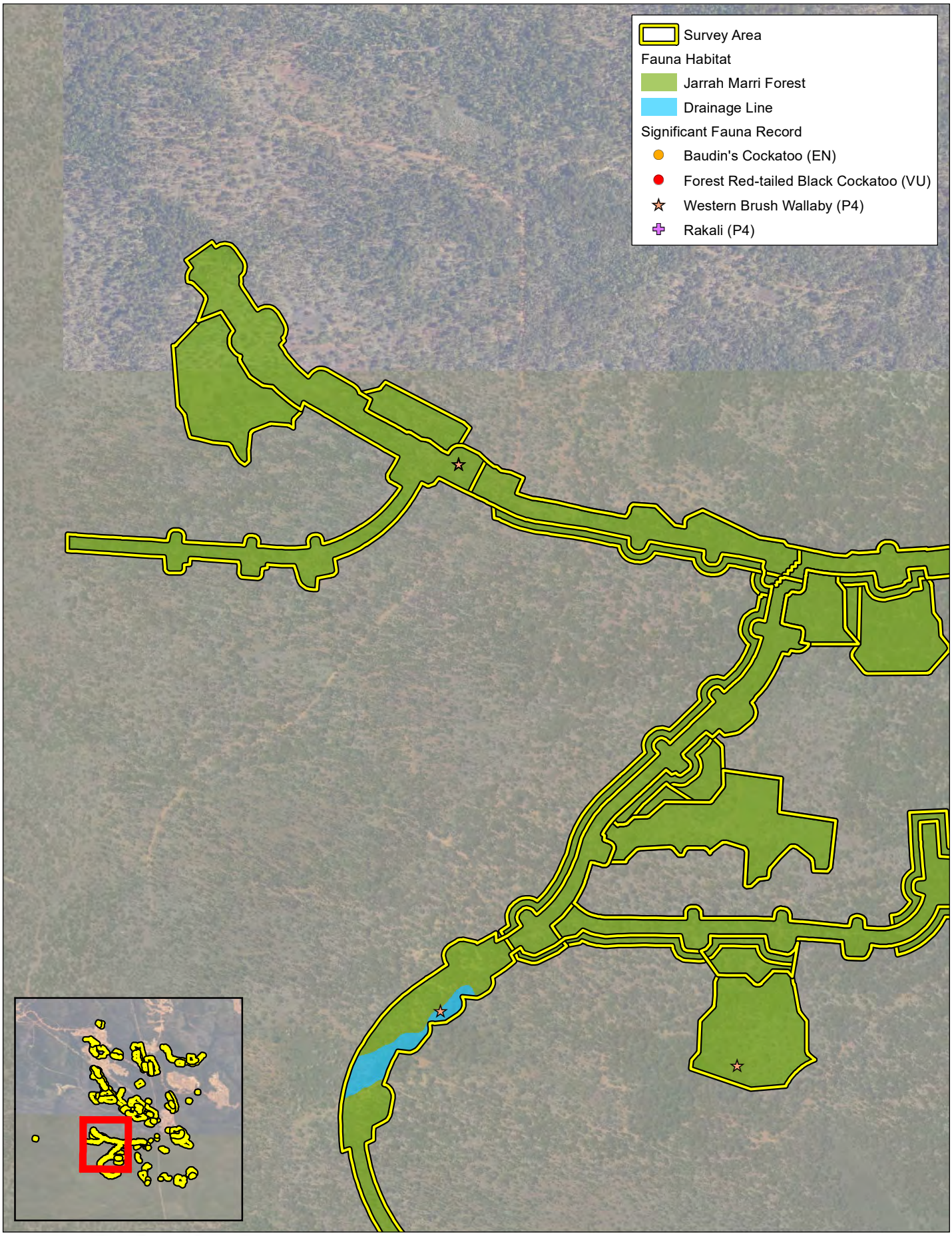
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Fauna Habitat and Significant Fauna Records

MAP 9-8

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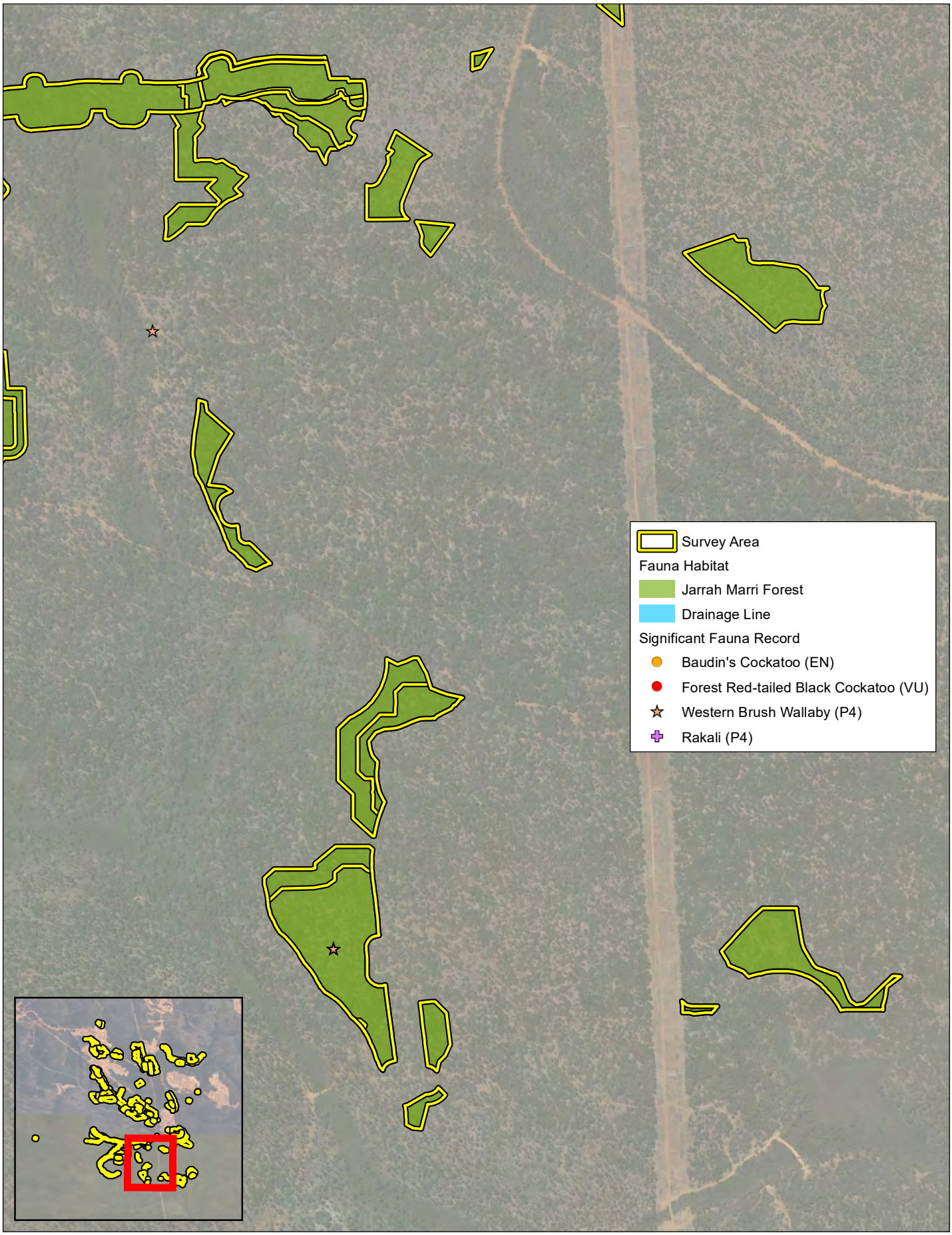
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Fauna Habitat and Significant Fauna Records

MAP 9-9

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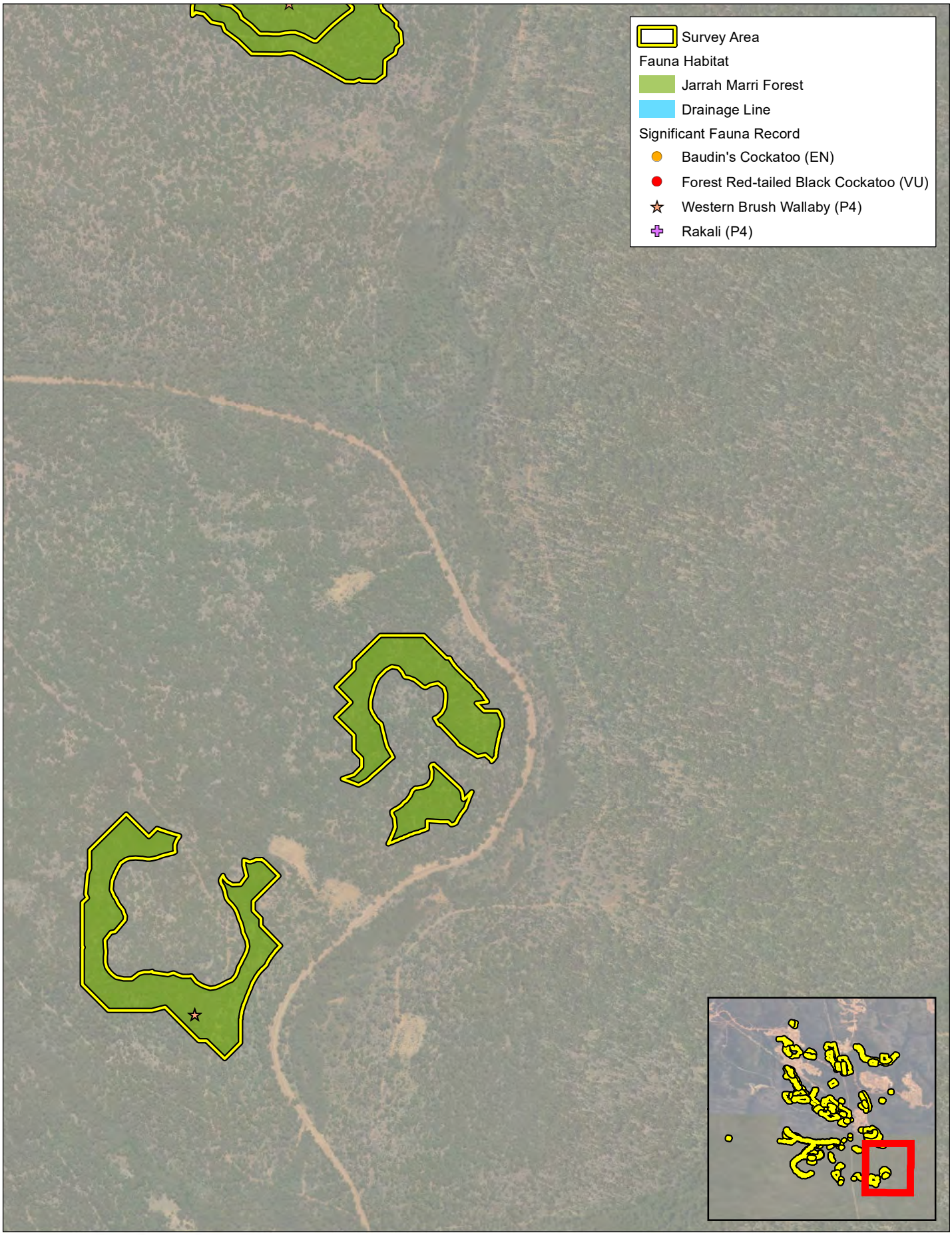
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Fauna Habitat and Significant Fauna Records

MAP 9-10

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Alcoa
Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine
Larego Region
Fauna Habitat and Significant Fauna Records
MAP 9-11

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Alcoa

Targeted Chuditch, Quokka, and Woylie Surveys Willowdale Mine

Larego Region

Fauna Habitat and Significant Fauna Records

MAP 9-12

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Appendix B Literature Review Summary

Targeted Chuditch, Quokka, and Woylie Survey

Willowdale Mine – Larego Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
Lit A	*Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)* (Harewood, 2017)	14 km north of the Survey Area	August 2011	Basic Fauna Assessment and Black Cockatoo Habitat Assessment	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	Four fauna habitats were identified: • Remnant native vegetation • Plantations • Existing cleared areas • River and ephemeral streams
Lit B	*Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a)	18 km north of the Survey Area	August 2021	Targeted Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo, Chuditch, Quokka, Carters's Freshwater Mussel, and other Priority species	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act	Seven fauna habitats were identified: • Bullich forest • Granite outcrop • Blackbutt forest • Flooded Gum woodland • Jarrah-Marri forest • Mine rehabilitation • Pine plantation

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
					• Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act • Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act • Peregrine Falcon (*Falco peregrinus*) – Listed as Special Protection under the BC Act • Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Listed as Conservation Dependent By DBCA • Western False Pipistrelle (*Falsistrellus mackenziei*) - Listed as Priority 3 by the DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA	
Lit C	*Black Cockatoo Habitat Assessment – Pinjarra Racecourse* (Harewood, 2019)	30 km north of the	2019	Targeted Black Cockatoo Habitat Assessment	• Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at	No fauna habitats were identified. However, 34 habitat trees consisting of Flooded Gum, Tuart,

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
		Survey Area			Vulnerable under the BC Act and EPBC Act	Marri and introduces eucalypts were identified.
Lit D	*Chuditch Pre-mine Survey, Myara* (Way, 2013)	43 km north of the Survey Area	March – April 2013	Targeted Chuditch Survey	• Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act	Two fauna habitats were identified: • Jarrah forest • Drainage line
Lit E	*Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006)	43 km north of the Survey Area	1996-2006	Long Term Fauna Monitoring Program	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Noisy Scrubbird (*Atrichornis clamosus*) – Listed as Endangered under the BC Act and EPBC Act • Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act	No fauna habitats were recorded.
Lit F	*Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North* (GHD, 2021b)	54 km north of Survey Area	August 2021	Targeted Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo, Chuditch, Quokka, and other Priority species	• Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Carnaby's Cockatoo (*Zanda latirostris*) - Listed as Endangered under the BC Act and EPBC Act • Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at	Eight fauna habitats were identified: • Jarrah-Marri forest • Bullich forest • Granite outcrop • Blackbutt forest • Flooded Gum woodland • Melaleuca dampland • Mine rehabilitation • Pine plantation

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
					Vulnerable under the BC Act and EPBC Act • Quokka (*Setonix brachyurus*) – Listed as Vulnerable under the BC Act and EPBC Act • Chuditch (*Dasyurus geoffroii fortis*) - Listed at Vulnerable under the BC Act and EPBC Act • Peregrine Falcon (*Falco peregrinus*) – Listed as Special Protection under the BC Act • Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – Listed as Conservation Dependent By DBCA • Masked Owl Southwest (*Tyto novaehollandiae*) – Listed as Priority 3 by the DBCA • Southern Death Adder (*Acanthophis antarcticus*) – Listed as Priority 3 by the DBCA • Rakali (*Hydromys chrysogaster*) – Listed as Priority 4 by the DBCA	

ID	Report	Survey location	Survey timing	Survey type	Significant fauna recorded during the survey	Fauna habitats recorded during the survey
					• Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA • Western False Pipistrelle (*Falsistrellus mackenziei*) - Listed as Priority 3 by the DBCA	
Lit G	*Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment* (GHD, 2012)	60 km north of the Survey Area	November, 2011	Level 1 Fauna and Habitat Assessment	• Forest Red-tailed Cockatoo (*Calyptorhynchus banksii naso*) – Listed at Vulnerable under the BC Act and EPBC Act • Baudin's Cockatoo (*Zanda baudinii*) – Listed as Endangered under the BC Act and EPBC Act • Western Brush Wallaby (*Notamacropus irma*) - Listed as Priority 4 by the DBCA • Quenda (*Isoodon fusciventer*) - Listed as Priority 4 by the DBCA • Letter-winged kite (*Elanus scriptus*) – Listed as Priority 4 the DBCA	Five fauna habitats were identified: • Melaleuca wetlands • Swampland • Jarrah/Marri forest • *Banksia*/*Allocasuarina* woodlands • Dense shrublands on clay flats

Appendix C Licences and Permits

Targeted Chuditch, Quokka, and Woylie Survey

Willowdale Mine – Larego Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

DEPARTMENT OF PARKS AND WILDLIFE

Department of Parks and Wildlife

Enquiries: 17 DICK PERRY AVE, KENSINGTON, WESTERN AUSTRALIA
Telephone: 08 9219 9000
Facsimile: 08 9219 8242
Web Site: https://wildlifelicensing.dpaw.wa.gov.au
Correspondance: **Locked Bag 30**
Bentley Delivery Centre WA 6983

Wildlife Conservation Act 1950

REGULATION 17

Fauna taking (scientific or other purposes) licence (Fauna taking (scientific or other purposes) licence)

The undermentioned person may take fauna for research or other scientific purposes and where authorised, keep it in captivity, subject to the following and attached conditions, which may be added to, suspended or otherwise varied as considered fit.

Director General

Conditions

1 The licensee must comply with the provisions of the Wildlife Conservation Act 1950, Wildlife Conservation Regulations 1970 and any Notices in force under this legislation.

2 The licensee shall take fauna only in the manner stated on the endorsed Regulation 17 licence application form and endorsed related correspondence.

3 Unless specifically authorised in the conditions of this Licence or otherwise in writing by the Director General, species of fauna declared as likely to become extinct, rare or otherwise in need of special protection shall not be taken.

4 Any by-catch of fauna, which is declared to be rare, likely to become extinct, or otherwise in need of special protection shall be released immediately at the point of capture. Where such fauna taken under this licence is injured or deceased, the licensee shall contact the Department's Wildlife Licensing Section for advice on disposal. Records must be kept of any such fauna so captured and details are to be included in the report required under further condition below.

5 Any interaction involving Gazetted Threatened Fauna that may be harmful to the fauna and/or invasive may require approval from the Commonwealth Department of the Environment ph 02 6274 1111. Interaction with such species is controlled by the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 and Environment Protection and Biodiversity Conservation Regulations 2000 as well as the Wildlife Conservation Act 1950 and Wildlife Conservation Regulations 1970.

6 No fauna shall be taken in areas where it would impinge on pre-existing scientific research programs.

7 Except in the case of approved lethal traps, the licensee shall ensure that measures are taken in the capture and handling of fauna to prevent injury or mortality resulting from that capture or handling. Where traps or other mechanical means or devices are used to capture fauna these shall be deployed so as to prevent exposure of trapped animals to ants and debilitating weather conditions and inspected at regular intervals throughout each day of their use. At the conclusion of research all markers used, and signs and structures erected by the licensee shall be removed and the environment returned to its original condition.

8 Not more than ten specimens of any one protected species of fauna shall be taken and removed from any location less than 20km apart. Where exceptional circumstances make it necessary to take a larger number of specimens from a particular location in order to obtain adequate statistical data, the collector must proceed with circumspection and justify their actions to the Director General in advance.

9 The licensee shall not release any fauna or their progeny in any area where it does not naturally occur, nor hand such fauna over to any other person or authority unless approved by the Director General, nor dispose of the remains of such fauna in any manner likely to confuse the natural or present day distribution of the species.

10 Bioprospecting involving the removal of sample aquatic and terrestrial organisms for chemical extraction and bioactivity screening shall not be conducted without specific written approval by the Director General.

11 No fauna is to be taken from any CALM land, as defined in the Conservation and Land Management Regulations 2002, without prior written approval of the Director General. No fauna is to be taken from any public land without the prior written approval of the Government Authority managing that land.

12 The licensee must not enter upon any private property or pastoral lease for the purposes of this licence, nor take any fauna from any private land or pastoral lease without the prior consent in writing of the owner or occupier. Similarly, in the case of Aboriginal lands, the licensee must not enter upon or take fauna from such lands without the written approval of the Department of Aboriginal Affairs and/or the relevant native title holders or applicants.

13 Copies of this licence and any written approval or consent required by conditions of this licence must be carried by the licensee and any person/s authorised under the licence at all times when conducting activities relevant to the licence

Department of Parks and Wildlife

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Bentley Delivery Centre WA 6983

and must be presented to an authorised officer of the Department upon request.

14 All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this licence shall be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range shall upon request be donated to the Western Australian Museum.

15 To prevent any unnecessary collecting in this State, all specimens and material taken and retained under the authority of this license shall, upon request, be loaned to the Western Australian Museum. Any unused portion or portions of any specimen collected under the authority of this license shall be offered to the Western Australian Museum for inclusion in its collection or made available to other scientific workers if so required.

16 Within one month of the expiration of this licence, the holder shall submit an electronic return into the department's Wildlife Licensing System, detailing the locality, site, geocode, date and number of each species of fauna captured, sighted or vouchered during the currency of the licence. A copy of any paper, report or thesis resulting from the research shall upon completion be lodged with the Director General.

Purpose

TFA 2324-0024 & BA27000875

Authorised Person

Surname	**Given name(s)**
Walker	Christina
Crossley	Lachlan
Girando	Simon
Geidans	Lukas
Li	Yanlin
Berry	Lewis
Lohr	Michael
Hickling	Alex
Fintan	Angel
Constanza	Lutz
Hill	Chloe

Date of Issue 10/07/2023
Valid From 10/07/2023
Date of Expiry 10/07/2023

Licensee: Mr Evan Nicholas Webb
Address PO Box 14
West Perth WA 6872
Australia

Issued by a Wildlife Licensing Officer of the Department of Parks and Wildlife under delegation from the Minister for Environment pursuant to section 133(1) of the Conservation and Land Management Act 1984.

Appendix D Fauna Desktop Assessment Results

Targeted Chuditch, Quokka, and Woylie Survey

Willowdale Mine – Larego Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

Conservation Status:
State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation,
Commonwealth - Listed under Environmental Protection and Biodiversity Conservation Act 1999.
CR - Critically Endangered, EN - Endangered, VU - Vulnerable, MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.
Database:
NM - NatureMap, PMST - EPBC Protected Matters Search Tool, DBCA - DBCA Threatened and Priority Fauna database search, Field - Recorded during the current field survey.
Literature:
A - *Fauna Assessment Pinjarra - Williams Road (SLK 14 – 67)* (Harewood, 2017)
B - *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a)
C - *Black Cockatoo Habitat Assessment – Pinjarra Racecourse* (Harewood, 2019)
D - *Chuditch Pre-mine Survey, Myara* (Way, 2013)
E - *Vertebrate Fauna Survey of Planned Mining Areas at Alcoa's Willowdale Larego Mining Region* (Environmental Management and Research Consultants, 2006)
F - *Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Holyoake* (GHD, 2021a)
G - *Report for Rail Reserves in the Shire of Serpentine Jarrahdale - Spring Flora and Vegetation Survey and Fauna and Habitat Assessment* (GHD, 2012)

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Amphibia															
Limnodynastidae	*Heleioporus albopunctatus*	Western Spotted Frog											x		
	Heleioporus eyrei	Moaning Frog								x			x	x	
	Heleioporus inornatus	Whooping Frog						x					x		
Myobatrachidae	*Crinia georgiana*	Quacking Frog						x	x	x			x	x	x
	Crinia glauerti	Clicking Frog						x	x	x			x		x
	Crinia insignifera	Squelching Froglet							x						
	Crinia pseudinsignifera	Bleating Froglet							x	x			x	x	
	Geocrinia leai	Ticking Frog								x			x	x	
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog							x	x			x	x	
	Litoria moorei	Motorbike Frog								x					

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Birds															
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill, Broad-tailed Thornbill							x	x			x	x	
	Acanthiza chrysorrhoa	Yellow-rumped Thornbill							x	x			x	x	
	Acanthiza inornata	Western Thornbill							x				x	x	
	Aphelocephala leucopsis	Southern Whiteface		VU		x									
	Gerygone fusca	Western Gerygone						x	x				x		
	Sericornis maculatus	Spotted Scrubwren						x	x	x			x	x	
	Smicrornis brevirostris	Weebill							x	x			x		x
Accipitridae	*Accipiter cirrocephalus*	Collared Sparrowhawk								x			x		
	Accipiter fasciatus	Brown Goshawk		MA									x	x	
	Aquila audax	Wedge-tailed Eagle							x	x			x	x	x
	Elanus scriptus	Letter-winged Kite	P4												x
	Haliastur sphenurus	Whistling Kite		MA						x			x		x
	Hieraaetus morphnoides	Little Eagle											x		
	Lophoictinia isura	Square-tailed Kite											x		
	Milvus migrans	Black Kite													x
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar							x	x				x	
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra							x	x			x	x	x
	Todiramphus sanctus	Sacred Kingfisher		MA						x			x	x	x
Anatidae	*Anas superciliosa*	Pacific Black Duck							x	x			x	x	
	Chenonetta jubata	Australian Wood Duck, Wood Duck, Maned Duck							x	x				x	
	Cygnus atratus	Black Swan								x					
	Oxyura australis	Blue-billed Duck	P4		x		x								
	Tadorna tadornoides	Australian Shelduck, Mountain Duck							x				x		

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Apodidae	*Apus pacificus*	Pacific Swift, Fork-tailed Swift	MI	MI, MA		x									
Ardeidae	*Botaurus poiciloptilus*	Australasian Bittern	EN	EN	x	x	x								
Artamidae	*Artamus cinereus*	Black-faced Woodswallow												x	
	Artamus cyanopterus	Dusky Woodswallow							x				x	x	
	Cracticus nigrogularis	Pied Butcherbird								x					
	Cracticus torquatus	Grey Butcherbird							x	x				x	x
	Gymnorhina tibicen	Australian Magpie							x	x			x	x	x
	Strepera versicolor	Grey Currawong							x	x			x	x	
Atrichornithidae	*Atrichornis clamosus*	Noisy Scrubbird	EN	EN	x	x	x						x		
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	x	x	x	x	x	x	x		x	x	x
	Eolophus roseicapilla	Galah												x	x
	Zanda baudinii	Baudin's Cockatoo	EN	EN	x	x	x	x	x	x			x	x	x
	Zanda latirostris	Carnaby's Cockatoo	EN	EN	x	x	x		x	x				x	
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike		MA					x	x			x	x	x
Casuariidae	*Dromaius novaehollandiae*	Emu							x	x			x	x	
Charadriidae	*Charadrius leschenaultii*	Greater Sand Plover	VU	VU, MI, MA		x									
	Thinornis cucullatus	Hooded Dotterel	P4	MA	x										
	Vanellus tricolor	Banded Lapwing												x	
Climacteridae	*Climacteris rufus*	Rufous Treecreeper								x			x	x	
Columbidae	*Columba livia*	Domestic Pigeon, Rock Dove													x
	Phaps chalcoptera	Common Bronzewing							x				x		x
	Phaps elegans	Brush Bronzewing						x					x	x	
	Spilopelia chinensis	Spotted Turtle Dove													x

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Spilopelia senegalensis	Laughing Turtle Dove													x
Corvidae	*Corvus bennetti*	Little Crow												x	
	Corvus coronoides	Australian Raven							x	x			x		x
Cuculidae	*Cacomantis flabelliformis*	Fan-tailed Cuckoo		MA					x				x	x	
	Chalcites basalis	Horsfield's Bronze Cuckoo		MA						x			x		
	Chalcites lucidus	Shining Bronze Cuckoo		MA									x	x	
Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird												x	
Estrildidae	*Stagonopleura oculata*	Red-eared Firetail											x	x	
Falconidae	*Falco cenchroides*	Nankeen Kestrel		MA											x
	Falco hypoleucos	Grey Falcon	VU	VU		x									
	Falco peregrinus	Peregrine Falcon	OS		x		x			x				x	
Hirundinidae	*Hirundo neoxena*	Welcome Swallow		MA					x						
	Petrochelidon ariel	Fairy Martin								x				x	x
	Petrochelidon nigricans	Tree Martin		MA						x			x	x	
Laridae	*Hydroprogne caspia*	Caspian Tern	MI	MI, MA	x		x								
	Sternula nereis nereis	Fairy Tern	VU	VU		x									
Locustellidae	*Cincloramphus cruralis*	Brown Songlark								x				x	
	Cincloramphus mathewsi	Rufous Songlark								x					
Maluridae	*Malurus elegans*	Red-winged Fairywren						x		x			x	x	
	Malurus leucopterus	White-winged Fairywren								x					
	Malurus pulcherrimus	Blue-breasted Fairywren								x					
	Malurus splendens	Splendid Fairywren						x	x	x			x	x	x
	Stipiturus malachurus	Southern Emu-wren												x	
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU	x	x	x								
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill							x	x			x	x	
	Anthochaera carunculata	Red Wattlebird							x	x			x	x	x

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Anthochaera lunulata	Western Little Wattlebird, Western Wattlebird							x	x			x	x	
	Gavicalis virescens	Singing Honeyeater											x	x	x
	Lichmera indistincta	Brown Honeyeater							x	x			x	x	x
	Melithreptus brevirostris	Brown-headed Honeyeater								x			x	x	
	Melithreptus chloropsis	Western White-naped Honeyeater							x	x			x	x	
	Phylidonyris niger	White-cheeked Honeyeater								x			x		x
	Phylidonyris novaehollandiae	New Holland Honeyeater							x	x			x	x	x
	Ptilotula ornata	Yellow-plumed Honeyeater								x					
Meropidae	*Merops ornatus*	Rainbow Bee-eater		MA						x			x	x	
Monarchidae	*Grallina cyanoleuca*	Magpie-lark		MA						x				x	x
	Myiagra inquieta	Restless Flycatcher								x			x	x	
Motacillidae	*Anthus australis australis*	Australian Pipit		MA									x		
	Motacilla cinerea	Grey Wagtail	MI	MI, MA		x									
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella								x			x		
Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush						x		x			x		
	Pachycephala fuliginosa occidentalis	Western Golden Whistler, Western Whistler							x	x			x	x	
	Pachycephala rufiventris	Rufous Whistler											x		x
Pandionidae	*Pandion haliaetus*	Osprey	MI	MI, MA	x	x	x								
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote							x				x	x	
	Pardalotus striatus	Striated Pardalote							x				x	x	

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin						x		x			x	x	
	Microeca fascinans	Jacky Winter													x
	Petroica boodang	Scarlet Robin								x			x	x	
	Quoyornis georgianus	White-breasted Robin						x		x			x	x	
Podargidae	*Podargus strigoides*	Tawny Frogmouth							x				x	x	
Pomatostomidae	*Pomatostomus superciliosus*	White-browed Babbler								x					
Procellariidae	*Pachyptila turtur subantarctica*	Fairy Prion		VU, MA		x									
Psittaculidae	*Barnardius zonarius*	Australian Ringneck							x	x			x	x	x
	Neophema elegans	Elegant Parrot								x				x	
	Parvipsitta porphyrocephala	Purple-crowned Lorikeet								x			x	x	
	Platycercus icterotis	Western Rosella								x			x	x	
	Polytelis anthopeplus	Regent Parrot								x					
	Psittacula krameri	Rose-ringed Parakeet, Indian Ringnecked Parrot											x		
	Purpureicephalus spurius	Red-capped Parrot							x	x			x	x	x
	Trichoglossus moluccanus	Rainbow Lorikeet												x	x
Rallidae	*Fulica atra*	Eurasian Coot							x					x	
	Hypotaenidia philippensis	Buff-banded Rail		MA						x					
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail						x	x	x			x	x	
	Rhipidura leucophrys	Willie Wagtail											x		x
Rostratulidae	*Rostratula australis*	Australian Painted Snipe	EN	EN, MA		x									
Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI	MI, MA	x	x	x								
	Calidris acuminata	Sharp-tailed Sandpiper	MI	VU, MI, MA		x									

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Calidris canutus	Red Knot	EN	VU, MI, MA		x									
	Calidris ferruginea	Curlew Sandpiper	CR	CR, MI, MA		x									
	Calidris melanotos	Pectoral Sandpiper	MI	MI, MA		x									
	Calidris ruficollis	Red-necked Stint	MI	MI, MA	x		x								
	Numenius madagascariensis	Far Eastern Curlew, Eastern Curlew	CR	CR, MI, MA		x									
	Tringa glareola	Wood Sandpiper	MI	MI, MA	x		x								
	Tringa nebularia	Common Greenshank	MI	EN, MI, MA	x	x	x								
Strigidae	*Ninox boobook*	Boobook Owl		MA	x		x	x		x				x	
Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	MI	MI, MA	x		x								
	Threskiornis spinicollis	Straw-necked Ibis		MA										x	x
Turnicidae	*Turnix varius*	Painted Button-quail								x			x	x	
Tytonidae	*Tyto javanica*	Eastern Barn Owl								x					
	Tyto novaehollandiae	Australian Masked Owl, Masked Owl	P3		x		x							x	
Zosteropidae	*Zosterops lateralis*	Grey-breasted White-eye, Silvereye		MA					x	x			x	x	
Mammalia															
Burramyidae	*Cercartetus concinnus*	Western Pygmy-possum, Mundarda								x					
Canidae	*Canis familiaris**	Dingo / Dog													x
	*Vulpes vulpes**	Red Fox												x	x
Dasyuridae	*Antechinus flavipes leucogaster*	Yellow-footed Antechinus, Mardo						x		x				x	
	Dasyurus geoffroii fortis	Western Quoll, Chuditch	VU	VU	x	x	x	x		x		x		x	
	Phascogale tapoatafa wambenger	Wambenger Brush-tailed Phascogale	CD		x		x								
	Sminthopsis gilberti	Gilbert's Dunnart								x				x	
Felidae	*Felis catus**	Cat						x	x	x				x	x

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Leporidae	*Oryctolagus cuniculus**	Rabbit								x				x	x
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo						x	x	x				x	x
	Notamacropus irma	Western Brush Wallaby	P4		x		x	x	x	x				x	x
	Setonix brachyurus	Quokka	VU	VU	x	x	x			x				x	
Molossidae	*Austronomus australis*	White-striped Free-tailed Bat								x				x	
	Ozimops kitcheneri	Western Free-tailed Bat								x				x	
Muridae	*Hydromys chrysogaster*	Water Rat, Rakali	P4		x		x	x						x	
	*Mus musculus**	House Mouse												x	
	*Rattus rattus**	Black Rat						x		x				x	
Myrmecobiidae	*Myrmecobius fasciatus fasciatus*	Numbat, Walpurti	EN	EN	x	x	x								
Peramelidae	*Isoodon fusciventer*	Quenda	P4		x		x			x				x	x
Phalangeridae	*Trichosurus vulpecula hypoleucus*	Common Brushtail Possum, Koomal						x		x				x	
Potoroidae	*Bettongia penicillata ogilbyi*	Brush-tailed Bettong, Woylie	CR	EN	x	x	x								
Pseudocheiridae	*Pseudocheirus occidentalis*	Western Ringtail Possum	CR	CE	x	x	x								
Suidae	*Sus scrofa**	Pig						x	x	x				x	
Tachyglossidae	*Tachyglossus aculeatus acanthion*	Short-beaked Echidna						x	x	x				x	
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat								x				x	
	Chalinolobus morio	Chocolate Wattled Bat								x				x	
	Falsistrellus mackenziei	Western False Pipiistrelle	P4		x		x			x				x	
	Vespadelus regulus	Southern Forest Bat								x				x	

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
Reptiles															
Agamidae	*Ctenophorus ornatus*	Ornate Crevice Dragon											x	x	
	Pogona minor	Dwarf Bearded Dragon								x			x	x	x
Carphodactylidae	*Underwoodisaurus milii*	Southern Barking Gecko								x			x		
Diplodactylidae	*Diplodactylus lateroides*	Speckled Stone Gecko												x	
	Diplodactylus polyophthalmus	Spotted Sandplain Gecko											x		
Elapidae	*Acanthophis antarcticus*	Southern Death Adder	P3											x	
	Notechis scutatus	Tiger Snake								x			x	x	
	Pseudonaja affinis	Dugite								x			x		x
	Suta nigriceps	Mitchell's Short-tailed Snake								x				x	
Gekkonidae	*Christinus marmoratus*	Marbled Gecko												x	
Pygopodidae	*Aprasia pulchella*	Pretty Worm-lizard											x	x	
	Delma fraseri	Fraser's Delma								x					
Pythonidae	*Aspidites ramsayi*	Woma	P1		x		x								
	Morelia spilota	Carpet Python								x			x	x	
Scincidae	*Acritoscincus trilineatus*	Western Three-lined Skink								x			x	x	
	Cryptoblepharus buchananii	Buchanan's Snake-eyed Skink												x	x
	Cryptoblepharus plagiocephalus	Péron's Snake-eyed Skink											x		
	Ctenotus delli	Dell's Ctenotus	P4		x		x						x		
	Ctenotus labillardieri	Common Southwest Ctenotus								x			x	x	
	Ctenotus ora	Coastal Plains Skink	P3		x		x								
	Egernia kingii	King's Skink											x	x	

Family	Scientific name	Common name	Conservation status		Database			Field	Literature						
			State	Common wealth	NM	PMST	DBCA		A	B	C	D	E	F	G
	Egernia napoleonis	South-western Crevice-skink						x		x			x	x	
	Hemiergis initialis initialis	Southern Earless Snake								x			x	x	
	Lerista distinguenda	Dwarf Four-toed Slider								x			x	x	
	Lerista microtis microtis	Southwestern Slider											x		
	Lissolepis luctuosa	Western Swamp Skink						x							
	Menetia greyii	Common Dwarf Skink								x			x	x	
	Morethia obscura	Shrubland Morethia Skink						x		x			x	x	
	Tiliqua rugosa	Bobtail						x		x			x	x	x
Typhlopidae	*Anilios australis*	Southern Blind Snake								x			x	x	
Varanidae	*Varanus gouldii*	Bungarra Or Sand Goanna						x		x			x	x	
	Varanus rosenbergi	Heath Goanna							x	x			x	x	x
	Varanus tristis	Racehorse Goanna												x	

Appendix E Fauna Site Sheets

Targeted Chuditch, Quokka, and Woylie Survey

Willowdale Mine – Larego Region

Alcoa of Australia Ltd

SLR Project No.: 675.VX5890.00001

17 June 2024

5870-CAM-01-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 413199		**Northing**	6354177
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Black, Grey				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)			
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges*		



Fulcrum photo ID	25fcd6ee-6219-42bf-b3be-55a6b20cf8de

5870-CAM-03-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 411051		**Northing**	6356534
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	5 - 25%	
Soil type	Sand		**Surface stone size classes present**	Pebbles (<0.6 cm), Rocks (20 - 60 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Grey				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	Clearing				
Introduced fauna	None observed		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah and Stags*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)			
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)	*Sedges*		



Fulcrum photo ID	fc74674b-03b7-4bd2-aa3a-62b70cf96373

5870-CAM-05-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 412964		**Northing**	6354412
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	None	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sand		**Surface stone size classes present**		
Soil colour	Black, Grey				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna			**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Closed shrubland and/or heathland (>80%)			
Ground stratum	Mid (0.5-1 m)	Open rushland and/or sedgeland (20-50%)	*Sedges*		



Fulcrum photo ID	17faecb2-102a-4ec6-acaa-702f8a4624d4

5870-CAM-09-LB

Project:	5890				
Date	2023-10-14		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 413690		**Northing**	6350349
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Exfoliating rock, Hollows - logs, Hummocks, Leaf litter, Peeling bark, Termite mounds	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)			
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Bankisa*		



Fulcrum photo ID	a75fcc57-c7ba-4ed5-b253-c5ce5fb5a3b3

5870-CAM-10-LB

Project:	5890				
Date	2023-10-14		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 413789		**Northing**	6348987
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Big Rocks (60 cm - 2 m), Rocks (20 - 60 cm), Small Rocks (6 - 20 cm)	
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	Clearing				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)			
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	*Pea shrubs*		



Fulcrum photo ID	b2e2a2fb-a23e-49c8-8755-c8e206abd71b

5870-CAM-12-LB

Project:	5890				
Date	2023-10-15		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 414687		**Northing**	6350647
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Rocks (20 - 60 cm), Small Rocks (6 - 20 cm)	
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Logs > 10 cm, Peeling bark, Rock crevices, Woody debris	
Disturbance	None observed				
Introduced fauna	Pig		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)			
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Grasses and sedges*		



Fulcrum photo ID	2bf75440-826d-4cfd-bdc9-34bab94dc7be-401e4b8f-802f-4e93-

5870-CAM-13-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 413084		**Northing**	6352726
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Clay loam		**Surface stone size classes present**	Pebbles (<0.6 cm)	
Soil colour	Orange				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Closed shrubland and/or heathland (>80%)			
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)	*Sedges*		



Fulcrum photo ID	3ec77bc4-f51a-425c-8265-5a75050fb7de

5870-CAM-16-LB

Project:	5890				
Date	2023-10-14		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 414500		**Northing**	6348638
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	North		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah and Allocasuarina*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)			
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	75423b83-ef94-4eb4-9337-cd370848f0ea

5870-CAM-17-LB

Project:	5890				
Date	2023-10-14		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 412681		**Northing**	6352341
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	South		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	Clearing				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open mallee shrubland (20-50%)			
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Small herbs and sedges*		



Fulcrum photo ID	ced6cc7a-b41f-4505-bd5d-74128d1fc492

5870-CAM-18-LB

Project:	5890				
Date	2023-10-15		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 413797		**Northing**	6355266
Landform and Soil			**Rock**		
Landform	Lower slope		**Rock type/s**	Laterite	
Aspect	South		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm), Stones (2 - 6 cm)	
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Clearing				
Introduced fauna	None observed		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)			
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Grasses*		



Fulcrum photo ID	5afb0ba5-ce56-49ee-8750-62b00bf22720

5870-CAM-19-LB

Project:	5890				
Date	2023-10-14		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 412917		**Northing**	6349007
Landform and Soil			**Rock**		
Landform	Upper slope		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Grey				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Logs > 10 cm, Peeling bark, Termite mounds	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)			
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	*Grasses and sedges*		



Fulcrum photo ID	0e367c3b-216d-4f82-b937-7c26c7fa729e

5870-CAM-23-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 410877		**Northing**	6355590
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Rocks (20 - 60 cm), Small Stones (0.6 - 2 cm)	
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	Dieback				
Introduced fauna	None observed		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)			
Ground stratum	Mid (0.5-1 m)	Open rushland and/or sedgeland (20-50%)			



Fulcrum photo ID	ad36fe10-d6cb-4c62-8e0a-bce88bd7e601

5870-CAM-24-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 410946		**Northing**	6355236
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm)	
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	Dieback				
Introduced fauna			**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)			
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges*		



Fulcrum photo ID	c1050e10-ed05-42dd-b784-19e8fdb020af

5870-CAM-26-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 412702		**Northing**	6355307
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sand		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Grey				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	Dieback				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Tall (>30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)			
Ground stratum	Low (>0.5 m)	Open rushland and/or sedgeland (20-50%)	*Sedges*		



Fulcrum photo ID	acb1d6d1-b690-4e55-b626-a5af26e4195e

5870-CAM-27-LB

Project:	5890				
Date	2023-10-14		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 415029		**Northing**	6349231
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)			
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	*Xanthorrhoea*		



Fulcrum photo ID	c9935215-218e-4b14-a67f-d49c7360b426

5870-CAM-28-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 412768		**Northing**	6354897
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sand		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm)	
Soil colour	Grey				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	Dieback				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)			
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	9922c67a-b31b-43a8-80b5-171f605037b6

5870-CAM-28-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 412768		**Northing**	6354897
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sand		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm)	
Soil colour	Grey				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	Dieback				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)			
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	9922c67a-b31b-43a8-80b5-171f605037b6

5870-CAM-30-LB

Project:	5890				
Date	2023-10-15		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 414174		**Northing**	6352804
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)			
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges and grasses*		



Fulcrum photo ID	fb7b0506-a3f8-46df-b841-382f3897ec83

5870-CAM-31-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 411808		**Northing**	6355031
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Rocks (20 - 60 cm), Small Stones (0.6 - 2 cm)	
Soil colour	Grey				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	Dieback				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)			
Ground stratum	Mid (0.5-1 m)	Rushland and/or sedgeland (50-80%)			



Fulcrum photo ID	/9c93bdb0-9d8c-4f70-b41e-4e17eed3a62d

5870-CAM-32-LB

Project:	5890				
Date	2023-10-13		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 413233		**Northing**	6354593
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm), Stones (2 - 6 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	Dieback				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)			
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges*		



Fulcrum photo ID	9f907646-156e-4f71-bfeb-f9479c1f5d67

5870-CAM-34-LB

Project:	5890				
Date	2023-10-14		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 412410		**Northing**	6352719
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	South		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Grey, Orange				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Peeling bark, Woody debris	
Disturbance	Clearing				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)		*Jarrah and She-oak*	
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)			
Ground stratum	Mid (0.5-1 m)	Open rushland and/or sedgeland (20-50%)		*Herbs*	



Fulcrum photo ID	4511c0c9-29f2-4b05-8348-b92cb4a1981c

5870-CAM-35-LB

Project:	5890				
Date	2023-10-15		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 414772		**Northing**	6352745
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Rocks (20 - 60 cm), Small Rocks (6 - 20 cm)	
Soil colour	Black				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Logs > 10 cm, Peeling bark, Rock crevices, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)		*Jarrah*	
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)		*Jarrah*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedges and grasses*	



Fulcrum photo ID	93f2c84d-146f-4179-94a7-40fbd1de8faa

5870-CAM-36-LB

Project:	5890				
Date	2023-10-14		**Sample Type**	Basic Fauna	
Zone	50	**Easting** 412422		**Northing**	6350668
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	None	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sand		**Surface stone size classes present**		
Soil colour	Brown, Grey				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	Clearing,Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Jarrah*		
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)			
Ground stratum	Tall (1-2 m)	Sparse hummock grassland (0.25-20%)	*Herbs*		



Fulcrum photo ID	62a285cc-eb8a-4bcc-915d-c73916b8fd40

5890-CAM-02-EW

Project:	5890				
Date	2023-10-15		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 414503		**Northing**	6351029
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Logs > 10 cm, Peeling bark, Rock crevices, Woody debris	
Disturbance	Logging,Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Marri, Allocasuarina, Jarrah, Banksia sessilis*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Bossiaea, Calytrix*		
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	*Sedge, herbs*		



Fulcrum photo ID	e4640a26-5456-4f3c-871d-2aba6ad8168c-5fd61c25-6187-

5890-CAM-04-EW

Project:	5890				
Date	2023-10-14		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 413062		**Northing**	6352206
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Grey				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)			
Mid stratum	Tall (>2 m)	Closed shrubland and/or heathland (>80%)		*Bossiaea, Acacia pulchella, Bracken*	
Ground stratum	Absent				



Fulcrum photo ID	fa21d811-6c98-4246-a483-4b88583654fe

5890-CAM-06-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 410950		**Northing**	6354138
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	50 - 75%	
Soil type	Sandy loam		**Surface stone size classes present**	Rocks (20 - 60 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)		*Marri, Jarrah, Allocasuarina*	
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)		*Calytrix, Bossiaea*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	e6648a78-370f-4442-9645-076a2df65829

5890-CAM-07-EW

Project:	5890				
Date	2023-10-15		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 411296		**Northing**	6350882
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	None	
Aspect	Northeast		**Surface stone cover**		
Soil type	Clay loam		**Surface stone size classes present**		
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Logs > 10 cm, Peeling bark, Termite mounds, Woody debris	
Disturbance	Pig rooting				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus globulus, E. patens*		
Mid stratum	Tall (>2 m)	Closed shrubland and/or heathland (>80%)	*Myrtaceae, Bossiaea*		
Ground stratum	Tall (1-2 m)	Open rushland and/or sedgeland (20-50%)	*Sedge*		



Fulcrum photo ID	02bb1e5c-9137-46fd-aebc-d8062482302f

5890-CAM-08-EW

Project:	5890				
Date	2023-10-14		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 411907		**Northing**	6352650
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus patens*		
Mid stratum	Tall (>2 m)	Closed shrubland and/or heathland (>80%)	*Bossiaea, Myrtaceae*		
Ground stratum	Tall (1-2 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	f8ed0961-b0cf-4046-ba16-a67fef1ac9e1

5890-CAM-11-EW

Project:	5890				
Date	2023-10-14		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	411883	**Northing**	6352707
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Logging				
Introduced fauna	Pig		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Marri*	
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)		*Bossiaea, Macrozamia, Bracken, Tetratheca*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedge, Tetratheca*	



Fulcrum photo ID	b250b4f3-2ab4-4326-bc8b-f30d8c55ebc0

5890-CAM-14-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	415154	**Northing**	6353208
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	West		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Logging				
Introduced fauna	Potential pig sign		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Marri, Banksia grandis*	
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)		*Bossiaea*	
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedge, Bracken, Tetratheca*	



Fulcrum photo ID	1ccce24f-c7ea-4019-88da-c958b3657bb0

5890-CAM-15-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 412292		**Northing**	6350989
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Black, Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Logging				
Introduced fauna	None observed		**Ground Cover**	51-75%	

Vegetation			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Marri, Jarrah*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Bracken*
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedges, Tetratheca, Bracken*



Fulcrum photo ID	eec68be2-d128-4dd6-a69a-14e51bbd16e6

5890-CAM-20-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 410834		**Northing**	6352823
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Present	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	Potential old pig sign		**Ground Cover**	51-75%	

Vegetation			
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*Bossiaea, Bracken*
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedge, Tetratheca*



Fulcrum photo ID	0b7fc701-1e98-4e78-b95d-8e45b1819146

5890-CAM-21-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 411613		**Northing**	6353040
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	Laterite	
Aspect	Southeast		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Present	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**		
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Marri, Jarrah*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Xanthorrhoea, Macrozamia*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	8194713f-498c-4873-b7b9-3e8c0fb0c8db

5890-CAM-22-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting** 414325		**Northing**	6354625
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	25 - 50%	
Soil type	Sandy loam		**Surface stone size classes present**	Rocks (20 - 60 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Marri*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Bracken*		
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*Stylidium, Boronia, Orchid*		



Fulcrum photo ID	3bd24db6-d37d-4ce9-8bec-94c425bc189f

5890-CAM-29-EW

Project:	5890				
Date	2023-10-14		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	412681	**Northing**	6351901
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	0 - 5%	
Soil type	Loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Logging				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri*		
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*Bossiaea, Bracken*		
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			



Fulcrum photo ID	bc487f79-f890-46c7-9ccf-35bbc2cc1157

5890-CAM-33-EW

Project:	5890				
Date	2023-10-14		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	412669	**Northing**	6350011
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Southwest		**Surface stone cover**	5 - 25%	
Soil type	Loam		**Surface stone size classes present**	Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Logging				
Introduced fauna	None observed		**Ground Cover**		
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Marri*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Bracken*		
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)			



Fulcrum photo ID	b0997f54-4c4d-4691-a2ab-c1ea9cc6afdf

5890-CAM-37-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone		**Easting**		**Northing**	
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	South		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Burrows, Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**		
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)		*Jarrah, Marri*	
Mid stratum	Tall (>2 m)	Closed shrubland and/or heathland (>80%)		*Bossiaea, Grevillea, Bracken*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedges, Tetratheca*	



Fulcrum photo ID	46a6fa6e-449f-49c8-9863-93f9bf051d8d

5890-CAM-38-EW

Project:	5890				
Date	2023-10-15		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	411260	**Northing**	6349796
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	None	
Aspect	East		**Surface stone cover**		
Soil type	Loam		**Surface stone size classes present**		
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Eucalyptus globulus*	
Mid stratum	Tall (>2 m)	Closed shrubland and/or heathland (>80%)		*Myrtaceae, Bossiaea, Bracken, Lasiopetalum*	
Ground stratum	Absent				



Fulcrum photo ID	6b0aa8eb-8146-43de-ab30-beafb45814d3

5890-CAM-39-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	412821	**Northing**	6350751
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northeast		**Surface stone cover**	5 - 25%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**		
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Jarrah, Marri*	
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)		*Bossiaea*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedge, Tetratheca*	



Fulcrum photo ID	6f663282-dca2-44ca-a00b-38ed0af34f0d

5890-CAM-40-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	412711	**Northing**	6353618
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	0 - 5%	
Soil type	Sandy loam		**Surface stone size classes present**	Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Logging				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Jarrah, Marri, Banksia grandis*	
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		*Bossiaea*	
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Sedge, Xanthorrhoea*	



Fulcrum photo ID	6aac911a-7f02-4856-bb0f-cacc6d4548f0

5890-CAM-41-EW

Project:	5890				
Date	2023-10-13		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	413985	**Northing**	6352460
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	Northwest		**Surface stone cover**	25 - 50%	
Soil type	Loam		**Surface stone size classes present**	Rocks (20 - 60 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Logging				
Introduced fauna	Pig		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri, Allocasuarina*		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea, Banksia grandis*		
Ground stratum	Mid (0.5-1 m)	Sparse tussock grassland (0.25-20%)	*Sedge, Tetratheca*		



Fulcrum photo ID	42bacb96-dba3-481c-a7d5-bec1bc52e086

5890-CAM-42-EW

Project:	5890				
Date	2023-10-14		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	413198	**Northing**	6351627
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	None	
Aspect	Northwest		**Surface stone cover**		
Soil type	Loam		**Surface stone size classes present**		
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	High quality		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Eucalyptus patens*		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Myrtaceae*		
Ground stratum	Tall (1-2 m)	Rushland and/or sedgeland (50-80%)	*Sedges, Xanthorrhoea, Lasiopetalum, Myrtaceae sp.*		



Fulcrum photo ID	09695d6f-4843-4b9b-82bc-1842c21c9ca8

5890-CAM-43-EW

Project:	5890				
Date	2023-10-15		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	411849	**Northing**	6349686
Landform and Soil			**Rock**		
Landform	Mid slope		**Rock type/s**	Laterite	
Aspect	East		**Surface stone cover**	25 - 50%	
Soil type	Loam		**Surface stone size classes present**	Big Rocks (60 cm - 2 m), Rocks (20 - 60 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Logging				
Introduced fauna	None observed		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Jarrah, Marri, Allocasuarina*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Bossiaea , Banksia grandis*		
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedge, prostrate Banksia*		



Fulcrum photo ID	29e3ad82-b578-4890-a888-795f7b238291

5890-CAM-44-EW

Project:	5890				
Date	2023-10-15		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	414281	**Northing**	6351283
Landform and Soil			**Rock**		
Landform	Drainage line		**Rock type/s**	None	
Aspect	Southeast		**Surface stone cover**		
Soil type	Loam		**Surface stone size classes present**		
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Present	
Fire History	Burnt (1-5 years)		**Microhabitats**	Hollows - logs, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus globulus, Marri, Jarrah*		
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*Bossiaea, Myrtaceae*		
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)			



Fulcrum photo ID	a96eec49-0c3e-40ea-8620-d880c50c8fb7

5890-CAM-45-EW

Project:	5890				
Date	2023-10-14		**Sample Type**	Terrestrial vertebrate fauna	
Zone	50	**Easting**	413041	**Northing**	6349511

Landform and Soil		**Rock**	
Landform	Mid slope	**Rock type/s**	Laterite
Aspect	Northeast	**Surface stone cover**	0 - 5%
Soil type	Loam	**Surface stone size classes present**	Rocks (20 - 60 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)
Soil colour	Brown		
Condition		**Habitat Features**	
Quality	Good	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris
Disturbance	Pig rooting		
Introduced fauna	Pig	**Ground Cover**	76-100%

Vegetation

Upper stratum	Mid (10-30 m)	Open forest (50-80%)	*Jarrah, Marri*
Mid stratum	Mid (1-2 m)	Shrubland and/or heathland (50-80%)	*Bossiaea, Bracken, Grevillea*
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)	*Sedge, Tetratheca*



Fulcrum photo ID	d1930796-6ee4-4610-9652-e01e78000ec0

Appendix F Significant Fauna Recorded During the Survey

Targeted Chuditch, Quokka, and Woylie Survey

Willowdale Mine – Larego Region

Alcoa of Australia Ltd

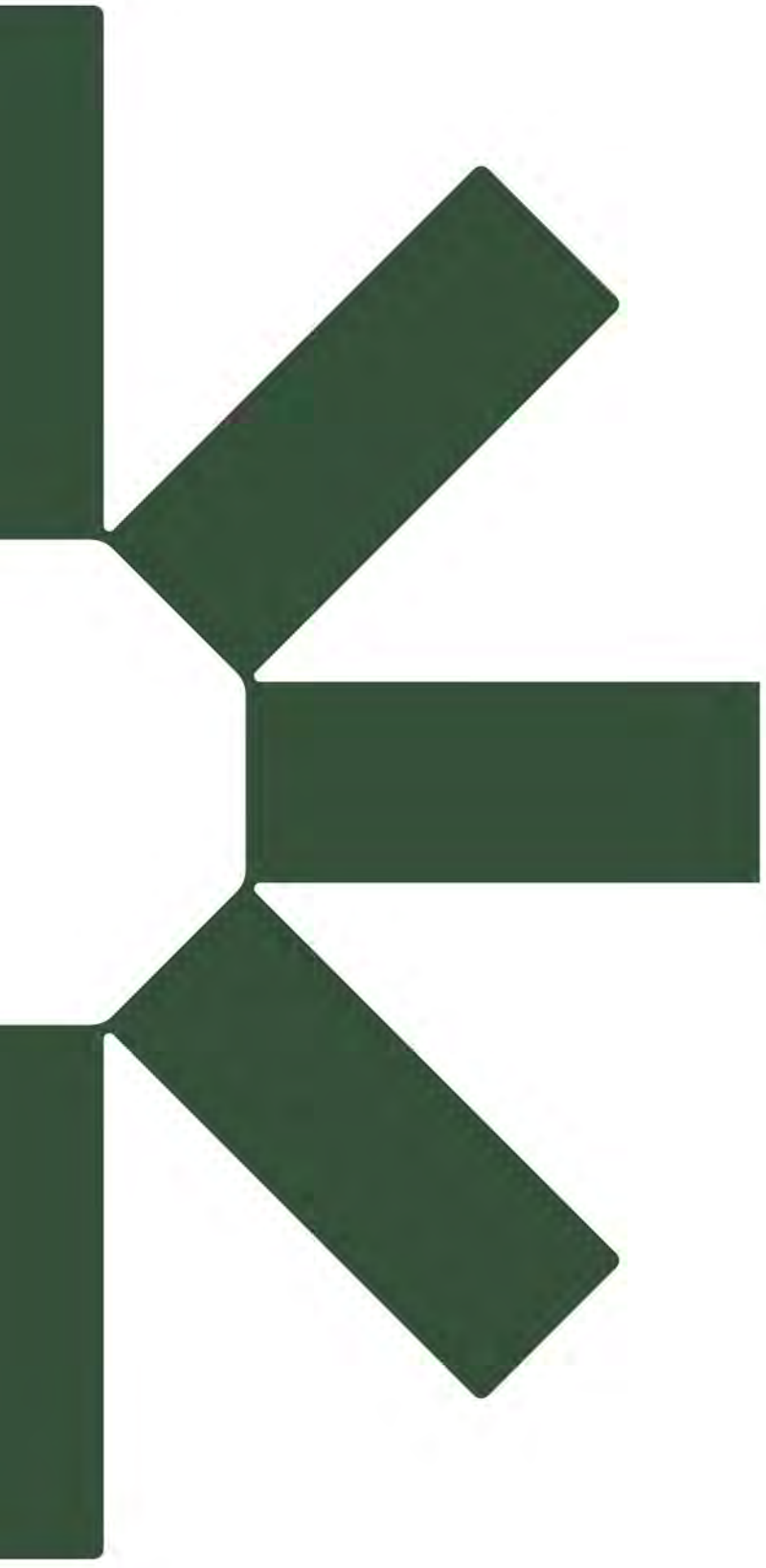
SLR Project No.: 675.VX5890.00001

17 June 2024

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Zanda baudinii	Baudin's Cockatoo	EN	EN	1	13-10-2023	-32.9519	116.0652	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	13-10-2023	-32.9519	116.0652	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	14-10-2023	-32.9706	116.0709	Foraging evidence
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	1	14-10-2023	-32.9606	116.0694	Sighting
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	2	14-10-2023	-32.9597	116.0817	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	3	14-10-2023	-32.9726	116.0779	Sighting - overhead
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	6	15-10-2023	-32.9744	116.0845	Feather
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU	6	15-10-2023	-32.9609	116.0577	Sighting
Dasyurus geoffroii	Chuditch	VU	VU	1	18-10-2023	-32.9758	116.0861	Scat
Hydromys chrysogaster	Rakali	P4		1	19-10-2023	-32.9941	116.0524	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	14-10-2023	-32.9480	116.0893	Sighting
Notamacropus irma	Western Brush Wallaby	P4		1	15-10-2023	-32.9828	116.0641	Sighting

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Notamacropus irma	Western Brush Wallaby	P4		1	18-10-2023	-32.9343	116.0467	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	18-10-2023	-32.9877	116.0565	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	19-10-2023	-32.9370	116.0662	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	20-10-2023	-32.9593	116.0459	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	20-10-2023	-32.9866	116.0502	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	23-10-2023	-32.9734	116.0827	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	23-10-2023	-32.9343	116.0467	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	24-10-2023	-32.9768	116.0507	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	26-10-2023	-32.9768	116.0507	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	26-10-2023	-32.9939	116.0679	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	27-10-2023	-32.9939	116.0679	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	27-10-2023	-32.9792	116.0870	Camera Trap

Scientific name	Common name	Conservation status		Abundance	Date	Latitude	Longitude	Record type
		State	Common wealth					
Notamacropus irma	Western Brush Wallaby	P4		2	29-10-2023	-32.9973	116.0848	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		2	29-10-2023	-32.9939	116.0679	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		2	30-10-2023	-32.9451	116.0689	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		2	31-10-2023	-32.9973	116.0848	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		2	01-11-2023	-32.9768	116.0507	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		2	01-11-2023	-32.9562	116.0922	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		2	03-11-2023	-32.9734	116.0827	Camera Trap
Notamacropus irma	Western Brush Wallaby	P4		1	07-11-2023	-32.9973	116.0848	Camera Trap



Making Sustainability Happen

Alcoa Targeted Significant Fauna Survey Memo

Willowdale Mine – Larego Region

Alcoa of Australia Ltd

181 - 205 Davy Road, Booragoon WA 6154,
Australia

Prepared by:

SLR Consulting Australia

Level 1, 500 Hay Street, Subiaco WA 6008,
Australia

SLR Project No.: 675.VX5890.00002

16 October 2024

Revision: 1.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	16 October 2024	Datta Li	L. Geidans	S. Walker

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Alcoa of Australia Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1.0 Introduction

1.1 The Project

Alcoa of Australia Ltd (Alcoa) commissioned SLR Consulting Australia Pty Ltd (SLR) to undertake targeted surveys for significant fauna within the Willowdale/Larego Survey Area. This memorandum reflects the camera trapping effort and results, as well as opportunistic sighting of significant fauna within 87 individual polygons covering 845.65 ha within the Survey Area. The Survey Area is located approximately 15 km southeast of the Waroona townsite, in the Jarrah Forest bioregion of Western Australia.

1.2 Objective and Scope

The objective of this document (the Memo) is to provide to Alcoa:

- An outline of the methodology for the use of baited camera traps for the targeted significant fauna survey.
- Preliminary results of baited camera traps placed within the Survey Area.
- A table showing the locations of significant fauna recorded within the Survey Area.
- A map showing locations of baited camera traps within the Survey Area.

2.0 Methods

Motion sensitive camera traps are a simple method to passively document fauna during a field survey. A targeted fauna survey undertaken from 15th – 17th July 2024 where a total of 80 camera traps were installed in areas of suitable habitat that focused on targeting Chuditch, Quokka, and Woylie. In addition, two spotlighting trips were undertaken on the 16th and 30th of July. A thermal imaging drone was used for the second night to locate fauna, which were confirmed by personnel on the ground to identify species. Opportunistic sightings of fauna were also recorded during the field survey.

Cameras were baited with a combination of universal bait (rolled oats, peanut butter, and sardines) and apples. Universal bait has been selected over 'Chuditch bait' (meat meal and fish oil) because it has demonstrated efficacy for attracting both Woylies and Chuditch (Wayne et al., 2008), and along with the apples has also successfully been used for luring Quokka's (Hayward et al., 2005). Following the Survey Guidelines for Australia's Threatened Mammals (DSEWPaC, 2011), the cameras were left installed for a minimum duration of 14 nights, and were retrieved between the 31st July and 1st August. The locations of the deployed cameras are displayed in **Figure 1**.

3.0 Results

A total of 43 vertebrate fauna species were recorded within the Willowdale/Larego Survey Areas (**Table 1**). The fauna recorded comprised of 25 bird species, 16 mammals, and two species of reptiles.

Five significant fauna taxa were recorded within the Survey Area (**Table 2**: **Figure 2**):

- Western Ringtail Possum (*Pseudocheirus occidentalis*) – Critically Endangered (BC Act); Critically Endangered (EPBC Act)
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable (BC Act); Vulnerable (EPBC Act)
- Quokka (*Setonix brachyurus*) – Vulnerable (BC Act); Vulnerable (EPBC Act)

- Western Brush Wallaby (*Notamacropus irma*) – Priority 4 (DBCA)
- Rakali/Water Rat (*Hydromys chrysogaster*) – Priority 4 (DBCA).

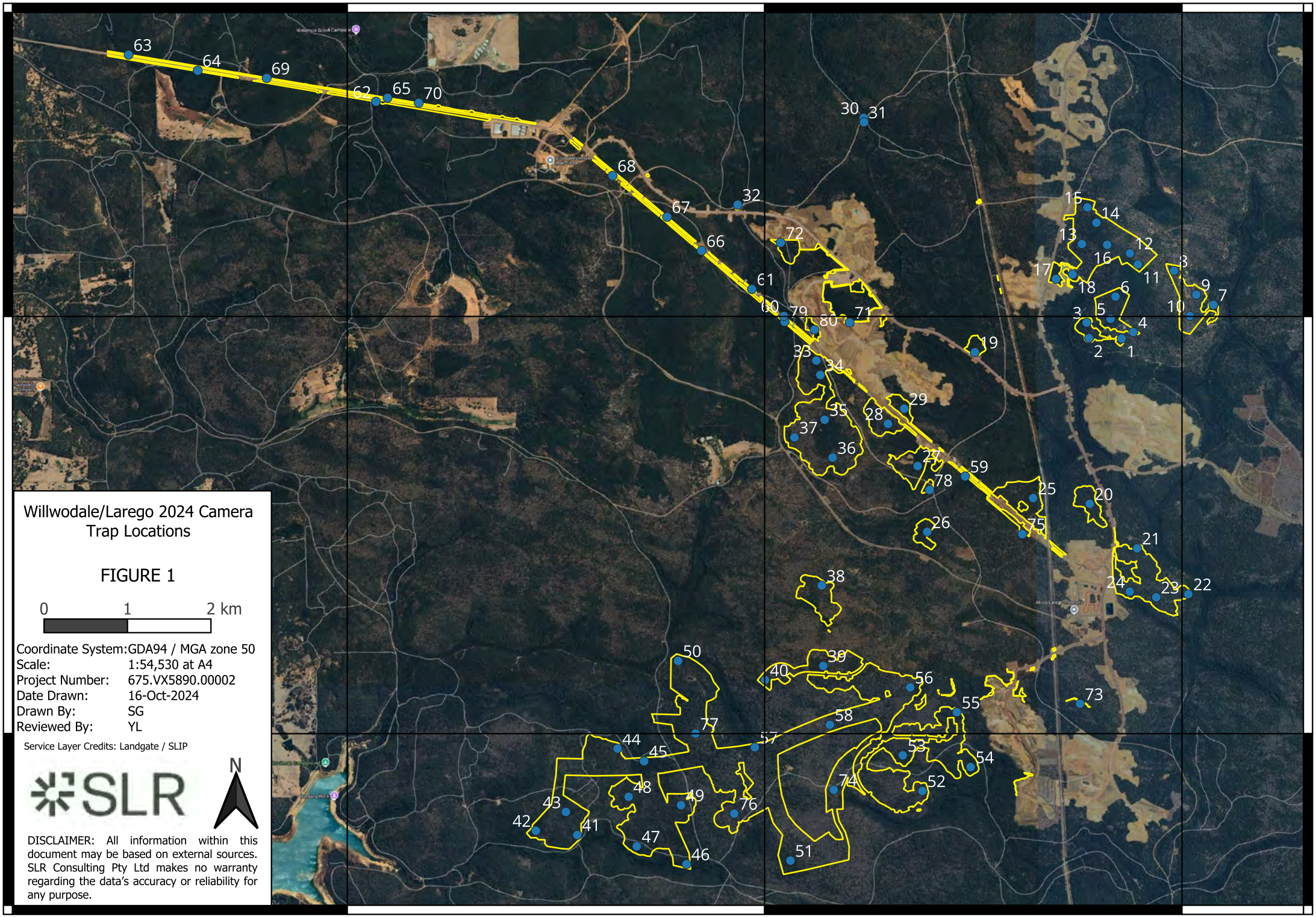

405000.000
410000.000
415000.000
6355000.000
6350000.000
Willwodale/Larego 2024 Camera Trap Locations
FIGURE 1
0
1
2 km
Coordinate System: GDA94 / MGA zone 50
Scale: 1:54,530 at A4
Project Number: 675.VX5890.00002
Date Drawn: 16-Oct-2024
Drawn By: SG
Reviewed By: YL
Service Layer Credits: Landgate / SLIP
SLR
N
DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

Table 1: Fauna taxa recorded within the Willowdale/Larego Survey Area

Family	Scientific Name	Common Name	Conservation Status		Method					
			State	Federal	Call	Sighting	Scat	Remains	Camera	Spotlighting
Aves										
Acanthizidae	*Acanthiza apicalis*	Inland Thornbill, Broad-tailed Thornbill	-	-					1	
	Acanthiza inornata	Western Thornbill	-	-					1	
	Sericornis maculatus	Spotted Scrubwren	-	-					28	
	Smicrornis brevirostris	Weebill	-	-					1	
Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar	-	-		1			8	
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra	-	-					1	
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	1	25				
Casuariidae	*Dromaius novaehollandiae*	Emu	-	-		4				
Climacteridae	*Climacteris rufus*	Rufous Treecreeper	-	-					2	
Columbidae	*Phaps elegans*	Brush Bronzewing	-	-					1	
Corvidae	*Corvus coronoides*	Australian Raven	-	-					35	
Maluridae	*Malurus elegans*	Red-winged Fairywren	-	-					117	
	Malurus splendens	Splendid Fairywren	-	-					9	
Meliphagidae	*Acanthorhynchus superciliosus*	Western Spinebill	-	-					2	
Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush	-	-					9	

Family	Scientific Name	Common Name	Conservation Status		Method					
			State	Federal	Call	Sighting	Scat	Remains	Camera	Spotlighting
	Pachycephala fuliginosa	Western Whistler	-	-						
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin	-	-					9	
	Petroica boodang	Scarlet Robin	-	-					9	
	Quoyornis georgianus	White-breasted Robin	-	-					49	
Podargidae	*Podargus strigoides*	Tawny Frogmouth	-	-					2	
Psittaculidae	*Platycercus icterotis*	Western Rosella	-	-					4	
	Purpureicephalus spurius	Red-capped Parrot	-	-					1	
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	-	-					3	
Turnicidae	*Turnix varius*	Painted Button-quail	-	-					1	
Zosteropidae	*Zosterops lateralis*	Grey-breasted White-eye, Silvereye	-	-					4	
Mammalia										
Canidae	*Vulpes vulpes*	Red Fox	-	-					2	
Dasyuridae	*Antechinus flavipes leucogaster*	Yellow-footed Antechinus, Mardo	-	-					364	
	Sminthopsis fuliginosa fuliginosa	Grey-bellied Dunnart	-	-					15	
Felidae	*Felis catus*	Cat	-	-					15	
Leporidae	*Oryctolagus cuniculus*	Rabbit	-	-					4	
Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo	-	-		2			13	
	Notamacropus irma	Western Brush Wallaby	P4	-		1			34	

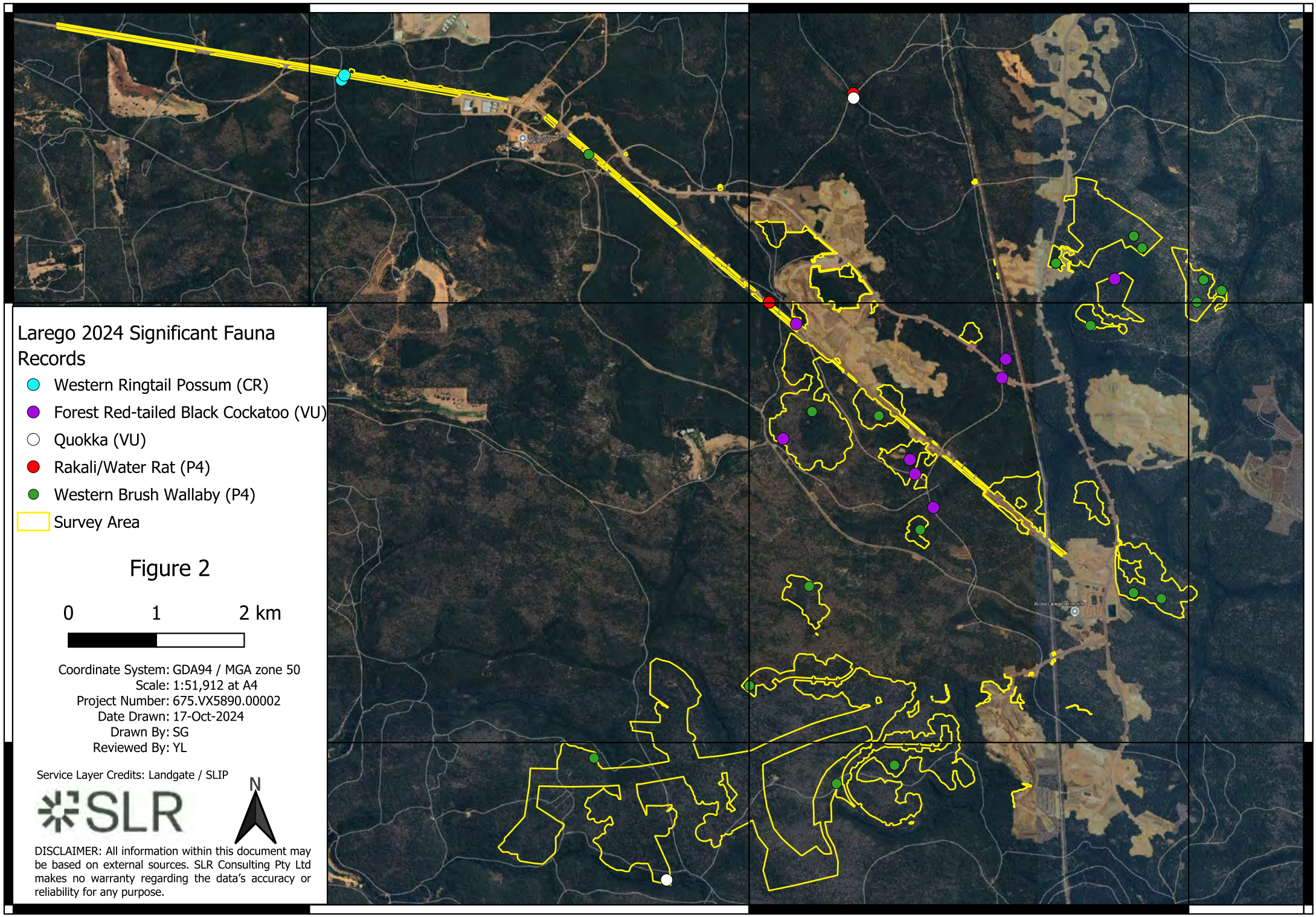
Family	Scientific Name	Common Name	Conservation Status		Method					
			State	Federal	Call	Sighting	Scat	Remains	Camera	Spotlighting
	Setonix brachyurus	Quokka	VU	VU			3		6	
Muridae	*Hydromys chrysogaster*	Rakali/Water Rat	P4	-					4	
	Mus musculus	House Mouse	-	-					29	
	Rattus fuscipes fuscipes	Western Bush Rat	-	-					100	
	Rattus rattus	Black Rat	-	-					57	
Phalangeridae	*Trichosurus vulpecula hypoleucus*	Common Brushtail Possum, Koomal	-	-				1	7	
Pseudocheiridae	*Pseudocheirus occidentalis*	Western Ringtail Possum	CR	CR						2
Suidae	*Sus scrofa*	Pig	-	-					17	
Tachyglossidae	*Tachyglossus aculeatus acanthion*	Short-beaked Echidna	-	-		1		1	15	
Reptilia										
Elapidae	*Suta nigriceps*	Mallee black-backed snake	-	-		1				
Scincidae	*Hemiergis initialis initialis*	South-Western Earless skink	-	-		1				

Table 2: Sites which recorded significant fauna taxa within the Willowdale/Larego Survey Area

Site Number ID	Latitude	Longitude	Scientific Name	Common Name	Conservation Status		Preliminary Habitat	Record Type
					State	Common wealth		
23	-32.9703061	116.0870908	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
46	-32.9986967	116.0265699	*Setonix brachyurus*	Quokka	VU	VU	Drainage Line	Camera Trap
53	-32.9871436	116.0544308	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
30	-32.9182163	116.0501465	*Hydromys chrysogaster*	Rakali/Water Rat	P4	-	Drainage Line	Camera Trap
24	-32.9696648	116.08371	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
35	-32.9507955	116.0447979	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
44	-32.9861356	116.0178631	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
26	-32.9630167	116.057815	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
38	-32.9687083	116.0442417	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
68	-32.9242098	116.0179252	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
60	-32.93954869	116.0396936	*Hydromys chrysogaster*	Rakali/Water Rat	P4	-	Drainage Line	Camera Trap
02	-32.942225	116.0787767	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
19	-32.951295	116.0529117	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap

Site Number ID	Latitude	Longitude	Scientific Name	Common Name	Conservation Status		Preliminary Habitat	Record Type
					State	Common wealth		
72	-32.9186749	116.0501891	*Setonix brachyurus*	Quokka	VU	VU	Drainage Line	Camera Trap/Scat
07	-32.9387467	116.0947583	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
40	-32.9788571	116.0368656	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
11	-32.9343026	116.0851307	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
10	-32.939927	116.0917254	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
09	-32.9376324	116.0925677	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
12	-32.9330935	116.0841199	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
17	-32.9357972	116.0746191	*Notamacropus irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Camera Trap
Opportunistic	-32.9374699	116.0817594	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	Jarrah-Marri Forest	Sighting
Opportunistic	-32.9417817	116.0429617	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	Jarrah-Marri Forest	Call
Opportunistic	-32.9558079	116.0566411	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	Jarrah-Marri Forest	Sighting
Opportunistic	-32.9535571	116.0412389	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	Jarrah-Marri Forest	Sighting
Opportunistic	-32.9475183	116.0679233	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	Jarrah-Marri Forest	Sighting

Site Number ID	Latitude	Longitude	Scientific Name	Common Name	Conservation Status		Preliminary Habitat	Record Type
					State	Common wealth		
Opportunistic	-32.9455999	116.0684272	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	Jarrah-Marri Forest	Sighting
Opportunistic	-32.9607483	116.0594467	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	Jarrah-Marri Forest	Sighting
Opportunistic	-32.9572853	116.0572466	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	Jarrah-Marri Forest	Sighting
Opportunistic	-32.9889851	116.0473642	*Notamacropus Irma*	Western Brush Wallaby	P4	-	Jarrah-Marri Forest	Sighting
Opportunistic	-32.9163251	115.9879426	*Pseudocheirus occidentalis*	Western Ringtail Possum	CR	CR	Drainage Line	Thermal Imaging with Spotlighting
Opportunistic	-32.91584026	115.9882794	*Pseudocheirus occidentalis*	Western Ringtail Possum	CR	CR	Drainage Line	Spotlighting


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Laregó 2024 Significant Fauna Records
Western Ringtail Possum (CR)
Forest Red-tailed Black Cockatoo (VU)
Quokka (VU)
Rakali/Water Rat (P4)
Western Brush Wallaby (P4)
Survey Area
Figure 2
0
1
2 km
Coordinate System: GDA94 / MGA zone 50
Scale: 1:51,912 at A4
Project Number: 675.VX5890.00002
Date Drawn: 17-Oct-2024
Drawn By: SG
Reviewed By: YL
Service Layer Credits: Landgate / SLIP
SLR
N
DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

4.0 Conclusion

The habitat within the Survey Area is predominantly Jarrah Forest/Woodland which is preferred by the Forest Red-tailed Black Cockatoo and the Western Brush Wallaby, whereas the Western Ringtail Possum, Quokka, and the Rakali/Water Rat preferred the riparian vegetation along the Drainage Line habitat.

Five significant taxa were recorded within the Survey Area (**Table 2**):

- Western Ringtail Possum (*Pseudocheirus occidentalis*) – CR (BC Act); CR (EPBC Act) was recorded twice within the Survey Area
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – VU (BC Act); VU (EPBC Act) was recorded eight times within the Survey Area
- Quokka (*Setonix brachyurus*) – VU (BC Act); VU (EPBC Act), was recorded twice within the Survey Area
- Western Brush Wallaby (*Notamacropus irma*) – P4 (DBCA), was recorded 18 times within the Survey Area
- Rakali/Water Rat (*Hydromys chrysogaster*) – P4 (DBCA) was recorded twice within the Survey Area

The most effective method for surveying Quokka is by deploying baited camera traps along the Drainage Line habitat, and thermal imaging combined with spotlighting is proven to be an effective method for surveying the Western Ringtail Possum.

5.0 References

DSEWPaC (2011) *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.dcceew.gov.au.

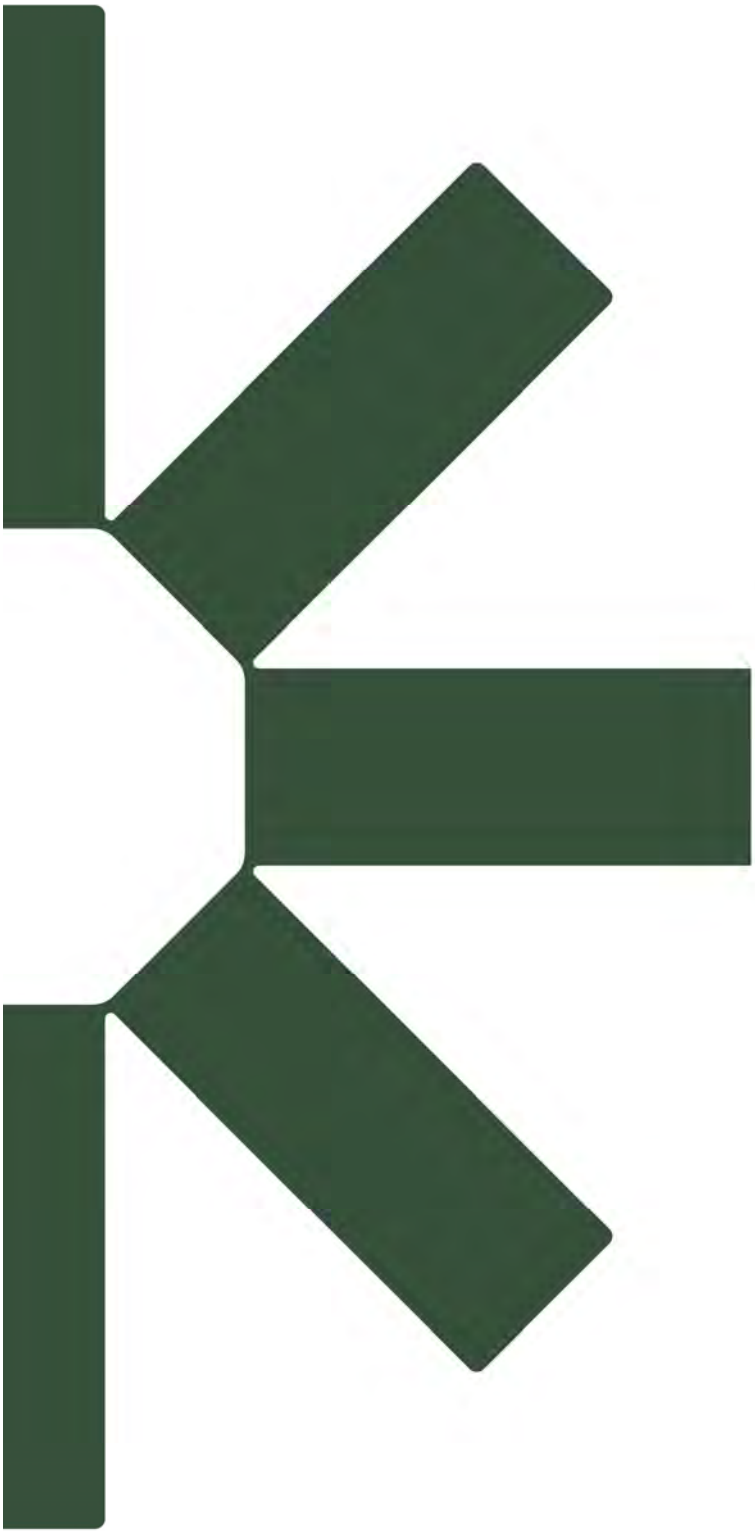
Hayward, M.W. *et al.* (2005) "Mortality and survivorship of the quokka (Setonix brachyurus)(Macropodidae: Marsupialia) in the northern jarrah forest of Western Australia," *Wildlife Research*, 32(8), pp. 715–722.

Wayne, A.F. *et al.* (2008) "Improved bait and trapping techniques for chuditch (Dasyurus geoffroii): overcoming reduced trap availability due to increased densities of other native fauna," *Conservation Science W. Aust.*, 7(1), pp. 49–56.

6.0 Feedback

At SLR, we are committed to delivering professional quality service to our clients. We are constantly looking for ways to improve the quality of our deliverables and our service to our clients. Client feedback is a valuable tool in helping us prioritise services and resources according to our client needs.

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Making Sustainability Happen

Alcoa Priority Areas Memo

Huntly Mine – Myara Region

Alcoa of Australia Ltd

181 - 205 Davy Road, Booragoon WA 6154,
Australia

Prepared by:

SLR Consulting Australia

Level 1, 500 Hay Street, Subiaco WA 6008,
Australia

SLR Project No.: 675.VX5890.00002

18 June 2024

Revision: 1.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	18 June 2024	S. Subaraj	M. Lohr	M. Lohr

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Alcoa of Australia Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1.0 Introduction

1.1 The Project

Alcoa of Australia Ltd (Alcoa) commissioned SLR Consulting Australia Pty Ltd (SLR) to undertake targeted surveys for significant terrestrial vertebrate fauna within the Huntly/Myara Survey Area. This memorandum reflects the camera trapping effort and results within 27 individual polygons covering 60.33 ha of priority areas within the Survey Area. The Survey Area is located approximately 20 km northeast of the Pinjarra townsite, in the Jarrah Forest bioregion of Western Australia.

1.2 Objective and Scope

The objective of this document (the Memo) is to provide to Alcoa:

- An outline of the methodology for the use of baited camera traps in the Survey Area.
- Preliminary results of baited camera traps placed in priority areas within the Survey Area.
- A map showing locations of baited camera traps and the site number IDs of trapping locations in priority areas within the Survey Area.

2.0 Methods

Motion sensitive camera traps are a simple method to passively document fauna during a field survey. Camera traps were placed in areas of favourable habitat with a focus on targeting Chuditch, Quokka, and Woylie. Cameras were baited with universal bait (rolled oats, peanut butter, and sardines) and left installed for a minimum duration of 14 nights as per the recommended period in the Survey Guidelines for Australia's Threatened Mammals (Department of Sustainability Environment Water Population and Communities, 2011). Universal bait has been selected over 'Chuditch bait' (meat meal and fish oil) because it has demonstrated efficacy for attracting both Woylies and Chuditch (Wayne *et al.*, 2008), and has also successfully been used for Quokka (Hayward *et al.*, 2005). A total of 80 cameras were deployed during the field survey. However, only ten cameras were located within the priority areas and thus only data from those cameras will be reflected (**Figure 1**).

3.0 Results

A total of 18 species of fauna were documented by the ten camera traps within the priority areas (**Table 1**). The fauna recorded comprised nine species of birds, seven species of native mammals, and two species of non-native mammals (**Table 1**).

Four significant fauna taxa were documented (**Table 2**):

- Chuditch/Western Quoll (*Dasyurus geoffroii*) – VU (BC Act; EPBC Act, recorded at seven different priority areas within the Survey Area.
- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*) – CD (BC Act), recorded at four different sites.
- Quenda/Southwestern Brown Bandicoot (*Isoodon fusciventer*) – P4 (DBCA), recorded at one priority area within the Survey Area.
- Western Brush Wallaby (*Notamacropus irma*) – P4 (DBCA), recorded at seven different priority areas within the Survey Area.

Figure 1 Map of locations for baited camera traps in priority areas within the Survey Area.



Table 1 Fauna taxa recorded in priority areas within the Survey Area

Site Number ID	Family	Scientific Name	Common Name	Conservation Status		No. Detections
				State	Federal	Camera Traps
Birds						
4, 24	Acanthizidae	*Acanthiza inornata*	Western Thornbill			2
55	Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar			1
38, 55	Artamidae	*Strepera versicolor*	Grey Currawong			2
43	Corvidae	*Corvus coronoides*	Australian Raven			1
22, 25	Maluridae	*Malurus elegans*	Red-winged Fairywren			2
22, 23	Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush			2
4, 38	Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin			2
22	Petroicidae	*Petroica boodang*	Scarlet Robin			1
55	Psittaculidae	*Platycercus icterotis*	Western Rosella			1
Mammals						
4	Canidae	**Vulpes vulpes*	Red Fox			1
22, 23, 25, 37, 38, 43, 55, 79	Dasyuridae	*Antechinus flavipes leucogaster*	Yellow-footed Antechinus, Mardo			8
4, 22, 23, 24, 25, 43, 55	Dasyuridae	*Dasyurus geoffroii fortis*	Chuditch/Western Quoll	VU	VU	7

Site Number ID	Family	Scientific Name	Common Name	Conservation Status		No. Detections
				State	Federal	Camera Traps
4, 38, 43, 79	Dasyuridae	*Phascogale tapoatafa wambenger*	Wambenger Brush-tailed Phascogale	CD		4
4, 25, 38, 55, 79	Macropodidea	*Macropus fuliginosus*	Western Grey Kangaroo			5
23, 24, 25, 37, 38, 79	Macropodidea	*Notamacropus irma*	Western Brush Wallaby	P4		7
4	Peramelidae	*Isoodon fusciventer*	Quenda / Southwestern Brown Bandicoot	P4		1
4	Suidae	**Sus scrofa*	Pig			1
23, 24, 25, 37, 38	Tachyglossidae	*Tachyglossus aculeatus acanthion*	Short-beaked Echidna			5

* = Introduced taxa

Table 2 Significant fauna recorded in priority areas within the Survey Area

Site Number ID	Scientific Name	Common Name	Conservation Status		Habitat	Deployment Dates	Latitude	Longitude	Record Type
			State	Commonwealth					
43	*Dasyurus geoffroii*	Chuditch/Western Quoll	VU	VU	Jarrah Forest	06-May-2024-27-May-2024	-32.4332	116.0964	Camera Trap
55	*Dasyurus geoffroii*	Chuditch/Western Quoll	VU	VU	Jarrah Forest	06-May-2024-27-May-2024	-32.4733	116.1745	Camera Trap
24	*Dasyurus geoffroii*	Chuditch/Western Quoll	VU	VU	Jarrah Woodland	07-May-2024-27-May-2024	-32.4542	116.2162	Camera Trap
25	*Dasyurus geoffroii*	Chuditch/Western Quoll	VU	VU	Jarrah Open Woodland	08-May-2024-28-May-2024	-32.4773	116.2138	Camera Trap
23	*Dasyurus geoffroii*	Chuditch/Western Quoll	VU	VU	Jarrah Forest	08-May-2024-28-May-2024	-32.4769	116.2105	Camera Trap
4	*Dasyurus geoffroii*	Chuditch/Western Quoll	VU	VU	Jarrah Forest	09-May-2024-27-May-2024	-32.4659	116.1099	Camera Trap
22	*Dasyurus geoffroii*	Chuditch/Western Quoll	VU	VU	Jarrah Forest	09-May-2024 - 27-May-2024	-32.4792	116.2123	Camera Trap
43	*Phascogale tapoatafa wambenger*	Wambenger Brush-tailed Phascogale	CD		Jarrah Forest	06-May-2024-27-May-2024	-32.4332	116.0964	Camera Trap
4	*Phascogale tapoatafa wambenger*	Wambenger Brush-tailed Phascogale	CD		Jarrah Forest	09-May-2024-27-May-2024	-32.4659	116.1099	Camera Trap
79	*Phascogale tapoatafa wambenger*	Wambenger Brush-tailed Phascogale	CD		Jarrah Marri Woodland	09-May-2024-28-May-2024	-32.4664	116.244	Camera Trap
38	*Phascogale tapoatafa wambenger*	Wambenger Brush-tailed Phascogale	CD		Jarrah Marri Woodland	09-May-2024-28-May-2024	-32.4659	116.2566	Camera Trap
4	*Isoodon fusciventer*	Quenda/ Southwestern Brown Bandicoot	P4		Jarrah Forest	09-May-2024-27-May-2024	-32.4659	116.1099	Camera Trap

Site Number ID	Scientific Name	Common Name	Conservation Status		Habitat	Deployment Dates	Latitude	Longitude	Record Type
			State	Commonwealth					
55	*Notamacropus irma*	Western Brush Wallaby	P4		Jarrah Forest	06-May-2024-27-May-2024	-32.4733	116.1745	Camera Trap
24	*Notamacropus irma*	Western Brush Wallaby	P4		Jarrah Woodland	07-May-2024-27-May-2024	-32.4542	116.2162	Camera Trap
25	*Notamacropus irma*	Western Brush Wallaby	P4		Jarrah Open Woodland	08-May-2024-28-May-2024	-32.4773	116.2138	Camera Trap
23	*Notamacropus irma*	Western Brush Wallaby	P4		Jarrah Forest	08-May-2024-28-May-2024	-32.4769	116.2105	Camera Trap
79	*Notamacropus irma*	Western Brush Wallaby	P4		Jarrah Marri Woodland	09-May-2024-28-May-2024	-32.4664	116.244	Camera Trap
38	*Notamacropus irma*	Western Brush Wallaby	P4		Jarrah Marri Woodland	09-May-2024-28-May-2024	-32.4659	116.2566	Camera Trap
37	*Notamacropus irma*	Western Brush Wallaby	P4		Jarrah Marri Woodland	09-May-2024-28-May-2024	-32.4677	116.2485	Camera Trap

4.0 Conclusion

The habitat within the priority area is predominantly Jarrah Forest/Woodland with most of the significant fauna species occurring within this habitat.

Four significant taxa were recorded in the priority areas within the Survey Area (**Table 2**):

- The Chuditch – VU (BC Act; EPBC Act) was recorded in seven of the ten priority areas within the Survey Area.
- Wambenger Brush-tailed Phascogale – CD (BC Act) was recorded in four of the ten priority areas within the Survey Area.
- The Western Brush Wallaby – P4 (DBCA) was recorded in seven of the ten priority areas within the Survey Area.
- The Quenda/Southwestern Brown Bandicoot – P4 (DBCA) was recorded in one of the ten priority areas within the Survey Area.

We can confirm there to be more than one Chuditch present, but the exact number of individuals within the priority areas will be determined later through spot analysis.

5.0 References

Baker, A.M. and Gynther, I.C. (2023) *Strahan's Mammals of Australia*. 4th edn. Wahroonga, Australia: Reed New Holland Publishers.

Barrett, G. *et al.* (2003) *The new atlas of Australian birds*. Melbourne, Australia: Royal Australasian Ornithologists Union.

Cogger, H.G. (2014) *Reptiles and amphibians of Australia*. 7th edn. Melbourne, Australia: CSIRO Publishing.

DBCA (2012a) *Fauna Profile - Quenda Isoodon obesulus*, *2012*. Available at: https://www.dpaw.wa.gov.au/images/documents/conservation-management/pests-diseases/quenda_2012.pdf.

DBCA (2017a) *Fauna Profile - Chuditch Dasyurus geoffroii*. Available at: http://www.dbca.wa.gov.au.

Van Dyck, S. and Strahan, R. (2008) *The mammals of Australia*. 3rd edn. Sydney, Australia: New Holland Publishers.

Menkhorst, P. *et al.* (2017) *The Australian Bird Guide*. Australia: CSIRO Publishing.

Pizzey, G. and Knight, F. (2001) *Field Guide to Birds of Australia*. Pymble, Australia: HarperCollins Australia.

SLR Consulting (2024) *Targeted Chuditch, Quokka, and Woylie Survey, Huntly Mine - Myara Region*.

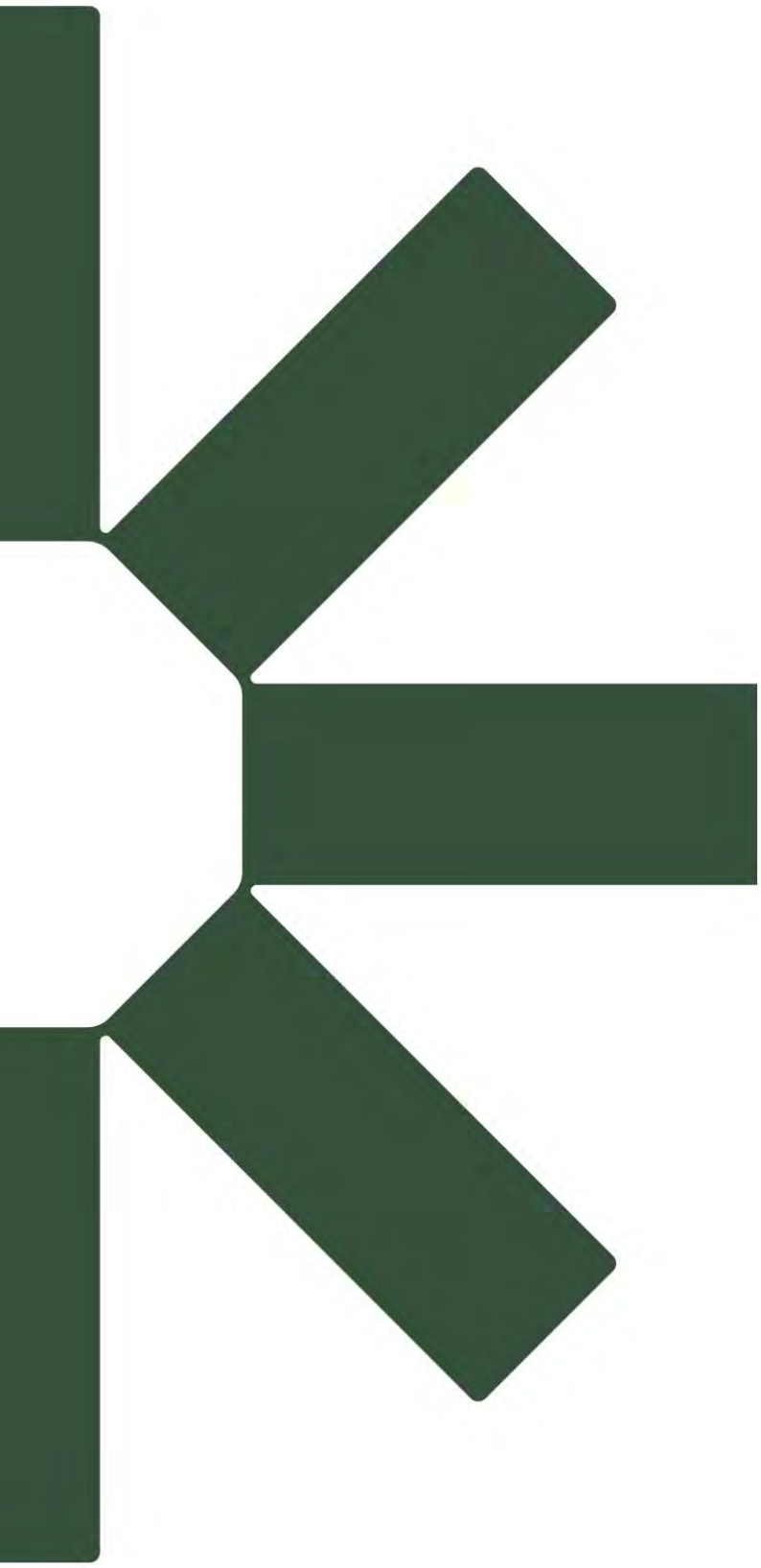
Wilson, S. and Swan, G. (2021) *A complete guide to reptiles of Australia*. 6th edn. New Holland Publishers.

Woinarski, J., Burbidge, A. and Harrison, P. (2014) *The action plan for Australian mammals 2012*. CSIRO Publishing.

6.0 Feedback

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Making Sustainability Happen

MEMO

HUNTLY MINE TARGETED FAUNA SURVEY

PREPARED FOR: ALCOA



© Spectrum Ecology Pty Ltd
ABN 68 615 115 243
PO Box 314 Leederville
Western Australia 6902
Ph: (08) 9317 8233
Email: info@spectrumecology.com.au

Project ID: 2435	Huntly Mine Targeted Fauna Survey
Prepared for:	Alcoa
Date of issue:	17/12/2024
Prepared by:	Georgia Ford, Joel Wilson
Spectrum Review:	Melinda Henderson

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1.1. Project Background

Alcoa of Australia Limited's (Alcoa) Western Australian (WA) mining operations comprise the Huntly and Willowdale bauxite mines, which are located in Alcoa's Mining Lease 1SA (ML1SA) within the Northern Jarrah Forest (NJF) IBRA subregion (Map 1.1).

Alcoa has approval to mine within ML1SA, subject to submitting draft five-year mine plans and associated environmental management programmes known as the Mining and Management Program (MMP). The MMP is submitted to the State's Mining and Management Program Liaison Group (MMPLG) on an annual basis.

1.2. Project Scope

Alcoa has committed to undertaking ecological surveys for the Huntly Mine, O'Neil region as part of its MMP assessment by the MMPLG. Spectrum Ecology and Spatial (Spectrum) completed a single season targeted fauna survey across ~650 ha of the Huntly Mine area (Survey Area). The survey will be used to:

- Amend the conceptual alignment to avoid significant fauna;
- Inform translocation and environmental management plans as required; and
- Assist Alcoa in preparing MMP submission to the MMPLG.

The targeted fauna survey comprises of:

- Targeted camera trap fauna survey for Chuditch (*Dasyurus geoffroii*, EPBC & BC Act Vulnerable), Woylie (*Bettongia penicillata*, EPBC Act Endangered & BC Act Critically Endangered), and Quokka (*Setonix brachyurus*, EPBC & BC Act Vulnerable).

The Survey Area covers 650.5 ha and is presented in Map 1.1.

1.3. Legislation & Guidelines

Fauna in Western Australia are protected by various legislation including:

- *Biodiversity Conservation Act 2016* (BC Act);
- *Environmental Protection Act 1986* (EP Act); and
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The survey was compliant with survey guidelines, as outlined in:

- EPA Environmental Factor Guideline: Terrestrial Fauna (EPA, 2016);
- EPA Technical Guidance Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020).

In addition to the above, species-specific guidelines were also accessed:

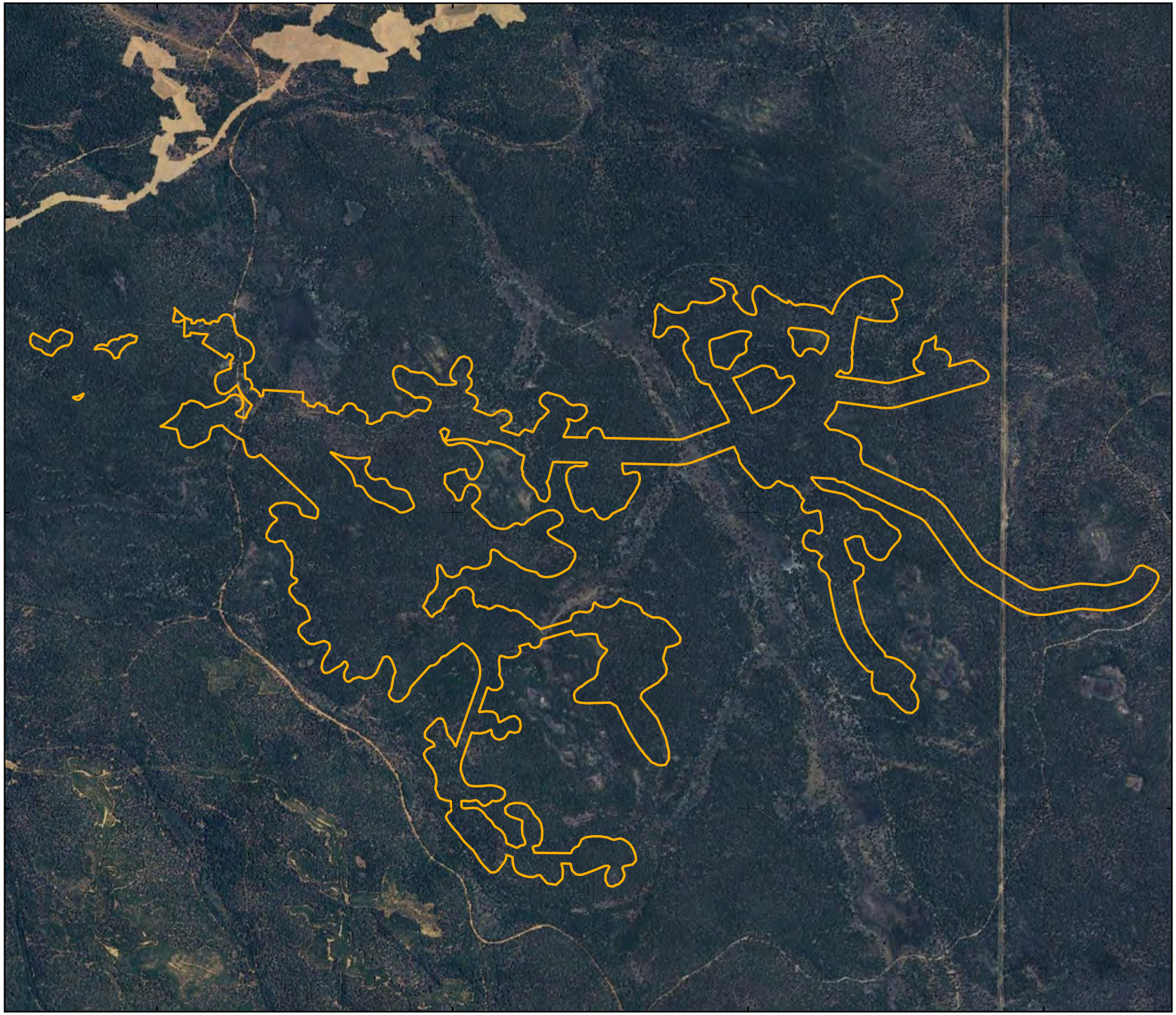
- Survey Guidelines for Australia's Threatened Mammals (DSEWPaC, 2011).

1.3.1. Significant Fauna Definitions

Significant fauna can include (EPA, 2016):

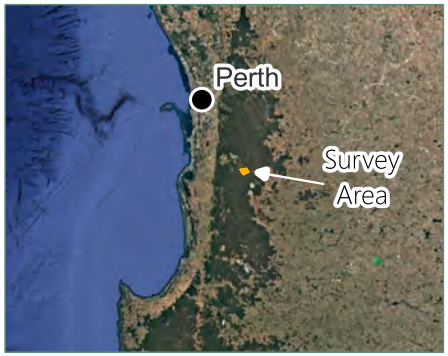
- Being identified as a Threatened or Priority species;
- Species with restricted distribution;
- Degree of historical impact from threatening processes; or
- Providing an important function required to maintain the ecological integrity of a significant ecosystem.

The Chuditch, Woylie and Quokka are all considered to be a significant species as they have been identified as Threatened species under both the EPBC Act and BC Act. Significant species may also be listed under the Department of Biodiversity, Conservation and Attractions (DBCA) priority fauna categories.



Legend

Survey Area



N

0 0.5 1 1.5 km

Scale 1:35,900 @ A4

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator
Units: Metre

Spectrum

Author: GF

Date: 17-12-2024

Survey Area

Alcoa Targeted Fauna Survey

MAP

Prepared for
Alcoa

1.1

2. METHODS

2.1. Motion Cameras

Forty camera traps baited with cotton rope soaked in fish oil were deployed throughout the Survey Area for a total of 2,470 trap nights (Table 2.1 and Map 2.1).

Table 2.1: Motion Camera Locations

Site	Easting (mE)	Northing (mN)	Date Deployed	Date Collected	Nights Deployed
ALC01	431801	6395546	10/09/2024	11/11/2024	62
ALC02	429706	6397116	10/09/2024	11/11/2024	62
ALC03	431459	6395881	12/09/2024	13/11/2024	62
ALC04	430477	6397210	10/09/2024	11/11/2024	62
ALC05	431606	6394791	10/09/2024	11/11/2024	62
ALC06	429330	6397169	10/09/2024	11/11/2024	62
ALC07	433952	6396983	11/09/2024	12/11/2024	62
ALC08	430423	6396604	9/09/2024	11/11/2024	63
ALC09	431010	6396500	9/09/2024	11/11/2024	63
ALC10	431809	6396827	11/09/2024	11/11/2024	61
ALC11	431807	6396418	11/09/2024	11/11/2024	61
ALC12	432699	6396772	11/09/2024	12/11/2024	62
ALC13	435015	6396136	12/09/2024	12/11/2024	61
ALC14	432581	6396427	11/09/2024	12/11/2024	62
ALC15	433451	6396471	11/09/2024	12/11/2024	62
ALC16	432022	6396046	11/09/2024	11/11/2024	61
ALC17	431008	6395770	10/09/2024	12/11/2024	63
ALC18	431205	6395220	10/09/2024	12/11/2024	63
ALC19	432209	6395048	10/09/2024	11/11/2024	62
ALC20	431910	6394459	10/09/2024	11/11/2024	62
ALC21	432069	6393935	10/09/2024	11/11/2024	62
ALC22	432707	6395233	10/09/2024	11/11/2024	62
ALC23	433342	6395068	13/09/2024	13/11/2024	61
ALC24	432545	6395648	11/09/2024	11/11/2024	61
ALC25	432936	6393724	10/09/2024	11/11/2024	62
ALC26	433501	6397313	11/09/2024	12/11/2024	62
ALC27	434036	6397460	12/09/2024	12/11/2024	61
ALC28	434581	6397253	12/09/2024	12/11/2024	61
ALC29	434329	6396513	11/09/2024	12/11/2024	62
ALC30	434014	6396357	11/09/2024	12/11/2024	62
ALC31	434481	6396151	12/09/2024	12/11/2024	61
ALC32	434576	6395659	12/09/2024	12/11/2024	61
ALC33	434959	6394850	12/09/2024	12/11/2024	61
ALC34	435471	6395656	12/09/2024	13/11/2024	62

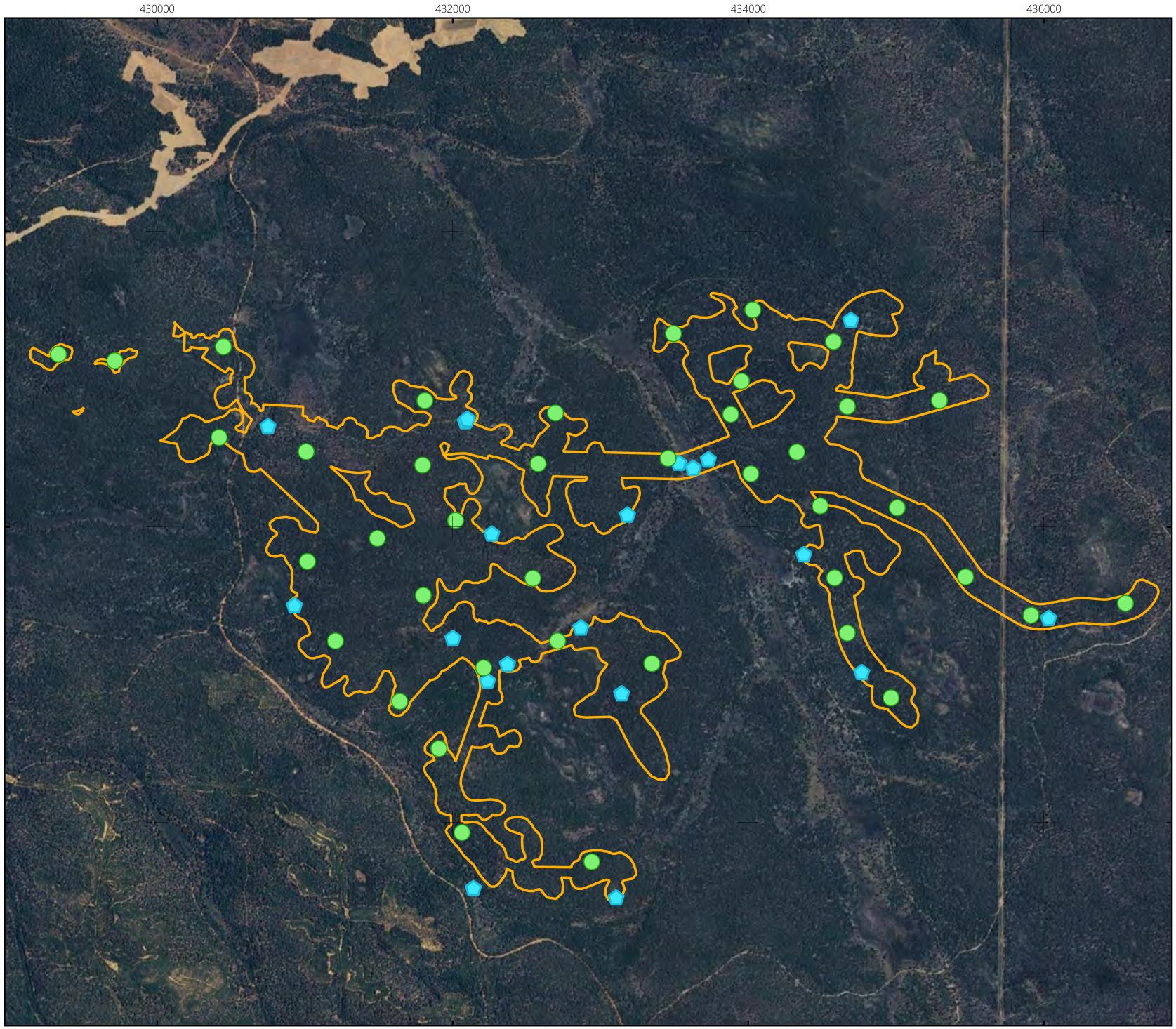
Site	Easting (mE)	Northing (mN)	Date Deployed	Date Collected	Nights Deployed
ALC35	434661	6395274	12/09/2024	12/11/2024	61
ALC36	435913	6395406	12/09/2024	13/11/2024	62
ALC37	433880	6396760	11/09/2024	12/11/2024	62
ALC38	435280	6396863	12/09/2024	12/11/2024	61
ALC39	434674	6396814	12/09/2024	12/11/2024	61
ALC40	436547	6395486	12/09/2024	13/11/2024	62
Datum: GDA94/MGA zone 50				Total	2,470

2.2. Targeted Searches

Searches for secondary evidence of target species including scats, tracks, dens/nests, tunnels, and remains were undertaken at 20 locations within the Survey Area (Table 2.2 and Map 2.1).

Table 2.2: Targeted Search Locations

Site	Easting (mE)	Northing (mN)	Date	Number of Personnel	Effort (minutes)
ALCT01	433143	6394870	13/09/2024	2	54
ALCT02	433628	6396397	13/09/2024	2	60
ALCT03	433183	6396080	13/09/2024	2	29
ALCT04	436033	6395380	13/11/2024	2	59
ALCT05	434768	6395014	13/11/2024	2	33
ALCT06	434376	6395812	13/11/2024	2	28
ALCT07	434694	6397398	13/11/2024	2	25
ALCT08	430750	6396679	14/11/2024	2	48
ALCT09	432086	6396712	14/11/2024	2	31
ALCT10	432099	6396729	14/11/2024	2	28
ALCT11	433530	6396431	14/11/2024	2	53
ALCT12	432867	6395316	14/11/2024	2	33
ALCT13	432370	6395069	14/11/2024	2	40
ALCT14	432001	6395245	14/11/2024	2	34
ALCT15	432140	6393552	14/11/2024	2	25
ALCT16	432236	6394955	14/11/2024	2	36
ALCT17	430929	6395466	15/11/2024	2	74
ALCT18	433106	6393488	15/11/2024	2	43
ALCT19	432265	6395952	15/11/2024	2	52
ALCT20	433730	6396455	15/11/2024	2	49
Datum: GDA94/MGA zone 50				Total	834



Legend

- Survey Area
- Motion Camera
- Targeted Search

N

0 0.5 1 1.5 km

Scale 1:35,900 @ A4

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator
Units: Metre

Spectrum Ecology + Spatial

Author: GF

Date: 17-12-2024

Survey Site Locations

Alcoa Targeted Fauna Survey

MAP

Prepared for
Alcoa

2.1

3. RESULTS

Two of the targeted species were recorded on motion camera, the Chuditch (*Dasyurus geoffroii*, EPBC & BC Act Vulnerable) and Woylie (*Bettongia penicillata*, EPBC Act Endangered & BC Act Critically Endangered (Table 3.1, Map 3.1, Plate 3.1, and Plate 3.2).

Based on spot pattern comparison two individual Chuditch were recorded (Plate 3.1). It is not possible to determine whether the Woylie captured on motion camera is one individual or multiple (Plate 3.2). Woylie records were from a single location, recorded on three separate nights (Table 3.1). All records of Chuditch and Woylie are from Jarrah Forest habitat.

Table 3.1: Threatened Fauna Records

Species	Number of Recordings	Easting (mE)	Northing (mN)	Site	Date
Chuditch *Dasyurus geoffroii*	1	431801	6395546	ALC01	6/10/2024
	1	432022	6396046	ALC16	20/10/2024
	1	431205	6395220	ALC18	26/10/2024
	1	432707	6395233	ALC22	12/09/2024
					24/09/2024
Woylie *Bettongia penicillata*	1	431010	6396500	ALC09	12/09/2024
	1				30/09/2024
	1				19/10/2024

Datum: GDA94/MGA zone 50

Four additional significant species were recorded during the survey:

- Wambenger Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*, BC Act Conservation Dependent);
- Western Brush Wallaby (*Notamacropus Irma*, DBCA Priority 4);
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*, EPBC & BC Act Vulnerable); and
- Carnaby's Black Cockatoo (*Zanda latirostris*, EPBC & BC Act Endangered) were opportunistically heard while traversing the Survey Area.

In addition to these listed species the following introduced species were recorded:

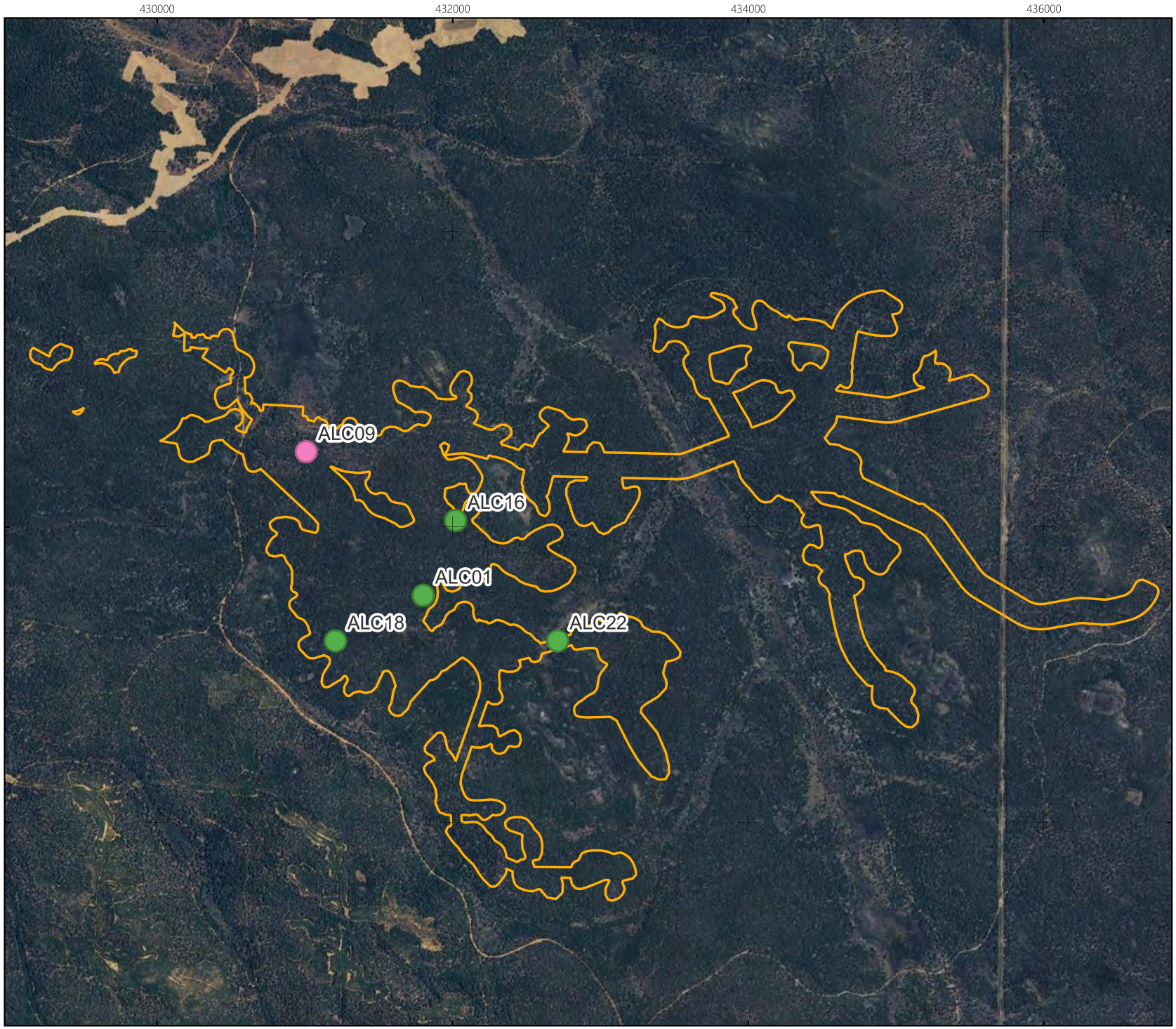
- Feral Cat (*Felis catus*) – exotic;
- Pig (*Sus scrofa*) – exotic;
- Rabbit (*Oryctolagus cuniculus*) – exotic (scat record only); and
- Laughing Kookaburra (*Dacelo novaeguineae*) – naturalised exotic.



Plate 3.1: Motion Camera images of Chuditch recorded during the survey



Plate 3.2: Motion Camera images of Woylie recorded during the survey



Legend

- Survey Area
- Chuditch (*Dasyurus geoffroii*, EPCB & BC Act Vulnerable)
- Woylie (*Bettongia penicillata*, EPBC Act Endangered & BC Act Critically Endangered)

N

0 0.5 1 1.5 km

Scale 1:35,900 @ A4

Coordinate System: GDA 1994 MGA Zone 50
Projection: Universal Transverse Mercator
Units: Metre

Spectrum

Author: GF

Date: 17-12-2024

Woylie & Chuditch Records

Alcoa Targeted Fauna Survey

MAP 3.1

Prepared for Alcoa

4. RECOMMENDATIONS

In light of the recorded Woylie(s), Spectrum recommends that a follow up motion camera survey be conducted, comprising clusters of cameras (up to five cameras in each cluster) in the vicinity of site ALC09 and GHDs Woylie records, as well as between these records. This may further elucidate the distribution of Woylies within the Jarrah Forest.

Spectrum proposes to install these motion cameras over five days in January 2025. We propose motion cameras be deployed for one month and collected over five days in February 2025. Nocturnal searches for Woylie (subject to night-work approval) and opportunistic Woylie scat collection for subsequent DNA analysis (dependent on number of scats collected) will be undertaken during the install trip (five days) and the secondary camera collection trip (five days).

The proposed dates for the surveys are;

- 20 to 24 January 2025; and
- 24 to 28 February 2025.

TERRESTRIAL ECOSYSTEMS

Baseline Monitoring of Rehabilitation Programs

Alcoa's Bauxite Mining Areas

Prepared for: Alcoa of Australia Ltd

Version 1. June, 2023





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Prepared For: Alcoa of Australia Ltd
PO Box 172
Pinjarra WA 6208

Prepared By: Terrestrial Ecosystems
10 Houston Place
Mt Claremont WA 6010
Phone: 08 9385 2398, 0407 385 289
Website: www.terrestrialecosystems.com
ABN: 40921131346

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EXECUTIVE SUMMARY

Alcoa of Australia Ltd (Alcoa) operates bauxites mines in the Huntly and Willowdale areas east of Pinjarra in the Western Australian Jarrah Forest. Alcoa is progressively rehabilitating mined areas once the local resources have been exhausted. The primary objective of Alcoa's bauxite mine rehabilitation program is to return a self-sustaining Jarrah Forest ecosystem after mining. This includes re-establishing populations of all faunal groups and species in densities and distributions required for maintaining forest biodiversity and ecosystem function.

Alcoa has established 12 long-term monitoring sites for vertebrate fauna. Three of the sites are in unmined habitat, and three of the sites are in areas rehabilitated 5, 10 and 15 years ago. It is proposed that the vertebrate fauna at these sites would be periodically monitored (e.g. every 5 years) to enable judgements to be made about the extent to which rehabilitated areas were progressing on a trajectory towards the recreation of functional ecosystems, as determined by the terrestrial vertebrate fauna assemblage, like that in the unmined areas. Outcomes from these monitoring surveys would inform planning for future rehabilitation programs and where appropriate taking corrective action in existing rehabilitated areas.

Terrestrial Ecosystems has undertaken the baseline survey, which will be the first of the long-term monitoring surveys. These survey data indicated that the three unmined sites selected as analogue climax communities for the rehabilitation areas are not similar, and there are appreciable differences among the fauna assemblages within aged classes of rehabilitation. Based on the available data, there are two alternative conclusions that can be reached about succession of rehabilitated areas along a trajectory to an analogue climax community:

- differences among the unmined areas makes it difficult to determine what is the target climax community, and it is possible there are other alternative Jarrah Forest communities that have not been sampled that would better represent climax communities that will eventuate in rehabilitated areas; or
- rehabilitation programs are not of sufficient quality to enable the mammal, reptile and amphibian assemblages in unmined area to recolonise rehabilitated areas within a 15-year period sufficiently to clearly indicate they are on a trajectory toward establishing analogue climax communities.

The preliminary data collected in this survey would suggest that conservation significant species are in the unmined areas, but not the rehabilitated areas. If further investigation indicates that this was the case, then a focus on the long-term preservation of conservation significant species, and in particular their use of rehabilitation areas should be a priority.

No foxes were recorded during the camera trapping program and only a single feral cat was recorded, however, the area surveyed was very limited when viewed in the context of the extent of Jarrah Forest managed by Alcoa. Feral pigs were abundant in a localised area and are known to cause environmental damage. It is suggested that Alcoa implement a program to manage feral pest species likely to be impact on ecosystems, and in particular conservation significant species.

It is suggested that this monitoring program is reviewed before the survey is repeated, with particular attention to:

- the fauna target(s) as represented by the rehabilitation trajectory and intended climax community(ies);
- survey design (i.e. location of analogue sites);
- use of camera traps to determine presence vs relative abundance or conservation significant fauna; and
- value-for-money of surveys, when compared with the alternative uses of these resources to achieve a similar objective(s) (e.g. the long-term preservation of conservation significant species, and in particular their use of rehabilitation areas).

1. INTRODUCTION

1.1 BACKGROUND

Alcoa of Australia Ltd (Alcoa) operates the Huntly and Willowdale bauxite mines east of Pinjarra in Western Australian on mineral lease ML1SA. The Huntly mine was established in 1972 and is located near Dwellingup and supplies bauxite ore to the Kwinana and Pinjarra refineries, as well as other clients. The Huntly mine currently includes locations at Myara, McCoy and Karnet. The Willowdale mine was established in 1984 and is located near Wagerup and supplies bauxite ore to the Wagerup refinery, as well as other clients. The Willowdale mine currently includes locations at Larego, Orion and Arundel.

The primary objective of Alcoa's bauxite mine rehabilitation program is to return a self-sustaining jarrah forest ecosystem after mining. This includes re-establishing populations of all faunal groups and species in densities and distributions required for maintaining forest biodiversity and ecosystem function. To ensure this objective is met, Alcoa established a long-term fauna monitoring program in 1991. This program characterises and monitors the key fauna of the areas in which Alcoa operates and assesses the impact of mining on these species.

1.2 SUCCESSION

Grant (2006) indicated that Alcoa's objective for its rehabilitation programs was to establish self-sustaining jarrah forest ecosystems. Grant (2006) went on to indicate that '*restored native ecosystems may be different in structure to the surrounding native ecosystems, but there should be confidence that they will change with time along with, or toward the structure and composition of the surrounding area*' and '*should be capable of withstanding disturbances such as fire or grazing*'. It has been presumed that this object is still applicable.

Primary succession is defined here as a process of change in the species structure of an ecological community over time from an assemblage that commences on barren or highly disturbed land to the climax community. This can be diagrammatically represented as shown in Plate 1.

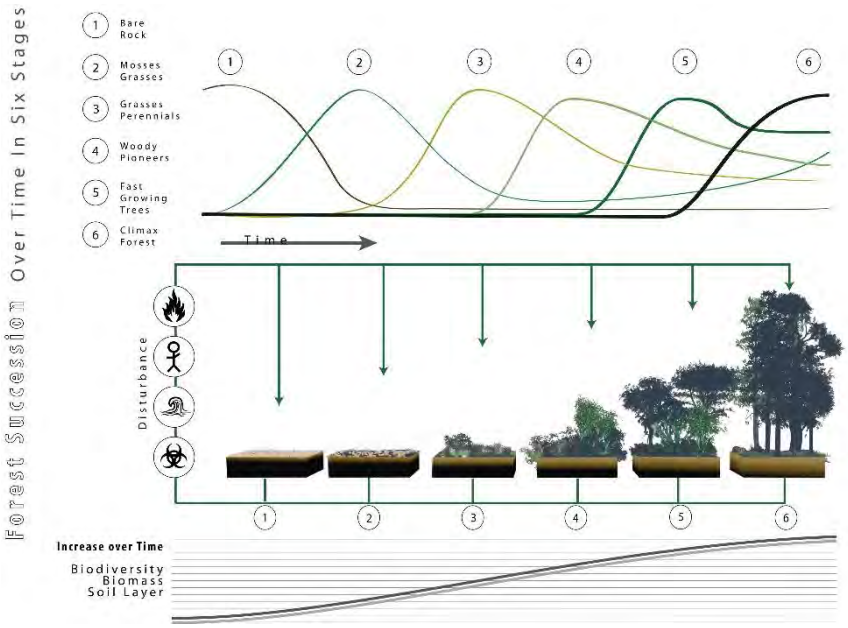


Plate 1. Conceptual diagram of primary succession

taken from https://commons.wikimedia.org/wiki/File:Forest_succession_depicted_over_time.png

During the very early stages, very few terrestrial vertebrate species will colonise the area due to a lack of suitable habitat and higher levels of predation because of a lack of cover and retreat sites. Once the vegetation, invertebrates and microbial activity move through the succession stages and additional habitat niches open up, then more species can colonise the rehabilitated areas. In some cases, the abundance of early colonisers (i.e. pioneers) will be reduced due to competition and changing habitat conditions. Rehabilitated areas will cycle through many iterations of this process and along the way, species abundance typically increases, and the various species reach population levels suitable for the habitat and resources available, until such time it becomes a climax community.

Vertebrate fauna are only a part of the primary succession process and their progress from pioneering species toward a climax community is interrelated with the vegetation, fungi, microbial and invertebrate community development. Within broad boundaries, the trajectory in rehabilitated areas should be apparent in monitoring data (Plate 2).

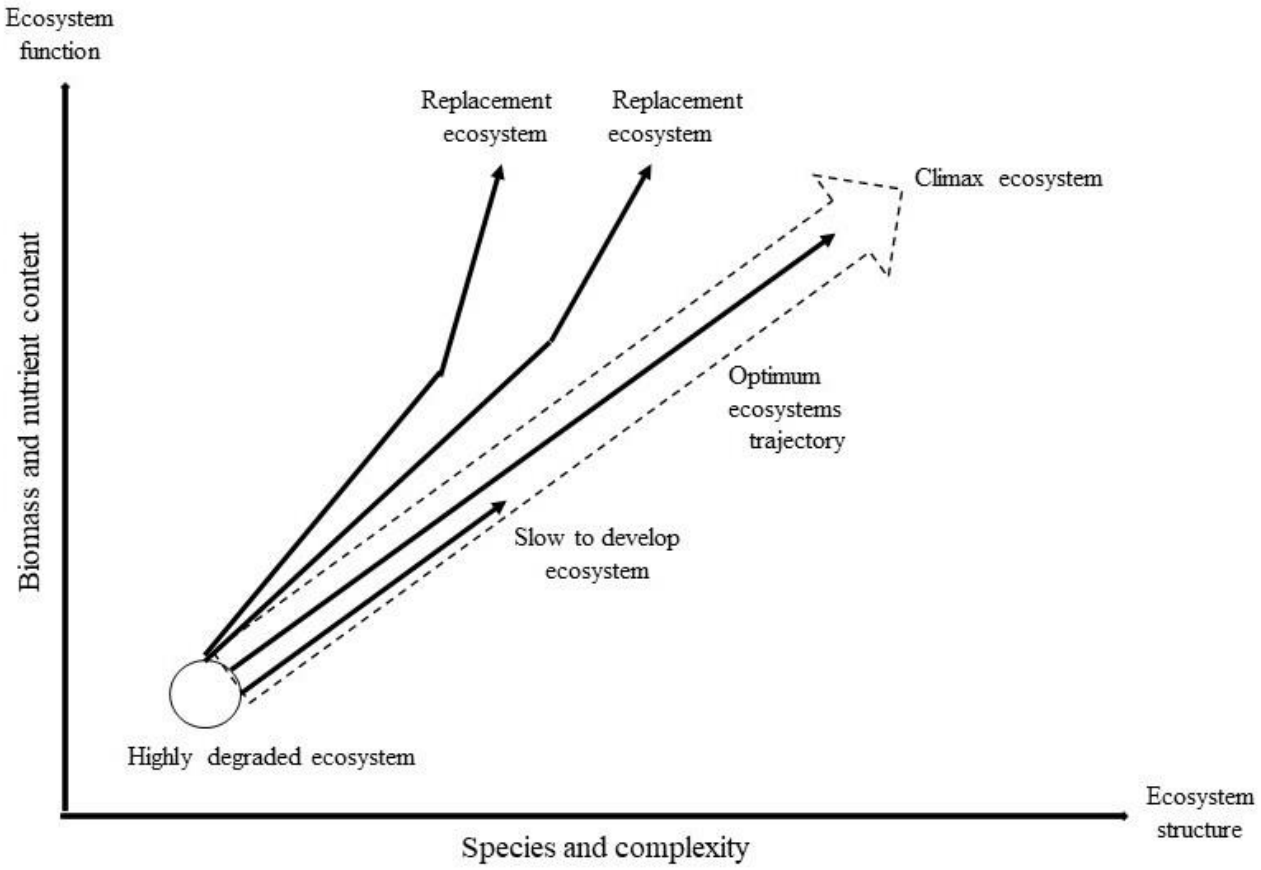


Plate 2. Primary succession trajectory(taken from: Bradshaw 1984)

Anderson et al. (2022) and Cross et al. (2019, 2021) argued that fauna have very often been forgotten in considering rehabilitation success with the focus on soils and vegetation. Anderson et al. (2022) went on to suggest a framework for incorporating fauna into the restoration process, and in doing so, identified the following five key criteria for effective faunal standards:

- appropriate reference ecosystem [analogue site(s)];
- faunal taxa to be considered;
- attributes of these taxa to be measured;
- acceptable level of similarity with reference conditions; and
- sampling methodology that is sufficiently robust to provide reliable comparative data.

1.3 OBJECTIVE

Alcoa's intention was to establish long-term monitoring sites for vertebrate fauna in unmined areas, and areas rehabilitated 5, 10 and 15-years ago. It was proposed that the vertebrate fauna at these sites would be periodically monitored to enable judgements to be made about the extent to which rehabilitated areas were progressing on a trajectory towards the recreation of functional ecosystems, like that in the unmined areas. Outcomes from these monitoring surveys would inform planning for future rehabilitated areas and where appropriate corrective action in existing rehabilitated areas.

Here we provide a description of the methods used to collect vertebrate fauna data, the results of the baseline monitoring program, discussion of the results and a commentary on the program and a suggested way forward.

2. METHODS

2.1 PIT-TRAPPING PROGRAM

Twelve sites in the Jarrah Forest (Figures 1 and 2) were established by Alcoa (Plates 16-39). This included three unmined analogue sites, three sites that were rehabilitated in 2007 (i.e. 15-years old), three sites that were rehabilitated in 2012 (i.e. 10-years old) and three sites that were rehabilitated in 2017 (i.e. 5-years old; Appendix A).

At each site there were four near parallel drift fences 30m long with approximately 25cm of flywire above the ground. Along each drift fence there were three 20L PVC buckets, three PVC 150mm diameter pipes that were 400mm deep and buried directly under the flywire drift fence. Three pair of funnels traps were deployed either side of the drift fence and three aluminium box traps were set approximately 10m to the side of the drift fence (Plate 3). Buckets used as pit-traps had holes and styrene sheets in the bottom to provide captured fauna protection from unfavourable environmental conditions. These traps targeted small mammals, reptiles and amphibians.

The location of trapping sites is shown in Figures 2-14 and the coordinates are provided in Appendix B. Traps were opened on 9 January and closed on 21 January 2023.

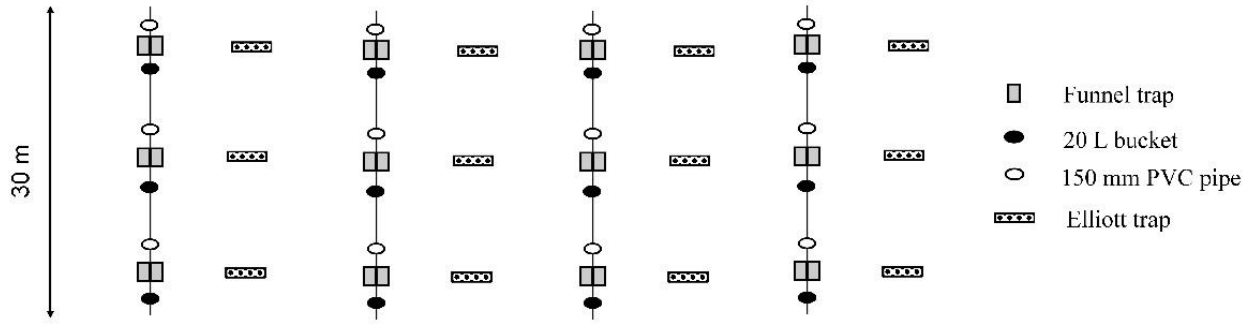


Plate 3. Trapping site layout

2.2 CAGE TRAPPING PROGRAM

Eighty cage traps (Plate 4) targeting Chuditch (*Dasyurus hallucatus*) were deployed adjacent to gravel tracks where Alcoa believed that there may have been Chuditch. Trapping sites were selected by Alcoa on the basis that one was inside the mine perimeter and comprised a variety of levels of disturbance (i.e. rehabilitation of various ages and remnant vegetation), and the other was outside the mine perimeter in unmined forest (Figures 18-21).

Cages were baited with raw chicken necks which were replaced every three days or as required. Traps were opened on 8 January and closed on 20 January 2023 at locations were Chuditch had previously been reported. Camera traps targeted the medium and large mammals, but any fauna recorded were reported.



Plate 4. Baited cage trap

2.3 CAMERA TRAPS

Twenty-four camera traps (Reconyx HC600) were deployed in the denser vegetation targeting Quokka (*Setonix brachyurus*) and Quenda (*Isoodon fusciventer*; Figures 15-17). Each camera trap had a non-reward lure (Plate 5) placed ~3-4m in front of the camera trap (Plate 6) in the detection zone. Lures were a mixture of peanut butter, rolled oats and sardines topped up with mullie oil. Traps were deployed on 8 January and retrieved on 20 January 2023.



Plate 5. Non-reward lure



Plate 6. Mounted camera trap

2.4 INVERTEBRATE SAMPLING

Each trapping site was searched for invertebrates for one hour by two people for the following taxonomic groups: isopods, diplopods, opiliones, scorpions, mygalomorph spiders and pseudoscorpions. Specimens were preserved in ethanol but not identified. In addition, specimens from these taxonomic groups caught in pit and funnel traps were also collected and preserved. All specimens were given to Alcoa for identification and analysis.

2.5 DATA ANALYSIS

The diversity for the trapped fauna assemblage can be measured in numerous ways (Hayek and Buzas 1997, Magurran 2004). The four most common attributes are species richness, evenness, a single diversity score and relative abundance. These metrics are interrelated and there are a diverse number of analytical tools available to quantify these metrics and similarity among the trapped assemblages for each site.

2.5.1 Principal component analysis

A principal component analysis (PCA) is used to reduce the complexity of large datasets by transforming a large dataset of variables into a smaller one that contains most of the information. PCAs were calculated (StatistiXL) for all survey site-based trapping data (i.e. excluding cage and camera trap data), to determine the extent to which vertebrate fauna assemblages were similar/different among sites. Eigenvalues >1 are typically used to determine the components that are useful, and for each component a percentage of its contribution to displaying the attributes of larger data set provides useful information about the importance of each component.

It should be expected that if succession processes were advancing along an expected trajectory, then, survey sites should be grouped in the PCAs based according to the period of rehabilitation (i.e. unmined, 15-years, 10-years and 5-years) using the most significant principal components (i.e. PCAs 1 and 2).

2.5.2 Similarity

If having established that there were differences among the trapped fauna assemblages at each site, and if rehabilitation and succession were advancing along an expected trajectory, then the extent to which the trapped fauna assemblages were similar is of interest. Ideally, the three unmined analogue sites should be more similar to each other than to the rehabilitation sites, and rehabilitation site similarity should be greatest among rehabilitation aged class sites.

The Morisita-Horn similarity index was used to compare similarity among combinations of trapped fauna assemblages at each site. The quantitative Morisita-Horn similarity index was selected because it is not strongly influenced by either species richness or sample size (Wolda 1981) and it was recommended by Magurran (2004). Readers should, however, be aware that it is heavily influenced by the abundance of the most abundant species. The Morisita-Horn similarity index was calculated using Species, Diversity and Richness software (Pisces Conservation Ltd 2010).

2.5.3 Species richness and relative abundance

The actual number of species caught at each trapping site is one measure of species richness and is directly related to the trapping effort and number of individuals caught. Had the trapping effort been extended and more individuals caught, then it is likely the number of species caught at each site would increase (Colwell and Coddington 1994, Magurran 2004). Species richness and abundance was calculated using Species, Diversity and Richness software IV (Pisces Conservation Ltd 2010).

It should be expected that the unmined sites would have the highest number of species and species abundance, and as rehabilitation sites progress along an expected succession trajectory, then species richness would increase, however, abundance for many species will rise and fall based on the available habitat and competition among species.

2.5.4 Evenness

Smith and Wilson (1996), supported by Magurran (2004), reported their measure of evenness (Evar) to be the most satisfactory overall. Species, Diversity and Richness software IV software (Pisces Conservation Ltd 2010) was used to calculate the Smith and Wilson method of determining evenness. It is unknown how evenness is related to fauna assemblages in rehabilitated sites.

2.5.5 Diversity

Fisher's alpha (also known as Log series diversity) was used to measure diversity because of its good discriminating ability and low sensitivity to sample size (Kempton and Taylor 1974, Magurran 1988, Hayek and Buzas 1997). Other more commonly used diversity indices were also calculated.

Log series diversity, Shannon-Wiener and Simpson's indices were calculated using Species, Diversity and Richness IV software (Pisces Conservation Ltd 2010).

3. RESULTS

All vertebrate fauna caught in pit, funnel and aluminium box traps are shown in Table 1.

Table 1. Trapping data results

		Survey site status	Unmined	Unmined	Unmined	15-year rehabilitation	15-year rehabilitation	15-year rehabilitation	10-year rehabilitation	10-year rehabilitation	10-year rehabilitation	5-year rehabilitation	5-year rehabilitation	5-year rehabilitation	Total
Taxa	**Family**	**Species** **Survey sites**	**1**	**2**	**3**	**7**	**8**	**12**	**4**	**5**	**6**	**9**	**10**	**11**	
Amphibian	Limnodynastidae	*Heleioporus eyrei*			2										2
		Heleioporus inornatus	1												1
	Myobatrachidae	*Crinia georgiana*		2					1			1			4
Mammal	Burramyidae	*Cercartetus concinnus*	3	2	1	23	13	8	3		12			1	66
	Dasyuridae	*Antechinus flavipes*		1	14	5	1	4	11	7	2	2	2		49
		Sminthopsis gilberti			1	2	1	2	5		1	2	1	2	17
	Muridae	*Mus musculus*								1	1	6		5	13
Reptile	Agamidae	*Pogona minor*				3	1			2	2			1	9
	Carphodactylidae	*Underwoodisaurus milii*	2	2						2		1	3	3	13
	Diplodactylidae	*Diplodactylus lateroides*		1		1	1				1	2	6	1	13
		Diplodactylus polyophthalmus				1			1					1	3
	Elapidae	*Suta gouldii*				1					1				2
		Suta nigriceps	1							3					4
	Gekkonidae	*Christinus marmoratus*												1	1
	Pygopodidae	*Lialis burtonis*									1				1
	Scincidae	*Acritoscincus trilineatus*		7	2	9	6	9	1	12	9		1	3	59
		Cryptoblepharus buchananii	3	7	2							1			13
		Egernia napoleonis	13	5	1					1					20
		Hemiergis initialis	2	4			2	2		5					15
		Lerista distinguenda	11	15	11	3	4			3	6	1			54
		Lerista elegans		1		1				3					5
		Menetia greyii	3		1	4	4		2	1	3	1	6	7	32
		Morethia obscura	14	13	2	7	7	4	4	6	9	9	1	4	80
		Tiliqua rugosa					1								1
	Typhlopidae	*Anilios australis*		5			1			1	1				8
		Total	53	65	37	60	42	29	28	47	49	26	20	29	485

Of interest, a single *Morelia imbricata* was recorded on one of the tracks while undertaking the survey (Plate 7).



Plate 7. Carpet python

Vertebrate fauna caught in cage traps are shown in Table 2.

Table 2. Fauna caught in a cage traps

Taxa	Family	Species	Trap numbers																		
			12C	13C	1C	28C	41C	42C	44C	45C	47C	50C	57C	59C	61C	63C	68C	6C	74C	76C	78C	Total
Mammal	Dasyuridae	*Dasyurus geoffroii*					1	1	1	1					1	1			1	3	2	12
	Peramelidae	*Isoodon fusciventer*											1				1					2
	Tachyglossidae	*Tachyglossus aculeatus*			1																	1
Reptile	Scincidae	*Tiliqua rugosa*										1	1									2
	Varanidae	*Varanus gouldii*		1		1		1	1	1	1			1		1						8
		Varanus rosenbergi	1	1		1						1						3				7
		Total	1	2	1	2	1	2	2	2	1	2	2	1	1	2	1	3	1	3	2	32

Vertebrate fauna caught by trap type are shown in Table 3.

Table 3. Vertebrate fauna recorded by trap type

Taxa	Family	Species	Aluminium box trap	Bucket	Funnel	Pipe	Cage trap - Large	Total
Amphibian	Limnodynastidae	*Heleioporus eyrei*		2				2
		Heleioporus inornatus		1				1
	Myobatrachidae	*Crinia georgiana*		3		1		4
Mammal	Burramyidae	*Cercartetus concinnus*		28		38		66
	Dasyuridae	*Antechinus flavipes*	21	4	5	19		49
		Dasyurus geoffroii					12	12
		Sminthopsis gilberti		8		9		17
	Muridae	*Mus musculus*	7		1	5		13
	Peramelidae	*Isoodon fusciventer*					2	2
	Tachyglossidae	*Tachyglossus aculeatus*					1	1
Reptile	Agamidae	*Pogona minor*		5	1	3		9
	Carphodactylidae	*Underwoodisaurus milii*		2	5	6		13
	Diplodactylidae	*Diplodactylus lateroides*		6	4	3		13
		Diplodactylus polyophthalmus		1	1	1		3
	Elapidae	*Suta gouldii*			2			2
		Suta nigriceps		1	3			4
	Gekkonidae	*Christinus marmoratus*				1		1
	Pygopodidae	*Lialis burtonis*			1			1
	Scincidae	*Acritoscincus trilineatus*		20	28	11		59
		Cryptoblepharus buchananii		1	1	11		13
		Egernia napoleonis	1	3	13	3		20
		Hemiergis initialis		9	2	4		15
		Lerista distinguenda		22	3	29		54
		Lerista elegans		5				5
		Menetia greyii		15		17		32
		Morethia obscura		21	38	21		80
		Tiliqua rugosa			1		2	3
	Typhlopidae	*Anilios australis*		2	2	4		8
	Varanidae	*Varanus gouldii*					8	8
		Varanus rosenbergi					7	7
		Total	29	159	111	186	32	517

Vertebrate fauna recorded by camera traps are shown in Table 4.

Table 4. Camera trap results

			Camera trap numbers																							
Taxa	Family	Species	CM1	CM2	CM3	CM4	CM5	CM6	CM7	CM8	CM9	CM10	CM11	CM12	CM13	CM14	CM15	CM16	CM17	CM18	CM19	CM20	CM21	CM22	CM23	CM24
Bird	Artamidae	*Strepera versicolor*	1													1	1									
	Casuariidae	*Dromaius novaehollandiae*		1																						
	Columbidae	*Phaps elegans*	2			1									1											
Mammal	Dasyuridae	*Antechinus flavipes*											1		1											
		Dasyurus geoffroii															1	1								
	Felidae	*Felis catus*													1											
	Macropodidae	*Macropus fuliginosus*	1		1	2		1		1			1		3	1	3	2		2	2	1		1	1	1
		Notamacropus irma											1	1	2											
		Setonix brachyurus									1	1	1	2	1											
	Muridae	*Mus musculus*	1																							
		Rattus rattus	1		1					1						1						1				
	Peramelidae	*Isoodon fusciventer*										1							1	1				1		1
	Suidae	*Sus scrofa*	1	1	2		4	3	1	2																
	Tachyglossidae	*Tachyglossus aculeatus*	1			1																				
Reptiles	Varanidae	*Varanus rosenbergi*	1																							

3.1 SIMILARITY AMONG SURVEY SITES

Survey site similarity (or difference) was determined using two metrics; PCA and Morisita-Horn similarity index.

For the PCA analysis, the PCAs 1 and PCAs 2, and PCAs 1 and PCAs 3 are plotted, and the eigenvalues and percent variance accounted by these PCAs are shown in Table 5.

Table 5. Percent variance and eigenvalues for the PCA

Value	PC 1	PC 2	PC 3	PC 4	PC 5	PC 6	PC 7	PC 8	PC 9	PC 10	PC 11
Eigenvalue	5.94	4.18	3.22	2.80	2.24	1.83	1.51	1.23	1.09	0.56	0.42
% of Variance	23.76	16.73	12.86	11.21	8.96	7.33	6.03	4.91	4.35	2.22	1.66
Cum. %	23.76	40.48	53.34	64.56	73.51	80.84	86.86	91.77	96.12	98.34	100.00

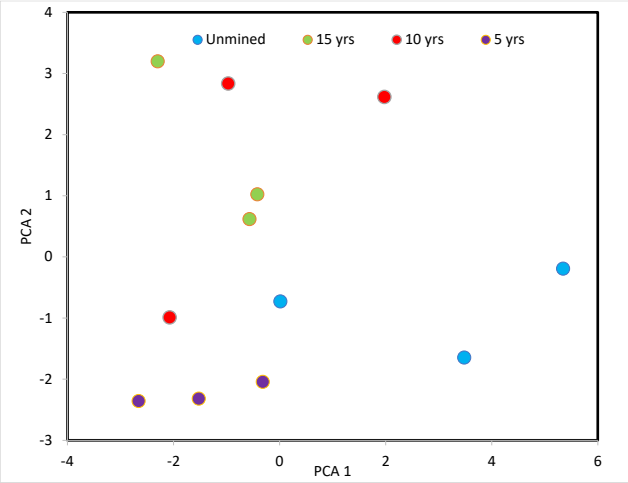


Chart 1. PCAs 1 and 2

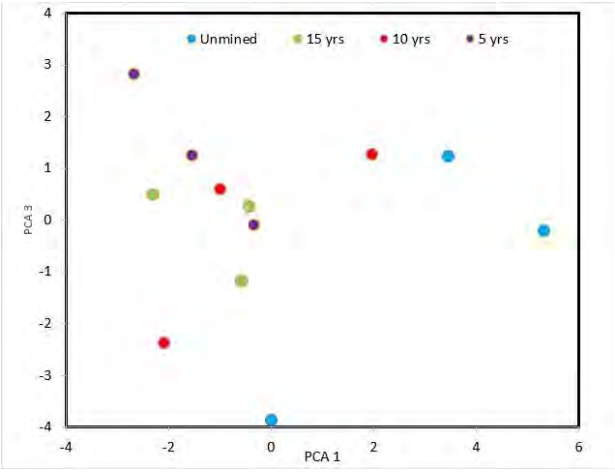


Chart 2. PCAs 1 and 3

The Morisita-Horn index provides an indication of the similarity of the fauna assemblage among sites (Table 6).

Table 6. Morisita-Horn index for 12 sites

	Sites	2	3	7	8	12	4	5	6	9	10	11
Sites		Unmined	Unmined	15	15	15	10	10	10	5	5	5
1	Unmined	**0.814**	0.410	0.344	0.500	0.269	0.232	0.378	0.540	0.547	0.177	0.344
2	Unmined		0.523	0.383	0.565	0.427	0.236	0.613	0.659	0.521	0.147	0.317
3	Unmined			0.330	0.317	0.368	0.710	0.513	0.404	0.290	0.226	0.116
7	15-years				**0.947**	**0.864**	0.500	0.439	**0.904**	0.276	0.229	0.388
8	15-years					**0.830**	0.418	0.506	**0.960**	0.392	0.282	0.487
12	15-years						0.568	0.707	**0.844**	0.304	0.180	0.364
4	10-years							0.486	0.438	0.459	0.352	0.316
5	10-years								0.619	0.396	0.265	0.432
6	10-years									0.466	0.258	0.512
9	5-years										0.331	0.645
10	5-years											0.634

*Cells in bold have a similarity greater than 0.75

3.2 SPECIES ABUNDANCE AND DIVERSITY

Species richness, Shannon Wiener index, Simpsons D index, Fishers' Alpha index and Smith and Wilsons B index are provided for each survey site and for all sites combined in Table 7.

Table 7. Diversity and abundance index scores

	Site #	Species richness	Shannon Wiener	Simpsons' D	Fishers' Alpha	Smith and Wilson B
Unmined	1	10	1.91	5.86	3.64	0.54
Unmined	2	13	2.22	8.19	4.89	0.56
Unmined	3	10	1.75	4.44	4.50	0.55
15-years	7	12	1.98	5.32	4.51	0.52
15-years	8	12	2.07	6.78	5.61	0.56
15-years	12	6	1.63	5.21	2.30	0.79
10-years	4	8	1.74	5.04	3.74	0.62
10-year	5	13	2.26	8.79	5.95	0.64
10-year	6	13	2.13	7.44	5.78	0.54
5-years	9	10	1.92	6.02	5.95	0.67
5-years	10	7	1.69	5.59	3.83	0.67
5-years	11	11	2.15	9.23	6.46	0.70
All		25	2.62	10.72	5.59	0.30

4. DISCUSSION

4.1 PIT, FUNNEL AND ALUMINIUM BOX TRAPS

It was anticipated that there would be similarity among the unmined sites in the vertebrate fauna assemblage and this would be reflected in a clustering of these sites in the graph of PCA 1 and PVA 2 (Chart 1) or PCA 1 and PCA 3 (Chart 2), which is not the case. The similarity index score for unmined sites 1 and 2 is relatively high (i.e. 0.81) but for sites 1 and 3 (i.e. 0.41), and 2 and 3 (0.52) there are differences. The most obvious differences were abundance of *Antechinus flavipes* (Plate 8), lower number of *Morethia obscura*, and less species and less individuals at unmined site 3 when compared with unmined sites 1 and 2.

Cryptoblepharus buchananii, *Egernia napoleonis* and *Lerista distinguenda* are species likely to be present and characterise climax assemblages, and should become evident as the rehabilitation programs progress. In this situation, their abundance appears uneven in the analogue sites and only *Lerista distinguenda* displays the anticipated pattern. If all unmined sites had a similar vertebrate fauna assemblage, then these data could collectively be used as the succession trajectory climax community, but given the differences, it begs the question if other unmined sites in the northern Jarrah forest were surveyed, then how different would they be to the existing three unmined survey sites. The vertebrate data in Appendix C (excluding volant species) indicates that there are numerous other species (particularly skinks) that have been recorded in the broader Jarrah Forest that were not caught in the three unmined survey sites.

Rehabilitation sites that are 5-years old provide a good grouping on PCA 2 when compared with the other groups, but had a similar dispersed grouping on PCA 1, and the similarly index suggests sites 9 and 11, and 10 and 11 are more closely aligned than sites 9 and 10. Pioneering colonising species are the *Mus musculus*, *Menetia greyii* and *Morethia obscura* and species richness of 7-11 is less than for older rehabilitated sites.

Rehabilitation sites that are 10-years old show an increase in species richness for two sites (i.e.13, 13 and 8), with sites well spread on PCA 1, but two sites are reasonably similar of PCAs 2 and 3 (Charts 1 and 2). The Morisita-Horn similarity index scores were low, reflecting the information provided by the PCAs. Small mammals are starting to colonise the 10-year rehabilitation sites, with an abundance of *Cercartetus concinnus* (Plate 9) at one site, which almost certainly reflects the abundance of suitable flowering plants. *Pogona minor* is a recognised early colonising reptile (Thompson and Thompson 2003, Thompson and Thompson 2007a) and *Acritoscincus trilineatus, Morethia obscura* and *Lerista distinguenda* were relatively abundant at two of the sites and widespread throughout the Jarrah Forest. As widely foraging species they have a greater propensity to colonise new areas than species with defined home ranges and high site fidelity.



Plate 8. Mardo



Plate 9. Western pygmy possum

Two of the rehabilitation sites that are 15-years old had a species richness of 12 and the other site had 6 recorded species, and this is reflected in the diversity scores. Two of these 15-year old sites grouped on PCA 1 and PCA 2 (Chart 1). A different two 15-years old rehabilitation sites also grouped closely on PCA 3 and also with two unmined sites (Chart 2).

These data might suggest it was more than one or two species contributing to the difference between unmined and 15-year old rehabilitation sites in the vertebrate fauna assemblage. *Cercartetus concinnus* were abundant at two sites and *Acritoscincus trilineatus* and *Morethia obscura* were abundant at all three sites. In the Goldfields we have observed substantial seasonal variability in the catch rate of *Cercartetus concinnus*, but the reason is not clear (Thompson 2004).

4.2 TRAP TYPES

Aluminium box traps mostly caught *Antechinus flavipes* and *Mus musculus*, and buckets, pipes and funnel traps caught most reptiles. Because buckets, pipes and funnel traps also caught *Antechinus flavipes* and *Mus musculus,* the aluminium box traps inflated the number of these two species caught in the trapping programs in the 12 survey sites compared with other species that did not enter these traps. As shown by Thompson and Thompson (2007b) bucket and pipe pit-traps are far superior at catching small mammals compared with funnel traps, and overall, pipe pit-traps recorded more individuals than bucket pit-traps followed by funnel traps (Table 3). Because various trap types catch a different suite of vertebrate fauna, each trap type introduces a bias into the dataset when analysed using diversity, similarity and PCA methods.

4.3 CAGE TRAPS

Cage traps were deployed to target terrestrial vertebrate fauna unlikely to be caught in pit, funnel and aluminium box traps, and were placed at locations where Chuditch had previously been recorded. The use of chicken necks as bait, restricted the range of animals likely to be caught to mostly carnivores, but it was noted that two Quenda were caught, but they are often caught using sardines. Twelve Chuditch were caught in baited cage traps (i.e. #41, 42, 44, 45, 61, 63, 74, 76 and 78). Cage traps 44, 61, 63, 74, 76 and 78 were all in unmined areas, and traps 41 and 42 were in areas rehabilitated in 2004 (i.e. 18 years old). Although cage traps were not deployed across all rehabilitation areas, these data might suggest that Chuditch are mostly confined to unmined and old rehabilitation areas. Placing cage traps in a wider range of aged rehabilitation areas would provide a better indication of their use of rehabilitated areas. The use of selective trapping sites indicated that Chuditch were present in the mined Jarrah Forest, but no indication of their relative abundance nor preferred habitats, which would be useful data if conservation programs for this species were to be planned and implemented.

4.4 CAMERA TRAPS

Camera traps target the larger vertebrate species and those unlikely to be caught in other types of traps. The Western Grey Kangaroo is clearly abundant in the areas that camera traps were deployed, and because of their large home ranges, they are likely to be widespread in the Jarrah Forest. Only two Chuditch (Plate 10) were recorded compared to 12 in cage traps, but this difference is probably largely due to where camera and cage traps were deployed. Quenda (Plate 13) were recorded in two of the three camera trapping locations. The Western Brush Wallaby (Plate 12) was recorded in one of the camera trapping areas (i.e. camera #11, 12 and 13). Quokkas (Plate 11) were recorded in one of the three camera trapping areas (i.e. #9, 10, 11, 12, 13).

Of concern was the abundance of pigs recorded by camera traps (#1, 2, 3, 5, 6, 7, 8) and these were all in the same location. One pig had an ear tag (Plate 15) suggesting that pig-hunters were using this pig in some type of competition to capture a 'marked' pig.



Plate 10. Chuditch



Plate 11. Quokkas



Plate 12. Western Brush Wallaby



Plate 13. Quenda

4.5 CONSERVATION SIGNIFICANT SPECIES

Two conservation significant species (*Setonix brachyurus* and *Dasyurus geoffroii*) and two priority species (*Notamacropus irma* and *Isoodon fusciventer*) were recorded in the survey. The Quokka and Western Brush Wallaby were in the same area, and one of the Quenda records was in this area, but most were in another area. Given that both *Setonix brachyurus* and *Dasyurus geoffroii* are listed as vulnerable under Commonwealth and State conservation legislation, where resources are available these species should be given a higher priority for protection and long-term conservation than the more abundant species that are widespread in the Jarrah Forest.

4.6 PEST AND PREDATOR SPECIES

A single feral cat (Plate 14) was recorded, and of concern it was in the area where Quokkas were recorded. No foxes were recorded, but a small number of Black Rats were recorded on camera traps but not in cage traps, possibly because of the bait used in these traps, and House Mice were caught in aluminium box, pipe and funnel traps. Pigs (Plate 15) are progressively becoming widespread in the Jarrah Forest and are considered a pest species because of the environmental damage they do particularly around creeks and in the denser vegetation. Pigs can also do significant damage to water courses and introduce disease into drinking water catchments. There is an obvious need to reduce or eliminate pigs from the Alcoa managed Jarrah Forest.



Plate 14. Feral cat



Plate 15. Pig with ear tag

5. SUMMARY AND CONCLUSIONS

The survey data indicated that the three unmined sites selected as analogue climax communities for the rehabilitation areas are not similar, and there are appreciable differences among the fauna assemblages within aged classes of rehabilitation.

5.1 SUCCESSION AND ON TARGET TO A CLIMAX FAUNA COMMUNITY

Based on the available data, there are two alternative conclusions that can be reached about succession of rehabilitated areas along a trajectory to a climax community:

- differences among the unmined areas makes it difficult to determine what is the target climax community, and it is possible there are other alternative Jarrah Forest communities that have not been sampled that would better represent climax communities that will eventuate in rehabilitated areas; or
- rehabilitation programs are not of sufficient quality to enable the mammal, reptile and amphibian assemblages in unmined area to recolonise rehabilitated areas within a 15-year period sufficient to clearly indicate they are on a trajectory toward establishing analogue climax communities.

If there is no one target climax community valid for all rehabilitation areas because the vertebrate fauna assemblage in the Alcoa mined Jarrah forest is variable, then the current survey methodology is unlikely to provide evidence that the fauna assemblages in the rehabilitated areas are within the expected trajectory to reach the analogue climax community. This issue can be partially addressed by redesigning the survey protocol and placing 'unmined' analogue survey sites in the unmined areas immediately adjacent to the rehabilitation areas. Given that the vertebrate fauna are most likely to colonise rehabilitation sites from the adjacent areas, this approach would provide the maximum opportunity for the vertebrate fauna assemblages in rehabilitated areas to be within expected trajectories toward climax communities. Variation from the expected trajectory would then most probably be a consequence of an inappropriate habitat (e.g. soils, vegetation and microbial activity, etc) in the rehabilitated areas instead of high variability in the analogue undisturbed site. Investigating and adjusting habitats in existing and future rehabilitation areas would be an obvious future task.

5.2 CONSERVATION SIGNIFICANT SPECIES

The presence of conservation significant species within the Jarrah forests that are being mined by Alcoa warrants attention. When mining in the area is completed there will remain many unmined areas, and with time many of the mined areas, irrespective of how they were rehabilitated will be progressing toward self-sustaining functional ecosystems, albeit possibly different to that which existed before mining. The scant data collected in this survey would suggest that conservation significant species are in higher densities in the unmined areas, compared to the rehabilitated areas. If further investigation confirms that this was the case, then a focus on the long-term preservation of conservation significant species, and in particular their use of rehabilitation areas should be a priority. This may mean developing a better understanding of the location and abundance of *Setonix brachyurus*, *Dasyurus geoffroii*, *Notamacropus irma* and *Isoodon fusciventer* in the general mining area and putting in place appropriate targeted management and monitoring regimes for these species.

5.3 PEST SPECIES

It was pleasing not to record foxes during the camera trapping program and only a single feral cat, however, the area surveyed was very limited when viewed in the context of the extent of Jarrah Forest managed by Alcoa. Foxes and feral cats are significant predators on our native vertebrate fauna (Catling 1988, Woinarski et al. 2018, Murphy et al. 2019, Woolley et al. 2019, Woinarski et al. 2020, Woolley et al. 2020, Fleming et al. 2021, Woinarski et al. 2021) and are implicated in the decline or extinction of many of the critical weight range mammals, and in many circumstances are having a long-term greater impact on the vertebrate fauna

assemblage than the mining operations. Therefore, resources allocated to feral cat and fox management may provide better long-term outcomes than spending huge resources on fine-turning rehabilitation programs to achieve analogue climax communities. A better understanding and appreciation of foxes and feral cats in the Alcoa mining areas is an obvious starting point for implementing management programs.

The localised abundance of feral pigs is of concern. Feral pigs are known to cause serious damage to ecosystems, biodiversity, fauna habitats, water sources and agricultural assets (National Feral Pig Action Plan Steering Group 2021), and in addition, they pose a biosecurity and disease risk to Australia. Alcoa is urged to develop and implement a feral pig management program within the Jarrah Forest under its stewardship.

5.4 REPEATING THIS SURVEY

To understand whether rehabilitated areas are moving along an established trajectory toward an analogue climax vertebrate fauna community, requires an understanding of what constitutes the climax vertebrate fauna community and the trajectory. Monitoring is then undertaken so that existing rehabilitated areas might be amended where that is feasible and planning for new areas is adjusted based on experience and monitoring results.

If Alcoa are not achieving the desired fauna outcomes, then it may have to revisit its rehabilitation programs which are probably tuned to its completion criteria that are largely based on the abundance of eucalypt stems in rehabilitated areas (Australian Government 2016) and may not be particularly focussed on recreating suitable fauna habitat.

It is suggested that this monitoring program is reviewed before the survey is repeated, with particular attention to:

- the fauna target(s) as represented by the rehabilitation trajectory and intended climax community(ies);
- survey design (e.g. location of analogue sites);
- use of camera traps to determine presence vs relative abundance or conservation significant fauna; and
- value-for-money of surveys, when compared with the alternative uses of these resources to achieve a similar objective(s) (e.g. the long-term preservation of conservation significant species, and in particular their use of rehabilitation areas).

6. REFERENCES

Andersen, A. N., L. D. Einoder, A. Fisher, B. Hill, and S. K. Oberprieler. 2022. Faunal standards for the restoration of terrestrial ecosystems: a framework and its application to a high-profile case study. Restoration Ecology **31**.

Australian Government. 2016. Mine Rehabilitation Leading Practice Sustainable Development Program for the Mining Industry. Canberra.

Bradshaw, A. D. 1984. Ecological principles and land reclamation practice. Landscape Planning **11**:35-48.

Catling, P. C. 1988. Similarities and Contrasts in the diets of foxes, *Vulpes vulpes*, and cats, *Felis catus*, relative to fluctuating prey populations and drought. Australian Wildlife Research **15**:307-317.

Colwell, R. K., and J. A. Coddington. 1994. Estimating terrestrial biodiversity through extrapolation. Philosophical Transactions of the Royal Society of London, Series B. **345**:101-118.

Cross, S. L., P. W. Bateman, and A. T. Cross. 2019. Restoration goals: Why are fauna still overlooked in the process of recovering functioning ecosystems and what can be done about it? Ecological Management & Restoration.

Cross, S. L., H. S. Bradley, E. P. Tudor, M. D. Craig, S. Tomlinson, M. J. Bamford, P. W. Bateman, and A. T. Cross. 2021. A life-of-mine approach to fauna monitoring is critical for recovering functional ecosystems to restored landscapes. Restoration Ecology.

Ecologia Environment. 2010. Pipes and Pump Stations Joint Venture CW00803 Dwellingup New Source Targeted Survey for Mammals of Conservation Significance. Perth.

Fleming, P. A., H. M. Crawford, A. M. Stobo-Wilson, S. J. Dawson, C. R. Dickman, S. J. Dundas, M. N. Gentle, T. M. Newsome, J. O'Connor, R. Palmer, J. Riley, E. G. Ritchie, J. Speed, G. Saunders, J. M. D. Stuart, E. Thompson, J. M. Turpin, and J. C. Z. Woinarski. 2021. Diet of the introduced red fox *Vulpes vulpes* in Australia: analysis of temporal and spatial patterns. Mammal Review **51**:508-527.

Grant, C. D. 2006. State-and-Transition Successional Model for Bauxite Mining Rehabilitation in the Jarrah Forest of Western Australia. Restoration Ecology **14**:28-37.

Hayek, L. C., and M. A. Buzas. 1997. Surveying natural populations. Columbia University Press, New York.

J N Dunlop & Associates. 1987. A Fauna Assessment of Four Water Supply Sources in the Darling Ranges.

Kabay, D. 2009. Monitoring for Wungong Catchment Forest Thinning Project - KPI 11 Fauna.

Kempton, R. A., and L. R. Taylor. 1974. Log-series and log-normal parameters as diversity discriminants for the *Lepidoptera*. Journal of Animal Ecology **43**:381-399.

Magurran, A. E. 1988. Ecological diversity and its measurement. Princeton University Press, Princeton, New Jersey.

Magurran, A. E. 2004. Measuring biological diversity. Blackwell, Oxford.

Murphy, B. P., L.-A. Woolley, H. M. Geyle, S. M. Legge, R. Palmer, C. R. Dickman, J. Augusteyn, S. C. Brown, S. Comer, T. S. Doherty, C. Eager, G. Edwards, D. A. Fordham, D. Harley, P. J. McDonald, H. McGregor, K. E. Moseby, C. Myers, J. Read, J. Riley, D. Stokeld, G. J. Trewella, J. M. Turpin, and J. C. Z. Woinarski. 2019. Introduced cats (*Felis catus*) eating a continental fauna: The number of mammals killed in Australia. Biological Conservation **237**:28-40.

National Feral Pig Action Plan Steering Group. 2021. National Feral Pig Action Plan: 2021-2031. Canberra.

Ninox Wildlife Consulting. 1989. A Vegetation and Vertebrate Fauna Assessment of Seven Proposed Mining Areas near Jarrahdale, Western Australia. Perth.

Pisces Conservation Ltd. 2010. Species diversity and richness IV. Pisces Conservation Ltd, England.

Smith, B., and J. B. Wilson. 1996. A consumer's guide to evenness measures. Oikos **76**:70-82.

Thompson, G. G., and S. A. Thompson. 2007a. Early and late colonizers in mine site rehabilitated waste dumps in the Goldfields of Western Australia. Pacific Conservation Biology **13**:235-243.

Thompson, G. G., and S. A. Thompson. 2007b. Usefulness of funnel traps in catching small reptiles and mammals, with comments on the effectiveness of the alternatives? Wildlife Research **34**:491-497.

Thompson, S. A. 2004. Mine site rehabilitation index using reptile assemblage as a bio-indicator. PhD. Edith Cowan University, Perth.

Thompson, S. A., and G. G. Thompson. 2003. The western bearded dragon, *Pogona minor,* (Squamata: Agamidae): An early lizard coloniser of rehabilitated areas. Journal of the Royal Society of Western Australia **86**:1-6.

Wardell-Johnson, G. 1982. A Vertebrate Fauna Survey of the Western Australian High Rainfall Forest of the Serpentine Area.

Woinarski, J. C. Z., S. M. Legge, L. A. Woolley, R. Palmer, C. R. Dickman, J. Augusteyn, T. S. Doherty, G. Edwards, H. Geyle, H. McGregor, J. Riley, J. Turpin, and B. P. Murphy. 2020. Predation by introduced cats *Felis catus* on Australian frogs: compilation of species records and estimation of numbers killed. Wildlife Research.

Woinarski, J. C. Z., S. L. South, P. Drummond, G. R. Johnston, and A. Nankivell. 2018. The diet of the feral cat (*Felis catus*), red fox (*Vulpes vulpes*) and dog (*Canis familiaris*) over a three-year period at Witchelina Reserve, in arid South Australia. Australian Mammalogy **40**:204-213.

Woinarski, J. C. Z., A. M. Stobo-Wilson, H. M. Crawford, S. J. Dawson, C. R. Dickman, T. S. Doherty, P. A. Fleming, S. T. Garnett, M. N. Gentle, S. M. Legge, T. M. Newsome, R. Palmer, M. W. Rees, E. G. Ritchie, J. Speed, J.-M. Stuart, E. Thompson, J. Turpin, and B. P. Murphy. 2021. Compounding and complementary carnivores: Australian bird species eaten by the introduced European red fox Vulpes vulpes and domestic cat Felis catus. Bird Conservation International:1-17.

Wolda, H. 1981. Similarity indices, sample size and diversity. Oecologia **50**:296-302.

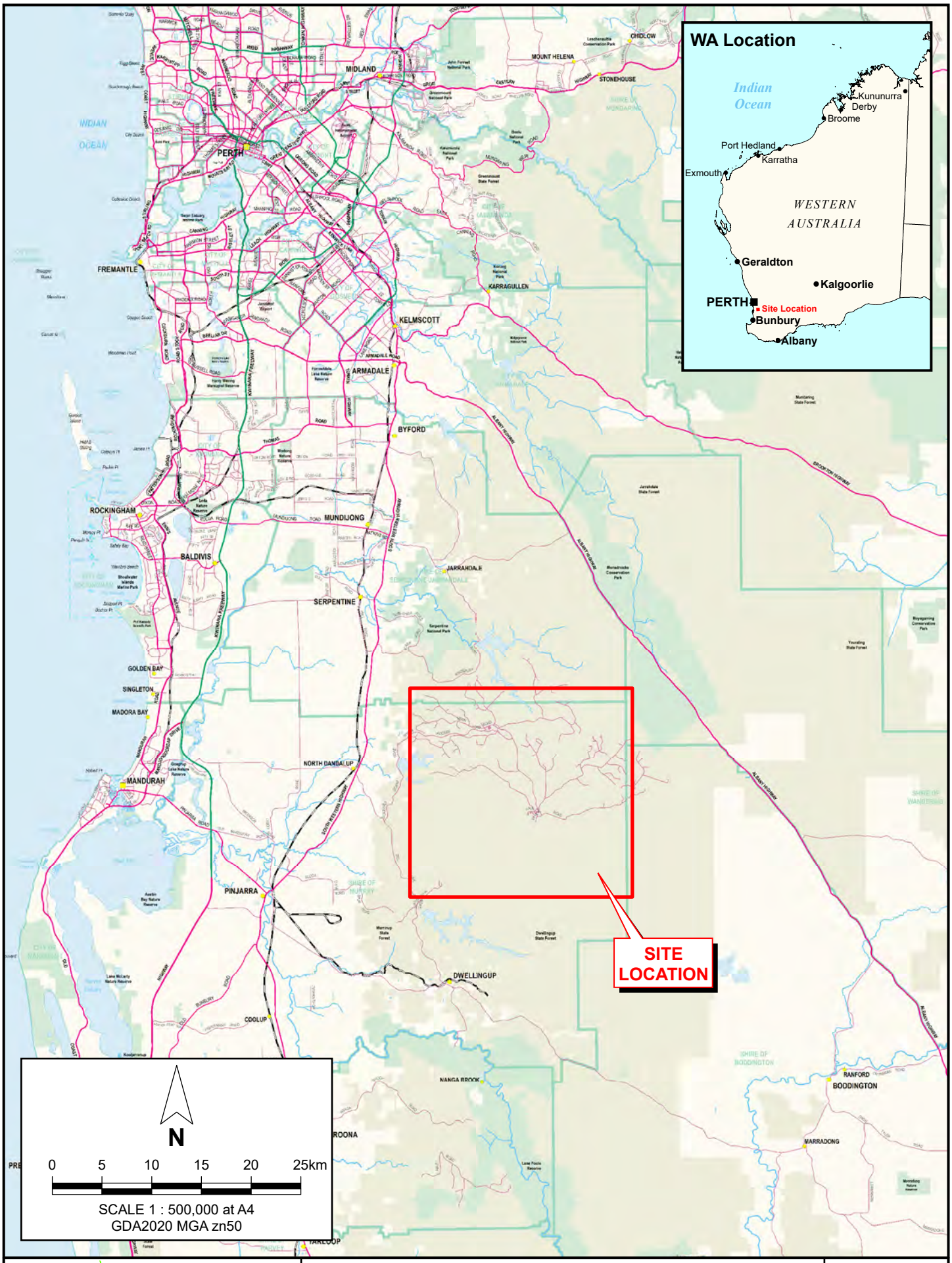
Woolley, L.-A., B. P. Murphy, H. M. Geyle, S. M. Legge, R. A. Palmer, C. R. Dickman, T. S. Doherty, G. P. Edwards, J. Riley, J. M. Turpin, and J. C. Z. Woinarski. 2020. Introduced cats eating a continental fauna: invertebrate consumption by feral cats (*Felis catus*) in Australia. Wildlife Research **47**:610-623.

Woolley, L. A., H. M. Geyle, B. P. Murphy, S. M. Legge, R. Palmer, C. R. Dickman, J. Augusteyn, S. Comer, T. S. Doherty, C. Eager, G. Edwards, D. K. P. Harley, I. Leiper, P. J. McDonald, H. W. McGregor, K. E. Moseby, C. Myers, J. L. Read, J. Riley, D. Stokeld, J. M. Turpin, and J. C. Z. Woinarski. 2019. Introduced cats *Felis catus* eating a continental fauna: inventory and traits of Australian mammal species killed. Mammal Review **49**:354-368.

Figures

Baseline Monitoring of Rehabilitation Programs
Alcoa's Bauxite Mining Areas





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TERRESTRIAL ECOSYSTEMS

Alcoa of Australia Ltd
BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

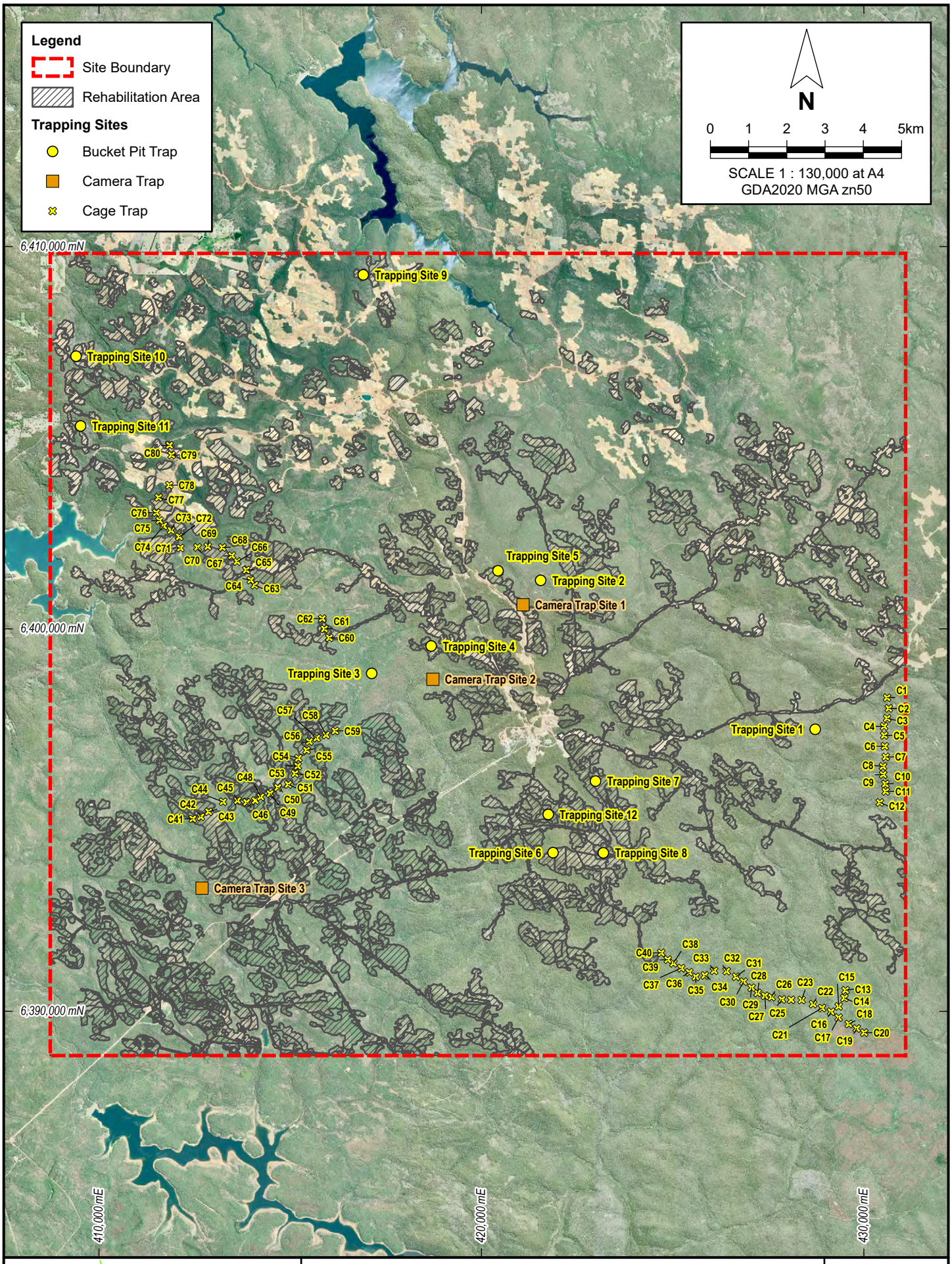
Figure 1

REGIONAL LOCATION

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TERRESTRIAL ECOSYSTEMS

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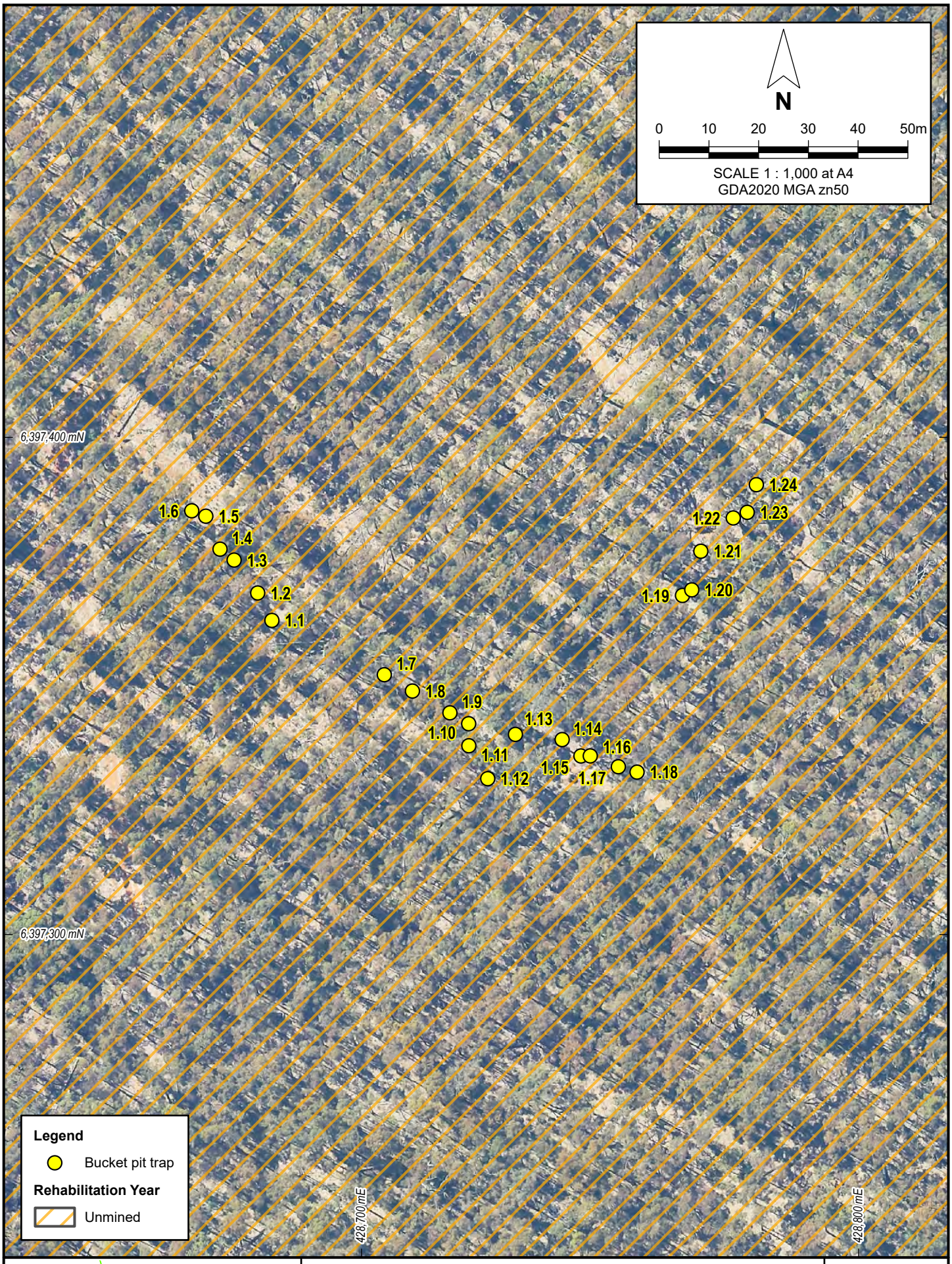
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Alcoa of Australia Ltd
BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

PROJECT AREA

Figure 2

Job: 2022-0087



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IN ALCOA'S BAUXITE MINING AREAS

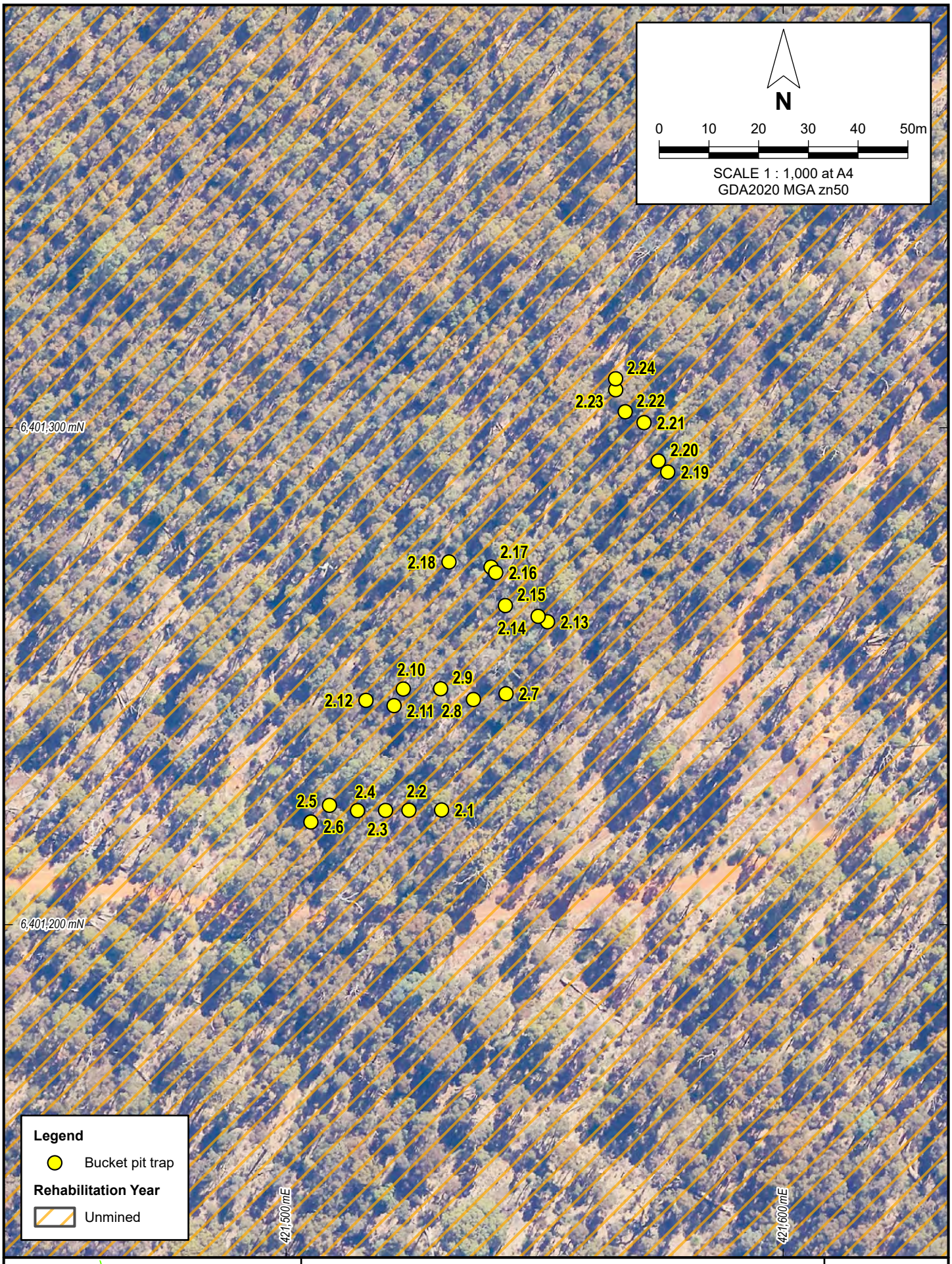
Figure 3

PIT TRAP LOCATIONS - TRAP SITE 1

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IN ALCOA'S BAUXITE MINING AREAS

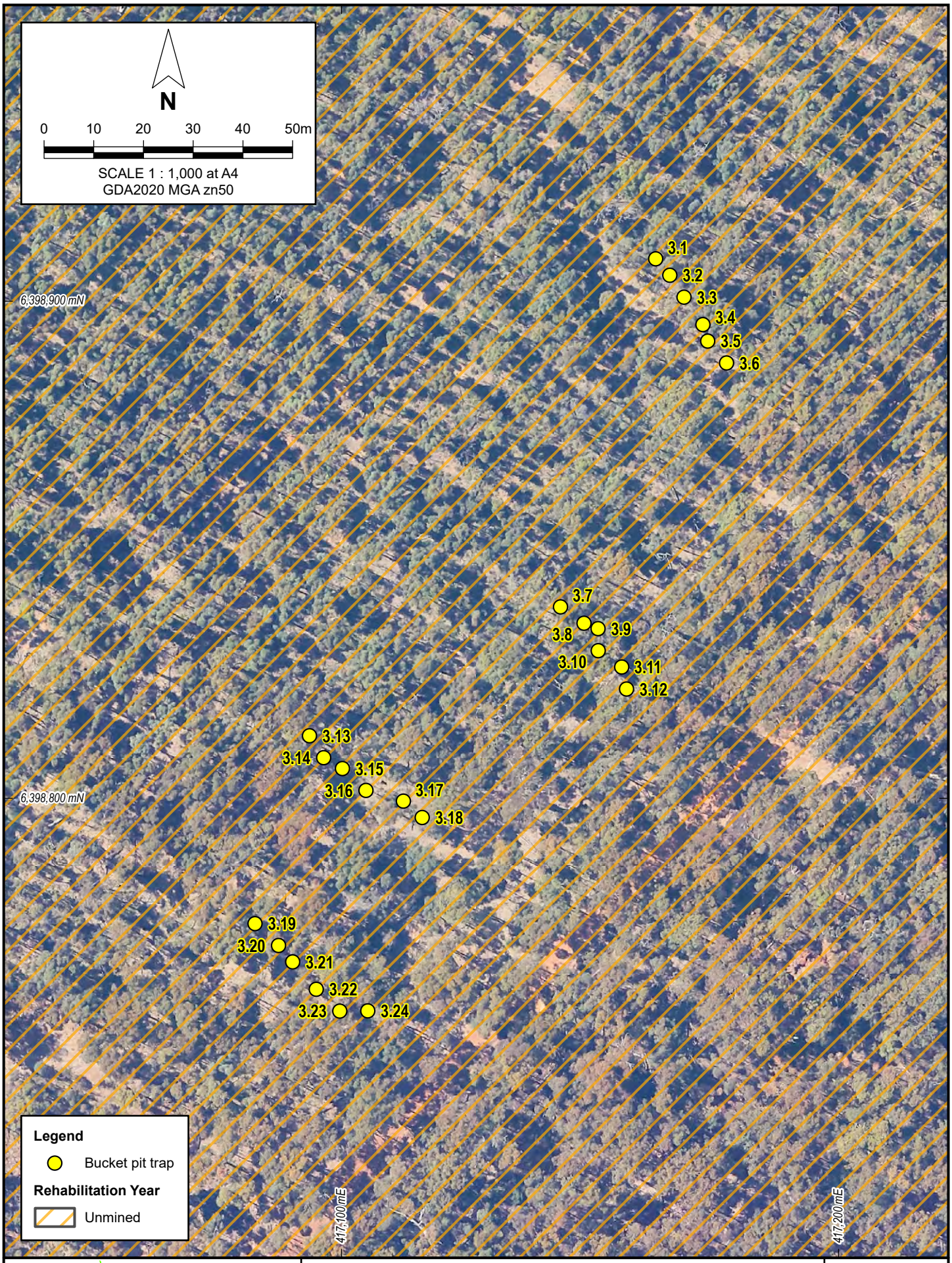
Figure 4

PIT TRAP LOCATIONS - TRAP SITE 2

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IN ALCOA'S BAUXITE MINING AREAS

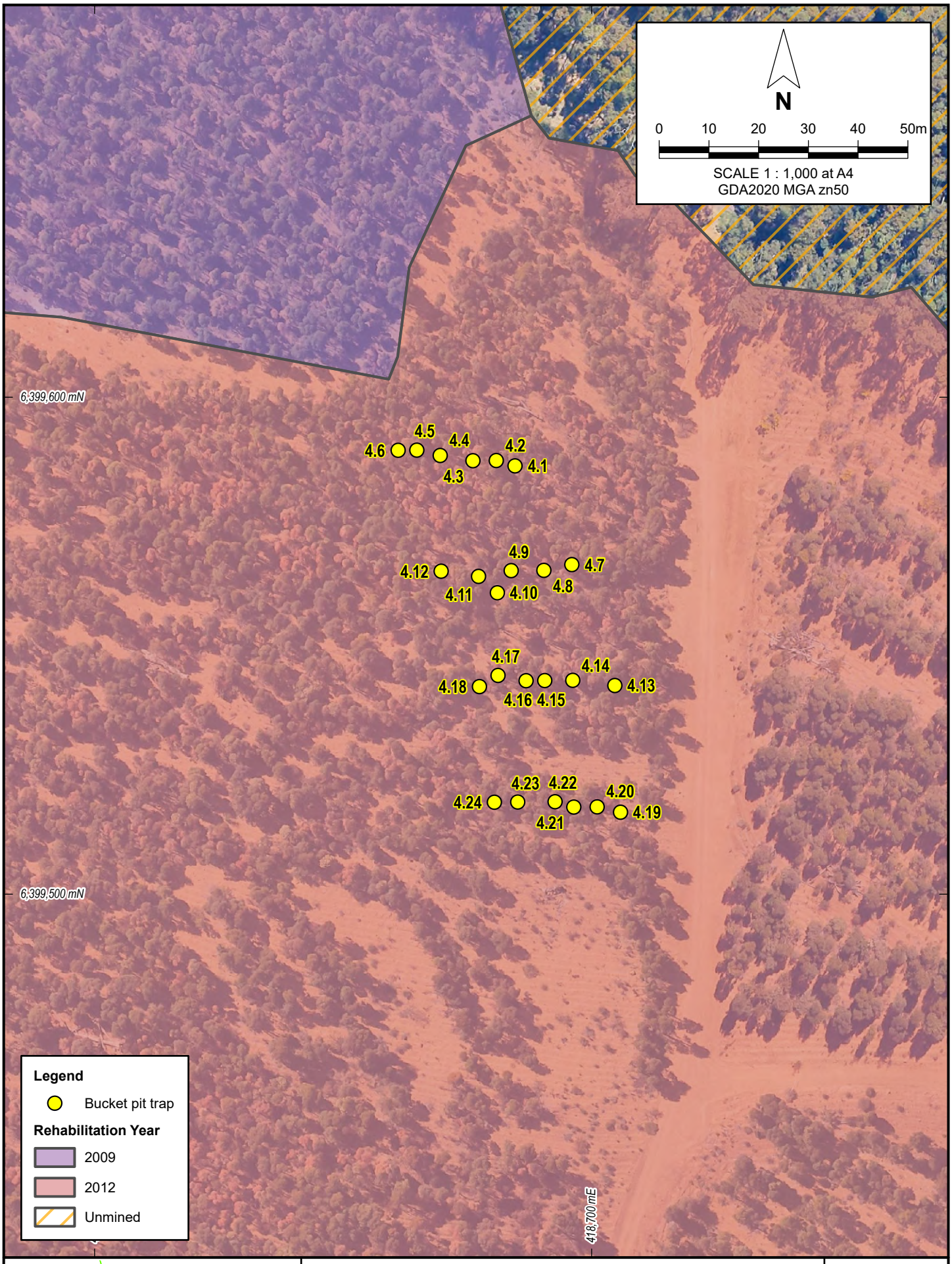
Figure 5

PIT TRAP LOCATIONS - TRAP SITE 3

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IN ALCOA'S BAUXITE MINING AREAS

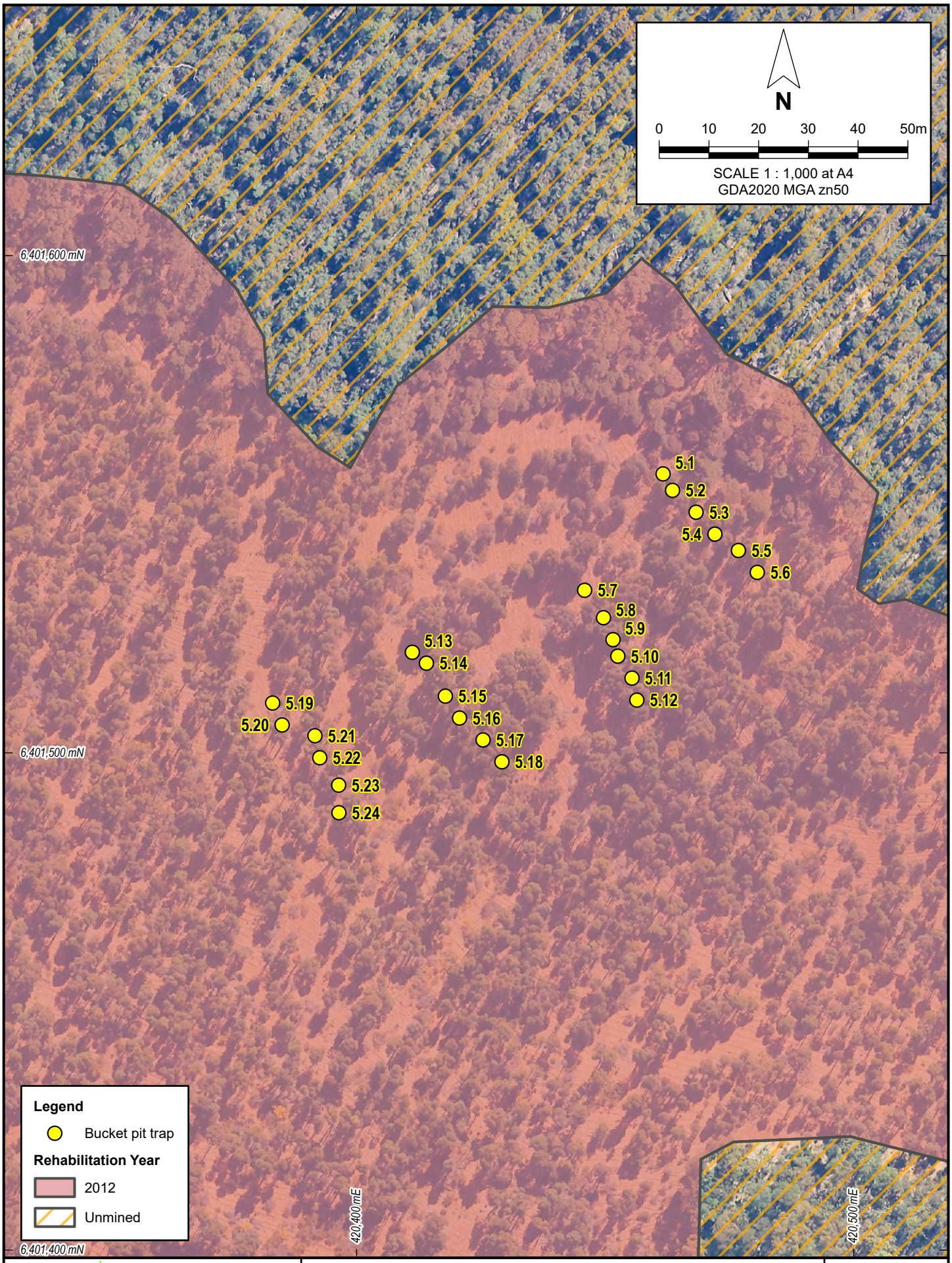
Figure 6

PIT TRAP LOCATIONS - TRAP SITE 4

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IN ALCOA'S BAUXITE MINING AREAS

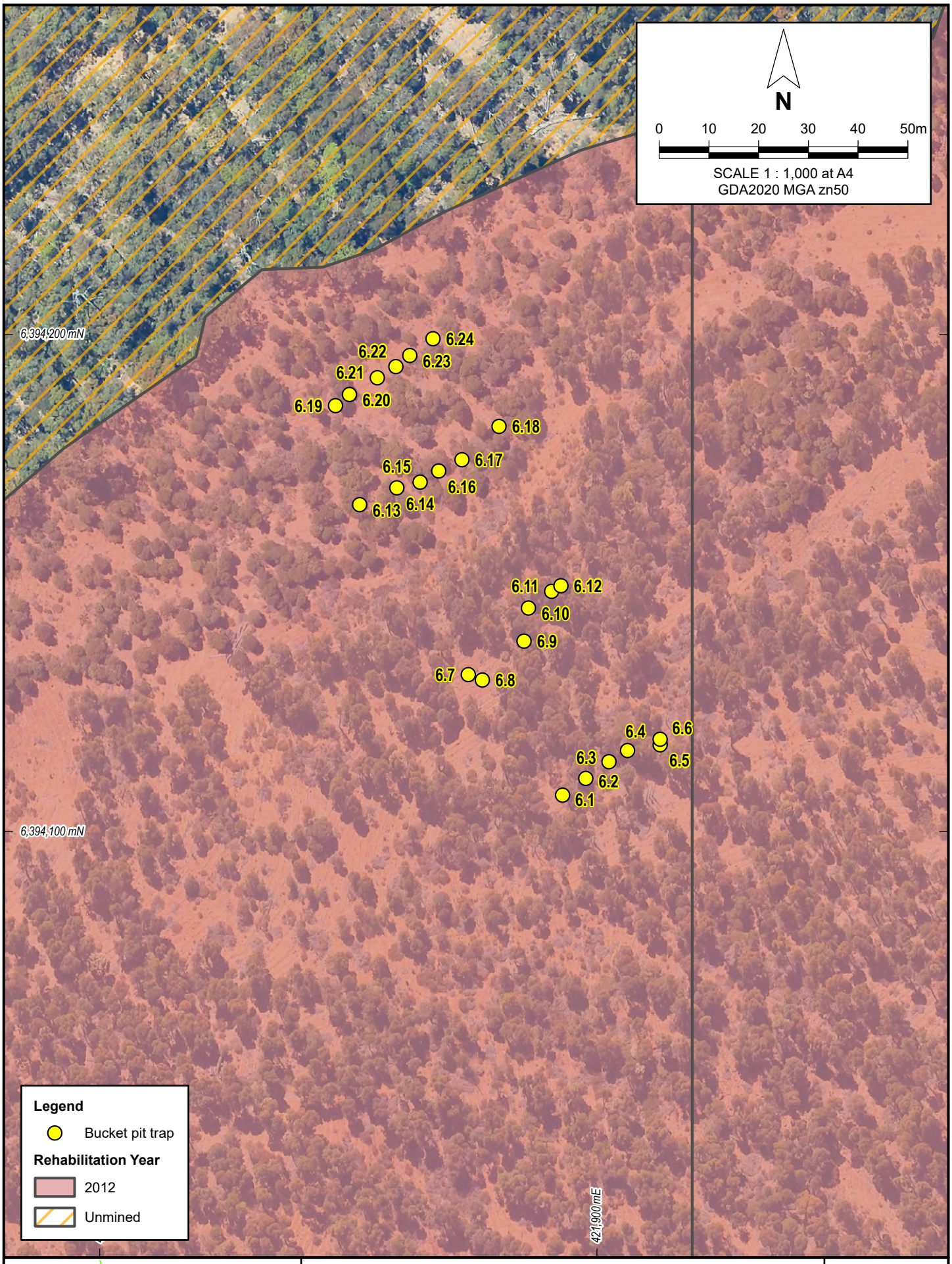
PIT TRAP LOCATIONS - TRAP SITE 5

Figure 7

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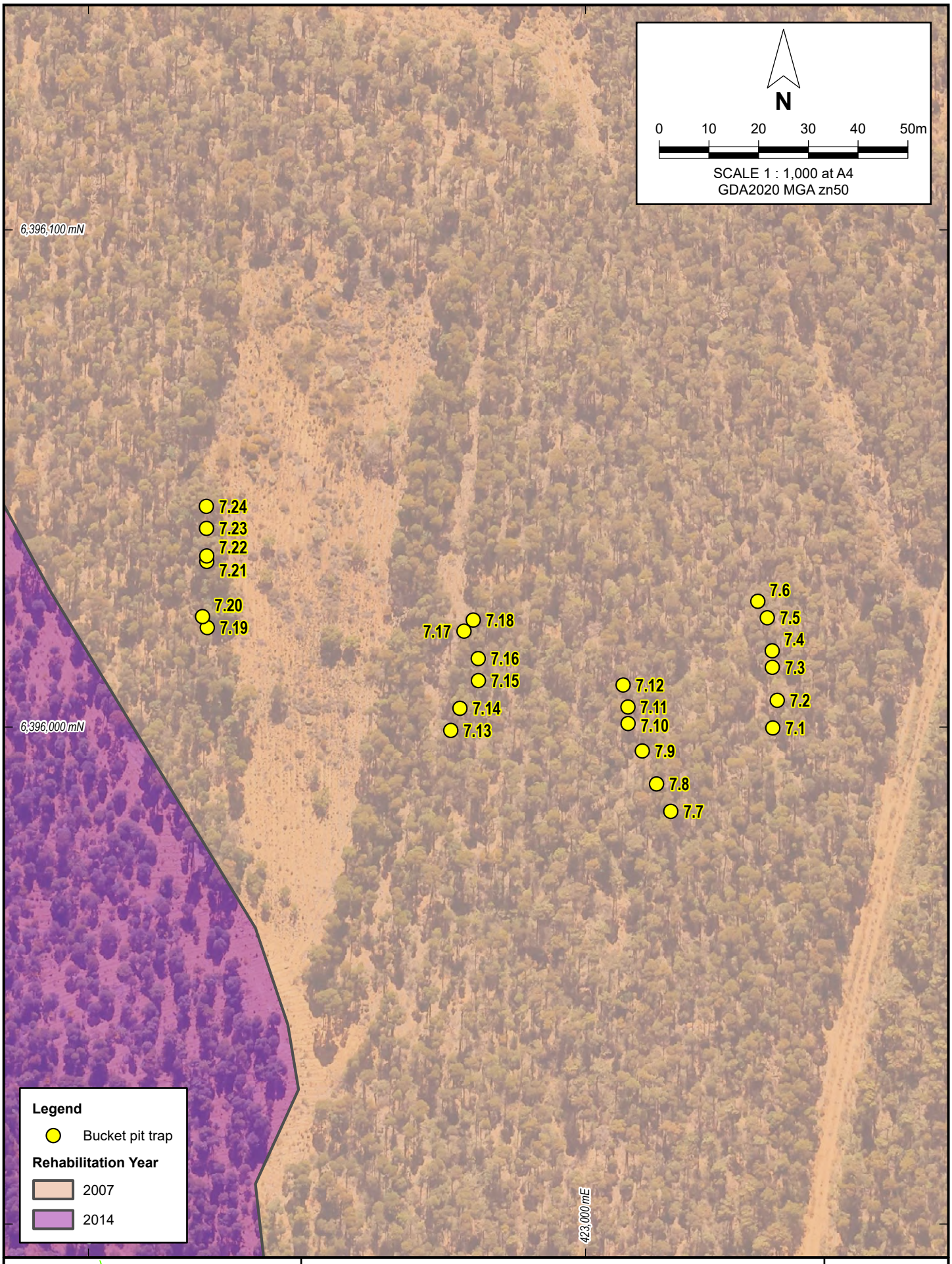
TERRESTRIAL ECOSYSTEMS

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IN ALCOA'S BAUXITE MINING AREAS

Figure 8

PIT TRAP LOCATIONS - TRAP SITE 6

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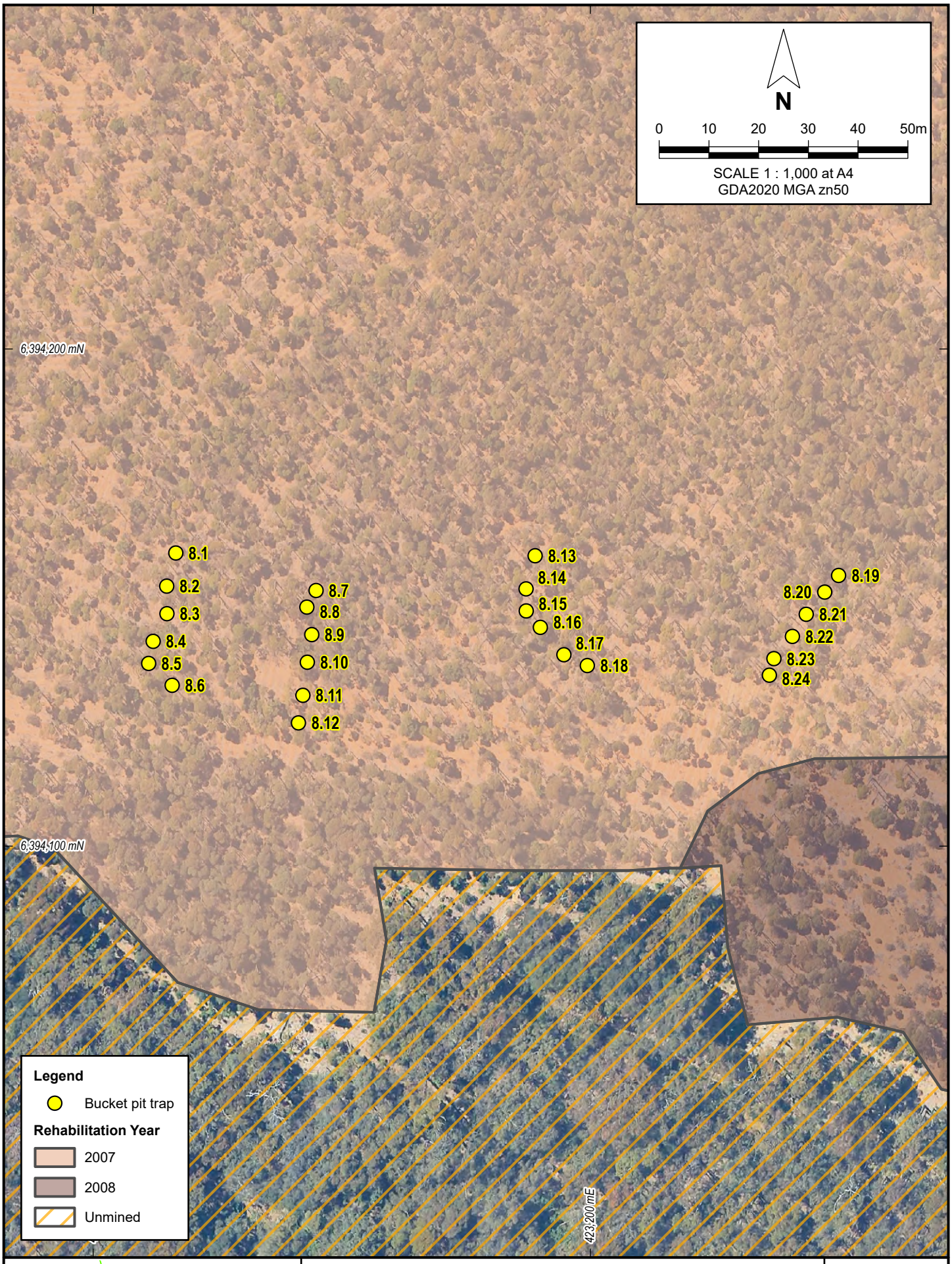
TERRESTRIAL ECOSYSTEMS

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Figure 9

PIT TRAP LOCATIONS - TRAP SITE 7

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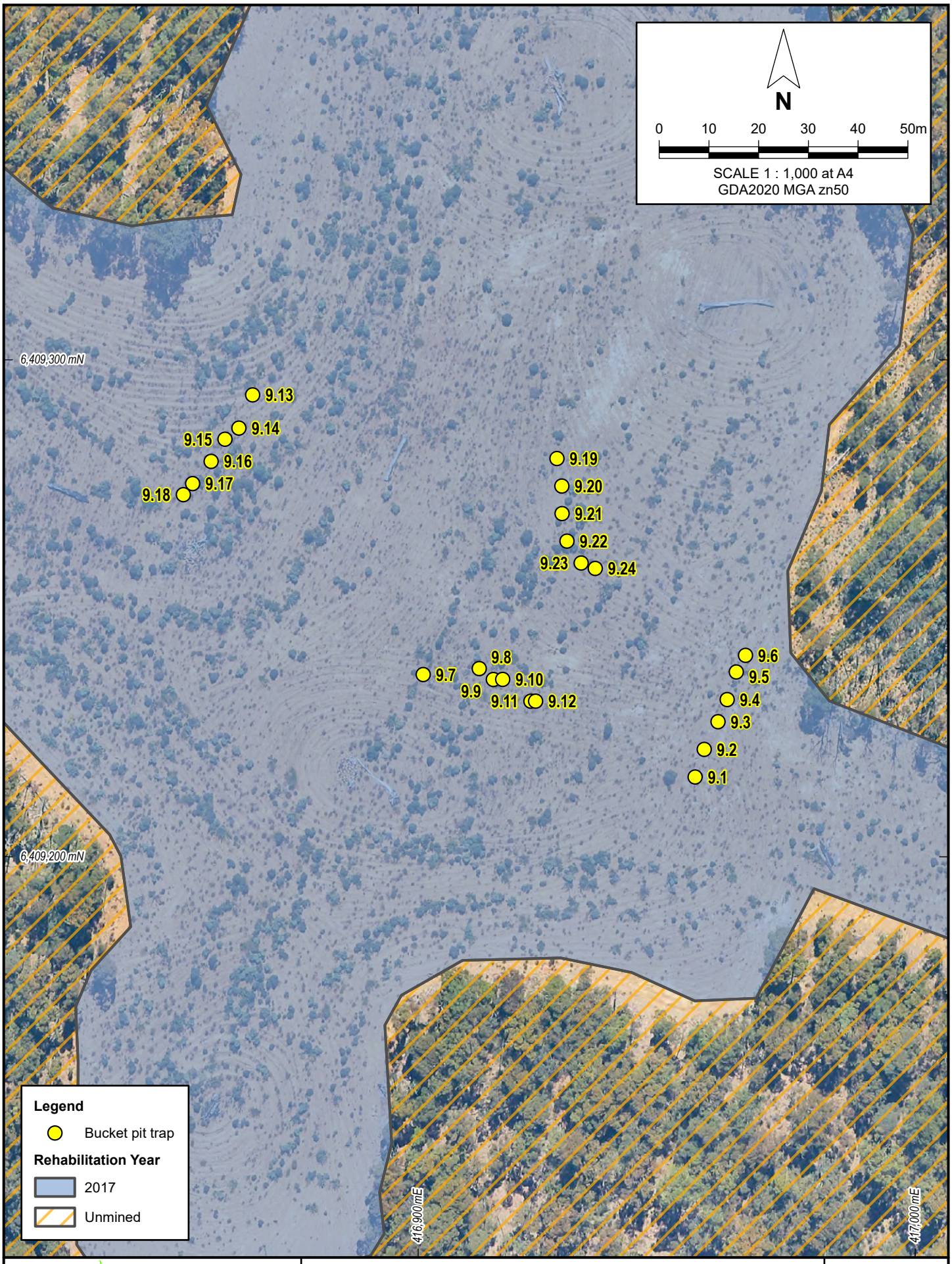
TERRESTRIAL ECOSYSTEMS

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IN ALCOA'S BAUXITE MINING AREAS

Figure 10

PIT TRAP LOCATIONS - TRAP SITE 8

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IN ALCOA'S BAUXITE MINING AREAS

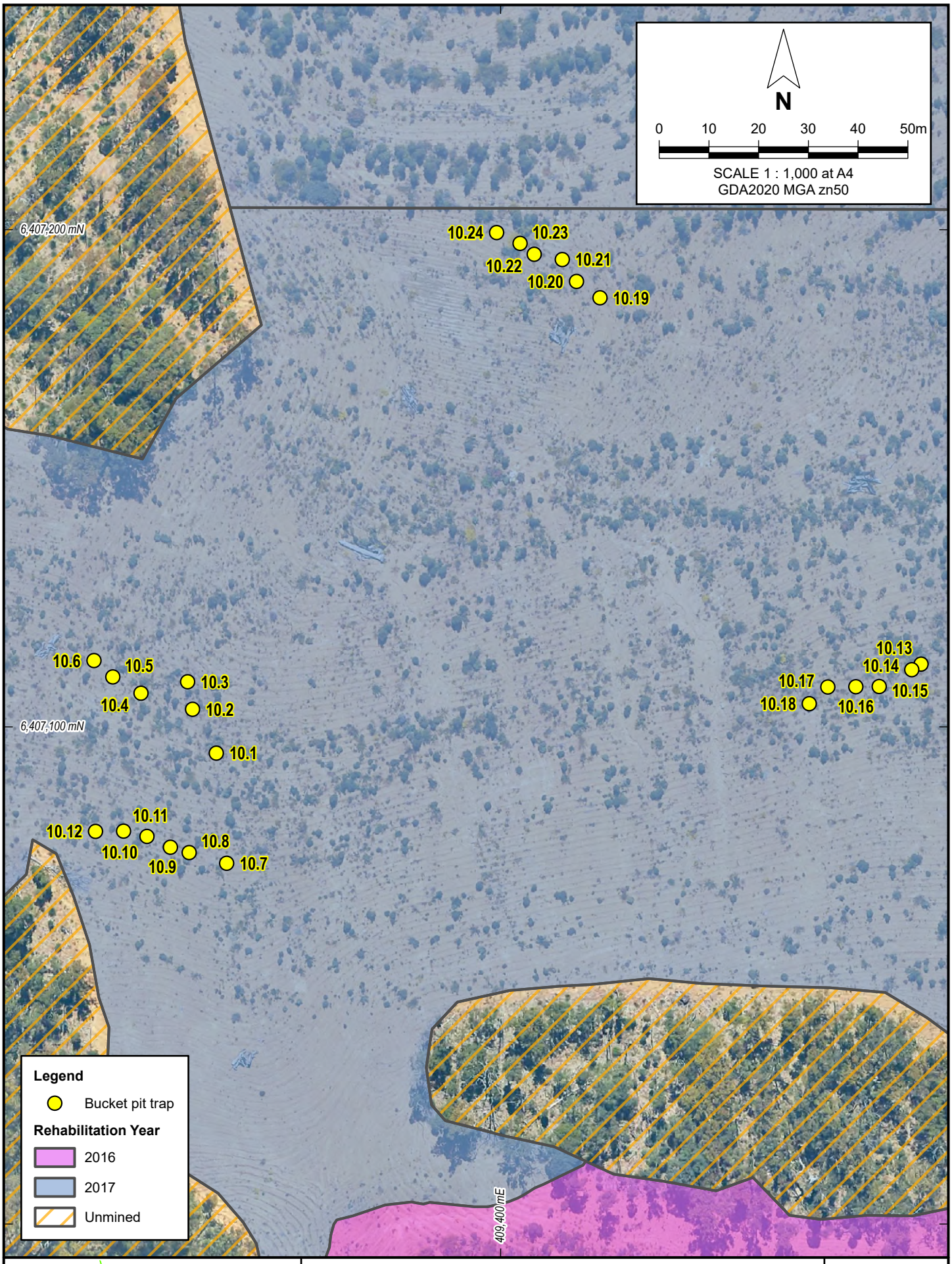
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PIT TRAP LOCATIONS - TRAP SITE 9

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IN ALCOA'S BAUXITE MINING AREAS

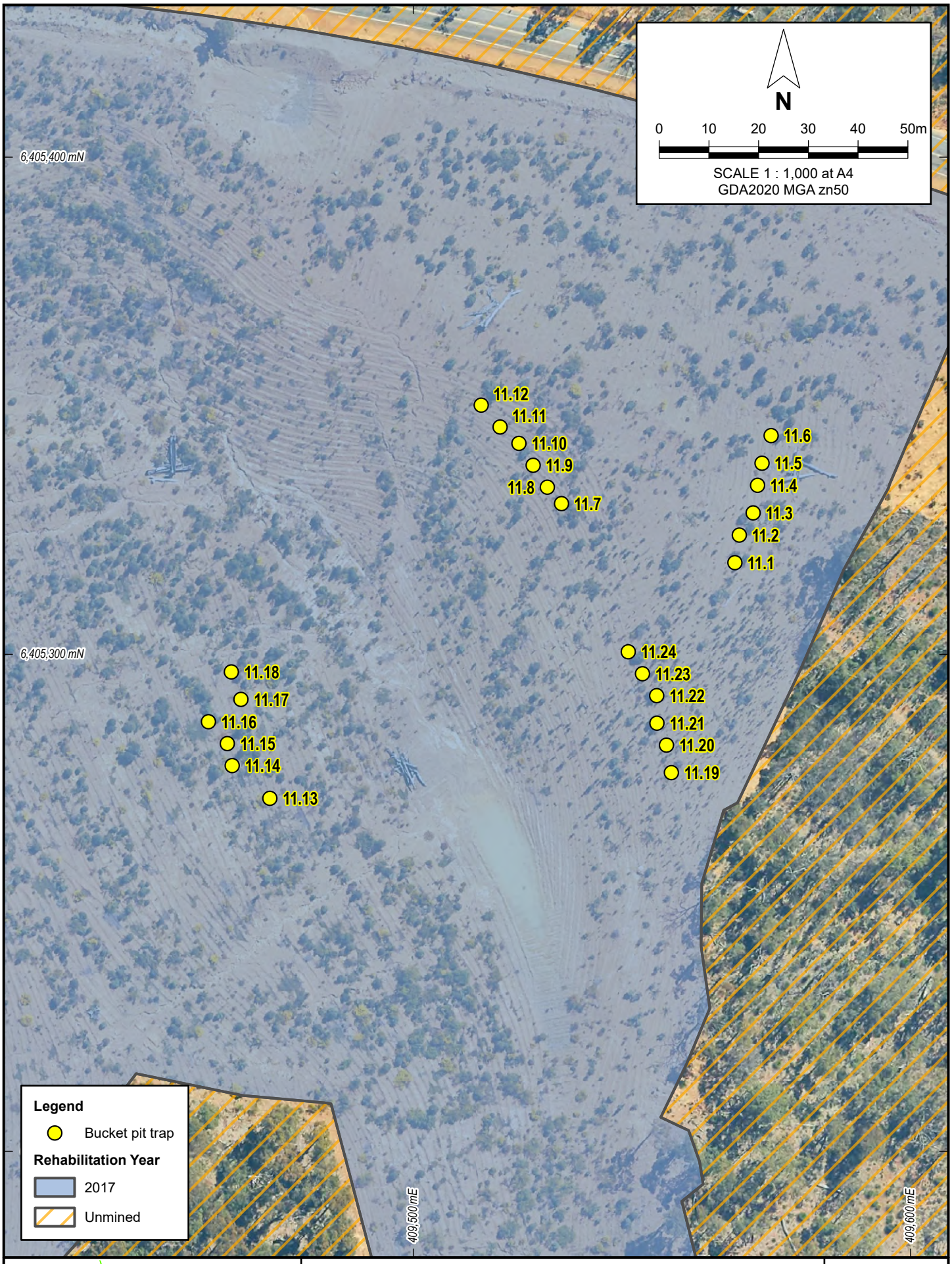
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PIT TRAP LOCATIONS - TRAP SITE 10

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TERRESTRIAL ECOSYSTEMS

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IN ALCOA'S BAUXITE MINING AREAS

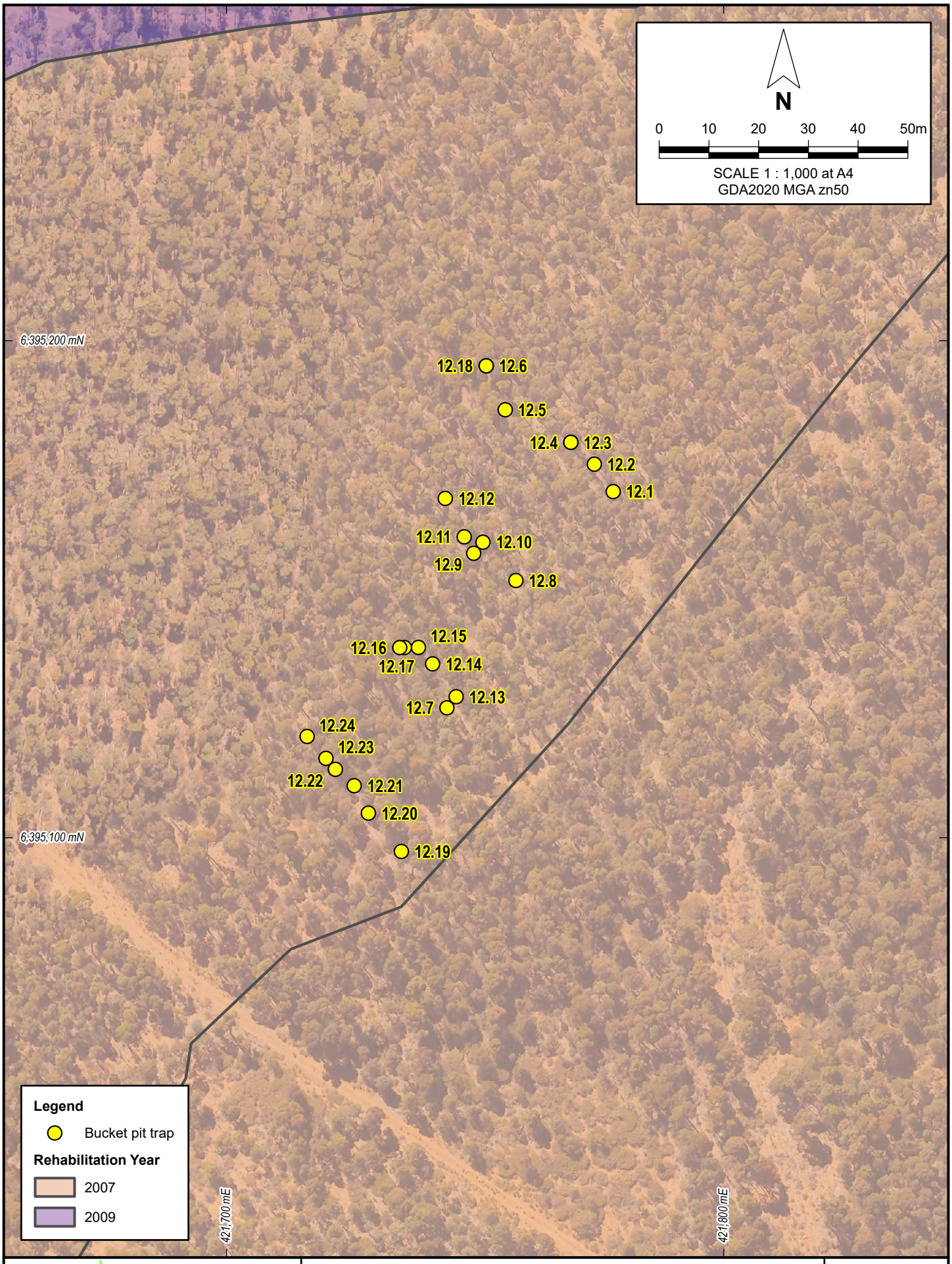
Figure 13

PIT TRAP LOCATIONS - TRAP SITE 11

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TERRESTRIAL ECOSYSTEMS

Alcoa of Australia Ltd
BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

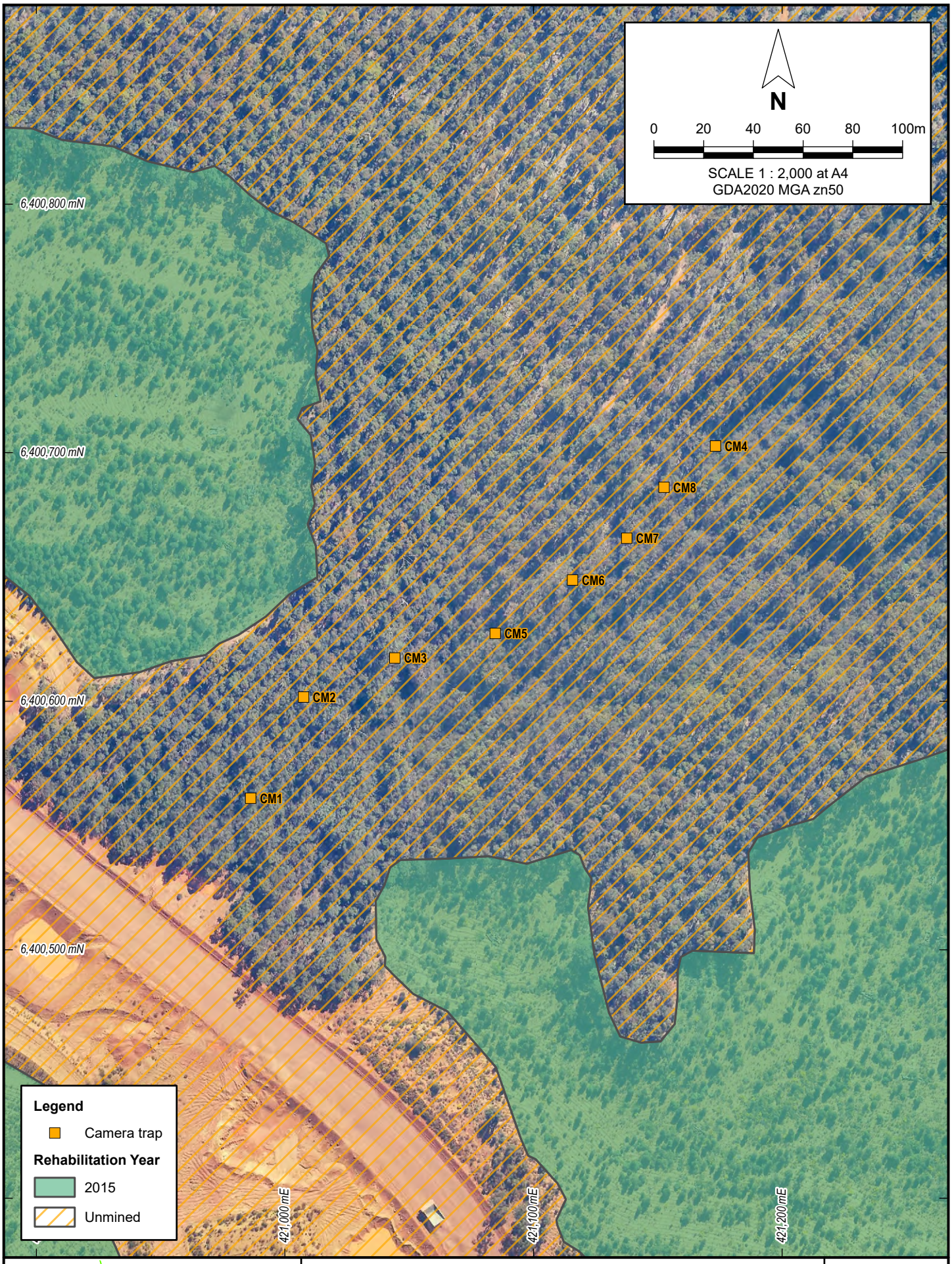
Figure 14

PIT TRAP LOCATIONS - TRAP SITE 12

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Date: 30 May 2023

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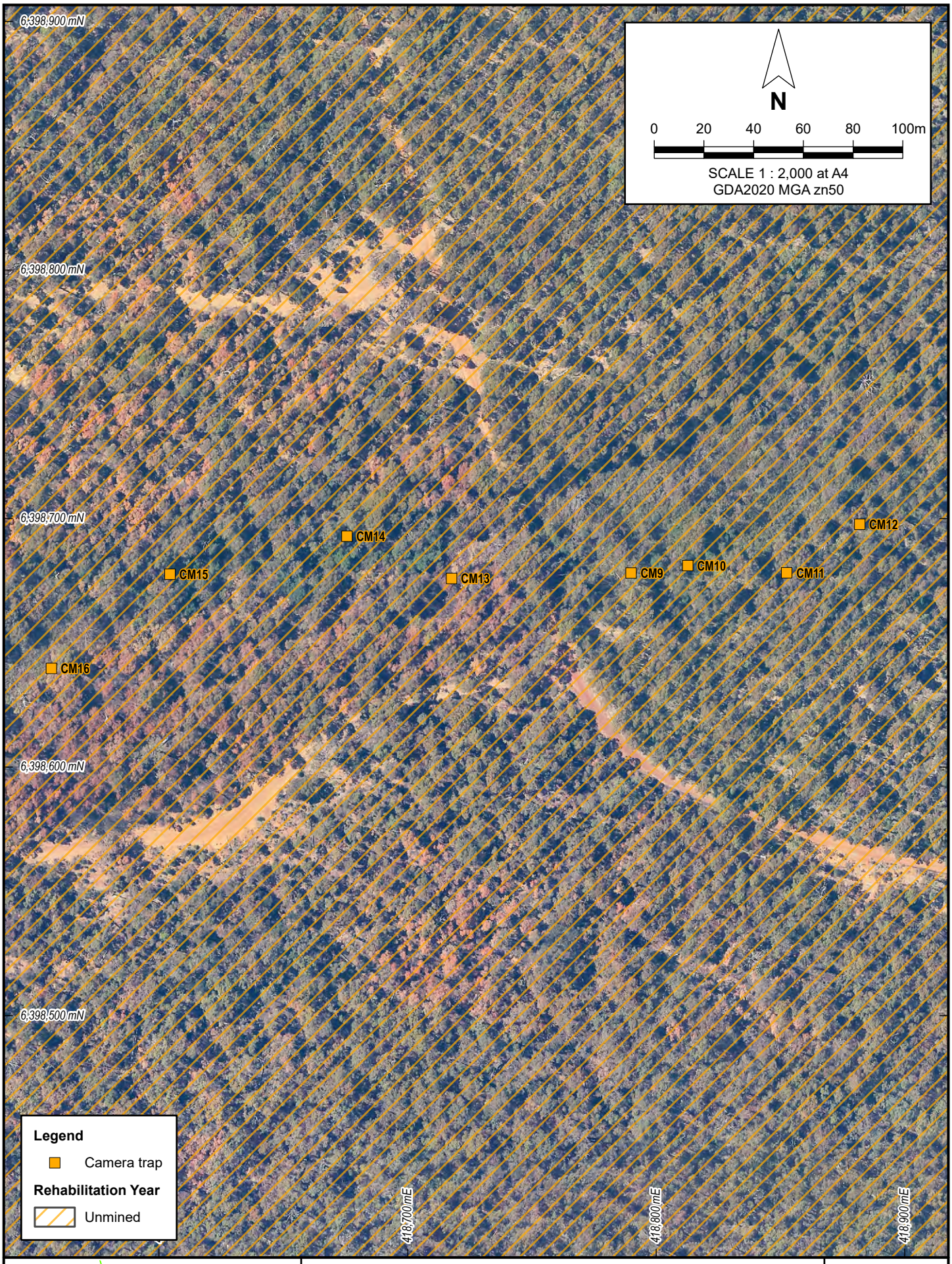
TERRESTRIAL ECOSYSTEMS

Alcoa of Australia Ltd
BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

Figure 15

CAMERA TRAP LOCATION - SITE 1

Drawn: S. Thompson | Date: 30 May 2023 | Job: 2022-0087



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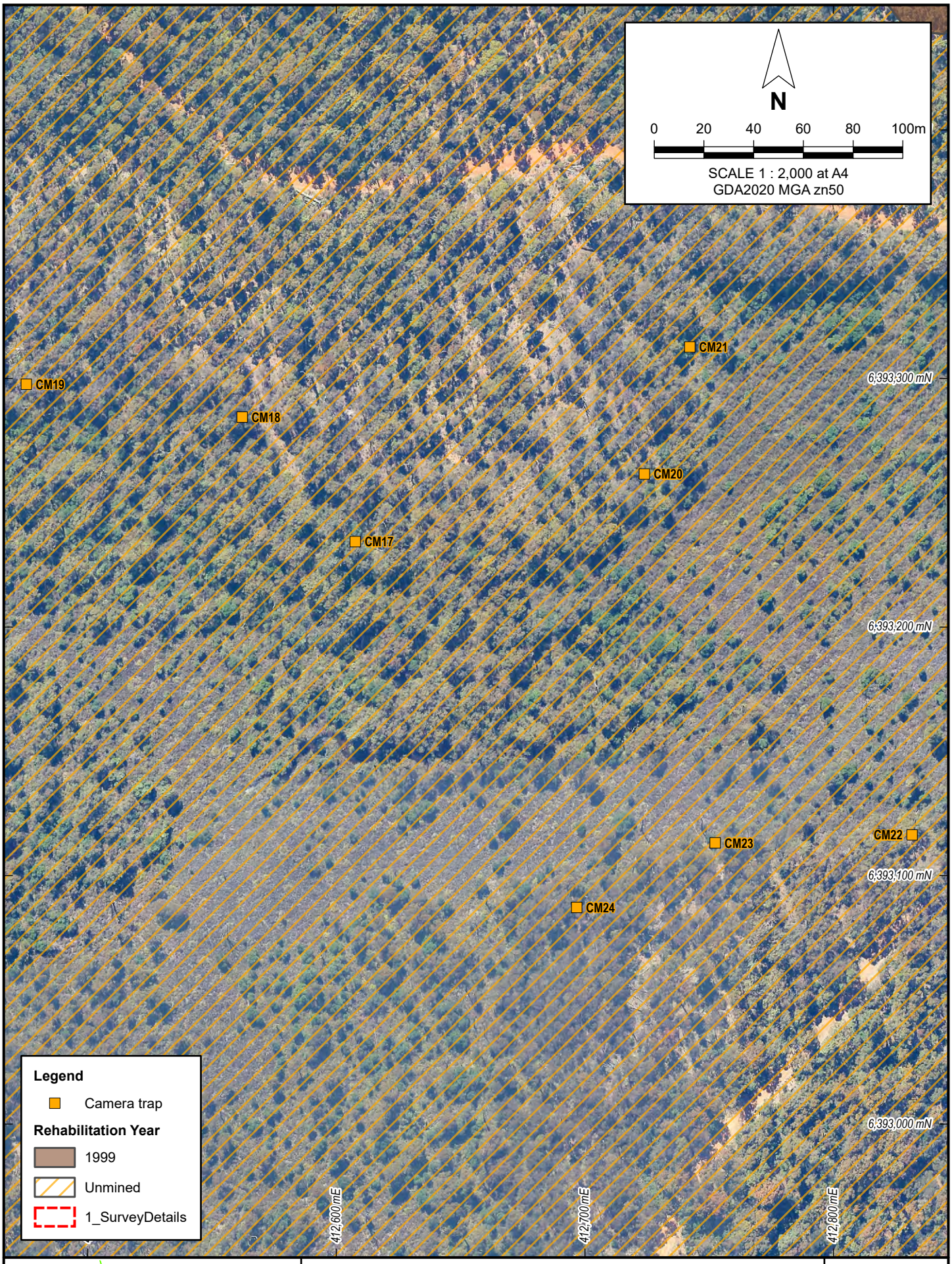
TERRESTRIAL ECOSYSTEMS

Alcoa of Australia Ltd
BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

Figure 16

CAMERA TRAP LOCATION - SITE 2

Drawn: S. Thompson | Date: 30 May 2023 | Job: 2022-0087



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TERRESTRIAL ECOSYSTEMS

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BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

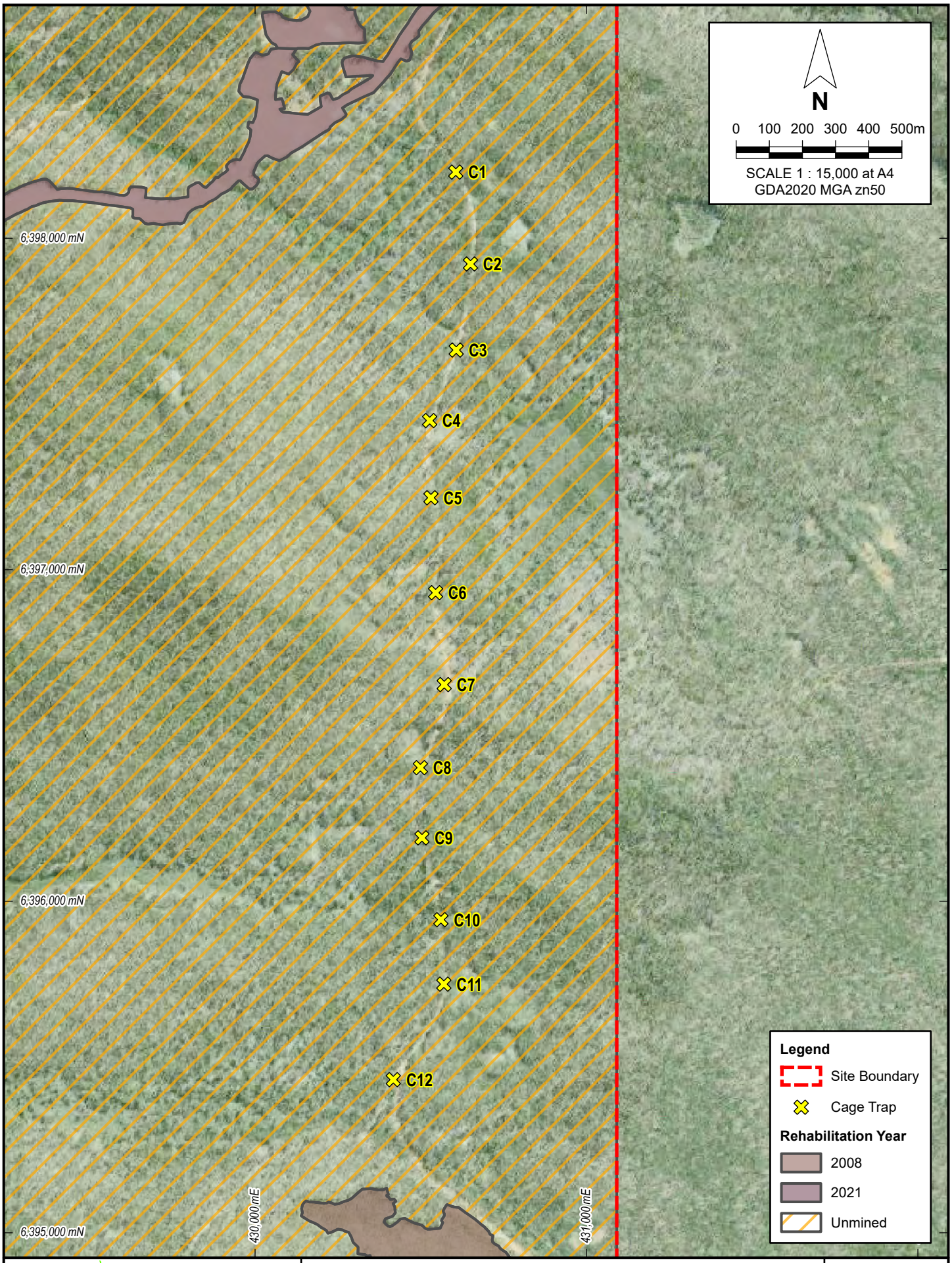
Figure 17

CAMERA TRAP LOCATION - SITE 3

Drawn: S. Thompson

Date: 30 May 2023

Job: 2022-0087



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TERRESTRIAL ECOSYSTEMS

Alcoa of Australia Ltd
BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

CAGE TRAPS - SITE 1

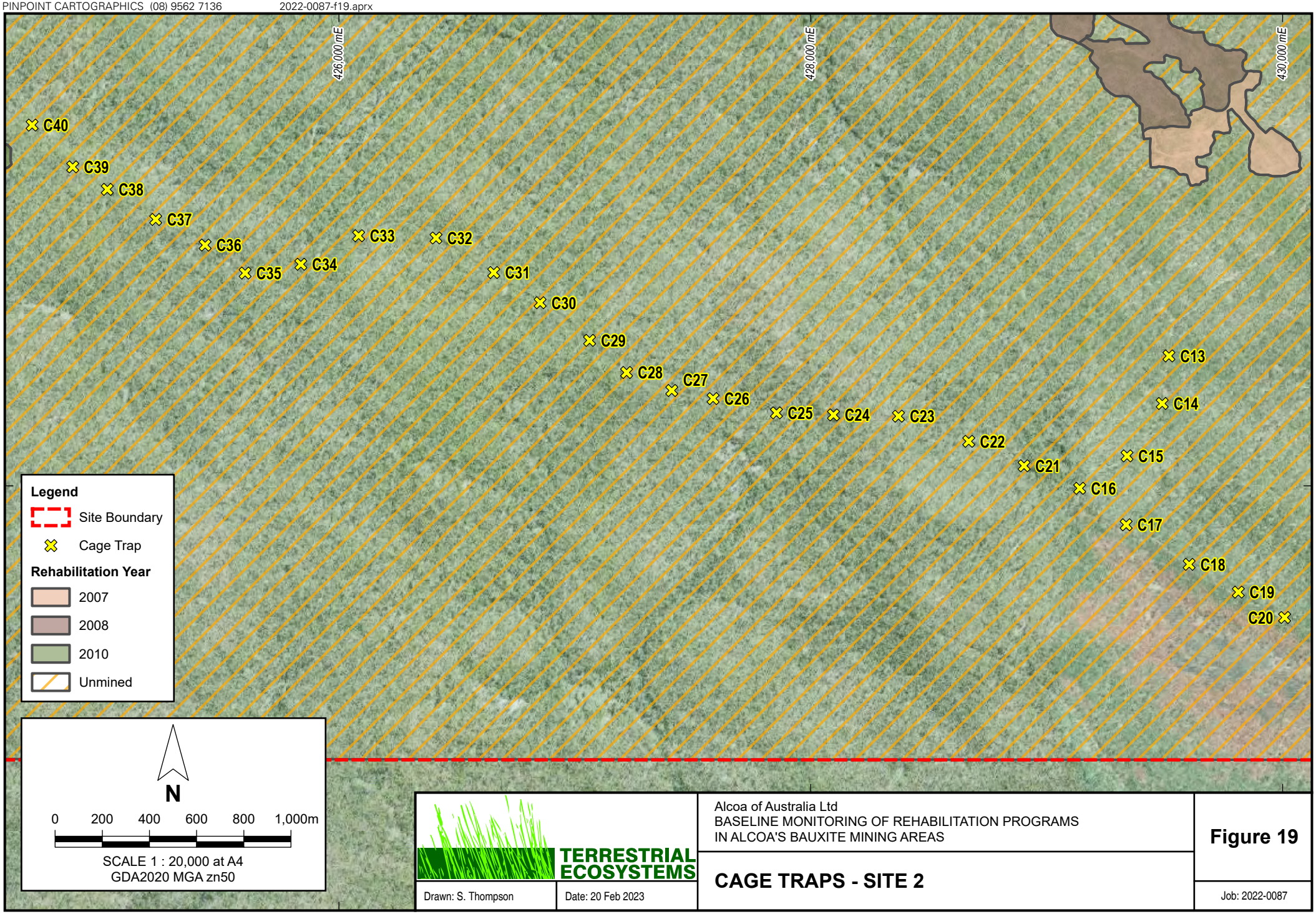
Figure 18

Drawn: S. Thompson

Date: 30 May 2023

Job: 2022-0087

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TERRESTRIAL ECOSYSTEMS

Drawn: S. Thompson

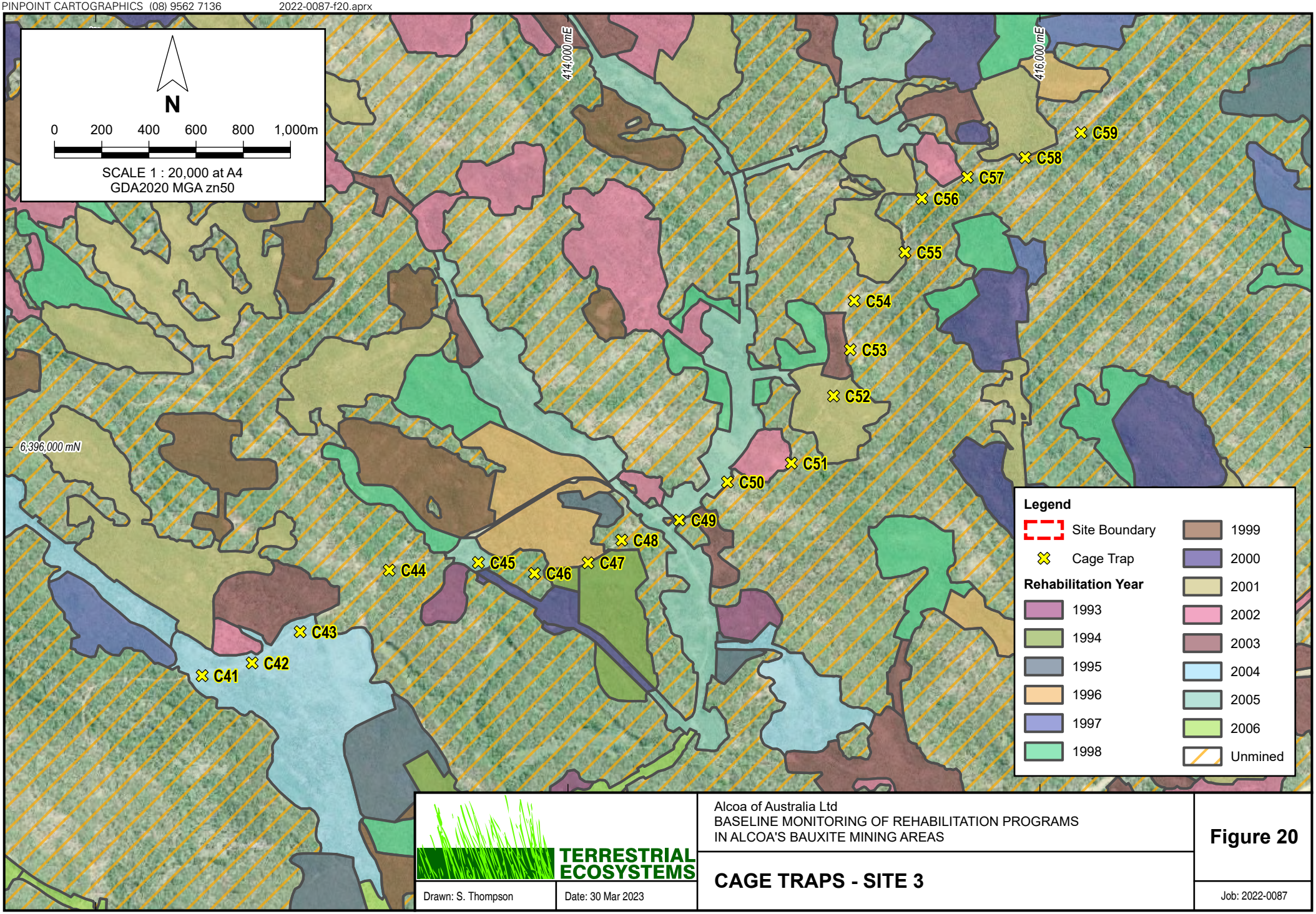
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Alcoa of Australia Ltd
BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

CAGE TRAPS - SITE 2

Figure 19

Job: 2022-0087



TERRESTRIAL ECOSYSTEMS

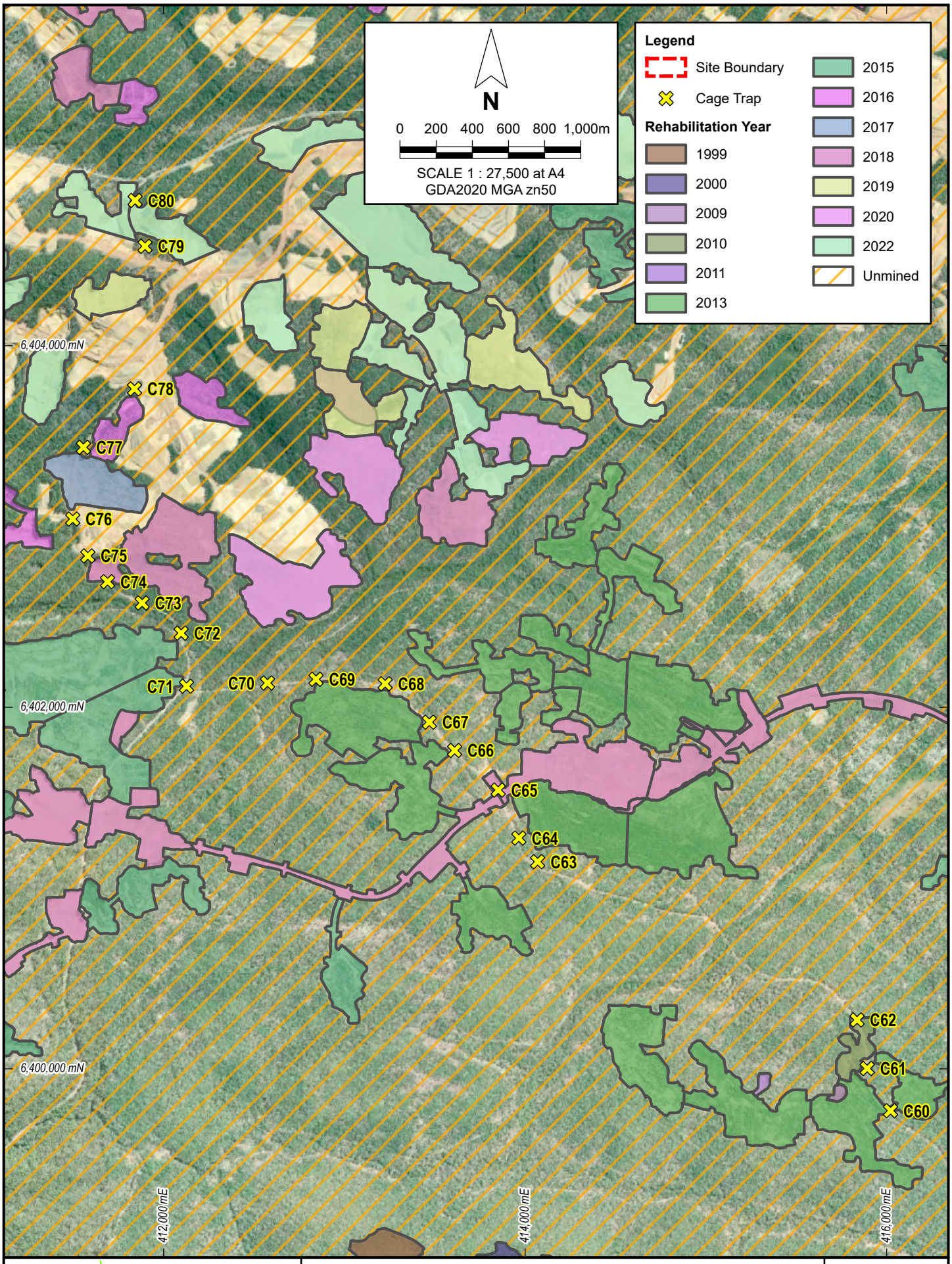
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Alcoa of Australia Ltd
BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

CAGE TRAPS - SITE 3

Figure 20

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TERRESTRIAL ECOSYSTEMS

Alcoa of Australia Ltd
BASELINE MONITORING OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS

Figure 21

CAGE TRAPS - SITE 4

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Appendix A.
Images of trapping sites

Baseline Monitoring of Rehabilitation Programs
Alcoa's Bauxite Mining Areas





Plate 16. Site 1 unmined



Plate 17. Site 1 unmined



Plate 18. Site 2 unmined



Plate 19. Site 2 unmined



Plate 20. Site 3 unmined



Plate 21. Site 3 unmined



Plate 22. Site 4 10-year rehabilitation



Plate 23. Site 4 10-year rehabilitation



Plate 24. Site 5 10-year rehabilitation



Plate 25. Site 5 10-year rehabilitation



Plate 26. Site 6 10-year rehabilitation



Plate 27. Site 6 10-year rehabilitation



Plate 28. Site 7 15-year rehabilitation



Plate 29. Site 7 15-year rehabilitation



Plate 30. Site 8 15-year rehabilitation



Plate 31. Site8 15-year rehabilitation



Plate 32. Site 9 5-year rehabilitation



Plate 33. Site 9 5-year rehabilitation



Plate 34. Site 10 5-year rehabilitation



Plate 35. Site 10 5-year rehabilitation



Plate 36. Site 10 5-year rehabilitation



Plate 37. Site 10 5-year rehabilitation



Plate 38. Site 10 15-year rehabilitation



Plate 39. Site 10 15-year rehabilitation

Appendix B.
Trapping site coordinates

Baseline Monitoring of Rehabilitation Programs
Alcoa's Bauxite Mining Areas



Table 8. Trap site coordinates and opening and closing dates

Trap #	Easting	Northing	Date opened	Date closed
Pit and funnel traps				
1.A	428680	6397362	9/1/2023	21/1/2023
1.B	428703	6397351	9/1/2023	21/1/2023
1.C	428729	6397339	9/1/2023	21/1/2023
1.D	428763	6397366	9/1/2023	21/1/2023
2.A	421553	6401260	9/1/2023	21/1/2023
2.B	421576	6401290	9/1/2023	21/1/2023
2.C	421531	6401223	9/1/2023	21/1/2023
2.D	421544	6401247	9/1/2023	21/1/2023
3.A	417176	6398886	9/1/2023	21/1/2023
3.B	417156	6398820	9/1/2023	21/1/2023
3.C	417115	6398794	9/1/2023	21/1/2023
3.D	417104	6398755	9/1/2023	21/1/2023
4.A	418660	6399587	9/1/2023	21/1/2023
4.B	418668	6399563	9/1/2023	21/1/2023
4.C	418676	6399540	9/1/2023	21/1/2023
4.D	418679	6399517	9/1/2023	21/1/2023
5.A	420382	6401508	9/1/2023	21/1/2023
5.B	420410	6401518	9/1/2023	21/1/2023
5.C	420455	6401509	9/1/2023	21/1/2023
5.D	420479	6401534	9/1/2023	21/1/2023
6.A	421911	6394117	9/1/2023	21/1/2023
6.B	421891	6394147	9/1/2023	21/1/2023
6.C	421879	6394180	9/1/2023	21/1/2023
6.D	421866	6394197	9/1/2023	21/1/2023
7.A	422922	6396018	9/1/2023	21/1/2023
7.B	422976	6396020	9/1/2023	21/1/2023
7.C	423016	6395981	9/1/2023	21/1/2023
7.D	423033	6396023	9/1/2023	21/1/2023
8.A	423113	6394130	9/1/2023	21/1/2023
8.B	423140	6394123	9/1/2023	21/1/2023
8.C	423198	6394134	9/1/2023	21/1/2023

Trap #	Easting	Northing	Date opened	Date closed
8.D	423235	6394132	9/1/2023	21/1/2023
9.A	416954	6409214	9/1/2023	21/1/2023
9.B	416922	6409229	9/1/2023	21/1/2023
9.C	416934	6409256	9/1/2023	21/1/2023
9.D	416851	6409271	9/1/2023	21/1/2023
10.A	409342	6407093	9/1/2023	21/1/2023
10.B	409343	6407071	9/1/2023	21/1/2023
10.C	409483	6407111	9/1/2023	21/1/2023
10.D	409398	6407197	9/1/2023	21/1/2023
11.A	409470	6405269	9/1/2023	21/1/2023
11.B	409550	6405274	9/1/2023	21/1/2023
11.C	409528	6405328	9/1/2023	21/1/2023
11.D	409563	6405316	9/1/2023	21/1/2023
12.A	421738	6395132	9/1/2023	21/1/2023
12.B	421743	6395166	9/1/2023	21/1/2023
12.C	421751	6395192	9/1/2023	21/1/2023
12.D	421715	6395118	9/1/2023	21/1/2023
Camera traps				
CM1	420985	6400559	8/01/2023	20/01/2023
CM2	421006	6400600	8/01/2023	20/01/2023
CM3	421043	6400615	8/01/2023	20/01/2023
CM4	421151	6400684	8/01/2023	20/01/2023
CM5	421136	6400664	8/01/2023	20/01/2023
CM6	421114	6400647	8/01/2023	20/01/2023
CM7	421083	6400625	8/01/2023	20/01/2023
CM8	421172	6400701	8/01/2023	20/01/2023
CM9	418788	6398676	8/01/2023	20/01/2023
CM10	418811	6398679	8/01/2023	20/01/2023
CM11	418851	6398676	8/01/2023	20/01/2023
CM12	418880	6398696	8/01/2023	20/01/2023
CM13	418716	6398674	8/01/2023	20/01/2023
CM14	418674	6398691	8/01/2023	20/01/2023
CM15	418603	6398676	8/01/2023	20/01/2023

Trap #	Easting	Northing	Date opened	Date closed
CM16	418555	6398638	8/01/2023	20/01/2023
CM17	412606	6393232	8/01/2023	20/01/2023
CM18	412561	6393283	8/01/2023	20/01/2023
CM19	412474	6393296	8/01/2023	20/01/2023
CM20	412722	6393260	8/01/2023	20/01/2023
CM21	412741	6393311	8/01/2023	20/01/2023
CM22	412830	6393114	8/01/2023	20/01/2023
CM23	412751	6393111	8/01/2023	20/01/2023
CM24	412695	6393085	8/01/2023	20/01/2023
Cage traps				
C1	430604	6398198	8/01/2023	18/1/2023
C2	430648	6397921	8/01/2023	18/1/2023
C3	430605	6397661	8/01/2023	18/1/2023
C4	430525	6397448	8/01/2023	18/1/2023
C5	430529	6397215	8/01/2023	18/1/2023
C6	430543	6396929	8/01/2023	18/1/2023
C7	430569	6396652	8/01/2023	18/1/2023
C8	430497	6396401	8/01/2023	18/1/2023
C9	430502	6396189	8/01/2023	18/1/2023
C10	430559	6395942	8/01/2023	18/1/2023
C11	430568	6395748	8/01/2023	18/1/2023
C12	430416	6395460	8/01/2023	18/1/2023
C13	429517	6390549	8/01/2023	18/1/2023
C14	429488	6390347	8/01/2023	18/1/2023
C15	429339	6390125	8/01/2023	18/1/2023
C16	429138	6389988	8/01/2023	18/1/2023
C17	429336	6389833	8/01/2023	18/1/2023
C18	429602	6389666	8/01/2023	18/1/2023
C19	429811	6389548	8/01/2023	18/1/2023
C20	430007	6389440	8/01/2023	18/1/2023
C21	428903	6390083	8/01/2023	18/1/2023
C22	428668	6390187	8/01/2023	18/1/2023
C23	428371	6390293	8/01/2023	18/1/2023

Trap #	Easting	Northing	Date opened	Date closed
C24	428095	6390299	8/01/2023	18/1/2023
C25	427853	6390307	8/01/2023	18/1/2023
C26	427585	6390368	8/01/2023	18/1/2023
C27	427410	6390402	8/01/2023	18/1/2023
C28	427218	6390478	8/01/2023	18/1/2023
C29	427061	6390614	8/01/2023	18/1/2023
C30	426852	6390774	8/01/2023	18/1/2023
C31	426655	6390902	8/01/2023	18/1/2023
C32	426410	6391048	8/01/2023	18/1/2023
C33	426082	6391058	8/01/2023	18/1/2023
C34	425837	6390937	8/01/2023	18/1/2023
C35	425601	6390900	8/01/2023	18/1/2023
C36	425432	6391018	8/01/2023	18/1/2023
C37	425222	6391127	8/01/2023	18/1/2023
C38	425017	6391254	8/01/2023	18/1/2023
C39	424871	6391350	8/01/2023	18/1/2023
C40	424699	6391527	8/01/2023	18/1/2023
C41	412449	6395031	8/01/2023	18/1/2023
C42	412661	6395085	8/01/2023	18/1/2023
C43	412864	6395217	8/01/2023	18/1/2023
C44	413242	6395477	8/01/2023	18/1/2023
C45	413619	6395510	8/01/2023	18/1/2023
C46	413857	6395464	8/01/2023	18/1/2023
C47	414084	6395509	8/01/2023	18/1/2023
C48	414226	6395605	8/01/2023	18/1/2023
C49	414471	6395690	8/01/2023	18/1/2023
C50	414674	6395851	8/01/2023	18/1/2023
C51	414945	6395931	8/01/2023	18/1/2023
C52	415124	6396216	8/01/2023	18/1/2023
C53	415194	6396412	8/01/2023	18/1/2023
C54	415211	6396619	8/01/2023	18/1/2023
C55	415426	6396824	8/01/2023	18/1/2023
C56	415498	6397052	8/01/2023	18/1/2023

Trap #	Easting	Northing	Date opened	Date closed
C57	415691	6397143	8/01/2023	18/1/2023
C58	415935	6397226	8/01/2023	18/1/2023
C59	416172	6397331	8/01/2023	18/1/2023
C60	416020	6399766	8/01/2023	18/1/2023
C61	415891	6399999	8/01/2023	18/1/2023
C62	415835	6400268	8/01/2023	18/1/2023
C63	414068	6401144	8/01/2023	18/1/2023
C64	413964	6401275	8/01/2023	18/1/2023
C65	413850	6401540	8/01/2023	18/1/2023
C66	413609	6401759	8/01/2023	18/1/2023
C67	413469	6401915	8/01/2023	18/1/2023
C68	413224	6402128	8/01/2023	18/1/2023
C69	412842	6402153	8/01/2023	18/1/2023
C70	412574	6402132	8/01/2023	18/1/2023
C71	412126	6402114	8/01/2023	18/1/2023
C72	412096	6402408	8/01/2023	18/1/2023
C73	411880	6402575	8/01/2023	18/1/2023
C74	411689	6402693	8/01/2023	18/1/2023
C75	411580	6402835	8/01/2023	18/1/2023
C76	411496	6403039	8/01/2023	18/1/2023
C77	411555	6403436	8/01/2023	18/1/2023
C78	411838	6403759	8/01/2023	18/1/2023
C79	411896	6404549	8/01/2023	18/1/2023
C80	411841	6404802	8/01/2023	18/1/2023

Appendix C. Vertebrate Fauna Recorded in Biological Surveys in the Region

Baseline Monitoring of Rehabilitation Programs
Alcoa's Bauxite Mining Areas



		Surveys	A	B		C							D		E			F
Family	Species	Common name		South	North	Site 3	Site 6	Site 4	Site 7	Site 5	Site 9	Site 8	Plot 5	Plot 6	Unknown	Lease		
Amphibians																		
Limnodynastidae	*Heleioporus barycragus*	Hooting Frog	X															
	Heleioporus eyrei	Moaning Frog	X	2														
	Heleioporus inornatus	Whooping Frog	X	2		1	1											
	Limnodynastes dorsalis	Western Banjo Frog	X					1										
	Neobatrachus pelobatoides	Humming Frog	X															
Myobatrachidae	*Crinia georgiana*	Quacking Frog	X	2	2	5	4	3	4	1			2					
	Crinia glauerti	Glauert's Frog	X		2	2									2			
	Crinia insignifera	Sin-bearing Froglet	X															
	Crinia pseudinsignifera	Bleating Froglet	X		2													
	Geocrinia leai	Lea's Frog	X		2		8			5					1			
	Pseudophryne guentheri	Gunther's Toadlet	X	2														
Pelodryadidae	*Litoria adelaidensis*	Slender Tree Frog	X	2	2										1			
	Litoria moorei	Motorbike Frog			2													
Reptiles																		
Agamidae	*Ctenophorus ornatus*	Ornate Crevice Dragon	X	2	2						1							
	Pogona minor	Western Bearded Dragon	X	2	2													
Carphodactylidae	*Underwoodisaurus milii*	Barking Gecko	X															
Diplodactylidae	*Diplodactylus lateroides*	Speckled Stone Gecko	X															
	Diplodactylus polyophthalmus	Spotted Sand Plain Gecko	X	2	2													
Diplodactylidae	*Oedura marmorata*	Marbled Velvet Gecko		2	2													
Elapidae	*Acanthophis antarcticus*	Southern Death Adder	X															
	Notechis scutatus	Tiger Snake	X	2	2										1			
	Suta gouldii	Gould's Snake	X	2	2													
	Suta nigriceps	Short-tailed Snake	X		2													
	Pseudonaja affinis	Dugite	X		2													
Gekkonidae	*Christinus marmoratus*	Marbled Gecko	X															
	Gehyra variegata	Variegated Gehyra	X															
Pygopodidae	*Aprasia parapulchella*	Pink-tailed Worm-lizard				1												
	Aprasia pulchella	Pretty Worm-lizard	X	2	2													
	Aprasia repens	Southwest Sandplain Worm Lizard	X															
	Lialis burtonis	Burton's Legless Lizard	X	2	2													
	Pygopus lepidopodus	Common Scaly-foot		2														
Pythonidae	*Morelia spilota*	Carpet Python	X															
Scincidae	*Acritoscincus trilineatus*	Western Three-lined Skink	X	2	2													
	Cryptoblepharus buchananii	Buchanan's Snake-eyed Skink	X	2	2					1				6	1			
	Ctenotus delli	Dell's Ctenotus	X	2	2								6					
	Ctenotus impar	Odd-stripped Ctenotus		2														
	Ctenotus labillardieri	Common South-west Ctenotus	X	2	2			2	1						2			
	Egernia kingii	King's Skink	X	2	2		2											
	Egernia napoleonis	Southwestern Crevice Skink	X	2	2	1	1	3							2			
	Hemiergis initialis	South-western Earless Skink	X	2	2			4	2				6		1			
	Lerista distinguenda	South-western Orange-tailed Slider	X	2	2				2				2					
	Lerista elegans	West Coast Four-toed Lerista	X															
	Liopholis pulchra	South-western Rock-skink	X															
	Lissolepis luctuosa	Western Mourning Skink	X	2	2													
	Menetia greyii	Common Dwarf Skink	X	2	2										1			
	Morethia obscura	Shrubland Pale-flecked Morethia	X	2	2	2		3	5				4		1			
	Tiliqua rugosa	Bobtail	X	2	2		2					3						
Typhlopidae	*Anilios australis*	Austral Blind Snake	X	2														
Varanidae	*Varanus gouldii*	Gould's Goanna	X	2														
	Varanus rosenbergi	Heath Monitor					1											
Mammals																		
Tachyglossidae	*Tachyglossus aculeatus*	Short-beaked Echidna		2	2										4			
Suidae	*Sus scrofa*	Pig		2											2			
Canidae	*Vulpes vulpes*	Red Fox													1			
Dasyuridae	*Sminthopsis fulinginosa*	Grey-bellied Dunnart	X															
Molossidae	*Austronomus australis*	White-striped Freetail Bat		2	2													
	Mormopterus planiceps	Southern Free-tail Bat	X	2														
Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat	X	2														
	Chalinolobus morio	Chocolate Wattled Bat	X		2													
	Falsistrellus mackenziei	Western False Pipistrelle																2
	Nyctophilus geoffroyi	Lesser Long-eared Bat	X	2														

		Surveys	A	B		C							D		E		F
Family	Species	Common name		South	North	Site 3	Site 6	Site 4	Site 7	Site 5	Site 9	Site 8	Plot 5	Plot 6	Unknown	Lease	
	Nyctophilus holtorum	Holt's Long-eared Bat	X		2												
	Nyctophilus major	Greater Long-eared Bat	X														
	Vespadelus regulus	Southern Forest Bat	X	2	2												
Dasyuridae	*Antechinus flavipes*	Yellow-footed Antechinus	X	2	2				2				50	58			
	Dasyurus geoffroii	Chuditch	X														
	Sminthopsis gilberti	Gilbert's Dunnart	X	2													
Burramyidae	*Cercartetus concinnus*	Southwestern Pygmy Possum	X														
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo	X	2	2										6		
	Notamacropus irma	Western Brush Wallaby	X	2	2										1		2
	Setonix brachyurus	Quokka	X														
Phalangeridae	*Trichosurus vulpecula*	Common Brushtail Possum											4	6			
Tarsipedidae	*Tarsipes rostratus*	Honey Possum	X														
Leporidae	*Oryctolagus cuniculus*	Rabbit	X												2		
Peramelidae	*Isoodon fusciventer*	Quenda	X	2	2								6	2	4		2
Muridae	*Mus musculus*	House Mouse		2	2												
	Rattus rattus	Black Rat	X			1						1					

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B Dunlop, J.N. and Associates and Ninox Wildlife Consulting (1987) *A Fauna Assessment of Four Water Supply Sources in the Darling Ranges. Raised Mundaring Dam, Raised Canning Dam, South Canning Dam, North Dandalup Dam*. Unpublished report for the Water Authority of Western Australia, Perth.

C Wardell-Johnson, G. (1982) *A Vertebrate Fauna Survey of the Western High Rainfall Forest of the Serpentine Area*. Unpublished report for Department of Conservation and Land Management, Perth.

D Kabay, D. (2009) Monitoring for *Wungong Catchment Forest Thinning Project KPII Fauna*. Unpublished report for Water Corporation, Perth.

E Ninox Wildlife Consulting (1989) *A Vegetation and Vertebrate Fauna Assessment of Seven Proposed Mining Areas near Jarrahdale, Western Australia*. Unpublished report for Metro Brick, Perth

F Ecologia Environment (2010) *Pipes and Pump Stations Joint Venture CW00803 Dwellingup New Source Targeted Survey for Mammals of Conservation Significanc*e. Unpublished report for the Water Corporation, Perth.


DETECTION DOG

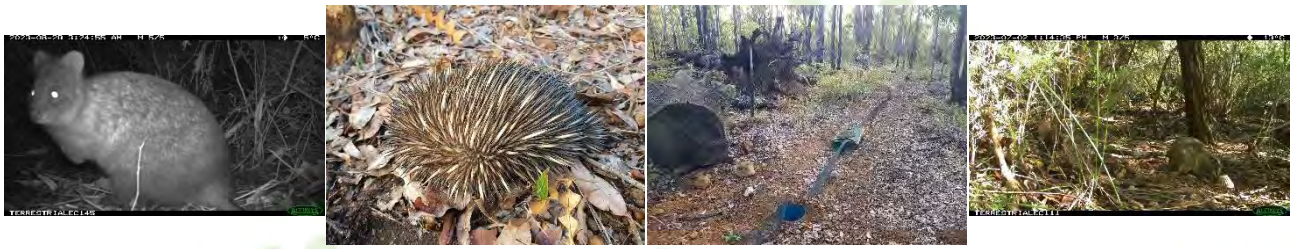
TERRESTRIAL ECOSYSTEMS

Baseline Monitoring of Rehabilitation Programs in Alcoa's Bauxite Mining Areas

Winter Survey

Prepared for: Alcoa of Australia Ltd

Version 1. October, 2023





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Prepared For: Alcoa of Australia Ltd
PO Box 172
Pinjarra WA 6208

Prepared By: Terrestrial Ecosystems
10 Houston Place
Mt Claremont WA 6010
Phone: 08 9385 2398, 0407 385 289
Website: www.terrestrialecosystems.com
ABN: 40921131346

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EXECUTIVE SUMMARY

Alcoa of Australia Ltd (Alcoa) has operated bauxite mines at Huntly and Willowdale east of Pinjarra in Western Australian since the 1970s. Once mining sites are no longer required, then they are rehabilitated with native vegetation. Alcoa has committed to monitoring the extent to which there is a progression toward the re-establishment of vertebrate fauna assemblages in these rehabilitated areas like that in selected analogue sites.

This is a report on the results of the second monitoring program. The first survey was undertaken in January 2023, and the results of the January and June-July 2023 surveys are compared and discussed. Comment and recommendations are provided on how Alcoa might enhance its program of establishing near-natural vertebrate fauna assemblages in rehabilitated areas.

1. INTRODUCTION

1.1 BACKGROUND

Alcoa of Australia Ltd (Alcoa) operates the Huntly and Willowdale bauxite mines east of Pinjarra in Western Australian on mineral lease ML1SA. The Huntly mine was established in 1972 and is located near Dwellingup and supplies bauxite ore to the Kwinana and Pinjarra refineries, as well as other clients. The Huntly mine currently includes locations at Myara, McCoy and Karnet. The Willowdale mine was established in 1984 and is located near Wagerup and supplies bauxite ore to the Wagerup refinery, as well as other clients. The Willowdale mine currently includes locations at Larego, Orion and Arundel.

The primary objective of Alcoa's bauxite mine rehabilitation program is to return a self-sustaining jarrah forest ecosystem after mining. This includes re-establishing populations of all faunal groups and species in densities and distributions required for maintaining forest biodiversity and ecosystem function. To ensure this objective is met, Alcoa established a long-term fauna monitoring program in 1991. This program characterises and monitors the key fauna of the areas in which Alcoa operates and assesses the impact of mining on these species.

1.2 SUCCESSION

Grant (2006) indicated that Alcoa's objective for its rehabilitation programs was to establish self-sustaining jarrah forest ecosystems. Grant (2006) went on to indicate that '*restored native ecosystems may be different in structure to the surrounding native ecosystems, but there should be confidence that they will change with time along with, or toward the structure and composition of the surrounding area*' and '*should be capable of withstanding disturbances such as fire or grazing*'. It has been presumed that this object is still applicable.

Primary succession is defined here as a process of change in the species structure of an ecological community over time from an assemblage that commences on barren or highly disturbed land to the climax community. This can be diagrammatically represented as shown in Plate 1.

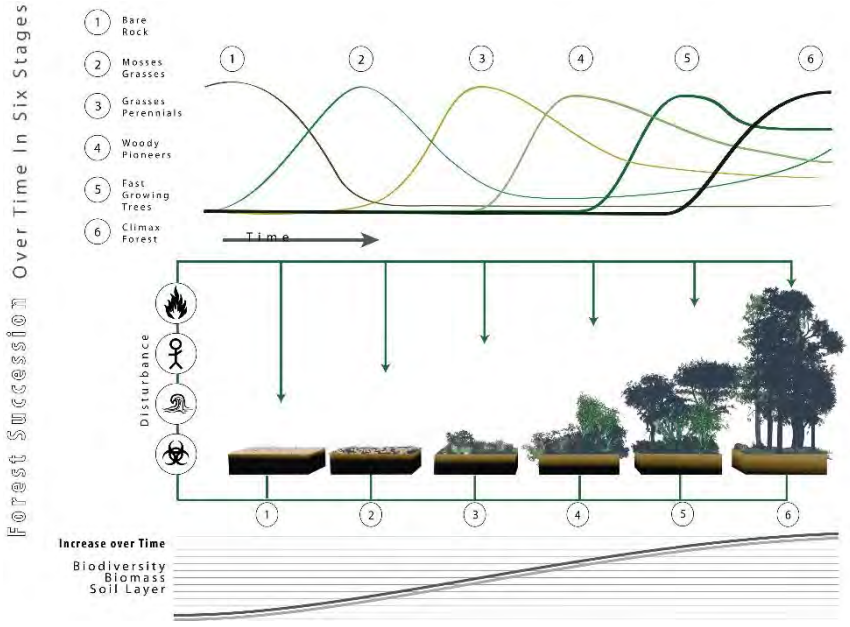


Plate 1. Conceptual diagram of primary succession

During the very early stages, very few terrestrial vertebrate species will colonise the area due to a lack of suitable habitat and there are likely to be higher levels of predation because of a lack of cover and retreat sites. Once the vegetation, invertebrates and microbial activity move through the succession stages and additional habitat niches become available, then more species can colonise the rehabilitated areas. In some cases, the abundance of early colonisers (i.e. pioneers) will be reduced due to competition and changing habitat conditions. Rehabilitated areas will cycle through many iterations of this process and along the way, species abundance typically increases, and the various species reach population levels suitable for the habitat and resources available, until such time it becomes a climax community.

Vertebrate fauna are only a part of the primary succession process and their progress from pioneering species toward a climax community is interrelated with the vegetation, fungi, microbial and invertebrate community development. Within broad boundaries, the trajectory in rehabilitated areas should be apparent in monitoring data (Plate 2).

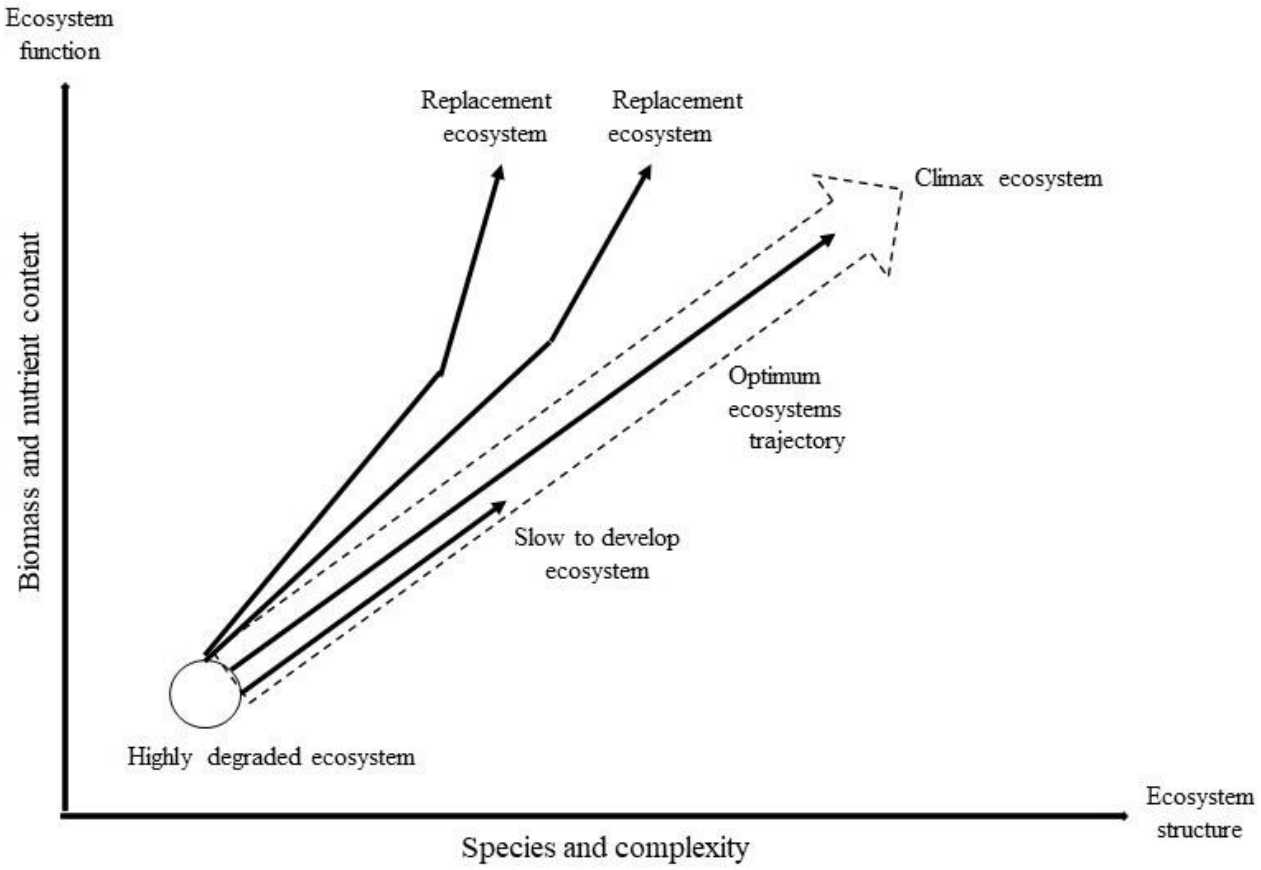


Plate 2. Primary succession trajectory(taken from: Bradshaw 1984)

Anderson et al. (2022) and Cross et al. (2019, 2021) argued that fauna have very often been forgotten in considering rehabilitation success with the focus on soils and vegetation. Anderson et al. (2022) went on to suggest a framework for incorporating fauna into the restoration process, and in doing so, identified the following five key criteria for effective faunal standards:

- appropriate reference ecosystem [analogue site(s)];
- faunal taxa to be considered;
- attributes of these taxa to be measured;
- acceptable level of similarity with reference conditions; and
- sampling methodology that is sufficiently robust to provide reliable comparative data.

1.3 OBJECTIVE

Alcoa's intention was to establish long-term monitoring sites for vertebrate fauna in unmined areas, and areas rehabilitated 5, 10 and 15-years ago. It was proposed that the vertebrate fauna at these sites would be periodically monitored to enable judgements to be made about the extent to which rehabilitated areas were progressing on a trajectory towards the recreation of functional ecosystems, like that in the unmined areas. Outcomes from these monitoring surveys would inform planning for future rehabilitated areas and where appropriate corrective action in existing rehabilitated areas.

Here we provide a description of the methods used to collect vertebrate fauna data, the results of the baseline monitoring program in winter, discussion of the results, a commentary on the program and a suggested way forward.

2. METHODS

The survey methodology adopted was identical to that implemented in the January 2023 monitoring survey.

2.1 PIT-TRAPPING PROGRAM

Twelve sites in the Jarrah Forest (Figures 1 and 2) were established by Alcoa (Plates 21-44). This included three unmined analogue sites, three sites that were rehabilitated in 2007 (i.e. 15-years old), three sites that were rehabilitated in 2012 (i.e. 10-years old) and three sites that were rehabilitated in 2017 (i.e. 5-years old).

At each site there were four near parallel drift fences 30m long with approximately 25cm of flywire above the ground. Along each drift fence there were three 20L PVC buckets, three PVC 150mm diameter pipes that were 400mm deep (Plate 4) and buried mid-line along the flywire drift fence. Three pair of funnels traps were deployed either side of the drift fence and three aluminium box traps were set approximately 10m to the side of the drift fence (Plate 5). Buckets used as pit-traps had holes and styrene sheets in the bottom to provide captured fauna protection from unfavourable environmental conditions. These traps targeted small mammals, reptiles and amphibians.

The location of trapping sites is shown in Figures 2-14 and the coordinates are provided in Appendix B. Traps were opened on 27 June and closed on 9 July 2023.

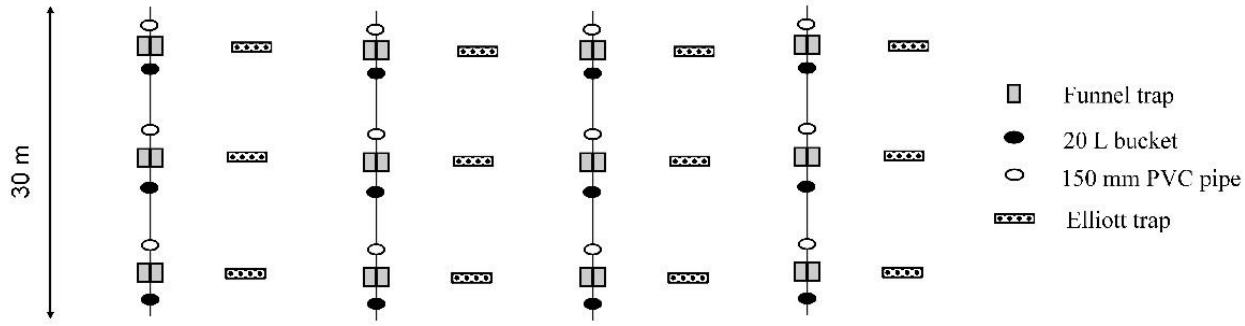


Plate 3. Trapping site layout



Plate 4. Pit-fall trap on a drift fence



Plate 5. Pair of funnel traps on a drift fence

2.2 CAGE TRAPPING PROGRAM

Eighty cage traps (Plate 6) targeting Chuditch (*Dasyurus geoffroii*) were deployed adjacent to gravel tracks where Alcoa believed that there may have been Chuditch. Trapping sites were selected by Alcoa on the basis that some were inside the mining area and comprised a variety of levels of disturbance (i.e. rehabilitation of various ages and remnant vegetation), and the others were outside the mine perimeter in unmined forest (Figures 18-21).

Cage traps were baited with raw chicken necks which were replaced every three days or as required. Cage traps were set up on 26 June and removed on 8 July 2023.



Plate 6. Baited cage trap

2.3 CAMERA TRAPS

Camera traps targeted the medium and large mammals, but any fauna recorded were reported.

Twenty-four camera traps (Reconyx HC600) were deployed in the denser vegetation targeting Quokka (*Setonix brachyurus*) and Quenda (*Isoodon fusciventer*; Figures 15-17). Each camera trap had a non-reward lure (Plate 7) placed ~3-4m in front of the camera trap (Plate 8) in the detection zone. Lures were a mixture of peanut butter, rolled oats and sardines topped up with mullie oil. Camera traps were deployed on 26 June and retrieved on 8 July 2023.



Plate 7. Non-reward lure



Plate 8. Mounted camera trap

2.4 INVERTEBRATE SAMPLING

Each trapping site was searched for invertebrates for one hour by two people for the following taxonomic groups: isopods, diplopods, opiliones, scorpions, mygalomorph spiders and pseudoscorpions. Specimens were preserved in ethanol but not identified. In addition, specimens from these taxonomic groups caught in pit and funnel traps were also collected and preserved. All specimens were given to Alcoa for identification and analysis.

2.5 DATA ANALYSIS

There were insufficient individual animals caught at the trapping sites to undertake any meaningful analysis. Some comparisons between what was caught and recorded in the January and July 2023 surveys has been provided in the discussion. All animal identifications were done by field staff.

2.6 STAFF

The field work was undertaken by Dr James Barr, Tom Raymond, Brody Altus, Stelleena Mackay, Mitch Plozza and Isaac Cable. Dr Graham Thompson drafted the report and it was reviewed by Dr Scott Thompson before being submitted to Alcoa for comment and review. As an EIANZ Certified Environmental Practitioner [CEnvP (Ecology Specialist)], Scott is appropriately qualified to sign off on the final report.

3. RESULTS

3.1 WEATHER

Compared with the January 2023 survey period, the June-July trapping was much cooler (Table 1). There was only one day of very light rain in January, whereas it rained on 12 days during the June-July survey period, although rain was light on many days.

Table 1. Weather data for the January and the June-July surveys (BOM ID 94620 Dwellingup)

Date	Min. T°	Max. T°	Max. rainfall	Date	Min. T°	Max. T°	Max. rainfall
7/1/2023	12.6	27.1	0	25/6/2023	6.2	11.9	4.4
8/1/2023	12.4	30.8	0	26/6/2023	3	12.9	0.2
9/1/2023	14.3	36.5	0	27/6/2023	-0.9	15.2	0
10/1/2023	18.9	35.5	0.8	28/6/2023	2.1	14.0	0.2
11/1/2023	17.1	29.1	0	29/6/2023	1	14.8	0
12/1/2023	13.6	31.9	0	30/6/2023	-0.2	15.0	0
13/1/2023	13.8	27.5	0	1/7/2023	-0.1	15.8	0.2
14/1/2023	11.9	28.5	0	2/7/2023	0.8	16.9	0.2
15/1/2023	11.5	31.8	0	3/7/2023	6	15.4	6.4
16/1/2023	13.4	25.2	0	4/7/2023	7.5	12.7	37.0
17/1/2023	9.8	26.6	0	5/7/2023	7.7	12.7	17.8
18/1/2023	11.9	30.0	0	6/7/2023	6.2	14.6	2.8
19/1/2023	13.1	33.8	0	7/7/2023	9.1	15.6	5.0
20/1/2023	16.2	35.5	0	8/7/2023	7.8	17.0	5.2
21/1/2023	18.8	38	0	9/7/2023	8.5	16.9	0.2

3.2 TRAPPING RESULTS

The location of trapping sites is shown in Figures 1-21 in the appendices. All vertebrate fauna caught in pit, funnel and aluminium box traps are shown in Table 2.

Table 2. Trapping data results

		Survey site status	Unmined	Unmined	Unmined	15-year rehabilitation	15-year rehabilitation	15-year rehabilitation	10-year rehabilitation	10-year rehabilitation	10-year rehabilitation	5-year rehabilitation	5-year rehabilitation	5-year rehabilitation	Total
Taxa	**Family**	**Species** **Survey sites**	**1**	**2**	**3**	**7**	**8**	**12**	**4**	**5**	**6**	**9**	**10**	**11**	
Frogs	Myobatrachidae	*Crinia georgiana*		9	5		7		8	8	4	36	26	6	109
		Crinia insignifera											1		1
	Pelodryadidae	*Litoria adelaidensis*											1		1
Mammals	Dasyuridae	*Antechinus flavipes*	4	11	2		3	8	2	1	6				37
		Sminthopsis sp.	2						1				1	1	5
	Burramyidae	*Cercartetus concinnus*									1				1
	Muridae	*Mus musculus*				1							2	1	4
Reptiles	Scincidae	*Cryptoblepharus buchananii*											1		1

We are unsure of the identity of the *Sminthopsis* spp. and an individual has been lodged with the Western Australian Museum for identification.

3.3 CAGE TRAP RESULTS

Vertebrate fauna caught in cage traps are shown in Table 3.

Table 3. Fauna caught in a cage traps

			Trap numbers																						
			Unmined	Reh. 2004	Reh. 2004	Reh. 2005	Unmined	Unmined	Unmined	Reh. 2005	Reh. 2001	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined
Taxa	**Family**	**Species**	**18C**	**42C**	**43C**	**45C**	**47C**	**48C**	**49C**	**50C**	**52C**	**53C**	**54C**	**5C**	**60C**	**67C**	**68C**	**69C**	**70C**	**72C**	**73C**	**76C**	**77C**	**78C**
Mammals	Dasyuridae	*Dasyurus geoffroii*	1	3	6	1	2	1	2	2	4		1		1	1		1	1	1	2	1	1	1
	Tachyglossidae	*Tachyglossus aculeatus*										1		2										
	Peramelidae	*Isoodon fusciventer*									1						1							

Thirteen of the 17 female (33 in total) Chuditch had 3-5 pouch young and one Chuditch was a recapture.



Plate 9. Echidna



Plate 10. Buchanan's Snake-eyed Skink



Plate 11. Dunnart



Plate 12. Chuditch pouch young



Plate 13. Releasing a Chuditch



Plate 14. Chuditch in a trap

3.4 RESULTS BY TRAP TYPE

Vertebrate fauna caught by trap type are shown in Table 4.

Table 4. Vertebrate fauna recorded by trap type

Taxa	Family	Species	Aluminium box trap	Bucket pit trap	Cage trap	Funnel	Pipe pit trap
Frogs	Myobatrachidae	*Crinia georgiana*		70		9	30
	Pelodryadidae	*Litoria adelaidensis*				1	
Mammals	Dasyuridae	*Antechinus flavipes*	30	3		1	3
		Dasyurus geoffroii			33		
		Sminthopsis sp.		1			4
	Burramyidae	*Cercartetus concinnus*					1
	Tachyglossidae	*Tachyglossus aculeatus*			3		
	Peramelidae	*Isoodon fusciventer*			2		
	Muridae	*Mus musculus*	1	1			2

Taxa	Family	Species	Aluminium box trap	Bucket pit trap	Cage trap	Funnel	Pipe pit trap
Reptiles	Scincidae	*Cryptoblepharus buchananii*					1
Total			31	75	38	11	41

3.5 CAMERA TRAPPING RESULTS

Vertebrate fauna recorded by camera traps are shown in Table 5.

Table 5. Camera trap results

			Camera trap numbers																							
			Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined	Unmined
Taxa	Family	Species	CM1	CM2	CM3	CM4	CM5	CM6	CM7	CM8	CM9	CM10	CM11	CM12	CM13	CM14	CM15	CM16	CM17	CM18	CM19	CM20	CM21	CM22	CM23	CM24
Bird	Alcedinidae	*Dacelo novaeguineae**																								1
	Acanthizidae	*Sericornis frontalis*	1	2		1	2	1		1	2															
	Maluridae	*Malurus elegans*	1	2		1	2	1	1	3						1										
		Malurus sp.													3											
		Malurus splendens													1											
	Pachycephalidae	*Pachycephala pectoralis*										1														
	Rhipiduridae	*Rhipidura albiscapa*		2			1					1														
Mammals	Suidae	*Sus scrofa**											1					1								
	Dasyuridae	*Antechinus flavipes*		1	1	1	2	2	2	1				1	2	1	1									1
		Dasyurus geoffroii									1	2	1	1	1	1		2								
		Sminthopsis sp.			1																					
	Macropodidae	*Macropus fuliginosus*																		1			1			
		Setonix brachyurus										3	2	2	2	3										
	Peramelidae	*Isoodon fusciventer*									2	2	2	2	2	2		1		1	1	1	1	1		2
	Muridae	*Mus musculus**	1	1		1	1						1		1	2	1	1			1		1	1		
		*Rattus rattus**	1	2	1	2	1	2	1	1											1		1	1	1	

* non-native species

One Fairywren was unable to be identified, and as indicated above, the *Sminthopsis* spp. has been lodged with the Western Australian Museum for identification.



Plate 15. Chuditch



Plate 16. Quenda



Plate 17. Black Rats



Plate 18. Quokkas



Plate 19. Quokka



Plate 20. Pig

In addition, two *Hemiergis initialis* were observed near trapping site 3, and a *Crinia insignifera* near trapping site 10 during the collection of invertebrates, and *Notamacropus irma* were recorded between cages 68-69, two *Sus scrofa* were recorded between trapping sites 3 and 4, and another was recorded crossing the road near the entry to Alcoa Myara mine site.

4. DISCUSSION

4.1 PIT, FUNNEL AND ALUMINIUM BOX TRAPS

The pit, funnel and aluminium box trapping program predominantly caught frogs in the June-July 2023 survey period, and in particular *Crinia georgiana* (Quacking Frog), and most of these captures were in the rehabilitation sites. Many fewer frogs were caught during the January 2023 survey period, which was expected because it was hotter and there had been much less rain in the summer period.

Forty- nine *Antechinus flavipes* (Yellow-footed Antechinus) were caught in the January survey compared to 37 in the June-July survey, which was similar, but 66 *Cercartetus concinnus* (Western Pygmy Possum) were caught in the January survey compared with one in the June-July survey period. Thompson (2004) similarly recorded large variations in the capture of *C. concinnus* in pit-traps in the Goldfields, and this is probably due to the abundance of nectar producing plants that are flowering at the time and the ambient temperature. In cold weather, *C. concinnus* enters torpor and if found it is typically curled up in a ball and immobile. Based on the data recorded in the January 2023 survey, these pygmy possums are present in most of the survey sites, but the June-July survey indicates that they are only caught when they move around.

Antechinus flavipes was predominantly caught in the older rehabilitated areas and unmined area in both the January and June-July surveys. This species is probably one of the early colonisers, as it is a mobile and a widely foraging dasyurid.

The capture of a single reptile in the trapping program (i.e. *Cryptoblepharus buchananii*; Buchanan's Snake-eyed Skink) is typical of what occurs in cold weather, as most of the small reptiles that warm up quickly and are active during winter have very small home ranges and therefore are less likely to be trapped, and the larger reptiles are generally inactive and therefore not caught.

Like the January survey, most of the *Mus musculus* (House Mouse) caught in the June-July survey were in the more recent rehabilitation areas being mobile and early colonisers (Thompson and Thompson 2007).

Overall, there was insufficient data to draw any conclusions about patterns of succession from the pit, funnel and aluminium box trapping data.

Table 6. Comparison of trapping results for the January and June-July 2023 surveys

		Survey site status	Unmined		Unmined		Unmined		15-year rehabilitation		15-year rehabilitation		15-year rehabilitation		10-year rehabilitation		10-year rehabilitation		10-year rehabilitation		5-year rehabilitation		5-year rehabilitation		5-year rehabilitation		Total	
Taxa	**Family**	**Species** **Survey sites**	**1**		**2**		**3**		**7**		**8**		**12**		**4**		**5**		**6**		**9**		**10**		**11**			
			Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul	Jan	Jul
Amphibian	Limnodynastidae	*Heleioporus eyrei*					2																				2	
		Heleioporus inornatus	1																								1	
	Myobatrachidae	*Crinia georgiana*			2	9		5				7			1	8		8		4	1	36		26		6	4	109
		Crinea insignifera																						1				1
	Pelodryadidae	*Litoria adelaidensis*																						1				1
Mammal	Burramyidae	*Cercartetus concinnus*	3		2		1		23		13		8		3				12	1					1		66	1
	Dasyuridae	*Antechinus flavipes*		4	1	11	14	2	5		1	3	4	8	11	2	7	1	2	6	2		2				49	37
		Sminthopsis gilberti					1		2		1		2		5				1		2		1		2		17	
		Sminthopsis sp.		2												2								1		1		
	Muridae	*Mus musculus*								1							1		1		6			2	5	1	13	4
Reptile	Agamidae	*Pogona minor*							3		1						2		2						1		9	
	Carphodactylidae	*Underwoodisaurus milii*	2		2												2				1		3		3		13	
	Diplodactylidae	*Diplodactylus lateroides*			1				1		1								1		2		6		1		13	
		Diplodactylus polyophthalmus							1						1										1		3	
	Elapidae	*Suta gouldii*							1										1								2	

		Survey site status	Unmined		Unmined		Unmined		15-year rehabilitation		15-year rehabilitation		15-year rehabilitation		10-year rehabilitation		10-year rehabilitation		10-year rehabilitation		5-year rehabilitation		5-year rehabilitation		5-year rehabilitation		Total	
		Suta nigriceps	1														3										4	
	Gekkonidae	*Christinus marmoratus*																							1		1	
	Pygopodidae	*Lialis burtonis*																	1								1	
	Scincidae	*Acritoscincus trilineatus*			7		2		9		6		9		1		12		9				1		3		59	
		Cryptoblepharus buchananii	3		7		2														1			1			13	1
		Egernia napoleonis	13		5		1										1										20	
		Hemiergis initialis	2		4						2		2				5										15	
		Lerista distinguenda	11		15		11		3		4						3		6		1						54	
		Lerista elegans			1				1								3										5	
		Menetia greyii	3				1		4		4				2		1		3		1		6		7		32	
		Morethia obscura	14		13		2		7		7		4		4		6		9		9		1		4		80	
		Tiliqua rugosa									1																1	
	Typhlopidae	*Anilios australis*			5						1						1		1								8	

4.2 CAGE TRAPS

Many more *D. geoffroii* (Chuditch) were caught in June-July (i.e. 33) than January 2023 (i.e. 12). Pouch young (i.e. 3-5) were present in 13 of the 17 females caught. If conditions were suitable, and most of the pouched young survived to join the adult population, then there would be a doubling of the population.

The number of *Isoodon fusciventer* (Quenda) caught in cage traps was the same for both survey periods (i.e. 2), with three *Tachyglossus aculeatus* (Echidna) being caught in the June-July survey and one in the January survey.

4.3 CAMERA TRAPS

Many more *Sus scrofa* (feral pigs) were recorded during the January survey than the June-July survey. This variability is almost certainly due to the pigs mobility and preference for wetter areas. In the summer months the pigs might prefer the cooler wetter creek areas but disperse more widely during winter as the wetter areas are more common. As was the case for the cage trapping program, many more *D. geoffroii* were recorded in the June-July period compared with the January period. The copulating period for *D. geoffroii* had mostly finished and it might be expected that there would be a die-off of the adult male cohort before summer.

Of interest is the huge variation in the number of *Macropus fuliginosus* (Western Grey Kangaroo) recorded by camera traps, with two recorded in the June-July survey and 24 in the January survey. *Macropus fuliginosus* is patchy and obviously moves around the Jarrah forest, and the same is probably true for *Notamacropus irma* (Western Brush Wallaby) which were recorded on camera traps in January and not at all in the June-July survey period. These macropods may also favour the cooler wetter environments which were the targeted areas for camera trapping and spatially restricted in summer.

Many more *I. fusciventer* were recorded in the June-July (i.e. 20) survey than in the January (i.e. 5) survey, and there is a similar pattern for *Setonix brachyurus* (Quokka) with 12 recorded in the June-July survey and six recorded in the January survey. As with the larger macropods (e.g. *M. fuliginosus*) both of these mammals are quite mobile, and camera trapping surveys can indicate presence, but unless there is a specific method of identifying individuals (i.e. body fur pattern), then they are not a good measure of abundance.

4.4 WINTER VS SUMMER SURVEY

Ambient weather conditions had a notable impact on the surface activity of reptiles, with many fewer reptiles recorded during the cooler months than during the summer. This pattern was expected as it is also evident at other localities such as the Goldfields (Thompson 2004, Thompson and Thompson 2005). Many mammal species activity patterns are less affected by weather so there is less temporal variation in the trapping data, but species that enter torpor (e.g. *C. concinnus*) can be less active during the cold weather, and are therefore less likely to be trapped.

4.5 SPATIAL AND TEMPORAL VARIATIONS

One of the most significant outcomes of the comparison of two monitoring surveys undertaken (i.e. January and June-July 2023) is the appreciable spatial and temporal variation in the vertebrate fauna assemblage (see species and abundance variation in Table 6). The PCAs for the January survey (Charts 1 and 2) indicate appreciable variability within trapping sites for the unmined and the three categories of rehabilitation. If there was sufficient data for the June-July survey (which there isn't), then a similar spread among PCA scores for similar aged habitats is also likely to be recorded. This indicates the degree of spatial variability.

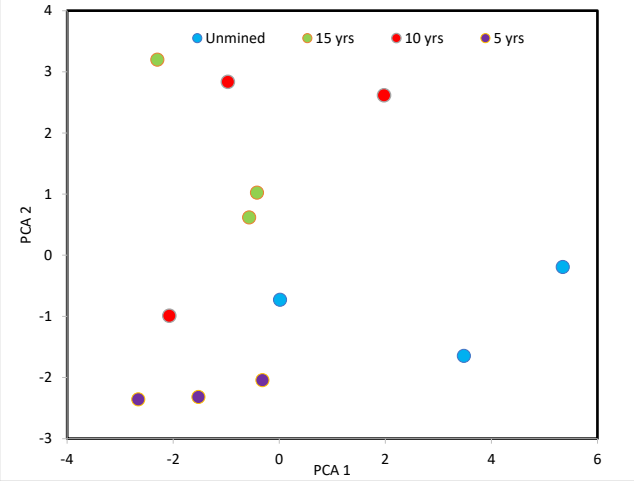


Chart 1. PCAs 1 and 2

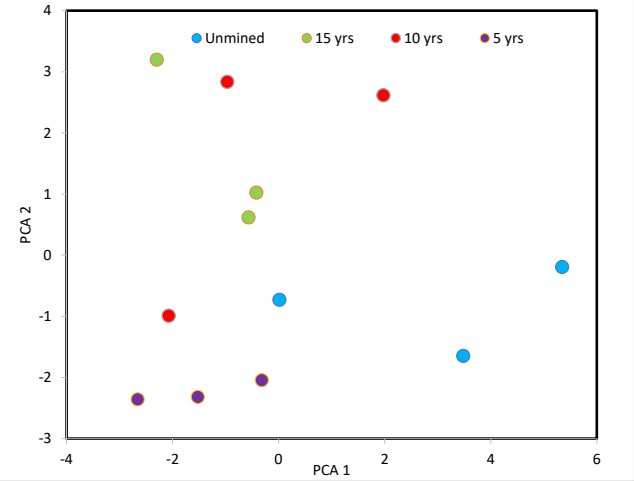


Chart 2. PCAs 1 and 3

Differences in the vertebrate fauna assemblage recorded using pit and funnel traps, cage traps and camera traps between the January and June-July surveys indicate very notable differences (see Table 6). Many of these differences are to be expected because of the variation in weather conditions (e.g. low reptile numbers during the winter survey period) and the mobility of species (e.g. camera trapping records for *M. fuliginosus* and *N. irma*). Therefore, comparison among capture records for different survey periods of the year are likely to provide spurious results if used for the purposes of monitoring succession over numerous years. However, it was not Alcoa's intention to compare the summer and winter results, rather to get a better appreciation of the vertebrate species in the various areas.

4.6 COMMENT

The high-level objective of these monitoring surveys is to mitigate potential impacts of bauxite mining on the vertebrate fauna in the northern Jarrah forest. Measuring outcomes of rehabilitation programs is an important part of this process, as it enables Alcoa to amend and fine-tune its rehabilitation programs, and to indicate to the environmental regulators and other stakeholders the success or otherwise of its rehabilitation programs in recreating self-sustaining, functional ecosystems.

Based on the data accumulated during the January 2023 survey, the current monitoring program requires adjustment, as the analogue sites for the rehabilitated areas appear not to be appropriate given the spatial variability in the vertebrate fauna assemblages in the unmined, and possibly older rehabilitated sites of the northern Jarrah forest. Given that it is the fauna assemblages in the unmined areas adjacent to the rehabilitated sites that are the primary source populations for the colonising fauna species in the rehabilitated areas, analogue survey sites should be near these areas. This will obviously require new survey sites to be established.

Many of the vertebrate fauna caught and recorded in the monitoring program are common, widespread and abundant, and given the mosaic disturbance pattern undertaken by Alcoa to mine bauxite in the northern Jarrah forest, the mining program is unlikely to threaten any of these common species. However, the northern Jarrah forest mining area is home to numerous threatened species (i.e. *S. brachyurus*, *D. geoffroii*, *I. fusciventer* and *N. irma*) and also home to a few feral vertebrate pest species (*Vulpes vulpes* (fox), *Felis catus* (cat), *S. scrofa*, *Rattus rattus* (Black Rat) and *M. musculus*). The fox is a known serious predator of *S. brachyurus*, *D. geoffroii* and *I. fusciventer* and the pigs are destroying habitat and ecosystems that that are crucial to the survival of these same species. Other than anecdotal information, little is known about the spatial distribution of *S. brachyurus*, *D. geoffroii*, *I. fusciventer, V. vulpes* and *S. scrofa* in the northern Jarrah forest areas mined by Alcoa. It is suggested that Alcoa focus on increasing the local population of threatened species and a reduction in the feral predators, as this will also have positive outcomes for the other native fauna in the Jarrah forest.

The camera and cage trapping program in June-July 2023 provided useful information about the abundance of these threatened species in selected areas, but the pit, funnel and aluminium box trapping program caught too few animals to be a useful monitoring tool.

The cage trapping programs targeted *D. geoffroii*, and they were also recorded in the camera trapping program. Cage trapping involves a stress on the animals, and it should therefore be avoided unless there is no other alternative to obtaining the same robust data. In this situation, camera traps can record the presence of Chuditch, and given that they have a unique spot pattern, most can be individually identified and therefore a cage trapping program would not be required. A few Quenda were caught in the cage trapping program, but the bait used was not very suitable for this species; Quenda were also recorded on camera traps. It is therefore suggested that cage traps are not used in future trapping programs, and an individual Chuditch identification program is used in its place based on a broader camera trapping network.

4.7 RECOMMENDATIONS

It is recommended that:

- the analogue sites for the rehabilitation areas be relocated to the unmined areas adjacent to the rehabilitated areas that are being monitored;
- the summer (i.e. January) surveys are used in the monitoring of rehabilitated and unmined areas only using pit, funnel and aluminium box traps;
- a program is developed to increase the population of *S. brachyurus*, *D. geoffroii* and *I. fusciventer* in mining areas, and in rehabilitated areas. This program will initially focus on identifying the location and abundance of these species and areas of *V. vulpes* and *S. scrofa* activity with a view to developing a long-term conservation plan that will increase the population of these threatened species; and
- the cage trapping program targeting Chuditch be replaced with camera trapping and a spot recognition analysis to determine relative abundance across the areas.

5. REFERENCES

Andersen, A. N., L. D. Einoder, A. Fisher, B. Hill, and S. K. Oberprieler. 2022. Faunal standards for the restoration of terrestrial ecosystems: a framework and its application to a high-profile case study. Restoration Ecology **31**.

Bradshaw, A. D. 1984. Ecological principles and land reclamation practice. Landscape Planning **11**:35-48.

Cross, S. L., P. W. Bateman, and A. T. Cross. 2019. Restoration goals: Why are fauna still overlooked in the process of recovering functioning ecosystems and what can be done about it? Ecological Management & Restoration.

Cross, S. L., H. S. Bradley, E. P. Tudor, M. D. Craig, S. Tomlinson, M. J. Bamford, P. W. Bateman, and A. T. Cross. 2021. A life-of-mine approach to fauna monitoring is critical for recovering functional ecosystems to restored landscapes. Restoration Ecology.

Grant, C. D. 2006. State-and-Transition Successional Model for Bauxite Mining Rehabilitation in the Jarrah Forest of Western Australia. Restoration Ecology **14**:28-37.

Thompson, G. G., and S. A. Thompson. 2007. Early and late colonizers in mine site rehabilitated waste dumps in the Goldfields of Western Australia. Pacific Conservation Biology **13**:235-243.

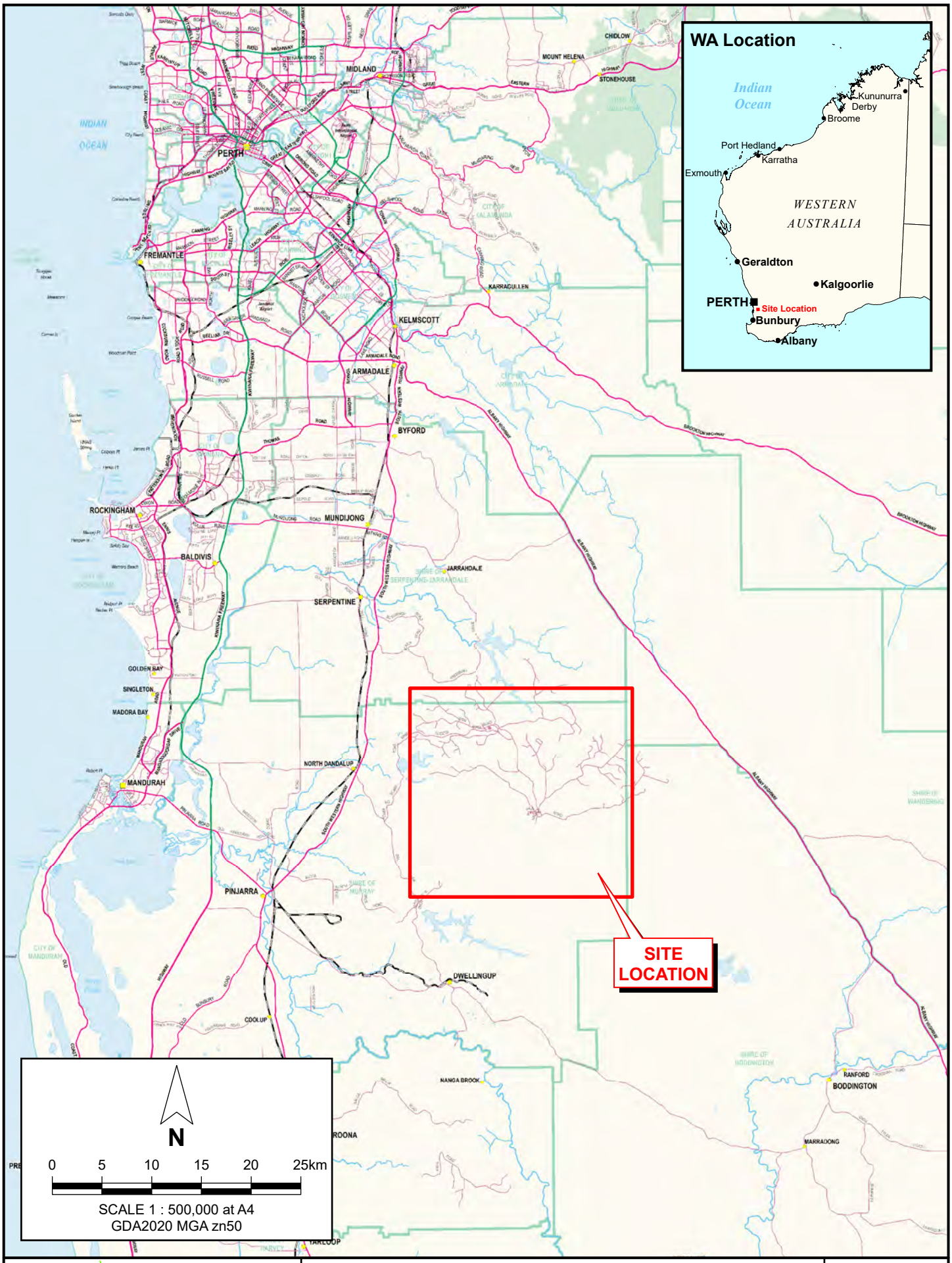
Thompson, S. A. 2004. Mine site rehabilitation index using reptile assemblage as a bio-indicator. PhD. Edith Cowan University, Perth.

Thompson, S. A., and G. G. Thompson. 2005. Temporal variation in reptile assemblages in the Goldfields of Western Australia. Journal of the Royal Society of Western Australia **88**:25-36.

Figures

Baseline Monitoring of Rehabilitation Programs in Alcoa's Bauxite Mining Areas
Winter Survey





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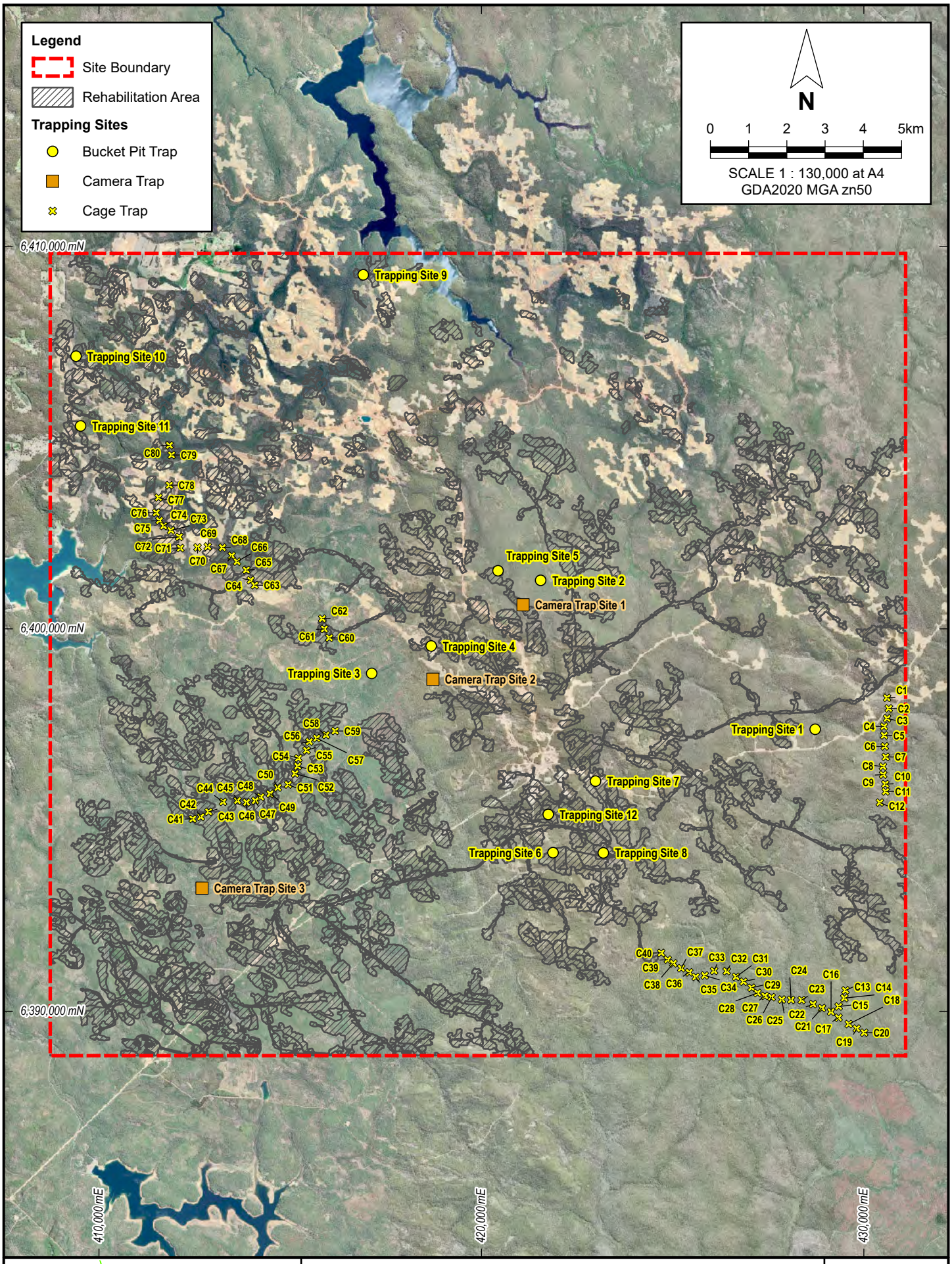
TERRESTRIAL ECOSYSTEMS

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BASELINE MONITORING SURVEY OF REHABILITATION PROGRAMS IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

Figure 1

REGIONAL LOCATION

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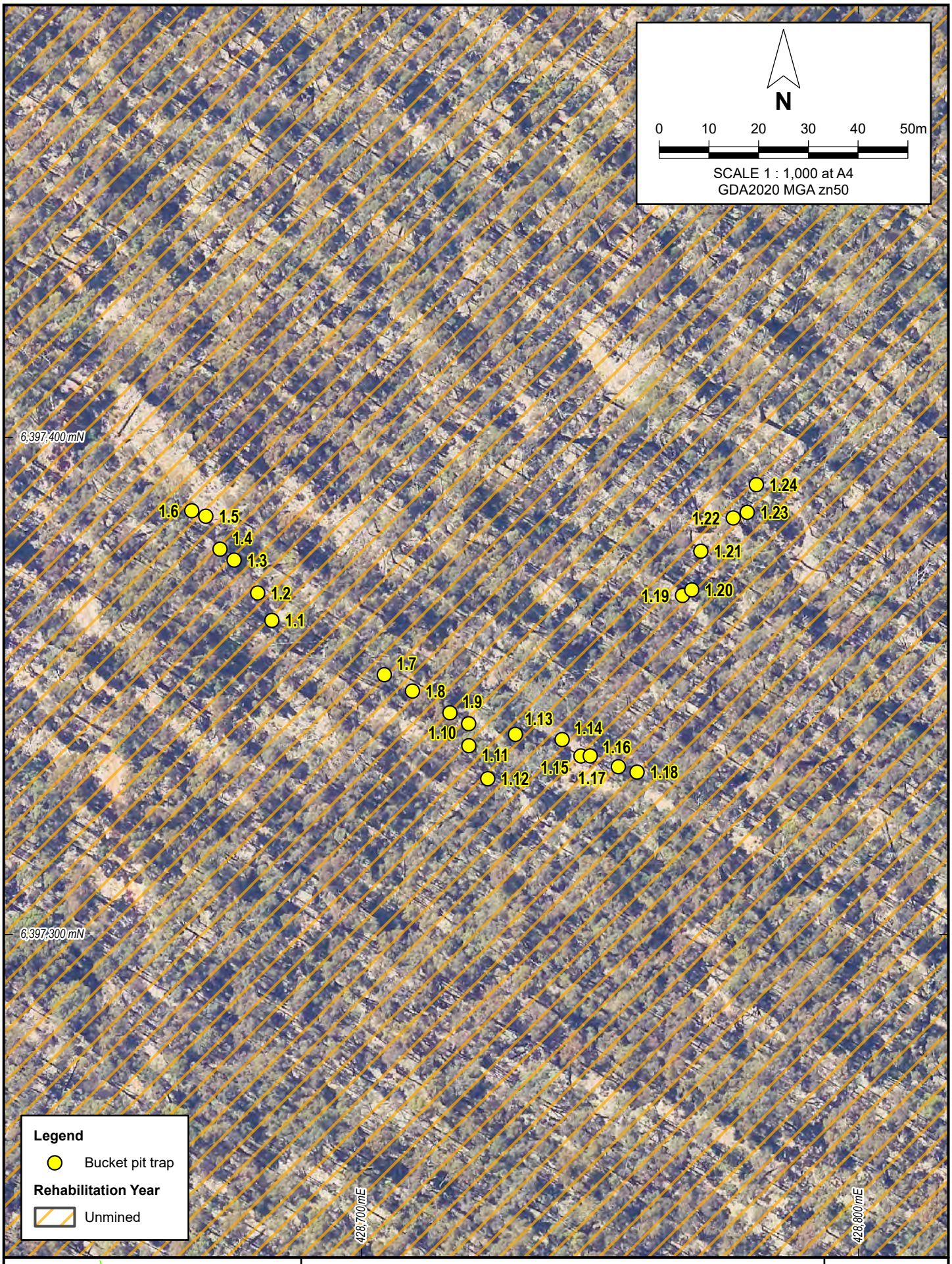
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PROJECT AREA

Figure 2

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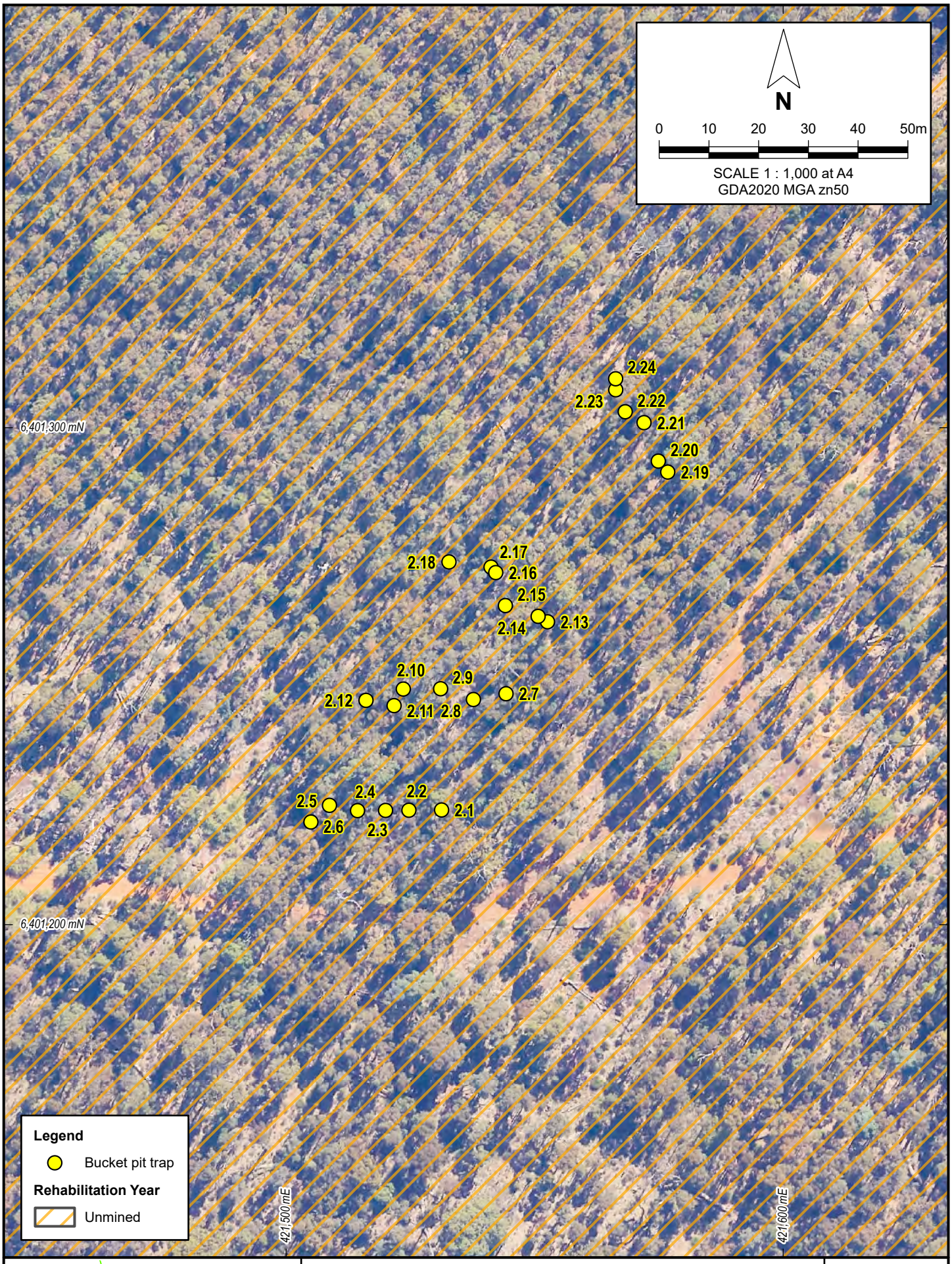
TERRESTRIAL ECOSYSTEMS

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BASELINE MONITORING SURVEY OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

Figure 3

PIT TRAP LOCATIONS - TRAP SITE 1

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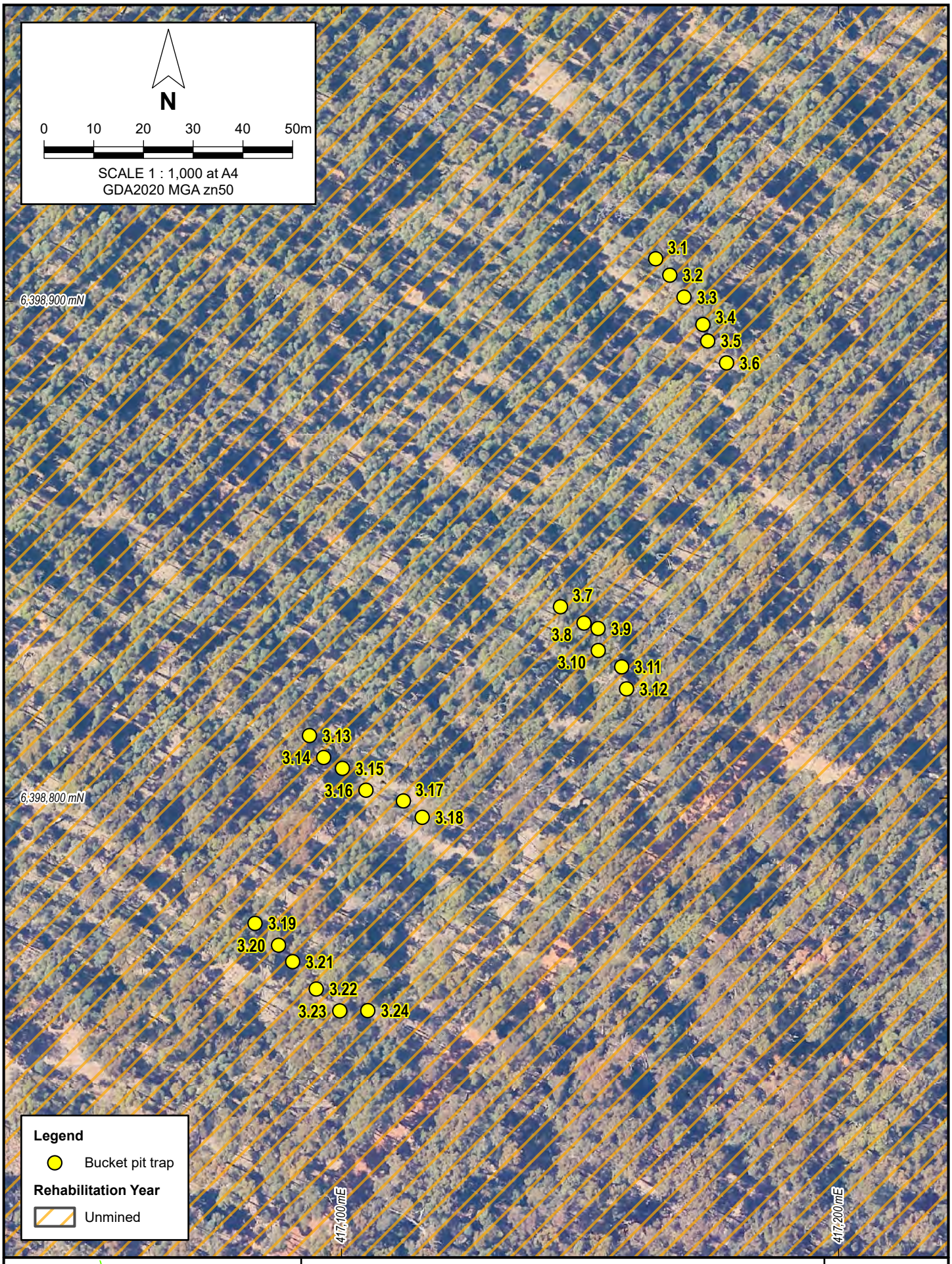
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PIT TRAP LOCATIONS - TRAP SITE 2

Figure 4

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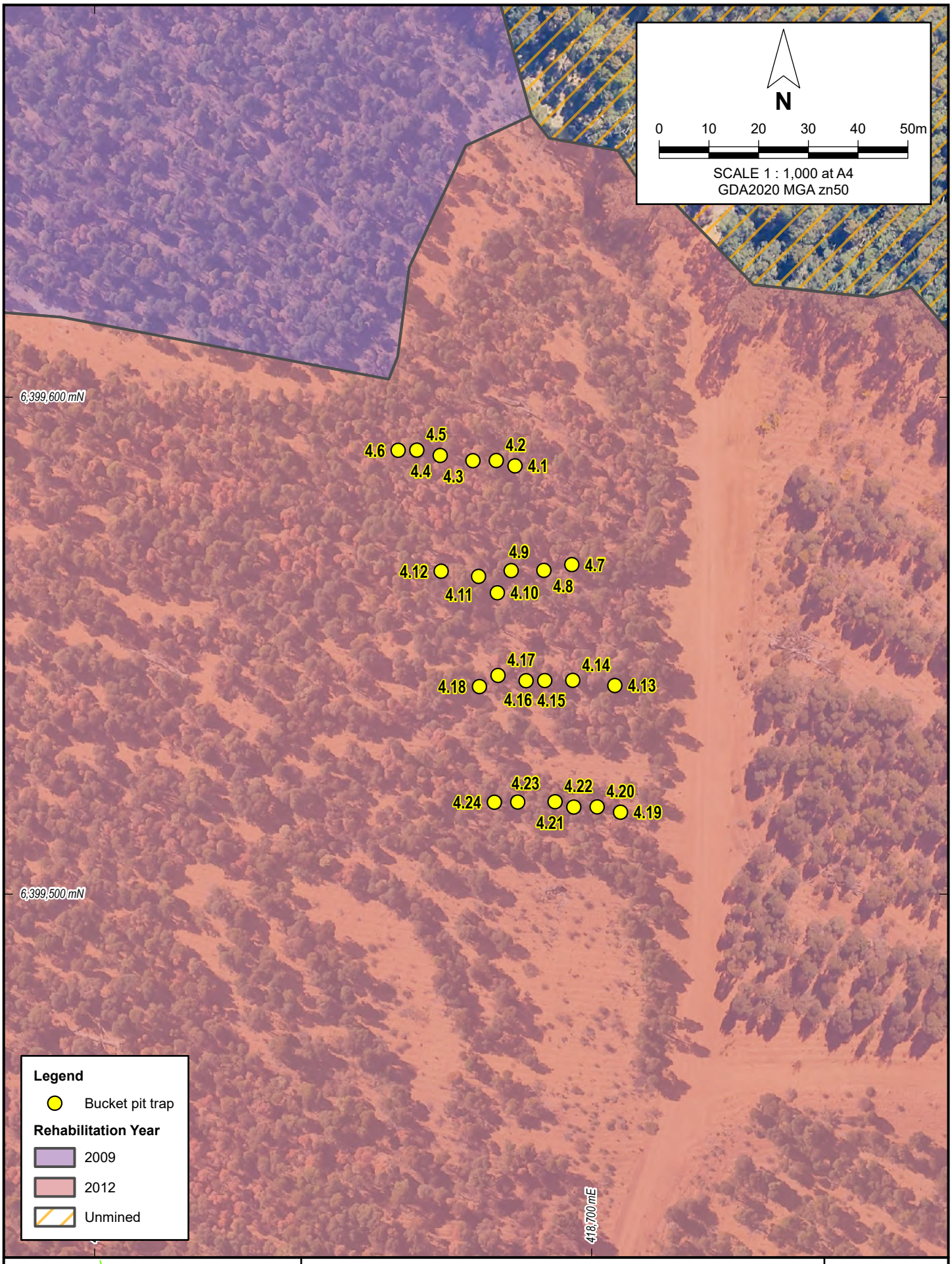
TERRESTRIAL ECOSYSTEMS

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Figure 5

PIT TRAP LOCATIONS - TRAP SITE 3

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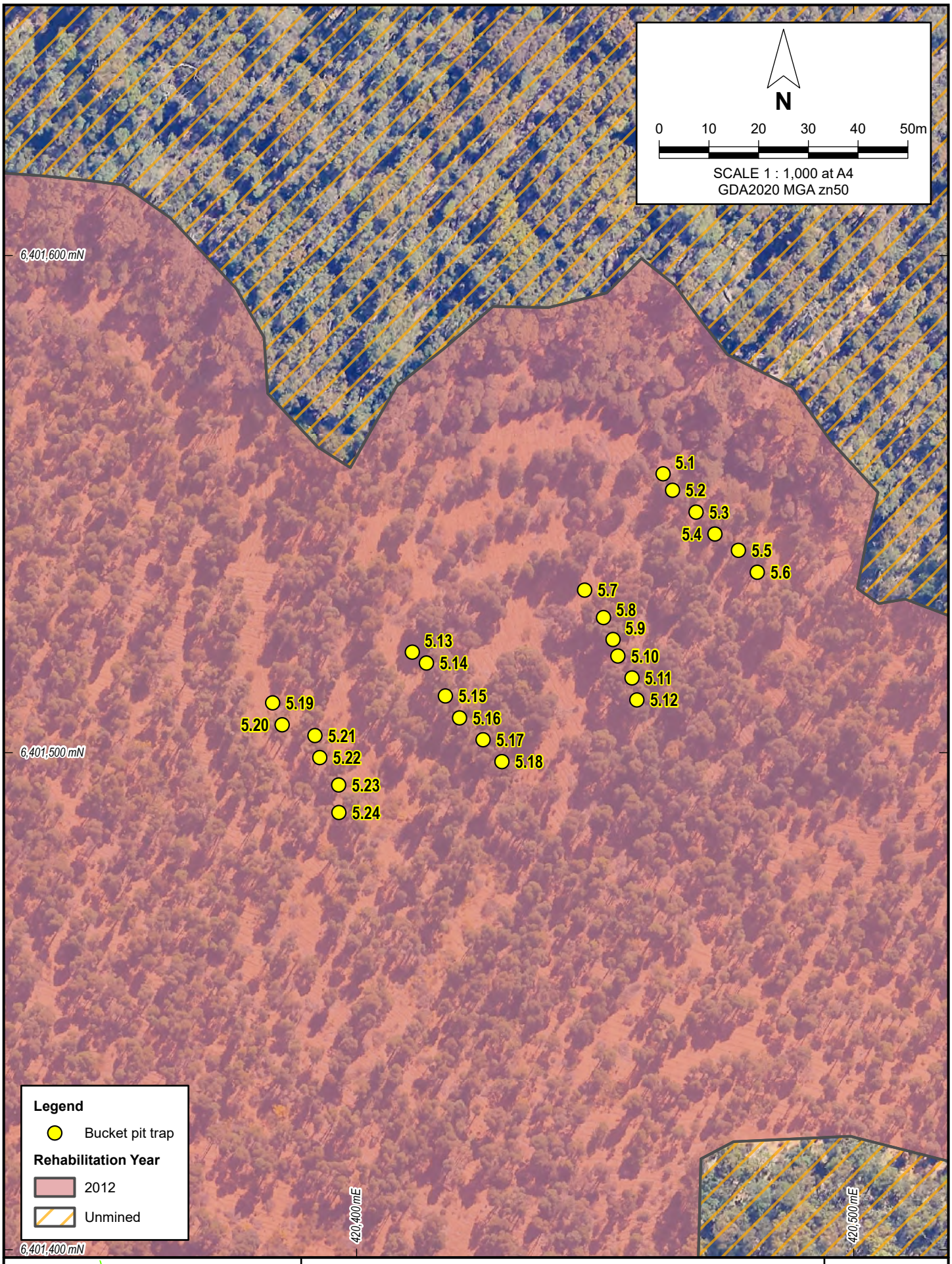
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IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

PIT TRAP LOCATIONS - TRAP SITE 4

Figure 6

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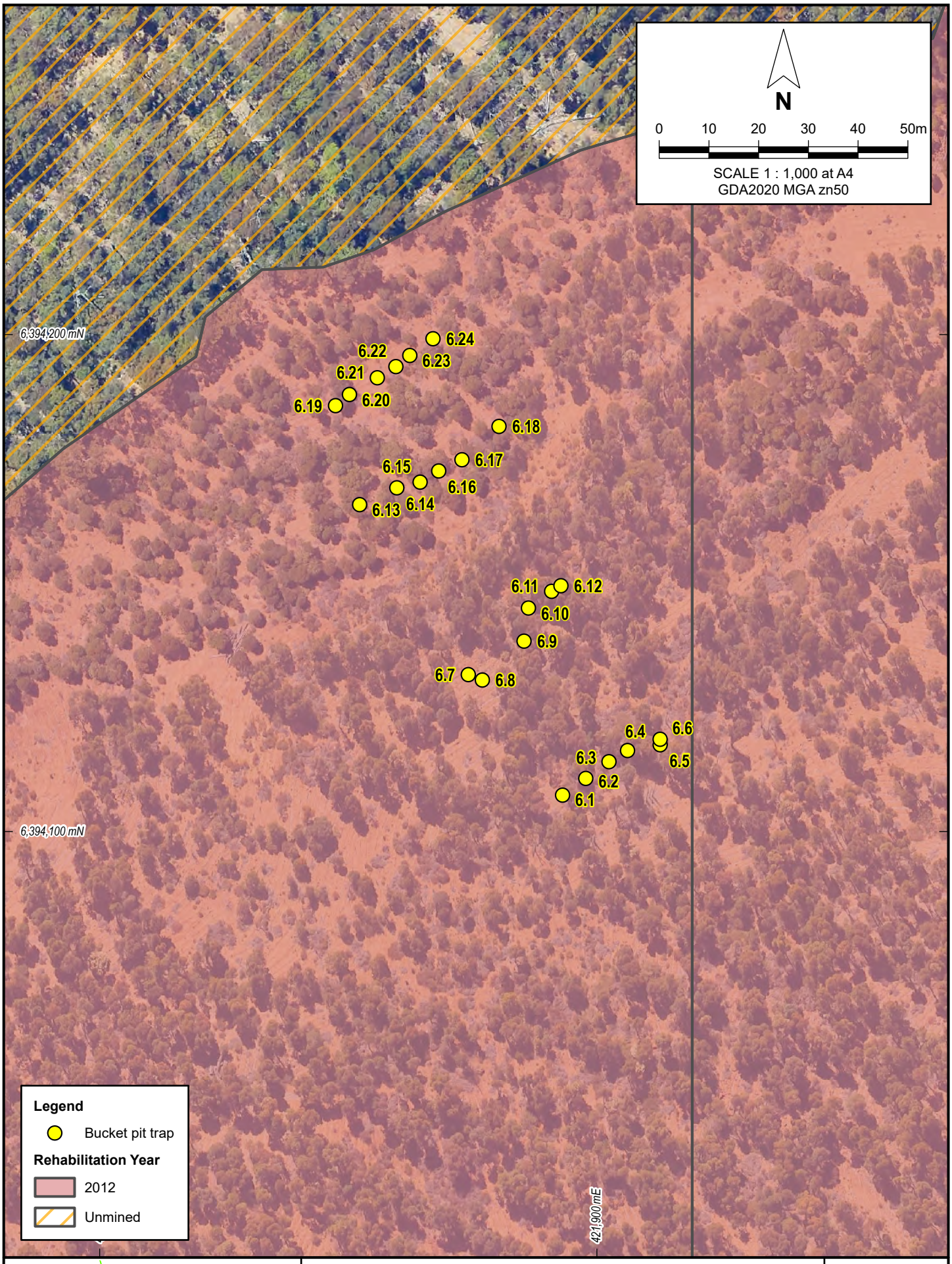
TERRESTRIAL ECOSYSTEMS

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IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

Figure 7

PIT TRAP LOCATIONS - TRAP SITE 5

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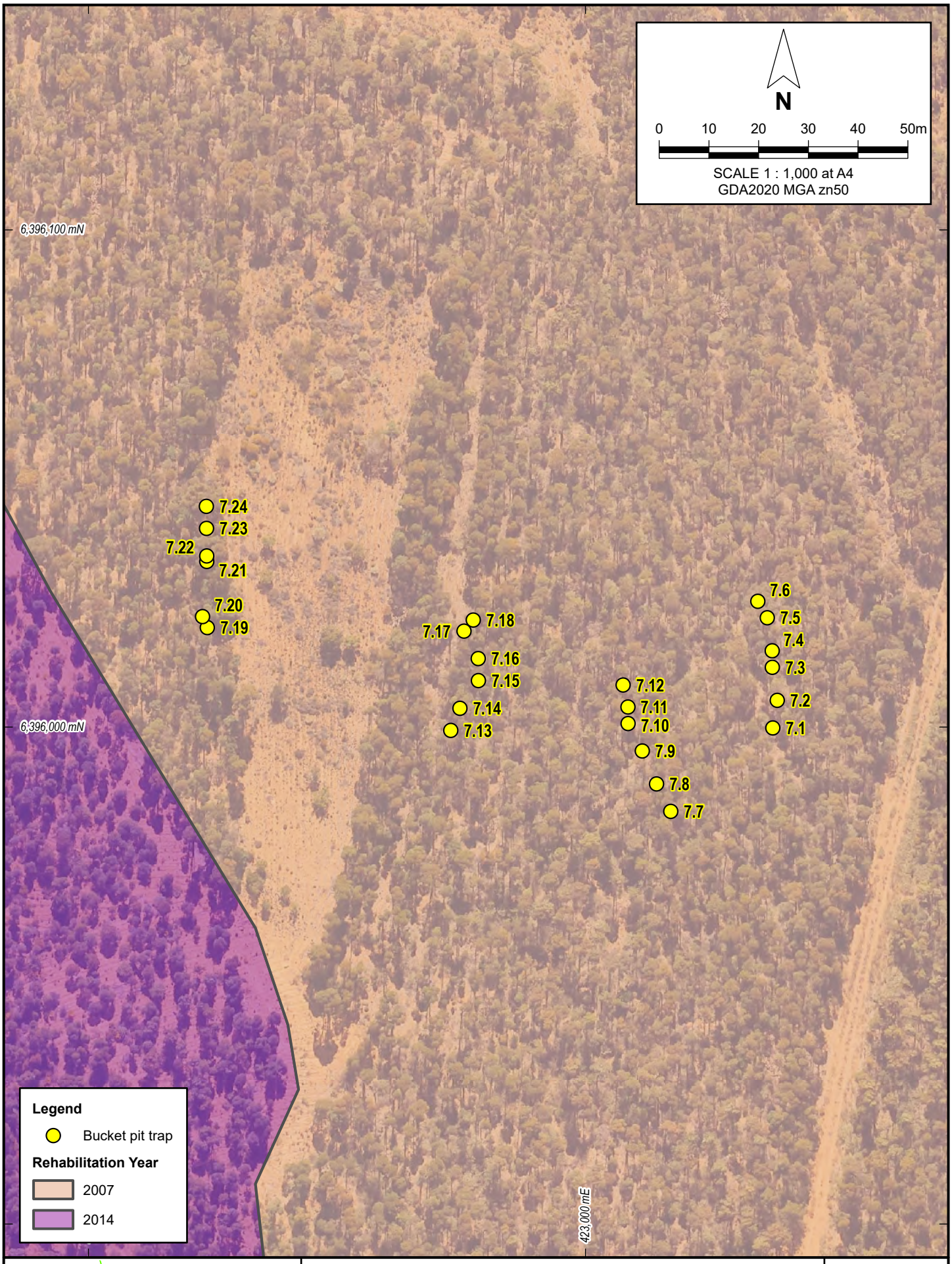
TERRESTRIAL ECOSYSTEMS

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Figure 8

PIT TRAP LOCATIONS - TRAP SITE 6

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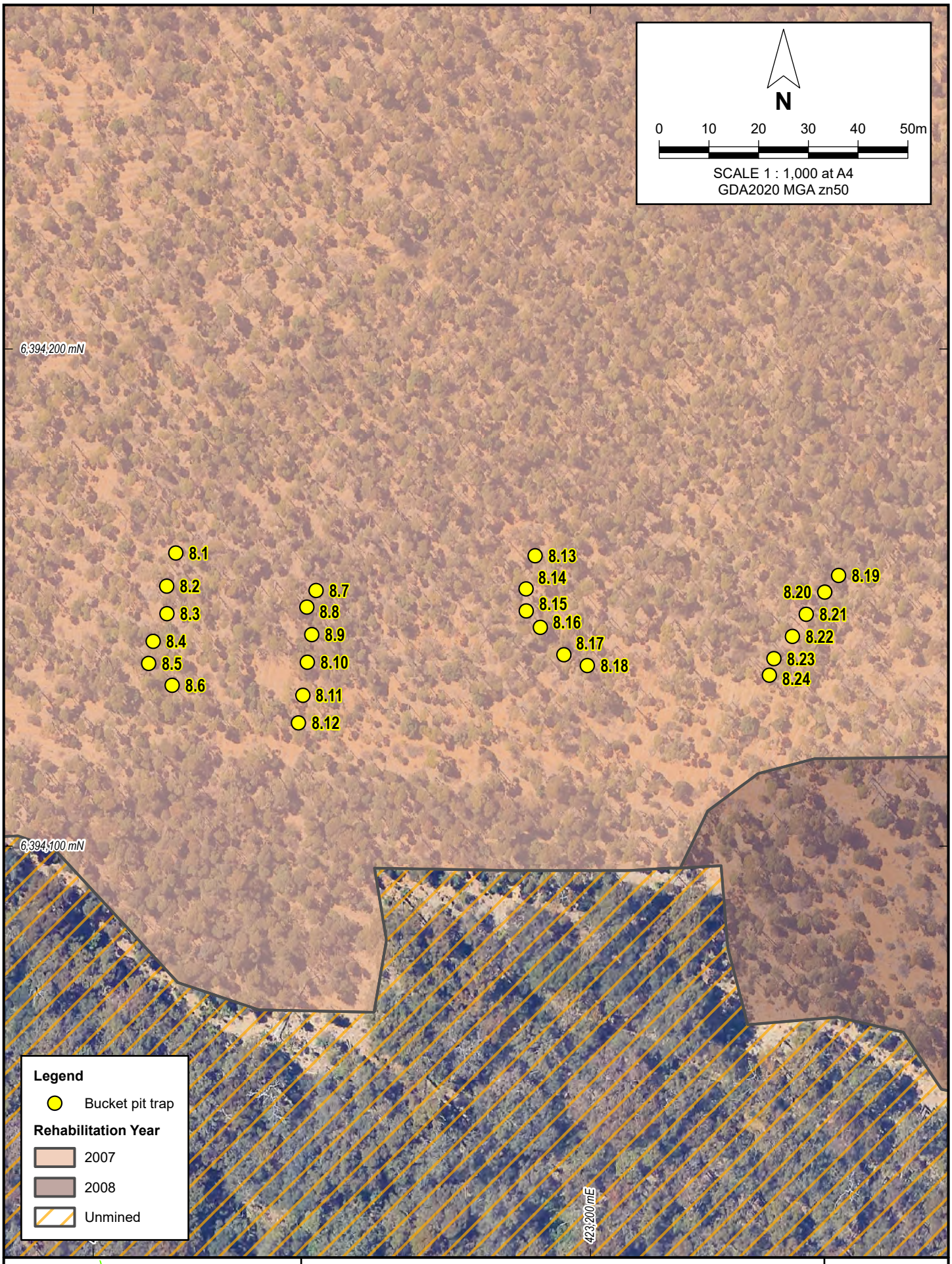
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IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

PIT TRAP LOCATIONS - TRAP SITE 7

Figure 9

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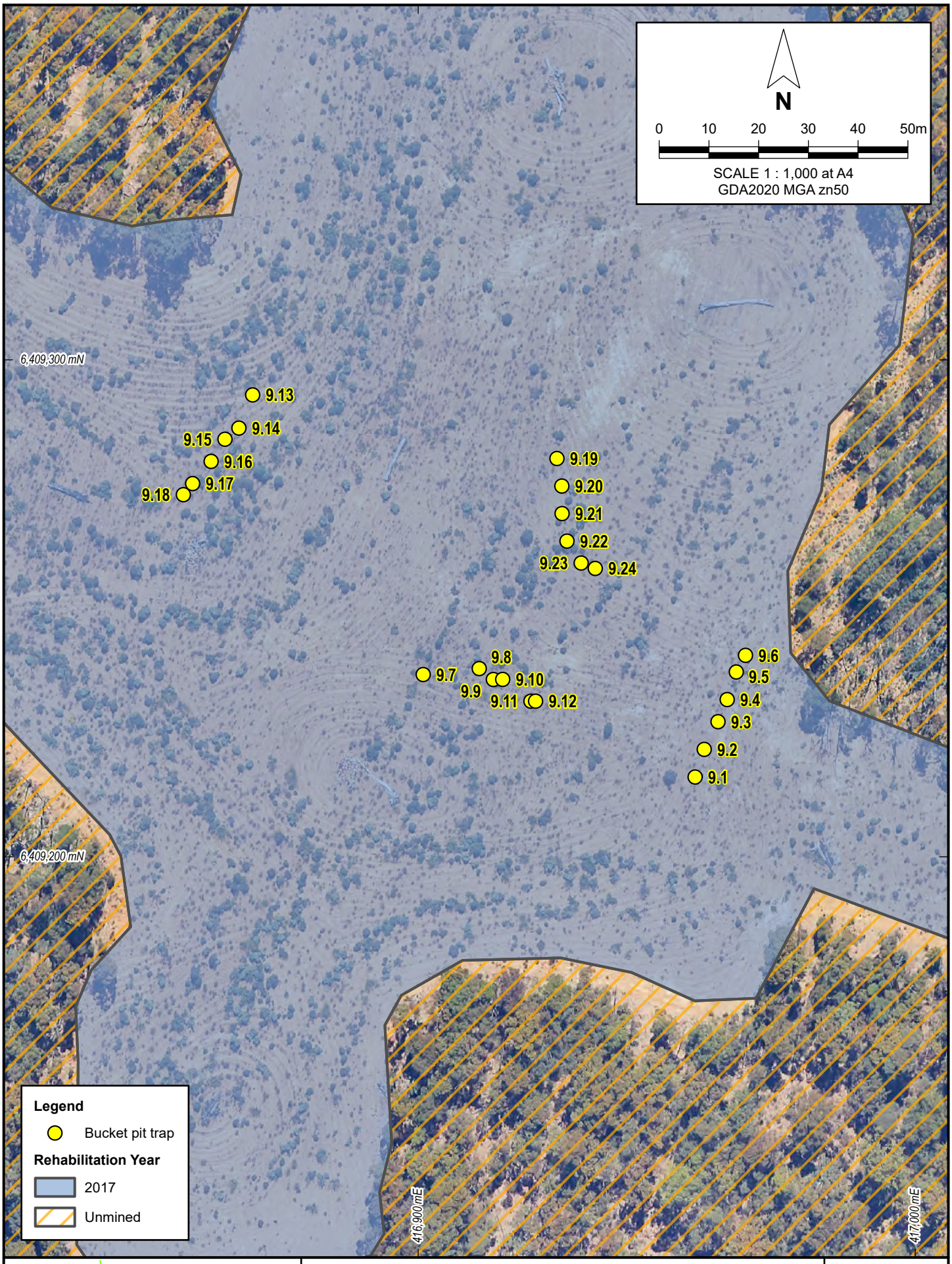
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IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

PIT TRAP LOCATIONS - TRAP SITE 8

Figure 10

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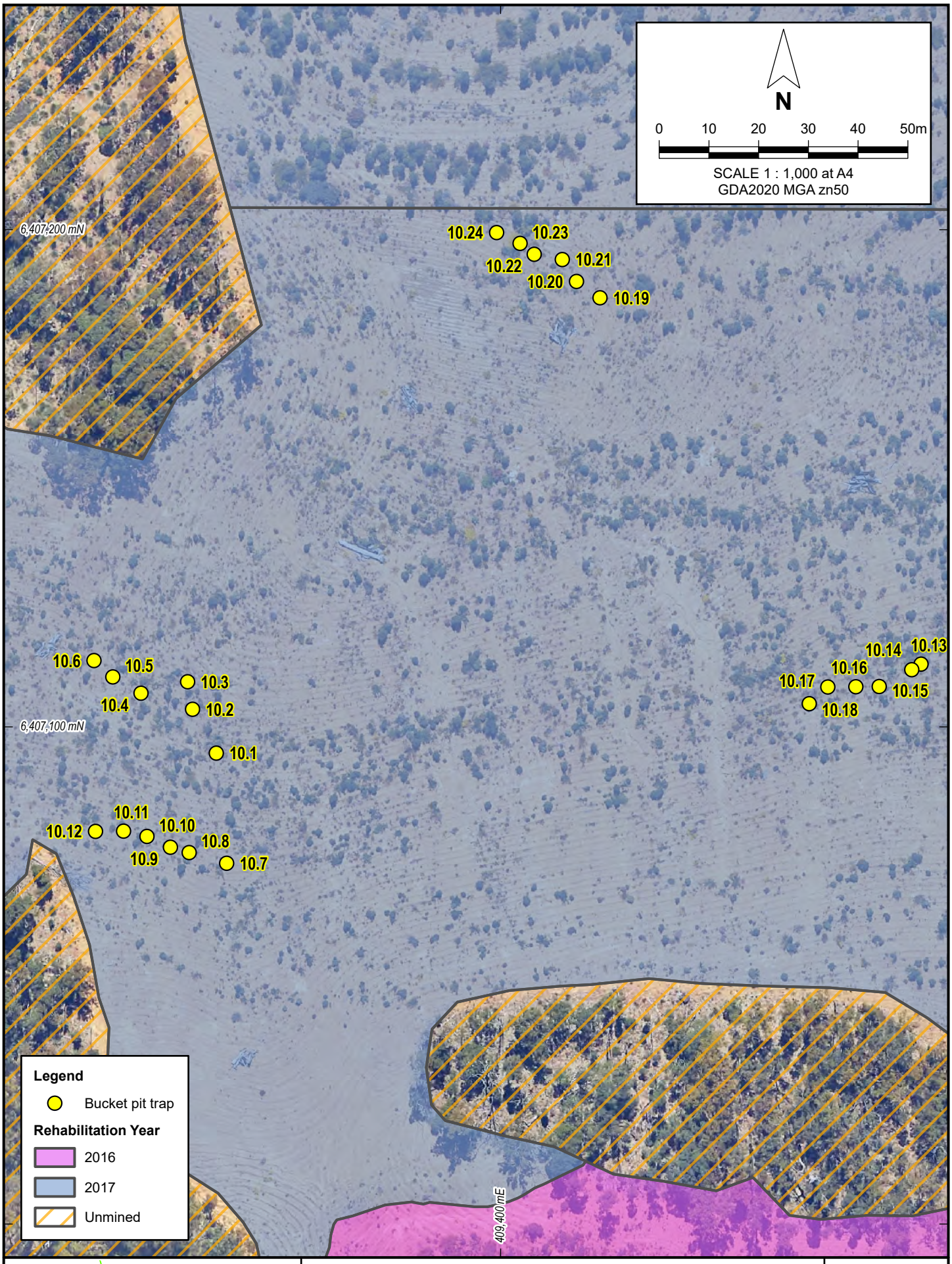
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IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

PIT TRAP LOCATIONS - TRAP SITE 9

Figure 11

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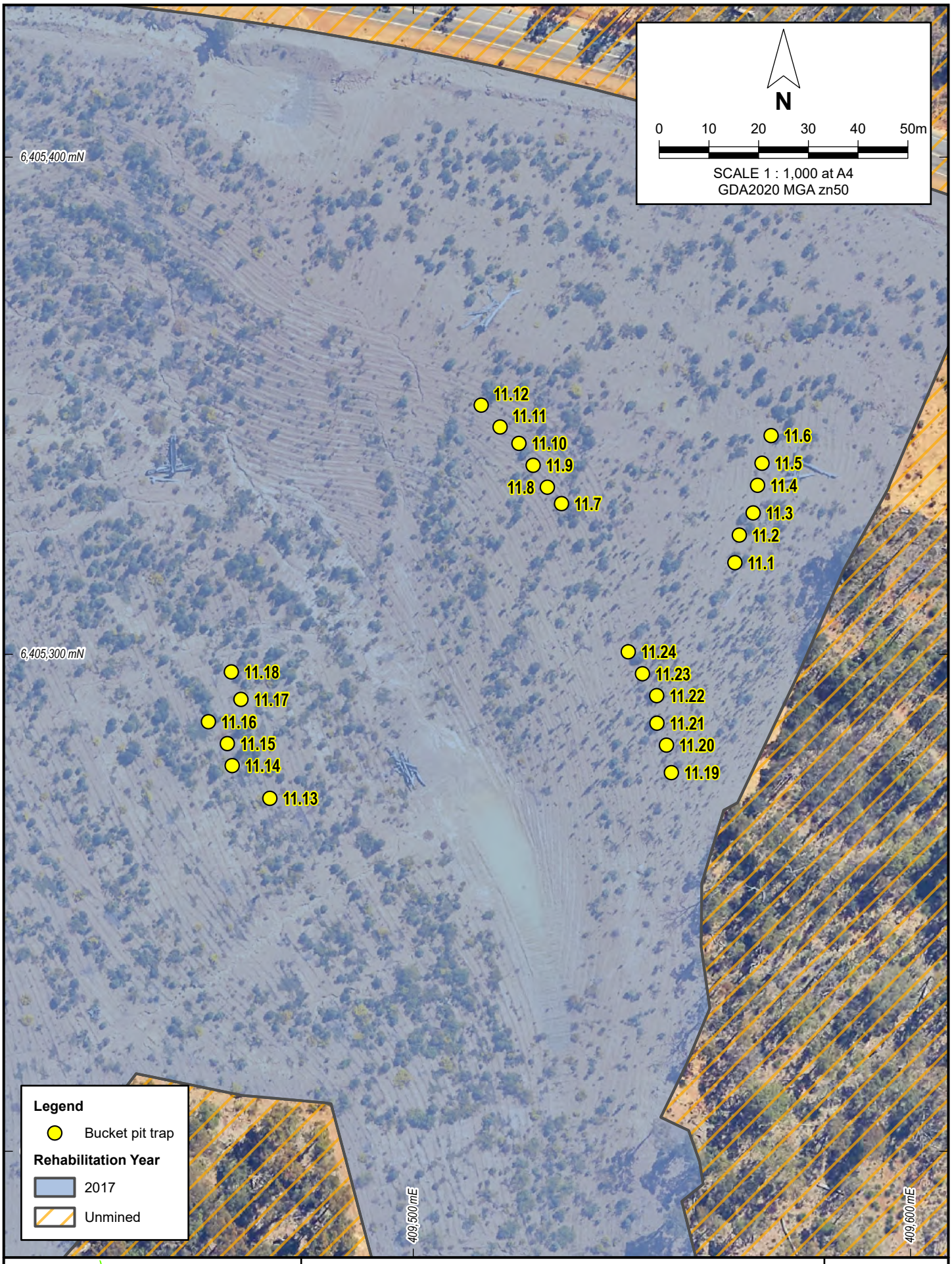
TERRESTRIAL ECOSYSTEMS

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IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

Figure 12

PIT TRAP LOCATIONS - TRAP SITE 10

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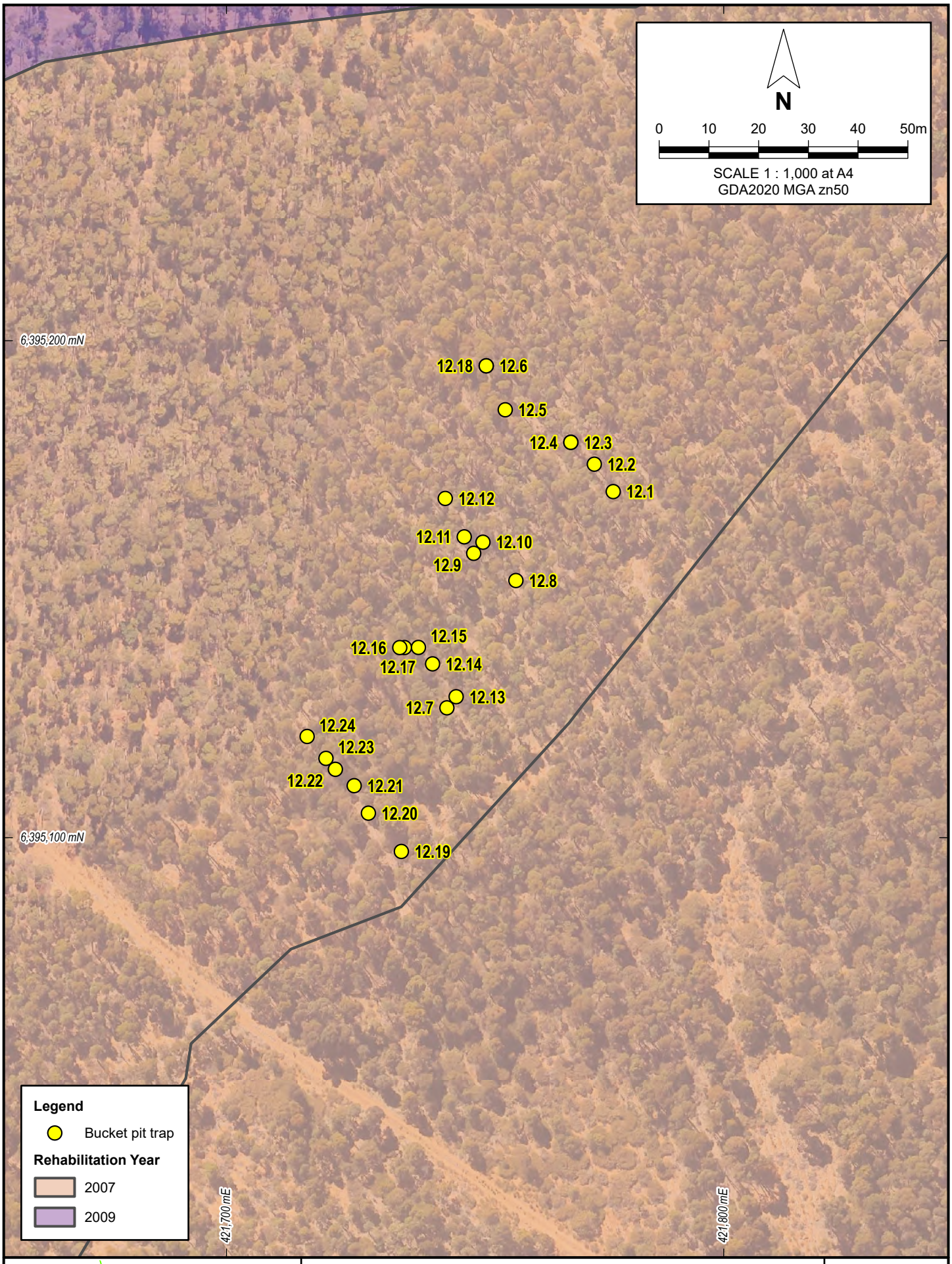
TERRESTRIAL ECOSYSTEMS

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IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

Figure 13

PIT TRAP LOCATIONS - TRAP SITE 11

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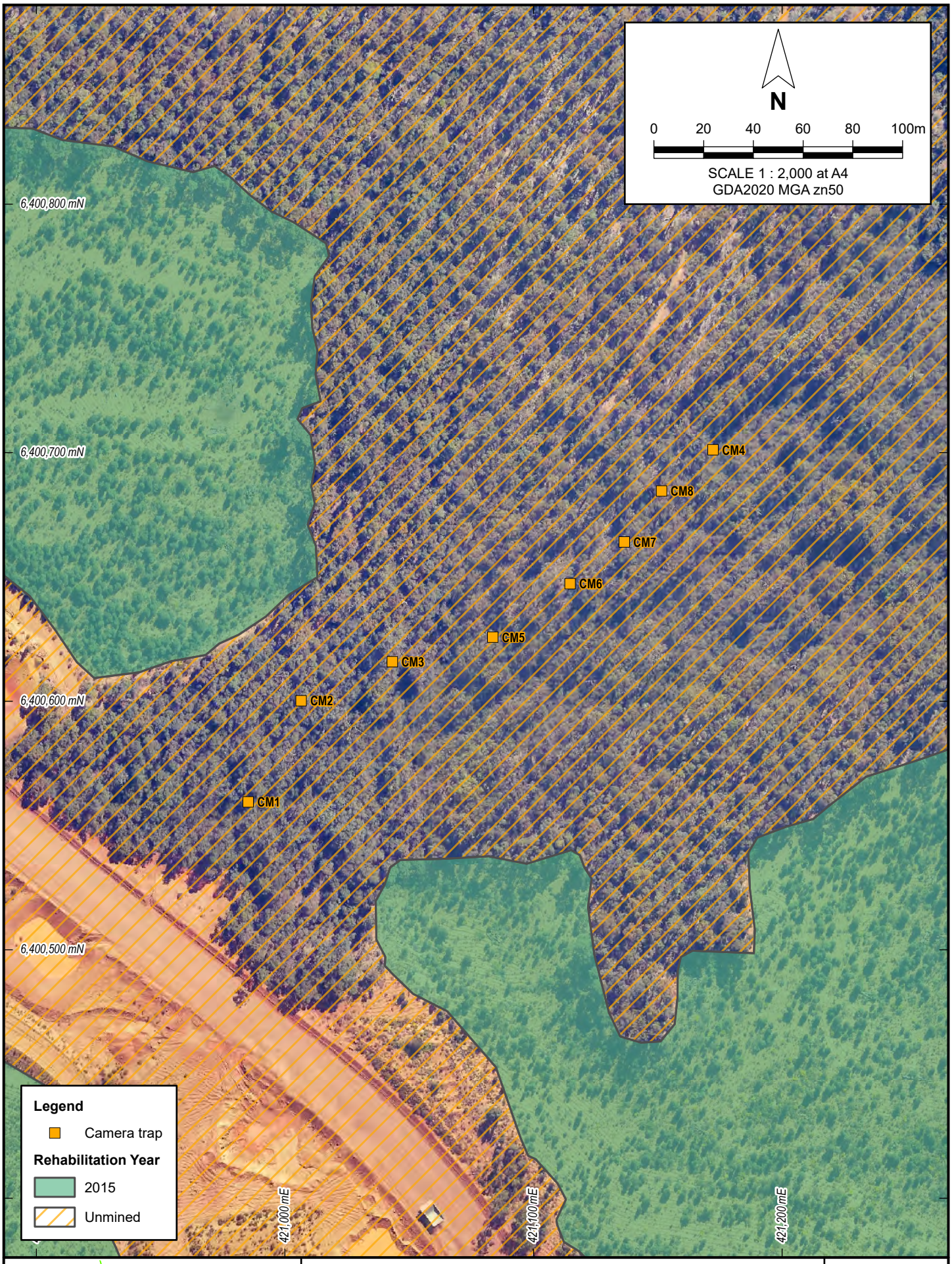
TERRESTRIAL ECOSYSTEMS

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IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

Figure 14

PIT TRAP LOCATIONS - TRAP SITE 12

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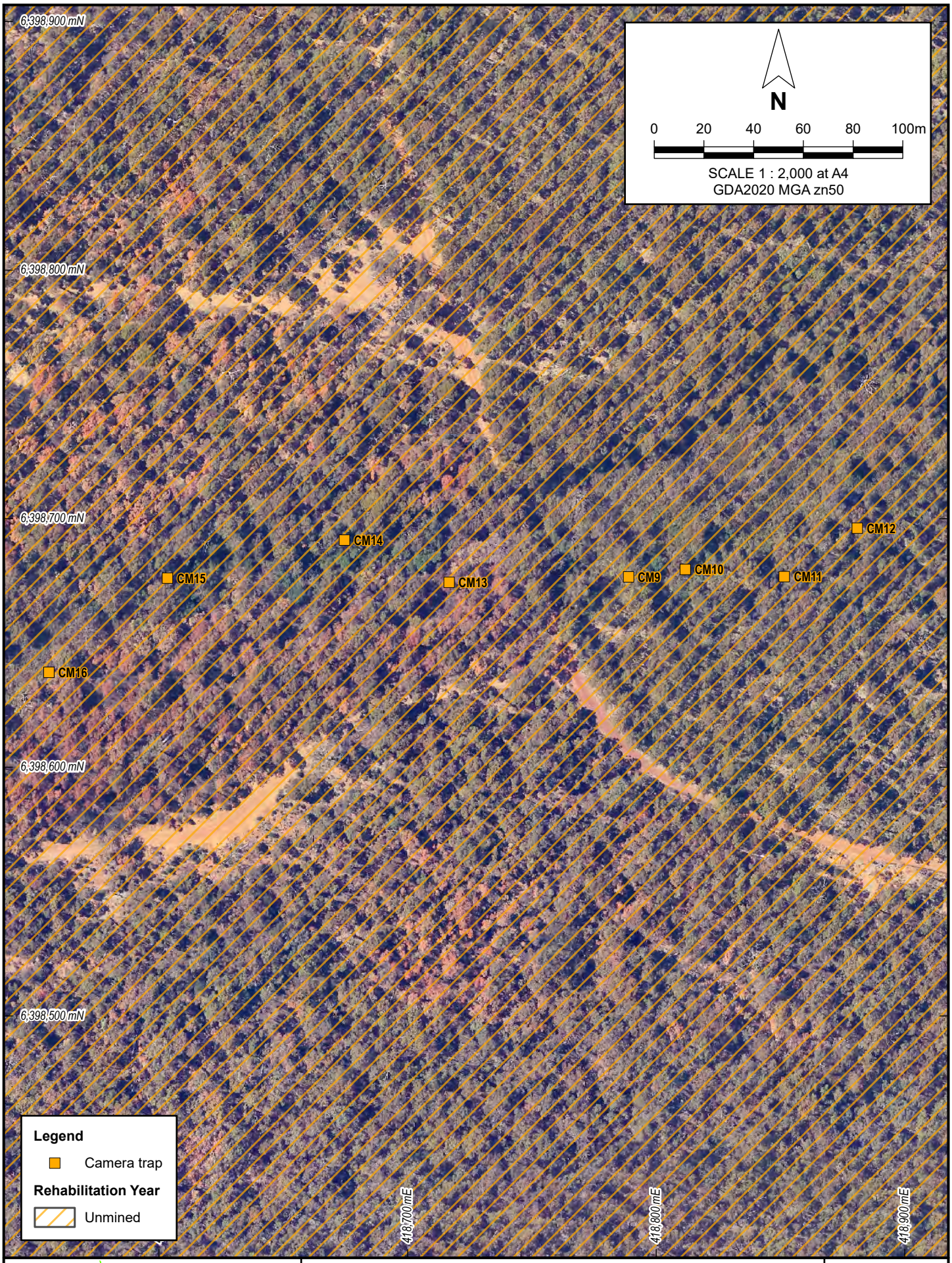
TERRESTRIAL ECOSYSTEMS

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Figure 15

CAMERA TRAP LOCATION - SITE 1

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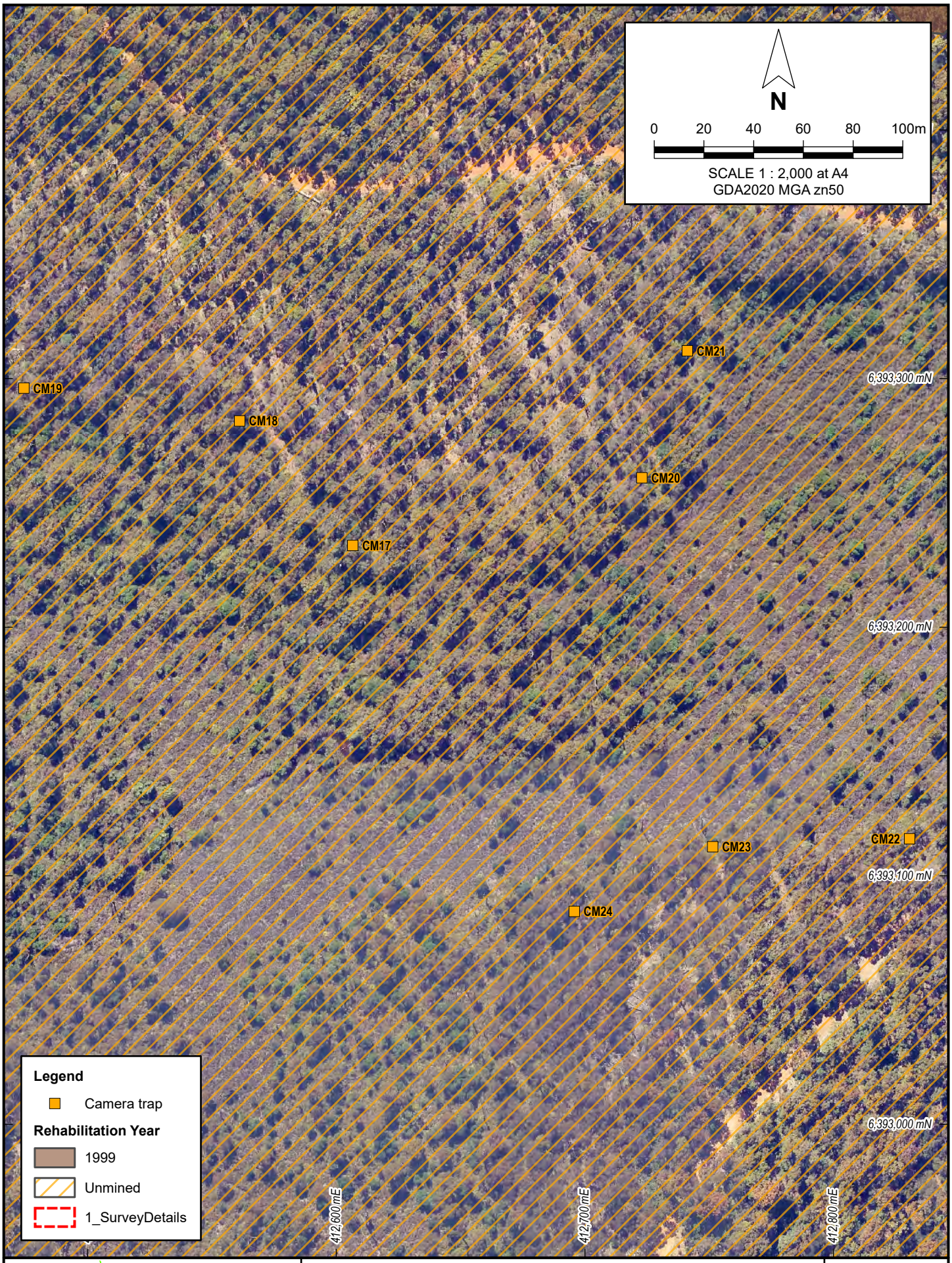
Figure 16

CAMERA TRAP LOCATION - SITE 2

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Job: 2023-0056



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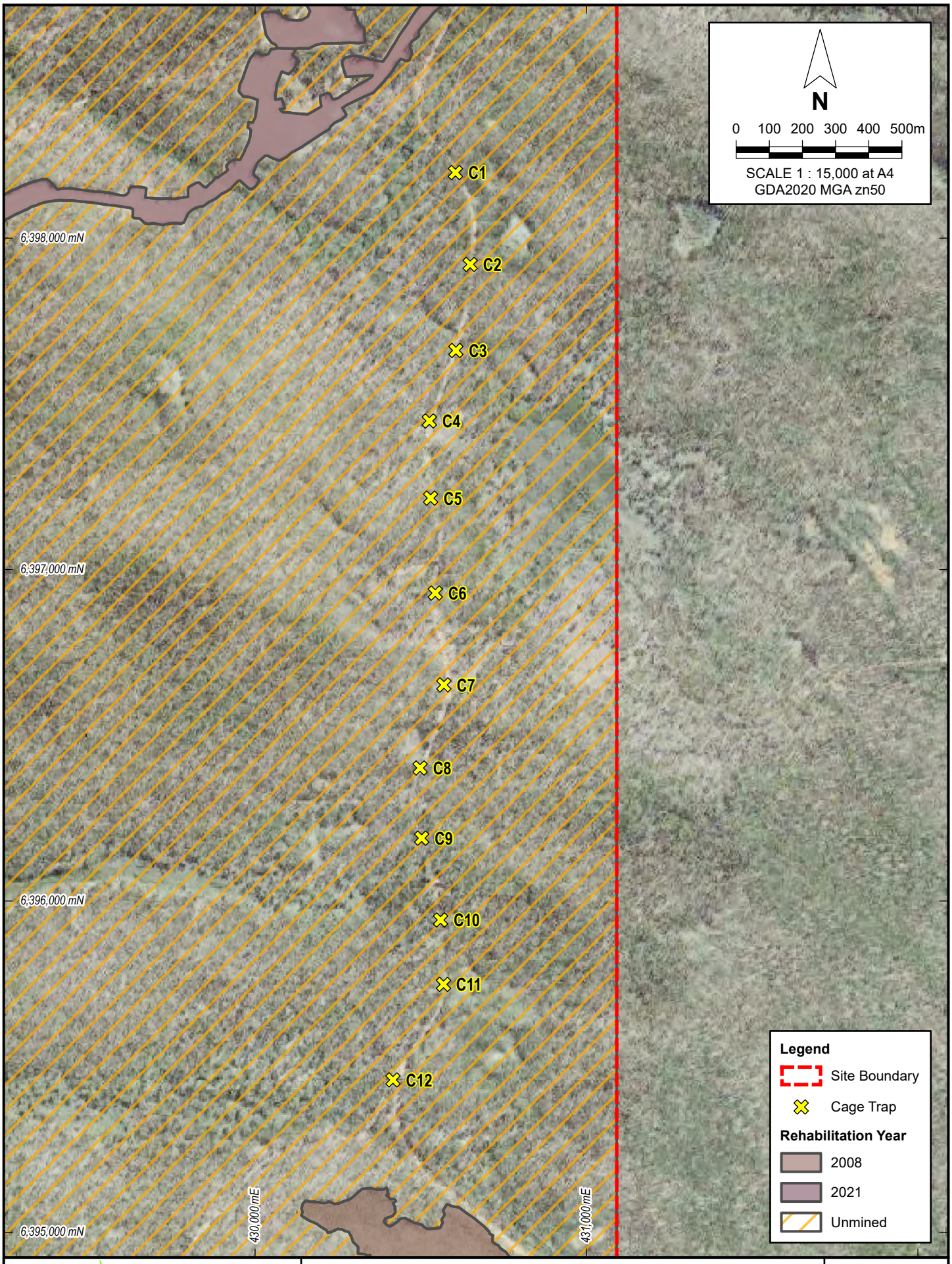
TERRESTRIAL ECOSYSTEMS

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Figure 17

CAMERA TRAP LOCATION - SITE 3

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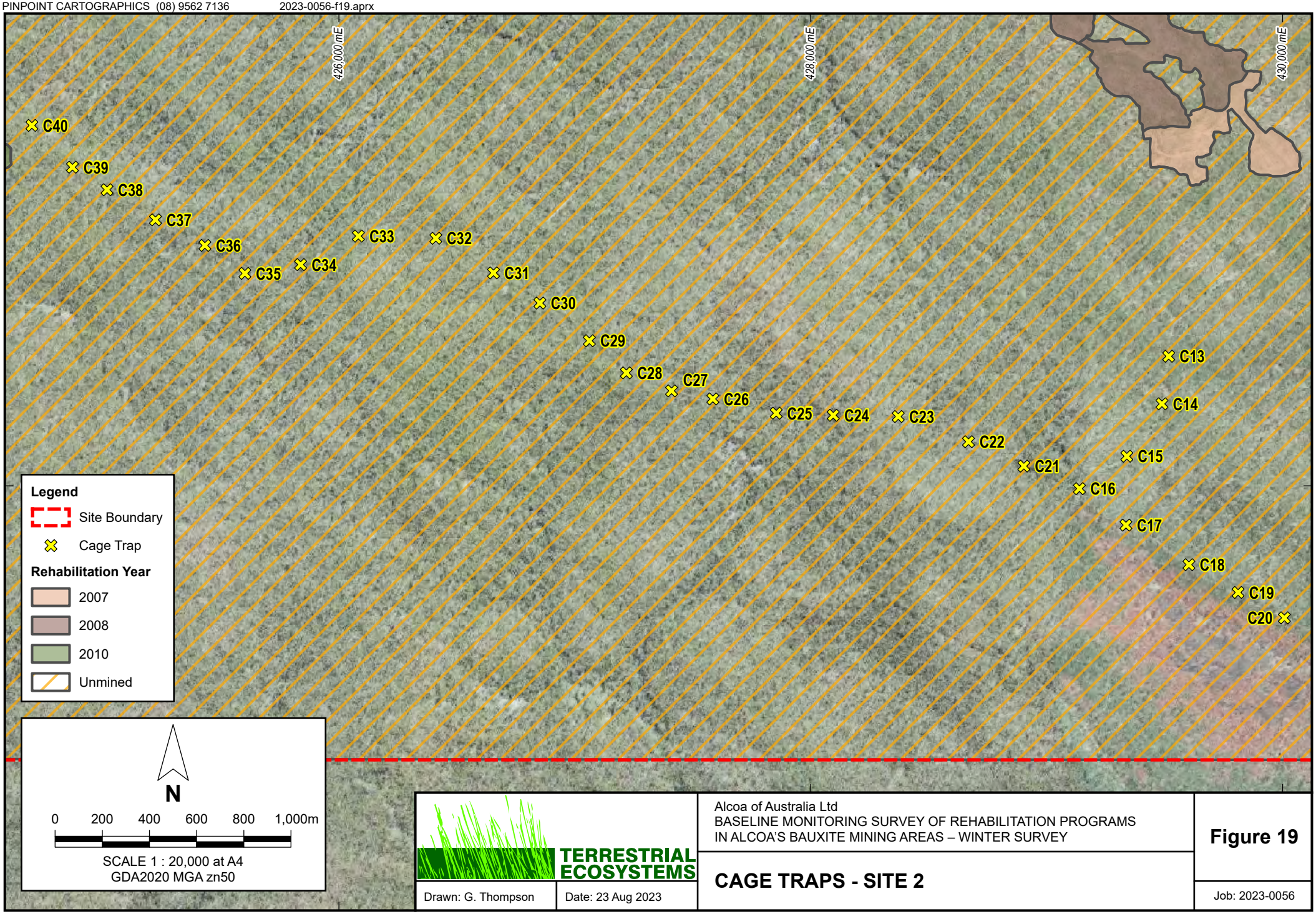
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BASELINE MONITORING SURVEY OF REHABILITATION PROGRAMS IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

CAGE TRAPS - SITE 1

Figure 18

Job: 2023-0056

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TERRESTRIAL ECOSYSTEMS

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Date: 23 Aug 2023

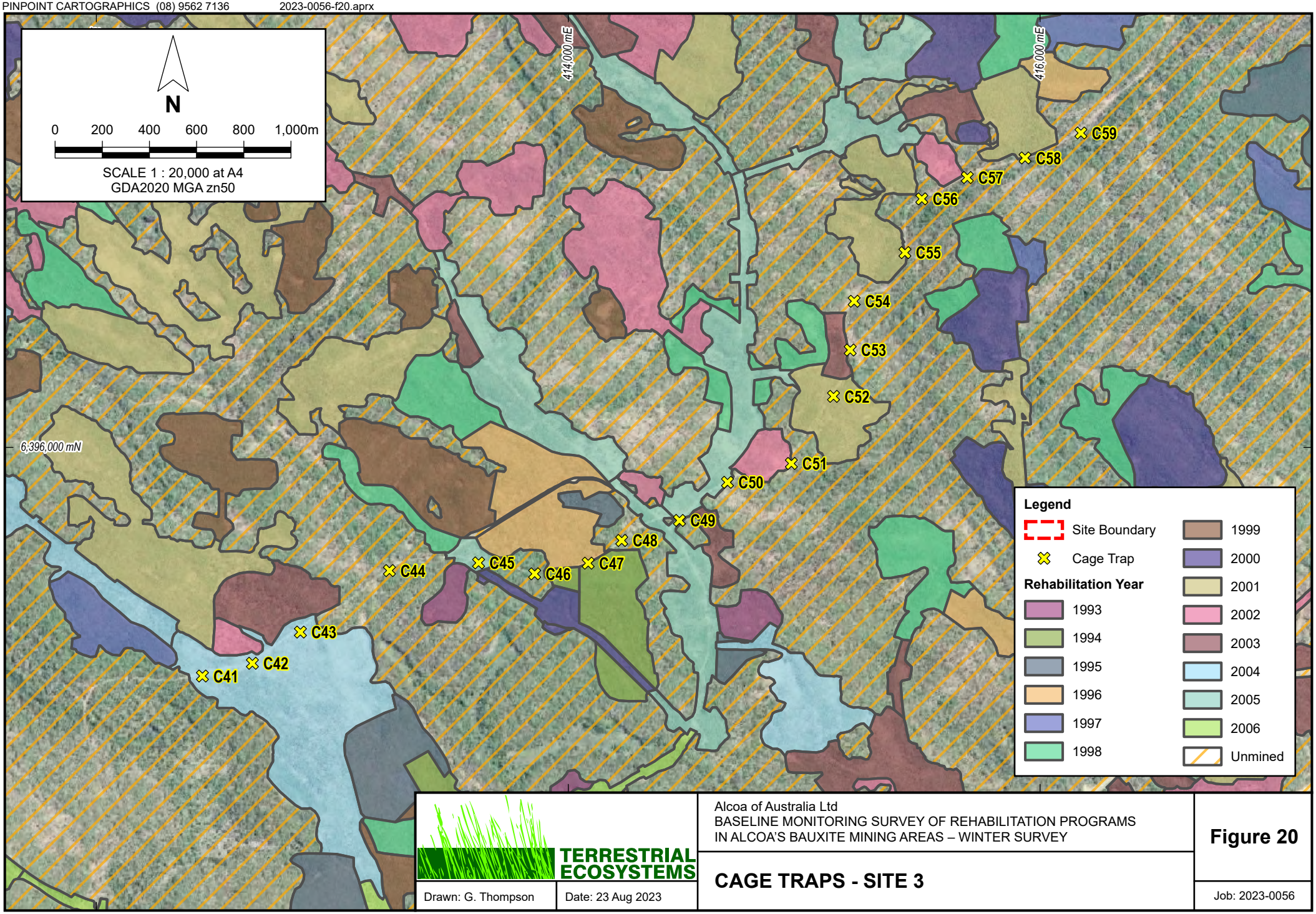
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BASELINE MONITORING SURVEY OF REHABILITATION PROGRAMS IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

CAGE TRAPS - SITE 2

Figure 19

Job: 2023-0056

PINPOINT CARTOGRAPHICS (08) 9562 7136 2023-0056-f20.aprx



TERRESTRIAL ECOSYSTEMS

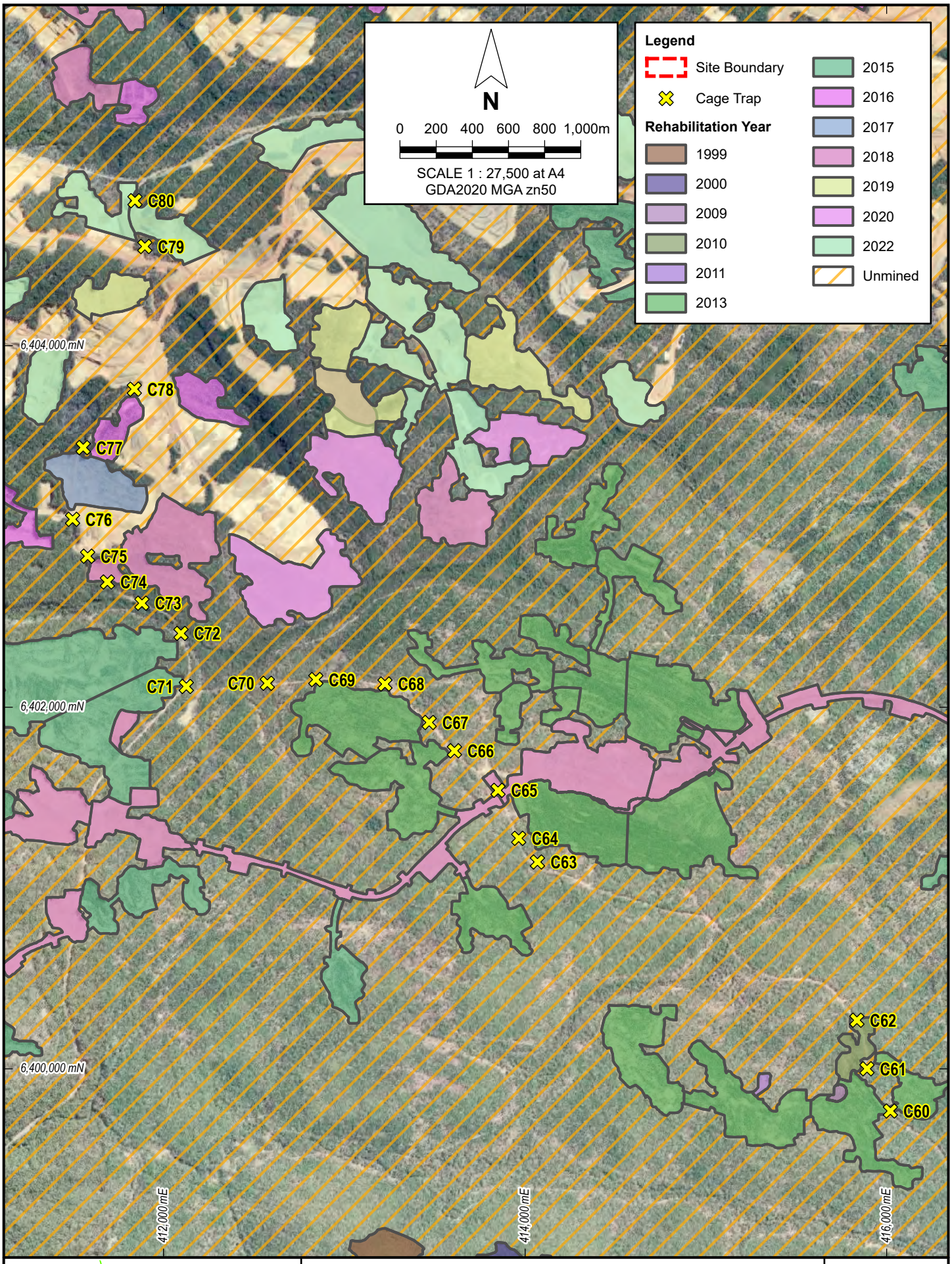
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BASELINE MONITORING SURVEY OF REHABILITATION PROGRAMS IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

CAGE TRAPS - SITE 3

Figure 20

Job: 2023-0056



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TERRESTRIAL ECOSYSTEMS

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BASELINE MONITORING SURVEY OF REHABILITATION PROGRAMS
IN ALCOA'S BAUXITE MINING AREAS – WINTER SURVEY

CAGE TRAPS - SITE 4

Figure 21

Job: 2023-0056

Appendix A.
Site habitat images

Baseline Monitoring of Rehabilitation Programs in Alcoa's Bauxite Mining Areas
Winter Survey





Plate 21. Site 1 Unmined



Plate 22. Site 1 Unmined



Plate 23. Site 2 unmined



Plate 24. Site 2 unmined



Plate 25. Site 3 unmined



Plate 26. Site 3 unmined



Plate 27. Site 7 15-year rehabilitation



Plate 28. Site 7 15-year rehabilitation



Plate 29. Site 8 15-year rehabilitation



Plate 30. Site 8 15-year rehabilitation



Plate 31. Site 12 15-year rehabilitation



Plate 32. Site 12 15-year rehabilitation



Plate 33. Site 4 10-year rehabilitation



Plate 34. Site 4 10-year rehabilitation



Plate 35. Site 5 10-year rehabilitation



Plate 36. Site 5 10-year rehabilitation



Plate 37. Site 6 10-year rehabilitation



Plate 38. Site 6 10-year rehabilitation



Plate 39. Site 9 5-year rehabilitation



Plate 40. Site 9 5-year rehabilitation



Plate 41. Site 10 5-year rehabilitation



Plate 42. Site 10 5-year rehabilitation



Plate 43. Site 11 5-year rehabilitation



Plate 44. Site 11 5-year rehabilitation

Appendix B.
Trapping site coordinates

Baseline Monitoring of Rehabilitation Programs in Alcoa's Bauxite Mining Areas
Winter Survey



B.1 TRAP LOCATIONS (GDA 94, ZONE 50)

Trap #	Easting	Northing	Date opened	Date closed
Pit and funnel traps				
1.A	428680	6397362	27/6/2023	9/7/2023
1.B	428703	6397351	27/6/2023	9/7/2023
1.C	428729	6397339	27/6/2023	9/7/2023
1.D	428763	6397366	27/6/2023	9/7/2023
2.A	421553	6401260	27/6/2023	9/7/2023
2.B	421576	6401290	27/6/2023	9/7/2023
2.C	421531	6401223	27/6/2023	9/7/2023
2.D	421544	6401247	27/6/2023	9/7/2023
3.A	417176	6398886	27/6/2023	9/7/2023
3.B	417156	6398820	27/6/2023	9/7/2023
3.C	417115	6398794	27/6/2023	9/7/2023
3.D	417104	6398755	27/6/2023	9/7/2023
4.A	418660	6399587	27/6/2023	9/7/2023
4.B	418668	6399563	27/6/2023	9/7/2023
4.C	418676	6399540	27/6/2023	9/7/2023
4.D	418679	6399517	27/6/2023	9/7/2023
5.A	420382	6401508	27/6/2023	9/7/2023
5.B	420410	6401518	27/6/2023	9/7/2023
5.C	420455	6401509	27/6/2023	9/7/2023
5.D	420479	6401534	27/6/2023	9/7/2023
6.A	421911	6394117	27/6/2023	9/7/2023
6.B	421891	6394147	27/6/2023	9/7/2023
6.C	421879	6394180	27/6/2023	9/7/2023
6.D	421866	6394197	27/6/2023	9/7/2023
7.A	422922	6396018	27/6/2023	9/7/2023
7.B	422976	6396020	27/6/2023	9/7/2023
7.C	423016	6395981	27/6/2023	9/7/2023
7.D	423033	6396023	27/6/2023	9/7/2023
8.A	423113	6394130	27/6/2023	9/7/2023
8.B	423140	6394123	27/6/2023	9/7/2023

Trap #	Easting	Northing	Date opened	Date closed
8.C	423198	6394134	27/6/2023	9/7/2023
8.D	423235	6394132	27/6/2023	9/7/2023
9.A	416954	6409214	27/6/2023	9/7/2023
9.B	416922	6409229	27/6/2023	9/7/2023
9.C	416934	6409256	27/6/2023	9/7/2023
9.D	416851	6409271	27/6/2023	9/7/2023
10.A	409342	6407093	27/6/2023	9/7/2023
10.B	409343	6407071	27/6/2023	9/7/2023
10.C	409483	6407111	27/6/2023	9/7/2023
10.D	409398	6407197	27/6/2023	9/7/2023
11.A	409470	6405269	27/6/2023	9/7/2023
11.B	409550	6405274	27/6/2023	9/7/2023
11.C	409528	6405328	27/6/2023	9/7/2023
11.D	409563	6405316	27/6/2023	9/7/2023
12.A	421738	6395132	27/6/2023	9/7/2023
12.B	421743	6395166	27/6/2023	9/7/2023
12.C	421751	6395192	27/6/2023	9/7/2023
12.D	421715	6395118	27/6/2023	9/7/2023
Camera traps				
CM1	420969	6400570	26/06/2023	9/07/2023
CM2	421001	6400591	26/06/2023	9/07/2023
CM3	421069	6400626	26/06/2023	9/07/2023
CM4	421158	6400680	26/06/2023	9/07/2023
CM5	421193	6400728	26/06/2023	9/07/2023
CM6	421213	6400731	26/06/2023	9/07/2023
CM7	421168	6400702	26/06/2023	9/07/2023
CM8	421136	6400657	26/06/2023	9/07/2023
CM9	418789	6398679	26/06/2023	9/07/2023
CM10	418901	6398694	26/06/2023	9/07/2023
CM11	418989	6398723	26/06/2023	9/07/2023
CM12	418750	6398714	26/06/2023	9/07/2023
CM13	418828	6398753	26/06/2023	9/07/2023
CM14	418857	6398770	26/06/2023	9/07/2023

Trap #	Easting	Northing	Date opened	Date closed
CM15	418685	6398687	26/06/2023	9/07/2023
CM16	418592	6398667	26/06/2023	9/07/2023
CM17	412297	6393542	26/06/2023	9/07/2023
CM18	412360	6393411	26/06/2023	9/07/2023
CM19	412550	6393205	26/06/2023	9/07/2023
CM20	412633	6393199	26/06/2023	9/07/2023
CM21	412695	6393235	26/06/2023	9/07/2023
CM22	412840	6393138	26/06/2023	9/07/2023
CM23	412790	6393121	26/06/2023	9/07/2023
CM24	412669	6393084	26/06/2023	9/07/2023
Cage traps				
C1	430604	6398198	26/06/2023	9/07/2023
C2	430648	6397921	26/06/2023	9/07/2023
C3	430605	6397661	26/06/2023	9/07/2023
C4	430525	6397448	26/06/2023	9/07/2023
C5	430529	6397215	26/06/2023	9/07/2023
C6	430543	6396929	26/06/2023	9/07/2023
C7	430569	6396652	26/06/2023	9/07/2023
C8	430497	6396401	26/06/2023	9/07/2023
C9	430502	6396189	26/06/2023	9/07/2023
C10	430559	6395942	26/06/2023	9/07/2023
C11	430568	6395748	26/06/2023	9/07/2023
C12	430416	6395460	26/06/2023	9/07/2023
C13	429517	6390549	26/06/2023	9/07/2023
C14	429488	6390347	26/06/2023	9/07/2023
C15	429339	6390125	26/06/2023	9/07/2023
C16	429138	6389988	26/06/2023	9/07/2023
C17	429336	6389833	26/06/2023	9/07/2023
C18	429602	6389666	26/06/2023	9/07/2023
C19	429811	6389548	26/06/2023	9/07/2023
C20	430007	6389440	26/06/2023	9/07/2023
C21	428903	6390083	26/06/2023	9/07/2023
C22	428668	6390187	26/06/2023	9/07/2023

Trap #	Easting	Northing	Date opened	Date closed
C23	428371	6390293	26/06/2023	9/07/2023
C24	428095	6390299	26/06/2023	9/07/2023
C25	427853	6390307	26/06/2023	9/07/2023
C26	427585	6390368	26/06/2023	9/07/2023
C27	427410	6390402	26/06/2023	9/07/2023
C28	427218	6390478	26/06/2023	9/07/2023
C29	427061	6390614	26/06/2023	9/07/2023
C30	426852	6390774	26/06/2023	9/07/2023
C31	426655	6390902	26/06/2023	9/07/2023
C32	426410	6391048	26/06/2023	9/07/2023
C33	426082	6391058	26/06/2023	9/07/2023
C34	425837	6390937	26/06/2023	9/07/2023
C35	425601	6390900	26/06/2023	9/07/2023
C36	425432	6391018	26/06/2023	9/07/2023
C37	425222	6391127	26/06/2023	9/07/2023
C38	425017	6391254	26/06/2023	9/07/2023
C39	424871	6391350	26/06/2023	9/07/2023
C40	424699	6391527	26/06/2023	9/07/2023
C41	412449	6395031	26/06/2023	9/07/2023
C42	412661	6395085	26/06/2023	9/07/2023
C43	412864	6395217	26/06/2023	9/07/2023
C44	413242	6395477	26/06/2023	9/07/2023
C45	413619	6395510	26/06/2023	9/07/2023
C46	413857	6395464	26/06/2023	9/07/2023
C47	414084	6395509	26/06/2023	9/07/2023
C48	414226	6395605	26/06/2023	9/07/2023
C49	414471	6395690	26/06/2023	9/07/2023
C50	414674	6395851	26/06/2023	9/07/2023
C51	414945	6395931	26/06/2023	9/07/2023
C52	415124	6396216	26/06/2023	9/07/2023
C53	415194	6396412	26/06/2023	9/07/2023
C54	415211	6396619	26/06/2023	9/07/2023
C55	415426	6396824	26/06/2023	9/07/2023

Trap #	Easting	Northing	Date opened	Date closed
C56	415498	6397052	26/06/2023	9/07/2023
C57	415691	6397143	26/06/2023	9/07/2023
C58	415935	6397226	26/06/2023	9/07/2023
C59	416172	6397331	26/06/2023	9/07/2023
C60	416020	6399766	26/06/2023	9/07/2023
C61	415891	6399999	26/06/2023	9/07/2023
C62	415835	6400268	26/06/2023	9/07/2023
C63	414068	6401144	26/06/2023	9/07/2023
C64	413964	6401275	26/06/2023	9/07/2023
C65	413850	6401540	26/06/2023	9/07/2023
C66	413609	6401759	26/06/2023	9/07/2023
C67	413469	6401915	26/06/2023	9/07/2023
C68	413224	6402128	26/06/2023	9/07/2023
C69	412842	6402153	26/06/2023	9/07/2023
C70	412574	6402132	26/06/2023	9/07/2023
C71	412126	6402114	26/06/2023	9/07/2023
C72	412096	6402408	26/06/2023	9/07/2023
C73	411880	6402575	26/06/2023	9/07/2023
C74	411689	6402693	26/06/2023	9/07/2023
C75	411580	6402835	26/06/2023	9/07/2023
C76	411496	6403039	26/06/2023	9/07/2023
C77	411555	6403436	26/06/2023	9/07/2023
C78	411838	6403759	26/06/2023	9/07/2023
C79	411896	6404549	26/06/2023	9/07/2023
C80	411841	6404802	26/06/2023	9/07/2023


DETECTION DOG

WESTERN
ENVIRONMENTAL

WILLOWDALE MINESITE

Black Cockatoo Targeted Assessment 2023

Western Environmental Pty Ltd
(08) 6162 8980
PO Box 437, Leederville, WA 6903
enquiries@westenv.com.au
westenv.com.au

Willowdale Minesite

Black Cockatoo Targeted Assessment 2023

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Alcoa of Australia Limited

Western Australia

Prepared by
Western Environmental Approvals Pty Ltd
Unit 5, 162 Colin Street
West Perth WA 6005
westenv.com.au

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Author	Reviewed by	Approved by
		
Andrew Fry Senior Environmental Scientist	**Dale Newsome** Director	**Dale Newsome** Director
21-Mar-2024	**21-Mar-2024**	**21-Mar-2024**

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Executive Summary

Alcoa of Australia Limited (Alcoa) has committed to undertaking pre-clearance ecological surveys as part of its Mining Management Plan (MMP) assessment and other state assessment processes. Alcoa commissioned Western Environmental Pty Ltd (WEPL) to undertake targeted pre-clearance black cockatoo assessments for the Larego region within the Willowdale bauxite mine. The project requires surveys of conceptual clearing alignments, with the survey program divided across five years (2024-2028). This report presents results for surveys undertaken in 2023 corresponding to 2024 conceptual clearing alignments.

The Survey Area is located in the Larego region of the Willowdale bauxite mine, 20 km southeast of the town of Waroona. The Survey Area for the 2023 program comprised two portions with one subject to foraging habitat assessment only:

- Breeding foraging and roosting habitat -2024 Conceptual Clearing Targets (437.35 ha).
- Foraging habitat only - Additional Areas (40.84 ha).

The black cockatoo habitat field survey methodology primarily followed the Commonwealth Referral Guidelines (DAWE, 2022) for identifying breeding, foraging and roosting habitat. Consideration was also given to survey requirements under the Alcoa (2023) Fauna Management Plan (Revision 0). Surveys were undertaken across a combined 60 person days between July 2023 and February 2024. Survey Areas have been previously surveyed to identify breeding habitat by Tony Kirkby/Alcoa between 2014 and 2023. Additional areas assessed for foraging habitat only have been previously surveyed to identify breeding habitat by Tony Kirkby/Alcoa across 2018, 2021 and 2023.

Breeding Habitat

A combined total of 13,267 potential, suitable or known nesting trees were recorded. The vast majority (97%) of these trees are Bamford Class 4 or 5 trees, defined by DAWE, 2022 as potential nesting trees, however these do not currently contain suitable nesting hollows.

Following phase 2 assessment of 86 trees assessed as having a moderate potential to contain suitable nesting hollows (Bamford Class 3), none were identified as containing suitable nesting hollows.

Four Bamford Class 2 trees which show signs of chew marks indicating they are a known breeding tree are present within the Survey Area. Three of these trees were previously recorded by Alcoa/T. Kirkby, with one additional known nesting tree added by 2023 surveys.

Foraging Habitat

The Alcoa (2023) Fauna Management Plan identifies that the Huntly and Willowdale mine areas contain predominantly high-quality foraging habitat due to the prevalence of Jarrah Forest. Foraging habitat quality was rated using the Commonwealth Habitat Quality Scoring Tool (DCCEEW, n.d.). Foraging habitat quality extents within the Survey Area out of ten are:

- Baudin's black cockatoo: 169.51 ha (10/10), 148.56 ha (9/10), 123.85 ha (8/10), 27.24 ha (7/10), 0.23 ha (1/10) and 8.80 ha (None 0).
- Carnaby's black cockatoo: 169.51 ha (10/10), 148.56 ha (9/10), 123.85 ha (8/10), 27.24 ha (7/10), 0.23 ha (1/10) and 8.80 ha (None 0).
- Forest red-tailed black cockatoo: 181.51 ha (10/10), 136.62 ha (9/10), 123.85 ha (8/10), 27.24 ha (7/10), 0.23 ha (1/10) and 8.80 ha (None 0).

Analysis of regional habitat extent indicates there is 63,554.92 ha of remnant native vegetation mapped within a 12 km buffer of the Survey Area. It is expected that the majority of this vegetation would contain suitable foraging species at the same or greater rate than that present within the Survey Area. The 469.4 ha of foraging habitat (excludes cleared areas) represents 0.74 % of the estimated regional habitat extent. The habitat quality within the Survey Area is considered likely to be analogous to that of the regional foraging habitat.

Roosting Habitat

Six locations were recorded that displayed evidence of having been used as a roost site. Of these one (Roost 01) was confirmed as a roosting site through secondary evidence and by dawn visits recording forest red-tailed black cockatoos roosting. Three sites (Roost 02, 04 and 06) are considered likely to be roost sites based on abundant scat patches, feathers and leaf clipping evidence. Roost 02 and 04 are separated by only 500m and may actually comprise one larger roosting area. Two roost sites (Roost 03 and 05) were small areas with small amount of roosting evidence. These sites have been used for roosting but do not appear to be frequently used or used by a large number of birds.

It is highly likely that more roost locations are present within the broader Larego region considering the frequency of observations of black cockatoos. Additional specific surveys involving repeated visits to suspected roost sites and dawn and dusk observations would be required to advance understanding of roosting behaviour in the Larego region.

Acronyms and Abbreviations

Abbreviation	Full Title
BC Act	*Biodiversity Conservation Act 2016*
CR	Critically Endangered
DAWE	Department of Agriculture, Water and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEWHA	Department of the Environment Water Heritage and the Arts
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection Biodiversity and Conservation Act 1999*
GIS	Geographic Information System
GPS	Global Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
km	Kilometres
m	Metres
MA	Marine
MI	Migratory
MMP	Mining Management Plan
MMPLG	Mining Management Planning Liaison Group
MNES	Matters of National Environmental Significance
OS	Other Specially Protected
P	Priority
PMST	Protected Matters Search Tool
T	Threatened
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WC Act	*Wildlife Conservation Act 1950*
WEPL	Western Environmental Pty Ltd

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1. Introduction

1.1 Project Background

Alcoa of Australia Limited (Alcoa) operates the Huntly and Willowdale bauxite mines, which are located in Alcoa's Mining Lease 1SA (ML1SA) within the Northern Jarrah Forest region. Alcoa has committed to undertaking pre-clearance ecological surveys as part of its Mining Management Plan (MMP) assessment and other state assessment processes. Targeted fauna surveys are undertaken based on conceptual clearing alignments which are used to:

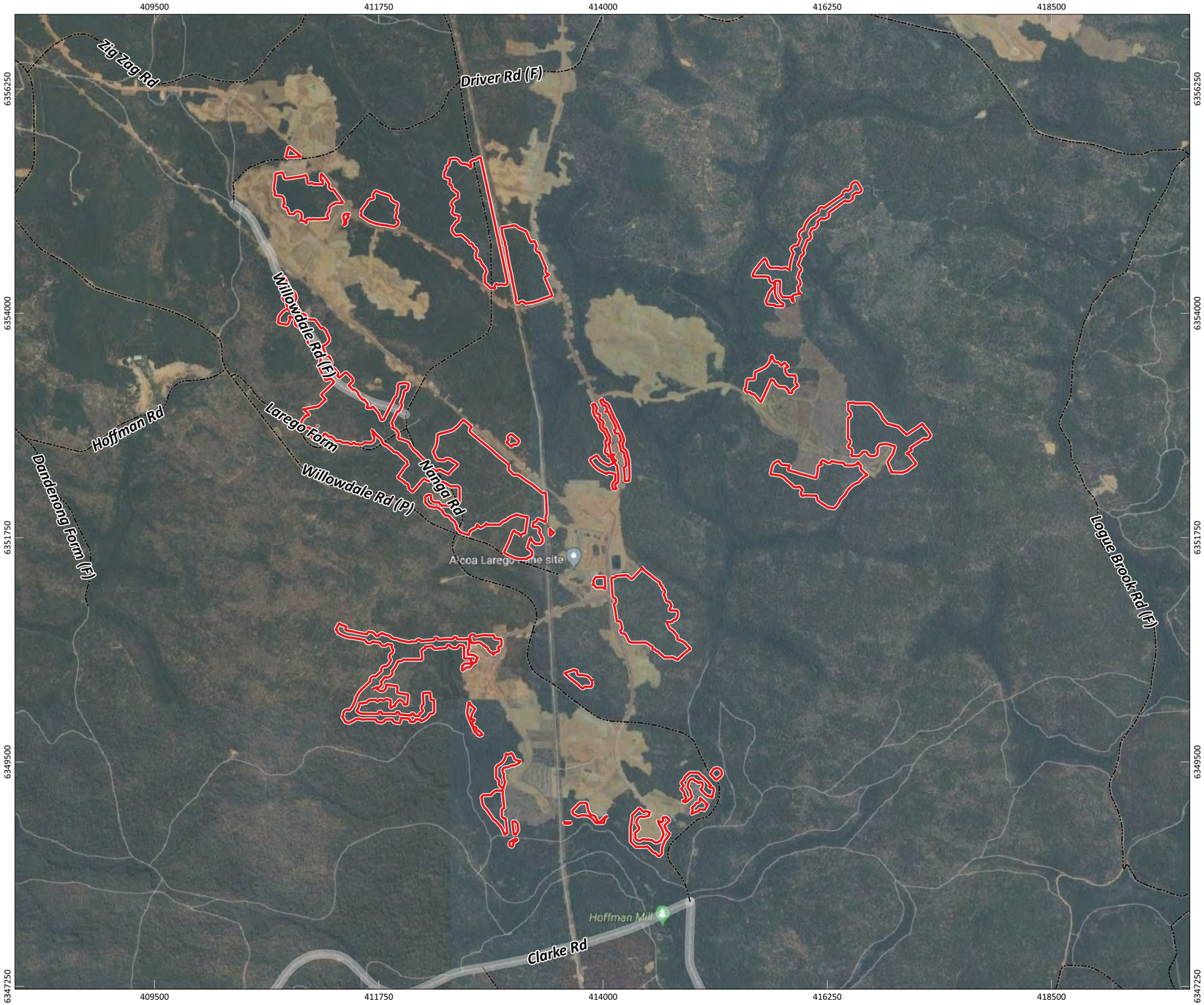
- Amend the conceptual alignment to avoid significant fauna.
- Inform translocation and environmental management plans as required.
- Develop mining avoidance zones for significant fauna; and
- Assist Alcoa in preparing MMP submission to the Mining and Management Program Liaison Group.

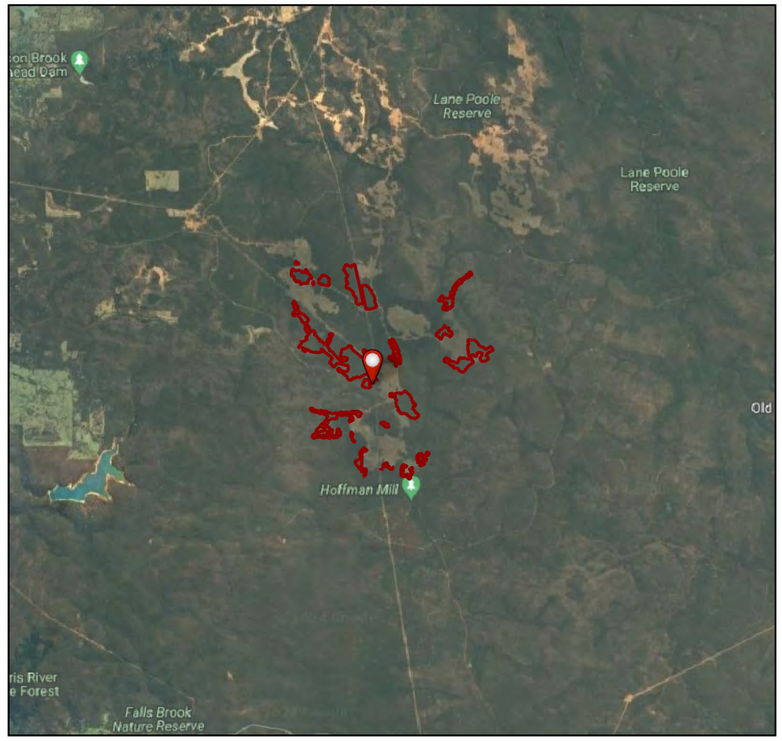
Alcoa commissioned Western Environmental Pty Ltd (WEPL) to undertake targeted pre-clearance black cockatoo assessments for the Larego region within the Willowdale bauxite mine. The project requires surveys of conceptual clearing alignments, with survey program divided across five years (2024-2028). This report presents results for surveys undertaken in 2023 corresponding to 2024 conceptual clearing alignments.

1.2 Location

The Survey Area is located in the Larego region of the Willowdale bauxite mine, 20 km southeast of the town of Waroona, see Figure 1. The Survey Area is within the Northern Jarrah Forest (JAF01) IBRA subregion (Commonwealth of Australia, 2012). The Survey Area for the 2023 program comprised two portions with one subject to foraging habitat assessment only:

- Breeding foraging and roosting habitat -2024 Conceptual Clearing Targets (437.35 ha).
- Foraging habitat only - Additional Areas (40.84 ha).





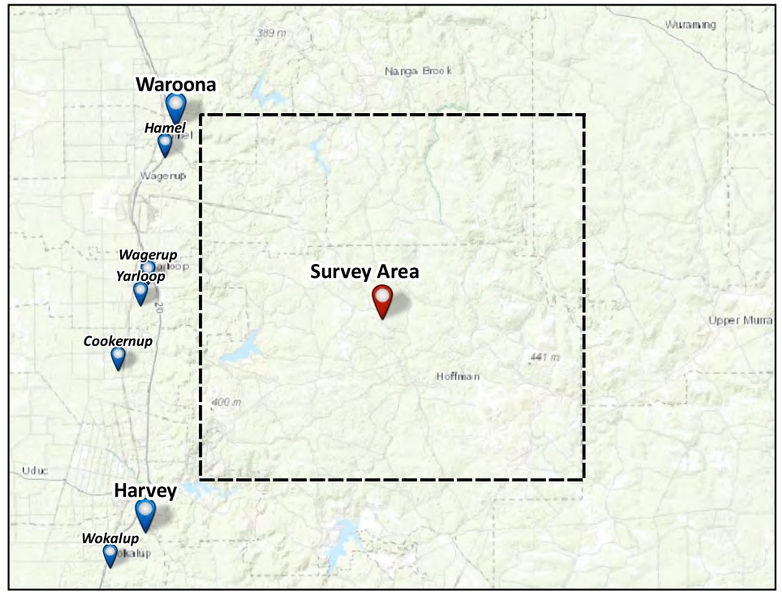


Figure 1: Survey Area

N

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PROJECT/REPORT NAME	Black Cockatoo Targeted Assessment 2023 Willowdale Minesite
SCALE	1:45,000
SHEET SIZE	A3 COLOUR
CLIENT	Alcoa of Australia Limited
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A23.033
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY Summer 2023
DRAWN BY / REVIEWED BY	HS/AF
DATE	13/3/2024

Legend

- SurveyArea
- Local Road
- Miscellaneous Road

No	Description	Drawn	Approved	Date
A	Original issue	HS	AF	13/3/2024

NOTES:

Cadastral boundary (LGATE-002). Base map ESRI Topo. Townsites (LGATE-248).

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Western Environmental Pty Ltd
08 6244 2310 | enquiries@westenv.com.au
Level 3/25 Prowse St, West Perth WA 6005
westenv.com.au

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1.3 Objectives and Scope of Work

The objective of the survey was to identify key black cockatoo habitat values within the Survey Area.

The scope of works included a black cockatoo habitat assessment as per DAWE (2022) *Referral guideline for 3 WA threatened black cockatoo species* (the Referral Guidelines) and marking of Significant Trees as per the Alcoa (2023) *Fauna Management Plan Huntly and Willowdale Mines* (the Fauna Management Plan).

The scope of 2023 black cockatoo surveys included two phases:

Phase 1: WEPL ecologists undertake a ground-based assessment recording potential nesting trees, suitable nesting trees or known nesting trees (as defined by DAWE (2022)), scoring foraging habitat quality and recording observation/ evidence of roosting and presence of species.

Phase 2: Follow up assessment of trees identified in phase 1 as potential suitable nesting trees or known nesting trees by Tony Kirkby via drone, pole camera or telephoto lens, where necessary. Trees with a diameter at breast height (DBH) qualifying as Alcoa Significant Trees were also confirmed by Tony Kirkby in phase 2. The results of the phase 2 assessment have been incorporated into this report.

1.4 Relevant Legislation and Guidance

This environmental assessment was conducted in accordance with Commonwealth and State legislation and guidelines:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Western Australian *Environmental Protection Act 1986* (EP Act).
- Western Australian *Biodiversity Conservation Act 2016* (BC Act).
- Western Australian Biodiversity Conservation Regulations 2018.
- Department of the Environment (DotE). (2013). *Matters of National Environmental Significance. Significant Impact Guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999.*
- Department of the Environment Water Heritage and the Arts (DEWHA). (2010). *Survey Guidelines for Australia's Threatened Birds*.
- Department of Agriculture, Water and the Environment (DAWE). (2022). *Referral Guidelines for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black-cockatoo.*

As well as those listed above, the assessment complied with Environmental Protection Authority (EPA) requirements for environmental survey and reporting in Western Australia, as outlined in:

- EPA. (2020). *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Known herein as the 'Fauna Technical Guidance'.

A short description of key legislation is provided in Appendix A. Other definitions, including species and ecological community conservation categories, are provided in Appendix B.

1.5 Survey Limitations and Constraints

Limitations and constraints of the fauna survey as outlined in the Fauna Technical Guidance are detailed below in Table 1.

Table 1: Limitations and Constraints Fauna Survey

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
Survey Level/ Scope	Negligible	A targeted assessment for black cockatoos was considered suitable.
Availability of contextual information	Negligible	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	Negligible	The entire Survey Area was traversed on foot.
Survey Intensity and Extent	Negligible	Survey effort for black cockatoos was suitable to adequately sample habitats present. A total of 54 person days of effort was allocated to phase 1. Assessment of potential black cockatoo nesting hollows was ground-based in phase 1 (undertaken by WEPL). A second survey phase was undertaken by others utilising a drone, pole camera or telephoto lens. Six person days of effort were allocated to phase 2.
Experience	Negligible	Phase 1 lead ecologist Andrew Fry has been conducting biological surveys in Western Australia for over 10 years, with over 5 years' experience undertaking targeted habitat assessments for black cockatoos. Phase 2 lead zoologist Tony Kirkby has extensive experience in black cockatoo nesting habitat with over 25 years' experience as a researcher and consultant, including long-term black cockatoo studies with the West Australian Museum.
Timing, weather, season	Negligible	Phase 1 Surveys undertaken from July -December. Phase 2 Surveys undertaken December-February. The surveys were undertaken within the recommended timing for both foraging and breeding habitat for forest red-tailed black cockatoo (year-round); partially for Carnaby's black cockatoo (July to December); and partially for Baudin's cockatoo (foraging Feb/March to September, breeding August-January) (DAWE,

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
		2022). The majority of survey work occurred within breeding periods. Assessment of hollow suitability based on dimensions are not seasonally restricted. Targeted searches were undertaken for secondary evidence of the species presence (e.g. foraging evidence from marri and jarrah nuts which can be done at any time of year).
Proportion of the fauna recorded, and any identification issues	Negligible	Targeted survey focused on three readily identifiable species only. No identification constraints were encountered.
Disturbances (fire, flood etc.)	Negligible	No recent fires or clearing disturbances posed a constraint to surveys. Long term changes due to modification of fire regime, historical and ongoing logging and bauxite mining are considered representative of contemporary habitat and are not considered constraints in the context of the scope of the surveys.

2. Methodology

The black cockatoo habitat field survey methodology primarily followed the Commonwealth Referral Guidelines (DAWE, 2022) for identifying breeding, foraging and roosting habitat.

Consideration was also given to survey requirements under the Alcoa (2023) Fauna Management Plan (Revision 0).

2.1 Desktop Assessment and Literature Review

Pre survey a desktop assessment was undertaken considering publicly available datasets and Alcoa fauna records/ existing tree survey data, see Table 2.

Table 2: Datasets for Desktop Assessment

Dataset Name and Date	Information Provided
Alcoa Potential Nest Trees-Larego Region (2012-2023)	Records of potential or actual nesting trees recorded by Alcoa as per Fauna Management Plan in the Willowdale mine region. Surveys were undertaken from 2013 to 2023 by Tony Kirkby and cover all Survey Areas and some surrounding areas.
Department of Biodiversity, Conservation and Attractions (DBCA). (2018) Carnaby's Cockatoo Confirmed Roost Sites (DBCA-050)	Describes the currently known and confirmed night roost areas for Carnaby's Black Cockatoo in the South - West of Western Australia (DataWA description).
Department of Biodiversity, Conservation and Attractions (DBCA). (2019) Black Cockatoo Roosting Sites - Buffered (DBCA-064).	Data from The Great Cocky Count which takes place annually in early to mid-April. This event records birds as they fly in to night roosts on a single day and has taken place since 2010. Three species are recorded: Carnaby's and Baudin's (white-tailed) and Forest Red-tailed Black-Cockatoos (DataWA description).
Department of Biodiversity, Conservation and Attractions (DBCA). (2019) Black Cockatoo Breeding Sites - Buffered (DBCA-063).	Sites where Black-Cockatoos (generally Carnaby's) are confirmed to be breeding. Breeding is inferred based on surveys which have recorded either birds entering/leaving the nest or the inside of the nest has been viewed with eggs or chicks. (DataWA description).

2.2 Field Survey Timing and Team

Table 3: Survey Effort Summary

Survey Phase	Team Position and Experience	Survey Effort and Timing
Phase 1 (2023)	Senior Ecologist-12 years Graduate Ecologist- 2 years	54 person days- July- December 2023
Phase 2 (2023)	Black cockatoo specialist- 25 years	Six person days- December 2023-February 2024

2.3 Breeding Habitat Assessment

The Commonwealth defines breeding habitat as trees species, known to support breeding, within the range of the species, which either have a suitable nest hollow or are of a suitable DBH (1.3 m from the ground) to develop a hollow (DAWE, 2022). Terminology used in this report for trees comprising breeding habitat follows that defined in glossary of DAWE (2022) as shown in Table 4.

Table 4: Breeding Habitat Terminology

Breeding Habitat Term	Definition (DAWE, 2022)
Known nesting trees	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting trees	Trees with suitable nesting hollows present, although no evidence of use.
Suitable nesting hollows	Any hollow with dimensions suitable for use for nesting by black cockatoos. See Table 8 for further discussion on nesting hollow characteristics.
Potential nesting trees	Trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows.

In 2023 breeding habitat assessment included two phases. The survey methodology of these phases are discussed in detail below. Portions of the breeding habitat Survey Area have been subject to prior survey efforts by Tony Kirkby and Alcoa to identify breeding habitat.

Phase 1

WEPL ecologists recorded every potential nesting tree and assessed from the ground potential for presence of suitable nesting trees or known nesting trees.

All trees with suitable DBH (>50cm jarrah, marri, blackbutt, bullich, flooded gum; >30cm wandoo) were recorded using a mobile GIS field data collector platform. The following was recorded for each such tree:

- species
- DBH (approximately 1.3 m from the ground)
- coordinates

For trees possessing hollows of >10cm diameter entry the following characteristics were recorded from ground-based observations:

- size of entry.
- hollow type (knot, fissure, spout, vertical/chimney.

- comments on likelihood of suitable nesting hollow formation based on factors including tree/branch architecture, branch diameter, tree species, appearance and thickness of entry rim, cracking in wood, presence of leaves/ sticks, blackening from burning, and any other pertinent observations.
- evidence of use including chew marks or wear.
- presence of other birds or bees.
- images of each hollow and overall tree.

In addition to Commonwealth guidelines for assessing potential breeding trees, a scoring system based on that developed by Dr Mike Bamford (referred to as Bamford Class) was applied to class potential breeding habitat. This system and the Bamford Class alignment with DAWE (2022) breeding habitat definitions are shown in Table 5.

Table 5: Black cockatoo Potential Breeding Tree Bamford Class System

Bamford Class	Description of Tree and Hollows/Activity	Alignment with DAWE (2022) Breeding Habitat Definitions
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow, eggs present.	Known Nesting Tree
2	Hollow of suitable size and angle visible with chew marks around entrance.	Known Nesting Tree
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m).	Suitable Nesting Tree (if confirmed hollow with suitable dimensions present in phase 2); Potential Nesting Tree (if confirmed hollow with suitable dimensions not present or highly unlikely to be present in phase 2)
4	Tree with hollows or broken branches that might contain hollows, but hollows or potential hollows are not of a suitable size, or are aligned or obstructed so as to prevent access	Potential Nesting Tree
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.	Potential Nesting Tree

Phase 2

Tony Kirkby verified the presence of any suitable nesting trees or known nesting trees by revisiting trees scored by WEPL ecologist during phase 1 as Bamford Class 1-3 trees. During the course of phase 1 survey, it was determined that WEPL ecologists were likely applying too high a precautionary threshold to scoring of Bamford Class 3 trees. Following consideration of scoring approach, Bamford Class 3 trees were subdivided into trees with moderate potential to contain suitable nesting hollows and trees deemed highly unlikely to

contain suitable nesting hollows. Of the overall 396 trees scored as Bamford Class 3, 86 were assessed as having a moderate potential to contain suitable nesting hollows and were included in phase 2 assessment. Of these no additional trees were identified as containing suitable nesting hollows. On this basis it was considered suitable to classify the remaining 310 Bamford Class 3 trees as highly unlikely to contain suitable nesting hollows and exclude them from phase 2 assessment.

Phase 2 assessment utilised a drone, pole camera or telephoto lens. Assessment confirmed if hollows are / have been used previously, are not suitable, currently suitable or potentially suitable in the future. Tony Kirkby has been conducting black cockatoo surveys throughout the south-west of Western Australia for the past 25 years and locating black cockatoo breeding trees for Alcoa Australia for the past ten years. Tony has extensive experience in hollow assessment having been involved in many long-term black cockatoo studies with the Western Australian Museum including a 17-year study undertaken into the breeding biology of forest red-tailed black cockatoos (Johnstone, Kirkby and Sarti 2013).

2.4 Foraging Habitat Assessment

The Commonwealth defines foraging habitat as areas including plants of species known to support foraging within the range of each black cockatoo species. Marri (*Corymbia calophylla*) and jarrah (*Eucalyptus marginata*) woodlands are particularly important to Baudin's and the forest red-tailed black cockatoo, while proteaceous heaths (shrublands dominated by Banksia, Hakea and Grevillea species) are also utilised by Carnaby's black cockatoo (DAWE, 2022).

The potential of the habitat within the Survey Area to support foraging was described, and any evidence was recorded (e.g. chewed marri and jarrah nuts), along with opportunistic sightings of any black cockatoo individuals. The mapped boundaries of foraging habitat were broadly aligned with the nine broad fauna habitat types described for the Huntly and Willowdale Mine areas as per the Alcoa (2023) Fauna Management Plan. The Fauna Management Plan identifies that "Preliminary fauna habitat mapping has been undertaken in areas of the Huntly and Willowdale mines where baseline fauna surveys have not been undertaken, and extrapolation of habitats was made using available historical site vegetation type mapping, undertaken by Mattiske Consulting. These areas have not been subject to ground truthing in accordance with EPA guidance for terrestrial fauna surveys". Ground truthing of fauna habitat mapping where relevant to defining foraging habitat occurred concurrent to this survey and any updated fauna habitat mapping as an outcome of these surveys will be used in future habitat assessments.

Habitat mapping of the Survey Area was used in conjunction with the site assessment to determine the foraging quality using the Foraging Habitat Scoring Tool (DAWE, 2022). The Foraging Habitat Scoring Tool (DAWE, 2022) is applied once only for an entire site.

A secondary finer grain assessment was undertaken using the '*Habitat Scoring System for WA black cockatoo foraging habitat*' (the Habitat Quality Scoring Tool) provided by DCCEEW in 2023 as an unpublished source. The Habitat Quality Scoring Tool produces a score of 0-7 for site condition and may be applied to each polygon of identified fauna habitat type. The site condition is scored based on percentage cover of foraging

species and influence of tree deaths or degrading factors. An overall site context score of 0-3 is then added. See Appendix C for detailed scoring tool methodologies.

Information collected for the Survey Area was also contextualised with consideration to the wider availability of foraging habitat for black cockatoos in the surrounding area (12 km radius). This buffer is selected as recommended in the Commonwealth referral guidelines due to black cockatoos mainly foraging within 12 km of their nest site during the breeding season and their reliance on this proximity of foraging resources to successfully raise chicks (DAWE, 2022). Analysis utilises Remnant Native Vegetation Extent mapping (DPIRD-005) and Vegetation Complexes- Swan Coastal Plain and Southwest forest region (DBCA-046 and DBCA-047) mapping to define extent and type of remnant vegetation.

2.5 Roosting Habitat Assessment

Roosting habitat was assessed based on observation of roosting or roosting evidence recorded during survey and based on habitat suitability (generally tall trees in the landscape in proximity to a water source). During the field survey, searches were conducted for evidence of roosting (e.g. piles of scats, feeding debris or chewed trees). Observations were also collected opportunistically in the early morning or late afternoon or black cockatoos congregating or perching in areas. These areas were further investigated as potential roosts.

2.6 Significant Trees

Under the Alcoa Fauna Management Plan Significant Trees are defined as the following:

- A jarrah tree with a diameter of not less than 2 000 mm at a height of 1300 mm above ground level.
- A marri tree with a diameter of not less than 1 500 mm at a height of 1300 mm above ground level.

AND

- Is healthy (i.e. retaining majority of limbs, with high percentage leaf cover on remaining limbs) and may provide roosting habitat for black cockatoos, as determined by a suitably qualified and experienced person.

Potential significant trees were identified from phase 1 WEPL survey data. They were then subject to follow up assessment by Tony Kirkby during phase 2 assessment.

3. Results

3.1 Desktop Assessment

As per the three species modelled distribution in DAWE (2022) the Survey Area falls within:

- A known foraging area and main wintering area for Baudin's black cockatoo but outside the predicted breeding range.
- The breeding range for Carnaby's black cockatoo.
- The likely to occur modelled distribution for forest red-tailed black cockatoo.

The desktop assessment considered proximity of the Survey Area to known nesting and roosting sites. Desktop assessments typically focus on a 12 km radius from Survey Area due to black cockatoos mainly foraging within 6-12 km of their nest site during the breeding season and their reliance on this proximity of foraging resources to successfully raise chicks (DAWE, 2022).

The nearest confirmed black cockatoo breeding site mapped by DBCA is located 30km west in the Lake Preston area (DBCA-063). To note this dataset is generally used to record Carnaby's breeding locations and is likely data deficient in the Willowdale area. Surveys of Alcoa mining operations areas undertaken by Alcoa and Tony Kirkby from 2012-2023 have identified 146 'nest trees' (defined as per Fauna Management Plan as "tree containing one or more hollows suitable as Black Cockatoo breeding habitat. A suitable hollow is based on hollow size, shape, and entry angle, irrespective of signs of use for breeding"). A breakdown by cockatoo species is not provided with this dataset however the Fauna Management Plan identifies that at least three Baudin's black cockatoo breeding events were recorded within the Giles Protection Zone, located in close proximity to the 2023 Survey Area. It is assumed that of the 146 'nest' trees identified, the majority are forest red-tailed black cockatoo breeding sites, as this species is most commonly recorded breeding in the Northern Jarrah Forest (Alcoa, 2023). Hence both Baudin's black cockatoo and forest red-tailed black cockatoo breeding sites are present <6km from the Survey Area.

There are two known night roosting locations for black cockatoos approximately 10 km to the west of the Survey Area, both are attribued as Carnaby's black cockcatoo roosting sites (DBCA-064).

See Figure 2 for known roosting and breeding locations within 12 km buffer from the Survey Area.

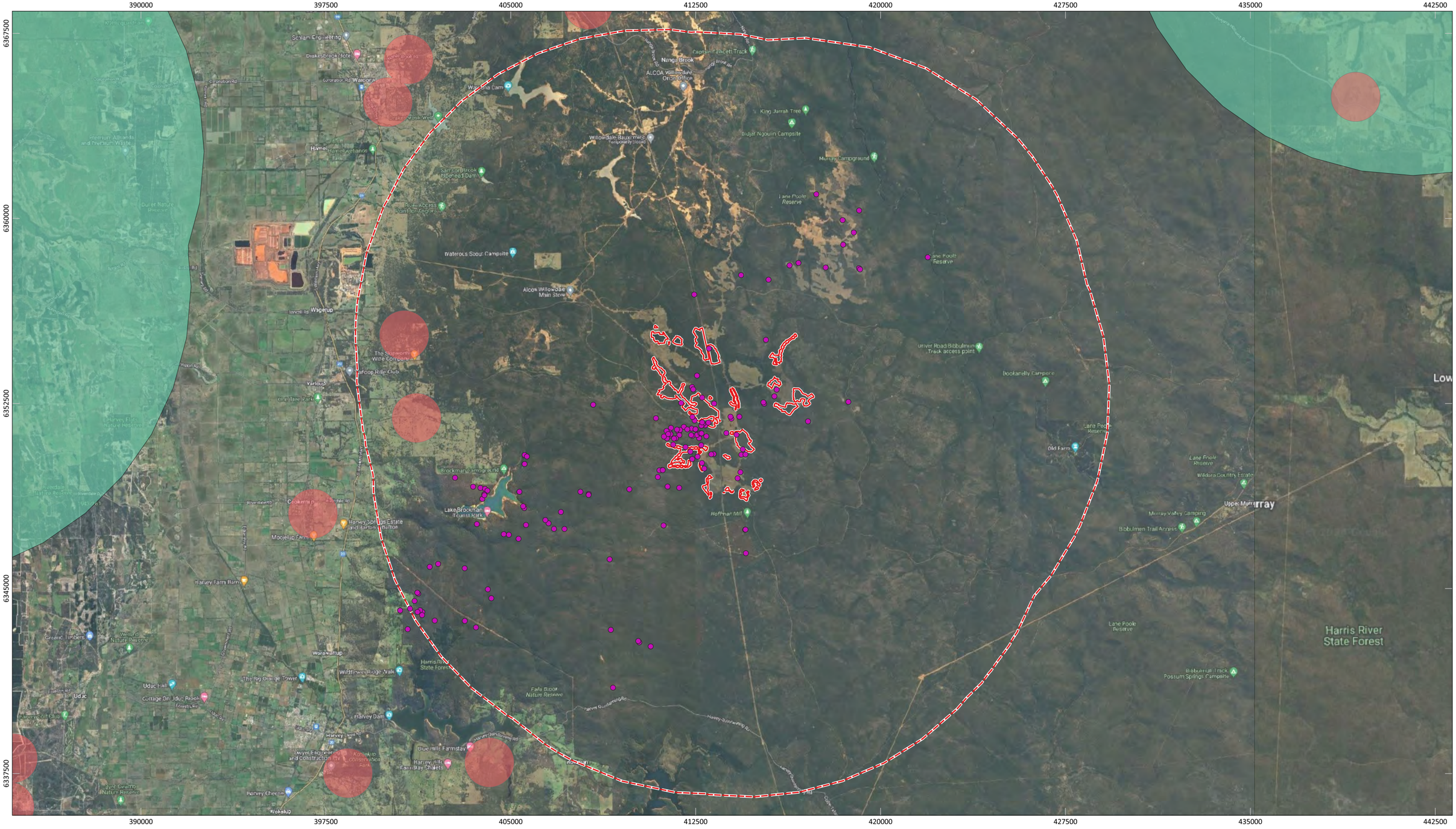


Figure 2: Known Black Cockatoo Roosting and Breeding Sites within 12 km Buffer

N

0 3 6 9 km

SCALE: 1:150,000	SHEET SIZE: A3 COLOUR	PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023 Willowdale Minesite	
		CLIENT: Alcoa of Australia Limited	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A23.033	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023		DRAWN BY / REVIEWED BY: HS/AF	DATE: 13/3/2024

Legend

- Survey Area
- 12 km Radius of Survey Area
- Black Cockatoo Roosting Sites - Buffered (DBCA-064)
- Carnabys Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions (DBCA-054)
- Larego Confirmed Nest Trees

No	Description	Drawn	Approved	Date
A	Original issue	HS	AF	13/3/2024

NOTES:

Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.

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3.2 Literature Review

A literature review was undertaken of previous terrestrial fauna studies considered relevant to the current Survey Area, to inform the targeted black cockatoo assessment. A summary of the key findings relevant to the survey is provided below in Table 6.

Table 6: Review of Previous Studies

Source- Title	Key Findings
Alcoa Fauna Management Plan (2023)	**Breeding Habitat** Willowdale contains a 206 ha Protection Zone in the Giles area. This Protection Zone contains a high density of nest tree, particularly in comparison to the surrounding area. In 2021 there were three Baudin's black cockatoo breeding events recorded. The Protection Zone includes a large number of trees of habitat and significant trees (864 Marri trees with a DBH>500mm, excluding nest trees). High quality foraging habitat and permanent water sources are also contained within the Protection Zone. The Huntly and Willowdale mine areas are highly likely to support breeding by forest red tailed black cockatoo and Baudin's cockatoo (T. Kirkby, pers. Comm; GHD, 2021). **Foraging Habitat (Desktop based assessment)** The Huntly and Willowdale mine areas contain predominantly high-quality foraging habitat due to the prevalence of Jarrah Forest, which contains key foraging species including Marri, Jarrah and proteaceous species. The mine areas comprise approximately 77% high quality foraging habitat for forest red-tailed black cockatoo and approximately 78% high quality foraging habitat for Baudin's and Carnaby's cockatoos. Other fauna habitats provide low to medium quality foraging habitat.
Doherty et al. (2016). Successional changes in feeding activity by threatened cockatoos in revegetated mine sites	Research project to determine whether there were successional patterns in cockatoo feeding activity in revegetation aged between 4 to 23 years. The study concludes that black cockatoos feed in vegetation at all three mine sites, despite variations in vegetation age, structure and floristics. Black cockatoos begun feeding on proteaceous and myrtaceous food plants within 4 and 7 years following revegetation, indicating that some food sources are restored quickly after mining disturbance of the Jarrah forest. FRTBC breeding was found to appear to be linked to the spatiotemporal availability of its primary food sources, the fruit from the tree species, Marri *Corymbia calophylla* and Jarrah *Eucalyptus marginata*. However, due to climate change experienced and predicted to be experienced in the future in Western Australia it is expected that the food resources during the breeding season for cockatoos will become increasingly limited in time and space, thus threatening their persistence. The preference for specific types of hollows indicated that suitable hollows are likely to be scarce in the landscape and that management prescriptions need to be developed to maintain the supply of suitable hollows.
Alcoa; Tony Kirkby (2011-2022) Preclearance black cockatoo hollow surveys	Black cockatoo surveys undertaken by Black Cockatoo Specialist as engaged by Alcoa. Surveys undertaken within all areas planned for clearing of potential black cockatoo breeding trees.

Source- Title	Key Findings
Willowdale and Huntly mines	146 nest trees identified within 15km of Survey Area
Tony Kirkby pers. comm. (2020)	Survey undertaken in 2020 of Jarrahdale and Huntly Mine rehabilitation at 20 and 30 years indicated predominantly low foraging by Black Cockatoos compared to higher foraging in adjacent un-mined forest (T. Kirkby, pers. comm., 2020). Doherty et al (2016) speculated that the lower foraging in rehabilitation may be due to the younger tree age; a higher stem density affecting growth, flowering and fruiting; or a higher stem density impeding access for canopy feeding.
GHD (2021) **Myara North– Terrestrial Fauna Survey and Black Cockatoo Assessment**	The Huntly and Willowdale mine areas are highly likely to support breeding by forest red-tailed black cockatoo and Baudin's black cockatoo. All three EPBC Act listed Black Cockatoo species were recorded primarily throughout the Marri-Jarrah Forest habitat type. All habitat types will be utilised for foraging by either one or all of the species.
Johnstone *et al* 2017 **The distribution, status movements and diet of the forest red-tailed black cockatoo in the south-west with emphasis on the Greater Perth region, Western Australia**	The loss of nest trees through logging, fire (including prescribed burns) and post-fire clean up, and weather is of concern, especially fire. Fire is acknowledged as a significant factor in the fall of hollow trees. Many veteran and stag Marri (the favoured nest tree) are particularly susceptible to fire. Most of these trees have only an outer living shell around rotten heartwood. A fire at the base of these trees quickly burns through the outer shell creating a chimney stack that destroys the tree. The January 2016 Waroona wildfire that swept through the Larego forest block destroyed a total of 19 of 41 known cockatoo hollows.

3.3 Observations

Individuals were recorded through a mix of physical observations, sound of nearby calls, patches of feathers/ scats and foraging evidence (primarily from marri, jarrah and sheoak nuts). A total of 220 records for any observation type were recorded. These are summarised in Table 7 and shown in Figure 3.

Table 7: Summary of Observation

Observation Type	Baudin's Black Cockatoo	Carnaby's Black Cockatoo	Forest Red-tailed Black Cockatoo
Observed or call recorded	-	1 record (2 individuals observed)	34 records (213 total individuals observed)
Foraging Evidence	-	2 records	180 records
Remains or Feathers		-	3 records
Totals	-	3 records	217 records

The most commonly recorded species was forest red-tailed black cockatoo. Groups of 6-12 individuals were recorded flying over the survey area and smaller groups of 2-6 individuals were recorded foraging in marri and jarrah trees.

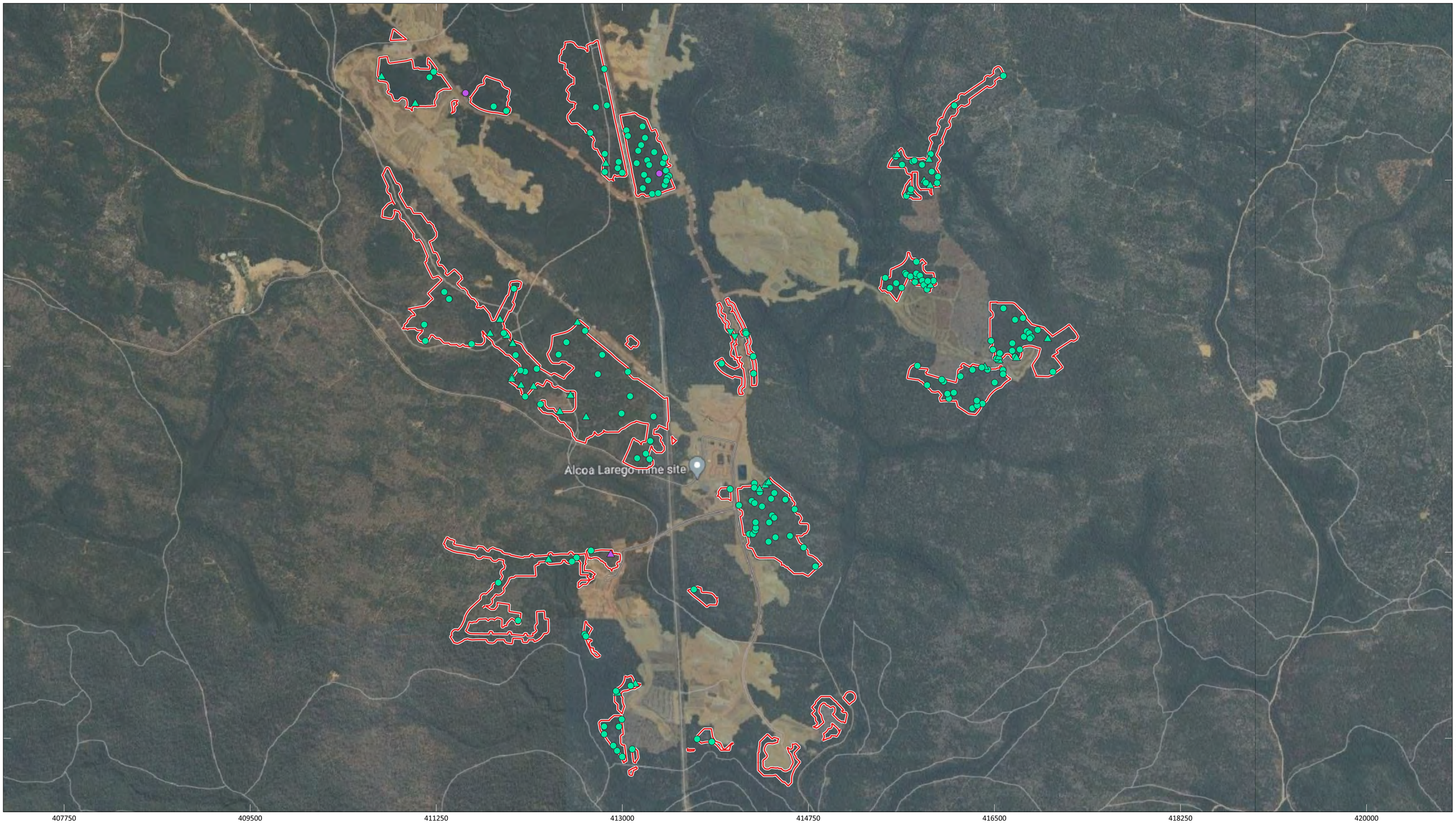


Figure 3: Black Cockatoo Observations

0 1 2 km

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SCALE: 1:35,000	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023 Willowdale Minesite	CLIENT: Alcoa of Australia Limited
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: HS/AF / DATE: 13/3/2024

Legend

- Survey Area

Carnaby's Black Cockatoo Observations

- Foraging or digging evidence
- Observed

Forest Red-tailed Black Cockatoo Observations

- Foraging or digging evidence
- Observed
- Remains

No	Description	Drawn	Approved	Date
A	Original issue	HS	AF	13/3/2024

NOTES:

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Level 3/25 Prowse St, West Perth WA 6005
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3.4 Breeding Habitat Assessment

Breeding habitat comprises trees species known to support breeding within the range of the species, which either have a suitable nest hollow, or are of a suitable DBH to develop a hollow (DAWE, 2022). Breeding typically occurs in native eucalypt species however many species of eucalypt including non-endemic species may develop suitable hollows for breeding (DAWE, 2022). In the Willowdale mine region tree species which may provide hollows for black cockatoos as per Tony Kirkby (2023 pers. comm.) are:

- Jarrah- *Eucalyptus marginata*
- Marri- *Corymbia calophylla*
- Bullich- *Eucalyptus megacarpa*
- Blackbutt-*Eucalyptus patens*
- Flooded Gum-*Eucalyptus rudis*
- Wandoo-*Eucalyptus wandoo*
- Powderbark Wandoo-*Eucalyptus accedens*

The most frequently utilised tree species for breeding in the Northern Jarrah Forest region is marri (T. Kirkby, pers. comm. 2023). A long-term study of suitable nesting trees being utilised by forest red-tailed black cockatoo identified that marri accounted for 91% of known nest trees when comparing marri against jarrah (Johnstone *et al*, 2013). Other tree species such as blackbutt, bullich and flooded gum (particularly bullich) while good hollow providers are restricted within their range to stream zones and are far less abundant than jarrah and marri. Wandoo and powderbark wandoo are also good hollow providers however are very uncommon in the Willowdale region (T. Kirkby, pers. comm. 2023).

Black cockatoo hollows are located throughout the landscape but tend to be clustered in stands of old growth marri (T. Kirkby, pers. comm. 2023).

A summary of understood suitable nesting hollow characteristics for the three species is provided below in Table 8.

Table 8 Black Cockatoo Nesting Hollow Characteristics

Species	Baudin's black cockatoo	Carnaby's black cockatoo	Forest red-tailed black cockatoo
Tree species and hollow characteristic	Nesting mainly in karri, marri, jarrah, wandoo, bullich, and tuart Preferred hollow dimensions have not been	Nesting mainly in salmon gum, wandoo, tuart, jarrah, flooded gum, karri and marri.	Nesting mainly in jarrah, marri, karri, wandoo, bullich, blackbutt and tuart

Species	Baudin's black cockatoo	Carnaby's black cockatoo	Forest red-tailed black cockatoo
	specifically studied but are considered likely to be similar to that of the Carnaby's black cockatoo	Utilise hollows with entry diameter of 10-65 cm, internal chamber floor diameter of 15-70 cm and depths of 30-300cm. (mean 26 cm entry, 33 cm floor and 130 cm depth).	Utilise hollows with entry diameters from 12-150 cm, internal floor diameter of 17-54 cm and depths of 30-820 cm. (mean 30 cm entry, 33 cm floor and 140 cm depth).
Sources	DAWE, 2022	DAWE, 2022, Saunders *et al* 2014a, Saunders *et al* 2014b	DAWE, 2022, Johnstone and Storr 1998, Johnstone *et al* 2013

A combined total of 13,267 potential, suitable or known nesting trees (DBH >50cm) were recorded. The vast majority (97 %) of these trees are Bamford Class 4 or 5 trees, which although defined by DAWE, 2022 as potential nesting trees, do not currently contain suitable nesting hollows. A breakdown of nesting trees by Bamford Class is shown below in Table 9.

Table 9: Summary of Potential Nesting Trees

Bamford Class	Class 1	Class 2	Class 3	Class 4	Class 5	Totals (tree species)
DAWE, 2022 Terminology	Known Nesting Tree		Suitable Nesting Tree (pending phase 2 inspection)	Potential Nesting Trees		
Tree species						
Blackbutt	-	-	-	-	5	**5**
Bullich	-	-	-	1	9	**10**
Dead	-	-	147	799	373	**1319**
Jarrah	-	-	188	1150	8547	**9885**
Marri	-	4	61	311	1672	**2048**
Total (Bamford Class)	-	**4**	**396**	**2,261**	**10,606**	**13,267**

Potential Nesting Trees

The large majority (10,606 trees) do not currently show signs of potential nesting hollow development (Bamford Class 5 trees). There were 2261 trees assessed as possessing small hollows which are of an insufficient size to support nesting, however these trees are of sufficient age and growth form to be developing hollows (Class 4 trees).

There are 396 Bamford Class 3 trees. These were recorded by WEPL ecologist in phase 1 and either appeared to have a potentially suitable nesting hollow visible (opening entry >10cm); or potentially suitable hollow present as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m which could not be confirmed from ground assessment. Bamford Class 3 trees were further subdivided into trees with moderate potential to contain suitable nesting hollows and trees deemed highly unlikely to contain suitable nesting hollows. Of the overall 396 trees scored as Bamford Class 3, 86 were assessed as having a moderate potential to contain suitable nesting hollows and were included in phase 2 assessment. Of these no additional trees were identified as containing suitable nesting hollows. On this basis it was considered suitable to classify the remaining 310 Bamford Class 3 trees as highly unlikely to contain suitable nesting hollows and exclude them from phase 2 assessment. All Survey Areas had been assessed for breeding habitat in previous years (2012 to 2023) by Tony Kirkby.

Known Nesting Trees

Four Bamford Class 2 trees which show signs of chew marks indicating they are a known breeding tree are present within the Survey Area. See Image 01 below for example of chew marks and hollow. Three of the trees were already known from previous surveys. Class 2 tree attributes are summarised in Table 10.

Table 10:Summary of Known Breeding Trees

Merge Tree Number	Species	DBH (cm)	Hollow Comments
364	Marri	100	Previously assessed by Alcoa/T. Kirkby. Tree ID 1400 on metal tag. Tony K reported slight chewing on upwards facing suitable hollow. WEPL also notes 20cm spout hollow present mid trunk.
529	Marri	70	Chimney hollow at 12m up in snapped trunk. Entry 30-35 cm across with suspected 30cm+ internal dimensions. Significant amount of chew marks from black cockatoo on rim indicating suitable hollow present.
1270	Marri	110	Previously assessed by Alcoa/T. Kirkby. Previously marked tree number 1997. TK reports top entry hollow present, difficult to see. WEPL report " Dead branches with upwards hollows".
3989	Marri (now dead)	95	Previously assessed by Alcoa/T. Kirkby. Tree 1836 on metal tag. Upwards opening 30cm chimney hollow in 40cm diameter branch at 18m. T. Kirkby reported chewing at entrance in 2022 assessment.



Image 01- Tree number 529 showing chew marks on rim

See locations of potential nesting trees and known breeding trees in Figure 4. Tree attributes, hollow comments and images of Bamford Class 2-3 are provided in Appendix D.

Fire Impacts on Breeding Habitat

During field surveys it was observed that significant areas of the Survey Area have been subject to impacts from intense fire which have modified breeding habitat quality. Assessment of fire footprint mapping (data supplied by Alcoa in 2023) indicates that the entire Survey Area was impacted by the Yarloop-Waroona bushfire in January 2016. The Yarloop-Waroona bushfire was a large scale, very intense fire that impacted approximately 70,000 ha of vegetation. The scale of impact is variable across the Survey Area, with ridges and plateaus most impacted and impacts increasing in the western and northern portions of the Survey Area. In highly impacted areas, a very high rate of mature trees (>80%) have suffered main trunk death, with trees resprouting from base as multi-stemmed, coppiced forms. See Image 2 below for example of fire impacted habitat.



Image 02- Fire Impacted Habitat

Within highly fire impacted habitat it was observed that a high proportion of large, senescent trees which are most suitable for black cockatoo hollow formation were destroyed by the fire. Evidence of large burnt-out stumps and remains of collapsed trees indicate that they were likely present pre 2016 fire. In particular it was noted that large marri trees which provide the most utilised breeding habitat were largely absent.

These observations are consistent with existing research, with Johnstone *et al* (2017) reporting that post 2016 fire, 19 of the 41 know black cockatoo hollows within the Larego forest block (covering the Survey Area) were destroyed. Whitford & Williams (2001) summarised that when exposed to fire, the base of the marri burns quickly, resulting in the loss of the trees' outer shell and destruction of the chimney stack. Due to the marri's lower wood density, it has increased susceptibility to fire, in comparison to jarrah's resistance to fire, correlating with its higher density. Johnstone *et al* (2013) also acknowledges that fire is a significant factor in loss of breeding habitat with veteran and stag marri trees particularly susceptible to collapse in fire.

As a result of these fire impacts portions of the Survey Area contain very low rates of suitable nesting trees and are dominated by multi-stemming regrowth, primarily jarrah.

Significant Trees

As per the Alcoa Fauna Management Plan Significant Trees (jarrah DBH>200cm; marri DBH>150cm) were identified from phase 1 WEPL survey data, then subject to follow up assessment by Tony Kirkby during phase 2 assessment. Significant trees recorded from the Survey Area are identified in Table 11.

Table 11: Significant Trees

WEPL Tree Number	Species	DBH (cm)	Assessment	Coordinate (AGD/84 Zone 50)	
				Easting	Northing
2664	Jarrah	230	Previously recorded significant tree. ID - 2675	412340.616	6352280.226
8116	Jarrah	210	Should be classed significant tree. Numbered ID-2102	416112.9196	6352335.585



Figure 4: Black Cockatoo Potential Breeding Habitat

N

0 1 2 km

SCALE: 1:35,000	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/AF / DATE: 1/5/2024

PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023
Willowdale Minesite

CLIENT: Alcoa of Australia Limited

Legend

- Survey Area
- Cleared Areas

Potential Nesting Trees (Class 2)

- Marri
- T. Kirkby Inspected

Bamford Tree Class

- 2

No	Description	Drawn	Approved	Date
A	Original issue	MD	AF	1/5/2024

NOTES:

Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.

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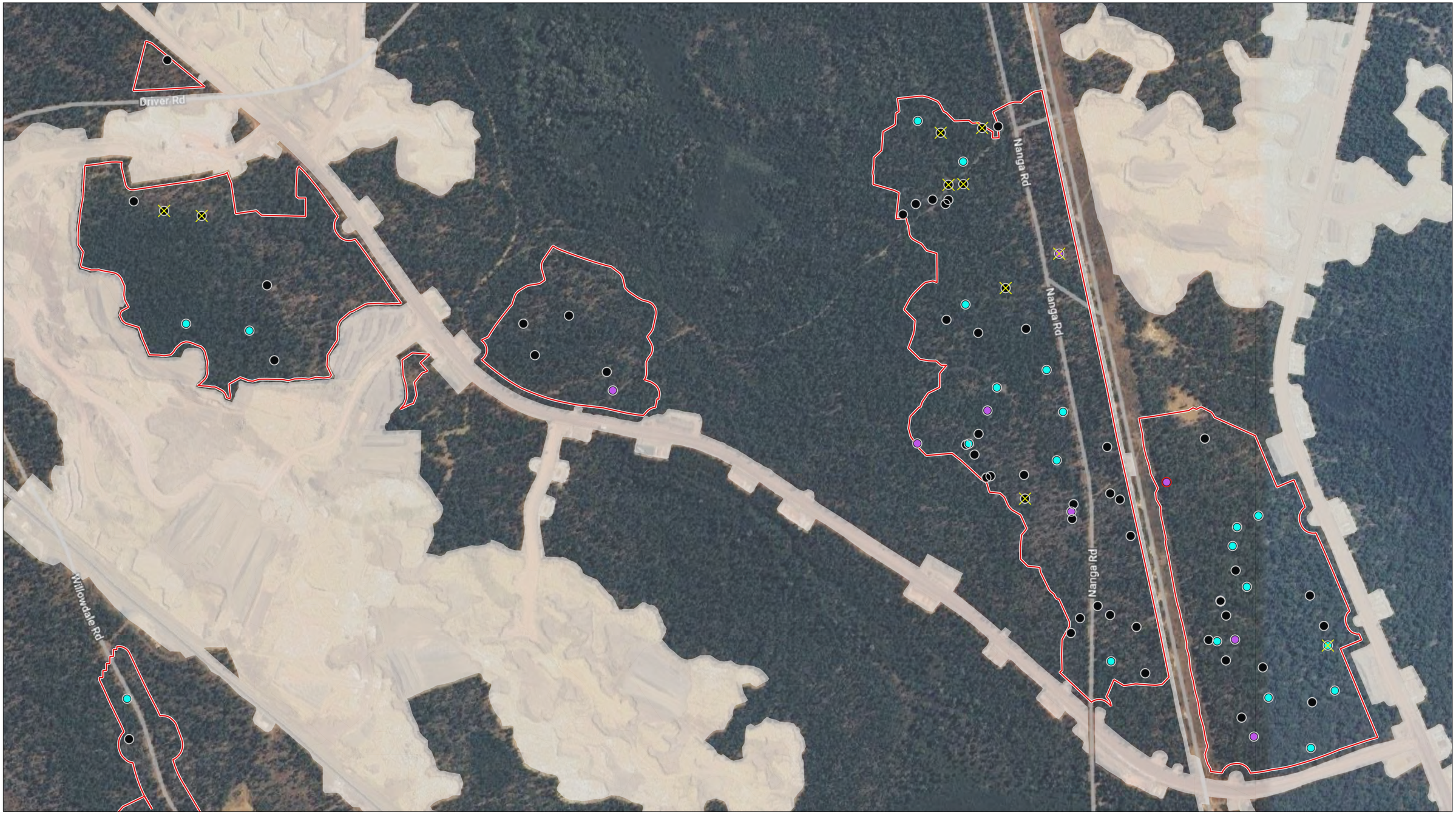


Figure 4a: Black Cockatoo Potential Breeding Habitat

N

0 250 500 m

PROJECT/REPORT NAME	Black Cockatoo Targeted Assessment 2023 Willowdale Minesite
SCALE	1:8,000
SHEET SIZE	A3 COLOUR
CLIENT	Alcoa of Australia Limited
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A23.033
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY Summer 2023
DRAWN BY / REVIEWED BY	MD/AF
DATE	1/5/2024

Legend

- Survey Area
- Cleared Areas

Potential Nesting Trees (Class 2 and 3)

- Dead
- Jarrah
- Marri
- T. Kirkby Inspected

Bamford Tree Class

- 2
- 3

OVERVIEW MAP



No	Description	Drawn	Approved	Date
A	Original issue	MD	AF	1/5/2024

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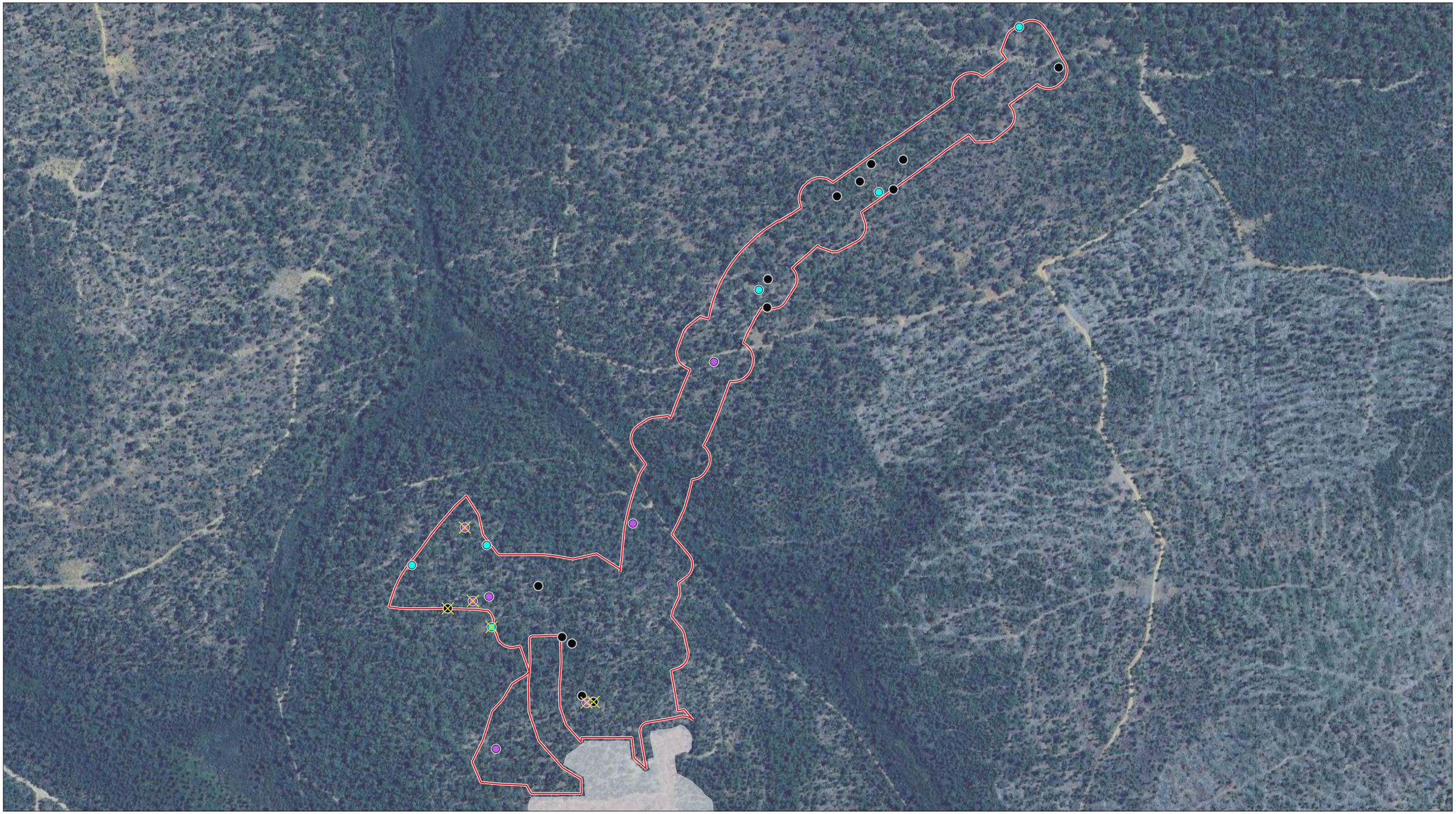


Figure 4b: Black Cockatoo Potential Breeding Habitat

N

0 150 300 m

SCALE: 1:6,000	SHEET SIZE: A3 COLOUR	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/AF	DATE: 1/5/2024

PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023
Willowdale Minesite

CLIENT: Alcoa of Australia Limited

Legend

- Survey Area
- Cleared Areas

Potential Nesting Trees (Class 2 and 3)

- Dead
- Jarrah
- Marri
- T. Kirkby Inspected

Bamford Tree Class

- 3

OVERVIEW MAP

No	Description	Drawn	Approved	Date
A	Original issue	MD	AF	1/5/2024

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Hoffman Rd
Hoffman Rd
Willowdale Rd
Willowdale Rd
Willowdale Rd
Willowdale Rd
Nanga Rd
Nanga Rd
Nanga

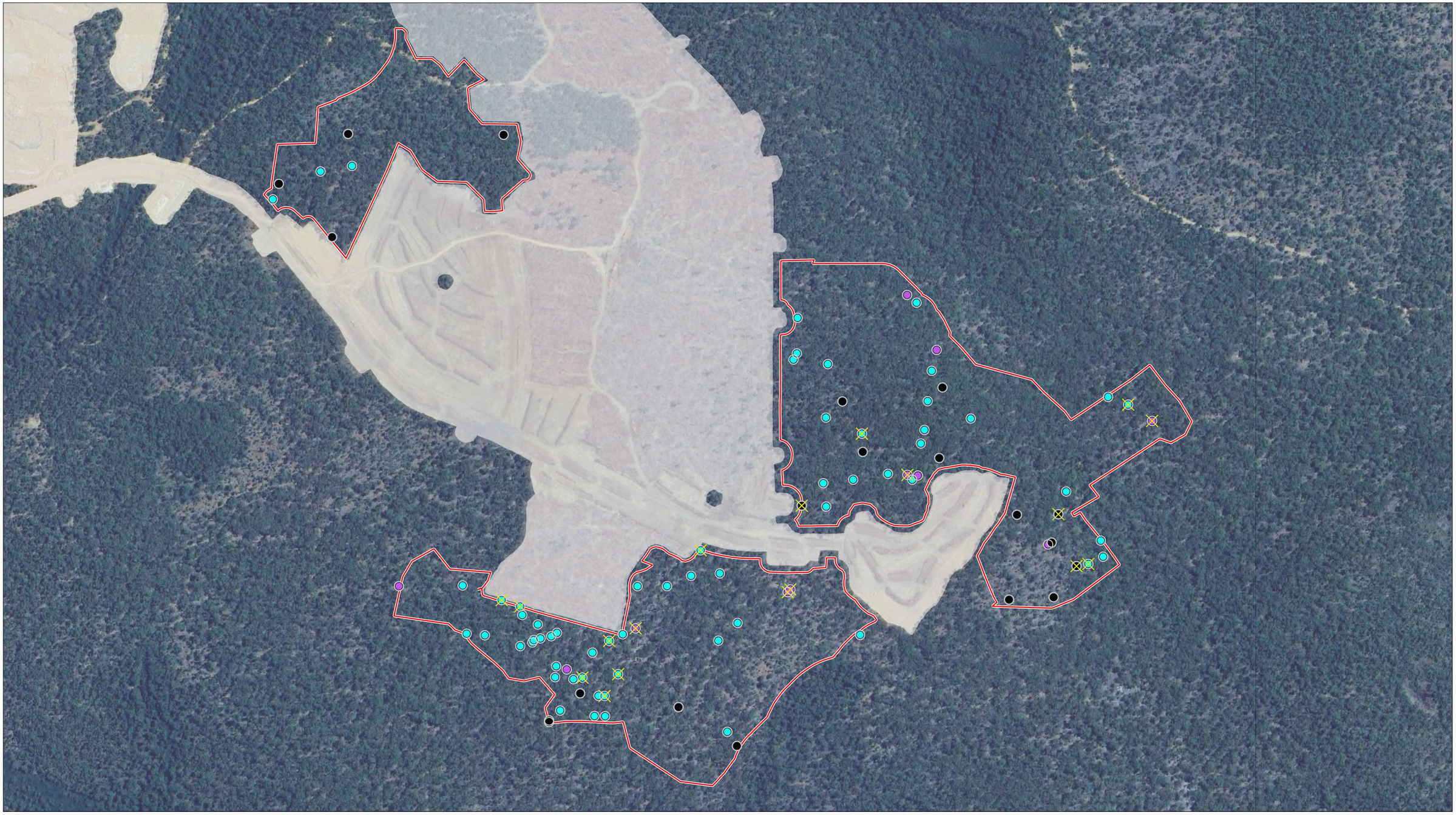


Figure 4d: Black Cockatoo Potential Breeding Habitat

N

0 200 400 m

SCALE: 1:7,500	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023 Willowdale Minesite	
CLIENT: Alcoa of Australia Limited	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/AF / DATE: 1/5/2024

Legend

- Survey Area
- Cleared Areas

Potential Nesting Trees (Class 2 and 3)

- Dead
- Jarrah
- Marri

- T. Kirkby Inspected

Bamford Tree Class

- 3

OVERVIEW MAP



No	Description	Drawn	Approved	Date
A	Original issue	MD	AF	1/5/2024

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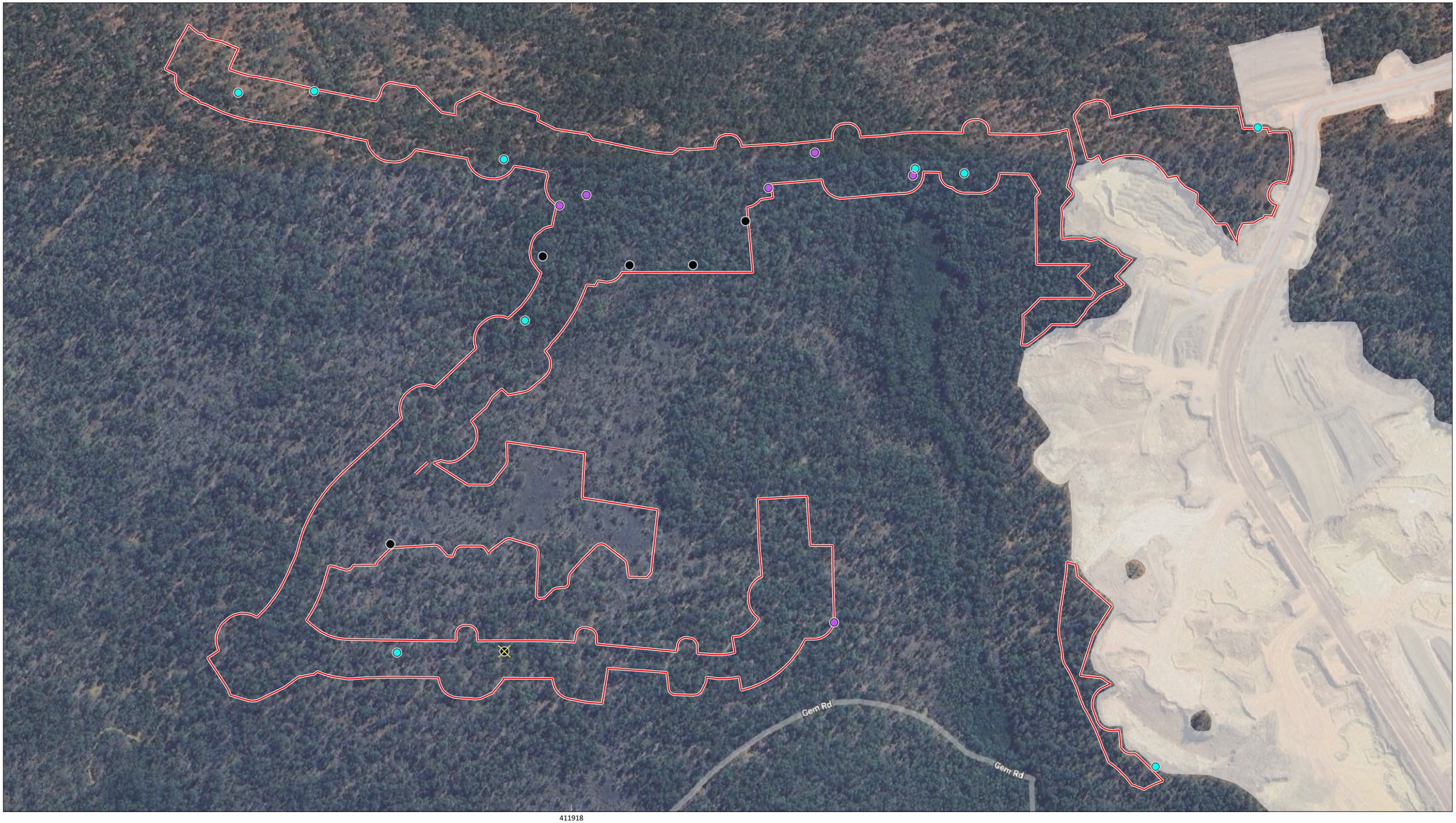
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Figure 4e: Black Cockatoo Potential Breeding Habitat

N

0 150 300 m

SCALE: 1:5,500	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/AF / DATE: 1/5/2024

PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023
Willowdale Minesite

CLIENT: Alcoa of Australia Limited

Legend

- Survey Area
- Cleared Areas

Potential Nesting Trees (Class 2 and 3)

- Dead
- Jarrah
- Marri
- T. Kirkby Inspected

Bamford Tree Class

- 3

OVERVIEW MAP

No	Description	Drawn	Approved	Date
A	Original issue	MD	AF	1/5/2024

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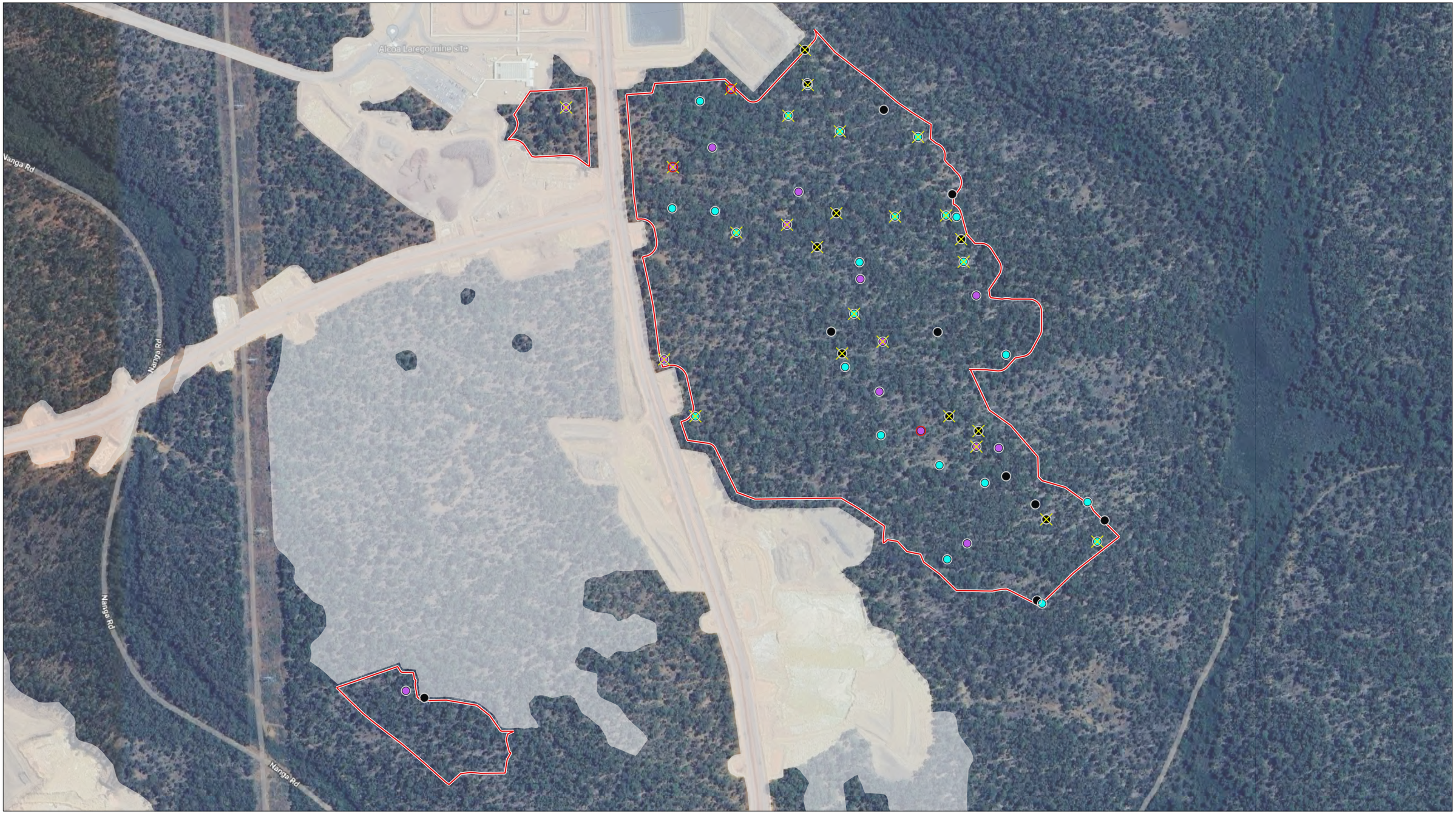


Figure 4f: Black Cockatoo Potential Breeding Habitat

N

0 150 300 m

SCALE: 1:6,000	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023 Willowdale Minesite	
CLIENT: Alcoa of Australia Limited	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/AF / DATE: 1/5/2024

Legend

- Survey Area
- Cleared Areas

Potential Nesting Trees (Class 2 and 3)

- Dead
- Jarrah
- Marri
- T. Kirkby Inspected

Bamford Tree Class

- 2
- 3

OVERVIEW MAP

No	Description	Drawn	Approved	Date
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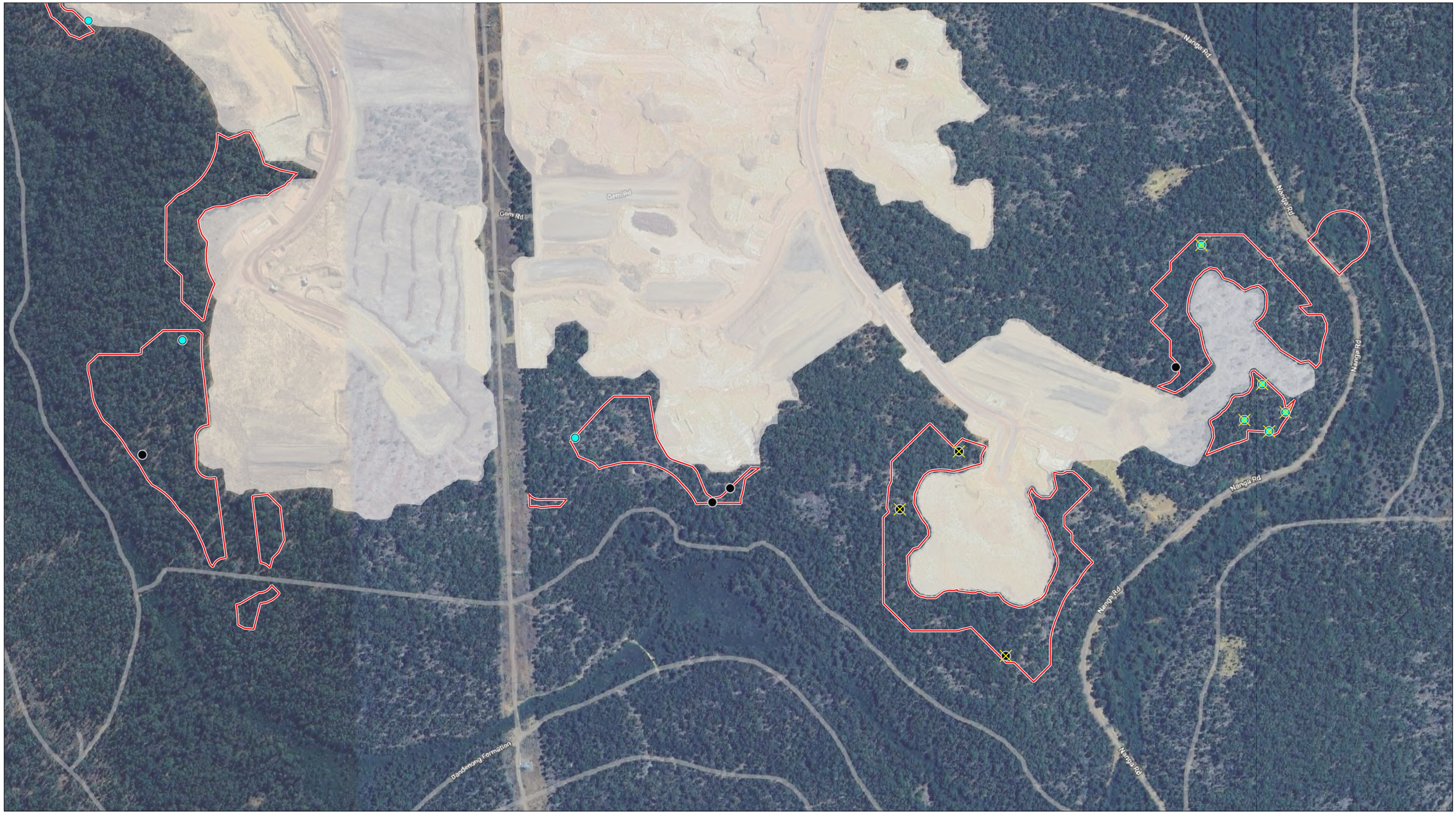


Figure 4g: Black Cockatoo Potential Breeding Habitat

N

0 200 400 m

SCALE: 1:7,000	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/AF / DATE: 1/5/2024

PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023
Willowdale Minesite

CLIENT: Alcoa of Australia Limited

Legend

- Survey Area
- Cleared Areas

Potential Nesting Trees (Class 2 and 3)

- Dead
- Jarrah
- T. Kirkby Inspected

Bamford Tree Class

- 3

OVERVIEW MAP



No	Description	Drawn	Approved	Date
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3.5 Foraging Habitat Assessment

The foraging habitat assessment was undertaken at three separate scales, applying guidance, and scoring tools/methodology appropriate to each scale. Assessments were:

- Whole of Survey Area as per Commonwealth referral guidelines foraging quality scoring tool (DAWE, 2022).
- Polygon specific foraging habitat quality as per the Habitat Quality Scoring Tool Commonwealth unpublished guidance (DCCEEW, n.d)
- Regional assessment of foraging habitat extent.

The results of these three assessments are discussed in the following sections.

The Alcoa (2023) Fauna Management Plan identifies that The Huntly and Willowdale mine areas contain predominantly high-quality foraging habitat due to the prevalence of Jarrah Forest, which contains key foraging species including marri, jarrah and proteaceous species. The mapped boundaries of foraging habitat were broadly aligned with the nine broad fauna habitat types described for the Huntly and Willowdale Mine areas as per the Alcoa (2023) Fauna Management Plan. Habitat types present within the Survey Area and extents are presented below in

Foraging Habitat Type	Black Cockatoo Habitat Quality (Alcoa, 2023)	Area (ha)
Blackbutt Forest/Bullich Forest- Blackbutt open forest with occasional bullich, and marri over sparse *Banksia littoralis*; or bullich forest valleys and drainage areas dominated by bullich and with some blackbutt, occasional marri, over sheoak and *Banksia littoralis.*	High to Medium	2.59
Jarrah /Marri Forest- Jarrah and marri open forest over grass trees (*Xanthorrhoea preissii*), *Lasiopetalum floribundum, Macrozamia* mid shrubland. Patches have dominance of understory sheoak and *Banksia grandis*. foraging habitat quality.	High	466.58
Melaleuca Dampland-Paperbark (*Melaleuca preissiana*) over sparse isolated *Banksia littoralis* over open Hakea, occasional Woody Pear (*Xylomelum*), Grass trees and over mixed shrub layer of Cyperaceae, Restionaceae, Babingtonia, Jacksonia and Acacia, over low shrubs, sedges and herbs. There are areas of sparse to occasional stunted jarrah and marri however these are limited to lowland transitional zones.	Low	0.23
Cleared-Roads**,** mining footprints, power corridor, other cleared areas.	None	8.80
Total		**478.19**

Commonwealth Referral Guidelines Foraging Quality Scoring Tool

The Commonwealth referral guidelines provides a foraging quality scoring tool to guide referral information (DAWE, 2022). The tool advises that if the Survey Area contains native vegetation used for foraging at any time by a black cockatoo species and is >1 ha in size, that it is considered at face value to be of very high quality and assigned a starting score of 10. The tool then allows for subtractions if attributes are present which reduce the functionality of the foraging habitat. The Commonwealth referral guidelines specify that the tool is to be applied once to the entire impact area even if there is more than one type of foraging habitat present. The calculated foraging habitat quality score is shown below in Table 12. Scores of 5-10 are identified as representing high value foraging habitat.

Table 12 Foraging Quality Scoring Tool (DAWE 2022)

Attribute	Baudin's black cockatoo	Carnaby's black cockatoo	Forest red-tailed black cockatoo
Starting score	10- contains native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly marri	10- contains eucalypt woodland and forest that contains foraging species	10- contains jarrah or marri woodland and/or forest
Foraging potential (-2 if no foraging evidence)	-2, no foraging evidence present	No change, foraging evidence present	No change, foraging evidence present
Connectivity (-2 if no other foraging habitat in 12km)	No change, other foraging habitat <1 km away	No change, other foraging habitat <1 km away	No change, other foraging habitat <1 km away
Proximity to breeding habitat (-2 if no breeding habitat in 12km)	No change, breeding habitat within 12 km	No change, breeding habitat within 12 km	No change, breeding habitat within 12 km
Proximity to roosting (-1 if >20km from known night roost)	No change, known roosting site <20 km distant	No change, known roosting site <20 km distant	No change, known roosting site <20 km distant
Impact from significant plant disease (-1 if >50% impact)	No change, impact from plant disease affecting <50% of foraging plants	No change, impact from plant disease affecting <50% of foraging plants	No change, impact from plant disease affecting <50% of foraging plants
Total score	**8**	**10**	**10**

Commonwealth Habitat Quality Scoring Tool

The Commonwealth referral guidance allows for the inclusion of additional information for foraging habitat which may be considered during an assessment, such as the extent and density of recognised foraging plants within a Survey Area. As an additional source of information, WEPL provides an assessment of foraging

habitat quality using a more detailed scoring tool developed by DCCEEW (n.d.) referred to as the Habitat Quality Scoring Tool to produce a numerical foraging habitat score. The Habitat Quality Scoring Tool allows for a score of 0 (none) to 7 (very high) for Site Condition. This is assessed based on density of known foraging species and health of vegetation. The 0-7 Site Condition score is applied to each mapped polygon of fauna habitat. The Habitat Quality Scoring Tool then applies a Site Context score out of three, this is applied only once to the whole Survey Area.

The Site Condition habitat quality score for each species, and the total area of that score present within the Survey Area are listed in Table 13 below and shown in Figure 5. The score was calculated as per the criteria listed in Appendix C. Example images of Site Condition classes are also shown in Appendix C

Table 13: Habitat Quality Scoring Tool- Site Condition Extent

Site Condition	Baudin's Black Cockatoo (ha)	Carnaby's Black Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
7- Very High	169.51	169.51	181.51
6- High	148.56	148.56	136.62
5-Moderate-High	123.85	123.85	123.80
4-Moderate	27.24	27.24	27.24
3-Low-Moderate	-	-	
2-Low	-	-	
1-Negligable to Low	0.23	0.23	0.23
0-None	8.80	8.80	8.80
Total	**478.19**	**478.19**	**478.19**

The Habitat Quality Scoring Tool then requires the application of a Site Context score out of three (see Table 14) which is added to the Site Condition score for a final x/10 score. See Table 15 for final Habitat Quality Scoring Tool score. Note that habitat with a Site Condition starting score of 2 or less are extremely unlikely to be suitable habitat and do not have a Site Context score added.

Table 14: Habitat Quality Scoring Tool-Site Context

Site Context					
Proximity of the site in relation to other habitat	3	Site is within 6 km of known breeding site.	or	Site is within 12 km of other foraging resources with site condition of at least 3.	**3**
	2	Site is within 12 km of known breeding site.		Site is within 15 km of other foraging resources with site condition of at least 4.	
	1	Site is within 15 km of known breeding site.		Site is between 15 km and 20 km of other foraging resources with site condition of at least 5.	
	0	Site is further than 15 km from known breeding site.		Site is further than 20 km from other foraging resources.	
Totals					**3**

Final habitat quality score extents are summarised below in Table 15.

Table 15: Final Habitat Quality Scoring Tool Score

Site Condition	Baudin's Black Cockatoo (ha)	Carnaby's Black Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
10	169.51	169.51	181.51
9	148.56	148.56	136.62
8	123.85	123.85	123.80
7	27.24	27.24	27.24
6	-	-	-
5	-	-	-
4	-	-	-
3	-	-	-
2	-	-	-
1	0.23	0.23	0.23
0	8.80	8.80	8.80
Total	**478.19**	**478.19**	**478.19**

Regional Foraging Habitat Assessment

Analysis of estimated foraging habitat extent within the local area was also undertaken to provide further context. The estimated extent of foraging habitat is calculated for a buffer of 12 km around and including the Survey Area. This buffer is selected as recommended in the Commonwealth referral guidelines due to black cockatoos mainly foraging within 12 km of their nest site during the breeding season and their reliance on this proximity of foraging resources to successfully raise chicks (DAWE, 2022).

Analysis considers Remnant Native Vegetation Extent mapping (DPIRD-005) and Vegetation Complexes-Swan Coastal Plain and South West forest region (DBCA-046 and DBCA-047). See summary of regional vegetation complexes and extents in Table 16 and displayed in Figure 6.

Analysis indicates there is 63554.92 ha of remnant native vegetation mapped within a 12 km buffer of the Survey Area. It is expected that the majority of this vegetation would contain suitable foraging species at the same rate than that present within the Survey Area.

Within the Survey Area there is 469.4 ha of foraging habitat (excludes cleared areas). This represents 0.74 % of the estimated regional habitat extent.

Table 16 Regional Foraging Habitat Extent

Vegetation Complex	Remnant Extent (ha)
Cooke	2003.643
Darling Scarp	858.788
Dwellingup	34558.795
Forrestfield Complex	62.583
Guildford Complex	66.918
Helena 1	1489.007
Lowdon	595.673
Murray 1	10232.29
Swamp	378.171
Yarragil 1	11142.761
Yarragil 2	2166.294
Total	**63,554.92**

411918

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Figure 5a: Black Cockatoo Foraging Habitat

N

0 0.5 1 km

SCALE: 1:18,500	SHEET SIZE: A3 COLOUR	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: HS/AF	DATE: 13/3/2024

PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023
Willowdale Minesite

CLIENT: Alcoa of Australia Limited

Legend

- Cleared Areas

Foraging Habitat Score (Bamford, 2018 Scale)

- 1 - Negligible
- 4 - Moderate
- 5 - Moderate to High
- 6-7 - High

OVERVIEW MAP

No	Description	Drawn	Approved	Date
A	Original issue	HS	AF	13/3/2024

NOTES:

Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.

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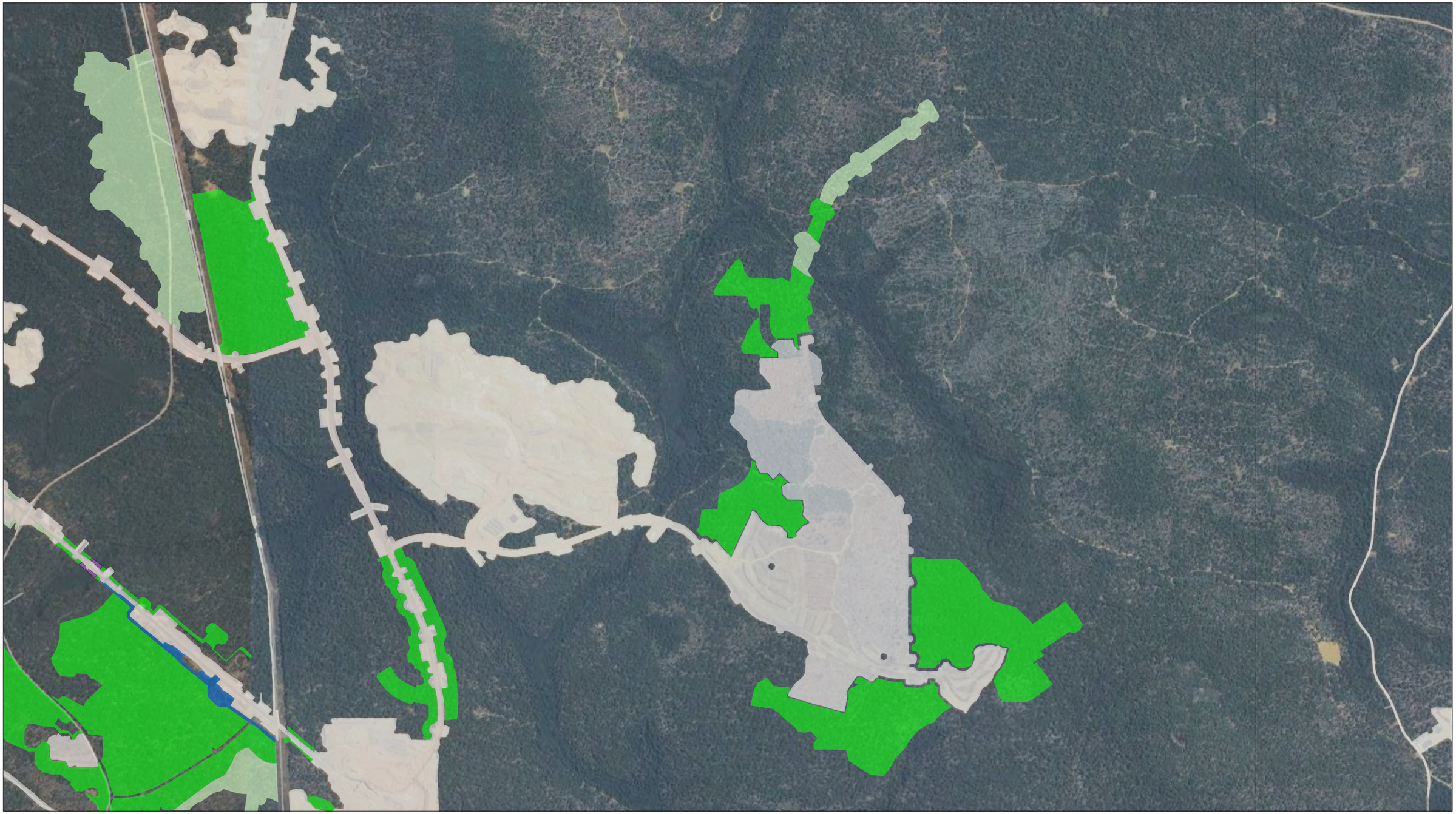


Figure 5b: Black Cockatoo Foraging Habitat

N

0 0.5 1 km

PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023 Willowdale Minesite		
SCALE: 1:18,000	SHEET SIZE: A3 COLOUR	CLIENT: Alcoa of Australia Limited
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: HS/AF	DATE: 13/3/2024

Legend

- Cleared Areas

Foraging Habitat Score (Bamford, 2018 Scale)

- 1 - Negligible
- 4 - Moderate
- 5 - Moderate to High
- 6-7 - High

OVERVIEW MAP

No	Description	Drawn	Approved	Date
A	Original issue	HS	AF	13/3/2024

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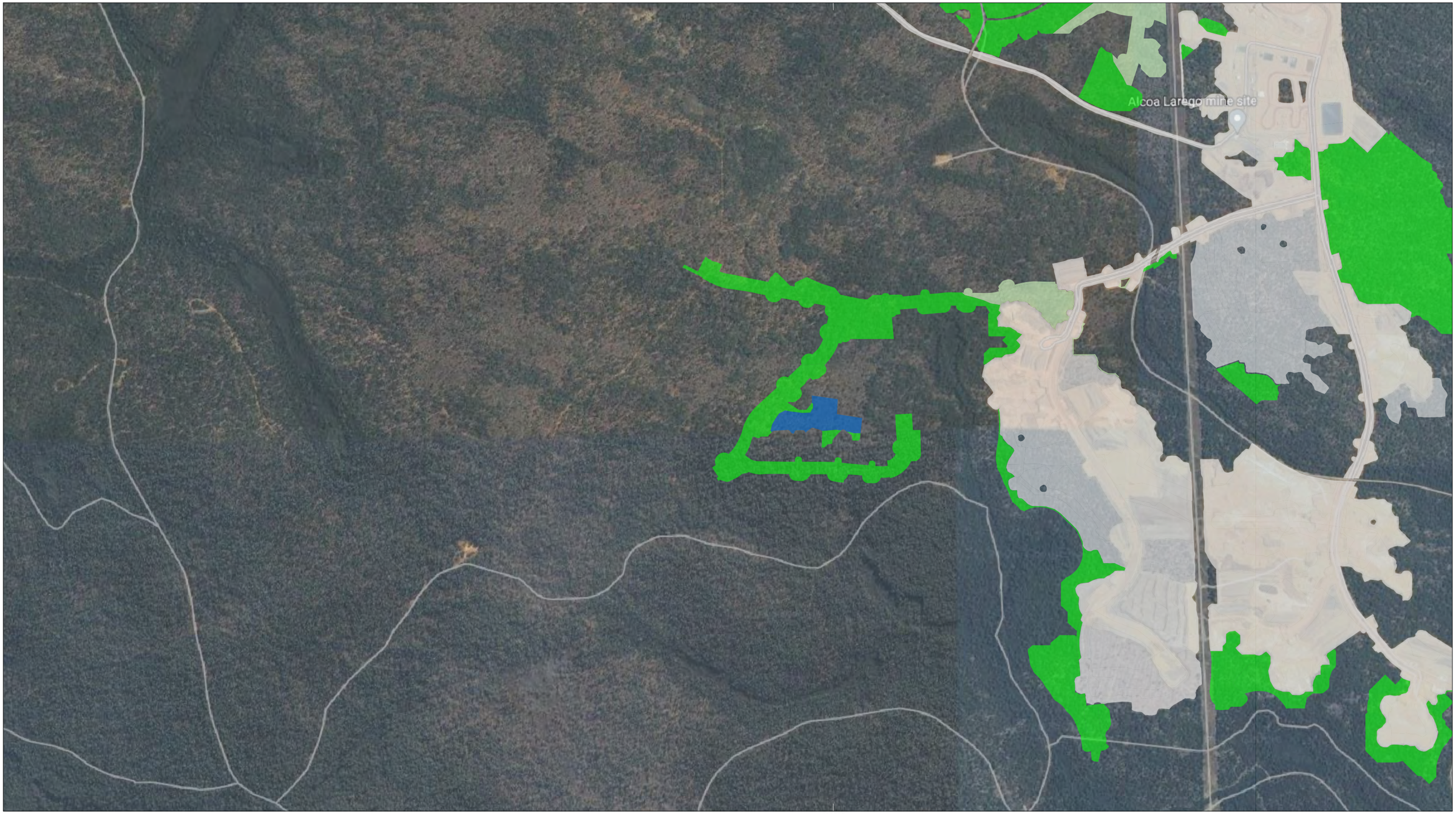
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Figure 5c: Black Cockatoo Foraging Habitat

N

0 0.5 1 km

PROJECT/REPORT NAME	Black Cockatoo Targeted Assessment 2023 Willowdale Minesite
SCALE	1:16,500
SHEET SIZE	A3 COLOUR
CLIENT	Alcoa of Australia Limited
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A23.033
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY Summer 2023
DRAWN BY / REVIEWED BY	HS/AF
DATE	13/3/2024

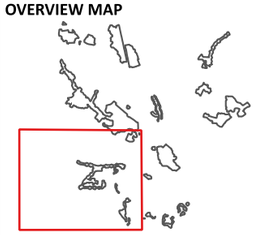
Legend

- Cleared Areas

Foraging Habitat Score (Bamford, 2018 Scale)

- 4 - Moderate
- 5 - Moderate to High
- 6-7 - High

OVERVIEW MAP



No	Description	Drawn	Approved	Date
A	Original issue	HS	AF	13/3/2024

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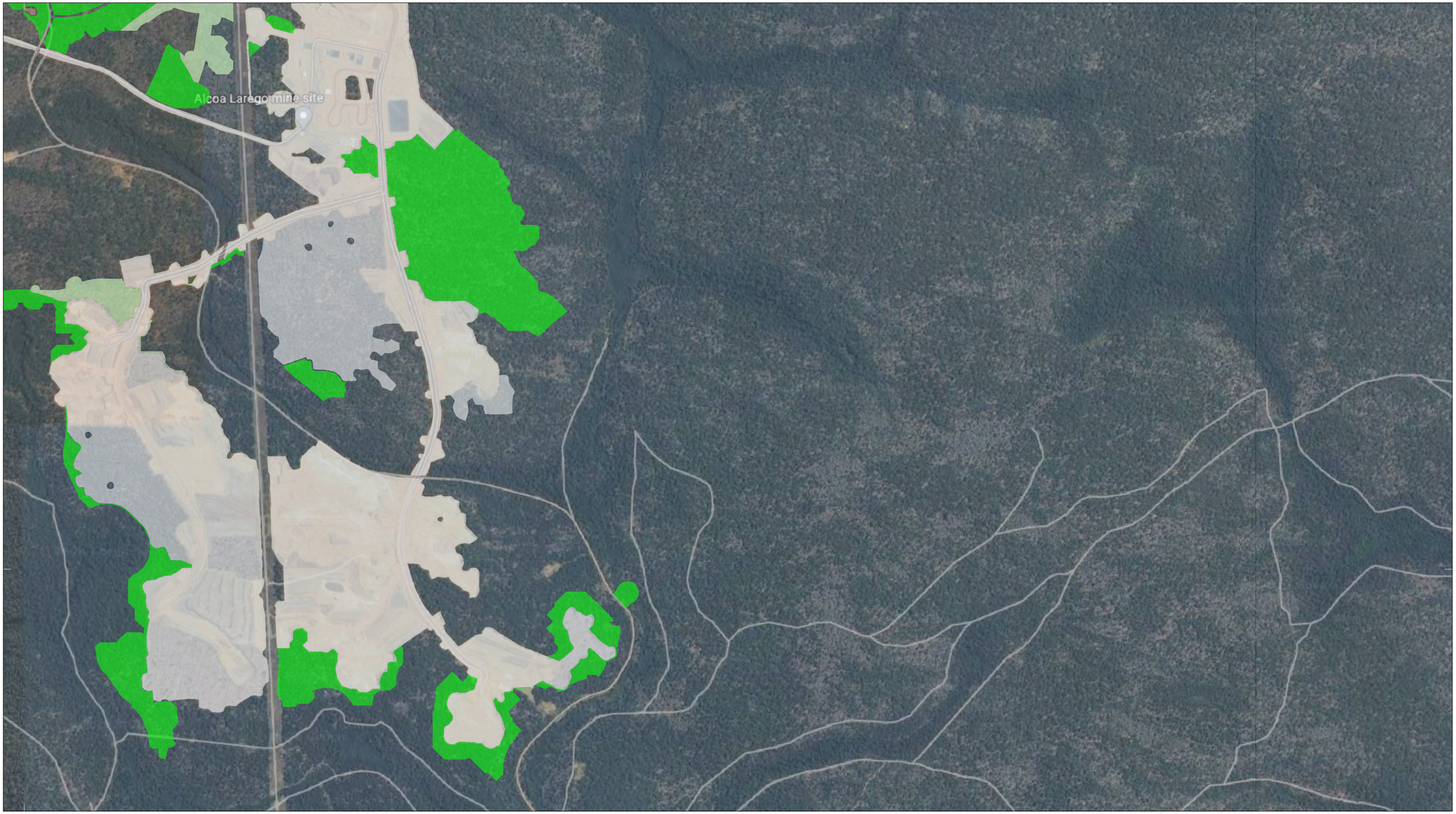
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Figure 5d: Black Cockatoo Foraging Habitat

0 0.5 1 km

N

SCALE: 1:16,500	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: HS/AF / DATE: 13/3/2024

PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023
Willowdale Minesite

CLIENT: Alcoa of Australia Limited

Legend

- Cleared Areas

Foraging Habitat Score (Bamford, 2018 Scale)

- 5 - Moderate to High
- 6-7 - High

OVERVIEW MAP



No	Description	Drawn	Approved	Date
A	Original issue	HS	AF	13/3/2024

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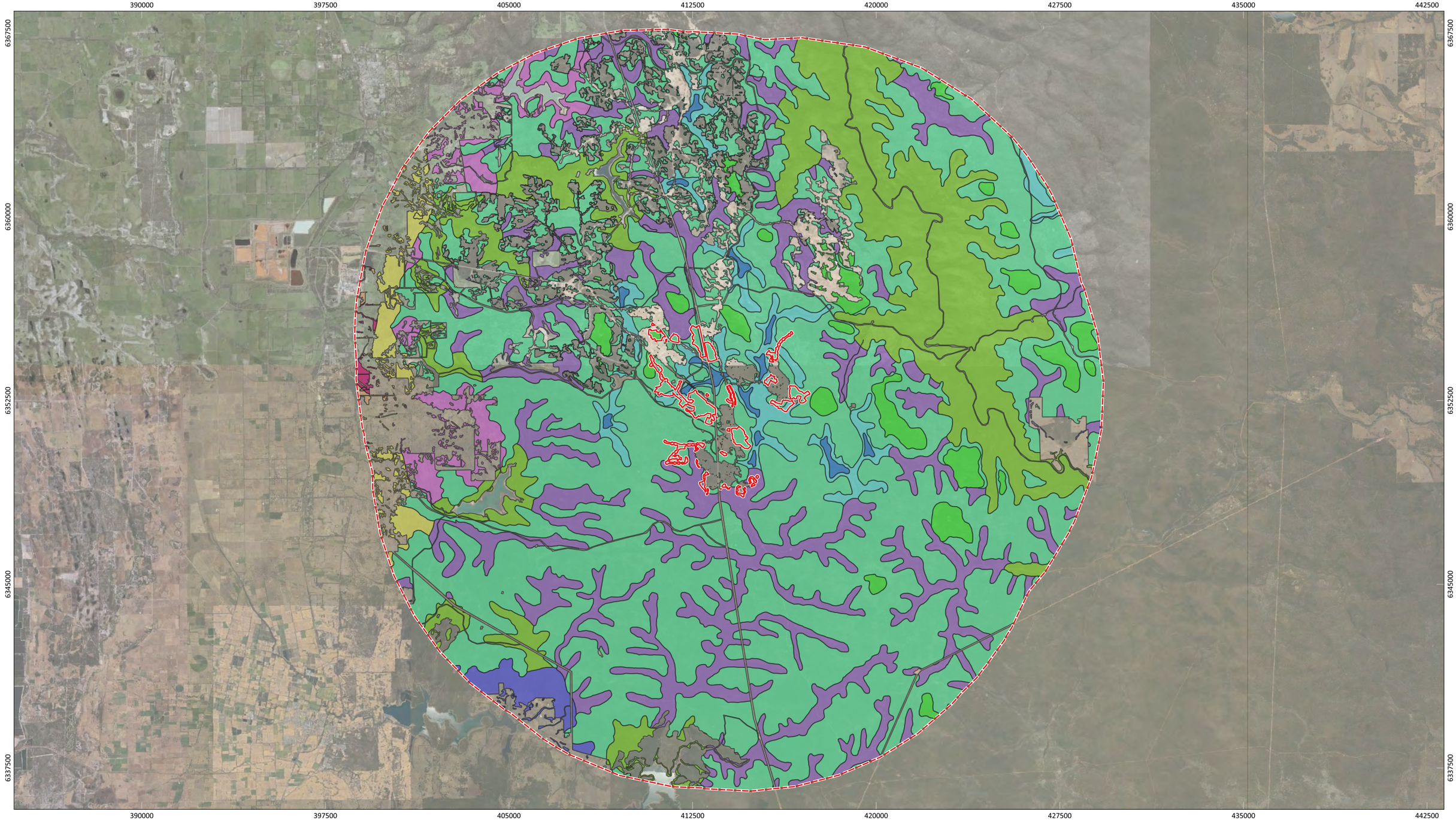


Figure 6: Black Cockatoo Foraging Habitat Extent 12 km Buffer

N

0 3 6 9 km

PROJECT/REPORT NAME	Black Cockatoo Targeted Assessment 2023 Willowdale Minesite
SCALE	1:150,000
SHEET SIZE	A3 COLOUR
CLIENT	Alcoa of Australia Limited
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A23.033
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY Summer 2023
DRAWN BY / REVIEWED BY	HS/AF
DATE	12/3/2024

Legend

- Survey Area
- 12 km Radius of Survey Area

Vegetation Complexes (DBCA-046; DBCA-047) within Extent of Remnant Native Vegetation (DPIRD-005)

- Cooke
- Darling Scarp
- Dwellingup
- Forrestfield Complex
- Guildford Complex
- Helena 1
- Lowdon
- Murray 1
- Swamp
- Yarragil 1
- Yarragil 2

No	Description	Drawn	Approved	Date
A	Original issue	HS	AF	12/3/2024

NOTES:

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3.6 Roosting Habitat Assessment

Night roosting locations are typically in proximity to foraging habitat (black cockatoos forage within 20km of night roosts and most frequently within 6km) and with access to water points <2km from roosting location (DAWE, 2022). Any groups of tall trees, particularly large native eucalypts in proximity to water sources may provide night roosting habitat (DAWE, 2022).

During the field survey six locations were recorded that displayed evidence of having been used as a roost site. Identification of potential roost sites primarily focused on secondary evidence including feather, scats, and branch clippings. During early mornings and late afternoon opportunistic observations of birds congregating at watering points and perching were recorded to assist in identifying potential roost sites. Roost site details are summarised below in Table 17 and locations shown in Figure 7.

Table 17: Summary of Roost Sites

Roost ID	Assessment and Comments	Location
Roost 01	Confirmed as a roost site. Roosting evidence spread over approximately 100m radius in patches under tall trees. Tall mature good condition jarrah and marri forest. Two known nesting trees are located <500 m to the southwest. Abundant scat patches, clipped leaves and twigs, dropped feathers from forest red-tailed black cockatoo. Forest red tail-black cockatoo observed here perching in trees at dawn on two separate mornings in August. Several permanent artificial watering points within 1km from water storage dams and stormwater basins at the Larego offices and crusher hub.	500m west of the Larego offices. At crest of hill running down to valley to north.
Roost 02	Considered likely to be a roost site for forest red tail-black cockatoo. Not visited at night or dawn to confirm. Abundant scat patches, feathers and leaf clipping spread around 100 m radius. Tall mature jarrah forest in good condition. Forest red-tailed black cockatoo frequently observed late afternoon drinking from sump on west side of the haul Rd 200m to the north. Several permanent artificial watering points within 2km from water storage dams and stormwater basins at the Larego offices and crusher hub. Located 500m south of Roost 04. May be part of a single larger roosting area.	1.5km north of Larego office on east side of Ajana Haul Rd. In broad valley with drainage line to east.
Roost 03	Small area with small amount of roosting evidence. Scat splatter patches, leaf and twig clips. No feathers identifying species or birds observed. Site visited at dawn in August on one occasion, no birds present. Small extent covering 20m radius. In medium size jarrah trees on edge of road. The site has been used for roosting but does not appear to be frequently used or used by a large number of birds.	1.5km west of Larego office at intersection of Larego Access Rd and Nanga Rd. On broad plateau.

Roost ID	Assessment and Comments	Location
	Considered likely to be a roost site for forest red tail-black cockatoo. Not visited at night or dawn to confirm. Abundant scat patches, feathers and leaf clipping spread around 100 m radius. Tall mature jarrah forest in good condition.	
Roost 04	Forest red-tailed black cockatoo frequently observed late afternoon drinking from sump on west side of the haul Rd 200m to the south. Several permanent artificial watering points within 2km from water storage dams and stormwater basins at the Larego offices and crusher hub. Located 500m North of Roost 02. May be part of a single larger roosting area.	2 km north of Larego office on east side of Ajana Haul Rd. In broad valley with drainage line to east.
Roost 05	Small area with small amount of roosting evidence. Scat splatter patches, leaf and twig clips. No feathers identifying species or birds observed. Small extent covering 20m radius. The site has been used for roosting but does not appear to be frequently used or used by a large number of birds. Drainage line 1.5 km to west and south may provide watering points.	200m south of intersection of Wills Haul Rd and Gregory 4 Haul Rd. On upper slope of broad hill.
Roost 06	Considered likely to be a roost site for forest red tail-black cockatoo. Not visited at night or dawn to confirm. Abundant scat patches, feathers and leaf clipping spread around 100 m radius. Tall mature jarrah forest in good condition. Known nesting tree located 800m to north. Watering points present <2km away in drainage sumps along haul road and drainage line to east.	At intersection of Ajana Haul Rd and HV Access Rd. On upper slope of broad hill.

It is highly likely that more roost locations are present within the broader Larego region considering the frequency of observations of black cockatoos.

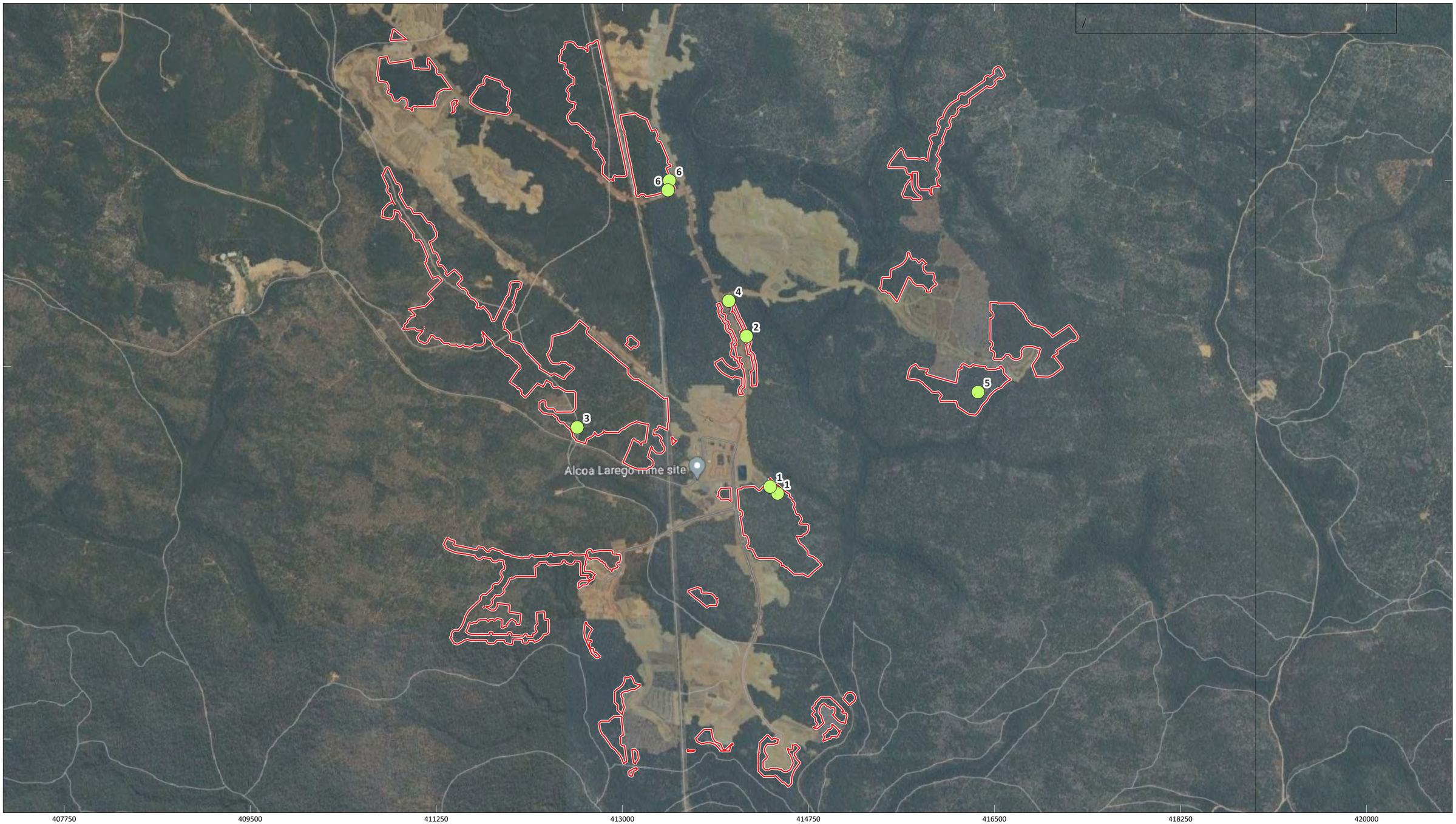


Figure 7: Black Cockatoo Roosting Sites

N; 0 – 1 – 2 km		PROJECT/REPORT NAME: Black Cockatoo Targeted Assessment 2023 Willowdale Minesite	
SCALE: 1:35,000	SHEET SIZE: A3 COLOUR	CLIENT: Alcoa of Australia Limited	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A23.033	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023		DRAWN BY / REVIEWED BY: HS/AF	DATE: 13/3/2024

Legend

- Survey Area
- Black Cockatoo Roosting Sites (WEPL, 2023)

No	Description	Drawn	Approved	Date
A	Original issue	HS	AF	13/3/2024

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4. Discussion

High quality black cockatoo habitat is present within the jarrah-marri forest of the Survey Area. All three species (forest red-tailed, Baudin's and Carnaby's black cockatoos) were either recorded during the survey or are known to occur from previous survey effort, with forest red-tailed black cockatoo being most frequently recorded. Forest red-tailed black cockatoo and Baudin's black cockatoo breeding is also known to occur within the Larego region.

Significant portions of the Survey Area have been subject to impacts from intense fire which have modified habitat quality. The Yarloop-Waroona bushfire in 2016 has resulted in significant areas where high proportion of large, senescent trees which are most suitable for black cockatoo hollow formation were destroyed by the fire. The quality of foraging habitat has also been decreased in these areas with reduced canopy cover of foraging species and die off of mature trees.

Breeding Habitat

A combined total of 13,267 potential, suitable or known nesting trees were recorded. The vast majority (97 %) of these trees are Bamford Class 4 or 5 trees, defined by DAWE, 2022 as potential nesting trees, however these do not currently contain suitable nesting hollows.

Following phase 2 assessment of 86 trees assessed as having a moderate potential to contain suitable nesting hollows (Bamford Class 3) none were identified as containing suitable nesting hollows.

Four Bamford Class 2 trees which show signs of chew marks indicating they are a known breeding tree are present within the Survey Area. Three of these trees were previously recorded by Alcoa/T. Kirkby, with one additional known nesting tree added by 2023 surveys.

Foraging Habitat

The Alcoa (2023) Fauna Management Plan identifies that The Huntly and Willowdale mine areas contain predominantly high-quality foraging habitat due to the prevalence of Jarrah Forest. Foraging habitat quality was rated using the Commonwealth Habitat Quality Scoring Tool (DCCEEW, n.d.). Foraging habitat quality extents within the Survey Area out of ten are:

- Baudin's black cockatoo: 169.51 ha (10/10), 148.56 ha (9/10), 123.85 ha (8/10), 27.24 ha (7/10), 0.23 ha (1/10) and 8.80 ha (None 0).
- Carnaby's black cockatoo: 169.51 ha (10/10), 148.56 ha (9/10), 123.85 ha (8/10), 27.24 ha (7/10), 0.23 ha (1/10) and 8.80 ha (None 0).
- Forest red-tailed black cockatoo: 181.51 ha (10/10), 136.62 ha (9/10), 123.85 ha (8/10), 27.24 ha (7/10), 0.23 ha (1/10) and 8.80 ha (None 0).

Analysis of regional habitat extent indicates there is 63,554.92 ha of remnant native vegetation mapped within a 12 km buffer of the Survey Area. It is expected that the majority of this vegetation would contain

suitable foraging species at the same or greater rate than that present within the Survey Area. The 469.4 ha of foraging habitat (excludes cleared areas) represents 0.74 % of the estimated regional habitat extent. The habitat quality within the Survey Area is considered likely to be analogous to that of the regional foraging habitat.

Roosting Habitat

Six locations were recorded that displayed evidence of having been used as a roost site. Of these one (Roost 01) was confirmed as a roosting site through secondary evidence and by dawn visits recording forest red-tailed black cockatoos roosting. Three sites (Roost 02, 04 and 06) are considered likely to be roost sites based on abundant scat patches, feathers and leaf clipping evidence. Roost 02 and 04 are separated by only 500m and may actually comprise one larger roosting area. Two roost sites (Roost 03 and 05) were small areas with small amount of roosting evidence. These sites have been used for roosting but do not appear to be frequently used or used by a large number of birds.

It is highly likely that more roost locations are present within the broader Larego region considering the frequency of observations of black cockatoos. Additional specific surveys involving repeated visits to suspected roost sites and dawn and dusk observations would be required to advance understanding of roosting behaviour in the Larego region.

5. References

Alcoa of Australia. (2023) Fauna Management Plan Huntly and Willowdale Mines (Revision 0).

Commonwealth of Australia. (2012) Interim Biogeographic Regionalisation for Australia, Version 7. Department of Sustainability, Environment, Water, Population and Communities.

Department of Agriculture, Water and the Environment (DAWE). (2022). *Referral Guideline for 3 WA Threatened Black Cockatoo Species: Carnaby's Cockatoo, Baudin's Cockatoo, and the Forest Red-tailed Black-cockatoo*. Commonwealth of Australia.

Department of Climate Change, Energy, the Environment and Water. (no date) *Habitat Scoring System for WA black cockatoo foraging habitat.* Unpublished guidance provided to proponents.

Department of the Environment Water Heritage and the Arts (DEWHA). (2010). *Survey Guidelines for Australia's Threatened Birds: Guidelines for Detecting Birds Listed as Threatened under the EPBC Act*. Canberra, Australia.

Doherty, S. Wingfield, B. Stokes, V. Craig, M. Lee, J. Finn, H. Calver, M (2016) Successional changes in feeding activity by threatened cockatoos in revegetated mine sites. Wildlife Research, 2016, 43, 93–104.

Environmental Protection Authority (EPA). (2020). *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*.

Environmental Protection Authority (EPA). (2021). *Statement of Environmental Principles, Factors and Objectives*.

GHD. (2021) Terrestrial Fauna Survey and Black Cockatoo Habitat Assessment for Huntly Mine - Myara North. Unpublished survey report.

Johnstone, R. E., Kirkby T. & Sarti K. (2013). The Breeding Biology of the Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* Gould in South-Western Australia. I. Characteristics of Nest Trees and Nest Hollows. *Pacific Conservation Biology,* 19(2), 121–142.

Johnstone, R. E., Kirkby T. & Sarti K. (2017). The distribution, status movements and diet of the forest red-tailed black cockatoo in the south-west with emphasis on the Greater Perth region, Western Australia. The West Australian Naturalist Vol. 30

Johnstone, R. E. & Storr, G. M. (1998). *Handbook of Western Australian Birds – Non-passerines (Emu to Dollarbird).* (Volume 1, pp. 278–280) Western Australian Museum.

Saunders, D. A., R. Dawson, A. Doley, J. Lauri, A. Le Souef, P.R. Mawson, K. Warren, and N. White. (2014a). *Nature conservation on agricultural land: a case study of the endangered Carnaby's Cockatoo Calyptorhynchus latirostris breeding at Koobabbie in the northern wheatbelt of Western Australia*. Nature Conservation 9: 19-43.

Saunders, D. A., P.R. Mawson, and P.R. Dawson. (2014b). *Use of tree hollows by Carnaby's Cockatoo and the fate of large hollow-bearing trees at Coomallo Creek, Western Australia 1969- 2013*. Biological Conservation 177:185-193

Whitford and Williams (2001) Survival of jarrah (Eucalyptus marginata Sm.) and marri (Corymbia calophylla Lindl.) Habitat trees retained after logging. Forest Ecology and Management Volume 146, Issues 1–3, 1 June 2001, Pages 181-197.

Databases Used

Department of Biodiversity, Conservation and Attractions (DBCA), (2018a) *Carnaby's Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions (DBCA-054).* Accessed on 10 September 2022 from https://catalogue.data.wa.gov.au/dataset/carnabys-cockatoo-confirmed-breeding-areas

Department of Biodiversity, Conservation and Attractions (DBCA). (2018b) *Vegetation Complexes – Swan Coastal Plain (DBCA-046).* Accessed on 18 April 2023 from https://catalogue.data.wa.gov.au/dataset/vegetation-complexes-swan-coastal-plain.

Department of Biodiversity, Conservation and Attractions (DBCA). (2018) *Vegetation Complexes – South West Forest Region of Western Australia (DBCA-047).* Accessed on 18 April 2023 from https://catalogue.data.wa.gov.au/dataset/vegetation-complexes-swf-50k.

Department of Biodiversity, Conservation and Attractions (DBCA). (2018) *Carnaby's Cockatoo Confirmed Roost Sites (DBCA-050).* Accessed on 18 April 2023 from https://catalogue.data.wa.gov.au/dataset/black-cockatoo-roosting-sites-buffered.

Department of Biodiversity, Conservation and Attractions (DBCA). (2018) *Carnaby's Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions (DBCA-054).* Accessed on 18 April 2023 from https://catalogue.data.wa.gov.au/dataset/black-cockatoo-roosting-sites-buffered.

Department of Biodiversity, Conservation and Attractions (DBCA). (2019) *Black Cockatoo Breeding Sites - Buffered (DBCA-063).* Accessed on 18 April 2023 from https://catalogue.data.wa.gov.au/dataset/black-cockatoo-breeding-sites-buffered

Department of Biodiversity, Conservation and Attractions (DBCA). (2019) *Black Cockatoo Roosting Sites - Buffered (DBCA-064).* Accessed on 18 April 2023 from https://catalogue.data.wa.gov.au/dataset/black-cockatoo-roosting-sites-buffered.

Department of Primary Industries and Regional Development (DPIRD). (2020). *Native Vegetation Extent (DPIRD-005)* Accessed on 18 April 2023 from https://catalogue.data.wa.gov.au/dataset/native-vegetation-extent.

Appendix A
Legislation

Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act aims to protect matters of national environmental significance (MNES). Under the EPBC Act, the Commonwealth Department of Climate Change, Energy and the Environment lists threatened species and communities in categories determined by criteria set out in the EPBC Act.

Projects likely to cause a significant impact on MNES should be referred to the DCCEEW for assessment under the EPBC Act.

Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 aims to conserve and protect biodiversity and biodiversity components within the State and to promote ecologically sustainable use of biodiversity components in the State.

Environmental Protection Act 1986

Declared Rare Flora (DRF) and Threatened Ecological Communities (TECs) are given special consideration in environmental impact assessments and have special status as Environmentally Sensitive Areas (ESAs) under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004. Exemptions for a clearing permit do not apply in an ESA. In addition, habitat necessary for the maintenance of indigenous fauna is considered in the clearing principles and assessed during consideration of applications for a clearing permit.

Biosecurity and Agricultural Management Act 2007

Plants may be 'Declared' by the Minister for Agriculture and Food under the BAM Act. The Western Australian Organism List contains information on the area(s) in which a plant is declared and the control and keeping categories to which it has been assigned in Western Australia. A declaration may apply to the whole State, to districts, individual properties or even to single paddocks. If a plant is 'Declared', landholders are obliged to control that plant on their properties.

Weeds of National Significance

The Australian Government along with the State and Territory governments has endorsed 32 WoNS. Four major criteria were used in determining WoNS:

- The invasiveness of a weed species.
- A weed's impacts.
- The potential for spread of a weed.
- Socio-economic and environmental values.

Each WoNS has a national strategy and a national coordinator, responsible for implementing the strategy. WoNS are regarded as the worst weeds in Australia because of their invasiveness, potential for spread, and economic and environmental impacts.

Department of Biodiversity, Conservation and Attractions Priority Lists

DBCA lists 'Priority' flora and fauna that have not been assigned statutory protection as "Threatened" under the BC Act and are under consideration for declaration as Threatened. Flora and fauna assessed as Priority 1-3 are considered to be in urgent need of further survey. Priority 4 flora requires monitoring every 5 -10 years.

DBCA maintains a list of Priority Ecological Communities (PECs) which identifies plant communities that require further investigation before possible nomination for TEC status. Once listed, a community becomes a PEC and, when endorsed by the WA Minister for Environment, becomes a TEC and protected as an ESA under Environmental Protection (Clearing of Native Vegetation) Regulations 2004.

Informal Recognition of Flora and Fauna

Certain populations or communities of flora and/or fauna may be of local significance or interest because of their patterns of distribution and abundance. For example, specific locations of flora and may be locally significant because they are range extensions to the previously known distribution, or are newly discovered taxa (and have the potential to be of more than local significance). In addition, many species are in decline as a result of threatening processes (land clearing, grazing, and changed fire regimes) and relict populations of such species assume local importance for DBCA. It is not uncommon for DBCA to make comment on these species of interest.

Appendix B
Definitions and Criteria

EPBC Act Categories for Flora, Fauna and Ecological Communities

Category	Threatened Species	Threatened Ecological Communities
Extinct	A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.	N/A.
Extinct in the wild	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time: (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.	N/A.
Critically Endangered (CE)	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered (EN)	A native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (VU)	A native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.	An ecological community is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.
Conservation Dependent	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: (a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish. (ii) the species is the focus of a plan of management that provides for	N/A.

Category	Threatened Species	Threatened Ecological Communities
	management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised. (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory. (iv) cessation of the plan of management would adversely affect the conservation status of the species.	

Conservation Codes for Western Australian Flora and Fauna (DBCA)

Conservation Codes for Western Australian Flora and Fauna	
Threatened, Extinct and Specially Protected fauna or flora[1] are species[2] which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such. **The Wildlife Conservation (Specially Protected Fauna) Notice 2018 and the Wildlife Conservation (Rare Flora) Notice 2018 have been transitioned under regulations 170, 171 and 172 of the Biodiversity Conservation Regulations 2018 to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016*.** **Categories of Threatened, Extinct and Specially Protected fauna and flora are:**	
T	**Threatened species** Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act). Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for Threatened Fauna. Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the Wildlife Conservation (Rare Flora) Notice 2018 for Threatened Flora. The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using International Union for Conservation of Nature (IUCN) Red List categories and criteria as detailed below.
CR	**Critically endangered species** Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered undersection 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.
EN	**Endangered species** Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.

Conservation Codes for Western Australian Flora and Fauna	
VU	**Vulnerable species** Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable undersection 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.
Extinct species **Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.**	
EX	**Extinct species** Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for extinct fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for extinct flora.
EW	**Extinct in the wild species** Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.
Specially protected species **Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.** **Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.**	
MI	**Migratory species** Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species. Published as migratory birds protected under an international agreement under schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.

Conservation Codes for Western Australian Flora and Fauna	
CD	**Species of special conservation interest (conservation dependent fauna)** Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Published as conservation dependent fauna under schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
OS	**Other specially protected species** Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Published as other specially protected fauna under schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
P	**Priority species** Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
1	**Priority 1: Poorly-known species** Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
2	**Priority 2: Poorly-known species** Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
3	**Priority 3: Poorly-known species** Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Conservation Codes for Western Australian Flora and Fauna	
4	**Priority 4: Rare, Near Threatened and other species in need of monitoring** (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

[1] The definition of flora includes algae, fungi and lichens.

DBCA Definitions and Criteria for TECs and PECs

Criteria	Definition
Threatened Ecological Communities	
Presumed Totally Destroyed (PD)	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B): A. Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or B. All occurrences recorded within the last 50 years have since been destroyed.
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C): A. The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii): i. geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years). ii. modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated. B. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years). ii. there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes.

Criteria	Definition
	iii. there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes. C. The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future. An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C): A. The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii): i. the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years). ii. modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. B. Current distribution is limited, and one or more of the following apply (i, ii or iii): i. geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years). ii. there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes. iii. there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C): A. The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.

Criteria	Definition
	B. The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations. C. The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.
Priority Ecological Communities	
Priority One	**Poorly known ecological communities** Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority Two	**Poorly known ecological communities** Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, state forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities, but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority Three	**Poorly known ecological communities** i. Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or. ii. Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or. iii. Communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities, but do not meet adequacy of survey requirements and / or are not well defined, and known threatening processes exist that could affect them.
Priority Four	**Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list**. These communities require regular monitoring. i. Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change These communities are usually represented on conservation lands. ii. Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. iii. Ecological communities that have been removed from the list of threatened communities during the past five years.

Criteria	Definition
Priority Five	**Conservation Dependent Ecological Communities** Ecological Communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Appendix C
Habitat Quality Scoring Tool and Reference Images

Habitat Scoring System for WA black cockatoo foraging habitat

This habitat scoring system describes elements indicative of suitable foraging habitat[1] for the three WA black cockatoo species (Carnaby's Black Cockatoo, Baudin's Black Cockatoo and the Forest Red-tailed Black Cockatoo) in WA. Its use must be supported by survey information and reporting, undertaken by suitably qualified and experienced ecologists.

Appropriate scores will best fit a description. Where all components of the 'detail' column description are not met, this must be specified, and justification provided for that score to be accepted by the Department.

For an offset site to be considered by the Department, the offset site must have a start score of 1 for each indicator (e.g., there must be a species stocking rate score of at least 1).

Indicator	Score	Detail	Impact site	Offset start quality	Without offset	With offset
Site Condition						
	Foraging value	Details				
Vegetation condition and structure. Habitat features	**7**	Very High	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>30% projected foliage cover), banksia and eucalypt woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths[2].				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.				
	6	High	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>25% projected foliage cover), banksia and eucalypt woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest and woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.				

[1] In some cases, an impact or offset site may contain or require both foraging and breeding habitat for one or more black cockatoos. Breeding habitat is species of trees known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow. For most species of trees, suitable DBH is 500 mm. For salmon gum and wandoo, suitable DBH is 300 mm.

[2] No tree deaths indicate robustness of habitat, unlikely for the habitat to decline in the medium-term. Tree deaths may be owing to disease, water stress, fire, etc.

Vegetation condition and structure. Habitat features	**5**	Moderate to high	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland (>20% projected foliage cover), banksia and eucalypt woodlands with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands, with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).				
	4	Moderate	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia or eucalypt woodlands with 20-30% projected foliage cover. Moderate percentage of tree deaths (30-40%).				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 20-30% projected foliage cover; OR Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to tree deaths (up to 30-40%).				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with: 20-30% projected foliage cover; OR 40-60% projected foliage cover but veg. condition reduced due to tree deaths (up to 30-40%).				
	3	Low to moderate	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia or eucalypt woodlands with 10-20% projected foliage cover.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 5-20% projected foliage cover.				
			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with 5-20% projected foliage cover.				
	2	Low	Carnaby's Black Cockatoo				
			Native kwongan heath and shrubland, banksia and eucalypt woodlands with <10% projected foliage cover; OR Paddocks and/or urban areas with scattered foraging trees such as banksias, marri.				
			Baudin's Black Cockatoo				
			Marri-Jarrah Forest or woodlands with 1-5% projected foliage cover; OR Paddocks and/or urban areas with scattered foraging trees such as banksia, hakea, dryandra.				

Vegetation condition and structure. Habitat features			Forest Red-tailed Black Cockatoo				
			Marri-Jarrah-Karri Forest, other eucalypt woodlands, or allocasuarina woodlands with 1-5% projected foliage cover; OR Paddocks and/or urban areas with scattered food plants such as Cape Lilac, *Eucalyptus caesia* and *E. erythrocorys*.				
	1	Negligible to low	All species				
			Scattered specimens of known food plants but projected foliage cover of these is <2%. May include: paddocks or urban areas with scattered foraging trees.				
	0	None	All species				
			No Proteaceae, eucalypts or other potential sources of food. May include bare ground or developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).				
			Totals				

Site Context								
Proximity of the site in relation to other habitat.	**3**	Site is within 6km of known breeding site.	or	Site is within 12km of other foraging resources with site condition of at least 3.				
	2	Site is within 12km of known breeding site.	or	Site is within 15km of other foraging resources with site condition of at least 4.				
	1	Site is within 15km of known breeding site.	or	Site is between 15km and 20km of other foraging resources with site condition of at least 5.				
	0	Site is further than 15km from known breeding site.	or	Site is further than 20km from other foraging resources.				
				Totals				

Final Totals				

Indicator		**Species Stocking Rate**[3]	**Impact Site**			**Offset Site**		
			CBC	**BBC**	**FRT**	**CBC**	**BBC**	**FRT**
Confirm presence/ absence of species.	**Yes**	Species is seen or reported regularly and/or there is abundant foraging evidence, e.g. chewed nuts can be identified as this species. Regularly is when the species is seen at intervals of every few days or weeks for at least several months of the year.						
	No	Species is recorded or reported very infrequently and there is little or no foraging evidence.						

[3] Species stocking rate is indicated by yes or no to confirm if any of the species is frequently present or not. If yes, the presence must be for the species being impacted by the proposal, not for a species that will not be impacted.

Legend	
	If the site scores between 0-2 (low to no value) for site condition, 0 for the site context score, or is **No** for species stocking rate, it is extremely unlikely to be considered as suitable habitat. This would not be appropriate to use as an offset site.

The metrics used to determine Site Condition, Site Context, and Species Stocking Rate were developed by the Department of Climate Change, Energy, the Environment, and Water in consultation with species experts in WA.

A standard habitat quality scoring system for a species allocates scores out of 3 for both site condition and site context, and out of 4 for species stocking rate. However, as black cockatoos are very mobile, this HQS uses a score out of 7 for site condition and a score out of 3 for site context. Site condition is considered the key factor in determining the quality of habitat for these black cockatoo species. Species stocking rate is considered only in terms of presence or absence of the species and does not add to the total score. Note that the species, or strong indicators of the species, must be present, consistent with the presence/usage description above, for an offset to be considered suitable.





Site Condition 4-Moderate. Marri-Jarrah Forest or woodlands with 20-30% projected foliage cover; OR Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to tree deaths





Site Condition 5- Moderate to High. Marri-Jarrah Forest or woodlands with 30-40% projected foliage cover; OR > 60% projected foliage cover but veg. condition reduced due to tree deaths (up to 20%).



Site Condition 6-High. Marri-Jarrah Forest and woodlands with >40% projected foliage cover. Low percentage (< 10%) of tree deaths.



Site Condition 7- Very High. Marri-Jarrah Forest and woodlands with >50% projected foliage cover. Low percentage (< 5%) of tree deaths.

Appendix D
Breeding Tree Data

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
364	Marri	2	100	Prev assessed. Tree 1400 metal tag. Tony K reported slight chewing on upwards facing hollow. Also 20cm spout hollow mid trunk	414156.5816	6351230.976	No image
529	Marri	2	70	Chimney hollow at 12m up in snapped trunk with 30cm+ internal. Chew marks from BC on rim, potential nest tree.	414250.0891	6351357.219	
1270	Marri	2	110	Previously assessed by Alcoa/T. Kirkby	414556.36	6350805.882	No image
3989	Dead	2	95	Previously assessed by Alcoa/T. Kirkby. Tree 1836 on metal tag. Upwards opening 30cm chimney hollow in 40cm diameter branch at 18m. T. Kirkby reported chewing at entrance in 2022 assessment.	413038.0688	6354722.224	
14	Dead	3	95	Potentially upwards opening hollow	414827.8811	6349143.528	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
31	Jarrah	3	135	Tony. 3 side entry 20cm opening hollows. No chew marks	414875.7646	6349373.483	 
55	Dead	3	100	Tony. Potentially several chimney hollows, unable to confirm	414308.4425	6348876.198	 
100	Dead	3	95	Tony. Potentially chimney hollow, can't confirm	414369.4009	6351420.387	
102	Jarrah	3	130	Tony. Snapped off at 12m. Potential for large chimmney hollow. Cant confirm.. sig tree	414373.9901	6351363.639	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
131	Dead	3	85	Tony. Potentially two spout hollows, can't confirm	414419.5447	6348984.983	
167	Dead	3	90	Tony. Potentially a chimney hollow at top, can't confirm. no obvious chew marks	414507.8889	6348600.289	
236	Jarrah	3	115	Tony. Potential 25 cm mid branch upwards opening. Potential upwards in main trunk fork.	414956.8385	6349043.995	
243	Jarrah	3	90	Tony. One upwards opening 25 cm hollow. No chew	414990.3698	6349111.593	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
245	Jarrah	3	110	Tony. Potential upwards 25 cm opening, cant confirm. Sig tree	415003.336	6349022.829	
260	Jarrah	3	130	Tony. One 30 cm upward opening hollow. No chew. Sig tree	415034.3244	6349058.65	
311	Marri	3	65	Tony. Mid trunk hollow	413984.1582	6351327.32	
350	Marri	3	100	Tony. Side opening 20cm hollow. Angle slightly down. Potential for upwards opening hollow in upper branches.	414142.3835	6350921.081	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
362	Jarrah	3	70	Potential for upwards facing hollows in dead branches.cant confirm. No evidence of chew	414155.3766	6351164.631	
416	Jarrah	3	160	Tony. Potentially chimney hollow in canopy, can't confirm	414192.8599	6350829.329	
425	Jarrah	3	95	Potential hollow 10-15 cm	414200.2651	6351337.443	
472	Marri	3	90	Potentially chimney hollow, however does not appear to be deep enough for bc	414220.0485	6351262.685	
484	Jarrah	3	100	Potential 10-15 cm vertical hollow. Sig tree	414224.5336	6351160.319	

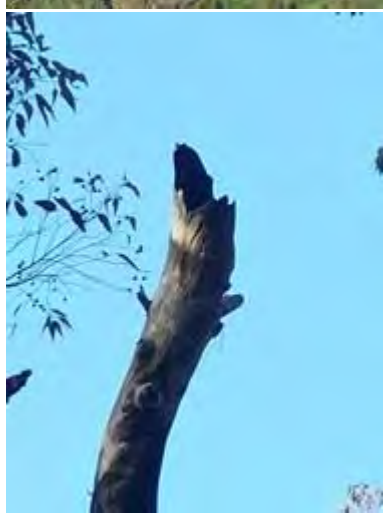
Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
553	Jarrah	3	125	Tony. Potentially chimney hollow, can't confirm	414258.9279	6351125.562	
672	Marri	3	120	Tony. Potential >30cm chimney opening in snapped off trunk at 10m . Can't confirm. No chew. Access partially blocked by branches	414340.5532	6351138.226	 
676	Jarrah	3	130	Tony. Potential mid trunk upwards 30cm hollow. Sig tree.	414342.5892	6351314.071	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
708	Marri	3	110	Potential upwards opening hollows in large branches. Can't confirm. Looks less likely hollows are developed. No signs of use.	414359.199	6351191.418	 
728	Dead	3	120	Potential chimney hollow, not very deep	414373.3105	6351366.562	 
760	Dead	3	90	Tony. Potentially spout hollows, canr confirm. No visible chewing evidence	414389.0946	6351102.282	
809	Dead	3	70	Two potential spout hollows, 10-15 cm	414411.7775	6350965.822	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
827	Dead	3	200	Tony. Potentially chimney hollow, can't confirm	414420.1359	6351156.787	
833	Jarrah	3	95	Tony. Potentially chimney hollow, can't confirm.	414425.8063	6351288.756	
838	Dead	3	100	Tony. Potentially mid trunk and chimney hollow, can't confirm.	414429.3954	6350930.671	
852	Jarrah	3	90	Potential chimney hollow 10-15 cm, becomes narrower from opening down	414434.3095	6350908.827	
880	Jarrah	3	140	Tony. Several potential hollows	414448.7276	6350994.636	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
899	Jarrah	3	80	10-15 cm mid trunk opening, potentially suitable hollow for bc	414457.4371	6351077.84	
902	Marri	3	70	Potential spout hollow 10-15 cm, however becomes narrower from opening down	414458.7418	6351050.747	
958	Marri	3	115	Potential for 2 upwards facing large chimney hollows. Does not look like they are developed to depth but can't confirm.	414489.4641	6350869.082	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
962	Jarrah	3	115	Potential chimney hollow of suitable size. Think unlikely to be developed to depth. Smaller hollows developing.	414492.0239	6350798.753	 
966	Marri	3	80	Tony.Mid trunk upwards facing hollow 15 cm by 25 cm. Wear marks, no chew.	414494.7872	6350949.686	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
970	Dead	3	130	One 15- 20cm spout type hollow, wear marks no BC chew.potential for a large upwards opening hollows, can't confirm. Several well fromed	414496.6354	6351323.671	 
1008	Jarrah	3	100	Tony. Potential large chimney hollow in snapped off dead trunk section	414514.8255	6351151.517	 
1129	Dead	3	100	Potential spout hollows in snapped off branches, can't confirm. Has <10 cm hollows	413235.3448	6351721.391	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
1133	Dead	3	100	Snapped off tree, potential hollow in broken spot. No evidence of weather.	413239.255	6351675.845	
1144	Dead	3	50	Snapped off tree, potential chimney hollow, no sign of wear.	413252.6794	6351728.856	
1145	Marri	3	120	Potential mid trunk hollow ans spout hollow	413252.792	6351586.668	
1156	Dead	3	80	10-20 cm spout opening and potential chimney hollow from snappedoff tree.	413268.1892	6351606.408	
1171	Jarrah	3	70	10-15 cm mid trunk and downward facing hollows. No sign of wear.	413290.352	6351765.69	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
1194	Marri	3	90	10-15 cm spout opening present, potential hollow	413335.5787	6351730.886	
1262	Jarrah	3	160	Tony. Three large vertical branches suit to form chimney hollows. No use evidence. Sig tree	414551.9796	6351279.822	 
1318	Dead	3	70	Has 10-15 cm openings, potential hollow	414583.4761	6350965.196	
1326	Jarrah	3	80	Broken branches with potential hollow development and potential mid trunk hollow	414586.3238	6350750.503	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
1353	Jarrah	3	180	Tony. Potential chimney hollow at the top, can't conf8rm.	414597.011	6351153.209	
1355	Jarrah	3	130	One 15 cm knot hollow mid trunk. Likely too small for BC. Potential large upwards opening hollow in fork mid canopy. Can't confirm. Several small hollows. Sig tree	414598.9037	6350598.738	 
1363	Dead	3	120	Tony. Potential mid trunk hollow.	414602.1526	6350829.376	
1377	Dead	3	85	Potential spout hollow from broken branches, appears 15-20 cm	414607.0906	6351187.381	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
1396	Jarrah	3	110	Snapped off 12 m high, potential chimney hollow, cant confirm. No chewing evidence.	414613.9826	6351150.807	
1421	Dead	3	85	Tony. Snapped off tree with potential chimney hollow, can't confirm	414621.4483	6351115.001	
1429	Jarrah	3	100	Tony. One 25cm side opening. Other potential upwards	414625.3802	6351078.404	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
1438	Marri	3	90	20cm up angles knot type hollow. Unlikely to be deep enough but can't confirm. Other shallow spout type hollows forming at branch ends	414631.0234	6350624.393	 
1466	Marri	3	90	Potential >30cm chimney in upper. Can't confirm	414645.7953	6351024.149	 
1467	Marri	3	80	Tony. Potential chimney hollow	414645.9638	6350780.348	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
1472	Dead	3	140	Tony. Has a couple of potential spout openings, can't confirm. Sig tree	414649.3329	6350805.629	
1490	Jarrah	3	90	Has spout opening <10 cm however appears too narrow for bc	414659.5877	6350721.906	
1535	Marri	3	75	Two <10 cm vertical openings, potential hollow	414682.0366	6350778.212	
1553	Jarrah	3	120	Potential mid trunk slit hollow at 20cm wide and 40 tall. Think probably shallow but can't confirm.	414693.7269	6350928.637	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
1554	Dead	3	60	Has >10 cm chimney opening, potentially hollow, abut 4 m from ground appears shallow	414693.8344	6350732.574	
1595	Dead	3	80	Has vertical opening 10-15 cm, potential hollow immediately under snapped off top	414740.951	6350687.316	
1601	Dead	3	100	Dead snapped at 10m. Potential for large upwards hollow can't confirm	414743.6578	6350532.362	
1606	Jarrah	3	200	Very large tree, several large upwards dead branch with potential for large hollow formation. Smaller 10-12cm hollows present. Sig tree	414751.9025	6350527.336	
1611	Dead	3	80	Tony. Potential hollow in fork of tree	414758.6817	6350663.119	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
1631	Jarrah	3	60	Potential chimney hollow from snapped off tree, however side has cracks potentially thin wall	414825.1473	6350691.02	
1638	Jarrah	3	110	Tony. >30cm spout hollow. Wear marks no chew. Angle and access potentially reduces likelihood. Other small hollows present	414840.8826	6350627.3	 
1642	Dead	3	80	Has several 10-15 cm openings, potential hollow	414852.7995	6350661.405	
1655	Jarrah	3	80	Has potential chimney opening, however stocks are poking out, assume not that deep.	412596.1674	6351981.511	
1671	Jarrah	3	160	Has several snapped off big branches, one opening is jot very developed 10-	412614.1162	6351969.547	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
				15 cm. There has a crac aln ad oes not see suitable			
1688	Marri	3	80	Potential chimney hollow from snapped off tree top. Stocks poke out, potentially not very deep.	412642.9687	6351957.498	
1690	Jarrah	3	70	Pote tial chimney hollow about 20 cm. No chew marks visible	412643.9137	6351842.806	
1752	Jarrah	3	75	One 10-15 cm mid trunk hollow. No evidence of chew marks.	412736.2571	6352157.774	
1824	Dead	3	100	Has a mid trunk hollow 10-15 cm. No chew marks.	412852.06	6351895.032	
1898	Jarrah	3	85	Has small <10 cm hollow and potential 10-15 cm hollows in broken branches up in canopy.	412982.4387	6352132.441	
1921	Jarrah	3	120	Tony. Potential chimney hollow from snapped off tree top. No visible chewing evidence pi	413052.1538	6351972.002	
1923	Jarrah	3	100	Potential chimney hollow 20+ cm, however sides has cracks. No chew marks observed.	413066.8467	6352156.684	
1991	Jarrah	3	100	Potential spout hollow 10-15 cm.	413333.974	6352125.264	
2076	Jarrah	3	80	Has one <10 cm hollow with signs of wear. Has one undeveloped spout hollow from broken branch and one unco firmed spout hollow 10-15 cm facing upwards.	412597.81	6352171.522	
2086	Dead	3	130	One >10 cm opening but is visibly shallow. Has pote tial chimney hollow from snapped branch.	412631.2105	6352478.418	
2126	Dead	3	160	Has several potential chimney hollows <20 cm. None has smooth edges, signs of wear or chew marks.	412695.5096	6352381.246	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
2139	Jarrah	3	90	One >20 cm opening at the top. Potential spout hollow. No chew marks and bottom of the opening appears thin. Also three u developed spout hollows.	412712.6396	6352468.677	
2156	Jarrah	3	110	One 10-15 cm opening, potentially hollow. Additionally several <10 cm hollows along branches and spouts.	412756.9521	6352330.669	
2188	Jarrah	3	130	Has 10- 15cm opening, potential hollow. Also two undeveloped spout hollows from broken branches.	412828.8267	6352494.299	
2229	Dead	3	85	Unconfirmed chimney hollow at the top, 15-25 cm chimney width. Has several undeveloped hollows from broken branches. Also a <10 cm vertical hollow.	412912.7198	6352188.294	
2236	Jarrah	3	80	Tony. Potential chimney hollow, can't confirm. No chewing Mrks.	412919.3308	6352392.381	
2237	Jarrah	3	70	Potential know hollow, entrance appreciation >10 cm. No Wear or chew marks visible.	412924.3857	6352326.324	
2366	Jarrah	3	70	Has one potential 10-15 cm mid trunk hollow, however back wood is visible on the back wall so probably not enough depth for bc. Has two undeveloped hollows from broken branches.	412663.7625	6352191.198	
2367	Dead	3	75	Pote tial chimney hollow from broken tree top, can't confirm. Three undeveloped spout hollows from broken branches.	413176.0771	6352314.197	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
2380	Dead	3	70	One >15 cm chimney hollow with somewhat smooth edges. Facing slightly downward. No visiblt chew marks.	412032.5307	6352704.632	
2417	Dead	3	110	Tony. One pote tial chimney hollow, has somewhat smooth edges at entrance does not appear to have chew marks. Also two undeveloped spout hollows.	412056.8092	6352318.643	
2487	Jarrah	3	110	Has several >10 cm upwards facing spout hollows and undeveloped spout hollows. Cannot confirm if any has a hollow. None has sign of wear or chew marks.	412116.1508	6352508.212	
2547	Marri	3	135	Vertical branch 40cm dbh potential forming 20 cm chimney hollow. Can't confirm. Think unlikely developesxto bC size hollow	412159.8495	6352544.784	
2571	Jarrah	3	100	Two potential hollows with entrance >20cm in forks of trunk and largecbranch. Can't confirm. Think unlikely to be developing toBC sizexand depth. One 10 cm side entry hollow mid trunk	412197.1811	6352356.74	 
2664	Jarrah	3	230	Large 50 cm plus potential upwards opening hollow in snapped mid trunk.	412340.616	6352280.226	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
				think likley not developedcto deep chamberBut can't confirm			
2676	Jarrah	3	230	50 cm diameter cup opening in upper canopy. Potnetial for hollow development. Think unlikley. Cant confirm.	412347.9167	6352284.063	
2716	Jarrah	3	140	Potential 20cm opening spout hollow. Branch sufficient size for chamber development. Can't confirm but think unlikely to develop tocdepth. Other snapped branches	412374.991	6352616.032	
2767	Jarrah	3	170	Trunk snapped at 13m. Potential for large chimney hollow. Can't confirm. Think unlikely.	412419.1167	6352805.53	
2796	Jarrah	3	120	Trunk snapped at 12m. Potential chimney hollow of suitable size. Can't confirm.	412449.1717	6352627.436	
2895	Jarrah	3	100	One large broken branch with potential to contain suitable size chimney hollow. Can't confirm	412555.1511	6352608.213	
2923	Jarrah	3	95	Potential for 20-30 chimney hollow in 40cm branchbat fork. Can't confirm. Think unlikely to have BCsize chamber	412581.2938	6352865.753	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
3012	Jarrah	3	180	Tony. One >20 cm potential knot hollow and one >20 cm potential chimney hollow, can't confirm.	412660.0824	6352695.051	
3083	Jarrah	3	80	One potential >20 cm chimney hollow at top, upwards facing and can't confirm. One side has a Crack and no chew marks or other signs of wear visible. Also one undeveloped spout hollow in broken branch.	412744.7192	6352694.693	
3102	Jarrah	3	50	One potential >20 cm hollow in fork, can't confirm from ground. No signs of wear. Also two undeveloped spout hollows in branches.	412786.7344	6352523.543	
3103	Jarrah	3	50	Tony. One potential spout hollow >20 cm, upwards facing cant confirm. Also Potentially two >10 cm spout hollows, upwards facing, can't confirm.	412787.7288	6352540.53	
3122	Jarrah	3	160	Tony. Potential >20 cm mid trunk hollow, can't confirm firm from ground. also two undeveloped spout hollows.	412818.1745	6352527.122	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
3170	Jarrah	3	210	Tony. One potential side entry hollow mid trunk, 25cm entrance. Potential 20 cm spout hollow in snapped branch mid canopy	412909.8286	6352560.464	
3176	Dead	3	80	Tony. Potential >20 cm chimney hollow from. Snapped off t treepwards facing ca t Co firm.	412921.3368	6352513.093	
3237	Jarrah	3	90	Has two >20 cm mid trunk and fork hollow. Also three <10 cm spout hollows and a few undeveloped spout hollows.	411474.4855	6352861.25	
3243	Jarrah	3	70	Has one >20 cm potential mid trunk hollow and one >10 cm potential mid trunk hollow. Also two undeveloped spout hollows.	411478.6108	6353147.559	
3265	Dead	3	60	One 10-15 cm mid trunk hollow, however appears shallow but can't confirm. Also three <10 cm undevelopec spout hollowx.	411504.6648	6352758.205	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
3267	Dead	3	95	One >20 cm knot opening, potential hollow, about 8-10 m from the ground. No chew marks visible. Also one 10-15 cm undeveloped knot hollow and 8 <10-20 cm undeveloped spout hollows.	411505.9964	6352765.39	
3273	Jarrah	3	55	One 15-20 cm pote tial mid trunk hollow and a few <10 cm hollows along the trunk.	411510.3199	6353054.649	
3308	Jarrah	3	160	One >20 cm potential spout hollow, cannot confirm. Also potential large opening in fork, cannot confirm. Burnt out tree. Also >20 cm undeveloped and burnt out spout hollow.	411545.3984	6353107.709	
3317	Jarrah	3	130	One >20 potential hollow in fork, can't confirm. Not signs of wear or chew marks. Also two >10 cm undeveloped chimney and spout hollows.	411551.2094	6352693.859	
3346	Dead	3	170	Potential for chimney hollow at top of snapped burnt trunk. Can't confirm think unlikley	411596.8689	6353002.955	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
3358	Dead	3	100	Mid trunk slit hollow opening 20 cw widby 40 high. Is upwards opening. 14m up.edgesxlook smooth and worn. Tree was a jarrah.	411615.0762	6352908.203	
3382	Dead	3	100	Potential for chimney hollow in near vertical large snapped branch. Can't confirm. Think unlikely.	411672.8492	6352840.364	
3393	Jarrah	3	80	Snapped trunk at 13m. potential for chimney type hollow to be present. Can't see to confirm. Think unlikely as snap looks 10 ish years old	411686.9236	6352838.801	
3399	Dead	3	100	Potential for chimney hollow in snapped trunk at 15m. Tree heavily burnt. Can't confirm. Think unlikely bC chamber formed	411706.5098	6352889.995	
3439	Jarrah	3	105	One 15-20cm side entry hollow mid trunk. Think unlikely to develop BC size internal chamber	411803.4354	6352754.6	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
3463	Marri	3	70	One >20 cm potential spout hollow. No signs of wear.	411827.4433	6352686.008	
3492	Jarrah	3	90	Potential for mid trunk upwards opening in burnt out section at 6m up. Likely not developed to a hollow and too low to ground but can't confirm	411856.5604	6352874.353	
3498	Marri	3	65	One 10-15 cm knot hollow, one <10 cm knot hollow and two 10-15 cm undeveloped spout hollows.	411859.8929	6352688.829	
3514	Jarrah	3	100	Potential upwards angle opening 15-20cm hollow forming in large slit type scar mid trunk 15m up. Wear marks no chew. Think unlikely bc size chamber present.	411881.9852	6352872.532	
3521	Jarrah	3	125	One potential >30cm opening spout type hollow. On horizontal alignment. Think unlikely to have suitable chamber but can't confirm. Otherclarge snapped branches potential to form future hollows	411887.7046	6352788.827	 
3544	Marri	3	85	20cm upwards opening knot type hollow in mid trunk at 7m off ground. Wear marks but no chewing. Trunk	411902.6571	6352838.786	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
				size sufficient for BC sizes chamber developing			
3547	Marri	3	95	One >10 cm opening, knot hollow, cannot confirm. Also several undeveloped spout hollow ranging between <10->20 cm.	411906.4887	6352728.7	
3678	Jarrah	3	110	One 15 cm sideways opening knot type hollow. 15m up in 40 cm diameter branch. Branch large enough to potentially develop chamber. Think unlikely to have suitable chamber	411122.8866	6352727.616	 
3681	Jarrah	3	95	One potential >20 cm chimney hollow ab9ut 30 m from the ground. No signs of wear and has spiky edges. Also has one broken branch with undeveloped hollow.	411125.1649	6352915.274	
3691	Dead	3	155	Potential upwards opening hollow in fork at 13m. Entry 20cm by 25 cm. Going into main trunk. Think unlikely to have BC size chamber, can't confirm	411139.3078	6352757.613	 
3798	Jarrah	3	75	One >20 cm potential knot hollow, however edges are very uneven and now signs of wear.about 25 m above ground.	411308.8651	6353290.285	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
3821	Jarrah	3	85	Snapped off tree at about 15 m, has potential >20 cm chimney hollow. Appears to become narrower close to the opening.	411330.8938	6353010.622	
3844	Dead	3	70	One potential >10 cm mid trunk hollow. Has cracks along the sides and appear shallow. Also four undeveloped spout hollows.	411365.465	6352918.372	
4062	Dead	3	75	Snapped off tree at about 7 m, potential chimney hollow, cant confirm. No chew marks or other signs of wear.	413120.2677	6354815.721	
4200	Dead	3	50	One spout type hollow with entry of 10-15cm. Going into larger braanch with potential to form chamber. Think high unlikley to be developed	413128.5327	6354383.006	
4236	Jarrah	3	110	Three large upwards facing branches with potential to have upwards opening hollows. Rough broken rims suggest not developed tobdepth, can't confirm but thinking unlikley suitable.	413146.7116	6354380.236	
4248	Dead	3	110	Main trunk snapped at 15m. Potential for chimney hollow at top. Can't confirm. Think unlikley	413153.727	6354467.446	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
4250	Dead	3	80	Several large snapped off branches with potential to have upwards facing hollows. Branches of sufficient size to fit BC . hollow. think unlikley hollows present	413154.2616	6354465.733	
4283	Dead	3	110	Has three >10 cm potential spout hollows. One has cracks along the side and appear unstable. Also has a cup formation that appears to have sticks in it and other broken burnt out branches with undeveloped hollows	413165.6099	6354338.984	
4287	Dead	3	90	Main trunk snapped at 17m. Potential for chimney hollow formation.	413166.0407	6354435.378	
4318	Jarrah	3	90	Large snapped branch at 12m with potential for chimney hollow. Branch large enough to have BC size hollow. Think unlikely to be developed	413179.9843	6354584.996	
4331	Marri	3	85	Dead main trunk snapped off at 8m. Potential chimney hollow in trunk. Rim suggests some hollow formation. Think unlikely deep enough.	413185.2853	6354383.898	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
4342	Dead	3	70	Has two >10 cm potential spout hollows. Appear undeveloped as sides are uneven and no signs of wear, however can't confirm firm.	413186.5579	6354532.273	
4350	Jarrah	3	150	Several large snapped upwards facing branches with potential to contain hollows. Branches of sufficient size to develop BC size hollow. Think unlikely developed.	413189.5181	6354625.533	
4380	Dead	3	120	One >10 cm potential spout hollow, my vision obstructed by surrounding branches and leaves so cannot co firm. Also have several broken branches in canopy with undeveloped hollows	413199.3463	6354216.08	
4414	Jarrah	3	60	Has >20 cm potential slit hollow about 40 m above ground with pote tial signs of wear	413210.6312	6354497.151	
4458	Marri	3	110	One large upwards facing branch potentially develop chimney hollow. Some stocks visible at top, think unlikely developed	413225.7639	6354175.24	
4482	Jarrah	3	95	Main trunk snapped at 12m. Cup or hollow at top potential for chimney	413235.557	6354650.19	

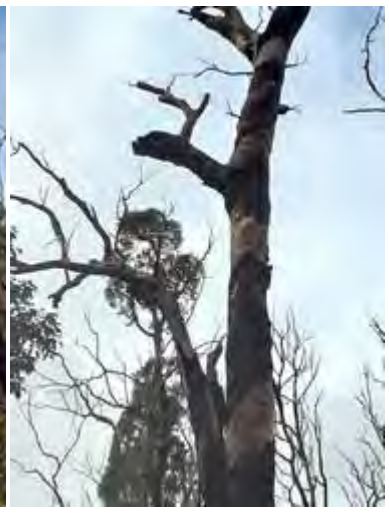
Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
				hollow. Think unlikely to be developed.			
4520	Dead	3	70	Have three ~10-15 cm potential spout/mid trunk hollows, all upwards facing so can't be co firmed. No chew marks or other signs of wear.	413244.891	6354324.027	 
4558	Jarrah	3	60	Has two >10 cm potential spout hollows. No signs of wear or chewed marks. 10-15 m above ground. Also broken branches with undeveloped hollows	413257.2091	6354258.99	 
807	Dead	3	75	Snapped off at 15-20 m, pote tial >20 cm chimney hollow. Tree is fully burnt out and cracks goes along the potential hollow down the trunk. No signs of wear	413346.2151	6354478.431	
4815	Jarrah	3	80	One >20 cm potential mid branch hollow 30-35 m above ground with no chew marks or sign of wear. One 10-15 cm knot hollow 20ish m above the with potential sign of wear but no chew marks.also undeveloped hollows from broken,en branches and along the trunk.	413348.3293	6354150.712	
4828	Dead	3	190	Snapped off tree at about 30 m with >20 cm potential chimney hollow. No chew marks or sign of wear.	413351.0074	6354249.134	
4884	Dead	3	125	Potential for upwards opening hollow mid main trunk in old fork aat 12m. Trunk suitable size for BC hollow formation	413376.3332	6354413.117	 

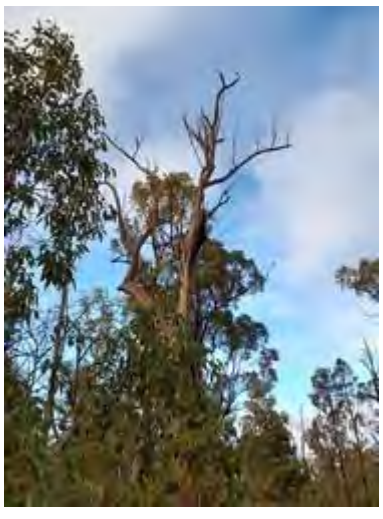
Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
4898	Jarrah	3	110	Tony. Chimney type opening of 40cm on snapped main trunk at 15m. Rim suggests that a hollow may be present.	413384.7653	6354371.042	
4937	Jarrah	3	110	Has two >10 cm potential spout hollows up in canopy, cannot confirm. No chew marks or sign of wear.	413399.7796	6354274.135	
5056	Dead	3	80	Snapped off tree at about 15 m. >20 cm potential spout/chimney hollow at top. Appear undeveloped with wood sticking out, but can't confirm,	412471.2041	6355297.357	
5076	Dead	3	80	Burnt out tree with a couple of branches with undeveloped hollows. Top of tree potential spout/chimney hollow >20 cm. Cannot confirm.	412498.853	6355320.01	
5080	Jarrah	3	120	One >20 cm potential knot hollow, cannot confirm, from ground about 30m from ground. Does not appear deep. Potential upwards facing spout hollow 30 m from groud at top from snapped off tree	412503.0925	6355498.567	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
5093	Dead	3	95	One 10-15 cm spout hollow at about 40 m height. Also other broken branches in canopy with undeveloped hollows.	412534.9453	6355329.42	
5103	Dead	3	110	Tony. Snapped off tree at about 25 m and a >20 cm potential chimney hollow, cannot confirm from ground. No chew marks visible or other signs of wear. Also has a pote tial >10 cm spout hollow and other broken branches.	412552.3954	6355473.123	
5108	Dead	3	100	Snapped off tree at about 2 m, has >20 m potential chimney hollow with cracks along side and rough edges. No signs of wear.	412562.777	6355320.136	
5114	Dead	3	120	Potetial spout/chimney hollow at top. Cannot confirm. Two Other broken branches potential undeveloped hollows . Very tall tree >50 m.	412568.9302	6355328.786	
5115	Dead	3	95	Tony. Dead marri central trunk snapped at 12m. Right diameter for BC hollow . Think likely chimney hollow forming at top. Rim of top smooth and thin looking	412569.1792	6355361.344	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
5141	Jarrah	3	250	Very large tree. Dead central trunk burnt out fully internally. Large upwards branch with potential chimney opening at top. Branch big enough for BC hollow	412600.7405	6355411.11	
5142	Dead	3	100	Tony. Dead marri. Trunk snapped at 18m. Potential side entry hollow 40cm opening at 15m. Also Potential chimney hollow at top. Suitable sizecto support BC hollow	412601.0664	6355362.797	
5176	Dead	3	110	Tony. Snapped off tree at about 35 m. has potential >20 cm chimney hollow with smooth edges. No chew marks present.	412641.5251	6355483.396	
5202	Dead	3	90	Has several burnt out branches with undeveloped hollows. One appear to be >10cm spout hollow about 20 m above ground however it is has an obstructed entry	412675.9756	6355486.783	
5328	Marri	3	120	Tony. Likely chimney hollow in snapped trunk at 14m. Rim smooth and narrow looking. Trunk suitable diameter to have BC hollow	412807.2034	6355213.29	
5351	Marri	3	85	Has one >10 cm potential spout hollow ~30 m above ground. Chamber appear too narrow suitable for bc.Also have broken branches with undeveloped hollows	412502.0092	6354805.381	
5382	Dead	3	140	Has one >10 cm slit hollow at ~~15 m height. No chew marks present. Also have larger broken branches in canopy that appears to be undeveloped.	412607.0036	6354802.497	
5384	Jarrah	3	130	Large dead main trunk and branches upwards facing with burnt out sections. Potential for chimney hollows. Think unlikley can't confirm	412612.9851	6354804.79	
5390	Dead	3	120	One >10 cm mid branch hollow up top in the canopy about 40 m up. Has	412625.1367	6354781.346	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
				smooth edges but no visible shew marks. Also several broken branches with undeveloped hollows and one just developing <10 cm slit hollow.			
5396	Dead	3	140	Large trunk snapped off at 20m. Potential for chimney hollow development at top. Can't confirm.	412633.8286	6354825.867	
5406	Dead	3	210	Has one >20 cm potential spout hollow about 30m up, cannot confirm. Does not appear to have smooth edges. Has one undeveloped spout hollow and three cup formations that are visibly shallow.	412650.5014	6354731.828	
5408	Marri	3	55	Dead central trunk snapped off. Chimney hollow opening at 25-30 cm 10m up . Potential hollow, rim looks thin and smooth. Think trunk not long dead and unlikley developed to BC depth	412652.9283	6354876.166	
5414	Dead	3	65	Has one >20 cm hollow in fork about 20 m up. Has smooth edges but no chew marks.	412659.6047	6354735.09	
5430	Dead	3	90	Tony. Has one >20 cm spout hollow ~30 m up, smooth bottom edge. No chew marks visible. Also one broken branch appears undeveloped. Also one bid open mid trunk, obstructed by shoots.	412692.0104	6355139.285	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
5450	Dead	3	130	One >10 cm knot hollow ~25 m from ground. Also broken branches with undeveloped hollows	412731.6828	6354737.721	
5452	Dead	3	150	Tony. Has one >20 cm pote tial spout hollow ~25 m above the ground. One side appears smooth a d potentially nibbled on, cannot confirm from ground. Mainly rough edges with no signs of wear. big broken branches up at the top that apper undeveloped	412733.8279	6354686.728	 
5505	Jarrah	3	150	One >20 cm potential spout hollow ~40m above ground. Slightly downward facing with smooth edges. No chew marks are visible.	412801.9557	6354769.206	
5523	Jarrah	3	75	Potential chimney hollow opening 20cm in dead main trunk snapped at 12m. Also potential side opening at 20cm in side branch at 12m. Think unlikely developed to depth	412815.3707	6354873.139	
5547	Dead	3	195	Large snapped upwards facing branches potential for chimney hollows. One 15cm side entry opening at 18m. Looks defined edge but no wear. One 20cm by 40cm slit opening at 6m. Think unlike to have hollow	412832.199	6354397.997	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
5554	Marri	3	120	Has one >20 cm potential spout hollow ~30 m above ground cannot confirm. No signs of wear or chew marks and has a crack along one side.	412833.287	6354658.916	
5556	Dead	3	70	Burnt out top with >10 cm pote tial chimney hollow ~25 m above ground, cannot confirm. Has cracks along one side and no signs of wear. Also has pote tial <10 cm knot hollow about 10 m from the ground, however upwards facing so cannot confirm	412835.0258	6354643.012	
5564	Dead	3	190	One >15 cm potential knot hollow about 20 m above ground that appears to be shallow and become narrower, however cannot confirm from ground. Also have e other large branches in canopy that appears undeveloped	412838.0279	6354674.81	
5597	Dead	3	100	Has one ~15 cm potential knot hollow that is upwards facing ~35 m above ground. Has smooth edges but can't confirm if chew marks are present. Also have broken branches in canopy with undeveloped hollows	412851.9145	6354429.892	
5655	Dead	3	110	Has one >10 cm potential spout hollow ~20 m above grou d, slightly upwards facing so cannot confirm. it has rough ecges and no visible chew marks or other signs of wear. Also have one <10 cm spout hollow and other broken branches with undeveloped hollows	412889.8701	6354456.032	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
5685	Dead	3	60	Has one >10 cm spout hollow with disturbed bark above galah? At ~15 m height.	412910.2893	6354797.848	
5693	Dead	3	90	Has one <10 cm potential knot hollow at ~30 m height. Has smooth edges but no visible chew marks. Also have broken branches with undeveloped hollows.	412916.5704	6354436.646	
5694	Dead	3	70	Has one >20 cm mid trunk hollow ~20 above ground with smooth edges. No visible chew marks. Also <10 cm slit hollow and other broken branches in canopy.	412916.8831	6354697.923	
5697	Jarrah	3	100	Large mid trunk opening 40-50cm facing upwards at 8m up. Think likely too open and shallow for BC chamber.	412918.6835	6354337.172	
5732	Dead	3	110	One >10 cm potential upwards facing knot/spout hollow ~25 m above ground and one >20 cm potential spout hollow about ~15 m above ground, slightly smooth edges. No signs of wear. One big broken branch at top appears undeveloped	412937.5599	6354684.912	 
5768	Dead	3	100	Has one 10-15 cm spout hollow ~20 m above ground with no signs of chew marks or other wear. Also have <10 cm spout hollow and other broken branches with undeveloped hollows	412960.8292	6354606.6	
5781	Dead	3	90	Has one >10 cm potential knot hollow about 15 m Above ground, it's upwards facing so cant confirm. Has smooth edges but not visible chew marks. Also Has >20 cm broken branches with undeveloped hollows.	412973.2733	6354410.968	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
5795	Dead	3	80	Snapped trunk at 14m potential for chimney hollow entry 30 cm . Think unlikley developed to depth	412992.196	6354311.524	
5844	Dead	3	60	Burnt and snapped off tree, potential >10 chimney hollow at ~15 m up. Also potetial >10 cm knot hollow at ~10 m.	411655.1644	6355062.744	
5857	Dead	3	105	One side entry hollow at 8m off ground. 40cm opening. Bottom edge looks thin with wear. Large burnt out upper branches. Potential spout hollows. Not preferred angle.	411679.9305	6354995.094	 
5911	Dead	3	110	Broken branches in canopy with undeveloped hollows	411753.3045	6355080.002	
5979	Dead	3	90	Dead trunk snapped at 16m. Potential for two chimney hollows at top. Can't confirm. No evidence of clear rim forming.	411834.4453	6354959.088	
5989	Marri	3	100	One upwards opening 15cm entry knot hollow at 15m going into main trunk. Think unlikley to haave BC size chamber. Upper trunk dead with large snapped branches	411847.4197	6354919.265	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
6069	Dead	3	120	Potential >10 cm spout hollow ~15 m up, upwards facing so cannot confirm. edges are somewhat smooth but no chew marks visible. Also broken branches at top with undeveloped hollows	412564.7814	6355071.047	
6084	Jarrah	3	100	Has one potential >10 cm hollow in fork ~30 m up. The opening travel down the trunk about 10 cm, smooth edges but no visiblw chew marks. Opening obstructed by minor branch and leaves. Also broken branches with undeveloped hollows	412605.8003	6355103.978	
6096	Dead	3	70	Has one >10 cm mid branch hollow ~30 m up and one >10 cm knot hollow ~25 m up that is obstructed by loose bark. Also have e broke branches with undeveloped hollows	412633.0679	6355043.042	
6120	Jarrah	3	130	Large dead central trunk snapped at 15m. One upwards opening hollow 25cm entry top main trunk. Also potential for two 20cm opening spout hollows . Think unlikley developed to depth	412673.1962	6354925.447	
6153	Dead	3	70	Has one >10 cm potential spout hollow ~15 m up. It's burnt out can't confirm if present. smooth edges but no visible chew marks	412735.8675	6355051.648	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
6180	Jarrah	3	80	Potential chimney type hollow at 16m in snapped main trunk. Entry 20cm, looks like wall thin down to 50cm depth. With Crack in wall	412780.0898	6354963.369	 
6286	Dead	3	115	Has two >10 cm knot hollows which both appear shallow as the wall is well visible. Has one >20 cm potential chimney hollow ~20 m up, has rough edges. Has one <10 cm mid branch hollow and small broken branches with undeveloped hollows	412882.8274	6348978.687	 
6327	Jarrah	3	95	Potential for upwards facing hollow in snapped dead main trunk at 18m. Trunk angled at 50 degrees. Think unlikley to be developed.	412958.1608	6349194.163	 
6414	Jarrah	3	105	Trunk snapped at 18m. Burnt at end with potential to have chimney hollow. Can't confirm but think unlikley developing suitable hollow. Small <10cm side entry hollows in upper branches	413697.2954	6349010.509	 
6429	Marri	3	90	Mostly dead central trunk. Potential upwards opening vertical hollow in branch at 10m. Branch 40cm dbh . May have hollow forming. Rim looks smooth. Can't confirm, think likely branch too small	413726.1016	6350386.654	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
6443	Dead	3	105	Has two >10 cm spout hollows ~15 m up. Both has smooth edges but no chew marks. Spout length is potentially too short for bc use. Also one <10 cm spout hollow and other broken branches with undeveloped hollows	413755.7866	6350375.416	 
6501	Dead	3	80	Has one potential >10 cm spout hollow 15-20 m up, upwards facing and can't confirm from ground. It has rough edges and no signs of wear. Also several undeveloped hollows from broken branches.	413955.4982	6348889.289	
6502	Dead	3	175	Has three >20 cm potential spout hollow up top in canopy approx 20 m up. No signs of wear or chew marks, all have rough edges.	413989.0769	6348915.749	 
6579	Jarrah	3	160	One 10cm upward facing entry in dead side branch at 18m. Branch diameter is 30 cm. Think highly unlikley forming BC size chamber.	412932.3815	6350739.773	 
6588	Jarrah	3	160	Large 40-50cm upwards facing opening in fork of main trunk at 15m. Think likely shallow or full of leaves , can't confirm. Seedling growing near rim suggests full of leaves. Potential for hollow to be present or develop	415434.9267	6353225.213	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
6592	Dead	3	95	Dead main trunk snapped at 17m. Potential for chimney type hollow formation in 50cm diameter upper trunk. Edges look jaggeg. Think unlikley hollow forming.	415447.1509	6353256.442	
6665	Jarrah	3	95	Mid trunk slit opening 60 cm long 20 cm wide , 10m off ground. Potential to develop chamber. Think unlikley. Also Potential chimney type hollow at 15m at top.	415531.1089	6353281.313	 
6710	Dead	3	130	One 25 cm vertical opening in fork at 15m. Potential for hollow, think very unlikley developed to depth. One 10 cm side entry spout type hollow in branch. Branch too small to have BC size chamber	415554.3768	6353148.982	 
6761	Dead	3	80	Dead pole type trunk snapped at 15m. Potential for chimney hollow forming at top. Think unlikley but can't confirm	415586.7068	6353356.925	 
6775	Jarrah	3	100	Main trunk snapped at 10m. Potential for upwards opening chimney hollow. Can't confirm but think unlikely developed.	415594.5458	6353292.446	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
7111	Dead	3	90	Upwards opening 30 cm knot hollow mid trunk at 8m. Edges smoothed off. Think unlikley developed to depth.	415900.134	6353355.117	
7198	Jarrah	3	170	Potential upwards facing hollow 30 cm opening, at fork at 15m faving east. . Snapped trunk sections at 15m . One large cup . Full leaves and sticks, not hollow forming. Small and shallow spout hollows at branch ends	412781.3448	6349795.434	
7299	Jarrah	3	120	Potential 20cm opening chimney hollow in 50cm diameter dead branch at 15. Think unlikley developed to depth but can't confirm.	415535.9094	6354439.013	
7329	Dead	3	100	Tony. Main trunk snapped at 15m. 40-50cm chimney type opening at top. Rim around edge looks thin suggesting depth development. Potential chimney hollow present	415593.7663	6354369.103	 
7347	Marri	3	85	Tony. One 25cm opening side entry hollow mid trunk at 15m. Hollow entry looks well developed. Upper 8m of trunk where hollow is is dead. Also potential chimney hollow in 40cm diameter trunk at top.	415621.339	6354499.656	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
7356	Marri	3	85	Tony. Main trunk snapped at 18m. 40 cm entry chimney opening at top. Rim looks thin suggests hollow developing. Potential suitable hollow present.	415634.2205	6354381.142	
7375	Marri	3	70	Main trunk snapped at 15m . Top 40cm diameter. Has clean looking rim around dead top section. vPotential for 20 to 30cm chimney hollow to form. Has thin young branches over entry blocking access. Think unlikley that suitable hollow present but potential.	415660.4286	6354388.212	
7388	Marri	3	160	Large dead central trunk snapped at 7m. Trunk diameter 1.5m at snap. Potential for large chimney hollow/cavity. Edges of rim look thin suggesting cavity present. Think high likelihood that too large and open to be suitable for BC.m	415671.487	6354142.589	
7482	Dead	3	85	Has one >10 cm knot hollow ~20 m up with smooth edges. The entrance is clamp shaped	415778.0616	6354322.89	
7503	Dead	3	70	Snapped off tree at 20-25 m. pote tialy >20 cm chimney hollow. Rough edges nut can't co firm from ground.	415794.057	6354312.521	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
7525	Dead	3	70	One >10 cm pote tial hollow ~20 m up. Very unlikely to have developed to depth. rough edges and no other signs of wear.	415810.2691	6354228.199	
7535	Marri	3	120	Tony. Main trunk snapped at 16m. Potential chimney hollow at top. Snapped top 60cm diameter. Rim looks thin suggests hollow. Small branches obstruct access.	415817.5805	6354217.26	
7546	Dead	3	70	Tony. Snapped off tree at ~20 m with potential >20 chimney hollow. Has smoother edge on the northern side and potential signs of chew marks.	415828.9316	6354218.292	
7673	Jarrah	3	150	Large 50cm diameter snapped off branches, burnt out sections and cavities. . Potential for 2 upwards facing openings in large snapped branches at 15. Think unlikley hollows forming , can't confirm	415656.6043	6354471.151	
7675	Jarrah	3	160	Tony. Main trunk snapped at 12m. Upwards facing 30-40cm opening in fork near top. Bottom rim edge looks smooth rounded and thin. Think hollow of some depth likely present.	415664.4959	6354339.046	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
7755	Marri	3	60	Trunk snapped at 12m. Potential chimney hollow in 30cm diameter branch . Rim looks thin and cracks suggest depth development. May be too narrow internally. Should be checked	415892.4536	6354506.08	 
7808	Marri	3	90	Dead central trunk. Snapped at 10m. Potential chimney hollow in 40cm diameter top. Edge of rim looks thin but jagged. Should be checked from top	416023.0452	6354766.769	 
7844	Jarrah	3	100	One potential >10 cm slit hollow along a branch in canopy, can't confkrm if developed depth. Also two >10 cm broken branches with hollows	416095.4501	6354882.908	
7850	Dead	3	120	One >10 cm potential spout hollow ~30 m up, can't confirm. One <10 cm knot hollow ~20 m up. One large undeveloped knot hollow from broken branch at ~25 m	416108.8225	6354854.394	 
7851	Dead	3	100	Has two larger broken branches that are burnt out. One has a crack along the side. The other can pote tially be a spout hollow, can't confirm from ground.	416110.073	6354899.96	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
7887	Dead	3	80	One potential >20 cm hollow in fork ~15 m up. No signs of wear or chew marks.	416221.4287	6355033.784	
7894	Dead	3	65	Two broken off branches, one visibly undeveloped and the other is potential >10 cm spout hollow, can't confirm from ground.	416258.3162	6355057.641	
7897	Dead	3	85	Snapped off tree at ~30 m, potential >20 cm chimney hollow at top, cant confirm. no signs of wear of chew marks.	416276.6795	6355085.685	
7902	Jarrah	3	100	One pote tial >10 cm fork hollow 15-20 m up. Entrance appears slightly obstructed but can't confirm	416288.9063	6355040.414	
7908	Dead	3	80	Three potential >10 cm spout hollows 15-20 m up. Can't confirm as all are upwards facing. Two unlikely to be suitable for bc and one very unlikely as it becomes more narrow after entrance.	416312.5417	6355044.685	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
7914	Dead	3	70	Two >10 cm potential spout hollows from burnt out broken branches, can't confirm depth. 15-20 m up. unlikely to be suitable for bc.	416328.1265	6355092.762	
7964	Marri	3	95	Tony. 40cm side entry hollow opening at 10m in damaged main trunk. Rim of hollow smoothed off and we'll defined. Can see back of hollow angle forward. Potential not developed to depth.	416472.8923	6352433.706	 
7967	Marri	3	90	. Tony. Main trunk old break at 10m. 50cm diameter chimney type opening present. Edges of hollow are thin with vertical cracks and parts where edge of hollow has broken. Potential to be too open to be suitable.	416478.1277	6352439.14	 
7989	Jarrah	3	115	One well defined 20cm side entry hollow in main trunk at 15m. Edges rounded and smooth. Potential for upwards facing hollows in two large snapped off branches	416515.2279	6355306.907	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8025	Dead	3	70	Potential chimney hollow I 40cm diameter branch. Rim is thin. Think unlikley developed hollow but can't confirm	416579.0215	6355241.372	 
8036	Jarrah	3	110	Mallee with 110 cm DBH Has one >10 cm knot hollow 10-15 m up. Smooth edges but can't confirm from ground. Trunk with 95 cm DBH has one <10 cm mid branch hollow and broken branches with undeveloped hollows	416618.7143	6352347.599	
8043	Dead	3	70	Potential suitable >20 cm chimney hollow from snapped off tree at ~20 m. no signs of wear or chew marks.	415739.95	6354405.293	
8056	Marri	3	100	Potential >10 cm fork hollow 25-30 m up, can't confirm.where visible, it appears to have rough edges, pote tial cup formation	416027.3841	6352278.012	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8063	Jarrah	3	110	One >10 cm knot hollow ~8 m up, one <10 cm slit hollow in a knot at least one <10 cm spout hollow with potentially a couple more that can't be confirmed. Also broken branches with undeveloped hollows	416040.743	6352258.392	 
8076	Dead	3	140	Two potential >10 cm spout hollows 20-25 m up, can't confirm from ground	416054.368	6352229.793	
8082	Jarrah	3	110	Tony. One pote tial >20 cm chimney hollow from snapped off tree top. Can't confirm, no signs of wear or chew marks visible.	416058.9014	6352261.558	
8092	Jarrah	3	100	One potential >10 cm knot hollow ~15 m up. Has rough edges and appears to have wood coming out of it. Also have one >10 cm knot hollow ~20 m up and broken branches scattered.	416079.1834	6352311.827	 
8096	Jarrah	3	115	One >10 cm knot hollow ~10 m up and a few broken branches with undeveloped hollows in canopy	416083.3139	6352184.124	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8101	Jarrah	3	90	One potential >10 cm knot hollow 15-20 m up. Upwards facing so cant confirm. Also two potential <10 cm knot hollows, upwards facing so can't confirm.	416091.3254	6352224.838	
8108	Jarrah	3	95	Tony. Has three >20cm (two mid branch and one knot) hollows 20-25 m up. All has semi smooth edges. Also broken branches with undeveloped hollows and two <10 cm hollows.	416103.648	6352224.437	 
8111	Jarrah	3	105	One pote tial >10 cm hollow 20-25 m up. Can't confirm. Also broken branches and undeveloped knot hollows along the trunk. One <10 cm knot hollow ~30 m up.	416104.7795	6352183.771	 
8116	Jarrah	3	210	Tony. One well defined 18 cm side entry hollow opening in 50 cm diameter branch at 15m. Snapped branches with shallow and small spout type hollow forming.	416112.9196	6352335.585	 
8127	Jarrah	3	130	Tony. Well defined 20 cm wide 30 high upwards opening knot type entry 12m up. Think good potential for chamber present. Second 10cm side entry hollow in 30cm diameter dead branch at 15m. Think too small for BC hollow.	416130.9738	6352268.369	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8134	Jarrah	3	180	Two potential upwards openings 30-40 cm diameter in forks at snapped main trunk at 10m. Think very unlikley developed to depth or having chamber. Can't confirm	416140.2207	6352348.746	
8180	Marri	3	80	Tony. One 20-25cm spout type opening in 3m long 40cm diameter dead branch. Angle 60 degrees and 11m up. Think good potential to form hollow	416166.1477	6352360.709	
8183	Jarrah	3	105	Two well defined 15-20cm knot type openings angled upwards at 60 degrees. 12 and 13m up. Potential for hollow present. Think unlikley developed to BC depths.	416170.1102	6352445.737	
8314	Jarrah	3	135	Large 40-50 cm upwards angle knot opening at 10m where large branch snapped. Potential for hollow to be developed. Think unlikley developed to depth but can't confirm	416229.5687	6352445.848	
8372	Dead	3	80	Snapped at 12m . Potential chimney hollow in 50cm diameter top. Rim looks thin around edge suggests some depth development	416252.6317	6352201.998	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8429	Jarrah	3	100	One 10-15 cm upwards facing opening at 8m. Potential hollow . Forming in growth around snapped main trunk. Well defined opening. Think likely too small and shallow for BC use if hollow forming	416278.0606	6352466.561	 
8480	Jarrah	3	190	Tony. Well defined 20cm side opening knot hollow at 9m. Has perch below improving access. Second similar opening 1m below but think shallow. Other <10cm spout hollows in branch ends	416297.2946	6352517.984	 
8555	Jarrah	3	185	One potential >10 cm knot hollow 30-35 m up, can't confirm from ground. Potentially some chew marks visible. Also other branches which all appear undeveloped hollows	416332.9351	6352335.959	 
8557	Jarrah	3	120	One potential >10 cm spout hollow ~30 m up, upwards facing so cant confirm. Has rough edges. below it's a <10 cm knot hollow. Also other broken branches with undeveloped hollows in canopy	416335.9026	6352471.457	 
8581	Jarrah	3	150	One >10 cm mid trunk hollow~10 m up with smooth edges. One pote tial >10 cm knot hollow ~15 m up, has rough edges. Can't confirm depth from ground. Also have broken branches with undeveloped hollows	416351.0917	6352152.203	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8601	Dead	3	125	One potential tial >10 cm slit hollow 15-20 m up, can't confirm depth from ground. Also have broken branches with undeveloped hollows	416370.4219	6352123.794	
8603	Jarrah	3	135	Two potential >10 cm spout hollows, one ~30 m up and the other ~20 m up. Both has rough edges and no signs of wear however can't confirm from ground. Also have other broken branches with undeveloped hollows	416371.6782	6352371.65	 
8672	Marri	3	85	Dead central trunk snapped at 8m. Has chimney opening 30cm diameter at top. Can see rim is thin and wall thin in upper sections indicates hollow. Joins to sideways trunk section 40 cm below. Think likely shallow and ends at join	415689.22	6352445.667	 
8734	Jarrah	3	80	One 10x15 cm side entry opening in 25cm diameter branch at 20m upper canopy. Entry rim looks well defined smooth and worn at base. Think branch is likely too small to support BC chamber development	415817.5527	6352447.155	 
8737	Jarrah	3	100	One side entry 20x30cm opening mid main trunk at 14m. Well defined smooth rim. Second 20x40cm opening 1m below. Can see back looks shallow. Think unlikley openings developed into chamber with depth	415825.6337	6352349.901	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8760	Jarrah	3	160	Two potential chimney openings in dead snapped 40cm diameter branches at 20m. One upwards angle spout with 15cm opening off dead main trunk at 17m. Think all are unlikley to have chamber developed. Can't confirm	415862.3556	6352346.773	
8776	Jarrah	3	80	Tony. 30x40cm side entry hollow upper main trunk at 14m. Rim of hollow smooth well defined. Minor chew marks on upper edge of rim galaha or BC investigate chew rather than nesting. Second 40 cm side entry opening on west side. Can see back is shallow	415896.1794	6352417.702	
8802	Jarrah	3	80	Tony. Has one >20 cm mid branch hollow 30-35 m up. Has smooth edges and pote tially some chew marks.	415933.4797	6352404.891	
8803	Jarrah	3	80	One >10 cm mid branch hollow at 20 m up. Has smooth edges and appear to have some type of wear around the edges.One <10 cm mid trunk hollow <10 m up and broken branches with beginning to develop-undevelop3d hollows.	415933.73	6352325.041	
8806	Jarrah	3	100	One ~10 cm mid branch hollow 20-25 m up. Smooth edges but too small? For bc. Also broken branches with undeveloped hollows in canopy	415937.8048	6352387.599	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8818	Jarrah	3	95	One potential >10 cm chimney hollow from snapped off tree top ~25 m up. Edges are rough so unlikely to be a well developed hollow	415957.9569	6352332.266	
8820	Jarrah	3	85	One potential ~10cm mid branch hollow 25 m up, can't confirm. No signs of wear and the edges are somewhat smooth. Also broken branches with undeveloped hollows in canopy	415960.9266	6352337.114	
8823	Jarrah	3	135	One large cup formation ~6 m up filled with debris. one potential >20 cm hollow 25-30 m up, it's hidden by branches so cant confirm. Edg3s appears rough and a large crack running along the top wall appears to be present. Also broken branches with undeve	415969.122	6352368.555	
8826	Jarrah	3	130	One >10 cm spout hollow 15-20 m up, has smooth edges. One >20 cm mid trunk hollow 10-15 m up. Smooth and thin edges, potentially too close to ground. broken branches with undeveloped. Burnt out branch, pot. hollow	415974.3859	6352340.489	
8837	Dead	3	85	One >10 cm mid branch hollow ~20 m up. It has smooth edges but no signs of wear. Also broken branch with undeveloped hollows.	415991.7023	6352175.228	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8838	Dead	3	95	Three >10 cm knot hollows 15, 20 and 25 m up. All with smooth edges. Two larger broken and burnt out branches that both appear undeveloped. Also small broken branches with undeveloped hollows in canopy	415991.7468	6352171.873	
8841	Jarrah	3	90	One potential >20 cm spout hollow 30 m up, can't confirm as it's downwards facing. Walls appears thin but edg3s are somewhat rough. One >10 cm burnt out branch appears undeveloped	415996.153	6352344.836	
8850	Jarrah	3	105	One potential hollow in fork >30 cm 20 m up. Potential cup formation, cant confirm. One pote tial >20 cm spout hollow 25 m up, burnt out brokwn branch. Appears a bit obstructed from bark at the top.	416004.0685	6352262.359	
8853	Jarrah	3	85	One ~10 cm knot hollow 20-25 m up, smooth edges but appears too small for bc. Appears to have >10 cm slit hollow 30 m up, can't confirm depth. One <10 cm mid trunk hollow 20-25 m up. Broken branches with undeveloped hollows.	416006.1419	6352284.443	
8855	Jarrah	3	100	One potential >20 cm fork hollow or cup formation 15-20 m up, can't confirm and no debris is visible. Tree is burnt out first 10 m from the ground. One potential >20 cm spout hollow 30 m up. Appears unlikely as edges are rough but can't confirm.	416007.6793	6352351.682	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
8873	Marri	3	110	Two large broken branches 25 & 30 m up with pote tial >10 cm spout hollows. Both have rough edges and no signs of wear. Also other broken branches with undeveloped hollows	416772.957	6352921.721	 
8882	Dead	3	150	A few >10 cm broken branches up in the canopy >30 m, with potentialt hollows, can't confirm from ground. All branches have rough edges and are unlikely to have w well developed hollow that is used. x2 <10 cm mid branch hollows. Broken branch Undeveloped	416778.174	6352703.912	 
8890	Dead	3	115	One pote tial >20 cm knot hollow at 20 m up. Its burnt out and somewhat smooth edges. No signs of wear. Two >10 cm at 25-30 m up Broken branches that appears undeveloped hollows with rough edges , however can't confirm.	416784.6885	6352846.066	 
8965	Jarrah	3	125	Several larger broken branches, all appear undeveloped. The broken branches in the canopy appears also to be undeveloped but cannot confirm from ground.	416841.7575	6352783.484	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
9142	Jarrah	3	85	One potential >10 cm mid branch hollow 20 m up, cant0confirm. One <10 cm hollow and broken branches in canopy.	416014.1766	6352195.18	
9186	Jarrah	3	110	One >10 cm broken branch with potential spout hollow 15 m up, cant confirm. Appears unlikely to be well developed, edges are very rough. Also a few <10 cm knot and spout hollows in canopy and broken branches.	416484.4253	6352902.287	
9194	Jarrah	3	100	One potential >10 cm spout hollow 20 m up. Appears to have thin walls but rough edges. Upwards facing so can't confirm,	416491.2149	6352914.671	
9196	Jarrah	3	120	Two 17cm side entry knot opening. Lower at 8m looks shallow, upper at 15m well defined with smooth rim and wear at base. Think unlikley developed to BC hollow depth.	416492.6607	6352986.302	 
9211	Dead	3	105	Tony. Snapped off tree at 20 m up, >20 cm potential chimney hollow at top. Edges are rough with no signs of wear. Can't confirm hollow from ground. Has a larger hole on the eastern side so potentially not a suitable hollow.	416500.9962	6352607.999	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
9302	Jarrah	3	100	One >10 cm spout/knot hollow 20-25 m up. Has smooth edges but unlikely to have developed enough depth. also one <10 cm knot hollow 30 m up a d other broken branches with undeveloped hollows	416544.4796	6352653.087	
9312	Jarrah	3	130	One 40x80 cm side entry opening. Base of rim looks blackened and not worn recently. Think likely not developed to depth internally. Two upwards angle snapped branches potential for hollow formation. Snap looks fresh, edges jagged. Think unlikley hollow.	416549.8076	6352785.362	
9314	Jarrah	3	60	One >10 cm mid trunk hollow 20-25 m up. Entrance mainly smooth but uneven in shape. No signs of chew marks. Unlikely to be suitable for bc.	416550.3586	6352606.174	
9323	Jarrah	3	90	Has one >10 cm mid branch hollow 15-20 m up. Has smooth edges but no signs of chew marks. unlikey to have developed into suiablt size for bc. Several broken branches with undeveloped hollows	416553.7119	6352893.201	
9382	Dead	3	220	Snapped at 10m. Top with opening 70cm diameter. Can see rim edges thin suggests hollow. Think unlikely suitable, too broad and open	416583.0283	6352817.897	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
9431	Jarrah	3	110	Large broke. Branches that all appear to have undeveloped hollows, however can't confirm from ground. All have rough edges and broken on an angle.	416604.6475	6352660.356	
9460	Jarrah	3	130	Tony. Two 15 cm side entry hollows in dead main trunk section at 20m. Think internally connecting. Rims well defined and smoothed off with ware marks. Accessible to birds from above.	416622.3951	6352753.018	
9465	Dead	3	180	Three 30-40cm potential upwards facing knot type openings in main trunk from 12-15m. Think likely open shallow cups. One well defined 15cm horizontal spout opening in large branch at 10m. Think shallow	416624.0775	6352716.269	
9569	Jarrah	3	120	One 12cm horizontal opening spout type hollow at12m in dead main trunk. Rim is thin and well defined with wear marks at base Minor chew marks on rim. Think very unlikley to support a BC size chamber internally.	416674.8121	6352671.905	
9643	Marri	3	105	Tony. Think likely a chimney hollow present with approx 20cm opening at 10m in 50cm diameter trunksection. Rim is in alive section grown rounded shape with well defined rim. Faces up need pole or drone to confirm	416714.1608	6352670.007	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
9662	Jarrah	3	60	One >10 cm1knot hollow 5 m up, appears shallow. One undeveloped knot hollow and one <10 cm mid branch hollow 15-20 m up.	416723.7752	6352660.18	
9684	Marri	3	110	Snapped at 15m . Top has 40-50cm upwards chimney opening. Edges are tin and rotted indicating some depth development. Some regrowth branches growing over top. Think lower likely that a suitable hollow present, think too wide and open	416735.0857	6352668.77	
9690	Jarrah	3	130	One spout type 20cm 45 degree angle opening main trunk at 10m. Bottom rim smooth, think unlikley developed to depth. dead snapped branches, burnt out sections, cavities and shallow cups in branch ends.	416741.0965	6352733.145	
9706	Jarrah	3	145	Potential for upwards angle 30cm slit type opening occurring in fork of dead main trunk at 18m. Can't get view to check depth. Rim looks well defined and smooth. Think unlikley BC size chamber present	416748.3435	6352760.56	
9725	Jarrah	3	120	One 25x40cm opening in horizontal large branch. Rim well defined and smoothed. Angle of branch and potential hollow not preferred by BC. Think unlikley chamber developed and non preferred angle	416754.9064	6352818.61	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
9734	Jarrah	3	110	One potential >20 cm spout hollow 15-20 m up, can't confirm from ground. Walls appear thin but edges are rough. A cup formation at 8 m. One potential <10 cm spout hollow in canopy and other broken branches with undeveloped hollows	416763.152	6352879.668	 
9844	Dead	3	110	One potential chimney hollow 25-30 m up from broken off branch. Walls appears thing but edges are mainly rough with no signs of wear. Unlikely to have developed depth.	410889.8082	6355629.298	 
9980	Marri	3	75	One potential >10 cm hollow in fork 10-15 m up. Could potentially also be a cup formation, can't confirm.ppears not worn on the bootom edge of entry so unlikely developed a depth.	416713.4601	6353032.449	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
9988	Jarrah	3	85	One 18cm upwards facing opening in fork of main trunk at 18m. Opening well defined, smooth rounded edges. Wear marks are from rubbing by adjacent branches. Think unlikley developed to BC chamber depth.	416732.4641	6353016.968	 
10020	Dead	3	240	Appears to have a cup formation 25 m up from snapped off tree top. Also potential >30 cm knot hollow 20 m up from broken off branch. No evidence of wear and bottom on entrance is rough.	416918.8818	6352418.613	 
10036	Dead	3	90	One potential >20 cm chimney hollow 30 m up. Edges are rough and the walls appears thin. No signs of wear. Can't confirm from ground.	416934.8983	6352589.607	 
10104	Marri	3	60	Snapped off tree at 15 m potential >10 cm chimney hollow. Walls appear thin however the edges are rough and have no signs of wear. ~50 cm down is a broken branch with an undeveloped hollow	416997.682	6352529.838	 

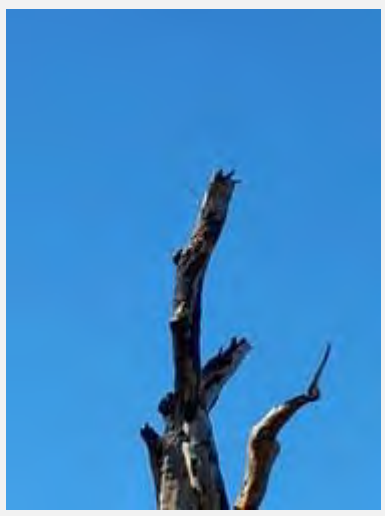
Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10114	Dead	3	70	Has one pote tial >20 cm spout hollow 20 m up. Cracks are running along the walls around the whole spout. 30 cm down is a burnt out dent in the branch and it appear unlikely for a well developed hollow. Edges are also rough no signs of wear	417004.7169	6352533.592	
10124	Dead	3	85	One potential >10 cm knot hollow 10 m up. Could also be cup formation, can't confirm. Edges are somewhat smooth but no signs of wear. Also a couple of broken branches with undeveloped hollows	417008.6586	6352423.414	
10140	Dead	3	140	Tony. One >10 cm spout hollow 30 m up. Not a huge entrance but it could pote tiall open up to larger chamber. Pote tial chew marks visible from something. Also has other broken branches with undeveloped hollows	417018.3449	6352590.699	 
10161	Jarrah	3	110	30cm opening potential chimney hollow top of main snapped trunk at 18m. Edges burnt and rough. One 15cm upwards opening knot type at 10m mid trunk, rim is rough with flake bark. Think both unlikley to have chamber development.	417034.0642	6352636.456	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10201	Dead	3	115	Tony. One potenial >30 cm hollow from snapped off tree 25 m up. could potentially be cup formation, can't confirm. Edges are rough and no signs of wear. Unlikely to have developed depth.	417054.8201	6352486.143	
10252	Jarrah	3	70	Tony. Potential >20 cm chimney hollow 20 m up from snapped off tree top. edges are somewhat smooth and appear relatively thin. Can't confirm from ground.	417078.7152	6352490.493	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10280	Jarrah	3	90	One potential >10 cm spout hollow 30 m up. Appears unlikely as the edges are very rough and no signs of wear. however can't confirm	417103.8279	6352537.518	
10288	Jarrah	3	125	One potential >20 cm spout hollo2 25 m up. appears to be undeveloped as the edges are very rough and wood is still poking out around dthe rim of the entrance.	417108.5841	6352505.106	 
10301	Jarrah	3	180	One 17cm spout opening into short 30cm diameter branch stump off main trunk. Edges look rough suggests no hollow formation. Sideways angle not preferred by BC. Think unlikley suitable.	417118.6083	6352827.104	 
10335	Jarrah	3	165	Tony. One 25cm side entry opening at 15m into 50cm diameter branch. Branch angle 45 degrees. Opening well defined smooth at base has minor chew marks at base. Think hollow forming. Second 15cm hollows at 18m. Rim well defined. Jagged wood vis at back	417158.9952	6352811.576	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10363	Marri	3	70	Tony. One upwards opening 18cm hollow top of dead central trunk at 8m. Rim well defined thin and worn smooth at base from use. Going into 35cm diameter trunk. Potential too narrow for BC size chamber development. Think good hollow present.	417207.2685	6352778.732	 
10428	Jarrah	3	80	Large upwards facing 40cm diameter dead snapped branches. Potential for chimney hollow formation. Rim looks thin and smooth. Think unlikely developed to depth	411425.4899	6350791.126	
10430	Jarrah	3	85	15-20cm side entry opening at 15m main trunk. Rim smooth. Potential upwards opening at 15-20cm in fork at 12m .	411537.6481	6350793.44	 
10458	Jarrah	3	95	One potential >20 cm chimney hollow 30 m up. Edges are rough but walls appear thin. Can't confirm depth. However it is a jarrah so probably unlikely.	411817.9678	6350692.717	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10464	Dead	3	120	One potential >20 cm spout hollow 15 m up, cant confirm. Unlikely suitable, because more narrow as it goes down and no signs of wear. Also broken branch with undeveloped hollows in canopy	411875.4916	6350549.216	
10476	Marri	3	85	Trunk snapped at 12m. Top section dead with potential chimney hollow developing. Edges of rim look thin. Cant see leaves accumulated.	411900.3454	6350624.421	
10498	Marri	3	80	Dead central trunk. 40cm diameter upward facing snapped branches ends jagged and rough but rims look thin with potential for hollow present. Think unlikley developed BC hollow. 30 cm side opening looks shallow.	411940.006	6350639.936	
10525	Dead	3	125	One pote tial >20 cm chimney hollow 15-20 m up, cant confirm from ground. No chew marks or other signs of wear. Roken branches with undeveloped hollows are also present in the canopy.	412003.8178	6350536.104	
10566	Dead	3	130	One potential >15 cm middle of branch hollow 15-20 m up, can't confirm from ground. Also a broken branch with a potential >10 cm spout hollow, can't confirm from ground. A few	412097.4462	6350536.628	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10582	Dead	3	75	One potential >10 cm spout hollow 20 m up, can't confirm. Appears to have thin walls, however u likely to be suitable due to the upwards angle. AlsoHas a a branch with an undeveloped hollow	412175.2409	6350601.369	
10586	Marri	3	160	Snapped trunk with >30cm chimney hollow. Chew from BC at entrance. BC observed chewing hollow edge. Departed in group. Think prospecting rather than nesting	412351.0873	6352053.565	
10588	Marri	3	100	Dead central trunk. Chimney type opening 10-20cm diameter in 30cm diameter branch. Thin around rim, no chew. Think unlikley developed to BC depth or chamber diameter.	411188.066	6353686.692	 
10589	Marri	3	85	Dead central trunk. One 20cm upwards facing opening in 40degree angle branch 45cm diam. At m 13high. Think unlikley developed to BC chamber depth and size	411251.1085	6353726.46	 
10590	Marri	3	130	Tony. Potential chimney hollow 20cm opening in 40cm diameter branch at 20m. Looks thin around rim suggests some hollow formation	411229.594	6353737.822	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10591	Jarrah	3	90	30cm spout opening at 15m in 45 cm diameter branch. At 30 degrees Blackened and burnt. Think unlikley hollow deep and angle not preferred	411169.7156	6353721.328	 
10592	Marri	3	90	Tony. Dead central trunk. 25-30cm upwards facing opening in 40cm diameter branch. At 60 degrees angle. 12m up. Rim thin hollow appears present	410992.1175	6353964.406	 
10593	Jarrah	3	100	Tony. Side entry 30cm opening at 17m. Potential spout opening 40cm diameter at 10 m	410992.0419	6353993.115	 
10594	Marri	3	70	Chimney hollow 40cm diameter at 10m in dead central trunk. Partially burnt out and collapsed. Think unlikley developed deep hollow in remaining trunk sections	411027.1315	6353870.343	
10595	Marri	3	80	Chimney hollow entry 15cm in 25cm diameter branch at 12m. Advanced decomp and white ant mud visible. Think unlikley developed suitable chamber	412306.1259	6350008.554	 

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10596	Jarrah	3	130	Potential chimney hollow opening 30cm in 45cm branch. Burnt and black inside. Think unlikely developed to depth	412425.9656	6350678.874	
10597	Jarrah	3	120	Two potential hollows in upwards angle 40cm diameter branch. At 12m and 18m. Rims look thin. Upper hollow has some wear. Think hollow forming but unlikley developed to depth	412498.55	6350671.942	
10598	Marri	3	150	Potential upwards opening hollow at knot 25cm opening mid way along cm 40cm diameter branch angle 60 degrees. At 12m.	412422.6582	6350668.816	
10599	Marri	3	90	Potential 45 degree 30cm diameter hollow in knot at 13m in mid of main trunk. Think unlikley developed to depth. Can't confirm	412209.1464	6350650.243	
10600	Jarrah	3	135	Side entry opening at 25cm diameter in 50cm diameter branch angled 50 degrees. m 20up.	411849.1528	6350454.471	
10601	Jarrah	3	110	Potential 40cm opening chimney hollow in 50cm diameter branch. Rim looks thin and smooth. at 16m. Think unlikley developed to depth	411066.1205	6355047.825	
10602	Jarrah	3	90	25cm upwards opening in knot . Branch angle 70degrees at 14m high. Looks blackened inside. Unlikely to develop to depth	410930.0282	6355062.611	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10603	Jarrah	3	110	Tony. 30cm spout into 50cm diameter trunk. Angle 70 degrees height 15m.	414021.4837	6352487.535	
10604	Dead	3	80	Chimney opening 20cm in 30cm diameter trunk. Has wear marks around rim. Also wear marks in tree forks. Potential roosting tree ?	414057.608	6352490.975	
10605	Jarrah	3	120	Tony. 25cm upwards facing hollow in knot mid main trunk at 12m. Rim well defined with wear marks	414232.6364	6352414.488	
10613	Marri	3	105	Tree snapped at 10 m. Potential for chimney hollow 30cm. Does not appear to be developed	413115.7231	6352031.508	
10616	Jarrah	3	90	One mid trunk 15-20cm upwards knot hollow. Can't tell depth	412955.9962	6352009.238	
10617	Jarrah	3	150	Several potential 30 cm upwards opening entrances. Can't estimate depth. Sig tree.	412582.3365	6352049.282	
10619	Jarrah	3	170	One 20 cm upwards opening knot hollow mid trunk. Several large snapped branches developing hollows in upper	412650.1425	6352091.001	
10620	Marri	3	105	2 large dead snapped branches potentially forming chimney hollow of >25cm. Can't confirm	412287.8837	6352108.185	
10621	Jarrah	3	220	Potential for chimney hollows in large upwards branches and on snappedcmain trunk. Can't confirm. Sig tree	412814.1307	6352250.942	
10622	Jarrah	3	140	Two 20cm spout type hollow entery.Thinj unlikely to be developed to depth. Several small hollows and dead branches	412791.7461	6352275.269	
10624	Jarrah	3	130	Tony. One 20 c20well developed side entery hollow. Potential for three upwards chimney hollows in trunk and large branches,	412770.2507	6352273.896	
10625	Jarrah	3	100	One 20cm upwards angle knot type hollow. Large dead branches in upper	412519.8055	6352450.817	
10627	Jarrah	3	135	Tony. One up angle knot type mid trunk. 20cm opening hollow.. has minor chew and wear marks. not clear if fron BC	412837.6074	6352489.14	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10629	Jarrah	3	90	Cup formation at 8 m. Medium sized branches broken off with potential spout hollows 20 m up. Can't confirm depth from ground. No chew marks or other signs of wear. Edges rough.	411170.377	6353537.131	
10630	Dead	3	70	One potential >10 cm spout hollow 20 m up. Upwards facing so can't confirm from ground. Edges are rough and no sign of chew marks or other wear. One 10 cm spout hollow 15 m up. No signs of wear.	410931.4688	6353935.02	
10631	Dead	3	195	Four Broken >10 cm branches 25 m up in canopy with potential hollows cant confirm from ground. No sign of wear.	410861.6094	6354007.718	
10632	Dead	3	155	One >10 cm potential knot hollow 20 m up. Potentially not developed depth, wood is poking out. Can't confirm from ground. No sign of wear is visible. Also broken branches with potential 10 cm spout hollow up in canopy, can't confirm from ground.	410807.3913	6354169.938	
10633	Jarrah	3	100	Three potential >10 cm hollows (knot, fork and spout). Can't confirm from ground. Fork and spout hollow appears undeveloped hollow.	410803.1408	6354256.693	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10634	Marri	3	95	Has one >10cm potential chimney hollow 25 m up. No signs of wear or chew marks. Can't confirm from ground. Narrows in after opening.	412277.6628	6350702.537	
10635	Dead	3	125	Tony. Has one >20 cm potential spout hollow 25 m up. Edges and wall appears thin and run down for about 0.5 m. No chew marks or wear.	411818.7743	6349965.648	
10636	Jarrah	3	75	Two dead and burnt out branches 15 m up. Potentially >10 cm chimney/spout hollows. Edges appear somewhat thin however rough and no signs of wear.	411660.0039	6349963.907	
10637	Dead	3	70	One potential chimney >10 cm hollow 15 m up. Can't confirm from ground. Edges are somewhat smooth however no signs of wear or chew marks.	411650.2667	6350124.2	
0638	Dead	3	70	One potential >10 cm chimney hollow 20 m up. No chew marks or other signs of wear, however can't confirm depth from ground. Walls appear thick, no gaps.	411119.7294	6354984.089	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10639	Dead	3	95	Potential >10 cm fork hollow can't confirm from ground, however unlikely. Also one <10 cm spout hollow. Other broken branches no hollow development.	411103.987	6355145.328	
10640	Dead	3	100	Tony. One potential >10 cm chimney hollow 20 m up in canopy. Can't confirm from ground. Edges somewhat flat and walls appear somewhat thin. No chew marks.	410963.5361	6355294.448	
10641	Dead	3	95	Tony. Has one potential >20 cm chimney hollow 20 m up. Edges appear smooth, no signs of chew marks or other wear.	410882.6405	6355305.181	
10642	Jarrah	3	160	Tony. One potential >10 cm spout hollow 10 m up. Has thin edges and crack along the side. Also potentially >10 cm upwards facing spout hollow 5 m above the other spout hollow. Appears to have thin edges with a cracked running down the side.	414123.8143	6352283.514	
10643	Dead	3	85	Potentially a >10 cm chimney hollow at the top of canopy, 25 m. Can't confirm from ground. Edges are somewhat smooth. No cracks to indicate thin walls. No signs of wear.	410817.6109	6355325.716	

Merge Tree Number	Species	Class Bamford	DBH (cm)	Hollow Comments	Easting (AGD84/AMG zone 50)	Northing (AGD84/AMG zone 50)	Images
10644	Marri	3	105	Tony. One >20 cm mid trunk hollow, smooth edges. Can't confirm depth from ground. Main trunk snapped off at 20 m. Potential chimney hollow, cracks along side potentially too big for suitable nesting.	414088.8405	6352924.945	
10645	Dead	3	115	One >10 cm mid trunk hollow. Potentially shallow as some type of texture is a bit noticeable, can't confirm depth from ground. Also some broken branches, none appear hollow formation.	414051.2916	6353063.72	
10646	Dead	3	70	Tony. Snapped off tree 15 m up. Potentially >10 cm chimney hollow. Edges rough, walls appear thin with cracks.	414095.117	6352932.346	
10647	Jarrah	3	90	Tony. One >20 cm might branch hollow 10 m up, has somewhat smooth edges. One potential >10 cm chimney hollow 20 m up. Has somewhat rough edges and small cracks along the side.	414116.6321	6352934.722	
10648	Dead	3	55	Potential >10 cm spout hollow 10 m up, can't confirm from ground but unlikely. Edges are rough, walls have cracks and appear thin.	414147.1015	6352853.127	

Tuesday, 15 October 2024

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(08) 6162 8980
PO Box 437, Leederville, WA 6903
enquiries@westenv.com.au

Alcoa of Australia
Marmion St & Davy St
576 Marmion St
Booragoon
WA 6154

ATTENTION: Sarah Boys

SUBJECT: TECHNICAL MEMO BLACK COCKATOO TARGETED ASSESSMENT, LAREGO JUNE – JULY 2024

Western Environmental Approvals Pty Ltd (WEPL) presents the following letter report in relation to the Black Cockatoo targeted nest and habitat assessment surveys.

Project Background

Alcoa of Australia Limited (Alcoa) has committed to undertaking pre-clearance ecological surveys as part of its Mining Management Plan (MMP) assessment and other state assessment processes. Alcoa commissioned Western Environmental Pty Ltd (WEPL) to undertake targeted pre-clearance black cockatoo assessments for the Larego region of the Willowdale bauxite mine. The project requires surveys of conceptual clearing alignments, with the survey program divided across five years (2024-2028). This report presents results for surveys undertaken between June and July 2024. The Survey Area is located in the Larego region of Willowdale Bauxite mine, 20 km southeast of the town of Waroona

The black cockatoo habitat field survey methodology primarily followed the Commonwealth Referral Guidelines (DAWE, 2022) for identifying breeding, foraging and roosting habitat. Consideration was also given to survey requirements under the Alcoa (2023) Fauna Management Plan (Version 1). Surveys were undertaken by WEPL ecologists across a combined 29 person days between June 2024 and July 2024.

Scope of Work

The objective of the survey was to identify key black cockatoo habitat values within the Survey Area.

The Survey Area comprised approximately 515 Hectares of bushland within the Larego Mine Site.

The Survey Area was subdivided by Alcoa into the following areas presented in Table 1

Table 1: Survey Areas

Alcoa Survey subdivision name	Area (Hectares)
WDL_BC_Survey_WE_2024_Priority_1	6
WDL_BC_Survey_WE_2024_Priority_2	153

Alcoa Survey subdivision name	Area (Hectares)
WDL_BC_Survey_WE_2024_Priority_3	132
Willowdale_BC_Survey_July	147
WDL_BC_Survey_WE_2024_ Priority_4	77

The scope of works included a black cockatoo habitat assessment as per DAWE (2022) *Referral guideline for 3 WA threatened black cockatoo species* (the Referral Guidelines) and marking of Significant Trees as per the Alcoa (2023) *Fauna Management Plan Huntly and Willowdale Mines* (the Fauna Management Plan).

The scope of 2023 black cockatoo surveys included two phases:

Phase 1: WEPL ecologists undertake a ground-based assessment recording, suitable or known nesting trees (as defined by DAWE (2022), scoring foraging habitat quality and recording observation/ evidence of roosting and presence of species.

Phase 2: Follow up assessment of trees identified in Phase 1 as potential suitable nesting trees or known nesting trees by recognised cockatoo expert (Tony Kirkby) via drone, pole camera or telephoto lens, where necessary. Trees with a diameter at breast height (DBH) qualifying as Alcoa Significant Trees were also confirmed by Surveyors in Phase 2. The current results of the Phase 2 assessment have been incorporated into this report. At the time of submission of this report, all Phase 1 trees have received a Phase 2 follow up survey.

Survey Limitations and constraints

Limitations and constraints of the fauna survey as outlined in the Fauna Technical Guidance are detailed below in Table 2

Table 2:Fauna Survey Limitations and constraints

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
Survey Level/ Scope	Negligible	A targeted assessment for black cockatoos was considered suitable.
Availability of contextual information	Negligible	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	Negligible	The entire Survey Area was traversed on foot.
Survey Intensity and Extent	Negligible	Survey effort for black cockatoos was suitable to adequately sample habitats present. A total of 29 person days of effort was allocated to Phase 1. Assessment of potential black cockatoo nesting hollows was ground-based in Phase 1 (undertaken by WEPL).

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Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
		Certain areas within potential Black cockatoo habitat adjacent to the material conveyor belt could not be completely accessed on the grounds of risk to health and safety and unviability of survey method within dense understory foliage. The inaccessible areas above were instead surveyed from vantage points overlooking the trees. Although not all angles/ aspects of potential trees within these areas could be fully viewed, the trees architecture, senescence and likelihood of hollow formation was considered by experienced observers. This was not considered to likely pose a significant constraint to survey. Survey Methodology was modified from the Referral Guidelines. Not all trees with suitable DBH were GPS marked under the Phase 1 survey methodology. Only trees with a potential Bamford class of 1-3 were fully assessed under the Phase 1 survey methodology. An exception was made for Alcoa Known Nesting Trees and trees classified as Alcoa Significant DBH trees. This is not considered a significant limitation as the purpose of the survey was to locate and identify Known and Suitable nesting trees.
Experience	Negligible	Phase 1 lead ecologist Andrew Fry has been conducting biological surveys in Western Australia for over 10 years, with over 5 years' experience undertaking targeted habitat assessments for black cockatoos. Phase 2 lead zoologist Tony Kirkby has extensive experience in black cockatoo nesting habitat with over 25 years' experience as a researcher and consultant, including long-term black cockatoo studies with the West Australian Museum.
Timing, weather, season	Negligible	Phase 1 and 2 Surveys undertaken between May and June 2024 The surveys were undertaken within the recommended timing for both foraging and breeding habitat for forest red-tailed black cockatoo (year-round); and partially for Baudin's cockatoo (foraging Feb/March to September, breeding August-January) (DAWE, 2022) and within the recommended timing for breeding and foraging Carnaby's black cockatoo (July to December); . The majority of survey work occurred outside of the core breeding periods. Assessment of hollow suitability based on dimensions are not seasonally restricted. Targeted searches were undertaken for secondary evidence of the species presence (e.g. foraging evidence from marri and jarrah nuts which can be done at any time of year). No survey days were called off or halted due to adverse weather conditions.
Proportion of the fauna recorded, and any identification issues	Negligible	Targeted survey focused on three readily identifiable species only. No identification constraints were encountered.
Disturbances (fire, flood etc.)	Negligible	No recent fires or clearing disturbances posed a constraint to surveys. Long term changes due to modification of fire regime, historical and ongoing logging and

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
		bauxite mining are considered representative of contemporary habitat and are not considered constraints in the context of the scope of the surveys.

Methodology

The black cockatoo habitat field survey methodology primarily followed the Commonwealth Referral Guidelines (DAWE, 2022) for identifying breeding, foraging and roosting habitat.

Consideration was also given to survey requirements under the Alcoa (2023) Fauna Management Plan (Revision 1).

Field Survey Timing and Team

Table 3:Survey Effort Summary

Survey Phase	Team Position and Experience	Survey Effort and Timing
Phase 1 (2024)	Senior Ecologist-13 years Consultant Ecologist- 3 years Graduate Ecologist- 1 year Graduate Ecologist- 1 year	29 person days- June-July 2024
Phase 2 (2024)	Black cockatoo specialist- 25 years	August- September 2024

Breeding Habitat Assessment

The Commonwealth defines breeding habitat as trees species, known to support breeding, within the range of the species, which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) (1.3 m from the ground) to develop a hollow (DAWE, 2022). Terminology used in this report for trees comprising breeding habitat follows that defined in glossary of DAWE (2022) as shown in Table 4.

Table 4: Breeding Habitat Terminology

Breeding Habitat Term	Definition (DAWE, 2022)
Known nesting trees	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting trees	Trees with suitable nesting hollows present, although no evidence of use.
Suitable nesting hollows	Any hollow with dimensions suitable for use for nesting by black cockatoos. See Table 4 for further discussion on nesting hollow characteristics.
Potential nesting trees	Trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows.

In 2024 the breeding habitat assessment included two phases. The survey methodology of these phases is discussed in detail below. Portions of the breeding habitat Survey Area have been subject to prior survey efforts by Tony Kirkby and Alcoa to identify breeding habitat.

Phase 1

WEPL ecologists recorded every suitable tree (Marri, Jarrah, blackbutt, bullich, flooded gum, wandoo and powderbark wandoo) which presented a hollow with a <10cm diameter point of entry. All suitable trees were recorded using a mobile GIS field data collector platform. The following data was recorded for each tree:

- Species
- DBH (approximately 1.3 m from the ground)
- Coordinates
- Size of entry.
- Hollow type (knot, fissure, spout, vertical/chimney)
- Comments on likelihood of suitable nesting hollow formation based on factors including tree/branch architecture, branch diameter, tree species, appearance and thickness of entry rim, cracking in wood, presence of leaves/ sticks, blackening from burning etc...
- Evidence of use including chew marks or wear.
- Presence of other birds or bees.
- Images of each hollow and overall tree.

In addition to Commonwealth guidelines for assessing potential breeding trees, a scoring system based on that developed by Dr Mike Bamford (referred to as Bamford Class) was applied to class potential breeding habitat. This system and the Bamford Class alignment with DAWE (2022) breeding habitat definitions are shown in Table 5.

Table 5: Black cockatoo Potential Breeding Tree Bamford Class System

Bamford Class	Description of Tree and Hollows/Activity	Alignment with DAWE (2022) Breeding Habitat Definitions
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow, eggs present.	Known Nesting Tree
2	Hollow of suitable size and angle visible with chew marks around entrance.	Known Nesting Tree
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m).	Suitable Nesting Tree (If confirmed hollow with suitable dimensions present in Phase 2);

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Bamford Class	Description of Tree and Hollows/Activity	Alignment with DAWE (2022) Breeding Habitat Definitions
		Potential Nesting Tree (if confirmed hollow with suitable dimensions not present or highly unlikely to be present in Phase 2)
4	Tree with hollows or broken branches that might contain hollows, but hollows or potential hollows are not of a suitable size, or are aligned or obstructed so as to prevent access	Potential Nesting Tree
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.	Potential Nesting Tree

Reassessment of Known Alcoa Nest Trees

The Larego mine Site is large and complex, due to this, a number of trees within the Survey Area had been assessed through previous survey effort to constitute Known Nesting Trees (See table above). Alcoa provided GPS locations for all trees previously recorded as Known Nesting Trees. Where previously recorded Known Nesting Trees occurred within the Survey Area, they were re-recorded by WEPL ecologists and their status as Know Nest Trees was reassessed.

Phase 2

Tony Kirkby verified the presence of any suitable nesting trees or known nesting trees by revisiting trees scored by WEPL ecologist during Phase 1 as Bamford Class 1-3. The Phase 2 assessment utilised a drone, pole camera and/ or telephoto lens. Assessment confirmed if hollows are / have been used previously, are not suitable, currently suitable or potentially suitable in the future. Tony Kirkby has been conducting black cockatoo surveys throughout the south-west of Western Australia for the past 25 years and locating black cockatoo breeding trees for Alcoa Australia for the past ten years. Tony has extensive experience in hollow assessment having been involved in many long-term black cockatoo studies with the Western Australian Museum including a 17-year study undertaken into the breeding biology of forest red-tailed black cockatoos (Johnstone, Kirkby and Sarti 2013).

Alcoa Significant DBH Trees

Under the Alcoa Fauna Management Plan, Significant Trees are defined as the following:

- jarrah trees with a diameter of no less than 2000mm at a height of 1300mm above ground level.
- marri trees with a diameter of no less than 1500mm at a height of 1300mm above ground level.

And

- Is healthy (i.e. retaining majority of limbs, with high percentage leaf cover on remaining limbs) and may provide roosting habitat for black cockatoos, as determined by a suitably qualified and experienced person.

Potential significant trees were identified from Phase 1 WEPL survey data. They were then subject to follow up assessment by Tony Kirkby during Phase 2 assessment.

Results

Breeding Habitat Assessment

Breeding habitat comprises trees species, known to support breeding, within the range of the species, which either have a suitable nest hollow or are of a suitable DBH to develop a hollow (DAWE, 2022). Breeding typically occurs in native eucalypt species however many species of eucalypt including non-endemic species may develop suitable hollows for breeding (DAWE, 2022). In the Huntley mine region tree species, which may provide hollows for black cockatoos as per Tony Kirkby (2023 pers. comm.) are:

- Jarrah- *Eucalyptus marginata*
- Marri- *Corymbia calophylla*
- Bullich- *Eucalyptus megacarpa*
- Blackbutt-*Eucalyptus patens*
- Flooded Gum-*Eucalyptus rudis*
- Wandoo-*Eucalyptus wandoo*
- Powderbark Wandoo-*Eucalyptus accedens*

The most frequently utilised tree species for breeding in the Northern Jarrah Forest region is marri (T. Kirkby, pers. comm. 2023). A long-term study of suitable nesting trees being utilised by forest red-tailed black cockatoo identified that that marri accounted for 91% of known nest trees when comparing marri against jarrah (Johnstone *et al*, 2013). Other tree species such as blackbutt, bullich and flooded gum (particularly bullich) while good hollow providers are restricted within their range to stream zones and are far less abundant than jarrah and marri. Wandoo and powderbark wandoo are also good hollow providers however are very uncommon in the Larego region (T. Kirkby, pers. comm. 2023).

Black cockatoo hollows are located throughout the landscape but tend to be clustered in stands of old growth marri (T. Kirkby, pers. comm. 2023).

A summary of understood suitable nesting hollow characteristics for the three species is provided below in Table 6.

Table 6: Black Cockatoo Nesting Hollow Characteristics

Species	Baudin's black cockatoo	Carnaby's black cockatoo	Forest red-tailed black cockatoo
Tree species and hollow characteristic	Nesting mainly in karri, marri, jarrah, wandoo, bullich, and tuart Preferred hollow dimensions have not been specifically studied but are considered likely to be similar to that of the Carnaby's black cockatoo	Nesting mainly in salmon gum, wandoo, tuart, jarrah, flooded gum, karri and marri. Utilise hollows with entry diameter of 10-65 cm, internal chamber floor diameter of 15-70 cm and depths of 30-300cm. (mean 26 cm entry, 33 cm floor and 130 cm depth).	Nesting mainly in jarrah, marri, karri, wandoo, bullich, blackbutt and tuart Utilise hollows with entry diameters from 12-150 cm, internal floor diameter of 17-54 cm and depths of 30-820 cm. (mean 30 cm entry, 33 cm floor and 140 cm depth).
Sources	DAWE, 2022	DAWE, 2022, Saunders *et al* 2014a, Saunders *et al* 2014b	DAWE, 2022, Johnstone and Storr 1998, Johnstone *et al* 2013

Phase 1 Survey Results

A combined total of 140 suitable or known nesting trees were recorded during Phase 1 of the survey. A breakdown of nesting trees by Bamford Class is shown below in Table 7.

Table 7 Summary of Potential, Suitable and Known Nesting Trees recorded in Phase 1

Bamford Class	Class 1	Class 2	Class 3	Class 4 or 5	Totals (tree species)
DAWE, 2022 Terminology	Known Nesting Tree		Suitable Nesting Tree (pending Phase 2 inspection)	No nest feature detected but suitable DBH or marked habitat tree	
Tree species					
Bullich	-	-	1	-	1
Blackbutt	-	-	1	-	1
Dead	-	-	10	-	10
Jarrah	-	1	21	5	27
Marri	1	11	81	8	101
Total (Bamford Class)	1	12	114	13	140

It should be noted as Phase 1 survey were undertaken from the ground with the use of Binoculars, without closer inspection it could be difficult to determine the origin of chew marks (potentially from other species i.e. galah, ring necked parrot) on potential nest hollows. As a result of this, records of Bamford class 2 trees may be higher than what was actually present.

Phase 1 Suitable Nesting Trees

There were 114 Bamford Class 3 trees recorded. These were recorded by WEPL ecologist in Phase 1 and either appeared to have a potentially suitable nesting hollow visible (opening entry >10cm); or potentially suitable hollow present as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m which could not be confirmed from ground assessment.

Phase 1 Known Nesting Trees

A single Bamford Class 1 tree was recorded within the survey area. A male/female pair of forest red tailed black cockatoos were observed on multiple occasions entering and leaving both of the hollows in the marri tree.

12 Bamford Class 2 trees which show signs of chew marks indicating they are a known breeding tree were recorded within the Survey Area.

Phase 1 Resurveyed Alcoa Known Nest Trees.

Eight trees that had been previously recorded in historic surveys by Tony Kirkby as known nesting trees within the Larego Site were revisited and reassessed by WEPL ecologists. Suitable nesting hollows for black cockatoo were not detected in one (1) of the resurveyed trees. The reassessed Alcoa Known Nest trees are presented in Table 8

Table 8: Resurveyed Alcoa Known Nesting Trees

WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		WEPL Comments
				Easting	Northing	
15	Marri	90	3	411744.0506	6350385.324	Listed as Alcoa Potential nest tree. (Tag missed) Potential chimney hollow at 15m in main trunk. Can't confirm. Needs drone
16	Marri	80	2	412282.1789	6350546.087	Alcoa nest tree 1837, 1x 25cm upwards angled to side entry or knot. At 10m in main trunk. Has fresh minor chew marks and abundant older chew marks.
38	Marri	70	2	411149.6878	6349805.35	Alcoa nest tree 1862, Chimney, 15m up, chewed
39	Marri	100	2	411161.7936	6349797.275	Alcoa nest tree 1858, Side entrance well chewed.
53	Marri	150	4	409807.7976	6349020.373	Dead with open top, Alcoa nest tree 2218, notes say chewed top opening, but

WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		WEPL Comments
				Easting	Northing	
						feature may have broken since, hollow not evident
87	Marri	80	2	415349.814	6355081.899	Alcoa nest tree 1835, 1x 30cm chimney hollow at 12m in main trunk. Abundant older chew marks on rim.
106	Marri	80	2	412356.4045	6350246.563	Alcoa nest tree 1861, Top entrance, 20cm diameter, 16m up, well chewed
112	Marri	80	2	411828.5815	6349082.073	Alcoa nest tree 1855, chimney, 30cm opening, 12 m up, chewed rim

Phase 2 Survey Results

All of the 140 Potential, Suitable or Known nesting trees identified in Phase 1 were subject to follow up assessment during Phase 2 of the survey. A breakdown of nesting trees by Bamford Class is shown below in Table 9.

Table 9 Summary of Potential, Suitable and Known Nesting Trees recorded in Phase 2

Bamford Class	Class 1	Class 2	Class 3	Class 4 or 5	Totals (tree species)
DAWE, 2022 Terminology	Known Nesting Tree		Suitable Nesting Tree	No nest feature detected but suitable DBH or marked habitat tree	
Tree species					
Bullich	-	-	-	1	1
Blackbutt	-	-	-	1	1
Dead	-	-	-	10	10
Jarrah	-	-	-	27	27
Marri	4	10	5	82	101
Total (Bamford Class)	4	10	5	121	140

Phase 2 Known Nesting Trees

There were four (4) trees recorded as Bamford Class 1 during Phase 2 of the Survey. Black cockatoos were recorded as present within the nesting hollows of all of these trees. There were 10 trees recorded as Bamford

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class 2 during Phase 2 of the survey. Both Bamford Class 1 and 2 trees are categorised as Known Nesting Trees. Details of these trees are presented below in Table 10

Table 10 Phase 2 Known Nesting Trees

WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		T.Kirkby Comments
				Easting	Northing	
51	Marri	60	1	409634.3379	6349001.653	Nest tree numbered 2147
55	Marri	95	1	410011.7229	6349426.521	Nest tree numbered 2130. Female at nest
112	Marri	80	1	411828.5815	6349082.073	Nest tree 1855. Female flushed
122	Marri	85	1	411056.2462	6349591.836	Nest tree numbered 2120. Female flushed
16	Marri	80	2	412282.1789	6350546.087	Tree 1837
38	Marri	70	2	411149.6878	6349805.35	Nest tree 1862
39	Marri	100	2	411161.7936	6349797.275	Nest tree1858
42	Marri	120	2	409869.004	6349169.413	Nest tree numbered 2127
43	Marri	95	2	409832.4677	6349164.469	New nest number 2154
52	Marri	60	2	409814.2415	6349017.483	Nest tree numbered 2123. SB note- please use existing number
69	Marri	75	2	408626.6602	6349409.921	Nest tree numbered 2125
71	Marri	60	2	411420.512	6350354.558	Numbered 2149
87	Marri	80	2	415349.814	6355081.899	Good condition and well chewed at entrance. Nest tree 1835
106	Marri	80	2	412356.4045	6350246.563	Nest tree 1861

Phase 2 Suitable Nesting Trees

There were five (5) trees confirmed as Bamford class 3 during Phase 2 of the survey. Details of these trees are presented below in Table 11.

Table 11: Phase 2 Suitable Nest Trees

WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		T.Kirkby Comments
				Easting	Northing	
2	Marri	110	3	413725.5255	6350921.872	Healthy possible nest tree.
15	Marri	90	3	411744.0506	6350385.324	Now numbered 2151
29	Marri	100	3	413848.0361	6355283.099	Suitable nest tree numbered 2152

WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		T.Kirkby Comments
				Easting	Northing	
84	Marri	150	3	410479.4093	6350091.709	Suitable nest tree. Forming hollows. Numbered 2135
88	Marri	105	3	412940.3581	6352910.166	Numbered 2159. Possible

Phase 2 Potential Nesting Trees

Of the 140 trees assessed during Phase 2, 119 of the trees were determined to not possess suitable hollows and were downgraded to potential nesting tree only (equivalent of Bamford class 4 and 5).

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Figure 1A: Phase 2 Survey: Potential, Suitable and Known Black Cockatoo Nest Trees

N

0 370 740 1,110 1,480 m

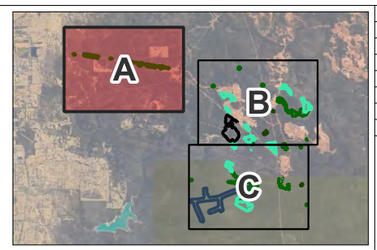
PROJECT/REPORT NAME	Alcoa Black Cockatoo Potential Nesting Tree Interim Data Report Larego Mine Site, near Waroona
SCALE	1:25,000
SHEET SIZE	A3 COLOUR
CLIENT	Aloca
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A23.033
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY Summer 2023
DRAWN BY / REVIEWED BY	MD/JR
DATE	11/10/2024

Legend

Survey Area
- Priority 2

Tree Species
- Dead
- Jarrah
- Marri

Potential, Suitable and Known Nest Trees
- Potential



No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	11/10/2024

NOTES:

Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.

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Western Environmental Pty Ltd
08 6244 2310 | enquiries@westenv.com.au
Level 3/25 Prowse St, West Perth WA 6005
westenv.com.au

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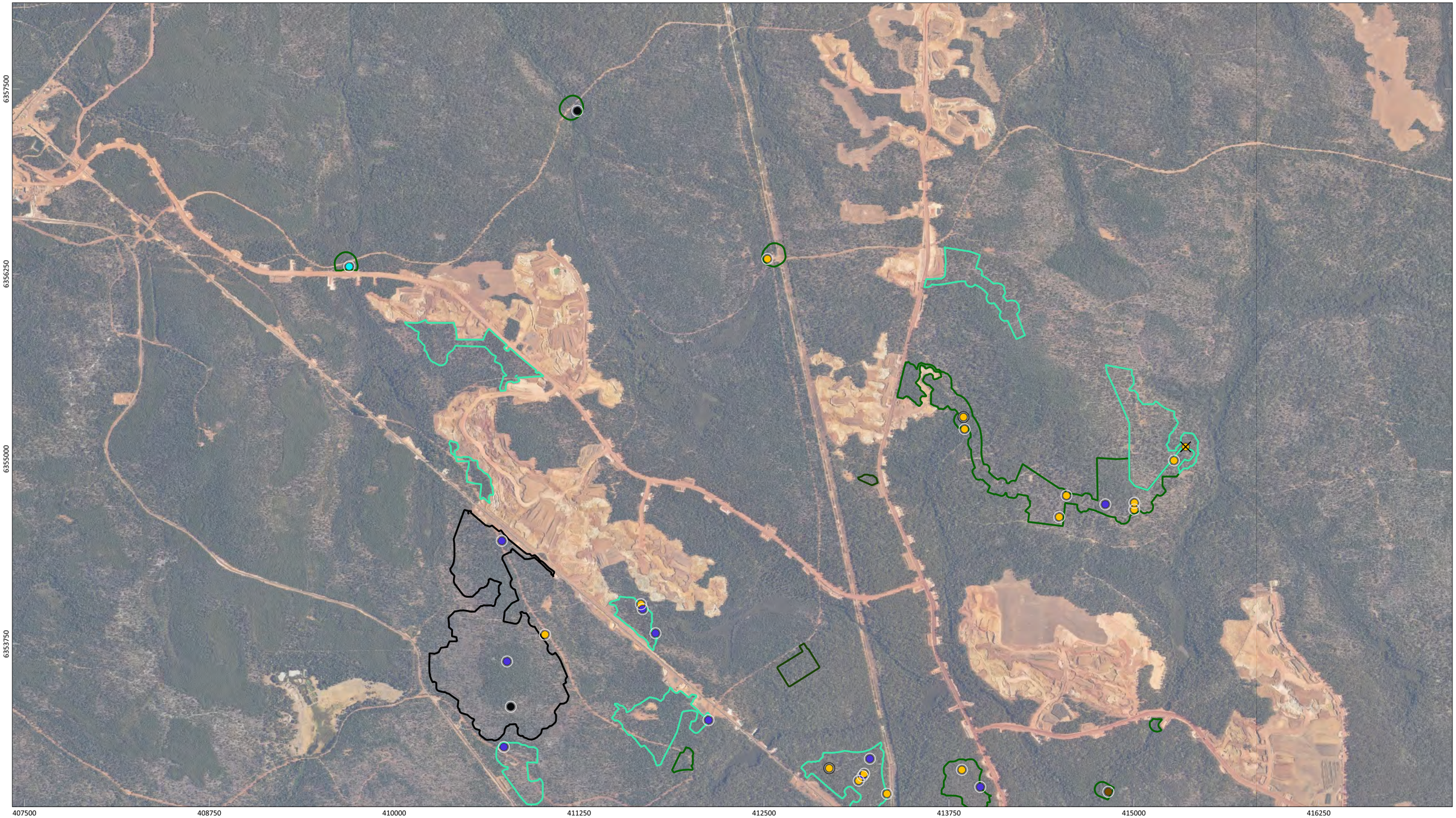


Figure 1B: Phase 2 Survey: Potential, Suitable and Known Black Cockatoo Nest Trees

N

0 370 740 1,110 1,480 m

SCALE: 1:25,000	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/JR / DATE: 11/10/2024

PROJECT/REPORT NAME: Alcoa Black Cockatoo Potential Nesting Tree Interim Data Report
Larego Mine Site, near Waroona

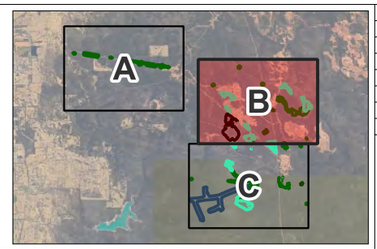
CLIENT: Aloca

Legend

Survey Area
- Priority 1
- Priority 2
- Priority 4
- Priority 5

Tree Species
- Blackbutt
- Dead
- Jarrah
- Marri
- Bullich

Potential, Suitable and Known Nest Trees
- Known
- Potential
- Suitable



No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	11/10/2024

NOTES:

Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.

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Western Environmental Pty Ltd
08 6244 2310 | enquiries@westenv.com.au
Level 3/25 Prowse St, West Perth WA 6005
westenv.com.au

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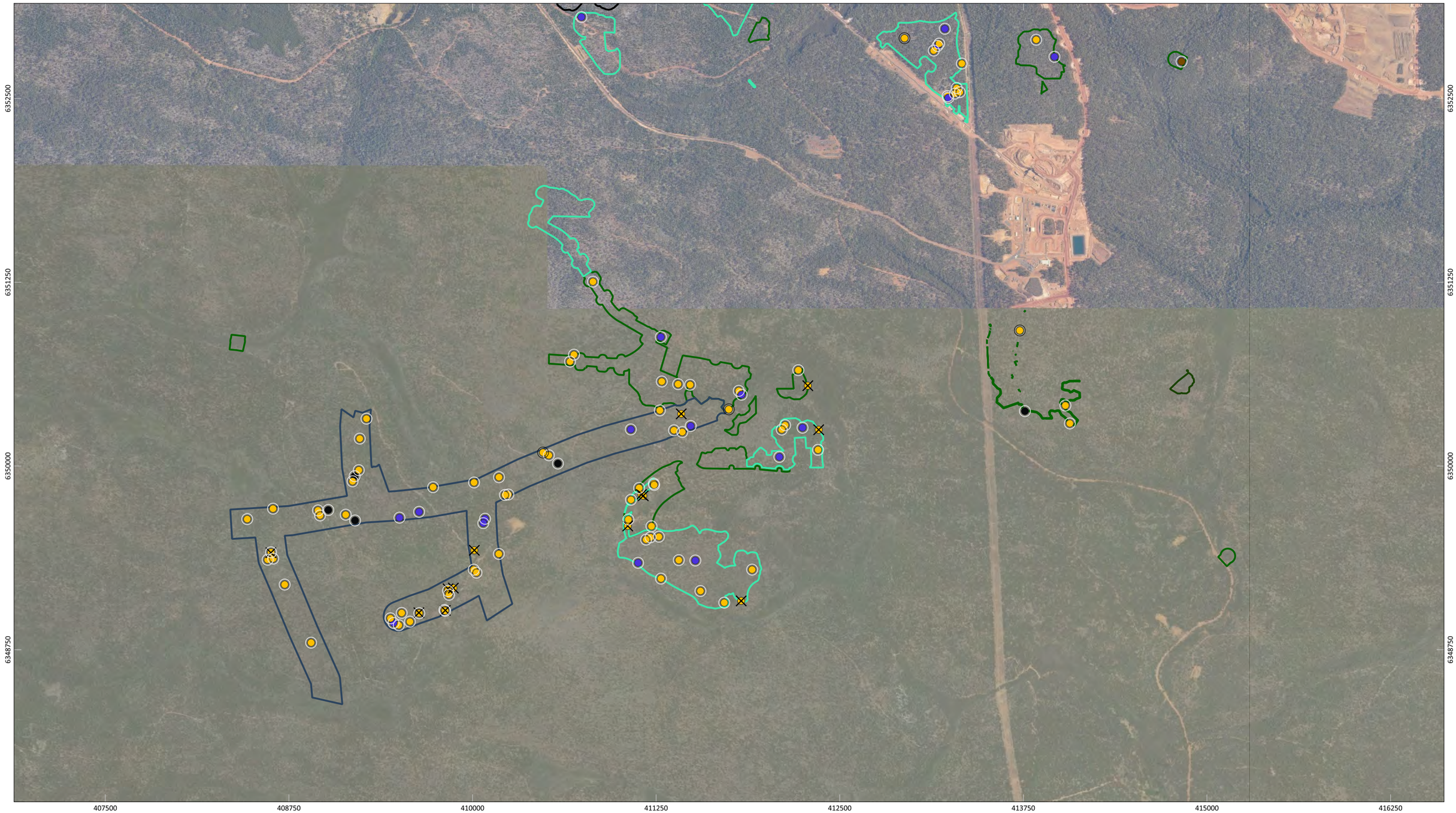


Figure 1C: Phase 2 Survey: Potential, Suitable and Known Black Cockatoo Nest Trees

N

0 370 740 1,110 1,480 m

PROJECT/REPORT NAME	Alcoa Black Cockatoo Potential Nesting Tree Interim Data Report Larego Mine Site, near Waroona
SCALE: 1:25,000	SHEET SIZE: A3 COLOUR
CLIENT: Aloca	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: MD/JR / DATE: 11/10/2024

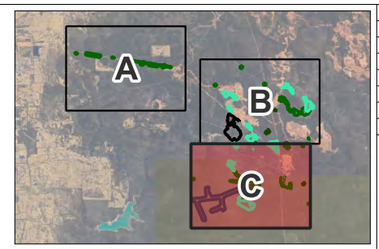
Legend

Survey Area
- Priority 1
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Tree Species
- Blackbutt

- Dead
- Jarrah
- Marri

Potential, Suitable and Known Nest Trees
- Known
- Potential
- Suitable



No	Description	Drawn	Approved	Date
A	Original issue	MD	JR	11/10/2024

NOTES:

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Western Environmental Pty Ltd
08 6244 2310 | enquiries@westenv.com.au
Level 3/25 Prowse St, West Perth WA 6005
westenv.com.au

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Figure 1: Potential, Suitable or Known Nesting Trees Phase 2

Alcoa Significant DBH trees

As per the Alcoa Fauna Management Plan, three Significant Trees (jarrah DBH>200cm; marri DBH>150cm) were confirmed from Phase 1 WEPL survey data by Phase 2 surveys. Significant trees recorded from the Survey Area are identified in Table 12.

Table 12: Alcoa Significant DBH Trees

WEPL Tree Number	Species	DBH (cm)	Coordinate (AGD/84 Zone 50)	
			Easting	Northing
108	Marri	160	412104.7665	6350247.57
125	Jarrah	250	412246.2868	6350260.485
126	Jarrah	240	412088.5161	6350061.589

Conclusions and Recommendations

High quality black cockatoo habitat is present within the jarrah-marri forest of the Survey Area. All three species (forest red-tailed, Baudin's and Carnaby's black cockatoos) were either recorded during the survey or are known to occur from previous survey effort, with forest red-tailed black cockatoo being most frequently recorded. Forest red-tailed black cockatoo and Baudin's black cockatoo breeding is also known to occur within the Larego region.

Breeding Habitat

A combined total of 140, suitable or known nesting trees were recorded during Phase 1 of the survey.

Fourteen Known Nesting Trees were confirmed within the Survey Area during Phase 2 of the Survey.

This report should be read in conjunction with the Schedule - Statement of Limitations. Should you have any queries regarding the above, please contact the undersigned on (08) 6162 8980.

Yours sincerely,
Western Environmental Approvals Pty Ltd



Jack Rogers
Environmental Consultant

Schedule

- Statement of Limitation

Appendices

- Appendix A: Phase 1 Survey Results
- Appendix B: Phase 2 Survey Results

Statement of Limitations

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Except as otherwise stated in this report, WEPL has not verified the accuracy or completeness of the data. WEPL does not represent or warrant that the data is true or accurate and disclaims any and all responsibility or liability with respect to the use of the data.

To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data.

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The conclusions must also be considered in light of the agreed scope of services (including any constraints or limitation therein) and the methods used to carry out those services, both of which are as stated or referred to in this report.

Environmental Conclusions

In accordance with the scope of services, WEPL has conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in this report.

On all sites, varying degrees of non-uniformity of vertical and horizontal conditions in media (soil, water, air, waste or other media as described in the report) are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of media conditions encountered. The conclusions are based on the data and the environmental field monitoring and/or testing actually undertaken and are therefore merely indicative of the environmental condition of the site at the time of preparing this report, including the presence or otherwise of contaminants or emissions. It should be recognised that site conditions, including the extent and concentration of contaminants, can change.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. To the maximum extent permitted by law, no other warranty, express or implied, is made.

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Other Limitations

This report is intended to be read in its entirety, and sections or parts of this report should therefore not be read and relied on out of context.

WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.



APPENDIX A: Phase 1 Survey Results

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
17/06/2024	Marri	3	110	1 potential side spout type hollow, 15cm diameter, clear opening, no chew marks, 13m height	413260.5625	6354864.866		1
17/06/2024	Marri	3	110	1x 30cm side entry hollow in knot of main trunk at 12m. We'll formed entry. Potential for 40cm chimney hollow in snapped main trunk at 15m.	413725.5255	6350921.872	Mapped by as Alcoa possible nest tree.	2
17/06/2024	Marri	3	105	Low potential for an upwards facing opening in v of trunk at 12m. Also, low potential of 30cm opening in spout at 14m. Think unlikely but needs drone to determine.	414035.9556	6350411.452		3
17/06/2024	Marri	3	110	1x 40cm side entry hollow at 8m. 1x short spout 20cm entry upwards facing. Both in main trunk. Both well forming.	414066.1926	6350289.523		4
17/06/2024	Marri	3	70	1x 30cm chimney hollow at 11m in snapped main trunk. Rim thin, hollow looks well developed.	413837.1438	6352899.837		5
17/06/2024	Jarrah	3	140	1 side entrance spout. With 35 cm entry. Mid canopy, 15 m from ground. Think just burnt jarrah. No chew.	413961.6507	6352783.727	Burnt jarrah	6
17/06/2024	Dead	3	105	2 knots upward facing. One mid truck, one mid canopy. Top hollow has 15 cm opening and 10m from ground. Other hollow has 10-15 cm hollow and 6m from ground. Both have defined rims. No chew.	413760.3703	6350373.1		7
18/06/2024	Jarrah	2	100	1 knot type hollow, 15cm diameter, 18m height, well rounded opening, chew marks present	411281.66	6350877.055		8
18/06/2024	Marri	3	95	1 side spout type hollow, 12cn diameter, 9m height, entrance curves around no chew marks	410819.3231	6351253.776	Spider webs present	9
18/06/2024	Marri	3	90	1 potential side sprout hollow, 10cm diameter, 10m height, no chew marks	411287.9868	6350574.645	Mostly hollow trunk	10
18/06/2024	Marri	3	75	1x 30cm chimney hollow at 8m in dead snapped main trunk. Burnt out, rim thin but very burnt.	410690.1548	6350757.196	Dead poor condition	11
18/06/2024	Marri	3	95	1x side entry 30cm diameter at 18m in main trunk. Angled slightly upwards. Is heavily fire blackened, may be shallow, can't tell from ground	411399.2109	6350556.744		12
18/06/2024	Marri	3	130	1x side entry hollow at 20m in main trunk. Tree living and in good condition. Hollow well defined. Looks good potential	411480.7046	6350552.261		13

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
18/06/2024	Marri	3	120	1x 50cm chimney hollow at 12m. Very blackened. Think unlikely suitable	411274.743	6350378.055		14
18/06/2024	Marri	3	90	Potential chimney hollow at 15m in main trunk. Can't confirm. Needs drone	411744.0506	6350385.324	Listed as Alcoa Potential nest tree.	15
18/06/2024	Marri	2	80	1x 25cm upwards angled to side entry on knot. At 10m in main trunk. Has fresh minor chew marks and abundant older chew marks. Is a used nest tree.	412282.1789	6350546.087	Alcoa tree tag id 1837	16
18/06/2024	Marri	2	100	1x 30cm side entry at 15m in main trunk. Hollow well defined, has chew marks on left side. Nest tree.	412217.4634	6350651.815	Alcoa habitat tree nearby but not listed as a nest tree. New nest tree	17
18/06/2024	Marri	3	90	1 side entry spout with 15-20 cm entrance. 10m from ground in mid to upper canopy. Burnt marri. unsure if developed to depth. No chew. Rim is damaged. May be unsuitable for BC.	410663.2159	6350710.319		18
18/06/2024	Marri	3	50	1 side entry spout with 15-20 cm entrance. Mid canopy. 8m from ground. Unsure if developed to depth. No chew.	411811.9718	6350511.295		19
18/06/2024	Jarrah	3	140	2 hollows. 1 Spout with side entry and 1 spout with upwards facing entry. Approx. 20 cm entries. Mid canopy. Approx 10 m from ground. May just be burnt. No chew.	411831.5073	6350485.051		20
19/06/2024	Dead	3	80	Very large side spout 10m up, 40cm diameter, no chew	406878.9957	6357412.171	Dead marri	21
19/06/2024	Dead	3	100	Small knot, midtrunk, 10cm diameter, 18m up, northern aspect, no chew	406824.1996	6357426.015	Dead Jarrah	22
19/06/2024	Jarrah	3	95	1 potential chimney type hollow, 20cm diameter, 15m height, no chew marks	401616.2169	6358193.119		23
19/06/2024	Jarrah	3	65	1 side spout hollow, 12cm diameter, 17m height, no chew marks, scorch marks on entrance	401485.0124	6358197.624		24
19/06/2024	Marri	3	95	1 potential chimney type hollow, and 1 hollow side spout, 20cm diameter for chimney and 10cm for spout, 15m height, no chew marks,	402531.8671	6358056.425		25
19/06/2024	Dead	3	100	Chimney, 18 m up, 50cm diame5er, no chew	402567.0904	6358109.617	Observed from afar, (conveyer road) measurements may be inaccurate, not taped	26
19/06/2024	Blackbutt	3	135	1 side entrance knot hollow. 20 cm side entry appears hollowing. Charcoal inside. 10 m from ground. Mid canopy. No chew.	414827.1731	6352751.499		27

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
19/06/2024	Marri	3	110	1 large 50 cm entry upward facing chimney/spout. Mid canopy. 12 m from ground.no chew.	413855.2867	6355201.771		28
19/06/2024	Marri	3	100	1x 20cm side entry in vertical branch at 20m. hollow looks well defined. Second recently snapped side branch may have created another entry.	413848.0361	6355283.099		29
19/06/2024	Marri	3	120	1 knot, upwards facing entry. Approx 10-15 cm opening. Defined lip. Unsure if wide enough due to visible angles. 8 m from ground, mid canopy. No chew.	414495.1511	6354607.892		30
19/06/2024	Marri	3	105	1 chimney, upward facing entry. Think 30 cm or more opening. Unsure of depth. 12m from ground. Mid canopy. No chew	415271.1422	6354989.764		31
19/06/2024	Marri	3	130	1x chimney hollow 25-30cm at 2525in snapped main trunk. Rim thin hollow looks well defined. 1x 50cm opening in near vertical spout in large snapped dead branch at 15m. Rim looks blackened inside.	414544.1931	6354752.342		32
19/06/2024	Marri	3	75	Potential for chimney hollow 40cm entry at 8m in snapped dead tree. Rim looks smooth and well defined, some blackening inside. Tree is poor condition dead and near collapse	415002.675	6354658.342		33
19/06/2024	Jarrah	3	165	Potential for 40cm opening spout type hollow 60-degree angle in large, snapped branch. Rim looks thin, small hollow entrances suggest some cavity present.	414807.2078	6354693.236		34
19/06/2024	Marri	3	120	1x chimney hollow 40cm diameter opening. After 20m in snapped main trunk. Rim looks thin and well defined.	415003.4145	6354703.838		35
19/06/2024	Jarrah	4	200	Alcoa Significant tree	414751.6029	6350521.4	New Alcoa significant tree	36
19/06/2024	Marri	2	100	Chimney, just off from centre. 50 cm entry. 12 m from ground. Chew present.	411133.5848	6349850.467		37
19/06/2024	Marri	2	70	Chimney, 15m up, chewed	411149.6878	6349805.35	Alcoa nest tree 1862	38
19/06/2024	Marri	2	100	Side entrance well chewed.	411161.7936	6349797.275	Alcoa marked nest tree 1858	39
19/06/2024	Marri	3	120	Chimney 45-degree, top canopy, 25 m up, no chew.	411217.874	6349590.047		40
20/06/2024	Marri	3	105	1 potential chimney type hollow, 16cm diameter, 30m height, unable to determine chew marks	405641.7289	6357613.64	Surveyed from edge of polygon closest to road, unable to access dense vegetation	41
20/06/2024	Marri	3	120	2 in total. 1 side spout hollow, 20cm diameter, 12m height, no chew marks, hollow has side entrance. 1 chimney type hollow, 15cm diameter, 20m height, no chew marks	409869.004	6349169.413		42

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
20/06/2024	Marri	3	95	1 chimney type hollow, 15cm diameter, 15m height, no chew marks. Have previously been marked with arrow	409832.4677	6349164.469		43
20/06/2024	Marri	3	60	1 chimney type hollow, 15cm diameter, 13m height, no chew marks, unable to estimate depth. Previously marked with H	409832.0528	6349149.529		44
20/06/2024	Marri	3	125	1 potential chimney, 15cm diameter, 15m height, no mark. Previously marked H	409839.0695	6349123.775		45
20/06/2024	Bullich	3	75	Connected 20 cm chimney and 15 cm side entry hollows in snapped main trunk at 12m. Trunk section only 30-40cm diameter. Likely too narrow for BC size breeding hollow	409694.9701	6356300.322	Bullich tree	46
20/06/2024	Marri	3	75	1x chimney hollow at 12. 30 cm entry rim thin and well defined. Fire blackened inside. Trunk dead	412522.691	6356351.787		47
20/06/2024	Marri	3	110	Potential chimney 70 cm diameter opening in snapped dead trunk at 10m. Think unlikely to be suitable, too large.	410007.8211	6349294.965		48
20/06/2024	Marri	3	105	Connected 20cm spout with 20cm side entry below. Hollow in spout type large branch with 60-degree angle. Hollow well defined.	410178.658	6349401.741		49
20/06/2024	Marri	3	80	1x chimney hollow 30cm at 15 m in snapped main trunk. Side entry hollow 25cm at 12m in main trunk. Rin well defined. Think internally connective. Good hollow tree	410026.3682	6349273.997		50
20/06/2024	Marri	1	60	One Chimney, 20cm across, 15m up, one know 15cm width, 12 m up, bird seen on multiple occasions entering and exiting both hollows	409634.3379	6349001.653	Black cockatoo seen entering	51
20/06/2024	Marri	2	60	Chimney, 20cm opening, 15m up, chew marks, 2 cockatoos seen potentially leaving the hollow	409814.2415	6349017.483		52
20/06/2024	Marri	4	150	Comments on Alcoa nest tree say chewed top opening, feature may have broken since, hollow not evident	409807.7976	6349020.373	Dead with open top, Alcoa nest tree 2218	53
20/06/2024	Dead	3	65	1 upward facing knots, approx. 20 cm entry. Upper canopy, 12m from ground. No chew. May just be burnt out, unsure if developed to depth.	411237.1678	6357352.079		54
20/06/2024	Marri	3	95	2 hollows, both approximately 13 m from ground. 1 knot is side facing entry with 10-15 cm opening. Has defined rim, no chew. 1 spout with 20 cm opening and upward facing entrance. No chew. Definitely hollow marri, very thin	410011.7229	6349426.521		55
20/06/2024	Jarrah	3	70	1 knot upwards facing entry. Approx cm 15cm opening. 8m from ground mid trunk. No chew.	410084.5114	6349641.059		56

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
20/06/2024	Jarrah	3	75	1 large hollow, side entrance knot, approx. 20-30 cm opening. 10 m from ground, between y of broke branch and remaining. No chew, defined rim.	410072.767	6349610.921		57
21/06/2024	Marri	4	145	No hollows, recording as DBH is close to significant tree size	411370.9281	6350242.838	Significant tree size marri	58
21/06/2024	Marri	3	110	1 side spout type hollow, 10cm diameter, 13m height, no chew marks, foraging evidence under tree. Canopy is tangled with adjacent marri Tree	411427.414	6350230.859		59
21/06/2024	Jarrah	4	195	No hollow. Significant tree size	411484.8248	6350272.149	Significant tree size	60
21/06/2024	Marri	3	120	1 potential chimney type hollow, 20cm diameter, 17m height, no chew marks, unable to determine depth.	408947.4248	6349697.942		61
21/06/2024	Marri	3	130	2 hollows in total, both side spouts, 15cm diameter, 13m height, no chew marks, scorch marks on entrance	408961.3284	6349663.172		62
21/06/2024	Marri	3	110	Potential 40cm opening chimney in snapped trunk at 10m think hollow probably not well developed	410243.1337	6349805.987		63
21/06/2024	Marri	3	120	1x 40cm opening spout hollow going into 60-degree angled branch. Hollow well defined, may continue into vertical main trunk.	410220.3847	6349802.7		64
21/06/2024	Marri	3	130	Potential 40cm chimney hollow snapped trunk at 10m. Inside blackened and burnt out may not continue to depth. Think low potential for suitable hollow	409730.8815	6349855.644		65
21/06/2024	Marri	3	105	Potential 50cm opening chimney hollow at 15m in snapped dead main trunk. Think likely too open to be suitable.	410009.938	6349887.818	Tree is dead	66
21/06/2024	Marri	3	80	30cm opening chimney hollow at 10m in dead main trunk. Rim well defined, hollow looks well formed.	410179.6432	6349923.605		67
21/06/2024	Marri	3	90	40cm opening chimney hollow at 8m in snapped main trunk. Rim is thin with vertices cracking. Think hollow is well delivered. May be too open.	408604.5949	6349362.332		68
21/06/2024	Marri	3	75	1x 25cm chimney hollow in dead main trunk at 12. Hollow looks well defines but burnt inside.	408626.6602	6349409.921		69
21/06/2024	Marri	3	70	1x 10cm upwards facing side entry at 15m in dead branches. Hollow well defines but think branch too narrow at 30cm diameter for BC hollow formation	408627.7193	6349412.962		70
21/06/2024	Marri	3	60	2 hollows, chimney and spout. Chimney is 15 cm diameter, 13 m up, no chew. Spout is 15cm diameter, 7m up no chew	411420.512	6350354.558		71

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
21/06/2024	Jarrah	3	100	2 chimneys. Very similar, 20 cm diameter, m 14up, no chew	411077.0834	6350248.827		72
21/06/2024	Marri	3	115	Short spout, 13 m up, 15 cm across, no chew	409813.3262	6349014.582		73
21/06/2024	Marri	3	70	30cm chimney, 15 m up, no chew	409636.889	6348998.198		74
21/06/2024	Marri	2	120	Low chimney/ spout on huge tree, 30cm diameter, 13m up, chewed edges	409573.2225	6348940.925		75
21/06/2024	Marri	3	95	Crook between Y in branches, hard hollow to spot, 15m up, no chew	409497.635	6348916.734		76
21/06/2024	Jarrah	3	160	Knot. 16m up, 15cm diameter no chew	409461.911	6348932.365		77
21/06/2024	Marri	3	75	Chimney with small spout on Side, 12m up cm 20cm wide no chew	409440.7864	6348963.893		78
21/06/2024	Marri	2	70	Knot in crook of branches, vertical. Maybe 20cmd, 10m up, edges chewed	409517.0287	6349000.176		79
21/06/2024	Marri	3	100	Chimney, 25cm d, 12m up, no chew	409135.9126	6349668.622		80
21/06/2024	Dead	3	80	Spout, in canopy, 15 m up, 12cm d, no chew	409017.4965	6349700.462	Marri	81
21/06/2024	Dead	3	160	2 spout on 45-degree angle. 10-15 m from ground. Approx 15-20 cm entry.	410580.893	6350016.751	Jarrah	82
21/06/2024	Marri	3	150	1 knot, 10 cm entry, upwards facing mid canopy. Potentially too small for BC. Defined No rim chew.	410518.9902	6350072.815	Significant tree marri 1.5 m	83
21/06/2024	Marri	3	150	10cm upward facing hollow knot. Approx 15m from. Ground. Defined smooth rim. Need more time to formation, think will be a good nesting tree for BC. No chew.	410479.4093	6350091.709	Significant tree marri 1.5 m	84
21/06/2024	Marri	3	55	1knot with 10cm entry. Side entrance, approx. 8m from ground mid canopy. No chew. Think unsuitable due to size of tree may be too small	408900.5705	6348797.922		85
21/06/2024	Marri	3	75	2 hollows. 1 spout at 45-degree angle. Upwards facing entry. 15 cm hollow burnt inside. 9m from ground. No chew. Defined rim at bottom of hollow. 1 chimney with small spout below. Approx 25 cm opening 10m from ground. No chew.	408720.6464	6349193.207		86
2/07/2024	Marri	2	80	1x 30cm chimney hollow at 12m in main trunk. Abundant older chew marks on rim.	415349.814	6355081.899	Alcoa nest tree tag 1835	87
2/07/2024	Marri	3	105	1x 30cm chimney hollow at 13m in snapped living main trunk. Has minor chew marks from BC on edges. Looks like hollow well formed.	412940.3581	6352910.166		88
2/07/2024	Jarrah	3	130	1x 20 by 60cm slit entry into main trunk at 10m. Hollow looks well defined	413165.1856	6352857.19	Tree is recently dead	89

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
2/07/2024	Marri	3	90	1x 25cm upwards facing knot hollow, going into vertical trunk section. At 12m in main trunk. Hollow rim well defined	413176.5319	6352873.405		90
2/07/2024	Jarrah	3	150	3 x hollows. One knot with side facing entrance Approx 15 cm opening.13 m from ground. No chew. one spout with upwards facing entry. approx. 30 cm opening. 14m from ground, defined rim. No chew. 1 chimney with rough edges, think unsuitable. 30m entry.	413215.1771	6352974.289	Partially Burnt jarrah	91
3/07/2024	Jarrah	3	120	2 hollows. 1 spout with upwards facing side entry. Approx 15m from ground. No chew. Think burnt. One knot with 10m from ground and approx. 20-25 cm entry.	411765.776	6353822.581	Burnt jarrah	92
4/07/2024	Marri	3	75	1 knot with upward facing entry. 10 cm entrance. 8m from ground. Wear marks present around rim. Rim is well defined. May be slightly too small. Unsure of depth.	413139.7593	6352826.068		93
4/07/2024	Jarrah	3	85	1 knot with 10-15 cm opening. Defined rim. 10 m from ground, no chew. Some bark around hollow may suggest lack of use. Possibly too small. Think unsuitable for BC	410726.782	6354446.997		94
1/07/2024	Dead	3	110	3 spouts all 10cm wide, starting from. 12 m up, dead tree with burnt branch tips	409199.6511	6349629.235	Marri	95
1/07/2024	Jarrah	4	220	No hollows evident, but large burnt branches	409502.0571	6349648.456	Alcoa significant dbh tree	96
1/07/2024	Jarrah	3	150	Burnt spout, 18m up. No chew	409635.6226	6349687.898	Almost dead	97
1/07/2024	Marri	3	55	Chimney, looks burnt but potential for hollow, 20cm diameter, 16m up, no chew	409277.3892	6350321.91	Mostly dead, not market with blue tape	98
1/07/2024	Marri	3	100	Chimney, 12 m up, 30cm diameter, no chew	409231.5979	6350186.248		99
1/07/2024	Marri	3	55	Spout in top canopy, 20c across, 10m up, thin rim but no chew	409224.9455	6349971.663		100
1/07/2024	Dead	3	60	Whole trunk hollow, 2 knot entrances,19 m up, no chew	409196.8384	6349930.903	Marri	101
1/07/2024	Marri	3	65	Spout, upper canopy, 30cm ac4oss no chew	409182.7483	6349895.603		102
2/07/2024	Marri	3	110	2 spouts, one 6m up, other 8m up, 20cm each, burnt no chew	411060.3432	6349635.958		103
2/07/2024	Marri	3	90	Chimney, too canopy, frayed edges but no chew, 20cm across, 13 m up	411078.3272	6349770.148		104
2/07/2024	Marri	3	55	Chimney, top flat, thin rim no chew, 20c diameter approx., 10m up	412351.7905	6350110.054		105
2/07/2024	Marri	2	80	Top entrance, 20cm diameter, 16m up, well chewed	412356.4045	6350246.563	Alcoa nest tree 1861	106
2/07/2024	Marri	3	150	Spout, 20cm opening 14m up, no chew, potential chimney at canopy too, but unable to get good view	412127.7463	6350277.456	Alcoa significant dbh	107

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
2/07/2024	Marri	4	160	No hollows apparent, but massive and tall, may have chimneys	412104.7665	6350247.57	Alcoa significant dbh tree	108
2/07/2024	Jarrah	3	90	Short spout, 15cm opening, 14 m up, no chew	411126.6843	6349341.052		109
2/07/2024	Jarrah	3	110	Spout, top canopy, multiple entrances, most about 25cm across, 16m up, no chew	411516.4394	6349356.988		110
3/07/2024	Marri	3	140	3 spouts, all in upper canopy, all three about 20cm diameter, 18 m up, thin rimmed on one bur, chew not evident on all	411902.9977	6349294.958	Significant dbh tree	111
3/07/2024	Marri	2	80	chimney, 30cm opening, 12 m up, chewed rim	411828.5815	6349082.073	Alcoa nest tree 1855	112
3/07/2024	Marri	3	80	Top canopy spout, 15 cm opening, 16m up, chew not evident but worn edges	411713.3834	6349070.096		113
3/07/2024	Marri	3	70	Chimney, 20cm opening, thin rim but chew not evident, 12m up,	411551.3132	6349149.587		114
3/07/2024	Marri	3	70	Chimney potential, scraggly top, 25cm opening,12m up, no chew apparent	411282.44	6349233.831		115
4/07/2024	Marri	3	80	Potential top opening, would be about 35cm diameter 16m up, no obvious chew	413330.6151	6352737.804		116
5/07/2024	Marri	3	100	2 spouts, one top canopy, 15 cm opening, 16m up, one mid trunk 30cm opening, 10m up, no chew evident	411018.9242	6353813.758		117
5/07/2024	Dead	3	110	2 hollows, one knot, 6m up, 40cm across, no chew, one spout, 30cm ac4oss, 19m up, no chew	410787.2252	6353326.141	Presumably jarrah	118
1/07/2024	Marri	3	100	2 potential side spout, 12cm diameter, 10m and 12m height, no chew marks.	408641.1702	6349709.64	Glary observation	119
1/07/2024	Marri	5	145	No hollows	408465.5573	6349638.64	No hollows, significant tree size	120
1/07/2024	Marri	3	80	1 side knot hollow, 13cm diameter, 9m height, no chew marks. Good opening	408642.5702	6349369.881		121
2/07/2024	Marri	3	85	1 potential chimney type hollow, 15cm diameter, 24m height. Unable to see into hollow, no sign of use or chew	411056.2462	6349591.836		122
2/07/2024	Marri	4	180	Potential developing chimney but looked not fully rotted out. Alcoa sig tree size	411233.4425	6349879.858	new significant tree size	123
2/07/2024	Marri	3	85	1 potential chimney, 14cm diameter, 8m height, no signs of use. Unable to determine depth	411236.1462	6349871.135		124
2/07/2024	Jarrah	5	250	No hollows	412246.2868	6350260.485	Significant tree size 230cm DBH	125

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
2/07/2024	Jarrah	5	240	No hollow	412088.5161	6350061.589	Significant tree size	126
2/07/2024	Marri	3	95	1 potential chimney hollow, 12cn diameter, 13m height, no chew marks, unable to determine depth	411268.176	6349518.836		127
2/07/2024	Marri	3	90	1 potential side spout hollow, 12cm diameter, 10m height. Maybe very old chew marks	411211.169	6349514.814		128
2/07/2024	Marri	3	0	1 side spout, 15cm diameter, 12m height, definitely hollowed out can see light and vertical cracking. No sign of use.	411181.0745	6349498.918	DBH not recorded	129
2/07/2024	Marri	3	80	1 spout type hollow, 10cm diameter, 9m height, no chew marks	411403.7816	6349359.75		130
3/07/2024	Jarrah	3	100	Chimney, open top, 20cm across, worn but no chew, 16m up,	410740.6302	6353054.035		131
3/07/2024	Jarrah	3	220	Massive tree, small burnt-out hollow in upper canopy, 20cm across, 20m up, no chew	412124.5276	6353235.238		132
3/07/2024	Marri	3	130	3 hollows, chimney, 25cm opening 16m up, 2 spouts, both 20cm opening, both about 14m up, no chew evident	411667.1766	6354018.809		133
3/07/2024	Jarrah	3	70	Knot, very good shape and size, 30cm across, 10m up, but no chew evident	411678.7893	6353985.884		134
4/07/2024	Marri	4	70	No observed features, potentially forming future hollow.	413295.5887	6352571.339		135
4/07/2024	Marri	3	80	1 spout type hollow, 10cm diameter, 8m height, very degraded entrance. No signs of use	413233.7301	6352516.456		136
4/07/2024	Jarrah	3	100	2 potential side spout hollow, 15cm diameter, 10m height, potential old chew marks.	413238.3965	6352504.37		137
4/07/2024	Marri	4	95	No observed features. Potential forming future hollows	413283.4887	6352533.03		138
4/07/2024	Marri	4	80	No observed features.	413316.7363	6352543.151	Rechecking habitat tree	139
5/07/2024	Jarrah	3	110	1 potential side spout hollow, 15cm diameter, 15m height, unable to see other side of hollow due to dense bush	410761.9551	6353631.896		140

APPENDIX B: Phase 2 Survey Results

Species	Phase 2 Bamford Class	Suitable Potential or Known Nesting Tree	DBH	Easting	Northing	Tony Kirkby Hollow Comments	Tree Number
Marri	4	Potential	110	413260.5625	6354864.866	Completely blocked and photo taken	1
Marri	3	Suitable	110	413725.5255	6350921.872	Healthy possible nest tree.	2
Marri	4	Potential	105	414035.9556	6350411.452	Blocked	3
Marri	4	Potential	110	414066.1926	6350289.523	Blocked	4
Marri	4	Potential	70	413837.1438	6352899.837	Blocked	5
Jarrah	4	Potential	140	413961.6507	6352783.727	Not a hollow	6
Dead	4	Potential	105	413760.3703	6350373.1	Blocked	7
Jarrah	4	Potential	100	411281.66	6350877.055	Blocked	8
Marri	4	Potential	95	410819.3231	6351253.776	Not a nest hollow. Almost horizontal	9
Marri	4	Potential	90	411287.9868	6350574.645	Too small	10
Marri	4	Potential	75	410690.1548	6350757.196	Blocked	11
Marri	4	Potential	95	411399.2109	6350556.744	Blocked	12
Marri	4	Potential	130	411480.7046	6350552.261	Not a hollow	13
Marri	4	Potential	120	411274.743	6350378.055	Blocked	14
Marri	3	Suitable	90	411744.0506	6350385.324	Now numbered 2151 from	15
Marri	2	Known	80	412282.1789	6350546.087	Tree 1837	16
Marri	4	Potential	100	412217.4634	6350651.815	Not a nest. Chew narks are rotten wood	17
Marri	4	Potential	90	410663.2159	6350710.319	Not a nest hollw. Almost horizontal	18

Species	Phase 2 Bamford Class	Suitable Potential or Known Nesting Tree	DBH	Easting	Northing	Tony Kirkby Hollow Comments	Tree Number
Marri	4	Potential	50	411811.9718	6350511.295	Blocked	19
Jarrah	4	Potential	140	411831.5073	6350485.051	Blocked	20
Dead	4	Potential	80	406878.9957	6357412.171	Blocked	21
Dead	4	Potential	100	406824.1996	6357426.015	Too small	22
Marri	4	Potential	95	401616.2169	6358193.119	Blocked. Marri not Jarrah	23
Jarrah	4	Potential	65	401485.0124	6358197.624	Too small	24
Marri	4	Potential	95	402531.8671	6358056.425	Blocked	25
Dead	4	Potential	100	402567.0904	6358109.617	Blocked	26
Blackbutt	4	Potential	135	414827.1731	6352751.499	Blocked	27
Marri	4	Potential	110	413855.2867	6355201.771	Blocked	28
Marri	3	Suitable	100	413848.0361	6355283.099	Possible/potential nest tree numbered 2152	29
Marri	4	Potential	120	414495.1511	6354607.892	Blocked	30
Marri	4	Potential	105	415271.1422	6354989.764	Blocked	31
Marri	4	Potential	130	414544.1931	6354752.342	Blocked	32
Marri	4	Potential	75	415002.675	6354658.342	Blocked	33
Jarrah	4	Potential	165	414807.2078	6354693.236	Blocked	34
Marri	4	Potential	120	415003.4145	6354703.838	Blocked	35
Jarrah	4	Potential	200	414751.6029	6350521.4	Not actually of significant DBH to class as Alcoa Significant Tree	**36**
Marri	4	Potential	100	411133.5848	6349850.467	No hollows. Chew marks are expansion marks	37

Species	Phase 2 Bamford Class	Suitable Potential or Known Nesting Tree	DBH	Easting	Northing	Tony Kirkby Hollow Comments	Tree Number
Marri	2	Known	70	411149.6878	6349805.35	Nest tree 1862	38
Marri	2	Known	100	411161.7936	6349797.275	Nest tree1858	39
Marri	4	Potential	120	411217.874	6349590.047	Blocked . Rotten	40
Marri	4	Potential	105	405641.7289	6357613.64	Blocked	41
Marri	2	Known	120	409869.004	6349169.413	Nest tree numbered 2127	42
Marri	2	Known	95	409832.4677	6349164.469	New nest number 2154	43
Jarrah	4	Potential	60	409832.0528	6349149.529	No hollows. H is old forestry mark	44
Marri	4	Potential	125	409839.0695	6349123.775	Blocked	45
Bullich	4	Potential	75	409694.9701	6356300.322	Was probably a nest hollow but now has large hole at floor level	46
Marri	4	Potential	75	412522.691	6356351.787	Blocked	47
Marri	4	Potential	110	410007.8211	6349294.965	Blocked	48
Marri	4	Potential	105	410178.658	6349401.741	Blocked	49
Marri	4	Potential	80	410026.3682	6349273.997	Blocked	50
Marri	1	Known	60	409634.3379	6349001.653	Nest tree numbered 2147	51
Marri	2	Known	60	409814.2415	6349017.483	Nest tree numbered 2123.	52
Marri	4	Potential	150	409807.7976	6349020.373	Tree present but hollow lost to fire	53
Dead	4	Potential	65	411237.1678	6357352.079	Blocked	54
Marri	1	Known	95	410011.7229	6349426.521	Nest tree numbered 2130. Female at nest	55
Jarrah	4	Potential	70	410084.5114	6349641.059	Blocked	56

Species	Phase 2 Bamford Class	Suitable Potential or Known Nesting Tree	DBH	Easting	Northing	Tony Kirkby Hollow Comments	Tree Number
Jarrah	4	Potential	75	410072.767	6349610.921	Blocked	57
Marri	4	Potential	145	411370.9281	6350242.838	135 dia. Too small	58
Marri	4	Potential	110	411427.414	6350230.859	Hollow too small	59
Jarrah	4	Potential	195	411484.8248	6350272.149	Poor condition	60
Marri	4	Potential	120	408947.4248	6349697.942	Blocked	61
Marri	4	Potential	130	408961.3284	6349663.172	Blocked	62
Marri	4	Potential	110	410243.1337	6349805.987	Blocked	63
Marri	4	Potential	120	410220.3847	6349802.7	Blocked	64
Marri	4	Potential	130	409730.8815	6349855.644	Blocked	65
Marri	4	Potential	105	410009.938	6349887.818	Blocked	66
Marri	4	Potential	80	410179.6432	6349923.605	Blocked	67
Marri	4	Potential	90	408604.5949	6349362.332	Blocked	68
Marri	2	Known	75	408626.6602	6349409.921	Nest tree numbered 2125	69
Marri	4	Potential	70	408627.7193	6349412.962	Not a hollow	70
Marri	2	Known	60	411420.512	6350354.558	Numbered 2149	71
Jarrah	4	Potential	100	411077.0834	6350248.827	Blocked	72
Marri	4	Potential	115	409813.3262	6349014.582	Blocked	73
Marri	4	Potential	70	409636.889	6348998.198	Blocked	74
Marri	4	Potential	120	409573.2225	6348940.925	Blocked	75

Species	Phase 2 Bamford Class	Suitable Potential or Known Nesting Tree	DBH	Easting	Northing	Tony Kirkby Hollow Comments	Tree Number
Marri	4	Potential	95	409497.635	6348916.734	No hollows	76
Jarrah	4	Potential	160	409461.911	6348932.365	Blocked	77
Marri	4	Potential	75	409440.7864	6348963.893	Blocked	78
Marri	4	Potential	70	409517.0287	6349000.176	Too small	79
Marri	4	Potential	100	409135.9126	6349668.622	Blocked but badly split	80
Dead	4	Potential	80	409017.4965	6349700.462	Too small	81
Dead	4	Potential	160	410580.893	6350016.751	Blocked	82
Marri	4	Potential	150	410518.9902	6350072.815	Too small	83
Marri	3	Suitable	150	410479.4093	6350091.709	Potential nest tree. Forming hollows. Numbered 2135	84
Marri	4	Potential	55	408900.5705	6348797.922	Too small	85
Marri	4	Potential	75	408720.6464	6349193.207	Blocked	86
Marri	2	Known	80	415349.814	6355081.899	Good condition and well chewed at entrance	87
Marri	3	Suitable	105	412940.3581	6352910.166	Numbered 2159. Possible/potential	88
Jarrah	4	Potential	130	413165.1856	6352857.19	Blocked	89
Marri	4	Potential	90	413176.5319	6352873.405	Blocked	90
Jarrah	4	Potential	150	413215.1771	6352974.289	Blocked	91
Jarrah	4	Potential	120	411765.776	6353822.581	Blocked	92
Marri	4	Potential	75	413139.7593	6352826.068	Too small	93
Jarrah	4	Potential	85	410726.782	6354446.997	Blocked	94

Species	Phase 2 Bamford Class	Suitable Potential or Known Nesting Tree	DBH	Easting	Northing	Tony Kirkby Hollow Comments	Tree Number
Dead	4	Potential	110	409199.6511	6349629.235	No hollows	95
Jarrah	4	Potential	220	409502.0571	6349648.456	Poor condition	96
Jarrah	4	Potential	150	409635.6226	6349687.898	Blocked	97
Marri	4	Potential	55	409277.3892	6350321.91	Top of tree now lost	98
Marri	4	Potential	100	409231.5979	6350186.248	Blocked	99
Marri	4	Potential	55	409224.9455	6349971.663	Too small	100
Dead	4	Potential	60	409196.8384	6349930.903	Blocked	101
Marri	4	Potential	65	409182.7483	6349895.603	Blocked	102
Marri	4	Potential	110	411060.3432	6349635.958	Blocked	103
Marri	4	Potential	90	411078.3272	6349770.148	Blocked	104
Marri	4	Potential	55	412351.7905	6350110.054	Blocked	105
Marri	2	Known	80	412356.4045	6350246.563	Nest tree 1861	106
Marri	4	Potential	150	412127.7463	6350277.456	1200mm dia	107
Marri	4	Potential	160	412104.7665	6350247.57	Numbered 2156. Sig tree	108
Jarrah	4	Potential	90	411126.6843	6349341.052	Top of tree recently fallen	109
Jarrah	4	Potential	110	411516.4394	6349356.988	Too small	110
Marri	4	Potential	140	411902.9977	6349294.958	Wrong angles. Almost horizontal	111
Marri	1	Known	80	411828.5815	6349082.073	Nest tree 1855. Female flushed	112
Marri	4	Potential	80	411713.3834	6349070.096	Not a hollow	113

Species	Phase 2 Bamford Class	Suitable Potential or Known Nesting Tree	DBH	Easting	Northing	Tony Kirkby Hollow Comments	Tree Number
Marri	4	Potential	70	411551.3132	6349149.587	Blocked and rotten	114
Marri	4	Potential	70	411282.44	6349233.831	Blocked and rotten	115
Marri	4	Potential	80	413330.6151	6352737.804	Blocked	116
Marri	4	Potential	100	411018.9242	6353813.758	No suitable hollows	117
Dead	4	Potential	110	410787.2252	6353326.141	Blocked	118
Marri	4	Potential	100	408641.1702	6349709.64	Hollow too small	119
Marri	4	Potential	145	408465.5573	6349638.64	Too small for sig tree	120
Marri	4	Potential	80	408642.5702	6349369.881	Blocked. Wrong angle. Almost horizontal	121
Marri	1	Known	85	411056.2462	6349591.836	Nest tree numbered 2120. Female flushed	122
Marri	4	Potential	180	411233.4425	6349879.858	Poor condition. Blocked hollow	123
Marri	4	Potential	85	411236.1462	6349871.135	Blocked	124
Jarrah	4	Potential	250	412246.2868	6350260.485	Tree numbered 2155	125
Jarrah	4	Potential	240	412088.5161	6350061.589	Tree numbered 2153	126
Marri	4	Potential	95	411268.176	6349518.836	Small blocked	127
Marri	4	Potential	90	411211.169	6349514.814	Blocked	128
Marri	4	Potential	0	411181.0745	6349498.918	Blocked	129
Marri	4	Potential	80	411403.7816	6349359.75	Blocked	130
Jarrah	4	Potential	100	410740.6302	6353054.035	Blocked	131
Jarrah	4	Potential	220	412124.5276	6353235.238	Hollow s too small	132

Species	Phase 2 Bamford Class	Suitable Potential or Known Nesting Tree	DBH	Easting	Northing	Tony Kirkby Hollow Comments	Tree Number
Marri	4	Potential	130	411667.1766	6354018.809	Blocked	133
Jarrah	4	Potential	70	411678.7893	6353985.884	Blocked	134
Marri	4	Potential	70	413295.5887	6352571.339	Blocked	135
Marri	4	Potential	80	413233.7301	6352516.456	Spout too small	136
Jarrah	4	Potential	100	413238.3965	6352504.37	Blocked. Tree 1412 nearby and in good condition	137
Marri	4	Potential	95	413283.4887	6352533.03	Good condition. Previously marked hab tree	138
Marri	4	Potential	80	413316.7363	6352543.151	Poor condition. Previously marked hab tree	139
Jarrah	4	Potential	110	410761.9551	6353631.896	Blocked	140

lThursday, 22 August 2024

Our Ref: A23.033-MEM-FSR_A.0_Myara_FINAL

(08) 6162 8980
PO Box 437, Leederville, WA 6903
enquiries@westenv.com.au

Alcoa of Australia
Marmion St & Davy St
576 Marmion St
Booragoon
WA 6154

ATTENTION: Sarah Boys

SUBJECT: TECHNICAL MEMO BLACK COCKATOO TARGETED ASSESSMENT, MYARA, MAY-JUNE 2024

Western Environmental Approvals Pty Ltd (WEPL) presents the following letter report in relation to the Black Cockatoo targeted nest and habitat assessment surveys.

Project Background

Alcoa of Australia Limited (Alcoa) has committed to undertaking pre-clearance ecological surveys as part of its Mining Management Plan (MMP) assessment and other state assessment processes. Alcoa commissioned Western Environmental Pty Ltd (WEPL) to undertake targeted pre-clearance black cockatoo assessments for the Myara region within the Huntley bauxite mine. The project requires surveys of conceptual clearing alignments, with the survey program divided across five years (2024-2028). This report presents results for surveys undertaken between May and June 2024 corresponding to 2024 conceptual clearing alignments. The Survey Area is located in the Myara region of the Huntly bauxite mine, 23 km northeast of the town of Pinjarra.

The black cockatoo habitat field survey methodology primarily followed the Commonwealth Referral Guidelines (DAWE, 2022) for identifying breeding, foraging and roosting habitat. Consideration was also given to survey requirements under the Alcoa (2024) Fauna Management Plan (Version 1). Surveys were undertaken by WEPL ecologists across a combined 53 person days between May 2024 and June 2024.

Scope of Work

The Survey Area comprised approximately 674 Hectares of bushland within the Myara Site.

The Survey Area was subdivided by Alcoa into the following areas presented in Table 1.

Table 1: Survey Areas

Alcoa Survey subdivision name	Area (Hectares)
WE_Priority1_Tranche_2	66
WE_Priority2_HUNFCA2024A	163
WE_Priority3_Tranche_3	197
WE_Priority4	221
Mt_Solus_missed	<1
HUN_Turbidity_Monitors WE_Priority4MMP25_East	26

The scope of works included a black cockatoo habitat assessment as per DAWE (2022) *Referral guideline for 3 WA threatened black cockatoo species* (the Referral Guidelines) and marking of Significant Trees as per the Alcoa (2024) *Fauna Management Plan Huntly and Willowdale Mines* (the Fauna Management Plan).

The scope of 2024 black cockatoo surveys included two phases:

Phase 1: WEPL ecologists undertake a ground-based assessment recording potential, suitable or known nesting trees (as defined by DAWE 2022), scoring foraging habitat quality and recording observation/ evidence of roosting and presence of species.

Phase 2: Follow up assessment of trees identified in phase 1 as potential suitable nesting trees or known nesting trees by Tony Kirkby and/or Glen Gaikhorst of GHD via drone, pole camera or telephoto lens, where necessary. Trees with a diameter at breast height (DBH) qualifying as Alcoa Significant Trees were also confirmed by Surveyors in phase 2. The current results of the phase 2 assessment have been incorporated into this report. At the time of submission of this report, only trees within **WE_Priority2_HUNFCA2024A** have received a phase 2 follow up survey.

Survey Limitations and constraints

Limitations and constraints of the fauna survey as outlined in the EPA technical guidance for fauna surveys (2020) are detailed below in Table 2.

Table 2:Fauna Survey Limitations and constraints

Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
Survey Level/ Scope	Negligible	A targeted assessment for black cockatoos was considered suitable.
Availability of contextual information	Negligible	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	Negligible	The entire Survey Area was traversed on foot.
Survey Intensity and Extent	Negligible	Survey effort for black cockatoos was suitable to adequately sample habitats present. A total of 53 person days of effort was allocated to phase 1. Assessment of potential black cockatoo nesting hollows was ground-based in phase 1 (undertaken by WEPL). A second survey phase was undertaken by others utilising a drone, pole camera or telephoto lens. Six person days of effort were allocated to phase 2. Survey Methodology was modified from the Referral Guidelines. Not all trees with suitable DBH were fully assessed under the phase 1 survey methodology. Only trees with a potential Bamford class of 1-3 were fully assessed under the phase 1 survey methodology. An exception was made for Alcoa Known Nesting Trees and trees classified as Alcoa Significant DBH trees. This is not considered a significant limitation as the purpose of the survey was to locate and identify Known and Suitable nesting trees.
Experience	Negligible	Phase 1 lead ecologist Andrew Fry has been conducting biological surveys in Western Australia for over 10 years, with over 5 years' experience undertaking targeted habitat assessments for black cockatoos. Ecology team survey members are suitably experienced, trained and operate under supervision of lead ecologist. Phase 2 lead zoologist were Tony Kirkby and/ or Glen Gaikhorst. Tony Kirkby has extensive experience in black cockatoo nesting habitat with over 25 years' experience as a researcher and consultant, including long-term black cockatoo studies with the West Australian Museum. Glen Gaikhorst of GHD is a Principal Zoologist with more than 25 years' experience leading and conducting fauna surveys.
Timing, weather, season	Negligible	Phase 1 and 2 Surveys undertaken between May and June 2024 The surveys were undertaken within the recommended timing for both foraging and breeding habitat for forest red-tailed black cockatoo (year-round); and partially for Baudin's cockatoo (foraging Feb/March to September, breeding August-January) (DAWE, 2022) and outside of the recommended timing for breeding and foraging of Carnaby's black cockatoo (July to December); . The majority of survey work occurred outside of the core breeding periods. Assessment of hollow suitability based on dimensions are not seasonally restricted.

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Possible Limitation	Degree of Limitation (Significant, Moderate or Negligible)	Potential Constraints on Survey Outcomes
		Targeted searches were undertaken for secondary evidence of the species presence (e.g. foraging evidence from marri and jarrah nuts which can be done at any time of year). No survey days were called off or halted due to adverse weather conditions.
Proportion of the fauna recorded, and any identification issues	Negligible	Targeted survey focused on three readily identifiable species only. No identification constraints were encountered.
Disturbances (fire, flood etc.)	Negligible	No recent fires or clearing disturbances posed a constraint to surveys. Long term changes due to modification of fire regime, historical and ongoing logging and bauxite mining are considered representative of contemporary habitat and are not considered constraints in the context of the scope of the surveys.

Methodology

The black cockatoo habitat field survey methodology primarily followed the Commonwealth Referral Guidelines (DAWE, 2022) for identifying breeding, foraging and roosting habitat.

Consideration was also given to survey requirements under the Alcoa (2024) Fauna Management Plan (Version 1).

Field Survey Timing and Team

Table 3:Survey Effort Summary

Survey Phase	Team Position and Experience	Survey Effort and Timing
Phase 1 (2024)	Senior Ecologist-13 years Consultant Ecologist- 3 years Graduate Ecologist- 1 year Graduate Ecologist- 1 year	53 person days- May- June 2024
Phase 2 (2024)	GHD Principal Ecologist- 25 years	Six person days- May- June 2024

Breeding Habitat Assessment

The Commonwealth defines breeding habitat as trees species, known to support breeding, within the range of the species, which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) (1.3 m from the ground) to develop a hollow (DAWE, 2022). Terminology used in this report for trees comprising breeding habitat follows that defined in glossary of DAWE (2022) as shown in Table 4.

Table 4: Breeding Habitat Terminology

Breeding Habitat Term	Definition (DAWE, 2022)
Known nesting trees	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting trees	Trees with suitable nesting hollows present, although no evidence of use.
Suitable nesting hollows	Any hollow with dimensions suitable for use for nesting by black cockatoos. See Table 4 for further discussion on nesting hollow characteristics.
Potential nesting trees	Trees that have a suitable DBH to develop a nest hollow, but do not currently have hollows.

In 2024 the breeding habitat assessment included two phases. The survey methodology of these phases is discussed in detail below. Portions of the breeding habitat Survey Area have been subject to prior survey efforts by Tony Kirkby and Alcoa to identify breeding habitat.

Phase 1

WEPL ecologists recorded every suitable tree (Marri, Jarrah, blackbutt, bullich, flooded gum, wandoo and powderbark wandoo) which presented a hollow with a >10cm diameter point of entry. All suitable trees were recorded using a mobile GIS field data collector platform. The following data was recorded for each tree:

- Species
- DBH (approximately 1.3 m from the ground)
- Coordinates
- Size of entry.
- Hollow type (knot, fissure, spout, vertical/chimney)
- Comments on likelihood of suitable nesting hollow formation based on factors including tree/branch architecture, branch diameter, tree species, appearance and thickness of entry rim, cracking in wood, presence of leaves/ sticks, blackening from burning etc..
- Evidence of use including chew marks or wear.
- Presence of other birds or bees.
- Images of each hollow and overall tree.

In addition to Commonwealth guidelines for assessing potential breeding trees, a scoring system based on that developed by Dr Mike Bamford (referred to as Bamford Class) was applied to class potential breeding habitat. This system and the Bamford Class alignment with DAWE (2022) breeding habitat definitions are shown in Table 5.

Table 5: Black cockatoo Potential Breeding Tree Bamford Class System

Bamford Class	Description of Tree and Hollows/Activity	Alignment with DAWE (2022) Breeding Habitat Definitions
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow, eggs present.	Known Nesting Tree
2	Hollow of suitable size and angle visible with chew marks around entrance.	Known Nesting Tree
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m).	Suitable Nesting Tree (If confirmed hollow with suitable dimensions present in phase 2); Potential Nesting Tree (if confirmed hollow with suitable dimensions not present or highly unlikely to be present in phase 2)
4	Tree with hollows or broken branches that might contain hollows, but hollows or potential hollows are not of a suitable size, or are aligned or obstructed so as to prevent access	Potential Nesting Tree
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.	Potential Nesting Tree

Reassessment of Known Alcoa Nest Trees

The Myara mine Site is large and complex, Due to this, a number of Trees within the Survey Area had been assessed through previous survey effort to constitute Known Nesting Trees (See table above). Alcoa provided GPS locations for all trees previously recorded as Known Nesting Trees. Where previously recorded Known Nesting Trees occurred within the Survey Area, they were re-recorded by WEPL ecologists and their status as Know Nest Trees was reassessed.

Phase 2

Tony Kirkby and/or Glen Gaikhorst or GHD environment verified the presence of any suitable nesting trees or known nesting trees by revisiting trees scored by WEPL ecologist during phase 1 as Bamford Class 1-3. The phase 2 assessment utilised a drone, pole camera and/ or telephoto lens. Assessment confirmed if hollows are / have been used previously, are not suitable, currently suitable or potentially suitable in the future.

Alcoa Significant DBH Trees

Under the Alcoa Fauna Management Plan, Significant Trees are defined as the following:

- jarrah trees with a diameter of no less than 2000mm at a height of 1300mm above ground level.
- marri trees with a diameter of no less than 1500mm at a height of 1300mm above ground level.

And

- Is healthy (i.e. retaining majority of limbs, with high percentage leaf cover on remaining limbs) and may provide roosting habitat for black cockatoos, as determined by a suitably qualified and experienced person.

Potential significant DBH trees were identified from phase 1 WEPL survey data. They were then subject to follow up assessment by Tony Kirkby during phase 2 assessment.

Results

Breeding Habitat Assessment

Breeding habitat comprises trees species, known to support breeding, within the range of the species, which either have a suitable nest hollow or are of a suitable DBH to develop a hollow (DAWE, 2022). Breeding typically occurs in native eucalypt species however many species of eucalypt including non-endemic species may develop suitable hollows for breeding (DAWE, 2022). In the Huntley mine region tree species, which may provide hollows for black cockatoos as per Tony Kirkby (2023 pers. comm.) are:

- Jarrah- *Eucalyptus marginata*
- Marri- *Corymbia calophylla*
- Bullich- *Eucalyptus megacarpa*
- Blackbutt-*Eucalyptus patens*
- Flooded Gum-*Eucalyptus rudis*
- Wandoo-*Eucalyptus wandoo*
- Powderbark Wandoo-*Eucalyptus accedens*

The most frequently utilised tree species for breeding in the Northern Jarrah Forest region is marri (T. Kirkby, pers. comm. 2023). A long-term study of suitable nesting trees being utilised by forest red-tailed black cockatoo identified that that marri accounted for 91% of known nest trees when comparing marri against jarrah (Johnstone *et al*, 2013). Other tree species such as blackbutt, bullich and flooded gum (particularly bullich) while good hollow providers are restricted within their range to stream zones and are far less abundant than jarrah and marri. Wandoo and powderbark wandoo are also good hollow providers however are very uncommon in the Myara region (T. Kirkby, pers. comm. 2023).

Black cockatoo hollows are located throughout the landscape but tend to be clustered in stands of old growth marri (T. Kirkby, pers. comm. 2023).

A summary of understood suitable nesting hollow characteristics for the three species is provided below in Table 6

Table 6: Black Cockatoo Nesting Hollow Characteristics

Species	Baudin's black cockatoo	Carnaby's black cockatoo	Forest red-tailed black cockatoo
Tree species and hollow characteristic	Nesting mainly in karri, marri, jarrah, wandoo, bullich, and tuart Preferred hollow dimensions have not been specifically studied but are considered likely to be similar to that of the Carnaby's black cockatoo	Nesting mainly in salmon gum, wandoo, tuart, jarrah, flooded gum, karri and marri. Utilise hollows with entry diameter of 10-65 cm, internal chamber floor diameter of 15-70 cm and depths of 30-300cm. (mean 26 cm entry, 33 cm floor and 130 cm depth).	Nesting mainly in jarrah, marri, karri, wandoo, bullich, blackbutt and tuart Utilise hollows with entry diameters from 12-150 cm, internal floor diameter of 17-54 cm and depths of 30-820 cm. (mean 30 cm entry, 33 cm floor and 140 cm depth).
Sources	DAWE, 2022	DAWE, 2022, Saunders *et al* 2014a, Saunders *et al* 2014b	DAWE, 2022, Johnstone and Storr 1998, Johnstone *et al* 2013

Phase 1 Survey Results

A combined total of 216 suitable or known nesting trees were recorded during phase 1 of the survey. A breakdown of nesting trees by Bamford Class is shown below in Table 7.

Table 7 Summary of Potential Nesting Trees recorded in Phase 1

Bamford Class	Class 1	Class 2	Class 3	Class 4 or 5	Totals (trees)
DAWE, 2022 Terminology	Known Nesting Tree		Suitable Nesting Tree (pending phase 2 inspection)	No nest feature detected but suitable DBH or marked habitat tree	
Tree species					
Blackbutt	-	-	2	-	2
Dead	-	-	15	1	16
Jarrah	-	10	69	7	86
Marri	-	15	87	10	112
Total (Bamford Class)	-	25	173	18	216

It should be noted that the as Phase 1 survey is undertaken from the ground with the use of Binoculars, without closer inspection it could be difficult to determine the origin of chew marks (potentially from other species i.e. galah, ring necked parrot) on potential nest hollows. As a result of this, records of Bamford class 2 trees may be higher than what was actually present.

Phase 1 Suitable Nesting Trees

There were 173 Bamford Class 3 trees recorded. These were recorded by WEPL ecologist in phase 1 and either appeared to have a potentially suitable nesting hollow visible (opening entry >10cm); or potentially suitable hollow present as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10m which could not be confirmed from ground assessment.

Phase 1 Known Nesting Trees

No Bamford Class 1 trees were recorded within the survey area.

25 Bamford Class 2 trees which show signs of chew marks indicating they are a known nesting tree were recorded within the Survey Area. See Image 01 below for example of chew marks and hollow.

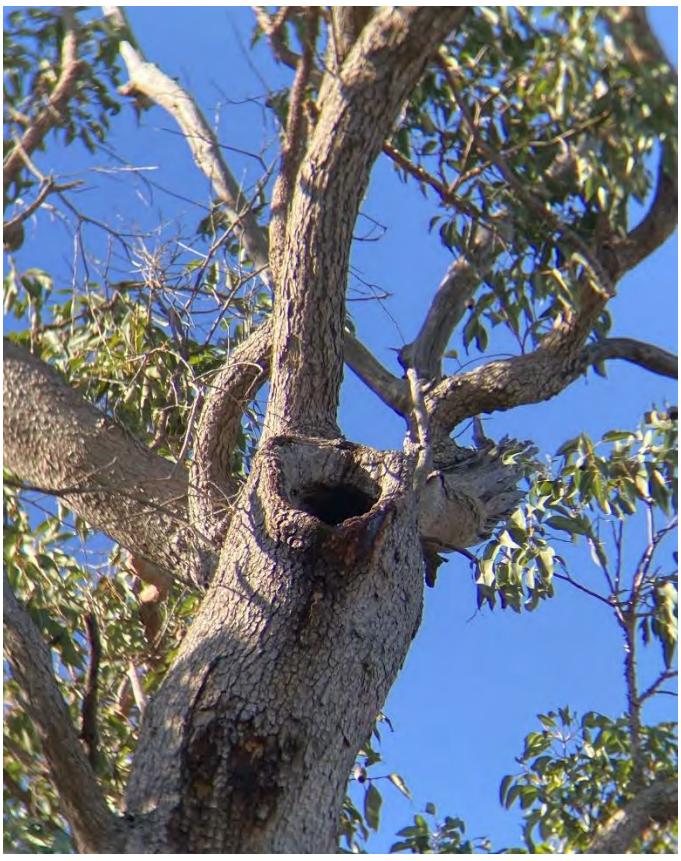


Image 01- Tree 153, a marri with a DBH of 100cm showing chew marks on rim of spout hollow

See locations of suitable nesting trees and known breeding trees in Figure 1. Tree attributes and hollow comments of Bamford Class 2-5 are provided in Appendix A.

Phase 1 Resurveyed Alcoa Known Nest Trees.

20 trees that had been previously recorded as known nesting trees within the Myara Site were revisited and reassessed by WEPL ecologists. Suitable nesting hollows for black cockatoo were not detected in three (3) of

the resurveyed trees and WEPL ecologists were unable to locate one (1) of the known nest trees which had presumably fallen.

At this time, none of the Resurveyed Alcoa Known Nesting Trees have received a phase 2 follow up survey. These trees will be resurveyed by Tony Kirkby and/ or Glen Gaikhorst at a later date. The reassessed Alcoa Known Nest trees are presented in Table 8.

Table 8: Resurveyed Alcoa Known Nesting Trees

WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		WEPL Comments
				Easting	Northing	
1	Marri	65	2	414924.1295	6410510.124	Alcoa nest tree 1542. 1 15-20 cm. chimney vertical mid canopy. Est height from ground 12 m. Old Minor chew marks
2	Marri	95	3	414957.953	6410395.255	Alcoa nest tree 1830. Unclear if. Hollow still present, view obscured
3	Marri	75	2	414952.9264	6410325.324	Alcoa nest tree 1831. Hollow, 20cm, chimney at 15m
11	Marri	120	2	416741.93	6408292.871	Alcoa nest tree 6669. 1 spout hollow, 12-15cm entry, 110 degrees entrance, old chew marks
14	Marri	80	3	417176.8226	6408134.339	Alcoa nest tree 1852. Potential chimney 27 m up off main trunk, 20cm
40	Marri	85	4	415285.3801	6411365.506	Alcoa nest tree 1526, tree appears to have burnt since being classed as a nest tree
70	Marri	90	3	426061.8651	6409972.767	Alcoa nest tree 4005. 1 side entrance hollow, 15cm diameter, 20m height, no chew marks observed
73	Marri	95	2	424711.5221	6406029.028	Alcoa nest tree 1451. Tree healthy
77	Marri	140	5	426307.9995	6409628.231	Alcoa nest tree 2518, no obvious hollow detectable
121	Marri	120	2	425329.895	6404721.352	Alcoa nest tree 2059, 1 side entry slit hollow 25m high 15cm wide. In main trunk at 20m. Fresh chew marks on top of entry and older chew around the rim.
133	Marri	85	3	426965.1657	6406837.529	Alcoa nest tree 1748, 1 hollow 17cm knot that connects with chimney, 17m height, no chew marks or sign of use, well rounded entrance, highly

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WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		WEPL Comments
				Easting	Northing	
						suitable. It's the only hollow on the tree, others are burnt out marks
134	Marri	90	3	416260.1593	6403494.07	Alcoa nest tree 1531, 1 hollow 15cm chimney and 1 12cm potential side spout, 15m to 20m height, both openings are not well rounded and no chew marks or sign of use.
135	Marri	95	3	425511.2028	6404435.747	Alcoa nest tree 6289, 1x side entry 30x40cm in Main trunk at 18m. Well defined hollow.
138	Marri	110	3	425914.1296	6404461.176	Alcoa nest tree 1735, 1x 30cm upwards angle knot hollow in main trunk at 18m. Very good looking hollow. Has bees in it currently. View obscured by small branch.
140	Marri	150	2	425538.9382	6404311.966	Alcoa nest tree 2064, Hollow with upper opening. 20 cm opening. 15 m from ground. Minor chew marks around entrance and back of wall.
145	Dead	0	n/a	429409.239	6407333.987	Alcoa nest tree 2854 has presumably fallen
160	Marri	140	4	427010.9448	6407322.517	Alcoa nest tree 163, unable to detect hollow.
163	Marri	105	4	427179.8599	6407305.66	Alcoa nest tree 3885, Hollow has broken off.
172	Marri	75	3	427612.8155	6409310.862	Alcoa nest tree 1757, 1x well-formed 30cm side entry hollow at 10m in main trunk. Has wear marks, no chew visible. Bee honeycomb at back, no activity from bees observed
207	Marri	75	3	429116.5946	6405366.066	Alcoa nest tree 1653. 1x upwards facing slit hollow, 50 cm high 15 wide. At top of main trunk at 12m. Well defined with wear and potential old, weathered chew marks.

412500 414000 415500 417000 418500 420000 421500 423000

6414000 6412500 6411000 6409500 6408000

Figure 1A: Potential, Suitable or Known Nesting Trees Phase 1

N

0 400 800 1,200 1,600 m

SCALE: 1:30,000	SHEET SIZE: A3 COLOUR		
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A23.033	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023		DRAWN BY / REVIEWED BY: SM/JR	DATE: 8/8/2024

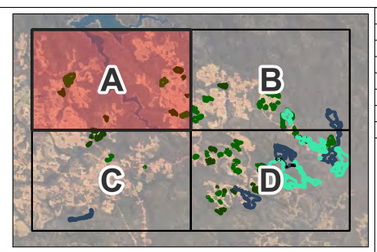
PROJECT/REPORT NAME: Alcoa Black Cockatoo Potential Nesting Tree Interim Data Report
Myara Mine Site, near Dwellingup

CLIENT: Aloca

Legend

Survey Area
- Priority 1
- Priority 2
- Turbidity Areas

Bamford Tree Class
- 2
- 3
- 4
- 5



No	Description	Drawn	Approved	Date
A	Original issue	SM	JR	8/8/2024

NOTES:

Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.

WESTERN ENVIRONMENTAL
Western Environmental Pty Ltd
08 6244 2310 | enquiries@westenv.com.au
Level 3/25 Prowse St, West Perth WA 6005
westenv.com.au

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Designed and Automated by AC

421500 423000 424500 426000 427500 429000 430500 432000

6414000 6412500 6411000 6409500 6408000

Figure 1B: Potential, Suitable or Known Nesting Trees Phase 1

N

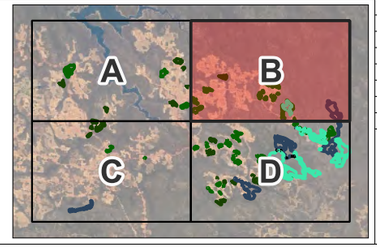
0 400 800 1,200 1,600 m

PROJECT/REPORT NAME: Alcoa Black Cockatoo Potential Nesting Tree Interim Data Report Myara Mine Site, near Dwellingup			
SCALE: 1:30,000	SHEET SIZE: A3 COLOUR	CLIENT: Aloca	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A23.033	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023		DRAWN BY / REVIEWED BY: SM/JR	DATE: 8/8/2024

Legend

Survey Area
- Priority 1
- Priority 2
- Priority 3
- Priority 4
- Turbidity Areas

Bamford Tree Class
- 2
- 3
- 5



No	Description	Drawn	Approved	Date
A	Original issue	SM	JR	8/8/2024

NOTES:

Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.

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Western Environmental Pty Ltd
08 6244 2310 | enquiries@westenv.com.au
Level 3/25 Prowse St, West Perth WA 6005
westenv.com.au

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412500 414000 415500 417000 418500 420000 421500 423000

6408000 6406500 6405000 6403500

Figure 1C: Potential, Suitable or Known Nesting Trees Phase 1

N

0 400 800 1,200 1,600 m

PROJECT/REPORT NAME: Alcoa Black Cockatoo Potential Nesting Tree Interim Data Report Myara Mine Site, near Dwellingup		
SCALE: 1:30,000	SHEET SIZE: A3 COLOUR	CLIENT: Aloca
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: SM/JR	DATE: 8/8/2024

Legend

Survey Area
- Priority 1
- Priority 2
- Priority 3
- Turbidity Areas

Bamford Tree Class
- 2
- 3
- 5



No	Description	Drawn	Approved	Date
A	Original issue	SM	JR	8/8/2024

NOTES:

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Western Environmental Pty Ltd
08 6244 2310 | enquiries@westenv.com.au
Level 3/25 Prowse St, West Perth WA 6005
westenv.com.au

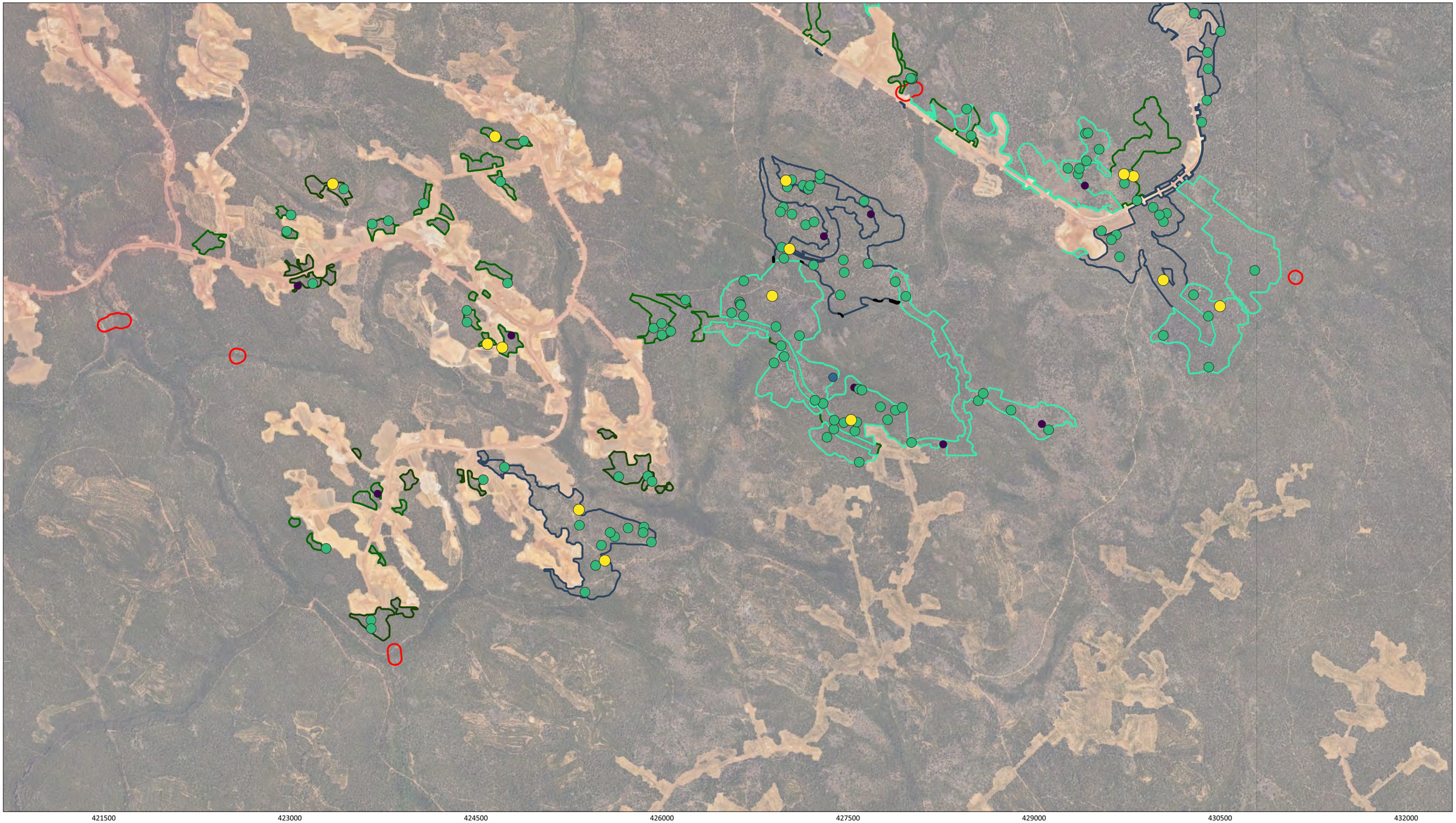
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421500 423000 424500 426000 427500 429000 430500 432000

6408000 6406500 6405000 6403500



421500 423000 424500 426000 427500 429000 430500 432000

Figure 1D: Potential, Suitable or Known Nesting Trees Phase 1

N

0 400 800 1,200 1,600 m

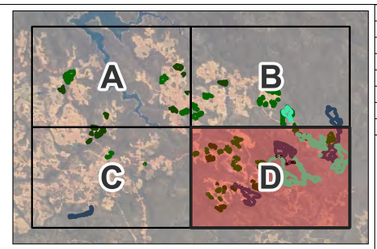
SCALE: 1:30,000	SHEET SIZE: A3 COLOUR
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A23.033 / VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY Summer 2023	DRAWN BY / REVIEWED BY: SM/JR / DATE: 8/8/2024

PROJECT/REPORT NAME: Alcoa Black Cockatoo Potential Nesting Tree Interim Data Report
Myara Mine Site, near Dwellingup

CLIENT: Aloca

Legend

Survey Area	Bamford Tree Class
Priority 1	2
Priority 2	3
Priority 3	4
Priority 4	5
Mt Solus Extra	
Turbidity Areas	



No	Description	Drawn	Approved	Date
A	Original issue	SM	JR	8/8/2024

NOTES:

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Western Environmental Pty Ltd
08 6244 2310 | enquiries@westenv.com.au
Level 3/25 Prowse St, West Perth WA 6005
westenv.com.au

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Phase 2 Survey Results

At the time of this report's submission, 74 of the 216 potential, suitable or known nesting trees were reassessed under the criteria for phase 2 survey. An additional two (2) suitable or known nesting trees were recorded during phase 2 which weren't detected during phase 1. The additional trees are presented below in Table 9. A full detailed list of Trees recorded during phase 2 is presented in Appendix B

Table 9: Additional Suitable and Known nest trees recorded during Phase 2.

WEPL Tree Number	Species	DBH (cm)	Coordinate (AGD/84 Zone 50)		Bamford class
			Easting	Northing	
Additional Tree (217)	Marri	70	417654.8	6406840.1	3
Additional Tree (218)	Marri	90	427645.3	6409039	2

Phase 2 Suitable Nesting Trees

There were six (6) trees confirmed as Bamford class 3 during Phase 2 of the survey. One (1) of the additional trees was recorded as Bamford class 3. Details of these trees are presented below in Table 10

Table 10: Phase 2 Suitable Nest Trees

WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		GHD Comments
				Easting	Northing	
31	Marri	105	3	420537	6410991	Suitable Nest Tree. Assessed with Alcoa drone at 14:05 10/06/2024. Lower hollow coming out of branch is hollow filled with water, not suitable for Black Cockatoo use. Top spout hollow is potentially suitable. Appears to have chew marks and smooth internal walls but is only approximately 80cm deep.
32	Marri	80	3	422250	6409553	Suitable nest tree. No external chew marks, Unable to determine depth as hollow deviates to the right (towards main trunk) no defined nest chamber. However, hollow is present but not currently suitable for Black Cockatoo use. Hollow assessed with Alcoa Drone and assessment with pole camera on the 11/06 at 9.30

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WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		GHD Comments
				Easting	Northing	
38	Marri	80	3	422973	6406965	Suitable Nest Tree. Hollow assessed with Alcoa drone on 18/6 at 8:55, Chimney hollow suitable but just a bit too shallow. other hollows blocked
55	Marri	0	3	424592	6406057	Suitable Nest Tree. Appears to have some external chew marks. Assessed with Alcoa drone on the 18/6 at10:26. Suitable hollow for Black Cockatoo present
78	Marri	140	3	424077	6407190	Suitable Nest Tree Hollow assessed with Alcoa drone on the 18/6 at 9:22. Difficult to get to, suitable size hollow but no signs of use. approximately 1m deep.
Additional tree (218)	Marri	70	3	427645	6409039	Suitable Nest Tree. Hollow appears to have small recent chews at hollow entrance. Hollow was assessed with drone and GoPro but appears to be just a bit too shallow. Assessment conducted on the 12/6 at 15:45

Phase 2 Known Nesting Trees

There were three (3) trees recorded as Bamford class 2 during Phase 2 of the survey. One (1) of the additional trees was recorded as Bamford class 2. Details of these trees are presented below in Table 11

Table 11: Phase 2 Known Nesting Trees

WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		GHD Comments
				Easting	Northing	
48	Marri	120	2	415382.1	6411179	Nest Tree. Top Chimney hollow is blocked. Lower hollow approximately 20m high, has heavy chews on entrance of hollow (on main trunk). Assessed with Alcoa drone on 10/6 at 12:05, Unable to view inside hollow due to height for pole cam.
59	Marri	65	2	424653.3	6407729	Nest Tree. Assessed with Alcoa drone on 18/6 at 11:25. old and new

WEPL Tree Number	Species	DBH (cm)	Bamford Class	Coordinate (AGD/84 Zone 50)		GHD Comments
				Easting	Northing	
						chews on rim, very suitable nest chamber, breeding tree.
Additional Tree (217)	Marri	90	2	417654.8	6406840.1	Nest Tree. Recent and historic chew marks at hollow entrance and some recent chews on hollow internal wall. Defined chamber. However, due to access unable to get drone into a position to view bottom of hollow. Tree assessed with Alcoa Drone on the 10/06. Lots of Forest Red-tailed Black Cockatoos nearby.

Phase 2 Potential Nesting Trees

Of the 74 trees assed during phase 2, 59 of the trees were determined to not possess suitable hollows and were downgraded to potential nesting tree only (equivalent of Bamford class 4 and 5)

Alcoa Significant DBH Trees

As per the Alcoa Fauna Management Plan, Trees with Significant DBH (jarrah DBH>200cm; marri DBH>150cm) were identified from phase 1 WEPL survey data. Significant trees recorded from the Survey Area are identified in Table 12. These tree require follow up survey in upcoming Phase 2 to determine their health status and confirm if they are Significant Trees.

Table 12 Alcoa Significant DBH Trees

WEPL Tree Number	Species	DBH (cm)	Coordinate (AGD/84 Zone 50)	
			Easting	Northing
26	Jarrah	210	423653.6803	6403831.922
29	Dead	150	422361.1893	6409621.075
51	Marri	150	415457.8731	6411315.443
52	Marri	160	415461.5692	6411459.093
53	Marri	170	415387.567	6411458.025
54	Jarrah	200	423008.3668	6407097.336
81	Marri	155	424785.6338	6406125.857
82	Dead	160	424426.2572	6406327.898
125	Dead	160	429622.5534	6406897.765
140	Marri	150	425538.9382	6404311.966

WEPL Tree Number	Species	DBH (cm)	Coordinate (AGD/84 Zone 50)	
			Easting	Northing
141	Dead	160	425847.4812	6404538.118
143	Marri	170	427305.0087	6406925.554
144	Jarrah	200	425333.8654	6404596.49
159	Jarrah	210	427009.5103	6407325.893
171	Jarrah	200	427519.1007	6409121.8
187	Jarrah	220	427378.4064	6405788.744
190	Jarrah	210	427549.43	6405706.619
201	Jarrah	205	428266.8815	6405249.296
206	Marri	150	429062.3488	6405412.756
212	Jarrah	200	426657.4185	6406283.533

Conclusions and Recommendations

High quality black cockatoo nesting habitat is present within the jarrah-marri forest of the Survey Area.

Breeding Habitat

A combined total of 218 potential, suitable or known nesting trees were recorded during phase 1 and 2 of the survey.

Following phase 2 assessment six (6) trees confirmed as containing suitable nesting hollows (Bamford Class 3). Three (3) were identified as containing known nesting hollows with chew marks from Black Cockatoo nesting events (Bamford class 2). These trees are summarised below in Table 13

Table 13: Known Nesting trees from Phase 2.

WEPL Tree Number	Species	DBH (cm)	Coordinate (AGD/84 Zone 50)	
			Easting	Northing
48	Marri	120	415382.1	6411179
59	Marri	65	424653.3	6407729
Additional Tree (217)	Marri	90	417654.8	6406840.1

This report should be read in conjunction with the Schedule - Statement of Limitations. Should you have any queries regarding the above, please contact the undersigned on (08) 6162 8980.
Yours sincerely,
Western Environmental Approvals Pty Ltd



Andrew Fry
Associate and Lead Ecologist

Schedule

- Statement of Limitation

Appendices

- Appendix A: Phase 1 Survey Results
- Appendix B: Phase 2 Survey Results

Statement of Limitations

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The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in this report, or the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

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Except as otherwise stated in this report, WEPL has not verified the accuracy or completeness of the data. WEPL does not represent or warrant that the data is true or accurate, and disclaims any and all responsibility or liability with respect to the use of the data.

To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data.

WEPL does not accept any responsibility or liability for any incorrect or inaccurate conclusions should any data be incorrect, inaccurate or incomplete or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WEPL.

The conclusions must also be considered in light of the agreed scope of services (including any constraints or limitation therein) and the methods used to carry out those services, both of which are as stated or referred to in this report.

Environmental Conclusions

In accordance with the scope of services, WEPL has conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in this report.

On all sites, varying degrees of non-uniformity of vertical and horizontal conditions in media (soil, water, air, waste or other media as described in the report) are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of media conditions encountered. The conclusions are based on the data and the environmental field monitoring and/or testing actually undertaken, and are therefore merely indicative of the environmental condition of the site at the time of preparing this report, including the presence or otherwise of contaminants or emissions. It should be recognised that site conditions, including the extent and concentration of contaminants, can change.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. To the maximum extent permitted by law, no other warranty, express or implied, is made.

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If an Auditor is engaged by the Client to undertake review of this report, it shall be made available subject to the terms and conditions of the agreement between the Client and WEPL and the caveats in this statement.

Other Limitations

This report is intended to be read in its entirety, and sections or parts of this report should therefore not be read and relied on out of context.

WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.



APPENDIX A: Phase 1 Survey Results

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
1/05/2024	Marri	2	65	1 15-20 cm. chimney vertical mid canopy. Est height from ground 12 m. Old Minor chew marks probably BC.	414924.1295	6410510.124	Alcoa tree 1542	1
1/05/2024	Marri	3	95	1 hollow? 10-15cm, spout, 45degree, mid canopy, 20m, Alcoa tree 1830	414957.953	6410395.255	Alcoa tree 1830. Unclear if. Hollow still present, view obscured	2
1/05/2024	Marri	2	75	Holow 1, 15cm, side entrance, 15m, chew marks Alcoa tree 1831. Hollow 2,20cm, chimney, 15m, no chew marks	414952.9264	6410325.324	Alcoa nest tree 1831.	3
6/05/2024	Jarrah	3	60	1 hollow, spout, 12cm d, 20m high main trunk,	414765.4647	6410459.335		4
6/05/2024	Jarrah	3	0	1, spout, 12cm d, 120 cm diameter, 15m up in branch.	416503.0992	6407971.298	DBH not recorded	5
6/05/2024	Marri	3	0	Knot, 10cmd, 110 cm diameter , 20m main trunk, small potential chew marks	416472.3873	6408099.083	Smaller holes present in upper branches, too small for cockatoos, DBH not recorded	6
6/05/2024	Marri	3	110	Spout, 23cmd, 25 m branch off main trunk	416714.4464	6408294.544		7
6/05/2024	Jarrah	3	80	1hollow, spout at 90degree right angle, 15cm diameter, main trunk, 20-22m height off ground	414926.2654	6410334.925		8
6/05/2024	Marri	3	110	1 Short spout, 12cm diameter, 15m height, no chew mark, one small branch on side,	414717.1751	6410402.567		9
6/05/2024	Marri	3	85	1mid trunk hollow, 10cm entrance, 12m height, no chew marks,	416531.5989	6408330.469		10
6/05/2024	Marri	2	120	1 spout hollow, 12-15cm entry, 110 degrees entrance, old chew marks. 1 spout 10cm entry, 120-degree entry, no fresh chew marks	416741.93	6408292.871	Alcoa Nest Tree 6669. 1 potential chimney, unable to see feature, see photo	11
6/05/2024	Dead	3	120	4 spouts, unable to confirm if hollow due to high, 15m up	417363.156	6408882.8	Dead tree not ID to sp. I think it's Jarrah	12
7/05/2024	Marri	3	110	1, branch hole, 15cm d, 20m h, no chew	416767.6254	6407875.874		13
7/05/2024	Marri	3	80	1, potential chimney 27 m up off main trunk, 20cm d, no chew	417176.8226	6408134.339	Alcoa tree 1852. Not clear if hollow still present	14
7/05/2024	Jarrah	2	90	1hollow, knot, 15cmd 16 m high on limb, small evidence of chewing	423344.8214	6407347.859		15
7/05/2024	Marri	3	80	1, chimney, 30cm d, 10m up, no chew marks	423434.82	6407306.288	Dead tree	16
7/05/2024	Marri	3	65	1 chimney type hollow, 90-degree entry, 10m height, no chew marks,	416344.5655	6407529.099		17

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
8/05/2024	Jarrah	5	112	No hollow detected on Alcoa significant tree	423063.3858	6406526.694	No hollows detected but habitat marker painted on trunk, noted	18
8/05/2024	Dead	3	112	2 chimneys,30cmd+25cmd, 15m+22m, no chew on either	423184.1175	6406544.6	Probable jarrah	19
8/05/2024	Marri	2	105	1large knot/short spout, 25cmd, 13mhigh, slight chew marks	421253.4693	6409283.128		20
8/05/2024	Jarrah	5	180	Hollows not apparent but huge tree with lots of snags,	423707.771	6404850.703	Marked as habitat tree, no number	21
9/05/2024	Jarrah	2	60	1, knot, 20cmd, 7m up, chew evidence	423759.5836	6410915.115		22
9/05/2024	Jarrah	3	55	1 chimney, 15cm diameter, 7-8m height	425885.6326	6404992.285	Burnt out	23
9/05/2024	Marri	3	70	Chimney, 30cmd, topmost main trunk, 8m up, no chew	425919.5424	6404949.532	Main trunk dead, regrowth from base	24
9/05/2024	Jarrah	3	100	1 spout hollow, 15cm diameter, 22m height	425650.1971	6404988.291		25
9/05/2024	Jarrah	3	210	2 potential spout, 15cm diameter, unsure as covered by foliage	423653.6803	6403831.922	Unable to clearly photograph	26
9/05/2024	Jarrah	3	75	1 top chimney hollow, 15cm diameter, 17m height	423655.0492	6403764.364		27
9/05/2024	Jarrah	3	100	1 spout, 20cmd, 15m up, no chew	424559.0165	6404963.793	Dead	28
10/05/2024	Dead	3	150	1 knot,12cmd, 13m up, no chew marks	422361.1893	6409621.075	Not identified to species but probably jarrah	29
10/05/2024	Jarrah	3	110	Spout, 25cmd, 15m up on branch,	422354.8132	6409441.694	Red tails foraging directly adjacent	30
10/05/2024	Marri	3	105	1 chimney, 1 spout type hollow, 15cm diameter, 20-23m height, no chew marks, recently burnt	420537.919	6410991.158		31
10/05/2024	Marri	3	80	1 chimney, 2 side spout, 15cm diameter, 10m height, no chew marks	422250.0542	6409553.322		32
10/05/2024	Jarrah	3	140	2 side hollow and 1 spout on side, 13cm diameter, 25m height, no chew marks	422421.3255	6409407.791		33
20/05/2024	Marri	3	60	1 hollow, chimney/ elbow, 8 m high, no chew	417351.7982	6406679.153		34
20/05/2024	Jarrah	3	70	One 30cm side entry hollow, mid trunk at 13m. Base of entry looks smooth and worn. Rim is thin with minor cracking. Think shallow hollow present.	423291.8409	6404410.265		35
20/05/2024	Jarrah	3	75	1 hollow 10-15 cm wide. Knot in mid trunk, Smooth lip. No chew	423142.9005	6410149.193		36
20/05/2024	Marri	2	75	1 potential chimney type hollow, 15cm diameter, 12m height, potentially old chew marks around edges.	415157.8517	6410995.569		37
20/05/2024	Marri	3	80	1 chimney with 20 cm entrance. Top of main trunk. 10m from ground. No wear or chew. Think unlikely developed to suitable size.	422973.8411	6406965.971		38

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
20/05/2024	Jarrah	2	85	1 side opening, 13cm diameter, unsure if extends all the way, old chew marks on left side of hollow, 20m height	417663.4922	6406875.685		39
20/05/2024	Marri	4	85	No features observed, burnt with lots of side tree shoots	415285.3801	6411365.506	Alcoa Sig tree 1526	40
20/05/2024	Marri	3	90	One 30-40cm diameter chimney hollow in dead main trunk at 15m. Rim thin and vertical cracks. No chew or wear evidence	422883.9076	6410023.559	Central main trunk dead and heavily rotted	41
20/05/2024	Marri	3	95	1 potential chimney, unable to confirm depth, 15m height, 20cm diameter. No chew marks	415342.0771	6411059.69		42
20/05/2024	Dead	3	100	3 hollows mid tree.20-30 cm entrances. Lowest hollow 5-6 m from ground. Side entrance hollows, smooth around lip, cracking above and below the middle hollow. No chew.	423066.6649	6410096.708		43
20/05/2024	Jarrah	3	105	2 hollows. One spout, one mid trunk/ side entrance. Approx 20 cm openings. 10 m from ground. Smooth lip on one side of spout. Appears unused. No wear or chew.	423057.9277	6410116.027		44
20/05/2024	Marri	3	105	1 chimney and 1 spout, 13cm diameter on spout, chimney diameter unsure. 20m height, recently burnt.	415071.8697	6411084.198		45
20/05/2024	Marri	3	115	1 chimney running down main trunk, 30cm diameter, 15m height, burnt out, no chew marks	415136.8993	6410920.305		46
20/05/2024	Jarrah	3	120	Three hollows. 1st side entry at 30cm mid main trunk. 2nd side entry 25cm open at elbow upper branches. 3rd 10 by 15cm upwards angle side entry in upper branches. All have wear around rim. Think unlikely BC hollow depth	423249.6569	6410094.1	Tree is dead. Dropping branches	47
20/05/2024	Marri	3	120	Chimney, top canopy, 20 cm diameter, 17 m up, no chew	415382.1455	6411178.559	Badly burnt but not dead yet	48
20/05/2024	Jarrah	3	125	Multiple potential chimney and side spout hollows, unable to clearly see depth due to it being recently burnt.	415319.0852	6411335.714		49
20/05/2024	Marri	2	130	Spout, upper branch, 15cm diameter, 10m up, potential chew	415390.4358	6411035.018	Hollow looked recently burned but good otherwise	50
20/05/2024	Marri	3	150	Canopy, chimney, 50cm diameter, 12m up, no chew, see comments	415457.8731	6411315.443	Burnt out marri, Alcoa Sig Tree	51
20/05/2024	Marri	5	160	No obvious hollow	415461.5692	6411459.093	Burnt out Marri, Alcoa Sig Tree	52
20/05/2024	Marri	2	170	1 spout, 12cm diameter, upper branches, 20mmup, likely chewed	415387.567	6411458.025	Alcoa Significant tree, Badly burnt	53
20/05/2024	Jarrah	3	200	One 20cm knot hollow slight upwards facing angle. Mid trunk at 6m. Minor wear. Think likely unsuitable.	423008.3668	6407097.336	Potential Alcoa sig tree. Burnt out at base, main trunk snapped at 10m.	54
21/05/2024	Marri	2	0	1 spout 25cm entrance. 20 m from ground.mid to upper Canopy. Old minor chew marks from BC. Think prospecting.	424592.8237	6406057.729	DBH not recorded	55

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
21/05/2024	Marri	2	60	Knot, on top of horizontal branch, 17cm diameter, 9m up, slight chew	425893.4067	6409910.891		56
21/05/2024	Marri	3	60	1 chimney type hollow, 13cm diameter, 15m height, no chew marks, termite infested	427284.3373	6408989.527		57
21/05/2024	Marri	3	60	1 side entrance hollow, 10cm, 9m height, no chew marks	427328.7001	6408988.148		58
21/05/2024	Marri	2	65	20 cm opening chimney hollow at 10m is snapped off main trunk. Has a small amount of fresh BC chew marks on rim. More older chew marks appear to be around rim. Hard to see view from NW angle.	424653.2504	6407728.923		59
21/05/2024	Marri	3	70	10-15 cm hollow. Sideways Knot.12 m from ground. Access to hollow is not good. Mid truck top portion. no chew, minor wear present unlikely to have suitable hollow.	423663.5615	6407024.366		60
21/05/2024	Marri	3	70	1 spout hollow, 10cm diameter, 10m height, no chew marks	428017.6016	6408190.847		61
21/05/2024	Marri	3	75	Chimney, 30cm diameter, 8m up, no chew	426949.8129	6409903.433	Marked with a white H	62
21/05/2024	Marri	3	75	1 chimney type hollow, 15cm diameter, 15m height, no chew marks observed	427260.4211	6408815.504		63
21/05/2024	Marri	3	80	1 side entrance hollow, 10cm, 7m height	427343.9239	6408960.065		64
21/05/2024	Marri	3	80	1 chimney type hollow, 12cm diameter, 10m height, no chew marks	428016.3424	6408197.885		65
21/05/2024	Dead	3	85	One potential spout, 10-20 cm entrance. Rough edges. Approx 20 m from ground. No chew or wear. Unlikely to be suitable hollow.	424427.7372	6406233.428		66
21/05/2024	Marri	3	85	Think a 20-30 cm chimney present in snapped main trunk at 20m. Rim looks thin with vertical cracks. No chew or wear. Needs drone	424755.1145	6406548.32		67
21/05/2024	Jarrah	3	90	1 chimney hollow and 1 side spout, 13cm diameter, full depth unable to be observed, 111m height, no chew marks, foraging evidence under tree	426114.3839	6409983.089		68
21/05/2024	Jarrah	3	90	1 side spout hollow, 15cm diameter, 12m height, no chew marks but lots of white fluffy feathers around tree	428004.838	6408199.367		69
21/05/2024	Marri	3	90	1 side entrance hollow, 15cm diameter, 20m height, no chew marks observed	426061.8651	6409972.767	Alcoa Sig Tree 4005	70
21/05/2024	Jarrah	3	95	50cm chimney hollow in dead snapped off main trunk at 12m. Internally blackened burnt out. Rim thin with vertical cracking. No chew or wear marks. Think hollow present but unlikely suitable	423793.6815	6407050.284	Main trunk dead, base burnt out.	71
21/05/2024	Jarrah	5	95	Not obvious maybe, in upper branches	426853.1623	6410361.092	Marked with a white H	72
21/05/2024	Marri	2	95	Three hollows. 2x 15 -20cm side opening knot type on main trunk at 14m, no chew. chimney with opening 30cm at top of snapped main trunk at 15m. Rim	424711.5221	6406029.028	Alcoa nest tree tag 1451. Tree healthy	73

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
				thin with vertical cracks. Small patch of fresh chew from BC think prospecting. Older chew marks on rim.				
21/05/2024	Marri	3	105	1 side spout, 12cm diameter, 12m height, no chew marks	426092.1122	6409959.723		74
21/05/2024	Marri	3	110	Think has 30cm chimney hollow in main snapped off trunk at 15m. Hard to see, need drone. Looks like thin edges of dead wood. Good form for typical chimney hollow type	424885.4096	6407693.726		75
21/05/2024	Jarrah	3	125	1 potential side spout, 13cm diameter, 15m height, no chew marks	426136.1357	6409976.727		76
21/05/2024	Marri	5	140	No obvious hollow,	426307.9995	6409628.231	Alcoa Sig tree 2518	77
21/05/2024	Marri	3	140	1 hollow, 40 cm chimney in main trunk. Snapped at 18 m. Unsure is developed to depth. Wear marks on lower edge. No chew.	424077.2033	6407189.947	View from west side.	78
21/05/2024	Marri	3	140	1 hidden side entrance, 13cm diameter, 20m height, no chew marks	427290.7652	6408942.915	Hard to see	79
21/05/2024	Jarrah	3	150	One upwards facing hollow 20cm entry in large 40cm diameter branch. Upper canopy at 18m. Heavily rotted with cracks along branch. Looks like whole limb mat be hollowed out. May lack suitable chamber	424698.149	6407366.237		80
21/05/2024	Marri	5	155	No hollows, sig tree only.	424785.6338	6406125.857	Alcoa sig tree. Main trunk dead and snapped off at 10m, poor condition. Side growth alive still	81
21/05/2024	Dead	3	160	6 potentially suitable hollows. 3 side/knot entrance in top canopy, entrances 10-20 cm wide. 2 potential vertical 15-25cm wide. and 1 side entrance main trunk 20 cm wide. 10-20 m from ground. No chew, wear present.	424426.2572	6406327.898	Jarrah	82
22/05/2024	Jarrah	2	0	Spout. 15-20 cm entrance. 15m from ground. Rough edges top of hollow opening. Wear and possible BC chew around lip and on back will of hollow. Think prospecting. Think unsuitable	429800.8126	6407408.892	DBH not recorded	83
22/05/2024	Marri	3	75	1 spout/ side entrance knot. Smooth lip. Entrance 10-15cm.8 m from ground. . Wear present. No Chew	428492.0107	6407736.821		84
22/05/2024	Marri	3	75	1x chimney hollow 25cm entry at 15m high at snapped off main trunk. Small side entry below which suggests trunk hollow several metres deep.	425931.8672	6406184.904		85
22/05/2024	Marri	3	75	2x side entrance mid trunk at 10 by 20cm. 10m high in the central trunk	426960.4671	6406043.721		86
22/05/2024	Jarrah	2	85	1 Hollow in upper canopy. 15-20 cm entrance. Knot, side entrance. 12 m from ground. Chew present. Think BC.	429724.0835	6407425.666		87
22/05/2024	Jarrah	3	95	2 hollows. 1 side entrance knot, with 15-20 cm entrance. 1m 1mfrom ground. 1 side entrance fissure, with 20cm entrance. 7 m from ground. No chew presents.	429829.908	6407213.535		88

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
22/05/2024	Marri	3	95	1x 45 degree opening knot type hollow 30cm opening. Mid trunk at 10m. 1x knot hollow 10-15cm open in large branch at 14m. Think this hollow too small.	425999.3516	6406129.948		89
22/05/2024	Marri	3	95	1x25cm spout hollow, 45-degree angle. 1xside entry hollow 15cm opening. Both at 14m in dead main trunk. Think hollow to 1m present.	425997.4245	6406222.943		90
22/05/2024	Marri	3	95	1x 40cm upwards facing knot hollow at 15m off the ground. Thin rim from recently snapped branch. Unlikely suitable	426070.1163	6406159.957		91
22/05/2024	Jarrah	3	100	2 hollows, spout, 15cm diameter, 10m up, no chew, spout 17cm d, 12m up, no chew	430350.6652	6407844.993		92
22/05/2024	Jarrah	3	105	1 side entrance knot, mid trunk. 10 m from ground. 10-15 cm entrance. Think not suitable. No chew.	427702.6205	6409080.368		93
22/05/2024	Jarrah	3	110	1 chimney and 1 sprout 1 mid trunk side entrance, 10 - 12m from ground. 30 -40 cm entrances. No chew. May be unsuitable due to access and large entrance.	427717.0676	6408875.493		94
22/05/2024	Marri	3	110	1x chimney and 1x spout that possibly connect internally. 40cm and 25cm openings at 12metres high at the end of main trunk.	426189.0896	6406412.75		95
22/05/2024	Dead	3	120	1 spout with 15-20 cm entrance. Mid trunk, 15 m from ground. No wear or chew.	429727.8131	6407352.168	Jarrah badly burned	96
22/05/2024	Jarrah	3	120	1 knot. 10-15 cm entrance. 10 m from ground. No chew. Think maybe unsuitable.	429775.2957	6407424.099	Badly burnt	97
22/05/2024	Jarrah	3	140	1 knot mid trunk 12m from ground. 20 -30 cm entrance. Minor wear present. No chew.	427670.1156	6409073.795		98
22/05/2024	Jarrah	3	160	1 fissure, side entrance. 35-40cm entrance. hollow mid trunk, 6 m from ground. No chew or wear. Fire damage present.	429354.5014	6407427.415		99
23/05/2024	Jarrah	3	70	Knot/spout, 18cm diameter, 8m up. Mid trunk. No chew	430030.207	6408817.953		100
23/05/2024	Jarrah	3	70	Knot, midtrunk, 20cm diameter, 9m up, no ch3w	430290.6566	6408722.868		101
23/05/2024	Jarrah	3	80	Knot/short spout, 25cm diameter, 45 degrees, 15m up, not obviously chewed but small potential	430397.7435	6408406.864		102
23/05/2024	Jarrah	3	80	1 fissure hollow, mid trunk. 30 cm entrance. 10m from ground. No chew. Think burnt out jarrah.	430122.1122	6408993.235		103
23/05/2024	Jarrah	3	80	1 knot, side entrance. Towards upper canopy. 10-15 cm entrance. 12 m from ground. No chew. Fire damage present.	429940.9505	6409339.35		104

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
23/05/2024	Jarrah	3	80	1 knot with15 cm entrance, mid trunk. 8 m from ground. No chew.	430067.7659	6407109.647		105
23/05/2024	Jarrah	3	85	1x knot hollow 12cm opening. At 20m in main trunk. well defined entry, no chew marks. unsure of depth.	427385.4694	6405371.78		106
23/05/2024	Jarrah	2	90	Knot, 15cm diameter, 15 m up, midtrunk, chew marks	430041.0254	6406572.761		107
23/05/2024	Jarrah	3	95	3 hollows. 2 spout, one spout in top canopy 20 cm entrance. Other spout mid trunk 10-15 cm. 10-15 m from ground. Knot with above/side entrance with 25-30 cm entrance. 12 m from ground. No chew.	430042.4408	6407043.63		108
23/05/2024	Marri	3	95	1x 12cm opening spout hollow. At 15m I a side branch. No chew. Up to 2m deep. Cracks in wall. entry not well defined. Is a chimney hollow also present, base burnt out, not suitable.	427298.4047	6405578.402		109
23/05/2024	Marri	3	95	1x vertical opening knot 20cm opening. 15m high in main trunk. No signs of use. Clear well-rounded entrance.	427388.7828	6405443.656	10m outside survey area.	110
23/05/2024	Marri	3	95	1x 30cm opening chimney hollow at 16m in main trunk. Hollow well defined, thin walled appears connected to other smaller hollows. Entry partially obstructed by branches. Think likely hollow present.	427233.507	6405603.886		111
23/05/2024	Dead	3	100	One knot. With 10-15 cm opening. towards upper canopy. 15 m from ground. One knot. With 10-15 cm opening. towards upper canopy. 15 m from ground. Chew present at bottom of hollow. Think prospecting. Wear present at bottom of hollow. No chew.	429662.9113	6406936.642	Branch snap next to hollow many have caused this damage	112
23/05/2024	Jarrah	3	100	1 spout at top canopy. 10-15 cm entrance. 12m from ground. No chew. Think unsuitable.	429959.3951	6407159.447	Jarrah with fire damage.	113
23/05/2024	Marri	3	105	1 hollow. Knot, side entrance at upper canopy. 15 cm entrance. Smooth lip around entrance.20 m from ground. No chew.	430104.2483	6408838.143		114
23/05/2024	Jarrah	3	110	Knot, midtrunk, 90 degree, 15cm diameter, 10 m up, hole burnt but scuffs maybe chew around edge	429688.8714	6406759.764	Maybe class 2, dbh hard to measure as standing on stilts	115
23/05/2024	Jarrah	3	110	3 hollows. 2 knots, smooth edges. Mid trunk. Entrances are around 15 cm. No chew. 1 spout with 10-15 cm entrance. 10 m up from ground. No chew.	429543.0102	6406969.885		116
23/05/2024	Marri	3	110	1 10cm side spout hollow, 10m height, no chew marks, rough rugged entrance. Tree has recently broken branches on ground.	424729.8422	6405064.346		117
23/05/2024	Dead	3	120	1 knot, side entrance. Smooth lip around edge. 10-15 cm opening. 18m from ground. 1 fissure. Directly about knot. 15 cm opening. m 18from ground. No chew.	430403.0444	6408275.314	Jarrah with fire damage	118
23/05/2024	Jarrah	3	120	Spout with 10-15 cm hollow. Side entrance. 20-25 m from ground. No chew.	430392.3466	6408021.679		119

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
23/05/2024	Jarrah	3	120	2 hollows. 1 spout with 15-20 cm entrance. 1 knot within Y of tree. With 10-15 cm opening. Smooth edges. 15 m from the ground. No chew.	430010.2818	6407097.217		120
23/05/2024	Marri	2	120	1x side entry slit hollow 25 high 15 wide. In main trunk at 20m. Fresh chew marks on top of entry and older chew around the rim.	425329.895	6404721.352	Alcoa nest tree tag 2059	121
23/05/2024	Marri	3	120	1x chimney hollow entry 50cm. In main trunk snapped off at7m. Rim thin and hollow present but fire blackened internally. Think unlikely suitable, too low, open and exposed.	425378.904	6404057.723		122
23/05/2024	Marri	3	120	1x side opening knot type hollow 10cm wide 20cm high. At 20m in main trunk. Entry well defined with some wear marks. Possibly a chimney hollow present 30cm entry at 22m at top of snapped main trunk.	415924.979	6403411.85		123
23/05/2024	Jarrah	3	130	Knot, mid trunk, 30cm diameter, 10m up, no chew	430503.7147	6408576.146		124
23/05/2024	Dead	3	160	1 Knot mid trunk. 15 cm entrance. 10 m from ground. No chew.	429622.5534	6406897.765	Jarrah	125
24/05/2024	Jarrah	3	60	Fissure, midtrunk, 12cm diameter, 5 m high, no chew	427158.1597	6407018.191		126
24/05/2024	Marri	3	60	Spout, 2 holes in spout, both at 45 degree, 18cm diameter for both 13m up, no chew	427225.8792	6407041.455		127
24/05/2024	Marri	3	60	1 15cm chimney type hollow, 10m height, undoubtedly dead opening, easy entry	427047.7688	6407104.369		128
24/05/2024	Marri	3	60	1 potential chimney type hollow, 15cm, 7m height, unrounded entrance, unsure of depth	426976.5147	6407159.597		129
24/05/2024	Marri	3	65	1 chimney hollow. 25 cm opening Cracking below entrance 1m. 8 m from ground.no chew. Minor wear.	425726.149	6404573.985		130
24/05/2024	Marri	3	75	2 potential chimney type hollows, 15cm, 10m height, both are hidden and unable to identify depth.	426954.4	6407121.973		131
24/05/2024	Jarrah	3	85	1 Knot side entrance 25-30 cm opening. 10 m from ground, no chew. Think unlikely.	425464.7734	6404272.929		132
24/05/2024	Marri	3	85	1 17cm knot hollow that connects with chimney, 17m height, no chew marks or sign of use, well rounded entrance, highly suitable. It's the only one on the tree, others are burnt out marks	426965.1657	6406837.529	Alcoa sig tree 1748	133
24/05/2024	Marri	3	90	1 15cm chimney type hollow and 1 12cm potential side spout, 15m to 20m height, both openings are not well rounded and no chew marks or sign of use.	416260.1593	6403494.07	Alcoa sig tree 1531	134
24/05/2024	Marri	3	95	1x side entry 30x40cm in Main trunk at 18. Well defined hollow.	425511.2028	6404435.747	Alcoa nest tree 6289 (Tag missing)	135

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
24/05/2024	Jarrah	3	100	1x 15 cm side entry in main trunk at 15. Hollows well defined worn edges, looks used by fauna. 1x 15cm side opening knot type hollow at 17m, access angle poor for BC. Well defined smooth rim.	425618.226	6404504.455		136
24/05/2024	Jarrah	2	110	1 side knot type hollow, 13cm, 15m height, opening is clean and rounded, well-hidden and with potential chew marks on edges, unable to determine depth of hollow.	427028.1926	6406823.184		137
24/05/2024	Marri	3	110	1x 30 cm upwards angle knot hollow in main trunk at 18m. Very good looking hollow. Has bees in it currently. View obscured by small branch.	425914.1296	6404461.176	Alcoa tree tag 1735	138
24/05/2024	Dead	3	120	1 upward facing Knot. With 20 cm entrance. Mid trunk, 8 m from. ground. No chew.	425853.8089	6404581.862		139
24/05/2024	Marri	2	150	Hollow with upper opening. 20 cm opening. 15 m from ground. Minor chew marks around entrance and back of wall.	425538.9382	6404311.966	Alcoa sig tree 2064	140
24/05/2024	Dead	3	160	1 upward facing Knot. 10cm entrance mid trunk.20 m from ground. No chew. Think unlikely	425847.4812	6404538.118	Jarrah	141
24/05/2024	Jarrah	3	170	1 side entrance knot. 20-25 cm entrance. Mid trunk. 10 m from ground. No chew.	425581.8928	6404538.754		142
24/05/2024	Marri	5	170	No obvious hollow	427305.0087	6406925.554	Alcoa Sig Tree, sprayed with a H	143
24/05/2024	Jarrah	3	200	1 Upward facing knot hollow. 3/4 way up the trunk. 12m from ground. No chew. Wear present.	425333.8654	6404596.49	Sig tree. Over 2m	144
22/05/2024	Dead	5	0	Alcoa significant tree 2854 has presumably fallen	429409.239	6407333.987	Alcoa Sig Tree 2854	145
4/06/2024	Blackbutt	3	115	1x side entry 30x 40cm at 25m in main trunk. Very good-looking potential hollow. Potential for upwards facing spout hollow 25cm opening I snapped side branch at 15m.	413159.1754	6402742.473	Located 10m south of unit and solar panels	146
4/06/2024	Marri	3	80	1x chimney 30cm entry snapped main trunk at 18m. Recent broken. Section on ground is a hollow. 1x side entry 30x 25cm in fork of main trunk. Think main trunk is hollowed out.	416301.0751	6412861.486	5m north of telemetry unit	147
4/06/2024	Blackbutt	3	120	1x 20cm upwards angled hollow opening in 45 degree sloped main trunk at 12m. . Rim smooth and well developed. Hard to see, look from east side. 1x spout hollow 50-degree angle. Rim rough and flaky, think unlikely suitable	419603.2588	6405291.218		148
4/06/2024	Jarrah	3	95	1 knot side entrance. 10 cm opening. mid trunk approx. 10 m from ground.no chew. Think burnt jarrah, maybe suitable hollow.	430041.4462	6406126.358		149
4/06/2024	Jarrah	3	85	1 side entrance knot hollow. With 10-15 cm entrance. 15 m from ground upper canopy. May be burnt out. No chew.	430285.6771	6406454.158		150

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
4/06/2024	Jarrah	3	70	1 side entrance knot/fissure mid trunk with 15-20 cm entrance. 6 m from ground. No chew, two other hollows around upper canopy, think too small for BC.	430404.3225	6406281.074		151
4/06/2024	Jarrah	3	150	1 knot side entrance with 10 cm opening. Mid trunk, approx. 15m from ground. No chew	430408.2695	6405871.243		152
4/06/2024	Jarrah	2	80	1 side entrance type hollow, 25-30cm diameter, 13m height, slight chew marks on bottom of hollow, unsure of depth.	430498.6589	6406361.88		153
4/06/2024	Jarrah	3	70	Knot, upper canopy, 12cm diameter, 10m up, no chew	430778.2752	6406650.747		154
5/06/2024	Marri	3	70	1 potential side knot hollow that connect to a potential chimney 14cm diameter, 15m height, no chew marks	426659.3641	6406566.002		155
5/06/2024	Marri	2	100	1 knot type hollow, 20cm diameter, 20m height, well rounded entrance, clear fresh chew marks.	426888.1687	6406445.336		156
5/06/2024	Jarrah	3	120	1 side entrance knot at top canopy. 15 m from ground. 10-15 cm entrance. Think unlikely BC hollow. Wear and discoloration within on back wall.	426982.7521	6406748.452		157
5/06/2024	Jarrah	2	180	1 side entrance type hollow, 13cm diameter, 13m height, old chew marks present.	426999.3366	6407373.796	10m out of area, DBH is burnt outs	158
5/06/2024	Jarrah	3	210	2 spouts, both 15cm diameter, but upper canopy, 18m up, no chew, see comments	427009.5103	6407325.893	Fused to adjacent Alcoa sig tree, significant dbh too, but burnt out at base	159
5/06/2024	Marri	4	140	Unable to detect hollow	427010.9448	6407322.517	Alcoa sig tree 163, incredibly, fused to adjacent jarrah	160
5/06/2024	Marri	3	135	1 spout type hollow, 15cm diameter, 20 to 23m height, no observed chew marks or signs of use. Other adjacent trunk has a slit and shows the entire stem is hollow.	427045.6759	6407380.917	Previous H mark	161
5/06/2024	Marri	3	95	1 side/spout type hollow 13cm diameter on lowed canopy, 10m height. 1 potential chimney type hollow, 12cm diameter, 15m height, can see vertical cracking. No chew marks on both.	427136.8397	6407335.574		162
5/06/2024	Marri	4	105	1 side spout has broken off, hollow trunk appears not hollow. No other features observed	427179.8599	6407305.66	Hollow has broken off. Alcoa Significant tree 3885	163
5/06/2024	Marri	3	0	1 potential chimney type hollow, 12cm diameter, 17m height in upper canopy, canny determine depth but chimney is dead wood. No chew marks or foraging evidence observed	427192.9183	6407334.51	DBH not recorded.	164

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
5/06/2024	Dead	3	95	1 upwards facing knot with smooth lower lip. 15 cm entrance. Mid trunk approx. 12 m from ground. No chew. Think burnt jarrah. Other hollows present. Think they are unsuitable.	427221.4873	6406692.729	Jarrah	165
5/06/2024	Marri	3	110	1 side spout hollow 15cm diameter and 1 potential side entrance hollow on the same trunk 12cm diameter. 13 to 16m height, no chew marks on both, upper canopy. Foraging evidence under tree	427273.5603	6407387.362		166
5/06/2024	Marri	3	90	Knot, upper trunk, 15cm diameter, 9m up, scratched 3dges probably natural and not chewed	427275.2843	6407421.824		167
5/06/2024	Marri	3	80	2x 20-30cm chimney hollows in upwards facing snapped branches at 15m.	427437.3293	6406452.882	Alcoa habitat tree, no tag number.	168
5/06/2024	Jarrah	3	140	1 chimney with 20 cm entrance. Mid canopy. Approx 10 m from ground. No chew.	427461.6979	6406734.249		169
5/06/2024	Dead	3	60	Spout, upper trunk, 20cm diameter, 9m up, no chew. Very good-looking hole	427469.0155	6406633.944	Probable marri	170
5/06/2024	Jarrah	5	200	no hollows	427519.1007	6409121.8	Significant tree by DBH. Not existing marked Alcoa tree. Alive but trunk snapped at 10m .	171
5/06/2024	Marri	3	75	1x well-formed 30cm side entry hollow at 10m in main trunk. Has wear marks, no chew visible. Bee honeycomb at back, no activity from bees observed	427612.8155	6409310.862	Alcoa tree tag 1757	172
5/06/2024	Marri	3	80	1 potential side spout type hollow, 15cm diameter, 10m height, no chew marks.	427629.0976	6407208.744		173
5/06/2024	Marri	3	105	1 side entrance spout with 15-20 cm entrance. 10 m from ground. Upper canopy. no chew.	427660.7299	6406706.021		174
5/06/2024	Marri	5	85	Non apparent	427684.0028	6407103.031	Alcoa significant tree 463,	175
5/06/2024	Marri	3	75	1 potential chimney type hollow, 15cm diameter, 10m height, no chew marks, unable to see depth	427880.1244	6406559.428		176
5/06/2024	Marri	3	100	1x upwards facing 30cm knot hollow. Upper main trunk at 15m. Well-formed hollow mouth good position and angle, think likely suitable hollow forming.	427965.8677	6406442.149		177
5/06/2024	Dead	3	95	1x potential chimney hollow 40 -50 cm at 15m in dead snapped main trunk. Think likely not suitable as too open. Needs drone to confirm	429272.6882	6407472.912	Was a marri. Decaying.	178
5/06/2024	Jarrah	3	140	1 side entrance spout hollow with 20 cm entrance. Upper canopy, approx. 14 m from ground.no chew. Think may be burnt but has potential suitable hollow.	429364.1752	6407470.779		179

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
5/06/2024	Marri	3	140	1× 50cm opening chimney hollow in dead main trunk at 10m. Dead main trunk appears hollow for some meters. 1x side entry 40cm diameter at 8 m connecting into hollow of main trunk	429413.6869	6407753.72	Main trunk dead, resprouting from base	180
5/06/2024	Jarrah	3	110	One potentially suitable hollow, upward facing fissure with 20 cm entrance. Mid trunk/large branch from main trunk. Approx m 10from ground. Other Large opening in main trunk appears to be formed by fire.	429422.1558	6407533.595		181
5/06/2024	Marri	3	85	1x 25 cm side entry going into 45-degree branch at 8. Rim well defined but back walls blackened. Think unlikely to be suitable	429433.2673	6407757.852		182
5/06/2024	Jarrah	3	130	1 upper/ side entrance knot with 15-20 cm entrance. Defined rim. Mid trunk toward top approx. from No ground. Chew.	429524.1173	6407626.554		183
6/06/2024	Jarrah	3	80	2 spouts, both top canopy 15cm diameter, 28m up. No chew	426903.2064	6405905.119	Dead tree, dropped branches all hollow	184
6/06/2024	Jarrah	3	80	Whole upper branch hollow, two entrance, 30-40 cm diameter, 8m up, no chew	426984.8717	6405956.541	Unable to see if hollows lead further I to trunk	185
6/06/2024	Marri	3	60	1 potential chimney type hollow, 15cm diameter, 10m height, no chew marks, rough opening	427330.1809	6405305.559		186
6/06/2024	Jarrah	4	220	Has small and shallow hollows. Either	427378.4064	6405788.744	Significant tree. Is standing with its canopy branches but 80% have died. Not in good condition	187
6/06/2024	Marri	3	80	Two potential chimney type hollows, both around 15cm diameter and 100dbh m brunt, no chew marks, rough openings. Entire run shows hollow cracking	427465.7505	6405423.592		188
6/06/2024	Jarrah	2	90	Knot, midtrunk, 20cm across, 8 m up, very defined chew	427523.971	6405445.037		189
6/06/2024	Jarrah	5	210	No suitable BC hollows.	427549.43	6405706.619	Sig tree more than 2 m DBH	190
6/06/2024	Marri	3	90	1 potential side spout, 14cm diameter, 10m height, no chew marks. Has vertical cracking	427555.2585	6405355.669		191
6/06/2024	Jarrah	3	70	Spout, midtrunk, 18cm diameter 15m up, no obvious chew but worn around edges	427570.5426	6405428.518		192
6/06/2024	Marri	3	110	1x spout hollow at 45 degrees. Main opening 35cm. Side opening 25cm. Think whole branch is hollow. Angle may make unsuitable but is a well-developed hollow. 1x potential chimney 20cm at 18m. Needs drone	427588.3425	6405693.846		193
6/06/2024	Jarrah	3	90	Knot, 25cm diameter mid trunk, 15 up, no chew	427589.9485	6405105.248	Could possibly be burn hole	194

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
6/06/2024	Marri	3	85	1x chimney 25cm opening in large vertical branch off main trunk at 12m. Rim thin and well defined. Snapped branch 1m long may not allow sufficient depth developments.	427611.6538	6405685.868		195
6/06/2024	Marri	3	105	1 chimney in upper canopy. 40 cm entrance with thin rim. Think not fully developed to depth. 8 m from ground. No chew.	427761.5009	6405550.885		196
6/06/2024	Marri	3	110	1x chimney 40cm opening at 10m in snapped main trunk. Hollow looks very well formed, tree living around rotted heart wood. High potential for suitable hollow or formation	427819.1219	6405447.421		197
6/06/2024	Jarrah	3	130	1 spout side entrance. 15 cm opening. defined rim. 6m from ground. Unlikely BC hollow.	427881.9247	6405523.407		198
6/06/2024	Marri	3	65	1x 30 cm chimney hollow in snapped main trunk at 12m. Hollow well defined, thin rim, think likely developed to depth. Main trunk dead and decaying. Resprouting from base	427937.1211	6405546.494		199
6/06/2024	Marri	3	130	1 potential side spout, 15cm diameter, 15 m height, mid trunk. No chew marks	428011.5829	6405263.759		200
6/06/2024	Jarrah	5	205	No hollow, but significant DBH over 2m	428266.8815	6405249.296		201
6/06/2024	Marri	3	105	1x potential chimney 25cm diameter at 15m in central trunk. Rim rough not well formed, think unlikely hollow is well developed. 1x upwards opening knot hollow 15cm diameter at 14m in main trunk.	428455.9238	6407950.661		202
6/06/2024	Marri	3	120	2 hollows. 1 spout with side entrance and 20 cm entrance. Entrance has thin wood. Spout is mid trunk and approx. 8 m from ground. 1 Chimney at top with large opening think 50 or more cm. No chew. Think both hollows are connected.	428549.5963	6405600.743		203
6/06/2024	Marri	3	75	1x potential chimney hollow 30-40 cm opening in snapped main trunk at 12m. Think unlikely developed to depth but rim is thin and section dead. Needs drone to confirm.	428589.6013	6405659.162		204
6/06/2024	Jarrah	3	120	1 knot in top canopy with 10 cm entrance. 15 m from ground. Defined rim. Think burnt. No chew.	428813.7443	6405524.32		205
6/06/2024	Marri	5	150	No hollows	429062.3488	6405412.756	Sig tree with dbh of 1.5 m	206
6/06/2024	Marri	3	75	1x upwards facing slit hollow, 50cm high 15 wide. At top of main trunk at 12m. Well defined with wear and potential old, weathered chew marks.	429116.5946	6405366.066	Alcoa habitat tree tag 1653. Also tag 1753 on ground.	207
7/06/2024	Jarrah	3	110	1 spout with entrance of 40 cm. Upward facing. 8 m from ground. Thin rim. No chew. Think burnt jarrah. One large branch of ground confirms tree is hollow forming.	426561.8228	6406308.59		208

Date	Species	Bamford class	DBH	Hollow Data	Easting	Northing	Comments	Tree Number
7/06/2024	Jarrah	3	100	1 knot upper canopy, 20cm diameter, 20m up on branch, no chew	426624.7014	6406396.582		209
7/06/2024	Marri	3	65	1 potential chimney type hollow, 20cm diameter, 8m height, no chew marks	426629.8078	6406379.047		210
7/06/2024	Marri	3	60	1 potential chimney type hollow, 15cm diameter, 10m height and no chew marks, vertical cracking observed on main trunk	426635.1916	6406371.059		211
7/06/2024	Jarrah	3	200	2 hollows. 1 potential spout with 15 cm opening. Difficult to view. Top canopy defined thin rim. 15m from ground. May no longer be suitable. 1 Upward facing hollow in upper canopy with 15cm entrance. 12m from ground. No chew on either hollow.	426657.4185	6406283.533	Badly Burnt jarrah with signs of regrowth.	212
7/06/2024	Jarrah	3	90	1 knot side entrance with 10-15 cm opening. 8m from ground, mid trunk. Think just burnt jarrah. No chew.	426918.5014	6406197.802		213
7/06/2024	Jarrah	3	160	1 side entrance knot with 15 cm opening. 13 M from ground, mid trunk. Probably burnt. Unsure of depth. No chew	427108.0255	6406124.767		214
7/06/2024	Marri	2	130	1x 50cm chimney hollow in snapped main trunk at 15m. Trunk partially died and decaying. Some living sections. Minor recent chew marks, appear from BC at top of opening. Think prospecting chew not breeding.	427161.6414	6410234.337		215
7/06/2024	Marri	3	95	Potential for 30cm opening chimney in snapped main trunk at 14m. Has branches surrounding. Think unlikely developed to depth. Needs drone to confirm	427172.1497	6410307.489		216

APPENDIX B: Phase 2 Survey Results

Species	Bamford class	DBH	Easting	Northing	Comments	Tree Number
Dead	4	150	422361.189	6409621.075	Habitat Tree, Blocked hollows assessed with Alcoa drone 11/06 at 9:15. all hollows blocked	29
Jarrah	4	110	422354.813	6409441.694	Habitat Tree Hollows assessed with Alcoa drone on 11/06/24 at 9:00 am. hollow present, not deep enough for BC, has sticks and leaf litter inside. another shallow hollow and other hollows are blocked. Another hollow present at top, no sign of use	30
Jarrah	4	140	422421.325	6409407.791	Blocked - Habitat Tree Tree assessed with drone on 11/06/2024 at 8:55am. assessed with Alcoa drone, all hollows blocked	33

Species	Bamford class	DBH	Easting	Northing	Comments	Tree Number
Marri	3	105	420537.919	6410991.158	Suitable Nest Tree Assessed with Alcoa drone at 14:05 10/06/2024. Lower hollow coming out of branch is hollow filled with water, not suitable for Black Cockatoo use. Top spout hollow is potentially suitable. Appears to have chew marks and smooth internal walls but is only approximately 80cm deep.	31
Marri	3	80	422250.054	6409553.322	Suitable nest tree No external chew marks, Unable to determine depth as hollow deviates to the right (towards main trunk) no defined nest chamber. However, hollow is present but not currently suitable for Black Cockatoo use. Hollow assessed with Alcoa Drone and assessment with pole camera on the 11/06 at 9.30/	32
Marri	4	60	417351.798	6406679.153	Habitat Tree Hollows Blocked Assessed with GoPro, Blocked. 10:30am	34
Jarrah	4	70	423291.841	6404410.265	Habitat Tree Hollows Blocked Hollows assessed by Alcoa drone at 13:29 on 13/6. Very shallow hollow present approx. 10cm then Blocked.	35
Jarrah	4	75	423142.9	6410149.193	Habitat Tree Hollows Blocked assessed with Alcoa drone at 14:45 on 10/06/2024	36
Marri	4	75	415157.852	6410995.569	Habitat Tree Hollows Blocked Assessed with Alcoa drone at 11:30 on 10/6/2024	37
Marri	3	80	422973.841	6406965.971	Suitable Nest Tree Hollow assessed with Alcoa drone on 18/6 at 8:55, Chimney hollow suitable but just a bit to shallow. other hollows blocked	38
Jarrah	4	85	417663.492	6406875.685	Habitat Tree Blocked Assessed with Drone (Alcoa drone) Blocked at 10:13	39
Marri	4	90	422883.908	6410023.559	Habitat Tree Blocked Assed with Alcoa drone (15:00) Blocked	41
Marri	4	95	415342.077	6411059.69	Habitat Tree Hollows Blocked Assessed with Alcoa drone	42

Species	Bamford class	DBH	Easting	Northing	Comments	Tree Number
Dead	4	100	423066.665	6410096.708	Habitat Tree Hollows Blocked Assessed with Alcoa drone	43
Jarrah	4	105	423057.928	6410116.027	Habitat Tree Hollows Blocked Assessed with Alcoa drone at 14:53 on the 10/6	44
Marri	4	105	415071.87	6411084.198	Habitat Tree Blocked Hollow assessed with GHD drone on 12/6 at 9:10 all hollows blocked	45
Marri	4	115	415136.899	6410920.305	Habitat Tree Hollow Blocked Hollow Assessed with Alcoa drone Blocked. Recently burnt out by fire	46
Jarrah	4	120	423249.657	6410094.1	Habitat Tree Hollow Blocked Hollow assessed with Alcoa Drone on the 10/06	47
Marri	2	120	415382.145	6411178.559	Nest Tree Top Chimney hollow is blocked. Lower hollow approximately 20m high, has heavy chews on entrance of hollow (on main trunk). Assessed with Alcoa drone on 10/6 at 12:05, Unable to view inside hollow due to height for pole cam.	48
Jarrah	4	125	415319.085	6411335.714	Habitat Tree Hollow Blocked Hollows assessed with Alcoa drone at 12:55 on 10/06 a	49
Marri	4	130	415390.436	6411035.018	Habitat Tree Hollows Blocked Assessed with Alcoa Drone	50
Marri	4	150	415457.873	6411315.443	Habitat Tree Hollow Blocked Assessed with Alcoa Drone at 12:20 on the 10/6. Tree is dead	51
Marri	4	170	415387.567	6411458.025	Habitat Tree Freshly broken branch. No sign of BC use. Hollow is wrong angle for BC Potential tree, pics taken with drone (Alcoa drone, 12:40) send to Tony for check	53

Species	Bamford class	DBH	Easting	Northing	Comments	Tree Number
Jarrah	4	200	423008.367	6407097.336	Habitat Tree Blocked hollow assessed with Alcoa drone on 18/6 at 8:48. hollow blocked	54
Marri	3	70	424592.824	6406057.729	Suitable Nest Tree Appears to have some external chew marks. Assessed with Alcoa drone on the 18/6 at 10:26. Suitable hollow for Black Cockatoo present	55
Marri	4	60	425893.407	6409910.891	Habitat Tree Blocked Assessed with Alcoa drone on the 11/6 at 11:15, all hollows blocked	56
Marri	4	60	427284.337	6408989.527	Habitat Tree No hollows present Hollow assessed with Alcoa drone 11/6 13:40. No hollows	57
Marri	4	60	427328.7	6408988.148	Habitat Tree No Hollow present Visual ground assessment with binoculars, no hollow. no pics	58
Marri	2	65	424653.25	6407728.923	Nest Tree Assessed with Alcoa drone on 18/6 at 11:25. old and new chews on rim, wicked nest chamber, breeding tree. go pro pics 18/6 12:10	59
Marri	4	70	423663.562	6407024.366	Habitat Tree Blocked hollow assessed on 14:57 on 13/6. hollow goes in about 10cm then blocked	60
Marri	4	70	428017.602	6408190.847	Habitat Tree No Hollow present Visual ground assessment with binoculars, no hollow. no pics	61
Marri	4	75	426949.813	6409903.433	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone 11:35 at 12:35, hollow blocked	62
Marri	4	75	427260.421	6408815.504	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone 11/6 at 13:50. blocked	63

Species	Bamford class	DBH	Easting	Northing	Comments	Tree Number
Marri	4	80	428016.342	6408197.885	Habitat Tree Hollow Blocked Hollow assessed with drone at 15:30 11/6. blocked	65
Dead	4	85	424427.737	6406233.428	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone 18/6 at 10:18. all blocked	66
Marri	4	85	424755.115	6406548.32	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone 16/6 at 9:56. Blocked	67
Jarrah	4	90	426114.384	6409983.089	Habitat Tree Hollow Blocked Assessed with Alcoa drone 11/6 at 11:45 all blocked	68
Jarrah	4	90	428004.838	6408199.367	Habitat Tree Hollow Blocked Hollow assessed with drone 15:28 on 11/6. Blocked	69
Marri	4	90	426061.865	6409972.767	Habitat Tree Hollow Blocked Assessed with Alcoa Drone 11/6 at 11:30, all hollows blocked	70
Jarrah	4	95	423793.682	6407050.284	Habitat Tree Hollow Blocked tree about to fall over. assessed with Alcoa drone art 15:05 13/6. blocked	71
Marri	4	105	426092.112	6409959.723	Habitat Tree Hollow Blocked Assessed with Alcoa drone on the 11/6 at 11:33 all hollows blocked	74
Marri	4	110	424885.41	6407693.726	Habitat Tree Hollow Blocked assessed with Alcoa drone on18/6 at 11:15.	75
Jarrah	4	125	426136.136	6409976.727	Habitat Tree Blocked Hollow Assessed with Alcoa drone 11/6 at 11:30	76
Marri	3	140	424077.203	6407189.947	Hollow assessed with Alcoa drone on the 18/6 at 9:22. Difficult to get to, suitable size hollow but no signs of use. approx. 1m deep. Has a H with a dot on it. no tag present	78

Species	Bamford class	DBH	Easting	Northing	Comments	Tree Number
Marri	4	140	427290.765	6408942.915	Habitat Tree Hollows Blocked Hollows assessed with Alcoa drone on the 11/6 at 13:25. All hollows to small or blocked.	79
Jarrah	4	150	424698.149	6407366.237	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone on 8/6 at 10:55	80
Jarrah, Dead	4	160	424426.257	6406327.898	Habitat Tree Hollow Blocked Assessed with Alcoa drone 18/6 at 10:13	82
Jarrah	4	0	429800.813	6407408.892	Habitat Tree Hollows Blocked Hollow assessed with GHD drone at 11:56 12/6.	83
Marri	x	75	428492.011	6407736.821	Tree already removed. SB note- TK surveyed this area in April 2024 and no nest/possible nests marked. Habitat Tree	84
Marri	4	75	425931.867	6406184.904	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone at 13/ 6 10:00.	85
Marri	4	75	426960.467	6406043.721	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone at 10:40 on the 13/6.	86
Jarrah	4	85	429724.084	6407425.666	Habitat Tree Small Hollow present, blocked with branches, no chew marks Assessed with GHD drone at 11:30 12/6., blocked and branch too small and no chews	87
Jarrah	4	95	429829.908	6407213.535	Habitat Tree Hollows Blocked Hollow assessed with Pole camera (GoPro) at 14:00 12/6. both hollows blocked	88
Marri	4	95	425999.352	6406129.948	Habitat Tree Small hollow present, not suitable for Black Cockatoo, suitable for Australin Ringneck Parrot. Hollow assessed with Alcoa drone at 10:16 on the 13/6. one hollow blocked.	89
Marri	4	95	425997.425	6406222.943	Habitat Tree One Blocked hollow and one very shallow hollow Hollow assessed with Alcoa drone 13/6 at 9: 53.top hollow blocked, side hollow too shallow	90

Species	Bamford class	DBH	Easting	Northing	Comments	Tree Number
Marri	4	95	426070.116	6406159.957	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone 13/6 at 9;45.	91
Jarrah	4	105	427702.621	6409080.368	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone 11/06 at 14:50	93
Jarrah	4	110	427717.068	6408875.493	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone at 14:20 on the 11/6.	94
Marri	4	110	426189.09	6406412.75	Habitat Tree Hollow Blocked Hollows assessed with drone on the 12/6 at 14:50.	95
Dead	4	120	429727.813	6407352.168	Habitat Tree Hollow Blocked hollow assessed with GHD drone at 12:04 on the 12/6.	96
Jarrah	4	120	429775.296	6407424.099	Habitat Tree Hollow Blocked Assessed with GHD drone at 11:42 on the 12/6	97
Jarrah	4	140	427670.116	6409073.795	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone on the 11/06 at 14:50	98
Jarrah	4	160	429354.501	6407427.415	Habitat Tree Hollow Blocked Hollow assessed with GHD drone 12/6 at 11:10.	99
Jarrah	4	85	427385.469	6405371.78	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone at 11:38 on the13/6.	107
Marri	4	95	427298.405	6405578.402	Habitat Tree Spout Hollow Blocked, side hollow is too small and lacks defined nest chamber. Hollow assessed with Alcoa drone at 11:10 on the 13/6.	110

Species	Bamford class	DBH	Easting	Northing	Comments	Tree Number
Marri	4	95	427388.783	6405443.656	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone at 11:28 on the 13/6.	111
Marri	4	95	427233.507	6405603.886	Habitat Tree Hollow Blocked Hollow assessed with Alcoa drone at 10:55 13/6.	112
Marri	2	90	417654.79	6406840.1	Nest Tree Recent and Historic chews at hollow entrance and some recent chews on hollow internal wall. Defined chamber. However, due to access unable to get drone into a position to view bottom of hollow. Tree assessed with Alcoa Drone on the 10/06. Lots of Forest Red-tailed Black Cockatoos nearby.	Additional Tree (217)
Marri	3	70	427645.32	6409039.15	Suitable Nest Tree Hollow appears to have small recent chews at hollow entrance. Hollow was assessed with drone and GoPro but appears to be just a bit too shallow. Assessment conducted on the 12/6 at 15:45	Additional Tree (218)