



PHOENIX

ENVIRONMENTAL SCIENCES

Population estimates for Numbat and Woylie for the Hotham North Project

Prepared for South32 Worsley Alumina Pty Ltd

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Final



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EXECUTIVE SUMMARY

South32 is the managing company for the South32 Worsley Alumina Pty Ltd Joint Venture (Worsley Alumina), which includes bauxite mining near Boddington, bauxite transport via overland conveyor, an alumina refinery near Collie, and port operations in Bunbury. Worsley recently received approval under the Environmental Protection Act 1986 (WA) to expand mining operations within the Northern Jarrah Forest. This approval was granted with the issue of Ministerial Statement 1237 (MS1237).

Ministerial statement 1237 includes conditions, which require assessment of populations of certain threatened fauna within both current and future operational areas. A key component of this is the requirement to conduct targeted surveys for conservation significant mammals, namely Woylie and Numbat, within the Hotham North Mining Region.

Simultaneously, Phoenix conducted a targeted significant mammal survey in an adjacent area for Newmont Mining Corporation (Newmont). Due to a data-sharing agreement between Newmont and Worsley Alumina, and the continuity of habitats across the survey areas, results from both surveys have been combined to provide a comprehensive assessment. These surveys were undertaken over 3 trips spanning 2 months from September to November 2024.

The Worsley study area for this survey covers 7,797.3 hectares, the combined area for both surveys is 11,650.5 ha including 2 active Newmont Boddington Gold mines and is located approximately 5.6 km northwest of Boddington. The study area contains critical habitats, including Jarrah/Marri forest, Jarrah/Marri/Allocasuarina forest, and mixed eucalypt woodland. These habitats support a diverse range of vertebrate fauna, particularly conservation significant species. The high number of detections for Woylie (705 records) and population estimate suggests that the study area supports a viable population. However, no Numbats were recorded. The presence of large, continuous habitat patches enhances ecological connectivity, providing essential foraging, dispersal, and breeding opportunities.

Connectivity to the broader Jarrah Forest is a key factor in maintaining viable populations of threatened species. The presence of large, intact habitat areas with sufficient ecological corridors enables species with extensive home ranges and those with fragmented distributions to persist in the landscape. Despite Numbat not being recorded, occasional desktop records suggest that the study area may provide dispersing habitat for these species, but their low numbers and frequency indicate that it is unlikely to support a viable population.

The high detection rates and population estimates of Woylie, coupled with their broad distribution across the study area, provide strong evidence that these species have viable populations within the study area and region. Conversely, the absence of Numbat detections align with the assessment and overall knowledge of the species that the study area is unlikely to support a viable population.

The survey results highlight a substantial contrast between native and introduced fauna records. Native species were recorded in high numbers, whereas introduced species such as feral Cats (4 records), Red Foxes (14 records), and Rabbits (1 record) were recorded infrequently. However, feral Pigs (33 records) emerged as a concern. Introduced species remain a key threat to native wildlife. Feral Pigs contribute to habitat degradation and compete with native fauna, while Foxes and Cats exert predation pressure on ground-dwelling species, particularly animals in the critical weight range such as Numbats and Woylie. Despite the pressures of feral predators, historical clearing and rehabilitation and mining activities, the study area continues to support Woylies. However, these pressures reinforce the need for ongoing conservation measures, such as habitat restoration, invasive species management, and maintaining ecological connectivity, to ensure the long-term viability of Critically Endangered fauna such as Woylie within the study area.

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
BoM	Bureau of Meteorology
CPW	Colorado Parks and Wildlife
CSFEMP	Conservation Significant Fauna Environmental Management Plan
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPIRD	Department of Primary Industries and Regional Development
EPA	Environmental Protection Authority
EPBC	Environment Protection and Biodiversity Conservation Act 1999
IBRA	Interim Biogeographic Regionalisation of Australia
NES	National Environmental Significance
PIT	Passive integrated transponder
PVA	Population viability analysis
SECR	Spatially explicit capture recapture
WA	Western Australia

1 INTRODUCTION

South32 is the managing company for the South32 Worsley Alumina Pty Ltd Joint Venture (Worsley Alumina), which includes bauxite mining near Boddington, bauxite transport via overland conveyor, an alumina refinery near Collie, and port operations in Bunbury. Worsley recently received approval under the Environmental Protection Act 1986 (WA) to expand mining operations within the Northern Jarrah Forest. This approval was granted with the issue of Ministerial Statement 1237 (MS1237) which includes conditions requiring the assessment of populations of threatened fauna within both current and future operational areas. A key component of this is the requirement to conduct targeted surveys for Woylie and Numbat within the Hotham North Mining Region.

1.1 BACKGROUND

Previous vertebrate fauna surveys have been conducted in this area by both Worsley Alumina and Newmont Mining Corporation (Newmont), which operates the Boddington Gold Mine within and around the study area. These surveys confirmed the presence of conservation significant species and suitable habitat (Phoenix 2025). However, with Worsley seeking to expand its operational footprint, the EPA requires additional data on the size of Woylie and Numbat populations to determine whether they remain viable within proposed mining areas and to establish baseline population estimates.

Simultaneously, Phoenix conducted a targeted significant mammal survey in an adjacent area for Newmont. Due to the data-sharing agreement between Newmont and Worsley Alumina and the continuity of habitats across the survey areas, the results from both surveys have been combined. Given the high connectivity of the landscape, it is likely that individuals move freely between the areas, maintaining gene flow and forming a single, broader population rather than isolated subpopulations. This integration allows for a more robust and comprehensive assessment of fauna values in the region. The Worsley study area for this survey covers 7,797.3 ha, the combined area for both surveys is 11,650.5 ha including 2 active Newmont Boddington Gold mines and is located approximately 5.6 km northwest of Boddington (Figure 1-1).

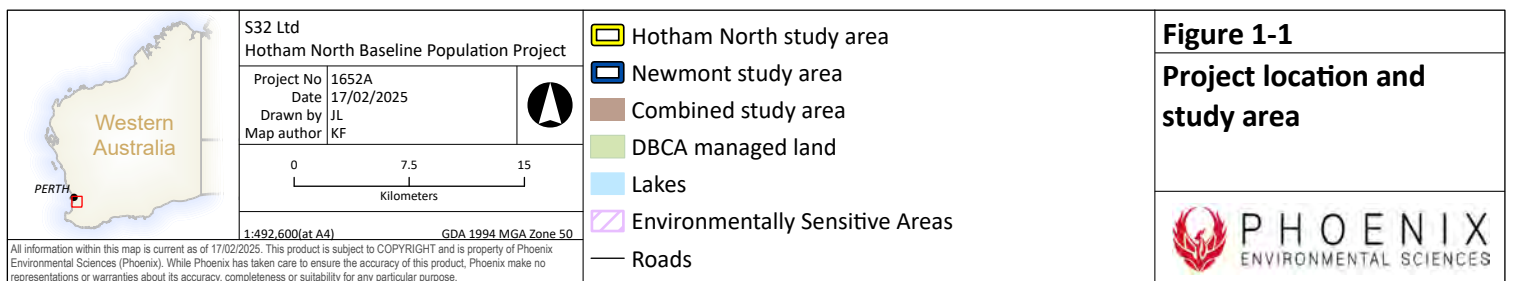
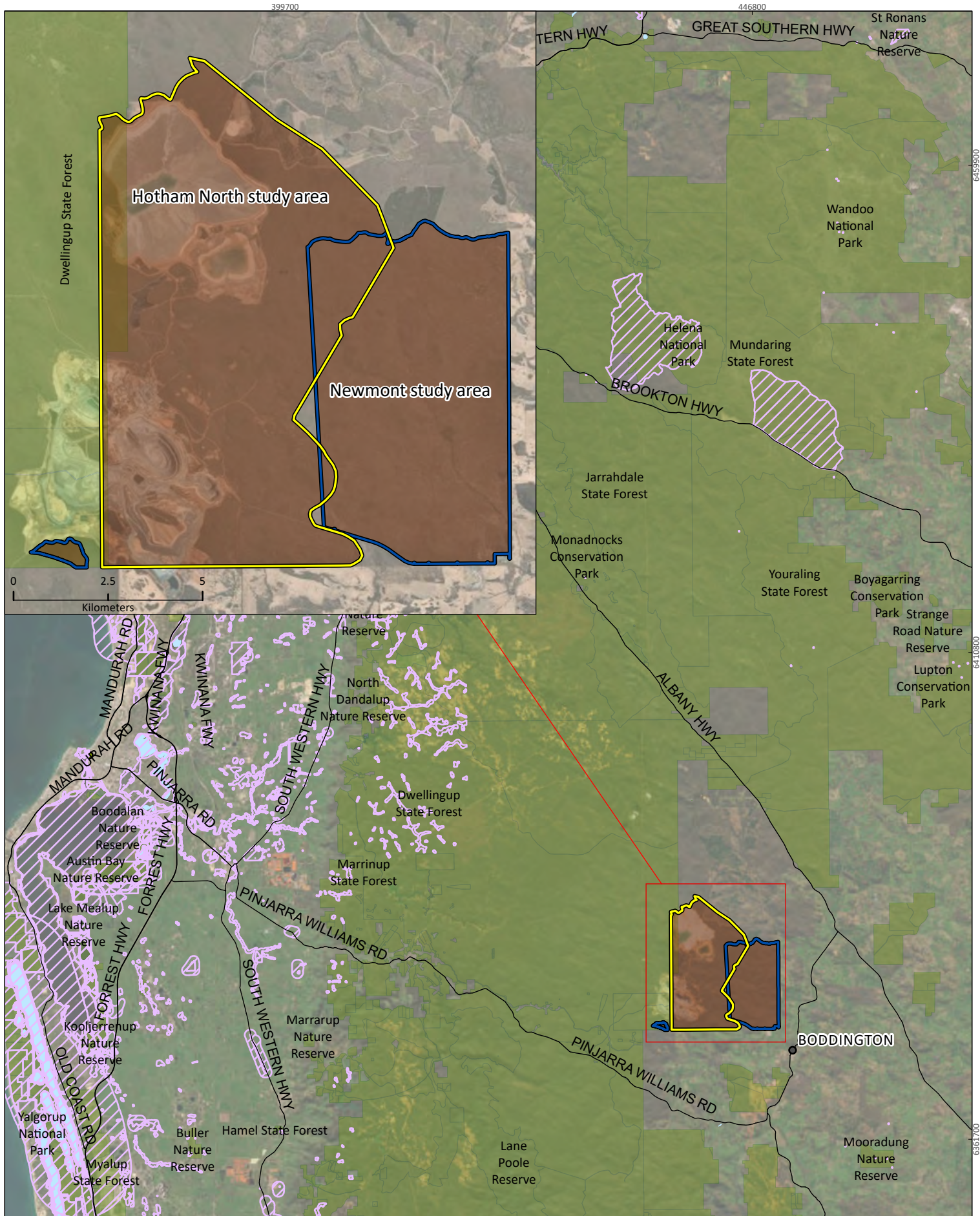
1.2 SCOPE OF WORK

The targeted vertebrate fauna surveys aimed to:

- Meet the requirements of Condition B13-3 of MS1237, which mandates commencement of targeted surveys for the Numbat (*Myrmecobius fasciatus*) and Woylie (*Bettongia penicillata ogilbyi*) within the Hotham North mine region within 12 months of the date of issue of the Ministerial Statement to determine baseline population size during implementation of the proposal and to inform reporting associated with the Conservation Significant Fauna Environmental Management Plan (CSFEMP) required under Condition B13-7.

1.3 STUDY AREA

The Worsley study area for this survey covers 7,797.3 ha, the combined area for both surveys is 11,650.5 ha including 2 active Newmont Boddington Gold mines and is located approximately 5.6 km north-west of Boddington (Figure 1-1).



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

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:

- CR – species facing an extremely high risk of extinction in the wild in the immediate future²
- EN – species facing a very high risk of extinction in the wild in the near future²
- VU – species facing a high risk of extinction in the wild in the medium term future².

Species may also be listed as specially protected under the BC Act in one or more of the following categories:

- 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

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 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 4 Priority (P) categories, P1 (highest) – P4 (lowest), based on level of knowledge/concern.

2.2.2 Critical habitat

Under the BC Act, habitat is eligible for listing as critical habitat if it is critical to the survival of a Threatened species and its listing is otherwise in accordance with the ministerial guidelines.

2.2.3 Other significant fauna

Under the EPA's environmental factor guideline (EPA 2016), fauna may be considered significant for reasons other than listing as a Threatened or Priority species, including:

- species with restricted distribution
- 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.

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 (JAF01) of the Jarrah Forest bioregion (Figure 3-1).

The Northern Jarrah Forest is characterised by Jarrah-Marri forest on laterite gravels and Wandoo woodlands on clay soils with eluvial deposits. This subregion includes areas of the Darling Scarp, with areas of granite outcropping and hills with dispersed deep drainage. Rainfall in the region varies from 1300 mm on the scarp to 700 mm in the east and northern areas. Woodlands of Jarrah-Marri, Bullich, Blackbutt and Wandoo follow the rainfall and topography. Areas of Banksia woodlands and heath are found on granite substrates in the forests of the north and east. Diversity appears to favour lower slopes and granite soils.

3.2 LAND SYSTEMS AND SURFACE GEOLOGY

The Department of Primary Industries and Regional Development (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 3 land systems, dominated by the Darling Plateau system (7,673.6 ha and 98.4% of the study area). The remaining south-east area consisting of the Quindanning system (109.9 ha and 1.4% of the study area) followed by the north-east area being Marradong upland system (13.8 ha and 0.2% of the study area). Each land system contains duplex soils and supports a range of eucalypt species including Jarrah, Marri and Wandoo (Table 3-1; Figure 3-2).

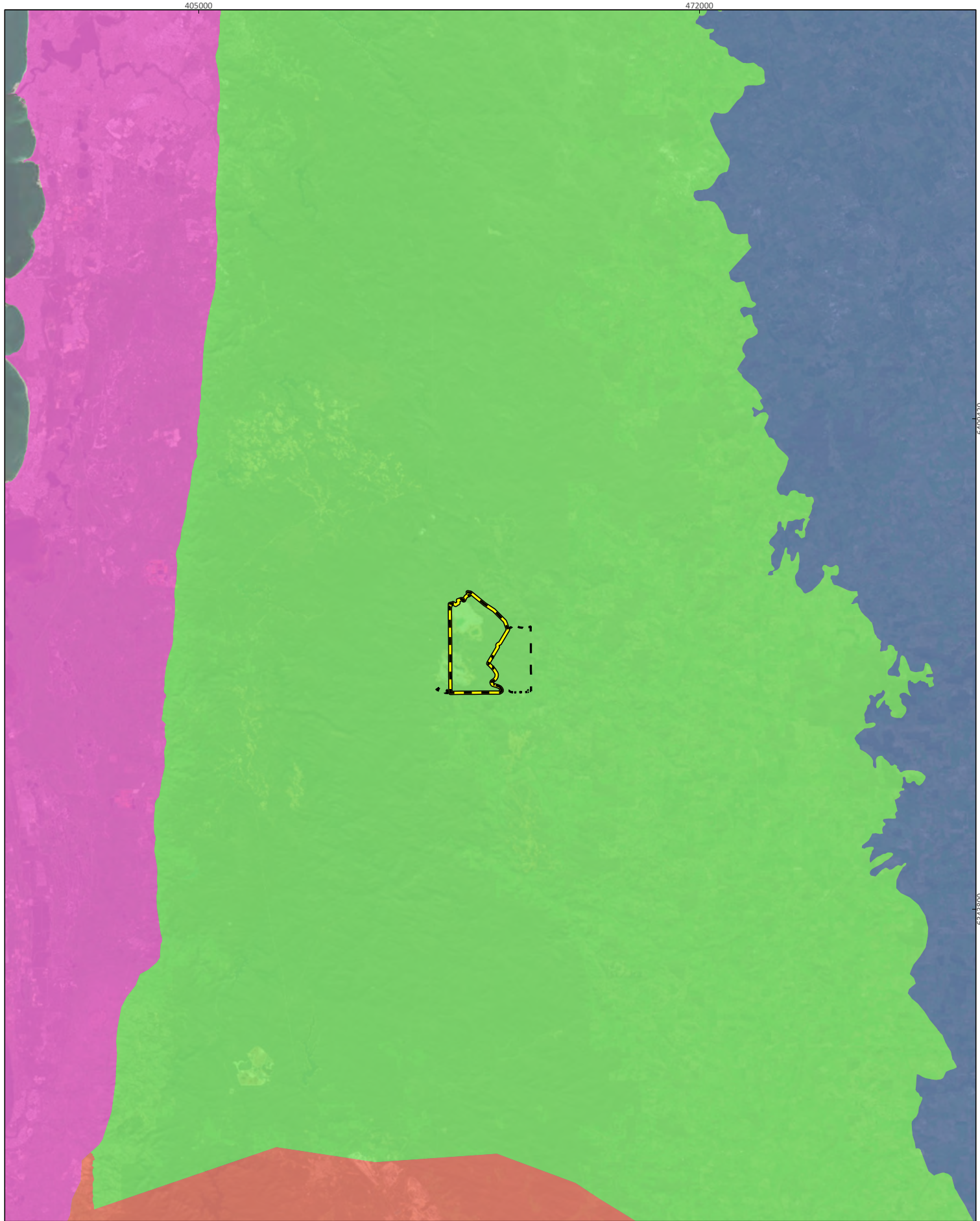
Table 3-1 Land systems of the study area

Land system	Description	Area (ha)	% of study area	Combined area	% of combined area
Darling Plateau System	Lateritic plateau. Duplex sandy gravels, loamy gravels and wet soils. Jarrah-marri-wandoo forest and woodland.	7,673.6	98.4	9,950.5	85.4
Quindanning System	Deep granitic valleys, in the northern and central Eastern Darling Range, with deep sandy duplex soils, shallow sand, loamy duplex and bare rock. Marri-Wandoo-york gum-jam woodland.	109.9	1.4	866.3	7.4
Marradong Upland System	Plateau remnants, in the central Eastern Darling Range, with sandy gravel, loamy gravel, grey deep sandy duplex and loamy duplex. Jarrah-marri-wandoo forest and woodland.	13.8	0.2	833.7	7.2
Total		7,797.3	100%	11,650.5	100%

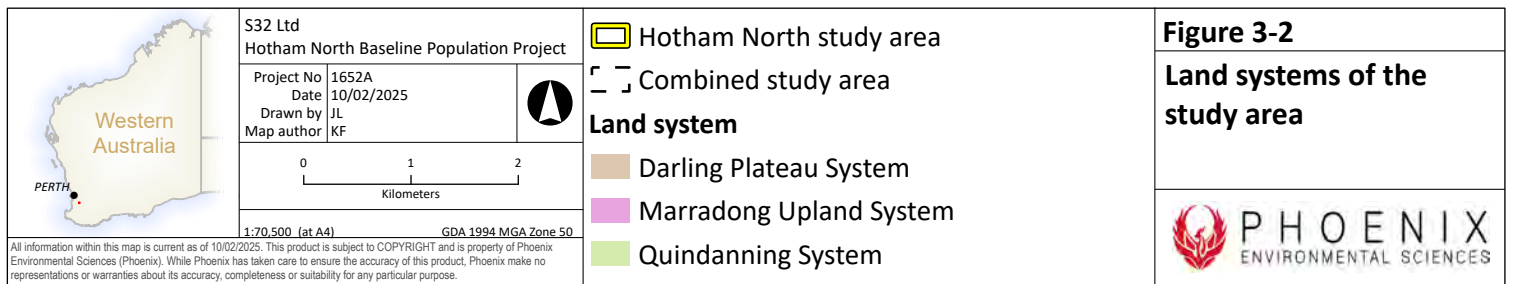
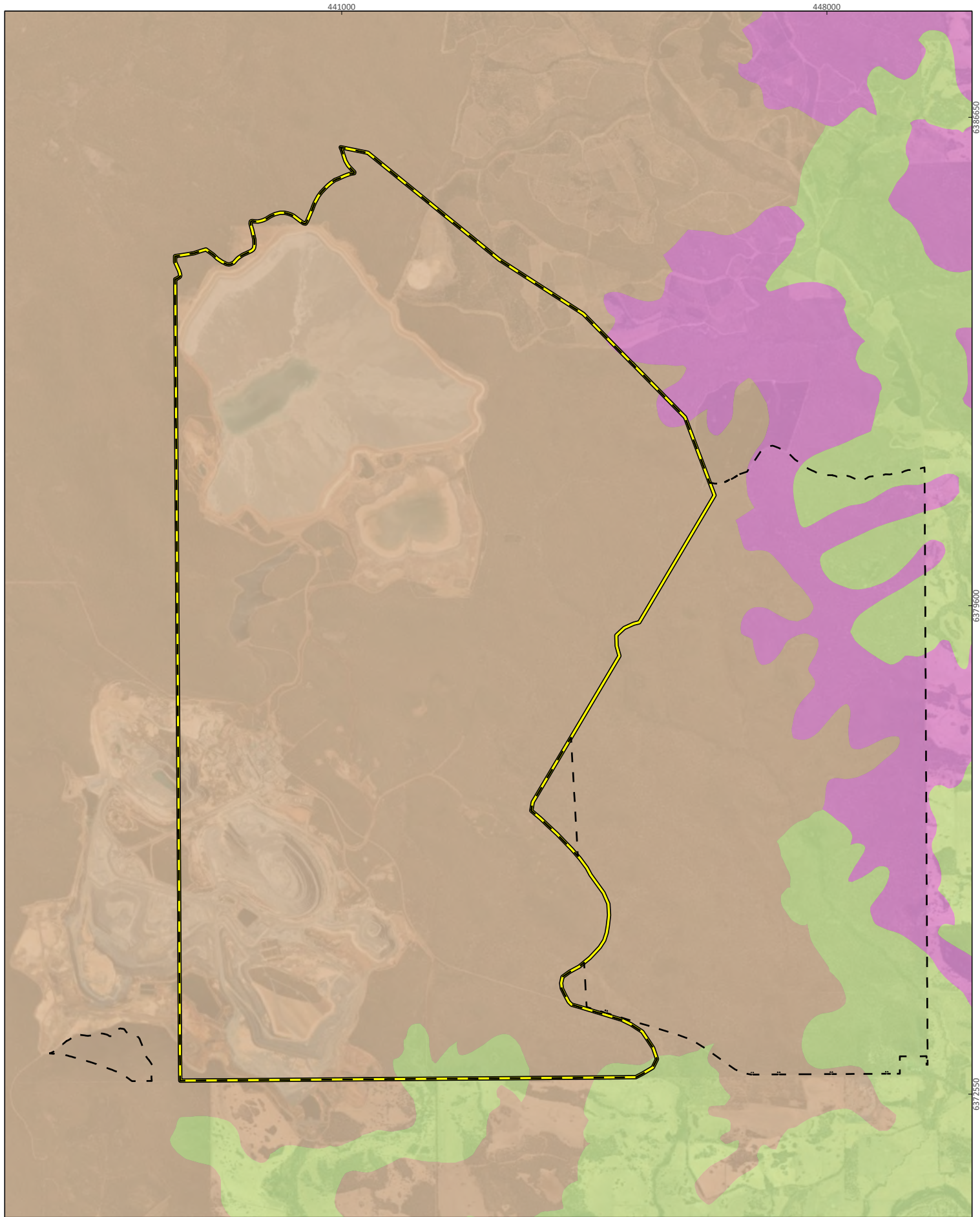
According to the Surface Geology of Australia 1:1,000,000 scale, Western Australia database (Stewart *et al.* 2008), the study area intersects 4 geological formations (Table 3-2). The most extensive formation is the Ferruginous duricrust 38498, which accounts for nearly two-thirds of the study area (4,844.6 ha and 62.1% of the study area), with all other formations primarily occurring in small patches throughout (Table 3-2; Figure 3-3).

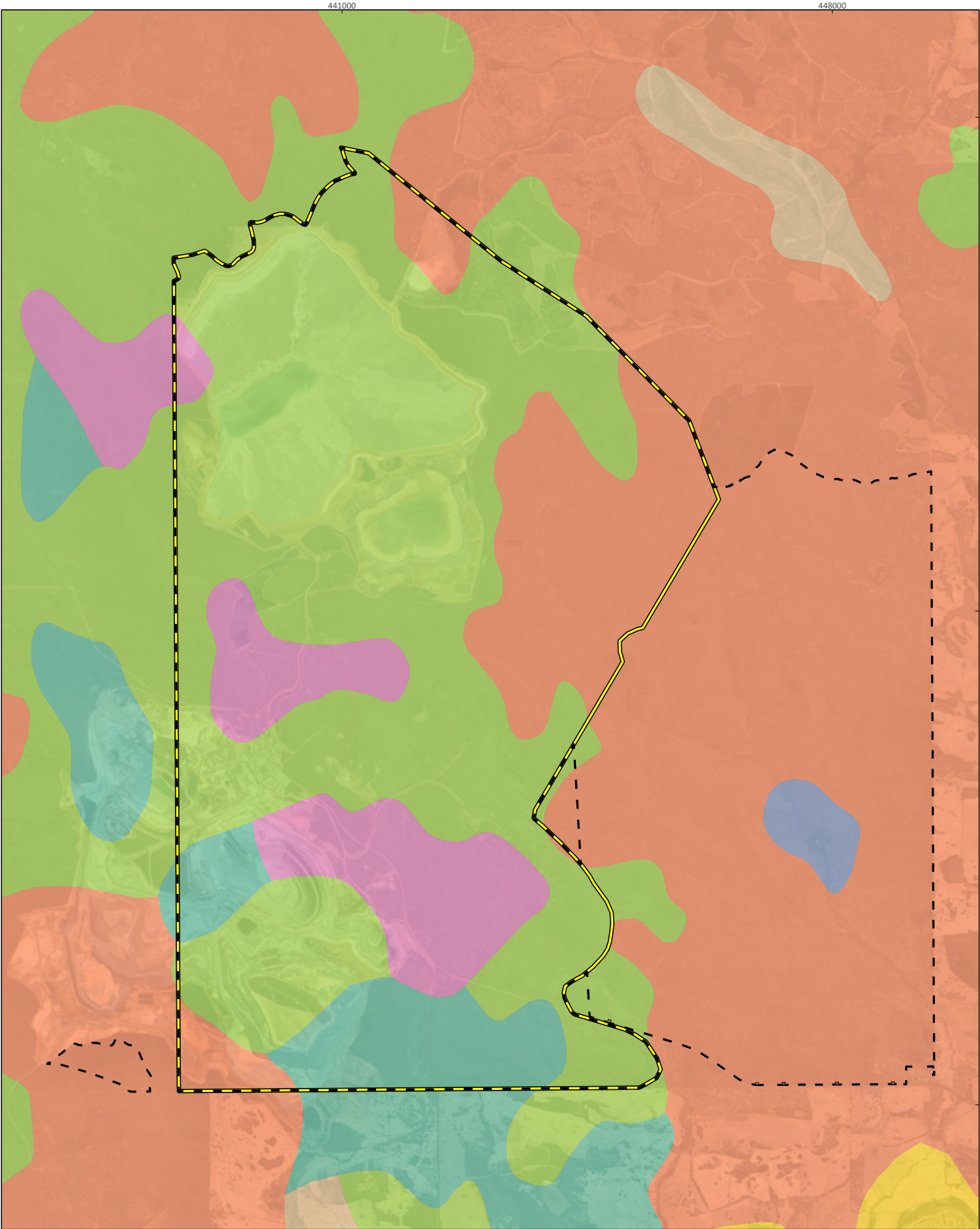
Table 3-2 Surface geology of the study area

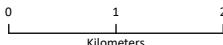
Surface geology	Abbreviation	Description	Area (ha)	% of study area	Combined area	% of combined area
Ferruginous duricrust 38498	Czl	Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite	4,844.6	62.1	5,036.6	43.2
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	1,284.9	16.5	4,807.4	41.3
Amphibolite 74334	Aty	Amphibolite, mafic schist, mafic rock intercalated with granite, para-amphibolite; metabasalt, metagabbro, metapyroxenite and metadolerite; Youanmi Terrane	1,015.7	13	1,015.7	8.7
Felsic volcanic rocks and porphyry 74290	Afs	Plagiophytic dacite, felsic lavas and pyroclastics	652	8.4	652	5.6
Gneiss, granulite, migmatite 74310	An	Banded granitic gneiss (monzogranitic to granodioritic), quartzofeldspathic gneiss with mafic bands, migmatite, granofels, mafic and felsic granulites, hypersthene-plagioclase-quartz granulite; schist, pelitic or mafic granofels	0	0	138.8	1.2
Total			7,797.3	100%	11,650.5	100%



Western Australia PERTH	S32 Ltd Hotham North Baseline Population Project <table border="1"> <tr> <td>Project No</td> <td>1652A</td> </tr> <tr> <td>Date</td> <td>10/02/2025</td> </tr> <tr> <td>Drawn by</td> <td>JL</td> </tr> <tr> <td>Map author</td> <td>KF</td> </tr> </table> 0 10 20 Kilometers 1:656,200(at A4) GDA 1994 MGA Zone 50	Project No	1652A	Date	10/02/2025	Drawn by	JL	Map author	KF	Hotham North study area Combined study area Bioregion, subregion Avon Wheatbelt, Katanning Jarrah Forest, Northern Jarrah Forest Jarrah Forest, Southern Jarrah Forest Swan Coastal Plain, Perth	Figure 3-1 IBRA regions of the study area PHOENIX ENVIRONMENTAL SCIENCES
	Project No	1652A									
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All information within this map is current as of 10/02/2025. 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\Worareye\ExpandedMiningAreas\1652A_WOR_432_VER\GIS\Mapping\MapDocuments\Figure1\1652A_map11.aprx											





S32 Ltd Hotham North Baseline Population Project	
Project No	1652A
Date	10/02/2025
Drawn by	JL
Map author	KF
	
	
1:70,500 (at A4)	GDA 1994 MGA Zone 50

-  Hotham North study area
-  Combined study area
- Surface geology**
-  An
-  Aty
-  Czl
-  Qa
-  Qrc
-  Ag

Figure 3-3
Surface geology of the study area



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3.3 CLIMATE AND WEATHER

The climate of the JAF01 subregion is described as Warm Mediterranean (Williams & Mitchell 2001). The nearest Bureau of Meteorology (BoM) weather station with comprehensive data collection and recent historic climate data is Wandering (no. 010917, Latitude: 32.67°S, Longitude 116.67°E), located 23.7 km east of the study area.

Wandering records the highest mean maximum monthly temperature (32.3°C) in January (lowest in July, 15.8°C) and the lowest minimum mean monthly temperature (4.1°C) in August (highest in February, 14.6°C) (Figure 3-4). Mean annual rainfall is 528.6 mm with July and August recording the highest monthly means (98.6 and 94.1 mm respectively; Figure 3-4). The amount of rainfall across the JAF01 subregion varies considerably dependent on location, with the western scarp recording substantially higher rainfall than to the east and north of the subregion.

Daily mean maximum and minimum temperatures at Wandering preceding each survey were on average slightly warmer than the long-term averages (Figure 3-4). The cumulative winter rainfall (May to September 2024; 310 mm) was 73 mm lower than the long-term average of 383 mm (Figure 3-4); June and September (24.6 and 8.2 mm, respectively) recorded substantially lower rainfall compared to the long-term averages of 78.4 mm and 55.5 mm, respectively. In the 3 months preceding the first survey in September (June to August 2024), records from Wandering show higher than average rainfall was recorded in July and August (110.2 and 108.4 mm, respectively), and June recorded significantly below the long-term average (Figure 3-4).

Temperatures during the surveys were consistent with the long-term averages with the mean maximum temperature ranging between 15.7°C and 35.5°C dependent on the survey period, and the mean minimum temperature between -0.6°C and 18.3°C. A total of 42.2 mm of rainfall was recorded at Wandering, measured from the commencement of the first trip to the conclusion of the third trip (Figure 3-4).

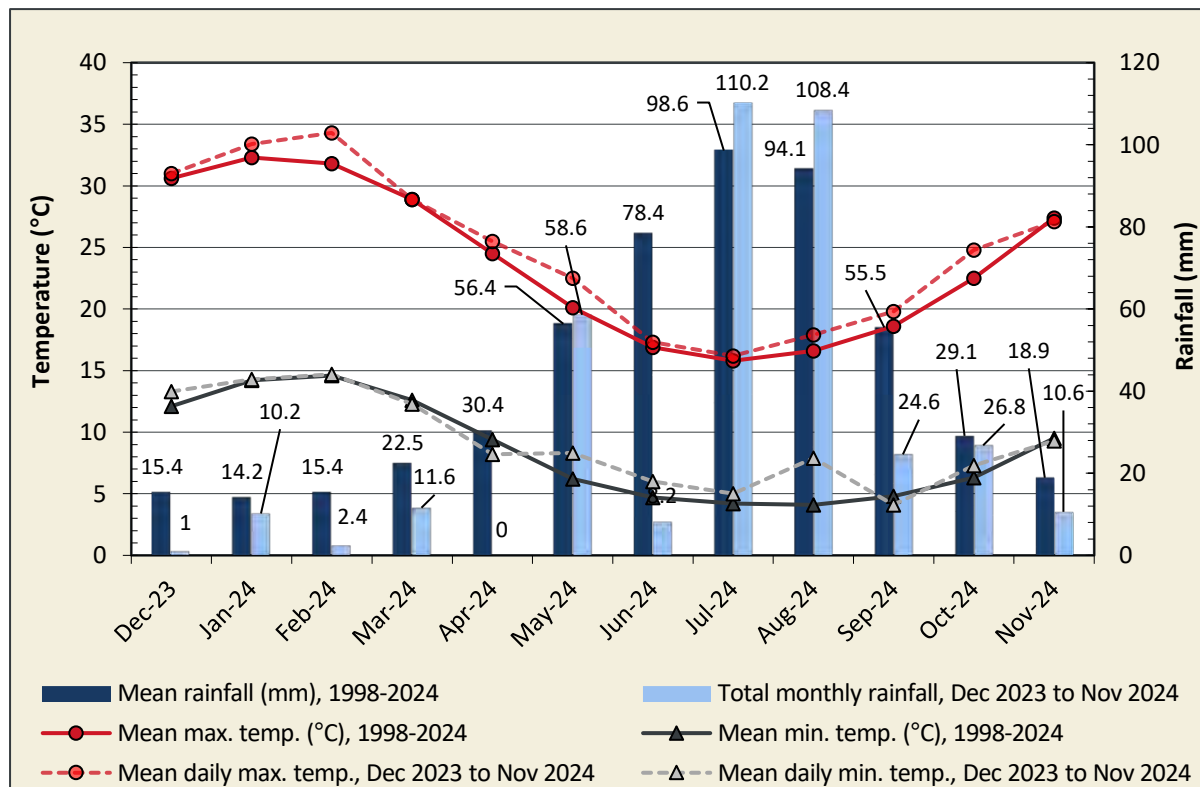


Figure 3-4 Annual climate and weather data for Wandering (no. 010917) and mean monthly data for the 12 months preceding the survey (BoM 2024).

4 METHODS

The surveys were conducted in accordance with relevant survey guidelines and guidance, including:

- *EPA Environmental Factor Guideline: Terrestrial fauna* (EPA 2016)
- *EPA Technical Guidance: Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020)
- Survey guidelines for Australia's threatened mammals (DSEWPac 2011).

4.1 FIELD SURVEY

4.1.1 Survey timing

Field survey dates are provided in Table 4-1.

Table 4-1 Survey dates

Survey type	Season	Dates
Camera deployment	Spring	23 September – 4 October 2024
Camera maintenance	Spring	25 October – 30 October 2024
Targeted trapping	Spring	21 November 2024 – 2 December 2024

4.1.2 Methods

Field methods for the targeted fauna survey of the survey area included:

- habitat assessment (4.1.2.1)
- motion sensitive camera trapping (4.1.2.2)
- targeted Numbat searches (4.1.2.3)
- coat pattern analysis (4.1.2.4)
- targeted trapping (4.1.2.5)
- population estimates (4.1.2.6)
- population modelling (4.1.2.7).

A total of 530 survey sites were sampled (Figure 4-1a-d; Appendix 1).

4.1.2.1 Habitat assessment

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 Woylie and Numbat were identified based on known habitats of the species within the Jarrah Forest bioregion. Tentative sites were selected for the fauna 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 and soil type. Sites were primarily chosen to represent the best example of distinct habitats within the broader habitat associations of the study area (Figure 4-1a-d; Table 4-2; Appendix 1; Appendix 2).

Total field survey effort for Woylie and Numbat across all methods resulted in 644 cage trap nights, 600 Aluminium box trap nights, 123 opportunistic sightings, 68 habitat assessments and 11,260

camera trap nights (Table 4-2; Figure 4-1a-d; Appendix 1). The combined efforts have resulted in a comprehensive survey effort across the habitats of the study areas (Figure 4-1d).

Table 4-2 Combined survey effort

Sites	Cage (nights)	Aluminium box (nights)	Opportunistic sighting	Habitat assessment (#)	Camera (nights)	Targeted Numbat searches (m)
B01 - B19	76	76	5			
C01 - C28	108	108	11	2		
N01 - N27	108	108	7			10,260
P01 - P33	132	132	6			3823
Q01 - Q25	108	92	5	3		
W01 - W26	112	84	6			
BCQ01 - BCQ50			24	50		
HM-1-01 - HM-1-36			6	1	1,012	
HM-2-01 - HM-2-36			2	1	1,048	
HN-1-01 - HN-1-10					300	
HS-1-01 - HS-1-36			5	1	2,196	
NHS-1-01 - NHS-1-36			9		2,277	
NM-1-01 - NM-1-36			4		958	
NM-2-01 - NM-2-36			1	1	1,074	
NS-1-01 - NS-1-36			6		2171	
NS-2-01 - NS-2-08					224	
Opp01 - Opp22			23	2		
WFP01 - WFP06				7		
Newmont-Nest01						
Newmont-ANH05 -Newmont-ANH07						
Newmont-ANH09 -Newmont-ANH10			1			
Newmont-ANH15 -Newmont-ANH23						
Newmont-Nest04-Newmont-Nest08			2			
Total	644	600	123	68	11,260	14,083

4.1.2.2 Motion sensitive camera trapping

Motion sensitive cameras were installed across the study area, using methods described in Thorn (2023), where camera arrays sites were sampled, with 4 arrays deployed at any one time. Each camera array consisted of 36 motion cameras placed in a 6 x 6 camera grid, with each camera placed 330 m apart and 25 cm above the ground. Two of the 4 camera arrays were static, while the third mobile array was moved once within the study area after approximately 4 weeks (Table 4-2; Figure 4-1a). Cameras were baited on a case-by-case basis, where microhabitats or locations showed signs of conservation significant fauna presence that may respond to bait. These cameras were baited with non-consumable, universal bait to promote longevity over the deployment period.

Images from the camera array data were processed through the Colorado Parks and Wildlife (CPW) photo Warehouse software (Newkirk 2016) and were used to identify any individuals uniquely-identifiable based on coat pattern. This includes significant mammals recorded in the survey that are discussed separately to this report (Phoenix 2024). Additionally, all species photographed were identified. Depending on the quality and number of individual identifications, population estimates were extrapolated based on number of individual images (capture, mark and recapture). It should be noted that at least 10 – 20 individuals should be detected in order to make meaningful population estimates (Thorn 2023).

Habitat assessments and searches for signs of dispersing Numbats was also completed to supplement camera data.

4.1.2.3 Targeted Numbat searches

Targeted Numbat searches were conducted by Numbat Niche Consulting, utilising both vehicle-based and on-foot surveys through suitable habitats. The search focused on identifying secondary evidence, such as scats and foraging signs, which can persist year-round. However, foraging signs are most detectable between Spring and Summer, with optimal conditions occurring later in the year due to warmer daytime temperatures and the increased likelihood of encountering dispersing individuals ahead of the breeding season (T. Wilkes-Jones, Pers. Comms, 4 Nov 2024; Figure 4-1c).

4.1.2.4 Coat pattern analysis

Individual Numbats, identifiable by their unique striped coat patterns, would have been mapped and assigned a unique number and name to enable identification upon subsequent recordings.

For population analysis, each time a known individual was identified via camera trap, it would have been counted as a single detection. If an individual remained in the camera's vicinity and continued to trigger the camera, all resulting images would have been considered part of the same detection and treated as a single 'capture' event.

An individual would have been classified as 'recaptured' if detected at the same or a different site more than one hour after the initial capture or detection. To maintain data integrity, any individuals that were only partially photographed or could not be confidently identified as new or previously recorded would have been excluded from population estimates, ensuring that the results were not skewed by uncertain identifications.

4.1.2.5 Targeted trapping

Some individual conservation significant species, such as Woylies, are difficult to uniquely identify using camera trap images. Therefore, individuals were caught and microchipped using passive

integrated transponder (PIT) tags (Mini Microchips Australia) for population estimates using physical capture, mark and recapture methods.

Targeted surveys for Woylie were undertaken across the study area (Figure 4-1b) using methods described in Smith (2020). Cage and aluminium box traps were deployed across the study area for 4 nights, before being moved to new areas for an additional 4 trapping nights. Moving traps avoids continuous trapping of 'trap-happy' individuals skewing the data. Caught animals were marked with PIT tags, released and recaptured to determine approximate population estimates in the study area.

Morphometric data was collected, and PIT tags were implanted in all captured Woylies. All captures were initially scanned with a microchip reader to determine whether they were previously caught individuals. All non-microchipped animals were implanted with a PIT tag and the 15-digit microchip number recorded to enable identification upon recapture. The following morphometric data was collected from captured individuals (where applicable):

- age
- head length (mm)
- mass (g)
- sex and reproductive condition
- short pes (foot) length (mm)
- body condition score (1-3).

While undertaking the targeted trapping, habitat assessments and searches for signs of dispersing Numbats was completed to supplement trapping data.

4.1.2.6 Population estimates

Where individual identification could not be obtained on camera images and detection rates were insufficient for modelling, individual identifications were derived by reviewing the following parameters for Woylie:

- geographic spread of detections via both physical trapping and camera data
- counting independent camera trap detections (i.e. detections with at least one hour between camera images)
- reviewing home range size
- frequency and temporal scale of detections
- number of individuals photographed at each detection.

By combining all types of species detections, reviewing the species expected range and the number of detections, we estimated a relative number of individuals across the study area. Doing so enables individuals to be identified and the population modelling to run. The estimated home range size for Woylie (*Bettongia penicillata ogilbyi*; EN/CR (EPBC Act; BC Act)) was 65 ha (Yeatman & Wayne 2015).

A home range buffer was applied to each detection so that detections that occurred outside of the buffer were considered unique individuals. Additionally, detections within the buffer that occur at different sites (i.e. separated by at least 330 m), but at the same or very similar times are likely to be different individuals, as they are unable to be detected at both sites simultaneously.

4.1.2.7 Population modelling

Spatially Explicit Capture-Recapture (SECR) is an R package used for analysing data from capture-recapture surveys, where individuals in a population are 'marked' (via PIT tags or being uniquely identifiable) and then detected (or not detected) across multiple occasions (Efford 2024; R Core Team 2023). The SECR package estimates population density and size while accounting for spatial information and the fact that individuals are not always detected. The SECR package is particularly

useful in studies where animals are detected by spatially distributed detectors (like cameras and traps) that vary in their effectiveness over space and time.

Over 6 separate models were run per metric provided to ensure appropriate parameters were included. In addition to this, adjusting the parameters appropriately and running outputs meant that models were not ‘overly fitted’ to the data, biasing the results.

For this survey, a capture-recapture model was run based on either the Half-normal Function, or Hazard Rate function, depending on which function best fit the data. These methods are similar to the modelling completed by Thomas (2020), adjusted for each of the targeted species. Key assumptions of this model are presented in Table 4-3.

Table 4-3 Key assumptions of the capture-recapture model

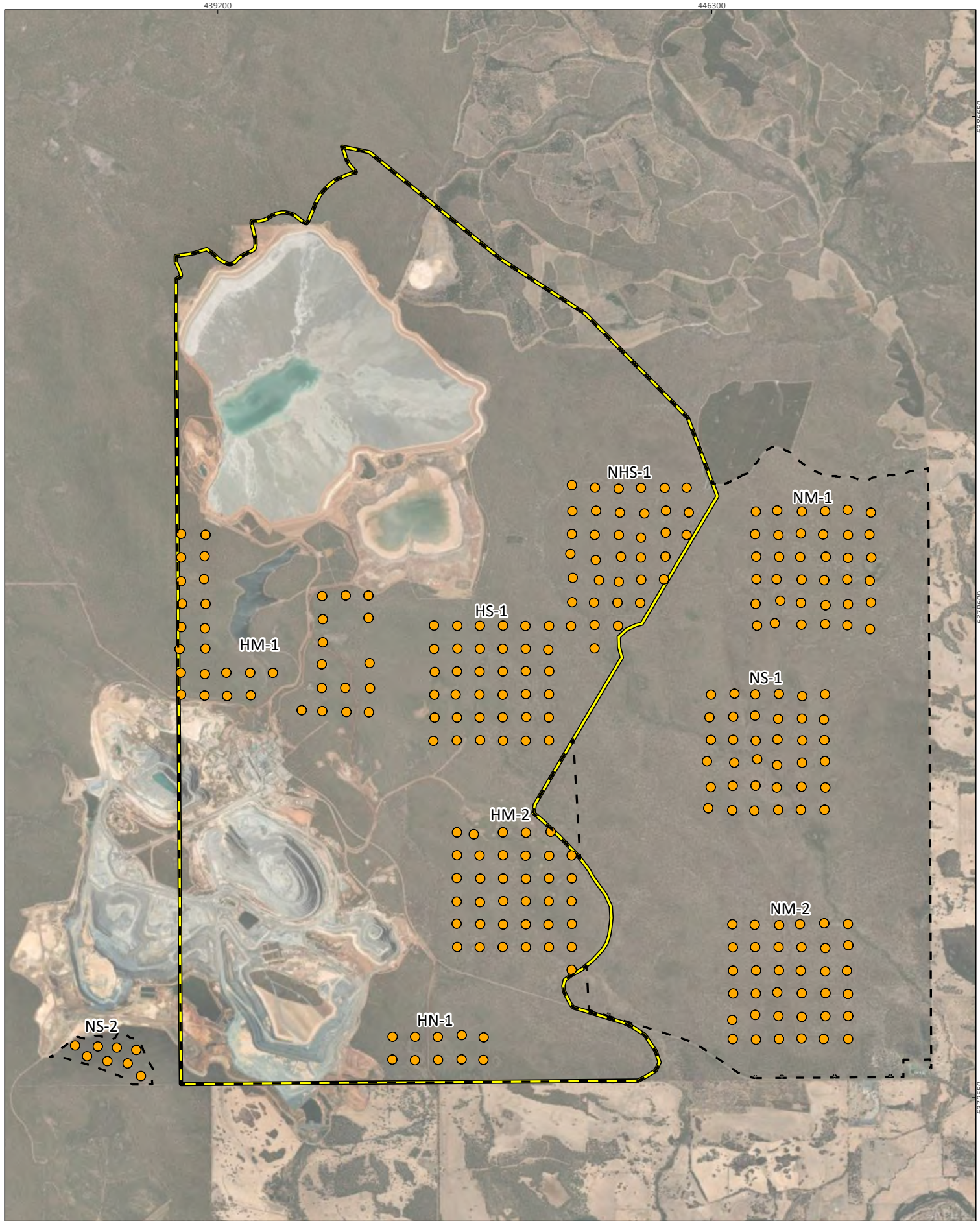
Assumption	Explanation
The population is closed	The model assumes there are no changes in the number of individuals (no births, deaths, or migration) between the time of the first and last capture occasion. While population changes during the field survey are possible, the model assumes the population size is constant.
Constant detection parameters	The model assumes that the detection probability (g_0) and the scale of the detection function (σ) are constant across space (i.e., the trapping area) and time. This means that the study area is homogenous in terms of detection probability. While in reality the landscape varies across space, the study area consists of suitable habitat for all targeted species and therefore is homogenous in terms of habitat suitability.
Individual homogeneity	The model assumes that there is no variation in individual detectability.
Poisson distribution for detections	The number of detections at each trap follows a Poisson distribution, meaning the number of detections is a count and can vary across traps, but it is assumed to follow a predictable statistical distribution.
Spatial and Temporal Independence	The model assumes that the detections at each trap are independent, and that the traps are spaced sufficiently apart that animals are unlikely to be detected by more than one trap at the same time.

4.1.3 Survey personnel

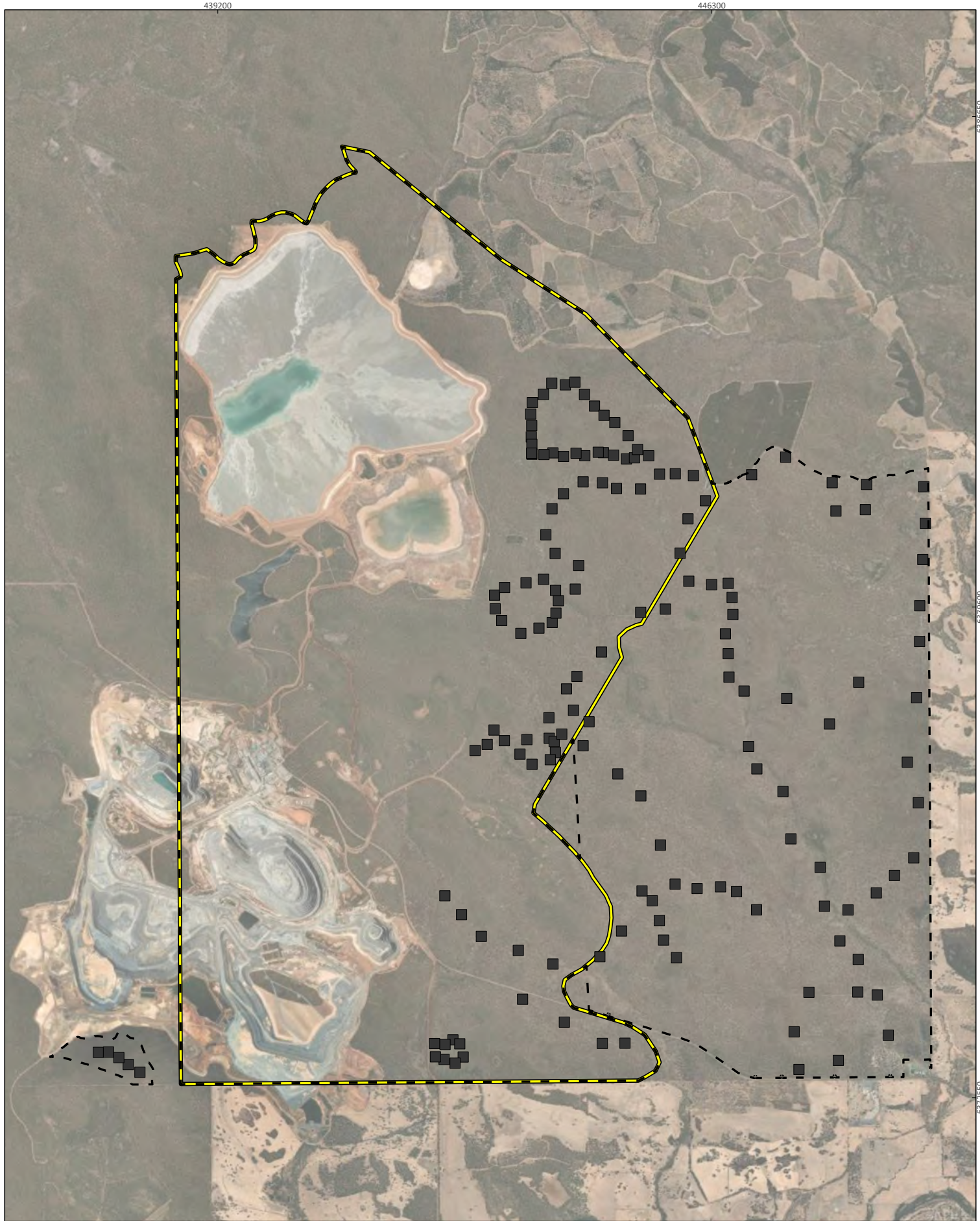
The personnel involved in the surveys are listed in Table 4-4. All survey work was carried out under relevant licences issued by DBCA under the BC Act and DPIRD under the Animal Welfare Act (Table 4-4).

Table 4-4 Survey personnel

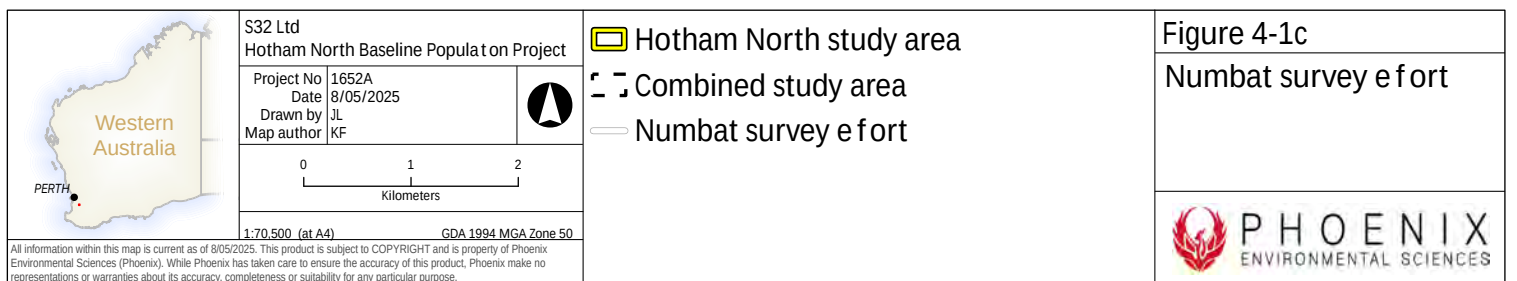
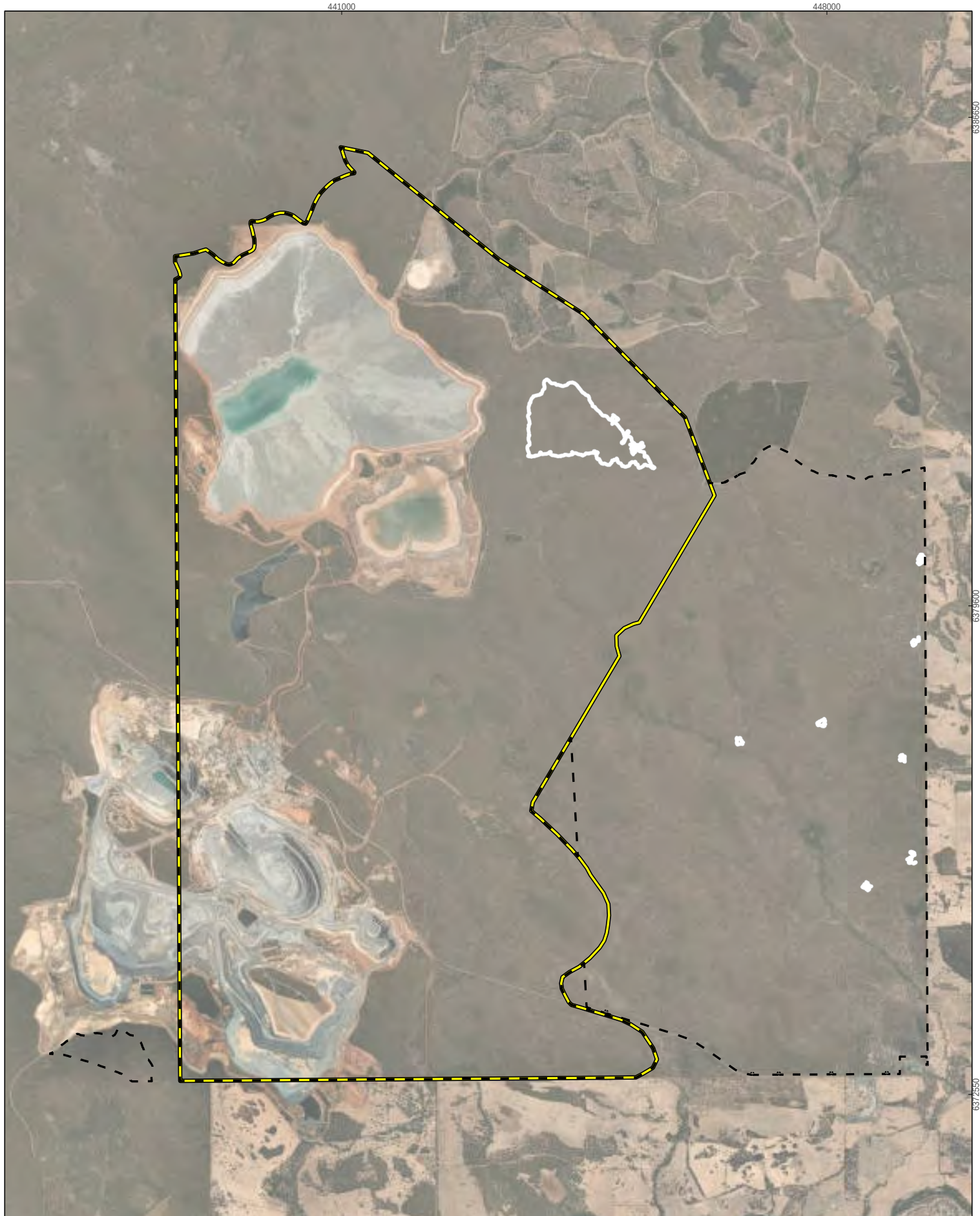
Name	Permit	Qualifications	Role/s
Kerryn Fox	Fauna taking (biological assessment) licence no. BA27001152 Authorisation to take or disturb threatened species licence no TFA-2425-0068 WAECS Scientific Use Licence no. U304/2022-2024.	MSc Veterinary Sciences	Project management, field survey, data management and analysis, reporting
Sarah Woodiss-Field		BSc Science (Zoology and Conservation Biology)	Field survey, camera image analysis
Ethan Broom		BSc Zoology (Hons)	Field survey
Brooke Quick		BSc Environmental Sciences	Field survey, camera image analysis
Paula Strickland		MSc Zoology and Conservation Biology	Field survey, camera image analysis
Tamara Wilkes-Jones		Numbat Niche Consulting, BSc Environmental Management	Project consultation, field survey, camera image analysis
Will Purser		MSc Biological Sciences (Zoology)	Field survey, camera image analysis, reporting
Deon Loo		BSc Science (Zoology)	Field survey, camera image analysis
Jacob Anderson		BSc Liberal Arts and Sciences (Biology)	Camera image analysis
Siyun Jung		BSc Zoology candidate	Camera image analysis

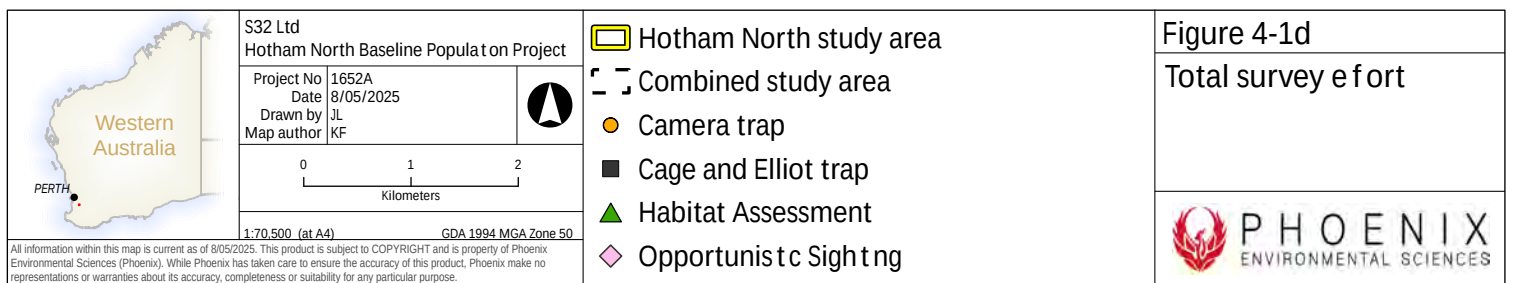
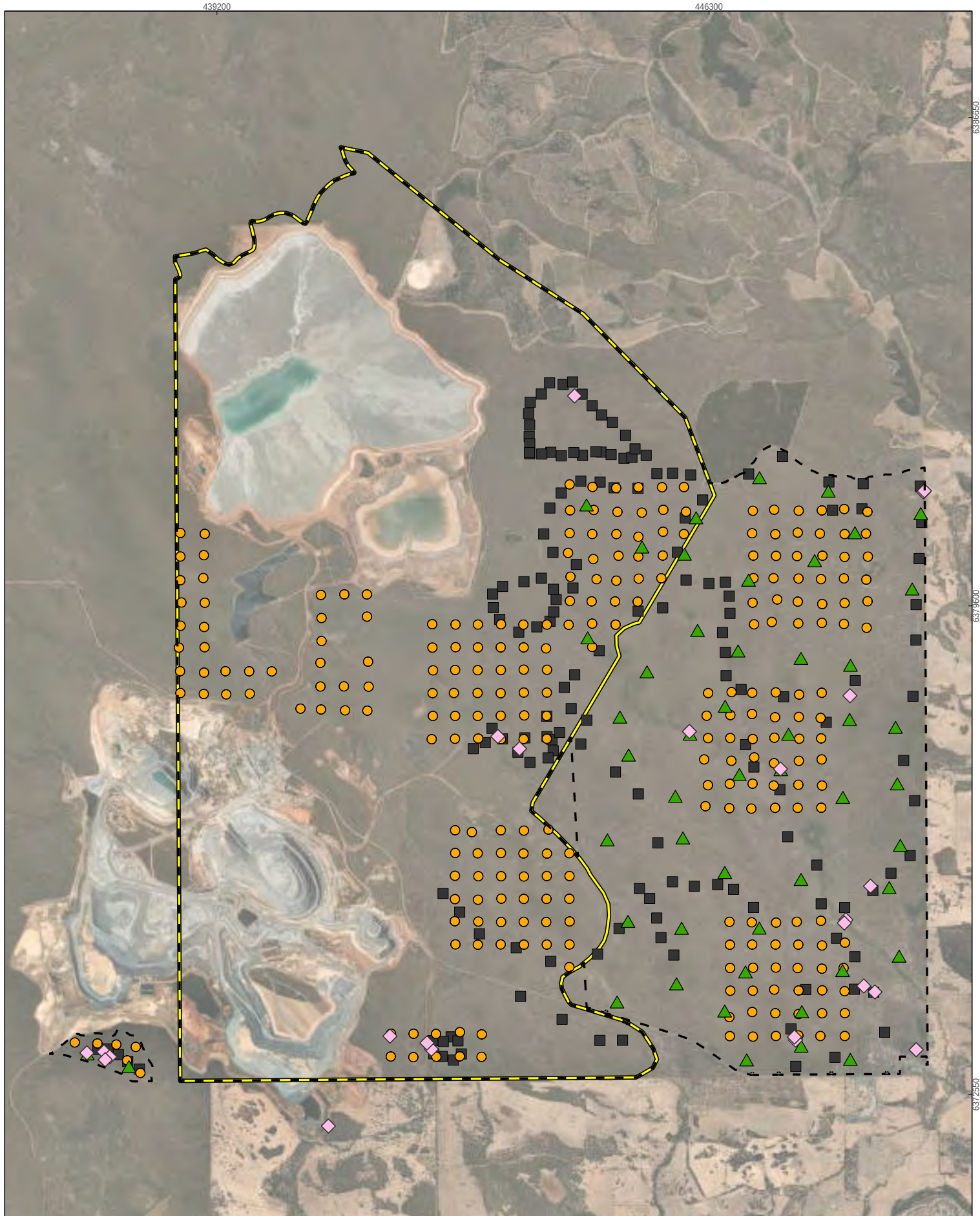


Western Australia PERTH	S32 Ltd Hotham North Baseline Population Project <table border="1"> <tr> <td>Project No</td> <td>1652A</td> </tr> <tr> <td>Date</td> <td>10/02/2025</td> </tr> <tr> <td>Drawn by</td> <td>JL</td> </tr> <tr> <td>Map author</td> <td>KF</td> </tr> </table> 0 1 2 Kilometers 1:70,500 (at A4) GDA 1994 MGA Zone 50 All information within this map is current as of 10/02/2025. 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.	Project No	1652A	Date	10/02/2025	Drawn by	JL	Map author	KF	Hotham North study area Combined study area Camera trap	Figure 4-1a Camera trapping arrays
		Project No	1652A								
Date	10/02/2025										
Drawn by	JL										
Map author	KF										



Western Australia PERTH	S32 Ltd Hotham North Baseline Population Project <table border="1"> <tr> <td>Project No</td> <td>1652A</td> </tr> <tr> <td>Date</td> <td>17/02/2025</td> </tr> <tr> <td>Drawn by</td> <td>JL</td> </tr> <tr> <td>Map author</td> <td>KF</td> </tr> </table> 1:70,500 (at A4) GDA 1994 MGA Zone 50 All information within this map is current as of 17/02/2025. 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.	Project No	1652A	Date	17/02/2025	Drawn by	JL	Map author	KF	Hotham North study area Combined study area Cage and aluminium box trap	Figure 4-1b Targeted trapping locations PHOENIX ENVIRONMENTAL SCIENCES
		Project No	1652A								
Date	17/02/2025										
Drawn by	JL										
Map author	KF										
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5 RESULTS

5.1 HABITATS

Existing vegetation complex mapping for the south-west (Mattiske 2024; Mattiske & Havel 1998) was reinterpreted to classify vertebrate fauna habitats within the study area. This reinterpretation involved assessing the suitability of mapped habitats based on vegetation structure, landscape features, and soil types to determine their potential to support Woylie and Numbat. Additionally, habitat polygons were updated to reflect current conditions in the study area.

A total of 7 habitat types were identified, as well as cleared land and rehabilitated land, plantations and dams (Table 5-1; Figure 5-1). A significant portion of the study area consists of cleared land, including mining operations and tracks covering 3,047.2 ha (39.1% of the study area). Among the remaining native vegetation, the dominant habitat is Jarrah (*Eucalyptus marginata*)–Marri (*Corymbia calophylla*) forest, with patches of Wandoo (*Eucalyptus wandoo*) on well drained soils, covering 1,882.3 ha (24.1%).

Mixed eucalypt woodland, occurring on slopes and valley floors, covers 859.2 ha (11%) and is associated with seasonal inundation. Other smaller habitat types include Melaleuca woodlands and shrublands in low-lying, water-logged areas, as well as rehabilitation areas, which consist of regenerating native vegetation with a dense structure but lacking mature canopy, covering 202.7 ha (2.6%). Additionally, plantation areas of pine and blue gum cover 214.8 ha (2.8%), and artificial dams make up 104.1 ha (1.3%).

Within the combined survey area, a total of 2.6 ha (0.02%) of the study area was not mapped under the Mattiske and Havel (1998) south-west forest vegetation complex mapping.

When considering the combined survey area, habitat proportions are as follows (Table 5-1):

- 3,054.3 ha (26.2%) – Cleared areas
- 3,002.7 ha (25.8%) – Jarrah/Marri forest
- 1,881.6 ha (18.1%) – Jarrah/Marri/Allocasuarina forest
- 2,895.3 ha (24.9%) – Mixed eucalypt woodland on slopes and valley floors
- 214.9 ha (1.8%) – Plantation
- 202.7 ha (1.7%) – Rehabilitation Areas
- 179.7 ha (1.5%) – Woodland and/or shrubland on shallow soils
- 104.1 ha (0.9%) – Dams
- 93.8 ha (0.8%) – Melaleuca woodlands/shrublands on low-lying water-logged areas
- 18.0 ha (0.2%) – Wandoo and other eucalypt woodland on slopes
- 2.6 ha (<0.1%) – Unmapped Areas
- 1.0 ha (<0.1%) – Heathland.

Table 5-1 Habitats in the study area.

Habitat	Description	Sites	Study Area (ha and %)	Combined Area (ha and %)	Representative photo
Cleared Not considered suitable habit for conservation significant fauna.	Mattiske and Havel (1998) name: N/A Mattiske (2024) name: Cleared land Areas cleared of almost all native vegetation. Land use consists of mining activities, vehicle tracks (pictured).	Opp13, Opp14, Opp07	3,047.2 (39.1%)	3,054.3 (26.2%)	

Habitat	Description	Sites	Study Area (ha and %)	Combined Area (ha and %)	Representative photo
Jarrah/ Marri forest Suitable habitat for Woylie and Numbat	Mattiske and Havel (1998) name: Jarrah/Marri forest/woodland on lateritic uplands and Jarrah/Marri/Wandoo open woodland/forest on lateritic uplands Mattiske (2024) name: Open forest of <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over <i>Hakea lissocarpa</i>, <i>Macrozamia riedlei</i>, <i>Acacia alata</i> and Open forest to woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> with occasional admixtures of <i>Banksia grandis</i>. Mixed eucalypt woodland dominated by Jarrah and Marri on laterite. More complex structure than open Jarrah, Marri and Wandoo woodlands and typically more highly elevated	W15, NS-1-31, N20, N22, NHS-1-29, HM-2-22, HM-2-24, NM-1-28, NM-1-17, Q07, NM-1-36, NM-1-30, P02, P07, HN-1-01, Opp15, Q06, HS-1-07, NM-1-01, HM-1-18, HM-1-26, HM-1-31, N11, HM-1-30, HM-1-27, HM-1-22, NS-1-17, NM-1-21, NM-1-15, Opp16, W02, W01, WFP06, C08, Opp17, W05, W04, W03, HN-1-09, BCQ29, N09, N08, NHS-1-03, NS-2-07, NS-2-06, NS-2-05, NS-2-02, NS-2-03, NS-2-04, NS-2-08, HM-2-01, HM-2-07, HM-2-08, BCQ30, Opp02, Opp01, BCQ32, Newmont-ANH20, Newmont-ANH21, NM-1-34, C13, C11, C10, C15, Newmont-ANH15, Newmont-ANH17, W13, W17, W14, W21, P27, P25, P22, P28, P29, HN-1-10, Q23, Q15, Q13, Q12, Q24, HS-1-29, HS-1-36, N15, N14, N21, N19, N18, N17, N16, B16, B10, NM-2-22, NM-2-14, NHS-1-25, NHS-1-18, NHS-1-24, NHS-1-17, HS-1-14, NHS-1-19, HS-1-26, HS-1-32, NHS-1-13, NHS-1-27, NHS-1-20, NHS-1-12, NHS-1-11, NHS-1-26, HS-1-33, NHS-1-22, HM-2-29, NM-1-13, NM-1-14, NM-1-20, NM-1-27, NM-1-33, NM-1-22, NM-1-23, NM-1-29, NM-1-18, HM-2-34, W12, NM-2-23, NHS-1-35, HS-1-20, HS-1-15, HS-1-21, NHS-1-16, HM-2-23, HM-2-05, NM-1-26, NM-1-32, NM-1-35, NM-1-24, BCQ25, BCQ24, W07, W06, C07, P01, Newmont-Nest07, W09, P04, P06, BCQ20, HN-1-08, HN-1-06, HN-1-05, BCQ21, BCQ22, Q05, Q01, NS-1-05, NS-1-02, NS-1-01, W08, NHS-1-09, NHS-1-02, NHS-1-08, NHS-1-04, HM-2-03, NM-1-07, NM-1-02, NM-1-08, NM-1-06, BCQ18, BCQ19, HM-2-04, BCQ17, BCQ45, BCQ41, BCQ23, BCQ34, BCQ16, BCQ44, NHS-1-36, Q18, HM-1-11, HM-1-15, N26, N27, N10, NHS-1-31, NHS-1-10, NHS-1-23, Q17, HM-2-11, C02, C03, Q02, Newmont-ANH05, P03, Q04, Q03, HM-1-07, HS-1-06, HS-1-02, HM-2-06, NS-2-01, HM-1-10	1,882.3 (24.1%)	3,002.7 (25.8%)	

Habitat	Description	Sites	Study Area (ha and %)	Combined Area (ha and %)	Representative photo
Jarrah/Marri/Allocasuarina forest Suitable habitat for Woylie and Numbat	Mattiske (2024) name: Open forest of <i>Allocasuarina fraseriana</i> , <i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i> and <i>Banksia grandis</i> over <i>Adenanthos barbiger</i> , <i>Leucopogon capitellatus</i> on gravels and sandy gravels on slopes and ridges.	HM-1-13, HM-1-14, HM-1-36, HM-1-05, HM-1-04, HM-1-01, HM-1-09, C22, C21, C14, Newmont-ANH18, W11, W10, W16, W20, P24, P23, HM-1-23, HM-1-28, HM-1-19, HM-1-32, Q19, Q16, HM-1-12, NS-1-12, HS-1-23, HS-1-17, HS-1-12, HS-1-18, N24, N13, N12, N23, B11, HM-1-33, HM-1-34, HM-1-21, NM-2-28, NM-2-17, NM-2-18, HS-1-25, HS-1-22, HS-1-19, HM-2-33, HM-2-27, HM-2-20, HM-2-15, HM-2-16, HM-2-10, HM-2-26, HM-2-32, HM-2-35, C23, BCQ33, Q21, Q20, NS-1-11, N07, NM-2-29, NM-2-04, BCQ48, C09, C01, Q09, HS-1-09, Newmont-Nest04, Newmont-ANH09, WFP04, N01, HM-1-03, HM-1-02, NS-1-06, N03, N02, N06, N05, HM-1-06, N04, N25, NM-2-09, NM-2-08, NM-2-11, HS-1-08, HS-1-01, HS-1-03, HM-2-02, HM-2-09, BCQ50, BCQ40, BCQ31, HN-1-07, P20, HM-1-35, NM-2-31	1,409.2 (18.1%)	1,881.6 (16.1%)	

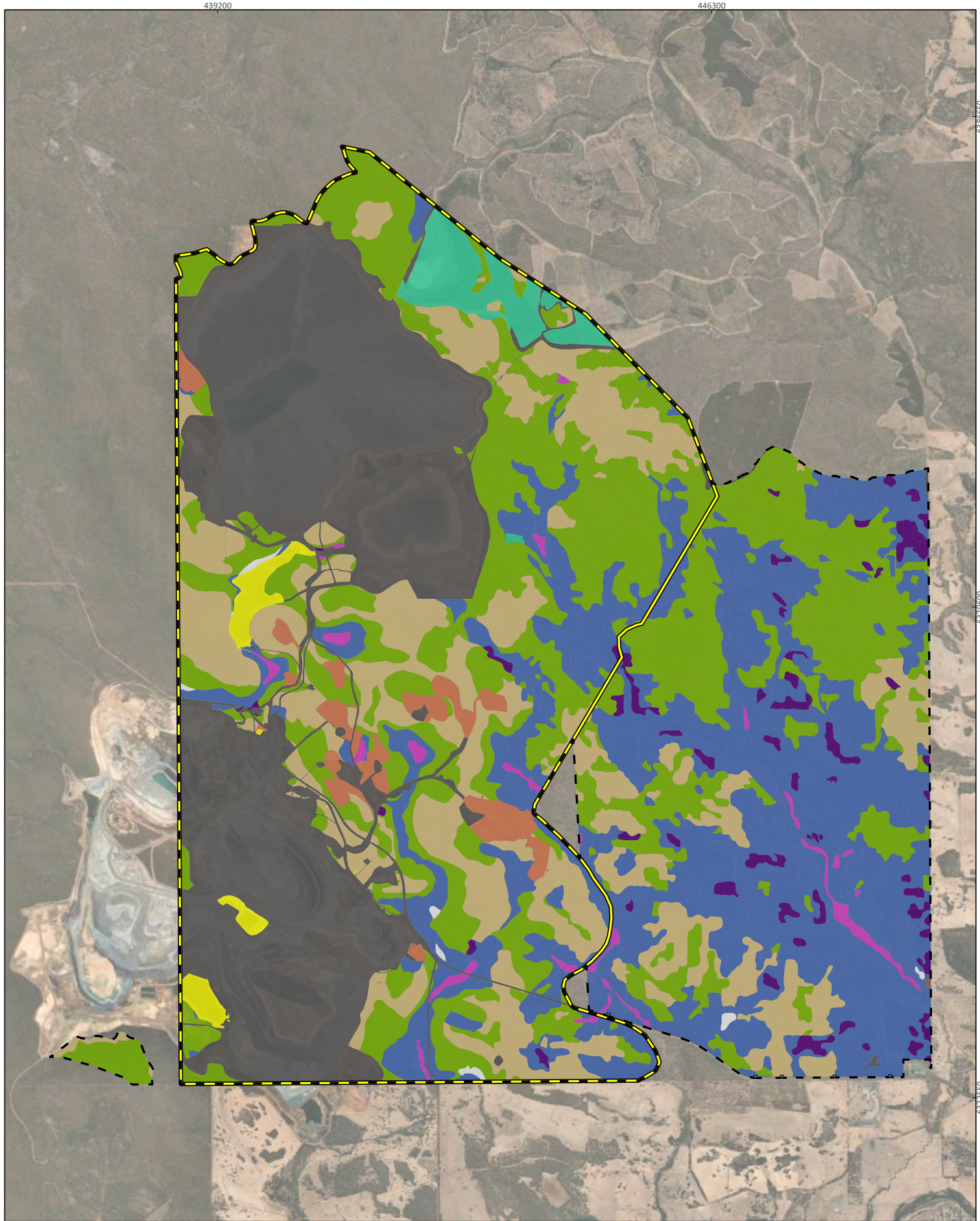
Habitat	Description	Sites	Study Area (ha and %)	Combined Area (ha and %)	Representative photo
Mixed eucalypt woodland on slopes and valley floors Suitable habitat for Woylie	Mattiske and Havel (1998) name: Open Jarrah/Marri on slopes with Blackbutt/Wandoo woodlands on valley floors Mattiske (2024) name: Open woodland of Eucalyptus rudis and Eucalyptus Wandoo over Acacia saligna, Hakea prostrata and Hypocalymma angustifolium on clay-loams on valley floors. Open Jarrah and Marri woodland with areas of Blackbutt and Wandoo on drainages and in valleys. Associated with seasonal inundation.	C25, C24, C20, Newmont-ANH16, W18, W19, W24, P26, P21, P12, P13, Newmont-ANH23, NS-1-13, NS-1-19, NS-1-25, NS-1-32, NS-1-26, NS-1-20, Q25, HS-1-31, B12, B13, B14, NM-2-33, NM-2-34, NS-1-22, NS-1-34, NS-1-27, NS-1-15, NM-2-15, NM-2-10, NM-2-16, NM-2-20, NHS-1-28, NHS-1-21, NS-1-29, NS-1-36, HS-1-34, HM-2-28, HM-2-21, NM-1-25, NM-1-19, NM-1-16, NM-1-12, HM-2-31, C19, P15, NM-2-27, NM-2-21, NM-2-32, NM-2-26, NM-2-30, NM-2-36, NM-2-35, NS-1-18, NM-2-02, NM-2-12, NS-1-35, NM-1-31, NM-1-09, BCQ38, BCQ06, BCQ13, BCQ03, BCQ01, W25, C05, P33, P05, WFP03, Opp19, Q08, NS-1-08, NS-1-09, HS-1-35, B03, B05, Opp09, NS-1-28, NM-2-03, NM-2-01, NM-2-06, NHS-1-07, NHS-1-06, NHS-1-05, BCQ14, BCQ07, BCQ37, BCQ08, BCQ10, BCQ15, BCQ42, BCQ04, BCQ05, BCQ12, BCQ43, C16, C18, C17, P32, P10, Newmont-ANH10, W22, W23, W26, P30, P31, Newmont-ANH19, HM-1-20, Q14, Q11, HS-1-24, HS-1-30, B15, NM-2-13, NHS-1-30, NHS-1-14, HS-1-13, NHS-1-15, HS-1-27, HS-1-28, NHS-1-34, HM-2-30, HM-2-17, NM-1-10, HM-2-14, HM-2-25, NM-2-07, NHS-1-33, NM-1-03, BCQ35, P08, Newmont-Nest05, B09, Newmont-Nest06, Opp21, Opp20, Opp11, WFP05, B04, B08, B01, NHS-1-01, NM-1-04, NM-1-05, BCQ09, Opp03, BCQ36, C28, C27, P17, Q22, NS-1-10, NS-1-24, C04, Opp04, BCQ47, BCQ28, Opp10, C12, P11, P14, P18, HM-1-29, HM-1-24, HM-1-16, NS-1-14, Q10, B19, NS-1-23, NM-2-19, NS-1-30, NHS-1-32, NS-1-16, HM-2-12, HM-2-18, Opp18, P09, Newmont-ANH06, Newmont-ANH07, Newmont-Nest01, WFP02, HN-1-02, HN-1-03, HM-1-08, NS-1-03, NS-1-07, C06, BCQ39, BCQ27, BCQ26, HS-1-11, HM-1-17, HM-1-25, HS-1-10, NS-1-33, WFP01, B02, BCQ46, BCQ11	859.2 (11%)	2,895.3 (24.9%)	
Plantation Not considered suitable habit for Numbat or Woylie	Mattiske and Havel (1998) name: N/A Mattiske (2024) name: Plantation Areas of pine and blue gum plantation, previously cleared of native vegetation.	None	214.8 (2.8%)	214.9 (1.8%)	Photo unavailable.

Habitat	Description	Sites	Study Area (ha and %)	Combined Area (ha and %)	Representative photo
Rehabilitation Areas Suitable habitat for Woylie	Mattiske and Havel (1998) name: N/A Mattiske (2024) name: Rehabilitation Areas Areas of regenerating native vegetation. Substrate previously ripped to promote growth. These areas are dense and lack mature, old-growth canopy.	HS-1-16, HM-2-19, HM-2-13, HS-1-05, HS-1-04, NM-2-05, NM-1-11, C26, P19, B17, B18, NS-1-21, NM-2-25, NM-2-24, Opp08, BCQ02, Newmont-ANH22, NS-1-04, B06, B07, Newmont-Nest08, Opp05	202.7 (2.6%)	202.7 (1.7%)	
Dam Not considered suitable habit for Woylie or Numbat	Mattiske and Havel (1998) name: N/A Mattiske (2024) name: Dam Artificial water bodies with cleared areas in the immediate surrounds. These areas are highly disturbed by mining activities and maintain exclusion zones.	None	104.1 (1.3%)	104.1 (0.9%)	Photo unavailable.

Habitat	Description	Sites	Study Area (ha and %)	Combined Area (ha and %)	Representative photo
Melaleuca woodlands/shrublands on low-lying water-logged areas Not considered suitable for Woylie or Numbat	Mattiske and Havel (1998) name: Melaleuca woodlands/shrublands on seasonally wet or water-logged clays and clay loams in swamps or depressions And Flooded Gum/Melaleuca and Casuarina woodland on valley floors Mattiske (2024) name: Tall shrubland of <i>Melaleuca lateritia</i>, <i>Hakea varia</i>, <i>Melaleuca viminea</i> and <i>Melaleuca incana</i> subsp. l on clay loams in seasonally wet valley floors. Seasonally inundated areas or permanent water-logged, low-lying swamps and depressions. Dominated by Melaleuca woodlands and scattered areas of shrubland.	HM-2-36, P16, Opp22, Opp06, HN-1-04, Opp12, BCQ49	50.2 (0.6%)	93.8 (0.8%)	

Habitat	Description	Sites	Study Area (ha and %)	Combined Area (ha and %)	Representative photo
Woodland and/or shrubland on shallow soils Suitable habitat for Woylie and Numbat	Mattiske and Havel (1998) name: Woodland and/or heath/shrubland on shallow soils on granite or outcrops Mattiske (2024) name: Mosaic of open woodland of <i>Allocasuarina huegeliana</i> and closed heath of Proteaceae Myrtaceae spp. to Lithic Complex on exposed or shallow granite outcrops. Mixed eucalypt woodlands with varying densities of heath and shrubland. Soils are shallow with granite outcropping present.	B18, NS-1-21, NM-2-25, NM-2-24, Opp08, BCQ02, Newmont-ANH22, NS-1-04, B06, B07, Newmont-Nest08, Opp05	14.4 (0.2%)	179.7 (1.5%)	

Habitat	Description	Sites	Study Area (ha and %)	Combined Area (ha and %)	Representative photo
Wandoo and other eucalypt woodland on slopes Suitable habitat for Woylie and Numbat	Mattiske and Havel (1998) name: Wandoo woodland with Jarrah/Marri/Blackbutt on valley slopes Mattiske (2024) name: Open woodland of <i>Eucalyptus patens</i> with some <i>Eucalyptus wandoo</i> over <i>Xanthorrhoea preissii</i> , <i>Macrozamia riedlei</i> , <i>Trymalium ledifolium</i> , <i>Acacia saligna</i> and <i>Hakea prostrata</i> on clay and clay loam soils on lower slopes. Woodland areas of Wandoo, Jarrah, Marri, Blackbutt or combinations of these species over lower lying areas.	B17	13.2 (0.2%)	18 (0.2%)	
Unmapped Areas	Unmapped	None	0 (0%)	2.6 (0.02%)	Photo unavailable.
Heathland Suitable habitat for Woylie:	Mattiske and Havel (1998) name: N/A Mattiske (2024) name: Mosaic of open heath of Proteaceae - Myrtaceae spp. with emergent patches of <i>Eucalyptus drummondii</i> on shallow soils on slopes. Mixed shrubland with scattered eucalypts offering a range middle and lower storey habitats.	None	0 (0%)	1 (0.01%)	Photo unavailable.
Total			7,797.3 (100%)	11,650.5 (100%)	



Western Australia PERTH	S32 Ltd Hotham North Baseline Population Project		Hotham North study area Combined study area	Mixed eucalypt woodland on slopes and valley floors Plantation Rehabilitation Areas Wandoo and other eucalypt woodland on slopes Woodland and/or shrubland on shallow soils	Figure 5-1 Habitats of the the study area
	Project No 1652A Date 10/02/2025 Drawn by JL Map author KF		Habitat Cleared Dam Heathland Jarrah/Marri forest Jarrah/Marri/Allocasuarina forest Melaleuca woodlands/shrublands on low lying water-logged areas		
		1:70,500 (at A4) GDA 1994 MGA Zone 50			
All information within this map is current as of 10/02/2025. 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.					

5.2 SIGNIFICANT VERTEBRATE FAUNA

Woylie (*Bettongia penicillata ogilbyi*; EN/CR (EPBC Act; BC Act) was recorded during both the camera and trapping surveys, however Numbat (*Myrmecobius fasciatus*; EN/CR (EPBC Act; BC Act) was not recorded during any of the field surveys (Table 5-2). Other conservation significant fauna, not the target of this survey, were recorded in the survey. This comprised of 5 Threatened and two Priority vertebrate fauna (Table 5-2), including 3 species of black cockatoo:

- Forest Red-tailed Black Cockatoo (*Calyptrorhynchus banksii naso*; VU (EPBC & BC Acts))
- Baudin's Cockatoo (*Zanda baudinii*; EN (EPBC & BC Acts))
- Carnaby's Cockatoo (*Zanda latirostris* EN (EPBC & BC Acts)).

Chuditch (*Dasyurus geoffroii*; VU (EPBC & BC Acts)), Quenda (*Isoodon fusciventer*; P4 (DBCA list)), South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*; CD (BC Act)) and Western Brush Wallaby (*Notamacropus irma*; P4 (DBCA list)) were also recorded (Table 5-2; Figure 5-2a). In addition to the significant vertebrate fauna, 5 naturalised introduced species were recorded (Figure 5-2b), including:

- Cat (*Felis catus*)
- Laughing Kookaburra (*Dacelo novaeguinea*)
- Pig (*Sus scrofa*)
- Rabbit (*Oryctolagus cuniculus*)
- Red Fox (*Vulpes vulpes*).

Threatened and Priority fauna records were reported to DBCA via the licencing return system.

Table 5-2 Details of significant and introduced vertebrate fauna recorded during the field survey

Species	Status	Distribution and ecology	Survey records	Field photograph
Targeted Conservation significant fauna				
Woylie (<i>Bettongia penicillata ogilbyi</i>)	EN/CR (EPBC Act; BC Act)	A nocturnal marsupial once widespread across Australia but now restricted to a few populations in southwest Western Australia. It prefers open eucalypt forests and shrublands with dense ground cover, where it forages for fungi, seeds, and tubers (Yeatman & Groom 2011). As an important ecosystem engineer, it plays a key role in soil turnover and seed dispersal, but predation and habitat loss have made it Critically Endangered.	705 records, 4 records from cage trapping, 10 opportunistic sightings 691 records from camera images.	
Numbat (<i>Myrmecobius fasciatus</i>)	(EN/CR (EPBC Act; BC Act)	A diurnal marsupial once found across southern Australia but now limited to a few small populations in southwest WA. It inhabits open eucalypt woodlands with abundant logs and loose soil, where it feeds almost exclusively on termites. Through its foraging behaviour—digging into soil and logs to access termite colonies—the numbat contributes to soil turnover and aeration, playing a valuable role as an ecosystem engineer (Thorn 2023). However, habitat loss and introduced predators have led to its Endangered status.	Not recorded	N/A

Species	Status	Distribution and ecology	Survey records	Field photograph
Other Conservation significant fauna				
Forest Red-tailed Black Cockatoo (<i>Calyptorhynchus banksii naso</i>)	VU (EPBC & BC Acts)	Endemic to the southwest of Western Australia, primarily found in Jarrah, Marri, and Karri forests. It relies on large, hollow-bearing trees for nesting and roosting, while its diet consists mainly of Marri, Jarrah, and Blackbutt seeds. This species is highly mobile, traveling long distances in search of food and water, and is considered vulnerable due to habitat loss and reduced availability of nesting hollows (DCCEEW 2024c).	49 opportunistic records flying over or perched in the study area.	
Baudin's Cockatoo (<i>Zanda baudinii</i>)	EN (EPBC & BC Acts)	Baudin's Black Cockatoo inhabits the tall, wet eucalypt forests of southwest Western Australia, particularly in Karri and Jarrah woodlands. It has a long, slender bill adapted for extracting seeds from Marri nuts, though it also feeds on Banksia, Hakea, and orchard crops. This species migrates seasonally, moving from inland forests to coastal areas, and is threatened by habitat destruction and poaching (DCCEEW 2024d).	5 records, one on camera trap HS-1-24 and 4 opportunistic sightings flying over the study area.	

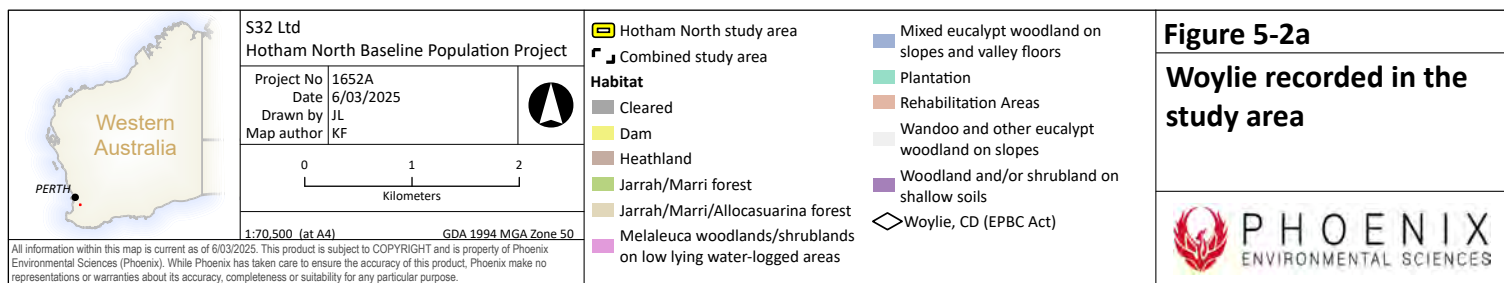
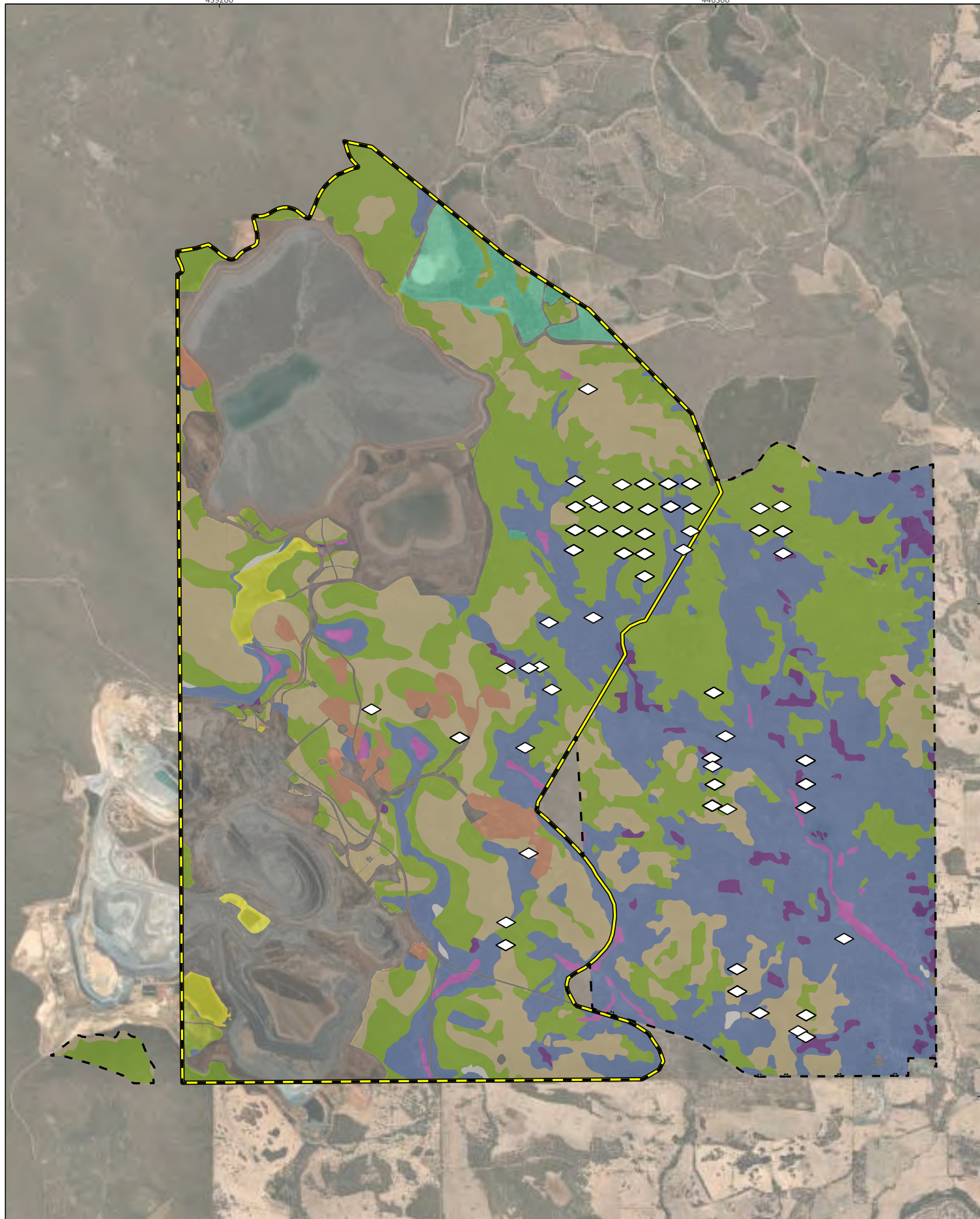
Species	Status	Distribution and ecology	Survey records	Field photograph
Carnaby's Cockatoo (<i>Zanda latirostris</i>)	EN (EPBC & BC Acts)	Carnaby's Black Cockatoo is found in the drier woodlands and heathlands of southwest Western Australia, with breeding populations concentrated in the Wheatbelt. It relies on Banksia, Hakea, and pine plantations for food and nests in hollows of old-growth eucalypts. Habitat fragmentation has severely impacted its population (DCCEEW 2024e).	20 records, 3 of which occurred on camera traps (HM-1-16, HM-1-19, HS-1-06) and 17 opportunistic records, some foraging in the study area and others flying over.	
Chuditch (<i>Dasyurus geoffroii</i>)	VU (EPBC & BC Acts)	A carnivorous marsupial found in southwest Western Australia, where it occupies Jarrah and Marri forests, woodlands, and riparian zones. It has a large home range and preys on small mammals, birds, reptiles, and invertebrates. While once widespread, habitat loss and predation by introduced species have significantly reduced its population, though conservation efforts have helped stabilise numbers (DCCEEW 2024b).	670 species records, 34 from physical captures (including recaptures) in cage and aluminium box traps, the remaining records from camera images.	

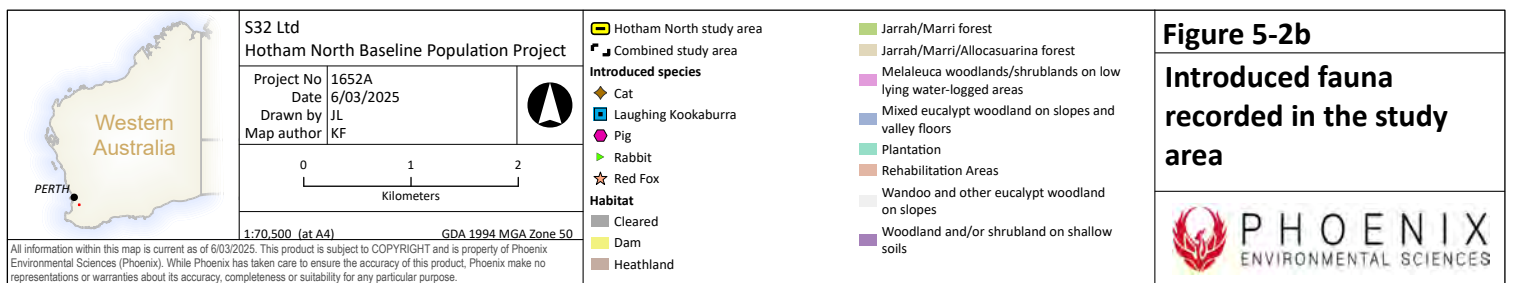
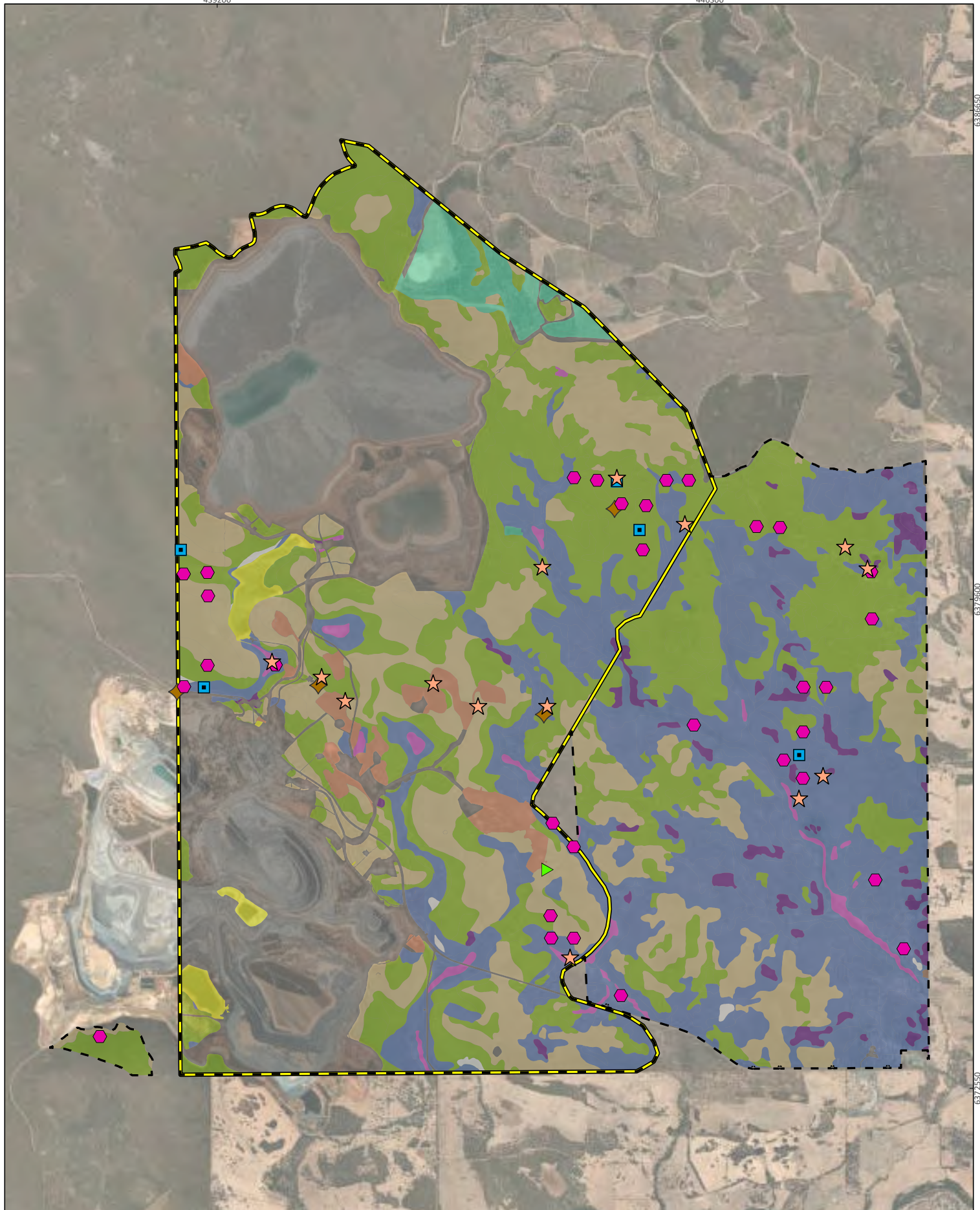
Species	Status	Distribution and ecology	Survey records	Field photograph
Quenda (<i>Isoodon fusciventer</i>)	P4 (DBCA list)	The Quenda, a subspecies of the Southern Brown Bandicoot, is a nocturnal, ground-dwelling marsupial found in dense understorey vegetation across southwest Western Australia. It prefers Jarrah and Marri forests, wetlands, and shrublands, where it forages for fungi, invertebrates, and plant roots. Despite being impacted by habitat clearing and predation, Quenda populations persist in urban bushland and conservation reserves (DBCA 2018b).	322 records, 4 records captured in either cage or Aluminium box traps (including recaptures) and the remaining from camera images.	
South-western Brush-tailed Phascogale (<i>Phascogale tapoatafa wambenger</i>)	CD (BC Act)	This arboreal marsupial is found in dry sclerophyll forests and woodlands of southwest Western Australia, particularly in areas dominated by Jarrah, Wandoo, and Marri. It nests in tree hollows and primarily feeds on insects, spiders, and nectar. Habitat fragmentation and competition for nesting sites have led to population declines, making it conservation dependant (DBCA 2018a).	79 records from camera trap images.	

Species	Status	Distribution and ecology	Survey records	Field photograph
Western Brush Wallaby (<i>Notamacropus irma</i>)	P4 (DBCA list)	The Western Brush Wallaby is widespread in southwest Western Australia, inhabiting open Jarrah and Marri woodlands, coastal heathlands, and shrublands. It is a solitary grazer, feeding on grasses and shrubs, and is highly reliant on habitat connectivity for movement between feeding and sheltering areas (DEC 2012). While less threatened than other macropods, it faces pressure from habitat loss and predation by Foxes and Cats.	730 records from camera trap images and seen opportunistically when traversing the study area.	
Introduced fauna				
Cat (<i>Felis catus</i>)	Introduced	Feral Cats are widespread across the region, occupying forests, woodlands, coastal scrub, and agricultural areas. As highly efficient predators, they have contributed to the decline and extinction of many native mammals, birds, and reptiles (Risbey <i>et al.</i> 2000). Their ability to hunt even at low prey densities makes them particularly damaging to small, ground-dwelling fauna (Doherty <i>et al.</i> 2017).	4 records from camera images at sites HS-1-35, HM-1-08, HM-1-22, NHS-1-17.	

Species	Status	Distribution and ecology	Survey records	Field photograph
Laughing Kookaburra (<i>Dacelo novaeguinea</i>)	Introduced	Introduced from eastern Australia, this predatory bird has expanded its range across the southwest. It preys on reptiles, amphibians, small birds, and invertebrates, potentially competing with native predatory birds and affecting local fauna populations. Its adaptability has enabled it to thrive in forests, woodlands, and urban areas (Moon 2013).	5 records from camera trap images at sites HM-1-16, HM-1-02, NHS-1-16, NS-1-28 and NHS-1-25.	
Pig (<i>Sus scrofa</i>)	Introduced	Feral Pigs are present in the southwest, particularly in forested and wetland areas. They cause widespread environmental damage by uprooting vegetation, compacting soil, and disturbing waterways. Their foraging behaviour disrupts native plant regeneration and creates favourable conditions for invasive weeds. Pigs also prey on small vertebrates and invertebrates, further impacting native species (Commonwealth of Australia 2017).	33 records including 5 opportunistic sightings of Pigs, scats, remains or foraging evidence and 28 locations with camera trap images.	

Species	Status	Distribution and ecology	Survey records	Field photograph
Rabbit (<i>Oryctolagus cuniculus</i>)	Introduced	Introduced for hunting, Rabbits have become a serious environmental pest across much of the southwest. They compete with native herbivores for food, contribute to soil erosion through overgrazing, and hinder vegetation regeneration by consuming seedlings. Their high reproductive rate makes them difficult to control, and they provide an abundant food source for other introduced predators like Foxes and Cats (Commonwealth of Australia 2016).	One record from camera trap images at site HM-2-27.	
Red Fox (<i>Vulpes vulpes</i>)	Introduced	One of the most destructive invasive predators in the region, Foxes have been responsible for severe declines in native mammal and bird populations. They are highly adaptable, hunting across a wide range of habitats from forests to farmland. Foxes not only prey on native species but also compete with them for food, exacerbating their impact on already vulnerable wildlife (Dall 2010; Risbey <i>et al.</i> 2000).	14 records, one opportunistic sighting of scat and 13 camera trap image records.	





5.3 WOYLIE

The field surveys yielded a substantial number of records for Woylies. A total of 691 independent detections of Woylies were recorded using camera trapping arrays. In contrast, only 4 detections were noted during the cage trapping survey. Additionally, the camera deployment survey captured 10 opportunistic sightings of Woylies, which occurred when field teams moved through the study area and flushed the animals (Table 5-2; Figure 5-2).

5.4 NUMBAT

No records of Numbat occurred during the field surveys, despite extensive targeted searches and the thorough camera array survey effort.

5.5 POPULATION ESTIMATES

Population modelling was undertaken to determine whether viable populations of Woylie are present within the study area. For the context of this report, the term 'viable population' refers to the definition within the Worsley Alumina CSEMP as *"A self-sustaining population with a high probability of survival because it has sufficient numbers and reproductive potential"*. Population estimates are provided for camera trapping data. Population estimates were not provided for physical trapping (cage and aluminium box) as capture rates were not sufficient to allow for meaningful estimates. Population estimates for camera trapping were based on detection rates, the number of individuals photographed and records outside of species-specific home range buffers (Table 5-3).

Since no Numbats were recorded in the survey, the likelihood of a viable population being present in the study area was determined based on the findings of the previous Phoenix (2025) desktop review and knowledge concerning the species in the JAF01 subregion.

Table 5-3 Population estimate of conservation significant mammals recorded in the study area

Species and status	Physical trapping			Camera trapping			Viable population	Comment
	Sample size (n)	Population density (animals/ha)	Population size (no. of individuals)	Sample size (detections No. individuals)	Population density (animals/ha)	Population size (no. of individuals)		
Woylie <i>Bettongia penicillata ogilbyi</i> EN/CR (EPBC Act; BC Act)	4	N/A	N/A	691 22	1.7 (95% CI: 1.1-2.7)	25.5 (95% CI: 16.4 – 39.8)	Present	Capture rates too low during physical trapping. Multiple detections across study area over multiple surveys. Thirteen clearly defined independent buffers evident with 7 individuals detected from multiple images. Multiple individuals detected less than 1 minute apart over 1.5 km spacing (Appendix 3).
Numbat <i>Myrmecobius fasciatus</i> EN (EPBC Act; BC Act)	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Numbat was not detected during the surveys, but previous records occur nearby. Targeted searches did not identify signs of presence despite recent records within 5 km of the study area (DBCA 2024; Phoenix 2025).

5.6 SURVEY LIMITATIONS

The limitations of the targeted fauna survey have been considered in accordance with EPA (EPA 2020) (Table 5-4).

Table 5-4 Consideration of potential survey limitations

Limitations	Category	Comments
Availability of contextual information at a regional and local scale	No	Many prior surveys have been conducted in the region and locality. Extensive vegetation mapping occurs throughout the region and has been updated to reflect the habitats of the study area.
Competency/experience of the team carrying out the survey	No	No limitation, the survey team has experience conducting fauna surveys in the southwest region of WA.
Scope and completeness	No	The scope was appropriate for the purpose of the survey. All aspects of the scope were completed with the available data gathered during the field survey. Where limited data was collected via trapping, the comprehensive camera trapping survey supplemented the trapping survey resulting in the completed scope.
Proportion of flora and fauna recorded and/or collected, any identification issues	No	All recorded vertebrate fauna were identified. There was some ambiguity around which species of White-tailed Black Cockatoos were recorded due to the nature of the detection.
Access within the study area	No	There were no access implications across the study area or combined area. Areas surrounding the dam in the S32SA had limited access and therefore were surveyed using camera traps and not systematic trapping. Additionally, restricted access to the study area to prevent the spread of dieback was overcome through thorough hygiene methods and reducing access immediately after >5 mm of rain. These restrictions did not limit the survey method.
Timing, rainfall, season	No	The surveys were conducted in Spring and early Summer in accordance with EPA (2020) and DAWE (2022) and during the optimal survey periods for mammals and birds (EPA 2020).
Disturbance that may have affected the results of the survey	No	No disturbance was observed during the course of the survey which could have impacted the results of the survey.

6 DISCUSSION

6.1 HABITATS

The fauna habitats identified within the study area are representative of those found throughout the broader south-west region of WA. The dominant habitats, including Jarrah/Marri forest, Jarrah/Marri/Allocasuarina forest, and mixed eucalypt woodland, are widespread across the region, providing important resources for a variety of vertebrate fauna. However, some habitat types, such as rehabilitation areas, are more limited in extent and primarily occur in disturbed or modified landscapes.

Habitats that support key life history stages (i.e., breeding, dispersal, and foraging) for Numbat and Woylie are considered either important or critical to species survival (DoE 2013; DPaW 2017). The Jarrah/Marri forest and Jarrah/Marri/Allocasuarina forest provide essential habitat for conservation significant species. These habitats provide resources for Woylie and Numbat, offering both foraging, nesting/denning and dispersal opportunities.

An important feature of the study area is its connection to the broader Jarrah forest, which enhances the availability of habitat and promotes ecological connectivity. Large, continuous expanses of habitat are essential for sustaining populations of threatened fauna. Such expanses allow movement between resource-rich areas, facilitating gene flow, and support species with large home ranges. The presence of intact habitat corridors between the study area and adjacent forested regions is particularly valuable for species like Numbat which appear to have limited dispersal in disturbed and modified landscapes (DPaW 2017).

While the majority of the study area remains suitable for fauna, historical and ongoing disturbances, such as land clearing and habitat fragmentation, have altered the extent and quality of certain habitats. Rehabilitation efforts within disturbed areas may contribute to long-term habitat availability and connectivity. Maintaining and enhancing habitat connectivity within the landscape is critical for ensuring the persistence of threatened and conservation significant species in the region.

The results of the survey highlight a substantial difference in the number and spread of records between native and introduced fauna. The study area supports a high diversity of conservation significant species, with Woylies having many records (Appendix 3). However, the presence of introduced species, particularly predatory and herbivorous pests, poses challenges for the long-term viability of these native populations.

Native fauna, including several conservation-significant species like the Woylie, were recorded in high numbers, indicating the study area provides important and connected habitat. Introduced species, such as Feral Pigs, Cats, and Foxes, were recorded less frequently but still pose a threat to native wildlife due to predation and habitat degradation. Overall, the results indicate that the study area provides high-quality habitat for both Woylies and is suitable for Numbat, though ongoing management of introduced species is advised for maintaining its ecological integrity.

6.2 WOYLIE

Survey data confirms the presence of a stable Woylie (*Bettongia penicillata ogilbyi*) population within the study area, supported by an even distribution of desktop records both inside and surrounding the region (Phoenix 2025). Trapping efforts resulted in the capture of 4 individuals, while camera surveys recorded 691 independent detections, identifying 22 unique individuals. Population estimates from camera data suggest a density of 1.7 individuals per hectare (95% CI: 1.1–2.7) and a total estimated population of 25.5 (95% CI: 16.4–39.8).

Determining whether the study area supports a viable Woylie population requires species-specific population viability analysis (PVA), which accounts for factors such as resource availability and carrying

capacity. Without these details, it is difficult to assess whether the estimated population is self-sustaining in isolation. However, given the extensive suitable habitat within the study area and its connectivity to the surrounding region, it is likely that the Woylie population in the study area represents a subpopulation of a larger regional population. In conservation and wildlife management, an industry benchmark for establishing a self-sustaining population is typically 20-50 individuals (Morris 2021). This minimum number is often difficult to obtain for many threatened species but acts as an indication of what may be deemed viable long-term. This Woylie population meets the industry benchmark of 20–50 individuals required to establish a translocated population (Morris 2021). The estimate suggests that the study area supports a viable and self-sustaining population. The even distribution of desktop records further indicates the species' long-term occurrence and stability in the region.

Woylies rely on structurally complex habitats, including open forests with dense understorey and shrubland. These features provide essential resources for foraging, nesting, and predator avoidance (DCCEEW 2024a). It is not surprising that Woylie were recorded in:

- Jarrah/Marri forest: Provides extensive areas of suitable foraging habitat, with an abundance of fungi, a key dietary component (DCCEEW 2024a). Fallen logs, tree hollows, and dense leaf litter offer essential shelter and protection from predators. Supports a diverse understorey, which provides food sources such as tubers and seeds (DCCEEW 2024a).
- Jarrah/Marri/Allocasuarina forest: Contains a structurally complex understorey with abundant coarse woody debris, providing key denning sites (DCCEEW 2024a). Supports a diverse fungal community, which is critical for Woylie diet and soil health (DCCEEW 2024a). Features dense vegetation patches that offer protection from predators such as Foxes and feral Cats.
- Mixed eucalypt woodland on slopes and valley floors: Provides a combination of open foraging areas and dense refuges for shelter. Contains a mix of native shrubs and grasses, which supplement the Woylie's diet (DCCEEW 2024a). Offers gentle slopes that facilitate movement between foraging and sheltering areas.
- Woodland and/or shrubland on shallow soils: Likely provides movement corridors between core habitat areas. Features scattered shrubs and ground cover that may offer seasonal food resources. Contains occasional logs and rock piles that may provide temporary shelter (Figure 5-1).

The study area offers a well-connected network of critical habitat, facilitating movement and dispersal, which is critical for maintaining genetic diversity and population resilience. Given the broader connectivity of the Jarrah forest, the Woylie population within the study area is likely part of a larger metapopulation extending into the surrounding landscape. The high detection rates, population estimates, and extensive habitat availability indicate that this population is stable and contributes to the ongoing persistence of the species in the region.

6.3 NUMBAT

The Numbat (*Myrmecobius fasciatus*) was not recorded during the field survey, despite the use of comprehensive, targeted survey methods. The camera array techniques employed in this survey followed the methodology of Thorn (2023), which utilised targeted camera arrays to estimate Numbat populations. However, despite the extensive camera trapping arrays and targeted searches, no Numbats were detected.

The study area hosts an abundance of suitable habitat for Numbats which includes key habitat definitions detailed above:

- Jarrah/Marri forest;
- Jarrah/Marri/Allocasuarina forest;

- Mixed eucalypt woodland on slopes and valley floors;
- Woodland and/or shrubland on shallow soils;
- Wandoo and other eucalypt woodland on slopes.

These 5 habitat types comprise of 4,178.3 ha (53.6%) the study area and 7,977.2 ha (68.5%) of the combined survey area. Furthermore, these habitat types offer the habitat preferences that are associated with Numbat detections. These preferences include an abundance of log hollows and loamy gravel soils that are well drained (compared to depressions and swamps). Numbats particularly prefer semi-wet soil and duplex sandy gravel which often coincide with the presence of termites and termite mounds. The other habitat types of the study area and combined areas are associated with areas closer to surface water, seasonal inundation and water-logged areas, which Numbats typically avoid (Thorn 2023).

Given the recent nearby records (DBCA 2024; Phoenix 2025), it is possible that dispersing individuals occasionally traverse the study area. However, the absence of detections during targeted surveys suggests that if Numbats do occur in the study area, they are likely present at very low densities and are unlikely to form a viable population.

6.4 CONCLUSION

The fauna habitats within the study area support a viable population of Woylie, which likely exists as a subpopulation connected to those in nearby habitats. While desktop records suggested the potential presence of Numbat, field surveys indicate that, if present, they likely occur at very low densities or only occasionally while dispersing. It is unlikely that the study area supports a viable population of Numbat.

The study area offers a mosaic of habitat types that meet the criteria for critical habitat for both Numbat and Woylie. These habitats provide important niche components for the viable Woylie population and any Numbats that may disperse through the area. The continued maintenance of these habitats and their resources is essential for supporting gene flow and connectivity with surrounding habitats in the region.

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Appendix 1 Survey site locations

Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
B01	Cage and Aluminium box Trap(s)	-32.704	116.446	N01	Cage and Aluminium box Trap(s)	-32.700	116.417
B02	Cage and Aluminium box Trap(s)	-32.708	116.446	N02	Cage and Aluminium box Trap(s)	-32.700	116.416
B03	Cage and Aluminium box Trap(s)	-32.708	116.451	N03	Cage and Aluminium box Trap(s)	-32.698	116.414
B04	Cage and Aluminium box Trap(s)	-32.704	116.451	N04	Cage and Aluminium box Trap(s)	-32.696	116.412
B05	Cage and Aluminium box Trap(s)	-32.705	116.460	N05	Cage and Aluminium box Trap(s)	-32.695	116.411
B06	Cage and Aluminium box Trap(s)	-32.709	116.460	N06	Cage and Aluminium box Trap(s)	-32.694	116.409
B07	Cage and Aluminium box Trap(s)	-32.714	116.459	N07	Cage and Aluminium box Trap(s)	-32.692	116.408
B08	Cage and Aluminium box Trap(s)	-32.720	116.459	N08	Cage and Aluminium box Trap(s)	-32.691	116.406
B09	Cage and Aluminium box Trap(s)	-32.725	116.459	N09	Cage and Aluminium box Trap(s)	-32.691	116.405
B10	Cage and Aluminium box Trap(s)	-32.732	116.458	N10	Cage and Aluminium box Trap(s)	-32.691	116.403
B11	Cage and Aluminium box Trap(s)	-32.740	116.457	N11	Cage and Aluminium box Trap(s)	-32.692	116.401
B12	Cage and Aluminium box Trap(s)	-32.746	116.459	N12	Cage and Aluminium box Trap(s)	-32.693	116.400
B13	Cage and Aluminium box Trap(s)	-32.753	116.458	N13	Cage and Aluminium box Trap(s)	-32.695	116.399
B14	Cage and Aluminium box Trap(s)	-32.755	116.455	N14	Cage and Aluminium box Trap(s)	-32.696	116.400
B15	Cage and Aluminium box Trap(s)	-32.757	116.452	N15	Cage and Aluminium box Trap(s)	-32.698	116.399
B16	Cage and Aluminium box Trap(s)	-32.730	116.449	N16	Cage and Aluminium box Trap(s)	-32.699	116.400

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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
B17	Cage and Aluminium box Trap(s)	-32.735	116.445	N17	Cage and Aluminium box Trap(s)	-32.700	116.400
B18	Cage and Aluminium box Trap(s)	-32.732	116.438	N18	Cage and Aluminium box Trap(s)	-32.700	116.401
B19	Cage and Aluminium box Trap(s)	-32.738	116.433	N19	Cage and Aluminium box Trap(s)	-32.700	116.403
BCQ01	Habitat Assessment	-32.779	116.448	N20	Cage and Aluminium box Trap(s)	-32.700	116.404
BCQ02	Habitat Assessment	-32.777	116.441	N21	Cage and Aluminium box Trap(s)	-32.700	116.406
BCQ03	Habitat Assessment	-32.762	116.435	N22	Cage and Aluminium box Trap(s)	-32.700	116.408
BCQ04	Habitat Assessment	-32.757	116.455	N23	Cage and Aluminium box Trap(s)	-32.700	116.410
BCQ05	Habitat Assessment	-32.741	116.438	N24	Cage and Aluminium box Trap(s)	-32.700	116.411
BCQ06	Habitat Assessment	-32.724	116.408	N25	Cage and Aluminium box Trap(s)	-32.700	116.412
BCQ07	Habitat Assessment	-32.713	116.423	N26	Cage and Aluminium box Trap(s)	-32.701	116.414
BCQ08	Habitat Assessment	-32.708	116.460	N27	Cage and Aluminium box Trap(s)	-32.701	116.415
BCQ09	Habitat Assessment	-32.705	116.445	Newmont-ANH05	Fauna site	-32.736	116.382
BCQ10	Habitat Assessment	-32.718	116.458	Newmont-ANH06	Fauna site	-32.737	116.380
BCQ11	Habitat Assessment	-32.726	116.431	Newmont-ANH07	Fauna site	-32.738	116.379
BCQ12	Habitat Assessment	-32.739	116.415	Newmont-ANH09	Fauna site	-32.739	116.391
BCQ13	Habitat Assessment	-32.750	116.423	Newmont-ANH10	Fauna site	-32.736	116.394
BCQ14	Habitat Assessment	-32.761	116.414	Newmont-ANH15	Fauna site	-32.737	116.401
BCQ15	Habitat Assessment	-32.735	116.449	Newmont-ANH16	Fauna site	-32.742	116.415
BCQ16	Habitat Assessment	-32.745	116.422	Newmont-ANH17	Fauna site	-32.750	116.419

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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
BCQ17	Habitat Assessment	-32.723	116.425	Newmont-ANH18	Fauna site	-32.755	116.419
BCQ18	Habitat Assessment	-32.707	116.408	Newmont-ANH19	Fauna site	-32.762	116.444
BCQ19	Habitat Assessment	-32.709	116.425	Newmont-ANH20	Fauna site	-32.756	116.459
BCQ20	Habitat Assessment	-32.703	116.435	Newmont-ANH21	Fauna site	-32.756	116.459
BCQ21	Habitat Assessment	-32.728	116.449	Newmont-ANH22	Fauna site	-32.777	116.459
BCQ22	Habitat Assessment	-32.751	116.456	Newmont-ANH23	Fauna site	-32.751	116.459
BCQ23	Habitat Assessment	-32.769	116.422	Newmont-Nest01	Fauna site	-32.739	116.380
BCQ24	Habitat Assessment	-32.773	116.441	Newmont-Nest04	Fauna site	-32.738	116.392
BCQ25	Habitat Assessment	-32.711	116.450	Newmont-Nest05	Fauna site	-32.763	116.440
BCQ26	Habitat Assessment	-32.734	116.413	Newmont-Nest06	Fauna site	-32.764	116.440
BCQ27	Habitat Assessment	-32.766	116.456	Newmont-Nest07	Fauna site	-32.755	116.418
BCQ28	Habitat Assessment	-32.773	116.429	Newmont-Nest08	Fauna site	-32.781	116.456
BCQ29	Habitat Assessment	-32.780	116.337	NHS-1-01	Camera Trap(s)	-32.704	116.406
BCQ30	Habitat Assessment	-32.778	116.331	NHS-1-02	Camera Trap(s)	-32.708	116.406
BCQ31	Habitat Assessment	-32.762	116.423	NHS-1-03	Camera Trap(s)	-32.711	116.406
BCQ32	Habitat Assessment	-32.714	116.443	NHS-1-04	Camera Trap(s)	-32.713	116.405
BCQ33	Habitat Assessment	-32.736	116.456	NHS-1-05	Camera Trap(s)	-32.716	116.406
BCQ34	Habitat Assessment	-32.733	116.429	NHS-1-06	Camera Trap(s)	-32.719	116.406
BCQ35	Habitat Assessment	-32.756	116.441	NHS-1-07	Camera Trap(s)	-32.722	116.405
BCQ36	Habitat Assessment	-32.768	116.447	NHS-1-08	Camera Trap(s)	-32.705	116.409
BCQ37	Habitat Assessment	-32.745	116.447	NHS-1-09	Camera Trap(s)	-32.708	116.409

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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
BCQ38	Habitat Assessment	-32.755	116.429	NHS-1-10	Camera Trap(s)	-32.711	116.409
BCQ39	Habitat Assessment	-32.717	116.433	NHS-1-11	Camera Trap(s)	-32.714	116.409
BCQ40	Habitat Assessment	-32.768	116.432	NHS-1-12	Camera Trap(s)	-32.717	116.410
BCQ41	Habitat Assessment	-32.737	116.439	NHS-1-13	Camera Trap(s)	-32.719	116.409
BCQ42	Habitat Assessment	-32.743	116.456	NHS-1-14	Camera Trap(s)	-32.722	116.409
BCQ43	Habitat Assessment	-32.750	116.411	NHS-1-15	Camera Trap(s)	-32.725	116.409
BCQ44	Habitat Assessment	-32.729	116.417	NHS-1-16	Camera Trap(s)	-32.705	116.413
BCQ45	Habitat Assessment	-32.712	116.417	NHS-1-17	Camera Trap(s)	-32.708	116.413
BCQ46	Habitat Assessment	-32.727	116.441	NHS-1-18	Camera Trap(s)	-32.711	116.413
BCQ47	Habitat Assessment	-32.737	116.424	NHS-1-19	Camera Trap(s)	-32.714	116.413
BCQ48	Habitat Assessment	-32.742	116.432	NHS-1-20	Camera Trap(s)	-32.717	116.413
BCQ49	Habitat Assessment	-32.771	116.413	NHS-1-21	Camera Trap(s)	-32.719	116.413
BCQ50	Habitat Assessment	-32.779	116.432	NHS-1-22	Camera Trap(s)	-32.722	116.413
C01	Cage and Aluminium box Trap(s)	-32.739	116.391	NHS-1-22	Camera Trap(s)	-32.722	116.413
C02	Cage and Aluminium box Trap(s)	-32.738	116.392	NHS-1-23	Camera Trap(s)	-32.705	116.416
C03	Cage and Aluminium box Trap(s)	-32.736	116.394	NHS-1-24	Camera Trap(s)	-32.708	116.417
C04	Cage and Aluminium box Trap(s)	-32.737	116.395	NHS-1-25	Camera Trap(s)	-32.711	116.416
C05	Cage and Aluminium box Trap(s)	-32.737	116.399	NHS-1-26	Camera Trap(s)	-32.714	116.416
C06	Cage and Aluminium box Trap(s)	-32.739	116.397	NHS-1-27	Camera Trap(s)	-32.717	116.416
C07	Cage and Aluminium box Trap(s)	-32.740	116.399	NHS-1-28	Camera Trap(s)	-32.720	116.416

Population estimates for Numbat and Woylie for the Hotham North Project
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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
C08	Cage and Aluminium box Trap(s)	-32.740	116.402	NHS-1-29	Camera Trap(s)	-32.705	116.420
C09	Cage and Aluminium box Trap(s)	-32.739	116.403	NHS-1-30	Camera Trap(s)	-32.708	116.420
C10	Cage and Aluminium box Trap(s)	-32.737	116.403	NHS-1-31	Camera Trap(s)	-32.710	116.420
C11	Cage and Aluminium box Trap(s)	-32.737	116.402	NHS-1-32	Camera Trap(s)	-32.714	116.420
C12	Cage and Aluminium box Trap(s)	-32.757	116.386	NHS-1-33	Camera Trap(s)	-32.716	116.420
C13	Cage and Aluminium box Trap(s)	-32.760	116.388	NHS-1-34	Camera Trap(s)	-32.705	116.423
C14	Cage and Aluminium box Trap(s)	-32.763	116.391	NHS-1-35	Camera Trap(s)	-32.708	116.424
C15	Cage and Aluminium box Trap(s)	-32.764	116.397	NHS-1-36	Camera Trap(s)	-32.711	116.423
C16	Cage and Aluminium box Trap(s)	-32.766	116.402	NM-1-01	Camera Trap(s)	-32.708	116.434
C17	Cage and Aluminium box Trap(s)	-32.765	116.410	NM-1-02	Camera Trap(s)	-32.711	116.434
C18	Cage and Aluminium box Trap(s)	-32.762	116.413	NM-1-03	Camera Trap(s)	-32.714	116.434
C19	Cage and Aluminium box Trap(s)	-32.757	116.416	NM-1-04	Camera Trap(s)	-32.717	116.434
C20	Cage and Aluminium box Trap(s)	-32.758	116.418	NM-1-05	Camera Trap(s)	-32.720	116.434
C21	Cage and Aluminium box Trap(s)	-32.761	116.419	NM-1-06	Camera Trap(s)	-32.723	116.434
C22	Cage and Aluminium box Trap(s)	-32.763	116.419	NM-1-07	Camera Trap(s)	-32.708	116.437
C23	Cage and Aluminium box Trap(s)	-32.766	116.421	NM-1-08	Camera Trap(s)	-32.711	116.437
C24	Cage and Aluminium box Trap(s)	-32.756	116.421	NM-1-09	Camera Trap(s)	-32.714	116.437

Population estimates for Numbat and Woylie for the Hotham North Project
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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
C25	Cage and Aluminium box Trap(s)	-32.757	116.425	NM-1-10	Camera Trap(s)	-32.717	116.437
C26	Cage and Aluminium box Trap(s)	-32.756	116.428	NM-1-11	Camera Trap(s)	-32.719	116.438
C27	Cage and Aluminium box Trap(s)	-32.757	116.431	NM-1-12	Camera Trap(s)	-32.722	116.437
C28	Cage and Aluminium box Trap(s)	-32.759	116.434	NM-1-13	Camera Trap(s)	-32.708	116.441
HM-1-01	Camera Trap(s)	-32.710	116.346	NM-1-14	Camera Trap(s)	-32.711	116.441
HM-1-02	Camera Trap(s)	-32.713	116.346	NM-1-15	Camera Trap(s)	-32.714	116.441
HM-1-03	Camera Trap(s)	-32.716	116.346	NM-1-16	Camera Trap(s)	-32.717	116.441
HM-1-04	Camera Trap(s)	-32.719	116.346	NM-1-17	Camera Trap(s)	-32.720	116.441
HM-1-05	Camera Trap(s)	-32.722	116.346	NM-1-18	Camera Trap(s)	-32.722	116.441
HM-1-06	Camera Trap(s)	-32.725	116.345	NM-1-19	Camera Trap(s)	-32.708	116.444
HM-1-07	Camera Trap(s)	-32.728	116.346	NM-1-20	Camera Trap(s)	-32.711	116.444
HM-1-08	Camera Trap(s)	-32.731	116.346	NM-1-21	Camera Trap(s)	-32.714	116.445
HM-1-09	Camera Trap(s)	-32.710	116.349	NM-1-22	Camera Trap(s)	-32.717	116.444
HM-1-10	Camera Trap(s)	-32.713	116.349	NM-1-23	Camera Trap(s)	-32.720	116.444
HM-1-11	Camera Trap(s)	-32.716	116.349	NM-1-24	Camera Trap(s)	-32.722	116.444
HM-1-12	Camera Trap(s)	-32.719	116.349	NM-1-25	Camera Trap(s)	-32.708	116.448
HM-1-13	Camera Trap(s)	-32.722	116.349	NM-1-26	Camera Trap(s)	-32.711	116.448
HM-1-14	Camera Trap(s)	-32.725	116.349	NM-1-27	Camera Trap(s)	-32.714	116.448
HM-1-15	Camera Trap(s)	-32.728	116.349	NM-1-28	Camera Trap(s)	-32.717	116.448
HM-1-16	Camera Trap(s)	-32.731	116.349	NM-1-29	Camera Trap(s)	-32.720	116.448

Population estimates for Numbat and Woylie for the Hotham North Project
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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
HM-1-17	Camera Trap(s)	-32.733	116.367	NM-1-30	Camera Trap(s)	-32.723	116.448
HM-1-18	Camera Trap(s)	-32.718	116.367	NM-1-31	Camera Trap(s)	-32.708	116.452
HM-1-19	Camera Trap(s)	-32.721	116.367	NM-1-32	Camera Trap(s)	-32.711	116.451
HM-1-20	Camera Trap(s)	-32.724	116.367	NM-1-33	Camera Trap(s)	-32.714	116.452
HM-1-21	Camera Trap(s)	-32.727	116.367	NM-1-34	Camera Trap(s)	-32.717	116.451
HM-1-22	Camera Trap(s)	-32.730	116.367	NM-1-35	Camera Trap(s)	-32.720	116.451
HM-1-23	Camera Trap(s)	-32.728	116.353	NM-1-36	Camera Trap(s)	-32.723	116.451
HM-1-24	Camera Trap(s)	-32.731	116.353	NM-2-01	Camera Trap(s)	-32.761	116.430
HM-1-25	Camera Trap(s)	-32.733	116.371	NM-2-02	Camera Trap(s)	-32.764	116.430
HM-1-26	Camera Trap(s)	-32.718	116.371	NM-2-03	Camera Trap(s)	-32.767	116.430
HM-1-27	Camera Trap(s)	-32.730	116.371	NM-2-04	Camera Trap(s)	-32.770	116.430
HM-1-28	Camera Trap(s)	-32.728	116.356	NM-2-05	Camera Trap(s)	-32.774	116.430
HM-1-29	Camera Trap(s)	-32.731	116.356	NM-2-06	Camera Trap(s)	-32.776	116.430
HM-1-30	Camera Trap(s)	-32.733	116.374	NM-2-07	Camera Trap(s)	-32.761	116.433
HM-1-31	Camera Trap(s)	-32.718	116.374	NM-2-08	Camera Trap(s)	-32.764	116.433
HM-1-32	Camera Trap(s)	-32.721	116.374	NM-2-09	Camera Trap(s)	-32.767	116.434
HM-1-33	Camera Trap(s)	-32.727	116.374	NM-2-10	Camera Trap(s)	-32.770	116.433
HM-1-34	Camera Trap(s)	-32.730	116.375	NM-2-11	Camera Trap(s)	-32.773	116.433
HM-1-35	Camera Trap(s)	-32.728	116.360	NM-2-12	Camera Trap(s)	-32.776	116.433
HM-1-36	Camera Trap(s)	-32.733	116.364	NM-2-13	Camera Trap(s)	-32.761	116.437
HM-2-01	Camera Trap(s)	-32.749	116.388	NM-2-14	Camera Trap(s)	-32.764	116.437

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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
HM-2-02	Camera Trap(s)	-32.752	116.388	NM-2-15	Camera Trap(s)	-32.767	116.437
HM-2-03	Camera Trap(s)	-32.755	116.388	NM-2-16	Camera Trap(s)	-32.770	116.437
HM-2-04	Camera Trap(s)	-32.758	116.388	NM-2-17	Camera Trap(s)	-32.773	116.437
HM-2-05	Camera Trap(s)	-32.761	116.388	NM-2-18	Camera Trap(s)	-32.776	116.437
HM-2-06	Camera Trap(s)	-32.764	116.388	NM-2-19	Camera Trap(s)	-32.761	116.440
HM-2-07	Camera Trap(s)	-32.749	116.390	NM-2-20	Camera Trap(s)	-32.764	116.441
HM-2-08	Camera Trap(s)	-32.752	116.391	NM-2-21	Camera Trap(s)	-32.767	116.440
HM-2-09	Camera Trap(s)	-32.755	116.391	NM-2-22	Camera Trap(s)	-32.770	116.441
HM-2-10	Camera Trap(s)	-32.758	116.391	NM-2-23	Camera Trap(s)	-32.773	116.440
HM-2-11	Camera Trap(s)	-32.761	116.391	NM-2-24	Camera Trap(s)	-32.776	116.440
HM-2-12	Camera Trap(s)	-32.764	116.391	NM-2-25	Camera Trap(s)	-32.761	116.444
HM-2-13	Camera Trap(s)	-32.749	116.395	NM-2-26	Camera Trap(s)	-32.764	116.444
HM-2-14	Camera Trap(s)	-32.752	116.395	NM-2-27	Camera Trap(s)	-32.767	116.444
HM-2-15	Camera Trap(s)	-32.755	116.395	NM-2-28	Camera Trap(s)	-32.770	116.444
HM-2-16	Camera Trap(s)	-32.758	116.395	NM-2-29	Camera Trap(s)	-32.773	116.444
HM-2-17	Camera Trap(s)	-32.761	116.395	NM-2-30	Camera Trap(s)	-32.776	116.444
HM-2-18	Camera Trap(s)	-32.764	116.395	NM-2-31	Camera Trap(s)	-32.761	116.448
HM-2-19	Camera Trap(s)	-32.749	116.398	NM-2-32	Camera Trap(s)	-32.764	116.448
HM-2-20	Camera Trap(s)	-32.752	116.398	NM-2-33	Camera Trap(s)	-32.767	116.447
HM-2-21	Camera Trap(s)	-32.755	116.398	NM-2-34	Camera Trap(s)	-32.770	116.448
HM-2-22	Camera Trap(s)	-32.758	116.398	NM-2-35	Camera Trap(s)	-32.773	116.448

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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
HM-2-23	Camera Trap(s)	-32.761	116.398	NM-2-36	Camera Trap(s)	-32.776	116.448
HM-2-24	Camera Trap(s)	-32.764	116.398	NS-1-01	Camera Trap(s)	-32.731	116.427
HM-2-25	Camera Trap(s)	-32.749	116.402	NS-1-02	Camera Trap(s)	-32.734	116.427
HM-2-26	Camera Trap(s)	-32.752	116.402	NS-1-03	Camera Trap(s)	-32.737	116.427
HM-2-27	Camera Trap(s)	-32.755	116.402	NS-1-04	Camera Trap(s)	-32.740	116.426
HM-2-28	Camera Trap(s)	-32.758	116.402	NS-1-05	Camera Trap(s)	-32.743	116.427
HM-2-29	Camera Trap(s)	-32.761	116.402	NS-1-06	Camera Trap(s)	-32.746	116.426
HM-2-30	Camera Trap(s)	-32.764	116.402	NS-1-07	Camera Trap(s)	-32.731	116.430
HM-2-31	Camera Trap(s)	-32.752	116.405	NS-1-08	Camera Trap(s)	-32.734	116.430
HM-2-32	Camera Trap(s)	-32.755	116.405	NS-1-09	Camera Trap(s)	-32.737	116.430
HM-2-33	Camera Trap(s)	-32.758	116.405	NS-1-10	Camera Trap(s)	-32.740	116.430
HM-2-34	Camera Trap(s)	-32.761	116.405	NS-1-11	Camera Trap(s)	-32.743	116.430
HM-2-35	Camera Trap(s)	-32.764	116.405	NS-1-12	Camera Trap(s)	-32.746	116.430
HM-2-36	Camera Trap(s)	-32.767	116.405	NS-1-13	Camera Trap(s)	-32.731	116.434
HN-1-01	Camera Trap(s)	-32.776	116.378	NS-1-14	Camera Trap(s)	-32.734	116.434
HN-1-02	Camera Trap(s)	-32.779	116.378	NS-1-15	Camera Trap(s)	-32.737	116.434
HN-1-03	Camera Trap(s)	-32.776	116.381	NS-1-16	Camera Trap(s)	-32.740	116.434
HN-1-04	Camera Trap(s)	-32.779	116.381	NS-1-17	Camera Trap(s)	-32.743	116.434
HN-1-05	Camera Trap(s)	-32.776	116.385	NS-1-18	Camera Trap(s)	-32.747	116.433
HN-1-06	Camera Trap(s)	-32.779	116.385	NS-1-19	Camera Trap(s)	-32.731	116.437
HN-1-07	Camera Trap(s)	-32.775	116.388	NS-1-20	Camera Trap(s)	-32.735	116.437

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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
HN-1-08	Camera Trap(s)	-32.779	116.388	NS-1-21	Camera Trap(s)	-32.737	116.437
HN-1-09	Camera Trap(s)	-32.776	116.392	NS-1-22	Camera Trap(s)	-32.741	116.437
HN-1-10	Camera Trap(s)	-32.779	116.392	NS-1-23	Camera Trap(s)	-32.744	116.437
HS-1-01	Camera Trap(s)	-32.722	116.384	NS-1-24	Camera Trap(s)	-32.746	116.437
HS-1-02	Camera Trap(s)	-32.725	116.384	NS-1-25	Camera Trap(s)	-32.732	116.441
HS-1-03	Camera Trap(s)	-32.728	116.384	NS-1-26	Camera Trap(s)	-32.735	116.441
HS-1-04	Camera Trap(s)	-32.731	116.384	NS-1-27	Camera Trap(s)	-32.737	116.441
HS-1-05	Camera Trap(s)	-32.734	116.384	NS-1-28	Camera Trap(s)	-32.740	116.441
HS-1-06	Camera Trap(s)	-32.737	116.384	NS-1-29	Camera Trap(s)	-32.743	116.441
HS-1-07	Camera Trap(s)	-32.722	116.388	NS-1-30	Camera Trap(s)	-32.746	116.441
HS-1-08	Camera Trap(s)	-32.725	116.388	NS-1-31	Camera Trap(s)	-32.731	116.444
HS-1-09	Camera Trap(s)	-32.728	116.388	NS-1-32	Camera Trap(s)	-32.735	116.444
HS-1-10	Camera Trap(s)	-32.731	116.388	NS-1-33	Camera Trap(s)	-32.737	116.444
HS-1-11	Camera Trap(s)	-32.734	116.388	NS-1-34	Camera Trap(s)	-32.740	116.444
HS-1-12	Camera Trap(s)	-32.737	116.388	NS-1-35	Camera Trap(s)	-32.744	116.444
HS-1-13	Camera Trap(s)	-32.722	116.391	NS-1-36	Camera Trap(s)	-32.746	116.444
HS-1-14	Camera Trap(s)	-32.725	116.391	NS-2-01	Camera Trap(s)	-32.776	116.329
HS-1-15	Camera Trap(s)	-32.728	116.391	NS-2-02	Camera Trap(s)	-32.777	116.332
HS-1-16	Camera Trap(s)	-32.731	116.391	NS-2-03	Camera Trap(s)	-32.777	116.335
HS-1-17	Camera Trap(s)	-32.734	116.391	NS-2-04	Camera Trap(s)	-32.777	116.338
HS-1-18	Camera Trap(s)	-32.737	116.391	NS-2-05	Camera Trap(s)	-32.778	116.331

Population estimates for Numbat and Woylie for the Hotham North Project
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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
HS-1-19	Camera Trap(s)	-32.722	116.395	NS-2-06	Camera Trap(s)	-32.778	116.334
HS-1-20	Camera Trap(s)	-32.725	116.395	NS-2-07	Camera Trap(s)	-32.779	116.337
HS-1-21	Camera Trap(s)	-32.728	116.395	NS-2-08	Camera Trap(s)	-32.780	116.339
HS-1-22	Camera Trap(s)	-32.731	116.395	Opp01	Opportunistic Sighting	-32.693	116.407
HS-1-23	Camera Trap(s)	-32.734	116.395	Opp01	Opportunistic Sighting	-32.779	116.334
HS-1-24	Camera Trap(s)	-32.737	116.395	Opp02	Opportunistic Sighting	-32.778	116.331
HS-1-25	Camera Trap(s)	-32.722	116.398	Opp02	Opportunistic Sighting	-32.776	116.440
HS-1-26	Camera Trap(s)	-32.725	116.398	Opp03	Opportunistic Sighting	-32.770	116.451
HS-1-27	Camera Trap(s)	-32.728	116.398	Opp04	Opportunistic Sighting	-32.778	116.459
HS-1-28	Camera Trap(s)	-32.731	116.398	Opp05	Opportunistic Sighting	-32.788	116.368
HS-1-29	Camera Trap(s)	-32.734	116.398	Opp06	Opportunistic Sighting	-32.761	116.448
HS-1-30	Camera Trap(s)	-32.737	116.398	Opp07	Opportunistic Sighting	-32.705	116.460
HS-1-31	Camera Trap(s)	-32.722	116.402	Opp08	Opportunistic Sighting	-32.777	116.440
HS-1-32	Camera Trap(s)	-32.726	116.402	Opp09	Opportunistic Sighting	-32.741	116.438
HS-1-33	Camera Trap(s)	-32.728	116.402	Opp10	Opportunistic Sighting	-32.736	116.424
HS-1-34	Camera Trap(s)	-32.731	116.402	Opp11	Opportunistic Sighting	-32.739	116.398
HS-1-35	Camera Trap(s)	-32.734	116.402	Opp12	Opportunistic Sighting	-32.737	116.394
HS-1-36	Camera Trap(s)	-32.737	116.402	Opp13	Opportunistic Sighting	-32.705	116.460
Opp14	Opportunistic Sighting	-32.777	116.383	W01	Cage and Aluminium box Trap(s)	-32.780	116.339
Opp15	Opportunistic Sighting	-32.776	116.378	W02	Cage and Aluminium box Trap(s)	-32.779	116.337
Opp16	Opportunistic Sighting	-32.778	116.333	W03	Cage and Aluminium box Trap(s)	-32.778	116.336

Population estimates for Numbat and Woylie for the Hotham North Project
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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
Opp17	Opportunistic Sighting	-32.778	116.334	W04	Cage and Aluminium box Trap(s)	-32.777	116.334
Opp18	Opportunistic Sighting	-32.778	116.384	W05	Cage and Aluminium box Trap(s)	-32.777	116.332
Opp19	Opportunistic Sighting	-32.732	116.449	W06	Cage and Aluminium box Trap(s)	-32.778	116.384
Opp20	Opportunistic Sighting	-32.757	116.452	W07	Cage and Aluminium box Trap(s)	-32.779	116.386
Opp21	Opportunistic Sighting	-32.770	116.452	W08	Cage and Aluminium box Trap(s)	-32.779	116.387
Opp22	Opportunistic Sighting	-32.761	116.448	W09	Cage and Aluminium box Trap(s)	-32.778	116.388
P01	Cage and Aluminium box Trap(s)	-32.701	116.438	W10	Cage and Aluminium box Trap(s)	-32.777	116.388
P02	Cage and Aluminium box Trap(s)	-32.703	116.433	W11	Cage and Aluminium box Trap(s)	-32.776	116.387
P03	Cage and Aluminium box Trap(s)	-32.706	116.426	W12	Cage and Aluminium box Trap(s)	-32.777	116.386
P04	Cage and Aluminium box Trap(s)	-32.709	116.423	W13	Cage and Aluminium box Trap(s)	-32.776	116.384
P05	Cage and Aluminium box Trap(s)	-32.713	116.422	W14	Cage and Aluminium box Trap(s)	-32.771	116.398
P06	Cage and Aluminium box Trap(s)	-32.717	116.424	W15	Cage and Aluminium box Trap(s)	-32.774	116.404
P07	Cage and Aluminium box Trap(s)	-32.717	116.427	W16	Cage and Aluminium box Trap(s)	-32.777	116.410
P08	Cage and Aluminium box Trap(s)	-32.717	116.430	W17	Cage and Aluminium box Trap(s)	-32.777	116.413
P09	Cage and Aluminium box Trap(s)	-32.719	116.430	W18	Cage and Aluminium box Trap(s)	-32.779	116.446
P10	Cage and Aluminium box Trap(s)	-32.721	116.430	W19	Cage and Aluminium box Trap(s)	-32.780	116.440
P11	Cage and Aluminium box Trap(s)	-32.724	116.429	W20	Cage and Aluminium box Trap(s)	-32.775	116.439

Population estimates for Numbat and Woylie for the Hotham North Project
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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
P12	Cage and Aluminium box Trap(s)	-32.726	116.429	W21	Cage and Aluminium box Trap(s)	-32.770	116.442
P13	Cage and Aluminium box Trap(s)	-32.729	116.430	W22	Cage and Aluminium box Trap(s)	-32.770	116.449
P14	Cage and Aluminium box Trap(s)	-32.731	116.432	W23	Cage and Aluminium box Trap(s)	-32.771	116.452
P15	Cage and Aluminium box Trap(s)	-32.741	116.434	W24	Cage and Aluminium box Trap(s)	-32.766	116.449
P16	Cage and Aluminium box Trap(s)	-32.744	116.438	W25	Cage and Aluminium box Trap(s)	-32.763	116.446
P17	Cage and Aluminium box Trap(s)	-32.750	116.439	W26	Cage and Aluminium box Trap(s)	-32.776	116.454
P18	Cage and Aluminium box Trap(s)	-32.754	116.443	WFP01	Opportunistic Sighting and ultrasonic recording	-32.705	116.449
P19	Cage and Aluminium box Trap(s)	-32.759	116.444	WFP02	Opportunistic Sighting	-32.739	116.433
P20	Cage and Aluminium box Trap(s)	-32.759	116.448	WFP03	Opportunistic Sighting	-32.718	116.421
P21	Cage and Aluminium box Trap(s)	-32.751	116.419	WFP04	Opportunistic Sighting	-32.753	116.420
P22	Cage and Aluminium box Trap(s)	-32.745	116.416	WFP05	Opportunistic Sighting	-32.762	116.444
P23	Cage and Aluminium box Trap(s)	-32.742	116.412	WFP06	Opportunistic Sighting	-32.780	116.339
P24	Cage and Aluminium box Trap(s)	-32.738	116.407	Q01	Cage and Aluminium box Trap(s)	-32.703	116.424
P25	Cage and Aluminium box Trap(s)	-32.736	116.404	Q02	Cage and Aluminium box Trap(s)	-32.703	116.422
P26	Cage and Aluminium box Trap(s)	-32.734	116.402	Q03	Cage and Aluminium box Trap(s)	-32.703	116.419
P27	Cage and Aluminium box Trap(s)	-32.731	116.405	Q04	Cage and Aluminium box Trap(s)	-32.705	116.416
P28	Cage and Aluminium box Trap(s)	-32.735	116.408	Q05	Cage and Aluminium box Trap(s)	-32.705	116.413

Population estimates for Numbat and Woylie for the Hotham North Project
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Site name	Site type	Latitude	Longitude	Site name	Site type	Latitude	Longitude
P29	Cage and Aluminium box Trap(s)	-32.733	116.406	Q06	Cage and Aluminium box Trap(s)	-32.704	116.410
P30	Cage and Aluminium box Trap(s)	-32.729	116.406	Q07	Cage and Aluminium box Trap(s)	-32.704	116.407
P31	Cage and Aluminium box Trap(s)	-32.726	116.410	Q08	Cage and Aluminium box Trap(s)	-32.705	116.404
P32	Cage and Aluminium box Trap(s)	-32.721	116.416	Q09	Cage and Aluminium box Trap(s)	-32.707	116.403
P33	Cage and Aluminium box Trap(s)	-32.720	116.420	Q10	Cage and Aluminium box Trap(s)	-32.711	116.402
Q18	Cage and Aluminium box Trap(s)	-32.718	116.394	Q11	Cage and Aluminium box Trap(s)	-32.713	116.403
Q19	Cage and Aluminium box Trap(s)	-32.720	116.394	Q12	Cage and Aluminium box Trap(s)	-32.715	116.407
Q20	Cage and Aluminium box Trap(s)	-32.722	116.395	Q13	Cage and Aluminium box Trap(s)	-32.718	116.406
Q21	Cage and Aluminium box Trap(s)	-32.723	116.398	Q14	Cage and Aluminium box Trap(s)	-32.718	116.403
Q22	Cage and Aluminium box Trap(s)	-32.723	116.400	Q15	Cage and Aluminium box Trap(s)	-32.716	116.401
Q23	Cage and Aluminium box Trap(s)	-32.722	116.403	Q16	Cage and Aluminium box Trap(s)	-32.717	116.399
Q24	Cage and Aluminium box Trap(s)	-32.721	116.403	Q17	Cage and Aluminium box Trap(s)	-32.717	116.395
Q25	Cage and Aluminium box Trap(s)	-32.719	116.403				

Site details			
Site	BCQ01	Position (WGS84)	116.4484, -32.7791
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam, laterite, loamy sand
Rock cover (%)	0	Rock type	granite - rocks, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Marri/Wandoo forest on plains. Open Jarrah forest with Wandoo and Marri over younger eucalypts, Zamia and mixed low shrubs over grasses, herbs and weeds on clay loam and sandy loam undulating plain.			
Habitat	forest		
Disturbance	litter, vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	90	Litter distribution	even/continuous
Tree cover (%)	10	Litter depth (cm)	1.0
Shrub cover (%)	5	Litter cover (%)	60
Grass cover (%)	65	Herb cover (%)	10



Site details			
Site	BCQ02	Position (WGS84)	116.4409, -32.7773
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam,sand,sandy clay,sandy loam
Rock cover (%)	2	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Marri/Wandoo forest on plains. Jarrah, Marri and Wandoo over younger eucalypts, Xanthorrhoea, Zamia and mixed low shrubs over mixed herbs and grasses on hill slopes of clay loam and sandy loam undulating plain surrounded by granite outcrops.			
Habitat	forest		
Disturbance	vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	215	Litter distribution	concentrated in drifts
Tree cover (%)	10	Litter depth (cm)	1.0
Shrub cover (%)	75	Litter cover (%)	70
Grass cover (%)	80	Herb cover (%)	50



Site details			
Site	BCQ03	Position (WGS84)	116.4345, -32.7619
Slope	gentle	Topography	undulating plain
Soil colour	brown-grey	Soil texture	clay loam
Rock cover (%)	5	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah woodland on plains. Open Jarrah woodland with Wandoo and scattered Marri over Allocasuarina, eucalypt saplings and sparse mid level mixed shrubs over grasses, sedges, herbs and weeds on clay loam undulating plain with laterite gravel and granite rocks			
Habitat	woodland		
Disturbance	excavation, vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	50	Litter distribution	even/continuous
Tree cover (%)	15	Litter depth (cm)	1.0
Shrub cover (%)	10	Litter cover (%)	80
Grass cover (%)	15	Herb cover (%)	10



Site details			
Site	BCQ04	Position (WGS84)	116.4545, -32.7568
Slope	moderate	Topography	hill slope
Soil colour	brown	Soil texture	clay,clay loam,sandy clay,sandy loam
Rock cover (%)	5	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024
1	Opportunistic sighting	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri/Wandoo forest on slopes. Jarrah, Marri and Wandoo over Banksia, eucalypt saplings, Zamia and Acacias over grasses and herbs on sandy clay loam hillslope.			
Habitat	forest		
Disturbance	vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	140	Litter distribution	under vegetation
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	45	Litter cover (%)	55
Grass cover (%)	50	Herb cover (%)	20



Site details			
Site	BCQ05	Position (WGS84)	116.4379, -32.7413
Slope	gentle	Topography	undulating plain
Soil colour	brown-grey	Soil texture	clay loam,loamy sand
Rock cover (%)	10	Rock type	granite - rocks, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Marri/Wandoo forest on plains. Jarrah and Wandoo forest with scattered Marri over sparse eucalypt saplings and mixed shrubs over moderate grasses, herbs and weeds on sandy clay loam undulating plain with granite rocks and laterite gravel.			
Habitat	forest		
Disturbance	evidence of feral animals, vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	60	Litter distribution	even/continuous
Tree cover (%)	20	Litter depth (cm)	1.0
Shrub cover (%)	15	Litter cover (%)	75
Grass cover (%)	15	Herb cover (%)	10



Site details			
Site	BCQ06	Position (WGS84)	116.4081, -32.7240
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	loam,loamy sand
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Wandoo forest on slopes. Wandoo and scattered Jarrah and Marri over eucalypt saplings, Zamia, Hakea and Grevillea over grasses and herbs on sandy loam hill slope.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Very Good	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	150	Litter distribution	even/continuous
Tree cover (%)	50	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	65
Grass cover (%)	30	Herb cover (%)	30



Site details			
Site	BCQ07	Position (WGS84)	116.4231, -32.7132
Slope	gentle	Topography	plain
Soil colour	brown	Soil texture	laterite,loam
Rock cover (%)	0	Rock type	laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Jarrah woodland on plains. Jarrah woodland with scattered Marri over Zamia, eucalypt saplings and mixed low shrubs over prostrate Banksia, herbs and scattered tussock grasses on loamy plain with laterite gravel.			
Habitat	woodland		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	95	Litter distribution	even/continuous
Tree cover (%)	40	Litter depth (cm)	1.0
Shrub cover (%)	45	Litter cover (%)	80
Grass cover (%)	5	Herb cover (%)	5



Site details			
Site	BCQ08	Position (WGS84)	116.4596, -32.7081
Slope	moderate	Topography	hill slope
Soil colour	brown,orange	Soil texture	clay loam,rocks
Rock cover (%)	10	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Jarrah/Marri/Wandoo woodland on slopes. Open Jarrah and Wandoo-dominated woodland with scattered Marri over Xanthorrhoea, eucalypt saplings, Allocasuarina, Hakea and Grevillea and mixed low shrubs over dense grasses, herbs and weeds on clay loam hill sope with granite rocks.			
Habitat	open woodland		
Disturbance	vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	125	Litter distribution	even/continuous
Tree cover (%)	10	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	25
Grass cover (%)	65	Herb cover (%)	10



Site details			
Site	BCQ09	Position (WGS84)	116.4454, -32.7051
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	1	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	28 Sep 2024	28 Sep 2024

Site description - visit 1 (28 Sep 2024)			
Jarrah/Marri/Wandoo woodland on slopes. Open Jarrah, Marri and Wandoo forest over eucalypt saplings, Zamia and mixed low shrubs over grasses and herbs on clay loam hill slope with sparse granite rocks.			
Habitat	open woodland		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	90	Litter distribution	even/continuous
Tree cover (%)	15	Litter depth (cm)	1.0
Shrub cover (%)	20	Litter cover (%)	85
Grass cover (%)	35	Herb cover (%)	20



Site details			
Site	BCQ10	Position (WGS84)	116.4583, -32.7179
Slope	moderate	Topography	breakaway
Soil colour	orange	Soil texture	gravel,gravel / alluvial
Rock cover (%)	2	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Wandoo woodland. Wandoo woodland with scattered young Jarrah and Marri over eucalypt saplings, Xanthorrhoea, Zamia, Acacia and scattered Banksia on a gravel breakaway with granite rocks.			
Habitat	woodland		
Disturbance	vehicle tracks		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	125	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	65	Litter cover (%)	45
Grass cover (%)	20	Herb cover (%)	15



Site details			
Site	BCQ11	Position (WGS84)	116.4314, -32.7258
Slope	moderate	Topography	undulating plain
Soil colour	brown-grey	Soil texture	clay loam and laterite,loamy sand
Rock cover (%)	5	Rock type	granite - rocks,laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Wandoo woodland on plains. Open Wandoo and Powderbark woodland over eucalypt saplings, Xanthorrhoea, Zamia and mixed low shrubs over sparse herbs and grasses on sandy clay loam undulating plain with sparse granite rocks and laterite gravel.			
Habitat	woodland		
Disturbance	historic clearing		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	82	Litter distribution	even/continuous
Tree cover (%)	40	Litter depth (cm)	1.0
Shrub cover (%)	35	Litter cover (%)	80
Grass cover (%)	2	Herb cover (%)	5



Site details			
Site	BCQ12	Position (WGS84)	116.4145, -32.7393
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam,sandy clay,sandy loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Marri/Wandoo forest on slopes. Jarrah and Wandoo forest with scattered Marri over eucalypt saplings, Zamia, Acacia and mixed low shrubs over grasses and herbs on sandy clay loam hill slope.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	215	Litter distribution	even/continuous
Tree cover (%)	65	Litter depth (cm)	1.0
Shrub cover (%)	35	Litter cover (%)	50
Grass cover (%)	65	Herb cover (%)	50



Site details			
Site	BCQ13	Position (WGS84)	116.4227, -32.7502
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	1	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Marri/Wandoo forest on slopes. Jarrah forest with scattered Marri and Wandoo over eucalypt saplings, Zamia, Acacia and mixed low shrubs over tussock grasses and herbs on clay loam hill slope.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	135	Litter distribution	concentrated in drifts
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	20	Litter cover (%)	65
Grass cover (%)	45	Herb cover (%)	40



Site details			
Site	BCQ14	Position (WGS84)	116.4142, -32.7609
Slope	negligible	Topography	hill slope
Soil colour	brown	Soil texture	loamy sand
Rock cover (%)	10	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	28 Sep 2024	28 Sep 2024

Site description - visit 1 (28 Sep 2024)			
Jarrah/Wandoo forest on slopes. Jarrah forest with scattered Wandoo over Banksia, Allocasuarina and mixed low shrubs over scattered grasses and herbs on sandy loam hill slope with sparse granite rocks.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	110	Litter distribution	even/continuous
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	70	Litter cover (%)	85
Grass cover (%)	5	Herb cover (%)	5



Site details			
Site	BCQ15	Position (WGS84)	116.4485, -32.7348
Slope	moderate	Topography	hill slope
Soil colour	brown-grey	Soil texture	clay loam and laterite
Rock cover (%)	10	Rock type	bauxite, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Jarrah/Wandoo forest. Jarrah and Wandoo forest with Powderbark and scattered Marri over Banksia sessilis, Zamia, eucalypt saplings and mixed low shrubs and over sparse grasses, annuals, weeds and herbs on clay loam hill slope with bauxite rocks and laterite gravel.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	50	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	10	Litter cover (%)	65
Grass cover (%)	5	Herb cover (%)	10



Site details			
Site	BCQ16	Position (WGS84)	116.4218, -32.7447
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri forest on slopes. Jarrah and Marri forest with scattered Allocasuarina over eucalypt saplings, Zamia and Acacia over grasses and herbs on sandy clay loam hill slope.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	175	Litter distribution	concentrated in drifts
Tree cover (%)	65	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	55
Grass cover (%)	35	Herb cover (%)	35



Site details			
Site	BCQ17	Position (WGS84)	116.4251, -32.7230
Slope	moderate	Topography	foot slope
Soil colour	brown	Soil texture	loam
Rock cover (%)	1	Rock type	Bauxite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Jarrah forest on slopes. Jarrah and scattered Marri over tall Banksia sessilis shrubland with eucalypt saplings and mixed low shrubs over herbs, weeds and sparse tussock grasses on loamy footslope with bauxite rocks and lots of fallen woody debri.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	101	Litter distribution	even/continuous
Tree cover (%)	35	Litter depth (cm)	1.0
Shrub cover (%)	60	Litter cover (%)	80
Grass cover (%)	1	Herb cover (%)	5



Site details			
Site	BCQ18	Position (WGS84)	116.4082, -32.7067
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Opportunistic sighting	28 Sep 2024	28 Sep 2024
1	Site description	28 Sep 2024	28 Sep 2024

Site description - visit 1 (28 Sep 2024)			
Jarrah/Marri forest on slopes. Jarrah forest with scattered Marri over sparse understory of eucalypt saplings, Zamia and mixed low shrubs over herbs and grasses on sandy loam hill slope.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	65	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	5	Litter cover (%)	65
Grass cover (%)	20	Herb cover (%)	15



Site details			
Site	BCQ19	Position (WGS84)	116.4252, -32.7086
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	28 Sep 2024	28 Sep 2024
1	Opportunistic sighting	28 Sep 2024	28 Sep 2024

Site description - visit 1 (28 Sep 2024)			
Jarrah/Marri forest on plains. Jarrah and Marri forest over eucalypt saplings, Zamia and mixed low shrubs over herbs and grasses on clay loam plain.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	60	Litter distribution	even/continuous
Tree cover (%)	20	Litter depth (cm)	1.0
Shrub cover (%)	5	Litter cover (%)	75
Grass cover (%)	25	Herb cover (%)	10



Site details			
Site	BCQ20	Position (WGS84)	116.4349, -32.7033
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	5	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	28 Sep 2024	28 Sep 2024
1	Opportunistic sighting	28 Sep 2024	29 Nov 2024
1	Opportunistic sighting	28 Sep 2024	29 Nov 2024

Site description - visit 1 (28 Sep 2024)			
Jarrah forest on slopes. Jarrah forest with sparse Marri over eucalypt saplings, Xanthorrhoea and mixed low shrubs over herbs and grasses on clay loam hill slope.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	75	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	5	Litter cover (%)	80
Grass cover (%)	25	Herb cover (%)	20



Site details			
Site	BCQ21	Position (WGS84)	116.4487, -32.7278
Slope	gentle	Topography	undulating plain
Soil colour	brown-grey	Soil texture	clay loam and laterite,gravel,rocks
Rock cover (%)	8	Rock type	granite - rocks,laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Open Jarrah/Marri woodland on plains. Jarrah woodland with scattered Marri over eucalypt saplings, Banksia sessilis, Xanthorrhoea and mixed low shrubs over prostrate Banksia, grasses, annuals and weeds on clay loam undulating plain with laterite gravel and granite rocks.			
Habitat	woodland		
Disturbance	historic clearing,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	70	Litter distribution	even/continuous
Tree cover (%)	15	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	40
Grass cover (%)	5	Herb cover (%)	10



Site details			
Site	BCQ22	Position (WGS84)	116.4562, -32.7511
Slope	moderate	Topography	hill slope
Soil colour	brown	Soil texture	clay loam,sandy clay,sandy loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024
1	Opportunistic sighting	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri forest on slopes. Jarrah and Marri forest over Banksia sessilis, eucalypt saplings, other Banksia spp. and Xanthorrhoea over grasses and herbs on sandy clay loam hill slope with granite rocks and laterite gravel.			
Habitat	forest		
Disturbance	historic clearing,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	185	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	70	Litter cover (%)	50
Grass cover (%)	55	Herb cover (%)	35



Site details			
Site	BCQ23	Position (WGS84)	116.4217, -32.7691
Slope	moderate	Topography	hill slope
Soil colour	brown	Soil texture	clay,clay loam,sandy clay,sandy loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024
1	Opportunistic sighting	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri/Wandoo forest on slopes. Young Jarrah, Marri and Wandoo forest over eucalypt saplings, Xanthorrhoea, Zamia, Acacias and mixed low shrubs over grasses and herbs on sandy clay loam hill slope.			
Habitat	forest		
Disturbance	historic clearing,vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	120	Litter distribution	even/continuous
Tree cover (%)	60	Litter depth (cm)	2.0
Shrub cover (%)	30	Litter cover (%)	80
Grass cover (%)	15	Herb cover (%)	15



Site details			
Site	BCQ24	Position (WGS84)	116.4409, -32.7729
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam,sandy clay,sandy loam
Rock cover (%)	1	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Marri/Wandoo forest on slopes. Jarrah and Marri forest with sparse Wandoo over eucalypt saplings, Xanthorrhoea and mixed low shrubs over grasses and herbs on sandy clay loam hill slope with sparse granite rocks.			
Habitat	forest		
Disturbance	vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	95	Litter distribution	even/continuous
Tree cover (%)	20	Litter depth (cm)	1.0
Shrub cover (%)	10	Litter cover (%)	65
Grass cover (%)	35	Herb cover (%)	30



Site details			
Site	BCQ25	Position (WGS84)	116.4495, -32.7105
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam and laterite,loamy sand
Rock cover (%)	0	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri forest on plains. Jarrah forest with sparse Marri over eucalypt saplings, Xanthorrhoea, Zamia and mixed low shrubs over mixed grasses, herbs, annuals and prostrate banksia on sandy clay loam undulating plain.			
Habitat	forest		
Disturbance	historic clearing,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	90	Litter distribution	even/continuous
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	75
Grass cover (%)	10	Herb cover (%)	10



Site details			
Site	BCQ26	Position (WGS84)	116.4131, -32.7343
Slope	gentle	Topography	depression
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Wandoo forest on seasonally inundated plains. Wandoo woodland with scattered Marri over eucalypt saplings, Acacia, Hakea and mixed low shrubs over grasses and herbs on seasonally-inundated clay loam plain.			
Habitat	riparian zone		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	190	Litter distribution	even/continuous
Tree cover (%)	50	Litter depth (cm)	2.0
Shrub cover (%)	70	Litter cover (%)	80
Grass cover (%)	40	Herb cover (%)	30



Site details			
Site	BCQ27	Position (WGS84)	116.4560, -32.7657
Slope	gentle	Topography	seasonally wet area
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Wandoo forest on seasonally inundated plains. Wandoo woodland with scattered Marri and Jarrah over Xanthorrhoea, eucalypt saplings, Acacia and Melaleuca over extensive grasses and herbs on water logged clay loam plain.			
Habitat	riparian zone		
Disturbance	evidence of feral animals, vehicle tracks, weed infestation		
Vegetation condition	Very Good	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	190	Litter distribution	concentrated in drifts
Tree cover (%)	15	Litter depth (cm)	1.0
Shrub cover (%)	35	Litter cover (%)	20
Grass cover (%)	90	Herb cover (%)	50



Site details			
Site	BCQ28	Position (WGS84)	116.4291, -32.7727
Slope	gentle	Topography	drainage line
Soil colour	whitish	Soil texture	clay loam, laterite
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Wandoo/Jarrah forest on seasonally inundated plains. Wandoo, Jarrah and Bullich forest over eucalypt saplings, Xanthorrhoea, Acacias and Grevilleas over widespread shrubs over grasses and herbs on seasonally inundated clay loam drainage line with laterite gravel.			
Habitat	riparian zone		
Disturbance	weed infestation		
Vegetation condition	Very Good	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	190	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	70	Litter cover (%)	45
Grass cover (%)	80	Herb cover (%)	15



Site details			
Site	BCQ29	Position (WGS84)	116.3372, -32.7795
Slope	gentle	Topography	plain
Soil colour	brown	Soil texture	gravel,loam
Rock cover (%)	0	Rock type	laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Jarrah/Marri forest on plains. Jarrah and sparse Marri over mid to tall Allocasuarina shrubland with Banksia, Acacia and mixed low shrubs over prostrate Banksia, sparse tussock grasses and herbs on loamy plain with laterite gravel.			
Habitat	forest		
Disturbance	exploration (drill pads and access tracks)		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	65	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	35	Litter cover (%)	80
Grass cover (%)	5	Herb cover (%)	1



Site details			
Site	BCQ30	Position (WGS84)	116.3308, -32.7778
Slope	gentle	Topography	plain
Soil colour	brown	Soil texture	loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Allocasuarina shrubland on plains. Tall Allocasuarina shrubland with Jarrah and Marri over Banksia sessilis and mixed low shrubs over sparse tussock grasses and herbs on loamy plain.			
Habitat	shrubland		
Disturbance	current operations		
Vegetation condition	Very Good	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	66	Litter distribution	even/continuous
Tree cover (%)	30	Litter depth (cm)	2.0
Shrub cover (%)	30	Litter cover (%)	90
Grass cover (%)	5	Herb cover (%)	1



Site details			
Site	BCQ31	Position (WGS84)	116.4226, -32.7619
Slope	moderate	Topography	hill slope
Soil colour	brown	Soil texture	clay loam,sandy clay,sandy loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024
1	Opportunistic sighting	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri/Allocasuarina forest. Jarrah, Allocasurina and scattered Marri over Banksia, younger eucalypts, Zamia, and sedges over herbs and grasses on clay loam hill slope.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	160	Litter distribution	even/continuous
Tree cover (%)	30	Litter depth (cm)	2.0
Shrub cover (%)	70	Litter cover (%)	75
Grass cover (%)	30	Herb cover (%)	30



Site details			
Site	BCQ32	Position (WGS84)	116.4433, -32.7141
Slope	gentle	Topography	undulating plain
Soil colour	brown-grey	Soil texture	clay loam,loamy sand,sand
Rock cover (%)	0	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024
1	Opportunistic sighting	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah and Marri forest. Jarrah and Marri forest over sparse eucalypt saplings, Banksia, Zamia, malvaceae spp and mixed low shrubs over Hibbertia, mixed grasses, annuals, herbs and weeds on sandy clay loam undulating plain with extensive patches of bare ground with no leaf litter.			
Habitat	forest		
Disturbance	historic clearing,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	93	Litter distribution	even/continuous
Tree cover (%)	35	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	65
Grass cover (%)	8	Herb cover (%)	10



Site details			
Site	BCQ33	Position (WGS84)	116.4556, -32.7360
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam,sandy clay
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Allocasurina with scattered Jarrah over Banksia, Zamia, Acacia amongst widespread Herbs and grasses on sandy clay loam.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	165	Litter distribution	even/continuous
Tree cover (%)	65	Litter depth (cm)	1.0
Shrub cover (%)	50	Litter cover (%)	50
Grass cover (%)	25	Herb cover (%)	25



Site details			
Site	BCQ34	Position (WGS84)	116.4294, -32.7330
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam and laterite,loamy sand
Rock cover (%)	2	Rock type	granite - rocks,laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024
1	Opportunistic sighting	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri forest on plains. Jarrah forest with scattered Marri over sparse eucalypt saplings, Allocasuarina and mixed low shrubs over grasses, herbs, prostrate Banksia, herbs and weeds on sandy clay loam undulating plain with laterite gravel and granite rocks.			
Habitat	forest		
Disturbance	historic clearing,vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	53	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	10	Litter cover (%)	50
Grass cover (%)	8	Herb cover (%)	10



Site details			
Site	BCQ35	Position (WGS84)	116.4409, -32.7556
Slope	gentle	Topography	undulating plain
Soil colour	brown-grey	Soil texture	clay loam,sandy loam
Rock cover (%)	0	Rock type	granite - rocks

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Wandoo forest on plains. Jarrah forest with Wandoo over eucalypt saplings and mixed low shrubs over dense grasses and weeds on sandy clay loam undulating plain.			
Habitat	forest		
Disturbance	vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	155	Litter distribution	even/continuous
Tree cover (%)	20	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	65
Grass cover (%)	80	Herb cover (%)	15



Site details			
Site	BCQ36	Position (WGS84)	116.4472, -32.7675
Slope	gentle	Topography	undulating plain
Soil colour	brown-grey	Soil texture	clay loam and laterite
Rock cover (%)	0	Rock type	granite - rocks, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Wandoo forest on plains. Jarrah forest with Wandoo and scattered Allocasuarina over eucalypt saplings, Acacia, Banksia sessilis and mixed low shrubs over open to moderate grasses, sedges, herbs and some weeds on clay loam undulating plain with laterite gravel and granite rocks.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	52	Litter distribution	even/continuous
Tree cover (%)	20	Litter depth (cm)	1.0
Shrub cover (%)	15	Litter cover (%)	60
Grass cover (%)	10	Herb cover (%)	7



Site details			
Site	BCQ37	Position (WGS84)	116.4474, -32.7450
Slope	gentle	Topography	undulating plain
Soil colour	brown-grey	Soil texture	clay loam and laterite,sandy loam
Rock cover (%)	20	Rock type	bauxite, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Jarrah/Marri forest on plains. Jarrah forest with scattered Marri over eucalypt saplings, Zamia, Xanthorrhoea and mixed low shrubs over sparse grasses and herbs on sandy clay loam undulating plain with bauxite rocks, laterite gravel and dense leaf litter.			
Habitat	forest		
Disturbance	historic clearing		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	70	Litter distribution	even/continuous
Tree cover (%)	20	Litter depth (cm)	1.0
Shrub cover (%)	35	Litter cover (%)	80
Grass cover (%)	5	Herb cover (%)	10



Site details			
Site	BCQ38	Position (WGS84)	116.4292, -32.7546
Slope	gentle	Topography	plain
Soil colour	red-brown	Soil texture	clay loam,gravel
Rock cover (%)	1	Rock type	granite - rocks, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Wandoo forest on plains. Jarrah and Wandoo forest over Zamia, Acacia, Banksia, Gastrolobium and mixed low shrubs over tussock grasses and herbs on red brown clay loam plain with laterite gravel, sparse granite rocks and fallen woody debris.			
Habitat	forest		
Disturbance	evidence of feral animals, weed infestation		
Vegetation condition	Excellent	Fire age	relatively recent (1-5 years)
Total veg. cover (%)	85	Litter distribution	under vegetation
Tree cover (%)	35	Litter depth (cm)	2.0
Shrub cover (%)	15	Litter cover (%)	40
Grass cover (%)	30	Herb cover (%)	5



Site details			
Site	BCQ39	Position (WGS84)	116.4329, -32.7167
Slope	gentle	Topography	plain
Soil colour	brown	Soil texture	loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024
1	Opportunistic sighting	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Wandoo/Marri forest on plains. Wandoo forest and scattered Marri over Zamia, Hakea, Acacia and mixed low shrubs over prostrate Banksia, herbs and extensive grass on brown loamy plain.			
Habitat	forest		
Disturbance	evidence of feral animals,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	135	Litter distribution	under vegetation
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	20	Litter cover (%)	30
Grass cover (%)	75	Herb cover (%)	10



Site details			
Site	BCQ40	Position (WGS84)	116.4322, -32.7676
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	sandy loam
Rock cover (%)	2	Rock type	granite - rocks, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri forest on slopes. Jarrah and Marri forest over Allocasuarina, Banksia sessilis, eucalypt saplings, other Banksia spp., scattered Hakea and Acacia over herbs and grasses on sandy loam hill slope.			
Habitat	forest		
Disturbance	historic clearing, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	137	Litter distribution	even/continuous
Tree cover (%)	30	Litter depth (cm)	2.0
Shrub cover (%)	20	Litter cover (%)	90
Grass cover (%)	45	Herb cover (%)	42



Site details			
Site	BCQ41	Position (WGS84)	116.4390, -32.7366
Slope	gentle	Topography	plain
Soil colour	brown	Soil texture	laterite,loam
Rock cover (%)	0	Rock type	laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024
1	Opportunistic sighting	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri forest on plains. Jarrah woodland with sparse Marri over Banksia spp., euclaypt saplings, Xanthorrhoea and mixed low shrubs over herbs and sparse tussock grasses on loamy plain with laterite gravel.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	95	Litter distribution	under vegetation
Tree cover (%)	40	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	70
Grass cover (%)	5	Herb cover (%)	10



Site details			
Site	BCQ42	Position (WGS84)	116.4558, -32.7433
Slope	moderate	Topography	hill slope
Soil colour	brown	Soil texture	clay loam,sandy loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Jarrah/Marri forest on slopes. Jarrah and Marri forest over Banksia, Zamia and euclaypt saplings over herbs and grasses on sandy clay loam hill slope.			
Habitat	forest		
Disturbance	vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	170	Litter distribution	even/continuous
Tree cover (%)	50	Litter depth (cm)	1.0
Shrub cover (%)	70	Litter cover (%)	60
Grass cover (%)	25	Herb cover (%)	25



Site details			
Site	BCQ43	Position (WGS84)	116.4110, -32.7502
Slope	gentle	Topography	hill slope
Soil colour	red-brown	Soil texture	clay loam,sandy clay,sandy loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Wandoo forest on slopes. Jarrah forest with scattered Wandoo over Banksia, Zamia and Fabacea sp. over grasses and herbs on clay sandy clay loam hill slope.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	160	Litter distribution	concentrated in drifts
Tree cover (%)	10	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	55
Grass cover (%)	60	Herb cover (%)	50



Site details			
Site	BCQ44	Position (WGS84)	116.4175, -32.7285
Slope	gentle	Topography	hill slope
Soil colour	brown	Soil texture	clay loam,loamy sand,sandy loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri/Wandoo forest on slopes. Open Jarrah forest with scattered young Wandoo and Marri over Zamia, Acacia and Banksia shrubs over herbs and grasses on sandy clay loam hill slope.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	170	Litter distribution	even/continuous
Tree cover (%)	15	Litter depth (cm)	1.0
Shrub cover (%)	25	Litter cover (%)	60
Grass cover (%)	80	Herb cover (%)	50



Site details			
Site	BCQ45	Position (WGS84)	116.4167, -32.7123
Slope	gentle	Topography	plain
Soil colour	brown	Soil texture	laterite,loam
Rock cover (%)	0	Rock type	laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024
1	Opportunistic sighting	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Jarrah forest on plains. Jarrah forest with scattered Marri over Zamia, eucalypt saplings, Acacia, Gastrolobium and mixed low shrubs over prostrate Banksia, herbs and sparse tussock grasses on loamy soil plain with laterite gravel.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	115	Litter distribution	under vegetation
Tree cover (%)	40	Litter depth (cm)	1.0
Shrub cover (%)	55	Litter cover (%)	70
Grass cover (%)	5	Herb cover (%)	15



Site details			
Site	BCQ46	Position (WGS84)	116.4411, -32.7268
Slope	moderate	Topography	hill slope
Soil colour	brown	Soil texture	clay loam,sandy clay
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Oct 2024	01 Oct 2024

Site description - visit 1 (01 Oct 2024)			
Wandoo woodland on slopes. Wandoo woodland with scattered Jarrah and Marri over eucalypt saplings, Xanthorrhoea, Zamia, Acacia and Hakea over herbs and grasses on sandy clay loam hill slope.			
Habitat	woodland		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	105	Litter distribution	even/continuous
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	70
Grass cover (%)	25	Herb cover (%)	10



Site details			
Site	BCQ47	Position (WGS84)	116.4239, -32.7366
Slope	gentle	Topography	plain
Soil colour	light-brown	Soil texture	clay loam,gravel,loam
Rock cover (%)	0	Rock type	Bauxite,laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Wandoo woodland on plains. Wandoo woodland with scattered Jarrah over eucalypt saplings, Grevillia and mixed low shrubs over prostrate Banksia, herbs and patchy tussock grasses on loamy clay plain with laterite gravel and sparse bauxite rocks.			
Habitat	woodland		
Disturbance	evidence of feral animals,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	75	Litter distribution	under vegetation
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	25	Litter cover (%)	35
Grass cover (%)	5	Herb cover (%)	15



Site details			
Site	BCQ48	Position (WGS84)	116.4315, -32.7421
Slope	gentle	Topography	plain
Soil colour	brown	Soil texture	clay,gravel,loam
Rock cover (%)	2	Rock type	granite - rocks, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Sep 2024	29 Sep 2024
1	Opportunistic sighting	29 Sep 2024	29 Sep 2024

Site description - visit 1 (29 Sep 2024)			
Jarrah/Marri forest on plains. Jarrah forest with scattered Marri and tall Allocasuarina over Banksia sessilis, other Banksia spp., Hibbertia and mixed low shrubs over prostrate Banksia, grasses and herbs on gently-sloping loamy clay plain with laterite gravel.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	relatively recent (1-5 years)
Total veg. cover (%)	75	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	35	Litter cover (%)	65
Grass cover (%)	10	Herb cover (%)	5



Site details			
Site	BCQ49	Position (WGS84)	116.4125, -32.7715
Slope	negligible	Topography	drainage line
Soil colour	brown	Soil texture	loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024
1	Opportunistic sighting	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Seasonally inundated plain with eucalypts, Banksia and Acacia over Cape Tulip and pasture grasses on loam.			
Habitat	riparian zone		
Disturbance	evidence of feral animals, revegetation, vehicle tracks, weed infestation		
Vegetation condition	Very Good	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	250	Litter distribution	under vegetation
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	70	Litter cover (%)	20
Grass cover (%)	100	Herb cover (%)	50



Site details			
Site	BCQ50	Position (WGS84)	116.4324, -32.7791
Slope	moderate	Topography	hill slope
Soil colour	brown	Soil texture	clay loam,sandy loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	30 Sep 2024	30 Sep 2024

Site description - visit 1 (30 Sep 2024)			
Jarrah/Marri forest on slopes. Jarrah and Marri forest with tall Allocasuarina and Banksia sessilis over Banksia spp., eucalypt saplings, low Allocasuarina and mixed low shrubs over sedges, grasses and herbs on sandy loam hill slope.			
Habitat	forest		
Disturbance	vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	170	Litter distribution	even/continuous
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	60	Litter cover (%)	65
Grass cover (%)	50	Herb cover (%)	30



Site details			
Site	C12	Position (WGS84)	116.3859, -32.7571
Slope	moderate	Topography	hill slope
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Cage trap (large)	27 Nov 2024	01 Dec 2024
1	Elliot trap (large)	27 Nov 2024	01 Dec 2024
1	Site description	01 Dec 2024	01 Dec 2024
1	Opportunistic sighting	29 Nov 2024	29 Nov 2024

Site description - visit 1 (01 Dec 2024)			
Jarrah/Wandoo forest on slopes. Jarrah and Wandoo forest over Zamia, Acacia, eucalypt saplings and Hakea over abundant grasses and herbs on sandy clay loam hill slope.			
Habitat	forest		
Disturbance	vehicle tracks,weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	105	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	30	Litter cover (%)	70
Grass cover (%)	25	Herb cover (%)	25



Site details			
Site	C14	Position (WGS84)	116.3919, -32.7632
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Elliot trap (large)	27 Nov 2024	01 Dec 2024
1	Cage trap (large)	27 Nov 2024	01 Dec 2024
1	Site description	01 Dec 2024	01 Dec 2024

Site description - visit 1 (01 Dec 2024)			
Wandoo forest on plains. Wandoo woodland over Hakea, Zamia, Acacia and younger Wandoo over grasses and herbs on sandy clay loam plain.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	90	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	30	Litter cover (%)	70
Grass cover (%)	15	Herb cover (%)	20



Site details			
Site	HM-1-03	Position (WGS84)	116.3456, -32.7162
Slope	moderate	Topography	foot slope
Soil colour	brown	Soil texture	gravel,loam,sand
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Camera trap	30 Oct 2024	26 Nov 2024
1	Site description	26 Nov 2024	26 Nov 2024

Site description - visit 1 (26 Nov 2024)			
Jarrad/Marri forest on slopes. Jarrah and Marri forest over Acacia, Zamia, eucalypt saplings and mixed low shrubs over prostrate Banksia, weeds, sparse herbs and grasses on sandy loam foot slope with laterite gravel			
Habitat	forest		
Disturbance	evidence of feral animals,weed infestation		
Vegetation condition	Very Good	Fire age	relatively recent (1-5 years)
Total veg. cover (%)	103	Litter distribution	under vegetation
Tree cover (%)	35	Litter depth (cm)	1.0
Shrub cover (%)	60	Litter cover (%)	40
Grass cover (%)	5	Herb cover (%)	3



Site details			
Site	HM-2-36	Position (WGS84)	116.4051, -32.7664
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Camera trap	26 Sep 2024	26 Oct 2024
1	Site description	01 Dec 2024	01 Dec 2024

Site description - visit 1 (01 Dec 2024)			
Wandoo forest on plains. Wandoo woodland over Hakea, eucalypt saplings, Acacia and mixed low shrubs over pasture grasses and herbs on clay loam plain.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	150	Litter distribution	even/continuous
Tree cover (%)	35	Litter depth (cm)	1.0
Shrub cover (%)	65	Litter cover (%)	60
Grass cover (%)	35	Herb cover (%)	15



Site details			
Site	HS-1-09	Position (WGS84)	116.3894, -32.7269
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Camera trap	25 Sep 2024	30 Oct 2024
1	Camera trap	30 Oct 2024	25 Nov 2024
1	Site description	01 Dec 2024	01 Dec 2024

Site description - visit 1 (01 Dec 2024)			
Jarrah/Marri forest on plains. Jarrah forest with sparse Marri over eucalypt saplings, Zamia, Acacia and mixed low shrubs over scattered herbs and grasses on sandy clay loam undulating plain.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	125	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	2.0
Shrub cover (%)	70	Litter cover (%)	85
Grass cover (%)	15	Herb cover (%)	15



Site details			
Site	NM-1-21	Position (WGS84)	116.4405, -32.7136
Slope	gentle	Topography	plain
Soil colour	light-brown	Soil texture	loam
Rock cover (%)	1	Rock type	Bauxite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Camera trap	28 Sep 2024	25 Oct 2024
1	Site description	25 Oct 2024	25 Oct 2024

Site description - visit 1 (25 Oct 2024)			
Jarrah/Marri forest on plains. Jarrah forest and sparse Marri over Banksia sessilis, Hibbertia, Zamia and mixed low shrubs over prostrate Banksia, sparse tussock grasses, sedge grasses and herbs in loamy plain with bauxite rocks			
Habitat	forest		
Disturbance	evidence of feral animals, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	85	Litter distribution	even/continuous
Tree cover (%)	35	Litter depth (cm)	1.0
Shrub cover (%)	40	Litter cover (%)	55
Grass cover (%)	5	Herb cover (%)	5



Site details			
Site	NM-2-21	Position (WGS84)	116.4404, -32.7673
Slope	negligible	Topography	undulating plain
Soil colour	light-brown	Soil texture	gravel,loam
Rock cover (%)	0	Rock type	laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Camera trap	27 Oct 2024	26 Nov 2024
1	Site description	27 Oct 2024	27 Oct 2024

Site description - visit 1 (27 Oct 2024)			
Jarrah/Wandoo forest on plains. Jarrah forest and sparse Wandoo over Allocasuarina shrubland with Banksia sessilis, eucalypt saplings and mixed low shrubs over prostrate Banksia, tussock grasses and herbs on loamy undulating plain with laterite gravel.			
Habitat	forest		
Disturbance	weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	88	Litter distribution	under vegetation
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	45	Litter cover (%)	65
Grass cover (%)	10	Herb cover (%)	3



Site details			
Site	Opp18	Position (WGS84)	116.3837, -32.7776
Slope	gentle	Topography	undulating plain
Soil colour	light-brown	Soil texture	sandy clay
Rock cover (%)	5	Rock type	granite - rocks, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	29 Nov 2024	29 Nov 2024

Site description - visit 1 (29 Nov 2024)			
Jarrah forest on slopes. Jarrah forest over Banksia grandis, Banksia sessilis, Zamia and mixed low shrubs over prostrate Banksia, sparse grasses and herbs on sandy clay undulating plain with laterite gravel and granite rocks. Large fallen trees present.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	68	Litter distribution	under vegetation
Tree cover (%)	45	Litter depth (cm)	1.0
Shrub cover (%)	5	Litter cover (%)	30
Grass cover (%)	3	Herb cover (%)	15



Site details			
Site	Opp22	Position (WGS84)	116.4478, -32.7611
Slope	negligible	Topography	floodplain
Soil colour	brown,light-brown	Soil texture	clay loam,loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	01 Dec 2024	01 Dec 2024

Site description - visit 1 (01 Dec 2024)			
Seasonally inundated melaluca shrubland. Shrubland-dominated depression between upper slopes vegetated with mallee eucalypts over melaleuca, Xanthorrhoea, Allocasuarina, Acacia and mixed low shrubs over sparse herbs and semi-continuous grasses on clay loam plain.			
Habitat	shrubland		
Disturbance	exploration (drill pads and access tracks)		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	97	Litter distribution	under vegetation
Tree cover (%)	15	Litter depth (cm)	0.0
Shrub cover (%)	30	Litter cover (%)	20
Grass cover (%)	50	Herb cover (%)	2



Site details			
Site	Q02	Position (WGS84)	116.4214, -32.7025
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Cage trap (large)	23 Nov 2024	27 Nov 2024
1	Elliot trap (large)	23 Nov 2024	27 Nov 2024
1	Site description	01 Dec 2024	01 Dec 2024

Site description - visit 1 (01 Dec 2024)			
Jarrah/Marri forest on plains. Jarrah forest with sparse Marri over abundant Banksia sessilis, eucalypt saplings, scattered Hibbertia and Acacias over sparse herbs and grasses on sandy loam plains with dense leaf litter.			
Habitat	forest		
Disturbance	litter, vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	135	Litter distribution	even/continuous
Tree cover (%)	25	Litter depth (cm)	2.0
Shrub cover (%)	70	Litter cover (%)	85
Grass cover (%)	25	Herb cover (%)	15



Site details			
Site	Q07	Position (WGS84)	116.4066, -32.7036
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Cage trap (large)	23 Nov 2024	27 Nov 2024
1	Cage trap (large)	23 Nov 2024	27 Nov 2024
1	Site description	01 Dec 2024	01 Dec 2024

Site description - visit 1 (01 Dec 2024)			
Jarrah/Marri/Wandoo forest on plains. Jarrah, Marri, Wandoo and Bullich forest over eucalypt saplings, Xanthorrhoea, Acacias and Grevilleas over scattered but abundant grasses and herbs on sandy clay loam plain.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	115	Litter distribution	even/continuous
Tree cover (%)	35	Litter depth (cm)	2.0
Shrub cover (%)	40	Litter cover (%)	75
Grass cover (%)	20	Herb cover (%)	20



Site details			
Site	Q09	Position (WGS84)	116.4021, -32.7068
Slope	gentle	Topography	undulating plain
Soil colour	brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Cage trap (large)	23 Nov 2024	27 Nov 2024
1	Elliot trap (large)	23 Nov 2024	27 Nov 2024
1	Site description	01 Dec 2024	01 Dec 2024

Site description - visit 1 (01 Dec 2024)			
Jarrah/Marri/Wandoo forest on plains. Young Jarrah, Marri and Wandoo forest over Xanthorrhoea, eucalypt saplings, Acacia and Hibbertia and mixed low shrubs over scattered herbs and grasses on sandy loam plain.			
Habitat	forest		
Disturbance	vehicle tracks, weed infestation		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	125	Litter distribution	even/continuous
Tree cover (%)	30	Litter depth (cm)	2.0
Shrub cover (%)	65	Litter cover (%)	80
Grass cover (%)	20	Herb cover (%)	10



Site details			
Site	WFP01	Position (WGS84)	116.4486, -32.7047
Slope	moderate	Topography	foot slope
Soil colour	brown	Soil texture	clay loam,gravel
Rock cover (%)	0	Rock type	Coffee rock / bauxite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Ultrasonic recording	24 Nov 2024	29 Nov 2024
1	Site description	24 Nov 2024	24 Nov 2024

Site description - visit 1 (24 Nov 2024)			
Wandoo woodland on slopes. Wandoo woodland with sparse Jarrah and Marri over open understory of Zamia, eucalypt saplings, Acacia and mixed low shrubs over sparse herbs and grasses on hard loamy foot slope with gravel.			
Habitat	woodland		
Disturbance	exploration (drill pads and access tracks)		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	50	Litter distribution	under vegetation
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	15	Litter cover (%)	30
Grass cover (%)	1	Herb cover (%)	4



Site details			
Site	WFP02	Position (WGS84)	116.4325, -32.7394
Slope	moderate	Topography	seasonally wet area
Soil colour	brown-grey,orange	Soil texture	clay loam,clay loam and laterite,sandy loam
Rock cover (%)	1	Rock type	laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	24 Nov 2024	24 Nov 2024
1	Ultrasonic recording	24 Nov 2024	29 Nov 2024

Site description - visit 1 (24 Nov 2024)			
Wandoo woodland on seasonally inundated plains. Open Wandoo woodland with other scattered eucalypts and paperbarks over mixed medium Melaleuca, Acacia, Banksia and mixed low shrubs on clay loam seasonally inundated plain with some laterite gravel.			
Habitat	woodland		
Disturbance	exploration (drill pads and access tracks),litter		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	84	Litter distribution	under vegetation
Tree cover (%)	20	Litter depth (cm)	2.0
Shrub cover (%)	60	Litter cover (%)	70
Grass cover (%)	1	Herb cover (%)	3



Site details			
Site	WFP03	Position (WGS84)	116.4213, -32.7176
Slope	negligible	Topography	plain
Soil colour	brown	Soil texture	loam
Rock cover (%)	0	Rock type	none

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Ultrasonic recording	24 Nov 2024	29 Nov 2024
1	Site description	24 Nov 2024	24 Nov 2024

Site description - visit 1 (24 Nov 2024)			
Jarrah/Marri/Wandoo forest on plains. Jarrah forest with Wandoo and sparse Marri over moderate understory of Acacia, eucalypt saplings, prostrate Banksia, Zamia, Hakea and mixed low shrubs over sparse herbs and grasses on loamy plain.			
Habitat	forest		
Disturbance	exploration (drill pads and access tracks)		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	84	Litter distribution	under vegetation
Tree cover (%)	35	Litter depth (cm)	2.0
Shrub cover (%)	45	Litter cover (%)	70
Grass cover (%)	1	Herb cover (%)	3



Site details			
Site	WFP04	Position (WGS84)	116.4199, -32.7526
Slope	gentle	Topography	plain
Soil colour	brown	Soil texture	loam
Rock cover (%)	1	Rock type	Coffee rock / Bauxite, laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	24 Nov 2024	24 Nov 2024
1	Ultrasonic recording	24 Nov 2024	29 Nov 2024

Site description - visit 1 (24 Nov 2024)			
Jarrah/Marri forest on plains. Jarrah forest with Marri over low and open understory of Zamia, eucalypt saplings and mixed low shrubs over prostrate Banksia, sparse herbs and grasses on loamy plain with bauxite rocks and laterite gravel.			
Habitat	forest		
Disturbance	Lopping, exploration (drill pads and access tracks)		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	74	Litter distribution	even/continuous
Tree cover (%)	45	Litter depth (cm)	1.0
Shrub cover (%)	25	Litter cover (%)	85
Grass cover (%)	2	Herb cover (%)	2



Site details			
Site	WFP05	Position (WGS84)	116.4442, -32.7624
Slope	gentle	Topography	plain
Soil colour	light-brown,red-brown	Soil texture	clay loam
Rock cover (%)	0	Rock type	laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Site description	24 Nov 2024	24 Nov 2024
1	Ultrasonic recording	24 Nov 2024	28 Nov 2024

Site description - visit 1 (24 Nov 2024)			
Wandoo woodland on plains. Wandoo woodland over low and open Acacia and mixed low shrubs over continuous matt of prostrate Banksia, sparse herbs and grasses on clay loam plain with laterite gravel.			
Habitat	woodland		
Disturbance	exploration (drill pads and access tracks)		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	92	Litter distribution	under vegetation
Tree cover (%)	25	Litter depth (cm)	1.0
Shrub cover (%)	65	Litter cover (%)	15
Grass cover (%)	1	Herb cover (%)	1

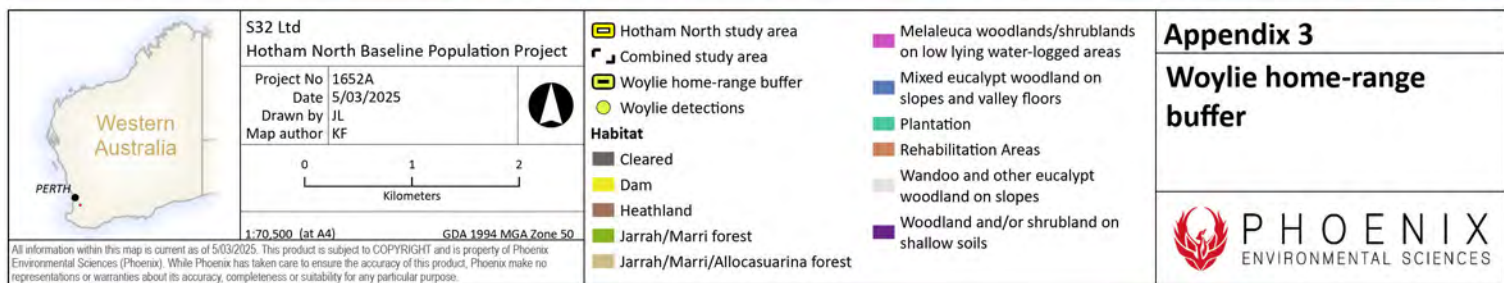
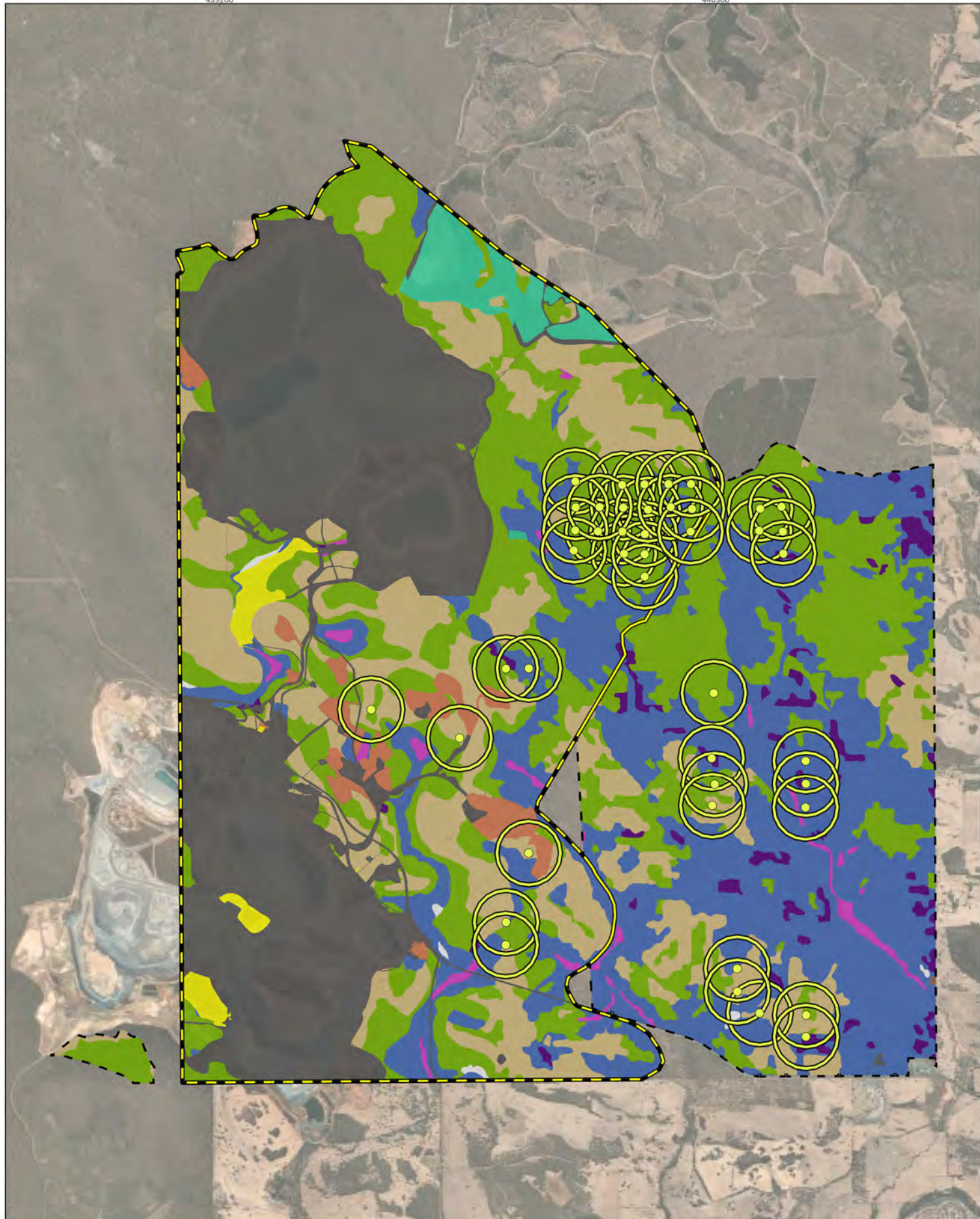


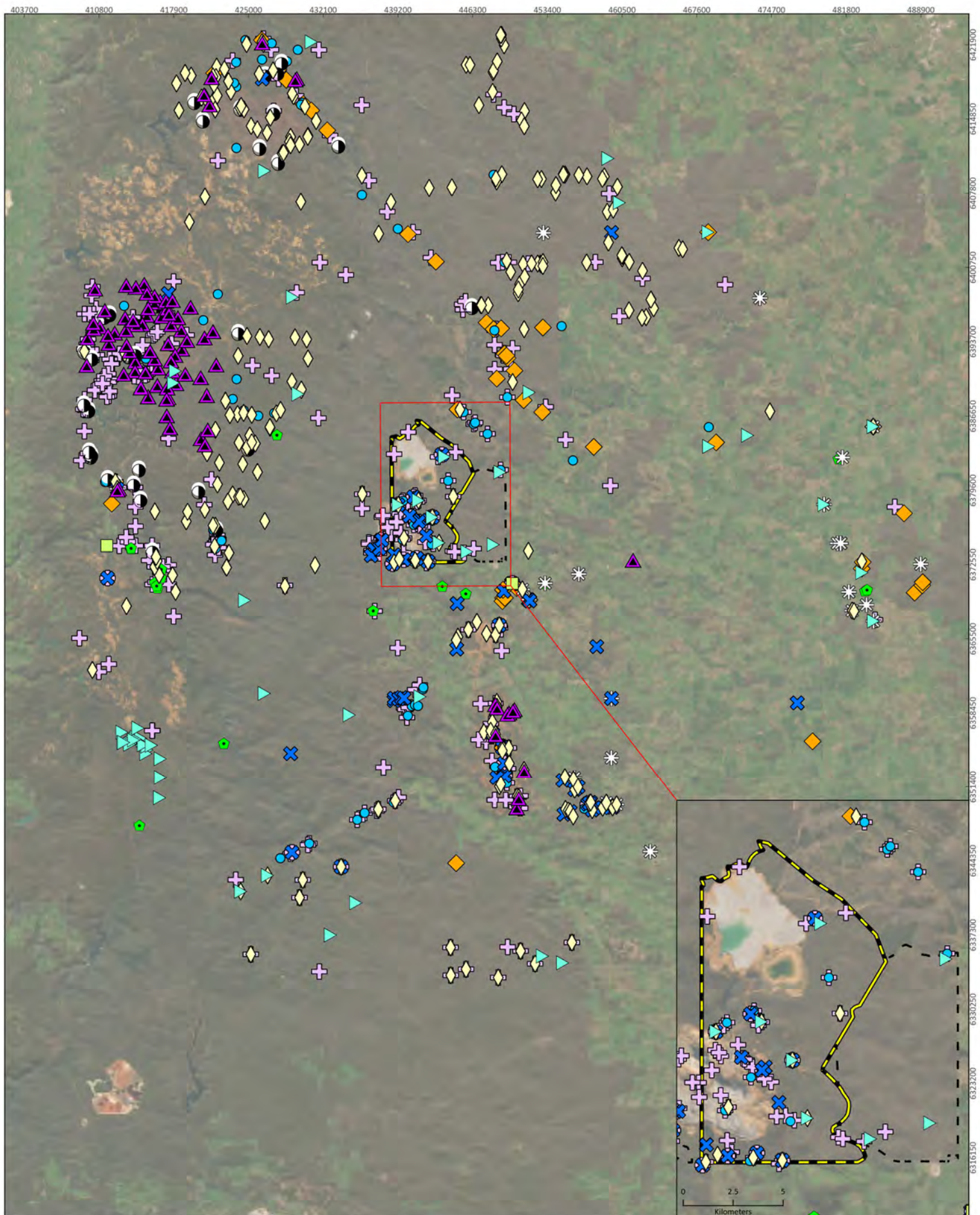
Site details			
Site	WFP06	Position (WGS84)	116.3388, -32.7800
Slope	moderate	Topography	foot slope
Soil colour	brown	Soil texture	gravel,loam
Rock cover (%)	0	Rock type	laterite

Sample and effort summary			
Visit	Sample method	Date start	Date stop
1	Ultrasonic recording	28 Nov 2024	02 Dec 2024
1	Site description	28 Nov 2024	28 Nov 2024

Site description - visit 1 (28 Nov 2024)			
Jarrah/Marri forest on slopes. Jarrah forest with scattered Marri and Allocasuarina over Xanthorrhoea, Acacia, eucalypt saplings and mixed low shrubs over prostrate Banksia, sparse herbs and grasses on loamy foot slope with laterite gravel.			
Habitat	forest		
Disturbance	exploration (drill pads and access tracks),vehicle tracks		
Vegetation condition	Excellent	Fire age	long-unburnt (>10 years)
Total veg. cover (%)	59	Litter distribution	under vegetation
Tree cover (%)	30	Litter depth (cm)	1.0
Shrub cover (%)	25	Litter cover (%)	45
Grass cover (%)	3	Herb cover (%)	1







Western Australia PERTH	S32 Ltd Hotham North Baseline Population Project Project No 1652A Date 6/03/2025 Drawn by JL Map author KF 0 7.5 15 Kilometers 1:462,750(at A4) GDA 1994 MGA Zone 50	Hotham North study area Combined study area Species, status Chuditch,Threatened - Vulnerable Numbat,Threatened - Endangered Quenda,Priority Quokka,Threatened - Vulnerable Rakali,Priority Red-tailed Phascogale,Specially Protected - Conservation Dependent	South-western Brush-tailed Phascogale,Specially Protected - Conservation Dependent Western Brush Wallaby,Priority Western-false Pipistrelle,Priority Western-ringtailed Possum,Threatened - Critically Endangered Woylie,Threatened - Critically Endangered	Appendix 4 Conservation significant mammal desktop records PHOENIX ENVIRONMENTAL SCIENCES
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