



PHOENIX

ENVIRONMENTAL SCIENCES

Targeted significant mammal and black cockatoo survey for the Boddington Gold Project

Prepared for Newmont Australia Ltd

April 2025

Final



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EXECUTIVE SUMMARY

Newmont Australia Ltd (Newmont) operates Newmont Boddington (NB, the Project), located 17 km northwest of Boddington, Western Australia (WA). The operation sits on land which is also under State Agreement for bauxite mining (Worsley on Newmont freehold land and Alcoa in State Forest). The current tailings storage facility referred to as the F1/F3 RDA, will reach maximum storage capacity in Q1 2030 with the new facility to be located in the northeast of the approved footprint (referred to as Residual Deposit Areas 2; RDA2) and is required to be operational by that time. An approved disturbance area within a defined Development Envelope was approved by the WA Environmental Protection Authority (EPA) and Australian environmental regulators in 2014. Newmont Boddington has completed the environmental studies required to inform the safe construction and operation of the RDA2 and will be submitting a proposal for assessment of this new footprint. Key changes in the new footprint are for material stockpiling, pipelines, roads, construction areas and other supporting infrastructure.

In August 2024, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by Newmont to undertake a targeted significant mammal and black cockatoo survey for the proposal. The purpose of the survey was to demonstrate the Project proposal meets EPA objective for terrestrial fauna and has effective mitigation for key threatening processes listed under the *Environmental Protection of Biodiversity and Conservation Act 1999* (EPBC Act).

The survey was undertaken concurrently with surveys for South 32, owned and operated by Worsley Alumina Pty Ltd (Worsley). Due to data sharing agreements between Newmont and Worsley, and the continuity of habitats between the survey areas, the results of the targeted significant mammal component of the survey have been combined to allow for more robust and comprehensive interpretation on the fauna values of the survey areas. Here after, the Newmont and Worsley survey areas are referred to as the Newmont study area and the Worsley study area.

The Newmont study area covers 4,341.6 ha and comprises 2 main survey areas: the Proposed Biodiversity Offset area (covering a total area of 4,609.2 ha; of which 3,103.5 ha was surveyed during this survey), and the Waste dump expansion area (59.7 ha). The Worsley study area is situated west of the Newmont study area and covers 7,797.3 ha (including a small overlap with Newmont study area in the northwest). The combined study area covers 11,650.5 ha

The survey of the study areas was undertaken over 3 trips in 2024 from 24 September – 1 October, 25–30 November, and 21 November–2 December. The survey scope included:

- targeted significant mammal survey:
 - presence/absence of significant taxa likely to occur in the Newmont study area
 - distribution and abundance of significant species
 - fauna movement and habitat use
- targeted black cockatoo survey:
 - presence/absence of significant taxa likely to occur in the Newmont study area
 - average potential hollow tree density within the Newmont study area to enable demographic analysis
 - compare presence and density of breeding trees with respect to dominant overstorey species and vegetation type and position in landscape
 - relative rank and area of breeding habitat within the Newmont study area based on the above derived data and using other spatial variables.

Field methods included using baited motion-sensitive camera trapping and physical trapping to target the significant mammal fauna; black cockatoo habitat assessments to assess black cockatoo foraging and breeding suitability; targeted searches and opportunistic sampling of significant fauna; and ultrasonic recordings for significant bat species. Population estimates and modelling were undertaken for significant mammal taxa recorded in the field survey from both camera trapping and

physical trapping (where applicable). Vegetation mapping by Mattiske (2024) was reinterpreted to define and delineate broad fauna habitats across the study areas.

A review of government databases within the 40 km desktop review area, in combination with integration of existing literature and survey data, identified 14 extant significant/keystone mammals and 3 black cockatoos, of which 11 taxa are listed as Threatened, Conservation-Dependent or Specially Protected under the EPBC Act and/or *Biodiversity Conservation Act 2016* (BC Act), 5 are listed as Priority species by the Department of Biodiversity, Conservation and Attractions (DBCA), one is listed as Extinct under the EPBC and BC Acts, and is a one keystone mammal species.

Based on the Mattiske (2024), 7 broad-scale fauna habitats were identified in the Newmont study area, comprising Wandoo woodland; Jarrah/Marri woodland; Jarrah/Marri/*Allocasuarina* woodland; Eucalyptus woodland on valley floors; Heathland; *Melaleuca* shrubland; and Plantation. A small proportion of the Newmont study area has been subject to disturbance. Habitat types identified and mapped broadly match with those described in previous surveys in the region are typical of the land systems present in the Newmont study area, including the Offset area. Most of the Newmont study area is represented by 3 habitats, exemplified by varying proportions of eucalypts (Jarrah, Marri, Wandoo) and she-oak dominant vegetation. The Worsley study area included 2 habitat types which do not occur in the Newmont study area: Rehabilitated areas and Dam.

Five Threatened, one Conservation Dependent (CD) and 2 Priority (P) species were recorded during the survey, all of which were recorded in the Newmont study area: Chuditch (Vulnerable (VU)), Woylie (Endangered (EN)/Critically Endangered), South-western Brush-tailed Phascogale (CD), Quenda (P4), Western Brush Wallaby (P4), Baudin's Cockatoo (EN), Carnaby's Cockatoo (EN) and Forest Red-tailed Black Cockatoo (VU). All of the species were recorded in the portion of the Offset area sampled in this survey, and 5 (potentially 6) were recorded in the Waste rock expansion area. Western Rosella was also recorded in the Newmont study area; however, it is uncertain whether the records represent the P4 subspecies. The likelihood of occurrence assessment for the remaining significant mammal taxa identified in the desktop review indicated 3 are likely to occur, 4 may possibly occur, and one is unlikely to occur. Population estimates and modelling indicated that all of the significant mammals recorded in the field survey meet the industry standard benchmark of 20-50 individuals required for translocation and are self-sustaining, viable population sizes. Five introduced vertebrate species were also recorded in the field survey, 4 of which occurred in the Newmont study area including cat, pig, fox and laughing kookaburra.

The results of the black cockatoo habitat assessment indicate the Newmont study area, including the Offset area and Waste rock expansion area, has extensive, high-quality habitat suitable for black cockatoo foraging and breeding. Foraging habitat is represented by Wandoo woodland, Jarrah/Marri woodland, Jarrah/Marri/*Allocasuarina* woodland, and *Eucalyptus* woodland on valley floors. High value breeding habitat for Forest Red-tailed Black Cockatoo and Carnaby's Cockatoo occurs in the Newmont study area and is represented by eucalypt-dominant habitat types. Breeding habitat for Baudin's Cockatoo was determined to be of low-value due to the species known breeding range occurring outside of the desktop search extent. The field surveyed recorded an average of 20.4 potential hollow trees (PHTs) per hectare from 1,169 PHTs recorded over a 50 ha sample area. Jarrah/Marri woodland recorded the highest average density (27.4 PHTs/ha), followed by Wandoo woodland (24.3), Jarrah/Marri/*Allocasuarina* woodland (19.3) and *Eucalyptus* woodland on valley floors (10.5). From the 290 hollows identified in the field survey, none showed evidence of breeding or occupancy by black cockatoos or any other fauna. The total extrapolated number of hollows was 25,133 across the Newmont study area (17,537 occurring inside the Offset area and 346 in the Waste dump expansion area), with an average density of 5.1 hollows/ha independent of habitat type. Jarrah/Marri woodland recorded the highest hollow density (6.9 hollows/ha), followed by Jarrah/Marri/*Allocasuarina* woodland (5.8 hollows/ha), Wandoo woodland (5.7 hollows/ha) and *Eucalyptus* woodland on valley floors (2.0 hollows/ha). However, due to the specific nesting requirements of black cockatoos, the majority of these hollows are expected to be of unsuitable size,

depth and orientation for breeding. Despite the absence of breeding records in the Newmont study area during the field survey, desktop and field survey records indicate breeding of Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo is known from the immediate region surrounding the study area. Artificial nest hollows may provide alternative breeding options for black cockatoos where natural hollows are limited. However, their success is highly dependent on site suitability and design.

Survey results suggest the Newmont study area and the wider combined study area serves as an important ecological refuge for significant fauna. Habitat connectivity is known to be a key factor in supporting viable population of significant mammals, and the maintenance of high-quality ecological corridors between the study areas and broader Jarrah Forest will assist in promoting gene flow and ecological continuity between populations in a partially fragmented and disturbed landscape. The presence of introduced species suggests the need for ongoing management and control, particularly for feral pigs, foxes, and cats.

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Definition
ANH	Artificial nest hollow
BC	Body condition
BC Act	<i>Biodiversity Conservation Act 2016</i>
NB	Newmont Boddington
BoM	Bureau of Meteorology
CD	Conservation Dependent
CPW	Colorado Parks and Wildlife
CR	Critically Endangered
DBCA	Department of Biodiversity, Conservation and Attractions
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPIRD	Department of Primary Industries and Regional Development
EN	Endangered
EP Act	<i>Environmental Protection Act 1986</i>
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESA	Environmentally Sensitive Area
EW	Extinct in the wild
EX	Extinct
IBRA	Interim Biogeographic Regionalisation of Australia
JAF	Jarrah Forest IBRA bioregion
JAF01	Norther Jarrah Forest IBRA subregion
LOO	Likelihood of occurrence
Mig.	Migratory species
NES	National Environmental Significance
Newmont	Newmont Australia Ltd
NNH	Natural nest hollow
Offset Area	Proposed Biodiversity Offset Area
OS	Fauna in need of special protection
P1-4	Priority 1 to 4 species
Phoenix	Phoenix Environmental Sciences
PHT	Potential hollow tree
PIT	Passive integrated transponder
PVA	Population viability analysis
RDA	Residual Deposit Area
SECR	Spatially Explicit Capture-Recapture
TEC	Threatened Ecological Community
VU	Vulnerable
WA	Western Australia
Worsley	Worsley Alumina Pty Ltd

1 INTRODUCTION

Newmont Australia Ltd (Newmont) operates Newmont Boddington (NB; the Project), located 17 km northwest of Boddington, Western Australia (WA; Figure 1-1). In August 2024, Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by Newmont to undertake a targeted significant mammal and black cockatoo survey for proposed expansions relating to the Project.

Newmont have commenced scoping surveys for proposed expansions of the Project, which will entail a second Residual Deposit Area (RDA2) and areas for their waste rock expansion. These scoping surveys are seeking to expand on the disturbance area approved in 2014 (see Section 1.1). An offsets management plan to support the expansion plan is in progress, which includes a Proposed Biodiversity Offset Area (Offset area). Together, the proposed expansion plans and offset strategy are defined in this report as the proposal.

The purpose of the survey was to demonstrate the proposal meets the WA Environmental Protection Authority (EPA) objective for terrestrial fauna, i.e. to protect terrestrial fauna so that biological diversity and ecological integrity are maintained (EPA 2016), and has effective mitigation for key threatening processes listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Project is located in the Shire of Boddington and the Southern Climatic Region as defined by EPA (2020).

1.1 BACKGROUND

Tailings generated from the Project are currently deposited into the F1/F3 RDA, an above-ground valley-fill tailings storage facility. This facility will reach maximum design capacity in mid-2029. Newmont has commenced more detailed studies for the RDA2, located in the Saddleback Tree farm to the northeast of the existing RDA (Figure 1-1).

An approved disturbance area within a defined development envelope was approved by the WA and Federal Environment Minister in 2014. However, the footprint is currently being re-assessed and amendments are anticipated, with a high probability of the need to refer the Project expansions again - the main changes are anticipated to be around the future tailings storage at RDA2 (the RDA2 proposed expanded disturbance footprint; Figure 1-1).

Spring fauna and flora surveys were completed in 2023 focusing on the immediate RDA2 proposed footprint. However, the footprint for material stockpiling, pipelines, roads, construction areas and other supporting infrastructure is currently being determined. Mine planning has also advised the Waste dump expansion area footprint has been amended and there is an area of vegetation that has been identified for disturbance which sits outside of the previously approved footprint. Newmont also anticipates the EPA requesting additional biodiversity surveys of offset areas to provide more detail on suitability as offset sites. There is also potential that the footprint amendments will result in the need to increase biodiversity offset areas.

An offsets management plan to support referrals is in progress. Newmont is refining the offset strategy and surveys of the Offset area (defined in section 1.3). The exact location of all offsets is yet to be confirmed. The RDA2 requires further environmental assessment. Newmont plans to submit a comprehensive revised referral in early 2025, to trigger an 'assessment on referral information level of approval. It is anticipated the results of this survey will be provided to regulators as part of a request for additional information following the original referral.

To demonstrate the proposal meets the WA EPA objective for terrestrial and has effective mitigation for EPBC Act key threatening processes; a targeted significant mammal and black cockatoo fauna

and habitat assessment survey was required of the Waste dump expansion area, and the Offset area to the east of Project operation (see section 1.3).

Simultaneously to this survey, Phoenix conducted a baseline population estimate survey for Numbat and Woylie for the South 32 Hotham North Project, owned and operated by Worsley Alumina Pty Ltd (Worsley). Due to a data-sharing agreement between Newmont and Worsley, the close proximity of the study areas and the continuity of habitats between the study areas, the results from both surveys have been incorporated. 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 immediate region.

Here after, the Newmont and Worsley survey areas are referred to as the Newmont study area and the Worsley study area.

1.2 SCOPE OF WORK

The scope of work for the targeted significant mammal and black cockatoo survey was as follows:

- desktop study –
 - to gather contextual information on the potential significant mammal assemblage and associated habitats of the Newmont study area, including assessment of previous significant fauna and habitat assessment surveys
 - to identify field survey requirements, including timing and methods
- reconnaissance survey – to delineate broad vertebrate fauna habitat information in the Newmont study area, including:
 - ground-truthing of habitats, habitat assessments to inform mapping
 - targeted mammals survey site selection
 - opportunistic fauna sampling based on sightings and secondary evidence.
- targeted survey (spring; September to November) – to confirm the presence/absence of significant mammals and black cockatoo species likely to occur in the Newmont study area:
 - to determine the distribution and abundance of specific significant species
 - to determine fauna movement and habitat use
 - to describe and map habitats or features that are important to significant fauna or faunal assemblages, such as for breeding, foraging or dispersal
 - to inform an environmental impact assessment for the Project expansion
 - be conducted in accordance with the relevant guidelines and guidance (DAWE 2022; DSEWPac 2011b; EPA 2016, 2020)
- collation and spatial assessment of any available black cockatoo potential habitat trees (PHT) and 'breeding tree' data, e.g. WA Museum, Department of Biodiversity, Conservation and Attractions (DBCA), Mattiske (tree density and tree species recorded in flora monitoring surveys) and South 32 PHT analysis and tree demographics transects from data to determine:
 - average PHT density within the spatially confined studies to enable demographic analysis
 - historic number of breeding trees
 - compare the presence and density of breeding trees with respect to dominant overstorey species and vegetation type and position in the landscape
 - relative rank and area (hectares) of breeding habitat within the Newmont study area based on the above-derived data and using other spatial variables, such as

vegetation type/fauna habitat, elevation, slope, and other spatial variables of potential relevance

- o undertake a brief review of the suitability/success of artificial nest boxes for each of the 3 black cockatoo species
 - o recommendations for further survey including representative areas to confirm the habitat quality and density of habitat trees estimated in the desktop study
- final technical report suitable for inclusion in environmental approval documentation.

1.3 STUDY AREA

The scope of work for this report focused on the Waste dump expansion area and the Offset Area.

At the time of the survey, the Offset area was one continuous area and fell entirely within the Newmont study area. However, Newmont is currently re-evaluating their offset strategy. Some of the revised Offset strategy does not intercept the area surveyed as part of the current scope for this report, in particular the component to the northeast of the Newmont study area (Figure 1-1). Some areas of the revised strategy also fall outside of the Newmont study area but intercepts the Worsley study area and were therefore sampled in this survey.

Newmont's revised offset strategy covers a combined 4,609.2 ha and occurs across 3 distinct geographical components incorporated into:

- the original Offset area, which includes the 2 components surveyed as part the scope of work for this report and covers 3,103.5 ha, referred to here after as the Offset area (this survey)
- the extension to the Offset area, which was not surveyed as part of the scope of work for this report (1,505.7 ha), covering the northeastern component and an extension to the middle component.

The extension to the Offset area is anticipated to be surveyed in 2025.

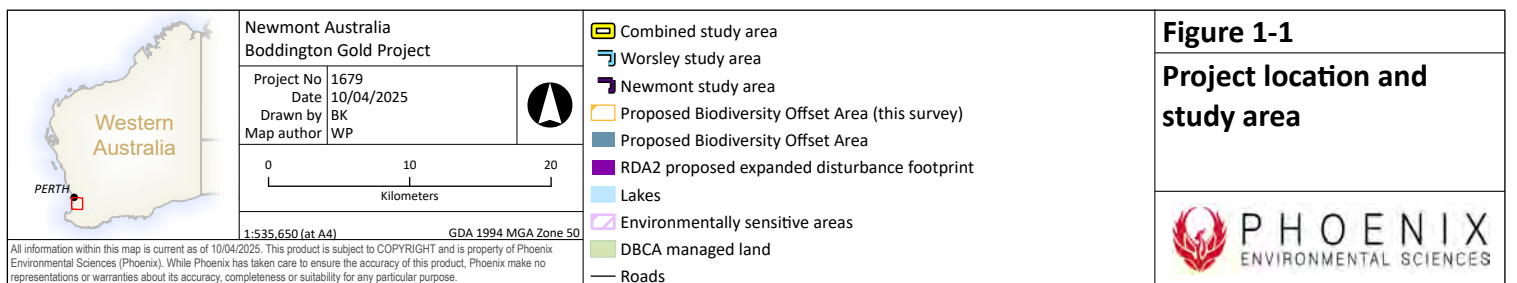
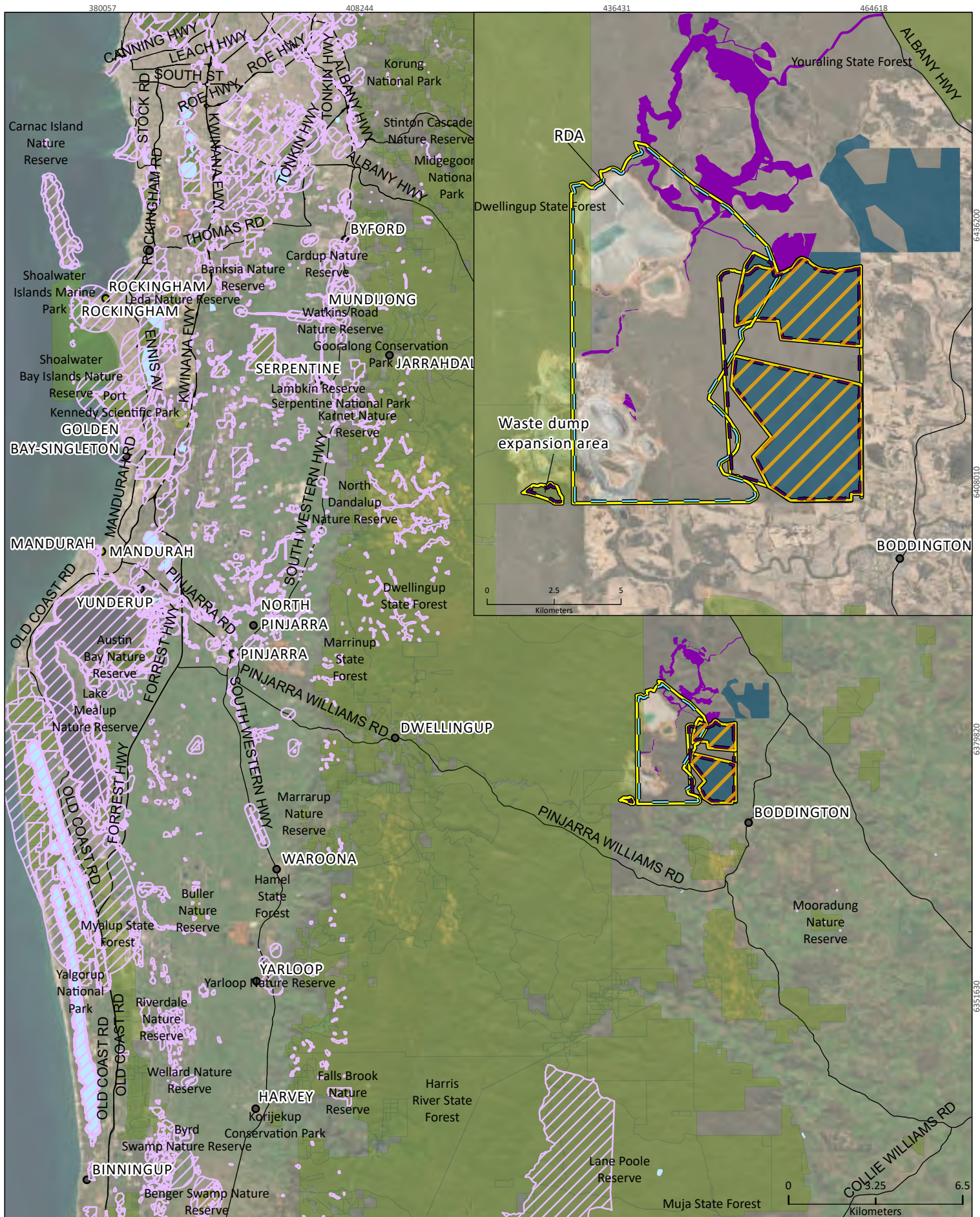
The Newmont study area covers 4,341.6 ha and includes (Figure 1-1):

- the Waste dump expansion area – a smaller component of the Newmont study area, located adjacent to the southern boundary of NB and covering 59.7 ha
- the Offset area (this survey).

Additional land occurring between the Offset area (this survey) components were surveyed and make up the remainder of the Newmont study area.

The Worsley study area is situated west of the Newmont study area and covers 7,797.3 ha. The Worsley study area includes areas of active mining, rehabilitation, mining infrastructure, access tracks and agriculture. The Worsley study area intersects a small portion of the Newmont study area and Offset area (this survey) in the northwest.

The combined Newmont and Worsley study areas (the combined study area) cover 11,650.5 ha (Figure 1-1).



2 LEGISLATIVE CONTEXT

The protection of fauna in WA is principally governed by 3 acts:

- Commonwealth 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 VU, EN or CR.

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 (SP) under the BC Act in one or more of the following categories:

- species of special conservation interest (CD fauna) – 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

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.

- migratory species (Mig.), including birds subject to international agreement
- species otherwise in need of special protection (OS).

The 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 an 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 or a Threatened Ecological Community (TEC) 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.

2.2.4 Environmentally Sensitive Areas

Under section 51B of the EP Act, the Minister for Environment may declare by notice either a specified area of the state or a class of areas of the state to be Environmentally Sensitive Areas (ESAs). ESAs are declared in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, which was gazetted on 8 April 2005 (Government of Western Australia 2005).

ESAs are areas where the vegetation has high conservation value. Several types of areas are declared ESAs including:

- the area covered by vegetation within 50 metres (m) of Threatened flora, to the extent to which the vegetation is continuous with the vegetation in which the Threatened flora is located
- the area covered by a TEC
- a defined wetland (Ramsar wetlands, conservation category wetlands and nationally important wetlands) and the area within 50 m of the wetland
- Bush Forever sites.

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 Newmont study area is located in the Northern Jarrah Forest subregion (JAF01) of the Jarrah Forest bioregion (JAF; Figure 3-1) which is characterised as (Williams & Mitchell 2001):

"Duricrusted plateau of Yilgarn Craton characterised by Jarrah-Marri Forest on laterite gravels and, in the eastern part, by woodlands of Wandoo-Marri on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands. The climate is Warm Mediterranean.

Northern Jarrah Forest incorporates the area east of the Darling Scarp, overlying Archaean granite and metamorphic rocks of an average elevation of 300 m, capped by an extensive lateritic duricrust, dissected by later drainage and broken by occasional granite hills. In the east, the laterite becomes deeply dissected until it compresses isolated remnants. The vegetation comprises Jarrah-Marri Forest in the west with Bullich and Blackbutt in the valleys grading to Wandoo and Marri woodlands in the east with Powder bark on breakaways. There are extensive but localised sand sheets with Banksia low woodlands. Heath is found on granite rocks and as a common understorey of forests and woodlands in the north and east. The majority of the diversity in the communities occurs on the lower slopes or near granite soils where there are rapid changes in site conditions".

3.2 LAND SYSTEMS AND SURFACE GEOLOGY

The Department of Primary Industries and Regional Development (DRIPD) 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 Newmont study area intersects 3 land systems, dominated by the Darling Plateau system which covers the western portion (2,765.4 ha, 63.7%). The Quindanning land system occurs in 4 areas in the southeast and northeast (756.4 ha, 17.4%), whereas the Marradong Upland system borders all other land systems to the east and northeast (819.9 ha, 18.9%). Similar proportions of land systems are seen in the Offset Area (this survey), whereas the entirety of the Waste dump expansion area comprises the Darling Plateau System. No additional land systems are intersected across the combined study area. Each land system contains duplex soils and is exemplified by a range of eucalypt species including Jarrah, Marri and Wandoo (Table 3-1; Figure 3-2).

According to the Surface Geology of Australia 1:1,000,000 scale, WA database (Stewart *et al.* 2008), the Newmont study area intersects 3 geological formations. The majority of the Newmont study area comprises Felsic intrusives 74292 (3,959.4 ha, 91.2%), with the remaining 9.8% comprising Ferruginous duricrust 38498 and Gneiss, granulite, migmatite 74310, occurring in the southwest and centre of the study area, respectively. Similar proportions are seen within the Offset area (this survey). The entirety of the Waste dump expansion area is made up of Felsic intrusives 74292. Two additional surface geologies occur across the combined study area: Amphibolite 74334 and Felsic volcanic rocks and porphyry 74290 (Table 3-2; Figure 3-3).

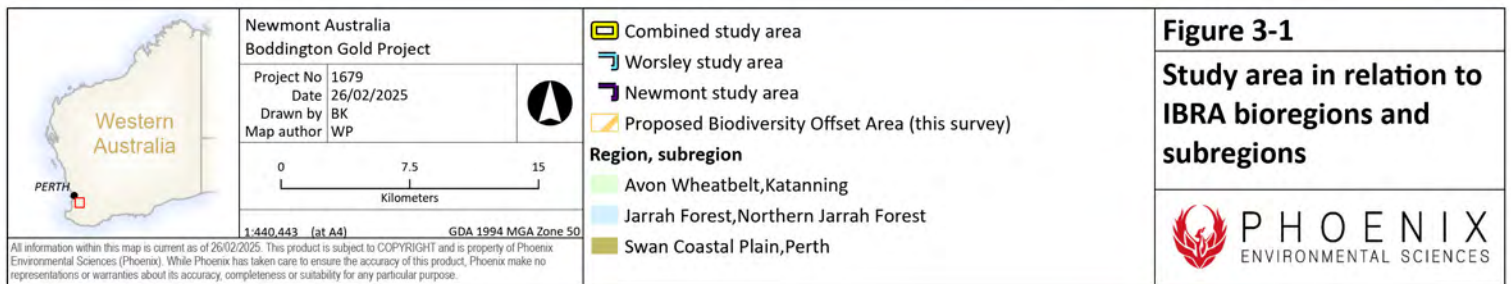
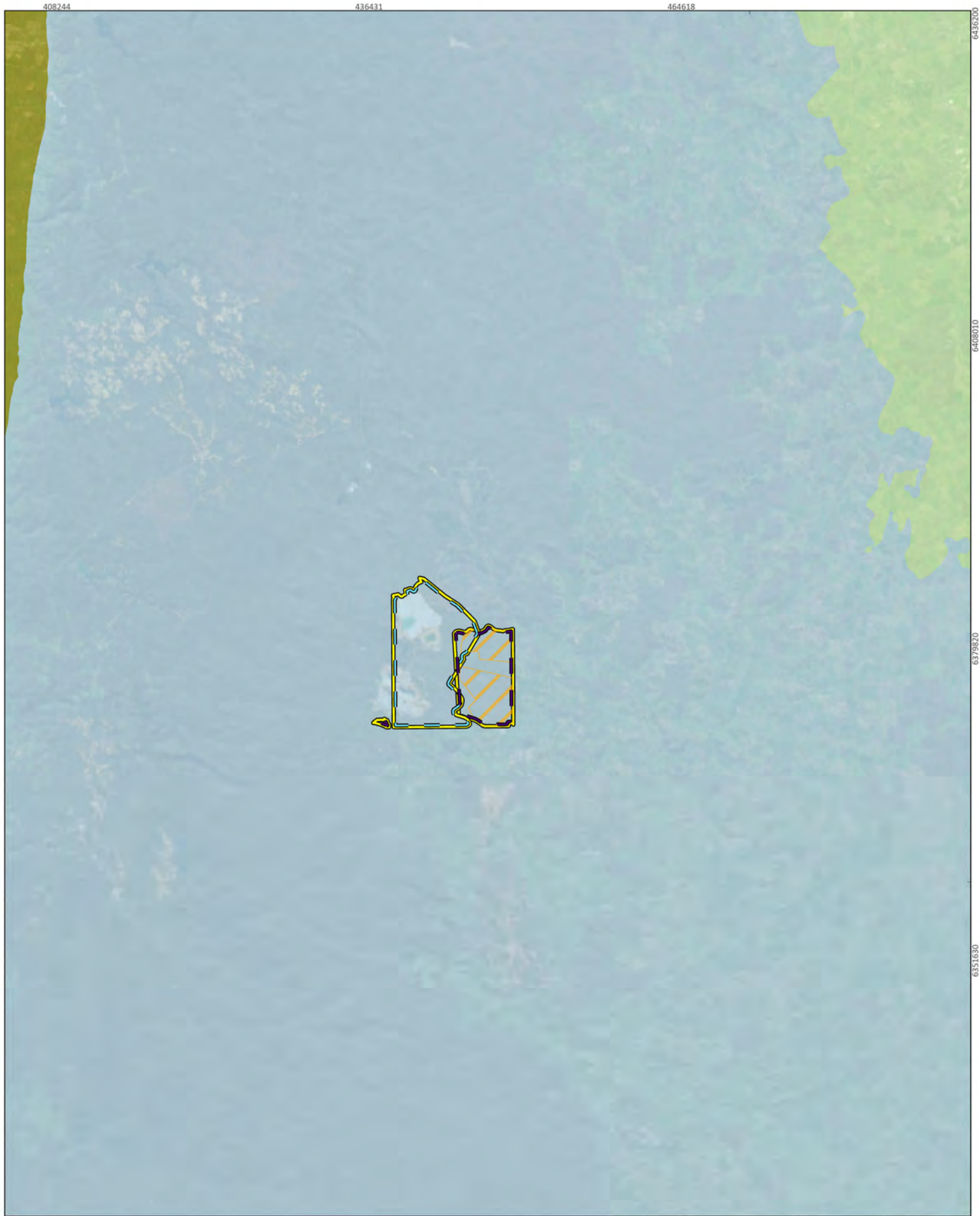
Table 3-1 Land systems and extent in the study areas

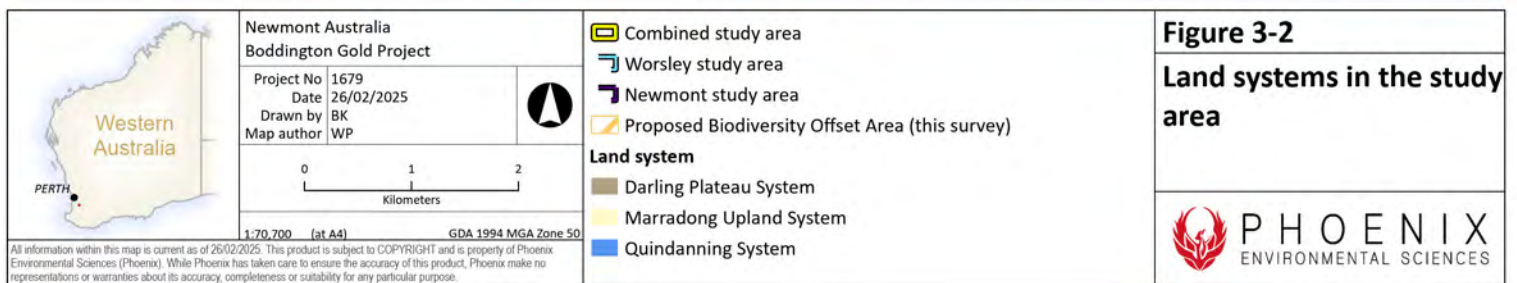
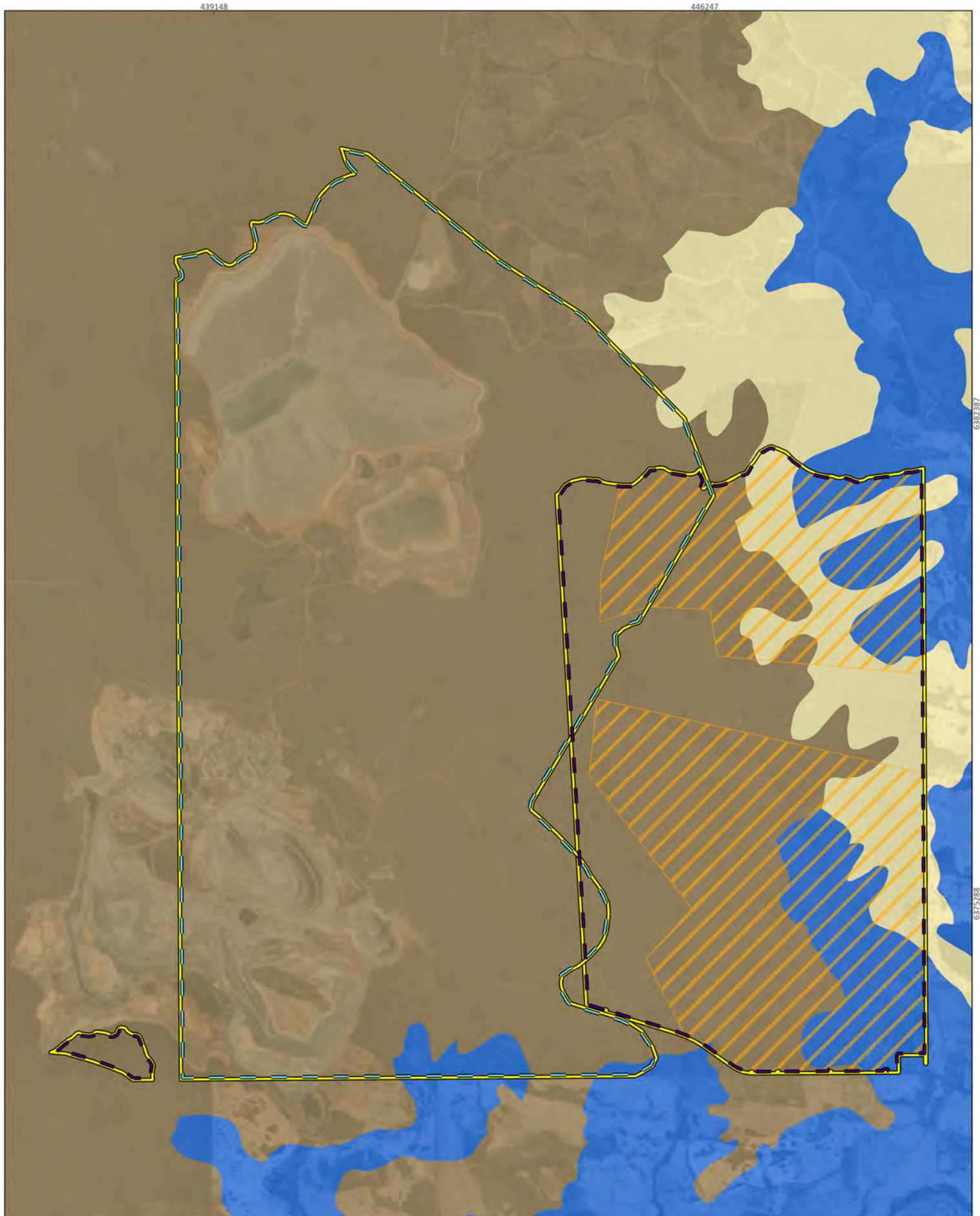
Land system	Description	Newmont study area		Offset area (this survey)		Waste dump expansion area		Combined study area	
		Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
Darling Plateau System	Lateritic plateau. Duplex sandy gravels, loamy gravels and wet soils. Jarrah-Marri-Wandoo Forest and woodland.	2,765.4	63.7	1,727.2	55.7	59.7	100.0	9,950.5	85.4
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.	819.9	18.9	622.7	20.1			833.7	7.2
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.	756.4	17.4	753.7	24.3			866.3	7.4
Total		4,341.6	100.0	3,103.5	100.0	59.7	100.0	11,650.5	100.0

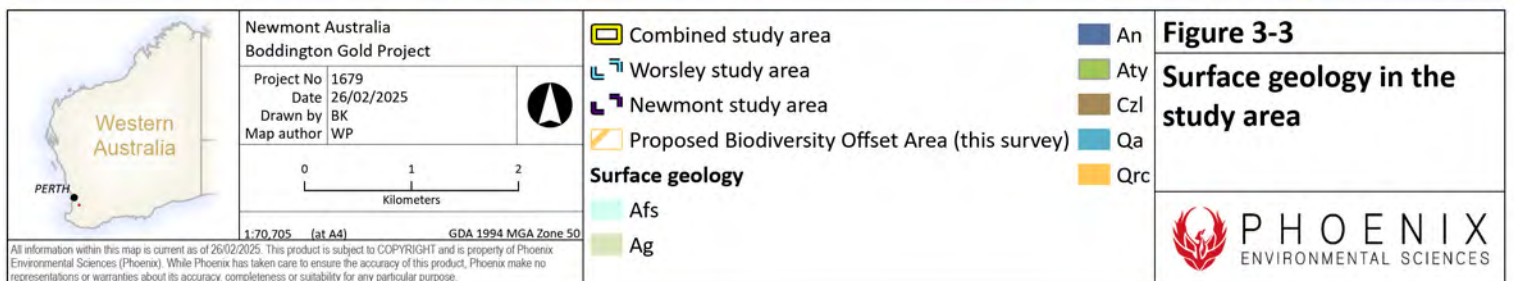
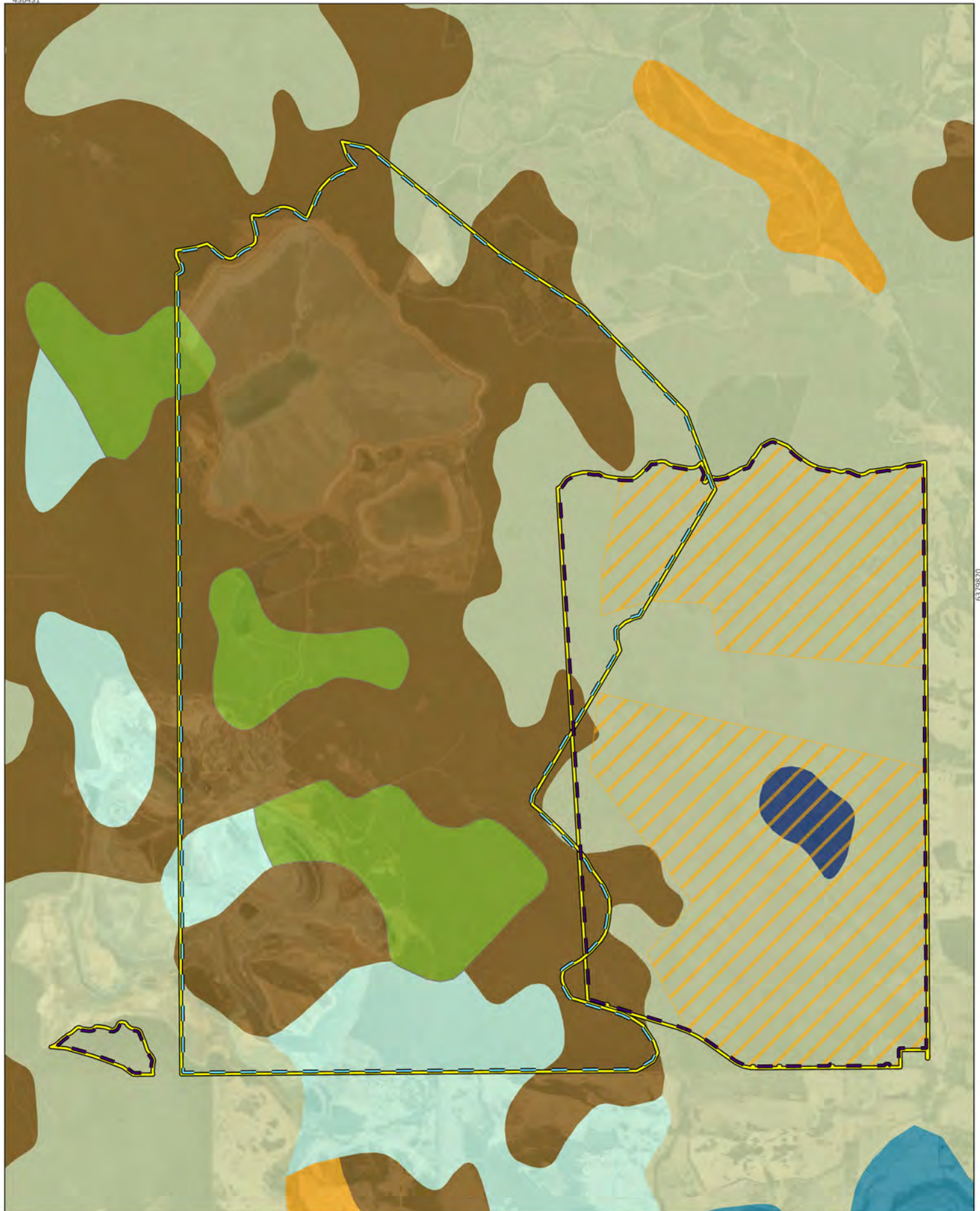
Table 3-2 Surface geology of the study areas, extent by deposit type

Surface geology	Abv.	Description	Newmont study area		Offset area (this survey)		Waste dump expansion area		Combined study area	
			Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
Felsic intrusives 74292	Ag	Undifferentiated felsic intrusive rocks, including monzogranite, granodiorite, granite, tonalite, quartz monzonite, syenogranite, diorite, monzodiorite, pegmatite. Locally metamorphosed, foliated, gneissic. Local abundant mafic and ultramafic inclusions.	3,959.4	91.2	2,960.9	95.4	59.7	100.0	4,807.4	41.3
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.	243.5	5.6	3.9	0.1			5,036.6	43.2
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.	138.8	3.2	138.8	4.5			0.0	0.0
Amphibolite 74334	Aty	Amphibolite, mafic schist, mafic rock intercalated with granite, para-amphibolite; metabasalt, metagabbro, metapyroxenite and metadolerite; Youanmi Terrane.	0.0	0.0	0.0	0.0			1,015.7	8.7
Felsic volcanic rocks and porphyry 74290	Afs	Plagiophytic dacite, felsic lavas and pyroclastics.	0.0	0.0	0.0	0.0			652	5.6
Total			4,341.6	100.0	3,103.5	100.0	59.7	100.0	11,650.5	100.0

Surface geologies highlighted in grey do not occur in the Newmont study area.







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 Newmont 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 depending on location, with the western scarp recording substantially higher rainfall than to the east and north of the subregion (Williams & Mitchell 2001).

Daily mean maximum and minimum temperatures at Wandering preceding each survey were 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 in July and August (110.2 and 108.4 mm, respectively), and June recorded significantly below the long-term average (Figure 3-4).

Temperatures recorded at Wandering during the surveys were consistent with the long-term averages. The mean maximum temperature ranged from 15.7°C to 35.5°C depending on the survey period, and the mean minimum temperature between -0.6°C and 18.3°C (Appendix 23). A total of 42.2 mm of rainfall was recorded at Wandering over the survey period, measured from the commencement of the first trip to the conclusion of the third trip (Appendix 23).

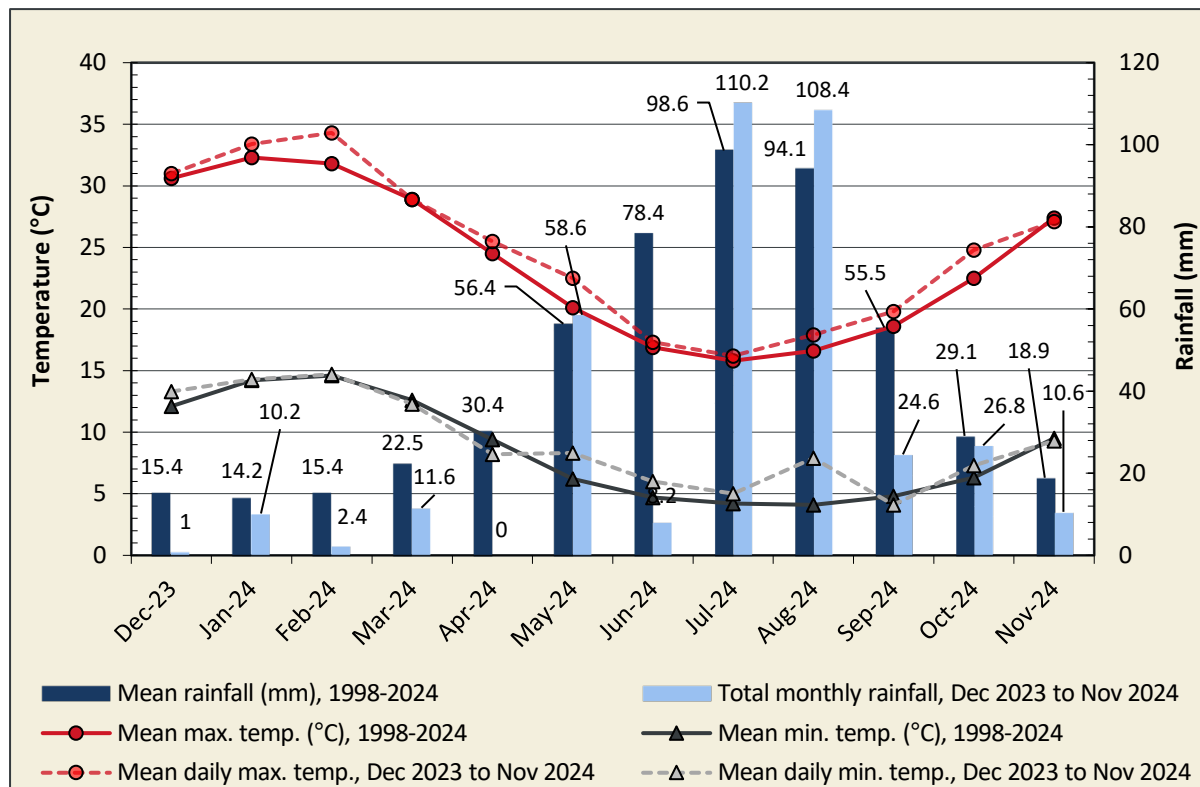


Figure 3-4 Annual climate and weather data for Wandering (no. 010917) and mean monthly data for the 12 months preceding the survey (BoM 2024)

3.4 LAND USE

The dominant land use for the JAF01 subregion is forestry (native forests), conservation, grazing (improved pastures), cultivation (dry land agriculture), forestry (plantations) and mining, with lesser areas of rural residential and urban land use (Williams & Mitchell 2001). A summary of land use within the desktop search extent of JAF01, extracted from the Collaborative Australian Protected Areas Database (CAPAD) (DoE 2016) is provided in Table 3-3 and Figure 3-5; contemporary values may differ marginally from those provided. According to CAPAD, land use within the 40 km desktop search extent is predominately production from relatively natural environments (54.9%), followed by production from dryland agriculture and plantations (27.6%). A large portion of the desktop search extent is allocated to conservation and natural environments (15.7%); however, 45.6% of this area is subject to other minimal uses that do not have any formal environmental protection, while most of the remaining area is allocated to nature conservation (54.4%).

According to CAPAD, land use of the Newmont study area is predominately production from relatively natural environments (99.5%), including 98.3% of the Waste dump expansion area and 99.5% of the Offset area (this survey). A small portion of the Newmont study area is allocated to conservation and natural environments (0.4%), of which 10.6 ha is located in the Offset area (this survey), and 1.0 ha in the Waste dump expansion area. While CAPAD indicates all of this area is subject to other minimal uses, Newmont is exploring the suitability of the Offset area component for conservation purposes. Similar proportions regarding other land use components are seen in the Offset area (this survey), the primary difference being a smaller area subject to dryland agriculture and plantations.

Historically, BGM has had 2 primary mining phases. The first phase commenced in 1986 and comprised the mining of bauxitic laterite and saprolitic profiles, before transitioning in 2001 to open-pit mining of supergene and basement ores. Newmont now exploits the large, hard-rock Wandoo deposit within the underlying greenstone basement for the commercial-grade production of copper and gold.

3.5 CONSERVATION RESERVES AND ENVIRONMENTALLY SENSITIVE AREAS

The Waste dump expansion area intersects the DBCA-regulated Dwellingup State Forest, which is protected under the *Conservation and Land Management Act 1984* – Section 5(1)(a). The Offset area (this survey) and Worsley study area do not intersect any conservation reserves. The wider desktop search extent intersects a further 36 conservation reserves detailed in the DBCA legislated lands and water dataset (DBCA 2022b) (Table 3-4). No DBCA lands of interest or ESAs intersect the Newmont study area or wider desktop search extent (DBCA 2022a; DWER 2023) (Figure 1-1).

Table 3-3 Land use and extent in the desktop search extent

Land use	Desktop search extent (40 km)		Newmont study area		Offset area (this survey)		Waste rock expansion area		Combined study area	
	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
Conservation and natural environments	101,240.8	15.7	16.1	0.4	10.6	0.3	1.0	1.7	105.7	0.9
Production from relatively natural environments	355,091.6	54.9	4,317.8	99.5	3,086.4	99.5	58.7	98.3	9,411.5	80.8
Production from dryland agriculture and plantations	178,343.7	27.6	7.1	0.2	5.8	0.2			244.3	2.1
Production from irrigated agriculture and plantations	1,957.4	0.3								
Intensive uses	5,161.2	0.8	0.6	<0.1	0.6	<0.1			952.1	8.2
Water	4,780.1	0.7							936.7	8.0
Total	646,574.8	100.0	4,341.6	100.0	3,103.5	100.0	59.7	100.0	11,650.5	100.0

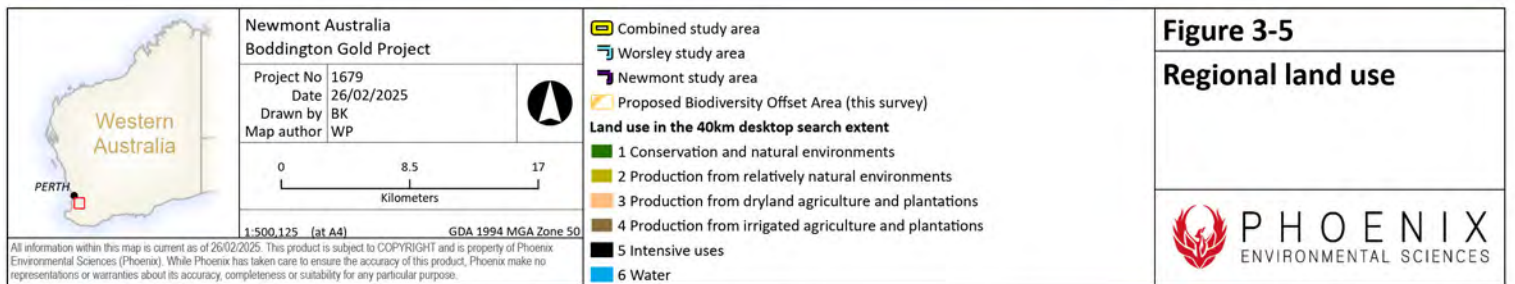


Table 3-4 Conservation Reserves, Environmentally Sensitive Areas and DBCA Lands of Interest in the desktop search extent

Identity	Name	Name type	Category	Tenure	Relevant act and section	Total area (ha)	Area - desktop search extent (ha)
F 14	Dwellingup State Forest	Unofficial	State Forest	Crown Land	CALM Act 1984 - Section 5(1)(a)	203,971.7	200,097.6
F 67	Youraling State Forest	Unofficial	State Forest	Crown Land	CALM Act 1984 - Section 5(1)(a)	44,561.9	39,804.2
F 15	Harris River State Forest	Unofficial	State Forest	Crown Land	CALM Act 1984 - Section 5(1)(a)	107,015.5	37,343.0
F 22	Jarrahdale State Forest	Unofficial	State Forest	Crown Land	CALM Act 1984 - Section 5(1)(a)	119,416.6	29,713.4
O 146 25		Un-named	Timber Reserve	Crown Land	CALM Act 1984 - Section 5(1)(b)	16,162.8	16,162.8
R 39826	Monadnocks Conservation Park	Gazetted	Section 5(1)(g) Reserve	Crown Land	CALM Act 1984 - Section 5(1)(g)	18,547.1	11,125.3
R 26666	Lupton Conservation Park	Unofficial	Conservation Park	Crown Land	CALM Act 1984 - Section 5(1)(ca)	11,234.3	10,846.3
F 23	Marrinup State Forest	Unofficial	State Forest	Crown Land	CALM Act 1984 - Section 5(1)(a)	7,694.0	7,693.9
O 69 25		Un-named	Timber Reserve	Crown Land	CALM Act 1984 - Section 5(1)(b)	9,245.5	6,728.1
O 148 25		Un-named	Timber Reserve	Crown Land	CALM Act 1984 - Section 5(1)(b)	6,635.1	6,635.1
F 51	Lol Gray State Forest	Unofficial	State Forest	Crown Land	CALM Act 1984 - Section 5(1)(a)	24,051.1	5,273.9
F 13	Mundaring State Forest	Unofficial	State Forest	Crown Land	CALM Act 1984 - Section 5(1)(a)	97409.6	4,831.1
O 160 25		Un-named	Timber Reserve	Crown Land	CALM Act 1984 - Section 5(1)(b)	3,825.4	3,825.5
R 39820	Lane Poole Reserve	Gazetted	Conservation Park	Crown Land	CALM Act 1984 - Section 5(1)(ca)	61,997.1	3,549.5
O 171 25		Un-named	Timber Reserve	Crown Land	CALM Act 1984 - Section 5(1)(b)	2,875.6	2,875.6
O 147 25		Un-named	Timber Reserve	Crown Land	CALM Act 1984 - Section 5(1)(b)	2,335.3	2,335.4
R 41850	Boyagarring Conservation Park	Unofficial	Conservation Park	Crown Land	CALM Act 1984 - Section 5(1)(ca)	1,444.5	1,444.5
O 145 25		Un-named	Timber Reserve	Crown Land	CALM Act 1984 - Section 5(1)(b)	786.4	786.4
R 32448	Mooradung Nature Reserve	Gazetted	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	754.2	754.2
R 36063	Strange Road Nature Reserve	Gazetted	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	657.1	657.1

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Identity	Name	Name type	Category	Tenure	Relevant act and section	Total area (ha)	Area - desktop search extent (ha)
R 36096		Un-named	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	577.7	577.7
R 5102		Un-named	Section 5(1)(h) Reserve	Crown Land	CALM Act 1984 - Section 5(1)(h)	271.6	271.6
R 30563	Moomagul Nature Reserve	Gazetted	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	214.1	206.4
R 5098	Marrarup Nature Reserve	Unofficial	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	144.8	144.8
R 4596		Un-named	Section 5(1)(g) Reserve	Crown Land	CALM Act 1984 - Section 5(1)(g)	1,025.9	77.6
F 60	Hamel State Forest	Unofficial	State Forest	Crown Land	CALM Act 1984 - Section 5(1)(a)	69.2	69.2
R 7230		Un-named	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	64.9	64.9
1232/218		Unofficial	Section 34A Freehold	Freehold	CALM Act 1984 - Section 34A	59.3	59.3
R 3525		Un-named	Section 5(1)(h) Reserve	Crown Land	CALM Act 1984 - Section 5(1)(h)	27.7	27.7
R 33448		Un-named	Conservation Park	Crown Land	CALM Act 1984 - Section 5(1)(ca)	46.8	21.5
R 37054	Westmere Nature Reserve	Gazetted	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	19.5	19.5
R 6268		Un-named	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	17.6	17.6
R 36742	Brookton Highway Nature Reserve	Gazetted	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	500.3	5.4
R 24430	Meelon Nature Reserve	Unofficial	Nature Reserve	Crown Land	CALM Act 1984 - Section 5(1)(d)	3.8	3.8
R 13917		Un-named	Section 5(1)(h) Reserve	Crown Land	CALM Act 1984 - Section 5(1)(h)	3.0	2.9
R 43202		Un-named	Section 5(1)(h) Reserve	Crown Land	CALM Act 1984 - Section 5(1)(h)	0.4	0.4
R 44367		Un-named	Section 5(1)(h) Reserve	Crown Land	CALM Act 1984 - Section 5(1)(h)	0.1	0.1

4 METHODS

The survey was conducted in accordance with the 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)
- Referral guidelines for 3 WA Threatened black cockatoo species Carnaby's Cockatoo (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*) and the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) (DAWE 2022)
- Survey guidelines for Australia's Threatened Bats (DEWHA 2010)
- Survey guidelines for Australia's Threatened Mammals (DSEWPaC 2011b).

4.1 DESKTOP REVIEW

Searches of several biological databases were undertaken to identify and prepare lists of significant fauna that may occur within the Newmont study area and wider combined study area (Table 4-1). A literature search was conducted for accessible reports for biological surveys conducted within 40 km of the Newmont study area to build on the lists developed from the database searches (Table 4-2). Some data sources do not provide record locations (such as Dandjoo Biodiversity Data Repository and EPBC Protected Matters Search Tool) and include instances where suitable habitat either may, is likely or known to occur but the species has not necessarily been observed.

Table 4-1 Database searches conducted for the desktop review

Database	Target group/s	Search coordinates and extent
EPBC Protected Matters Search Tool (DCCEEW 2024a)	EPBC Act Threatened fauna records	Newmont study area plus a 40 km buffer
DBCA Threatened and Priority Fauna Database (DBCA 2024b)	Threatened and Priority fauna records	Newmont study area plus a 40 km buffer
Birdlife Birddata (Birdlife 2024)	Threatened and Priority avifauna records	Newmont study area plus a 40 km buffer
DBCA NatureMap (DBCA 2024a)	Threatened and Priority fauna records	Newmont study area plus a 40 km buffer
Index of Biodiversity Surveys for Assessment (IBSA) database (IBSA 2024) for nearby survey reports and data	Threatened and Priority fauna survey records and data	Newmont study area plus a 40 km buffer
Phoenix Biological Database (Phoenix 2024b)	Threatened and Priority fauna records	Newmont study area plus a 40 km buffer
Carnaby's Cockatoo unconfirmed breeding areas (DBCA 2019d)	Carnaby's Cockatoo data	Newmont study area plus a 40 km buffer
Carnaby's Cockatoo unconfirmed roost areas (DBCA 2018b)	Carnaby's Cockatoo data	Newmont study area plus a 40 km buffer
Carnaby's Cockatoo confirmed breeding areas (DBCA 2019c)	Carnaby's Cockatoo data	Newmont study area plus a 40 km buffer
Carnaby's Cockatoo confirmed roost areas	Carnaby's Cockatoo data	Newmont study area plus a 40 km buffer

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Database	Target group/s	Search coordinates and extent
(DBCA 2018a)		km buffer
Black cockatoo breeding sites (DBCA 2019a)	Black cockatoo data	Newmont study area plus a 40 km buffer
Black cockatoo roosting sites (DBCA 2019b)	Black cockatoo data	Newmont study area plus a 40 km buffer

Table 4-2 Survey reports included in the desktop review

Report author	Survey description	Project
Bamford (2004)	Desktop review	Worsley Alumina Extension Area: northern mining envelopes
Biologic (2023)	Habitat assessment	Numbat habitat assessment for the Boddington Mine and Offset Properties
Biologic (2024a)	Targeted fauna survey	Gibbs offset property, Quindanning targeted vertebrate fauna survey
Biologic (2024b)	Baseline fauna survey	Lot 100 and Lot 102 offset properties, Collie baseline vertebrate fauna survey
Biostat (2017)	Habitat assessment	Level 1 fauna assessment for the mining extension areas associated with the Worsley Alumina production increase
Biostat (2019a) Biostat (2019b)	Desktop review and monitoring	Worsley mine expansion offset fauna habitat assessment and Boddington fauna monitoring
Biostat (2020a) Biostat (2020b)	Desktop review	PA offset fauna habitat assessment desktop study/ ecological value field survey
Biostat (2021)	Habitat assessment	Worsley mine expansion offset fauna habitat assessment
Ecologia (2024)	Detailed and targeted fauna survey	Newmont Boddington Gold, Future Tailings detailed and targeted fauna assessment
Ninox Wildlife Consulting (2003)	Detailed fauna survey	Vertebrate fauna survey of NB
Ninox Wildlife Consulting (2012)	Detailed fauna survey	Vertebrate fauna survey of NB
Phoenix (2021)	Targeted fauna assessment	Potential habitat tree survey and foraging analysis for the Worsley mine expansion proposal
Phoenix (2023)	Targeted fauna assessment	Black cockatoo breeding habitat assessment for the Worsley Mine Expansion Project
Newmont (unpublished data, 2012-2022)	Black cockatoo natural and artificial nest monitoring	Boddington Gold Project

4.2 FIELD SURVEY

4.2.1 Survey timing

Field survey dates for the combined survey scopes are provided in Table 4-3.

Table 4-3 Survey dates

Survey type	Scope of work	Season	Dates
Fauna survey	Camera deployment, black cockatoo habitat assessment	Spring	24 September – 1 October 2024
Fauna survey	Camera maintenance	Spring	25–30 November 2024
Fauna survey	Targeted trapping, ultrasonic recordings, camera collection, hollow inspections	Spring/summer	21 November–2 December 2024

4.2.2 Field methods

Field and post-survey analytical methods for the fauna survey included:

- habitat assessment (see 4.2.2.1)
- habitat mapping (4.2.2.2)
- motion-sensitive camera trapping (4.2.2.3)
- targeted Numbat searches (4.2.2.4)
- coat pattern analysis (4.2.2.5)
- targeted trapping (4.2.2.6)
- population estimates (4.2.2.7)
- population modelling (4.2.2.8)
- bat echolocation recordings (4.2.2.9, Newmont study area only)
- passive active searches and opportunistic records (4.2.2.10)
- black cockatoo habitat assessment (4.2.2.11; Newmont study area only)
- foraging habitat determination (4.2.2.12, Newmont study area only)
- breeding habitat determination (4.2.2.13, Newmont study area only)
- PHTs and hollow records (4.2.2.14; Newmont study area only).

A total of 525 survey sites were sampled across the combined study area, of which 322 are located in the Newmont study area (Figure 4-2; Appendix 1). Sites in the Newmont study area are represented by 50 black cockatoo habitat assessments, 85 trap sites, 153 camera sites, 6 targeted ultrasonic bat sites, 11 nest monitoring hollow checks and 17 opportunistic sites. The location of study area specific sites is detailed in Appendix 1. In Table 4-4, sites have been grouped by sampling prefix which represent broad sampling areas and/or survey methods.

4.2.2.1 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 significant mammal and black cockatoo species were identified based on known habitats of such species within the JAF bioregion. Tentative sites were selected for the targeted fauna survey to represent all relevant habitat types (based on the Mattiske 2024 vegetation

mapping; see 4.2.2.2) and to achieve widespread sampling across the combined study area. 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 and channels (drainage channels, valleys and dams), vegetation complexes and conditions, and soil type. Sites were primarily chosen to represent the best example of distinct habitats within the broader habitat associations of the Newmont study area and to achieve geographical spread across the combined study area. Habitat descriptions and characteristics were recorded at a selection of the survey sites to adequately depict the fauna habitats present and complement the Mattiske (2024) vegetation mapping. Habitat descriptions included describing the dominant vegetation types; recording signs of disturbance such as weeds, vehicle tracks, logging, and fire history; soil type; rock type and coverage; leaf litter abundance and depth etc., to determine the quality and overall characteristics of habitats at each location (Figure 4-2; Table 4-4; Appendix 2).

4.2.2.2 Habitat mapping

Vegetation complexes identified and mapped by Mattiske (2024) were reattributed to accurately describe and delineate the fauna habitats present in the Newmont study area. The wider combined study area was also mapped to better understand and interpret how the local significant mammal assemblage is utilising the broader area and habitat associations. This reinterpretation involved assessing the dominant vegetation structure in association with the surrounding landscape features and soil types. Habitat mapping also made use of the following data sources:

- Heddl *et al.* (1980) vegetation complexes (Mattiske & Havel 1998)
- previous Phoenix vegetation and habitat mapping (Phoenix 2024b)
- land Systems (geology, landform, soils, vegetation) (Payne & Leighton 2004).

Table 4-4 Combined terrestrial fauna survey effort

Site(s)	Habitat assessment (#)	Cage (trap-nights)	Aluminium box (trap-nights)	Camera (trap-nights)	Nocturnal foraging (hours)	Black Cockatoo Quadrats (#)	Hollow checks (#)		Ultrasonic recordings (nights)	Targeted Numbat searches (hours)
							ANH	NNH		
BCQ01-BCQ50	50					50		97		
B01-B19		76	76							
C01-C28	2	112	112							
N01-N27		108	108							171
P01 – P33		132	132							63.7
Q01 – Q25	3	108	92							
W01 – W26		116	92							
WFP01 – WFP05	6								28	
HM-1-01 – HM-1-36	1			1,012						
HM-2-01 – HM-2-36	1			1,048						
HS-1-01 – HS-1-36	1			2,196						
HN-1-01 – HN-1-10				300						
NM-1-01 – NM-1-36	1			958						
NM-2-01 – NM-2-36	1			1,074						
NS-1-01 – NS-1-36				2,171						
NS-2-01 – NS-2-08				224						
NHS-1-01 – NHS-1-36				2,277						
Newmont-ANH05							1			
Newmont-ANH06							1			

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Site(s)	Habitat assessment (#)	Cage (trap-nights)	Aluminium box (trap-nights)	Camera (trap-nights)	Nocturnal foraging (hours)	Black Cockatoo Quadrats (#)	Hollow checks (#)		Ultrasonic recordings (nights)	Targeted Numbat searches (hours)
							ANH	NNH		
Newmont-ANH07							1			
Newmont-ANH09							1			
Newmont-ANH10							1			
Newmont-ANH15							1			
Newmont-ANH16							1			
Newmont-ANH17							1			
Newmont-ANH18							1			
Newmont-ANH19							1			
Newmont-ANH20							1			
Newmont-ANH21							1			
Newmont-ANH22							1			
Newmont-ANH23							1			
Newmont-Nest01							1			
Newmont-Nest04							1			
Newmont-Nest05							1			
Newmont-Nest06							1			
Newmont-Nest07							1			
Newmont-Nest08							1			
Opp01-Opp022	2				2.5					
Newmont study area total	63	364	332	6,704	2.5	50	20	97	28	234.7
Combined study area total	68	652	612	11,260	2.5	50	20	97	28	234.7

4.2.2.3 Motion-sensitive camera trapping

Camera trapping was used to target significant mammals identified as potentially occurring across the combined study area including Woylie, Chuditch, Brush-tailed Phascogale, Red-tailed Phascogale, Quenda, Western Ringtail Possum, Quokka and Western Brush Wallaby.

Motion-sensitive cameras were installed across the combined study area, using methods described in Thorn (2023). Four camera array sites were sampled within the Newmont study area, with 3 arrays deployed at any one time. An additional 3 camera arrays were deployed across the Worsley study area. One of the 7 camera arrays intersected both study areas.

Each camera array consisted of 36 motion cameras placed in a 6 x 6 camera grid (where feasible), with each camera placed 330 m apart and 25 cm above the ground at a detection angle of 40°. Camera traps faced southwards to avoid direct sun glare, and towards forest clearings to minimise vegetation obstructing the field of view within the first ~ 5 m from the camera. Three of the 7 camera arrays were static, while the other 4 camera arrays were mobile and moved once within the combined study area after approximately 4 weeks (2 in the Newmont study area, and 2 in the Worsley study area). These cameras were baited with non-consumable, universal bait (a mixture of rolled oats, peanut butter, sardines and fish oil contained within PVC baiting stations). Fish oil was also poured over woody debris and placed in front of the camera to promote longevity over the camera deployment period. Vegetation near cameras was pruned to reduce false-trigger events.

A mix of Reconyx Hyperfire 600s and Swift Enduros were used with settings configured to take 5 photos on the 'rapid fire' function and a 5-second video per trigger with a 15-second delay between triggers. The camera's passive infrared sensor sensitivity was variably set depending on the surrounding vegetation to minimise false triggers and ranged from medium-high to very high.

The static cameras were deployed from late September 2024 to late November 2024 and serviced once in October 2024. The mobile camera arrays were moved during the October maintenance period to increase the chances of detection and increase spatial coverage of the combined study area.

Two additional camera transects were established, one consisting of 8 cameras in the Waste dump expansion area, and one consisting of 10 cameras within the Worsley study area (adjacent to Sidings Road). Cameras were a mix of Reconyx Hyperfire 600s and Swift Enduros and were configured to the same settings detailed above. These cameras were spaced approximately 200 m apart.

Images from the cameras were processed through the Colorado Parks and Wildlife (CPW) photo Warehouse software (Newkirk 2016) and used to identify uniquely identifiable species, such as Numbats and Chuditch, based on unique stripe and spot patterns (see section 4.2.2.5). Depending on the quality and number of individual identifications, population estimates were extrapolated based on the number of individual images (capture, mark and recapture) and approximate range size (see 4.2.2.7). It should be noted that at least 10 – 20 individuals should be detected to make meaningful population estimates (Thorn 2023).

A total of 11,260 camera trap nights were undertaken throughout the combined study area, including 6,704 across the Newmont study area (Table 4-4, Figure 4-2, Figure 4-3).

4.2.2.4 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 4-5).

4.2.2.5 Coat pattern analysis

Individual coat patterns were mapped on species with uniquely identifiable coat patterns where possible (i.e. Chuditch and Numbat). Each individual was then given a unique number and 'name', so they could be identified if recorded (recaptured) again (Appendix 22).

Any time an animal was able to be identified (by their recorded coat pattern) by a camera trap, it was considered one detection. If individuals remained in the vicinity of the camera and continued triggering the camera, these images were all considered a single detection and one 'capture' event. An individual was considered 'recaptured' if they were detected at the same site, or elsewhere, >1 hour since the last time it was detected. Individuals who were partially photographed or could not be identified as a new or previously photographed individual were excluded from the population estimates to avoid skewing the results.

4.2.2.6 Targeted trapping

Targeted surveys for the significant mammal fauna were undertaken across the combined study area using methods described in Smith (2020) (Figure 4-2; Figure 4-4). The combined study area was divided into approximately equal halves where cage and Elliott traps were deployed and baited with universal bait for 4 nights, before being moved to the remaining half of the study area for another 4 nights. Moving traps avoids continuous trapping of 'trap-happy' individuals skewing the data. Traps were spaced between 150-300 m apart dependent on the quality of habitat and density of the understory.

The Elliott and cage traps were baited with a universal bait and were shrouded with either reflective closed cell insulation (R2.5 rated; Elliott traps) or hessian bags (cage traps) to provide shade and protection for any captured animals. All traps were given as much shade as possible under/around vegetation.

Traps were checked within 3 hours of sunrise. Baits were removed and replaced every second day. The total systematic trapping effort for the 158 systematic trapping sites during the surveys was 1,264 trap nights (694 of which occurred in the Newmont study area; Table 4-4), where a trap-night is defined as one trap remaining open for one night.

Morphometric data was collected, and Passive Integrated Transponder (PIT) tags were implanted in all captured significant mammals. All captures were initially scanned with a microchip reader (ISO11784/5 FDX-B) to determine whether they were previously caught individuals. All non-microchipped animals were implanted with a PIT tag (Mini Microchips Australia) and the 15-digit microchip number was recorded to enable identification upon recapture. The following morphometric data was collected from captured individuals (where applicable):

- age class
- head length (mm) – taken from the occipital condyles to the tip of the nose
- mass (g)
- sex and reproductive condition (male/female; if female: dirty pouch/new pouch)
- short pes (foot) length (mm) – taken from the 'heel' of the hindfoot to the distal end of the foot pads
- body condition (BC) score (1-5; Figure 4-1).

BC was determined for each uniquely identified individual. An array of images of each animal, or physical inspection when captured, was used to assess overall BC from multiple angles and allocate a BC score based on URM (2020). The scoring tool ranges from 1 (emaciated) to 5 (obese; Figure 4-1).

4.2.2.7 Population estimates

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

- geographic spread of species 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 for each target species
- frequency and temporal scale of detections
- number of individuals photographed at each detection.

By combining all types of species detections and reviewing the expected ranges and the number of detections, we can estimate a relative number of individuals across the combined study area. Doing so enables individuals to be identified and the population modelling to run.

The estimated home range size for each targeted species was as follows:

- Quenda (*Isodon fusciventer*; P4 DBCA list): 9 ha (Valentine 2021)
- South-western Brush-tailed Phascogale (*Phascogale tapoatafa wambenger*; CD BC Act): 45 ha (halfway between the estimated range of 20 – 70 ha; (DEC 2012a))
- Western Brush Wallaby (*Notamacropus irma*; P4 DBCA list): 12 ha (Povh 2017)
- Woylie (*Bettongia penicillata ogilbyi*; EN EPBC Act; CR BC Act): 65 ha (Yeatman & Wayne 2015).

A species-specific 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.

4.2.2.8 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 camera traps and unique identification with spot pattern analyses as well as microchipped in this case) 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.

At least 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 4-5.

- Half-normal Function: The detection probability decreases with distance from the trap, and this decline follows the half-normal rate function, meaning the likelihood of detection drops off steadily as distance from the trap increases.

Table 4-5 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 combined study area is homogenous in terms of detection probability. While in reality the landscape varies across space, the combined 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.

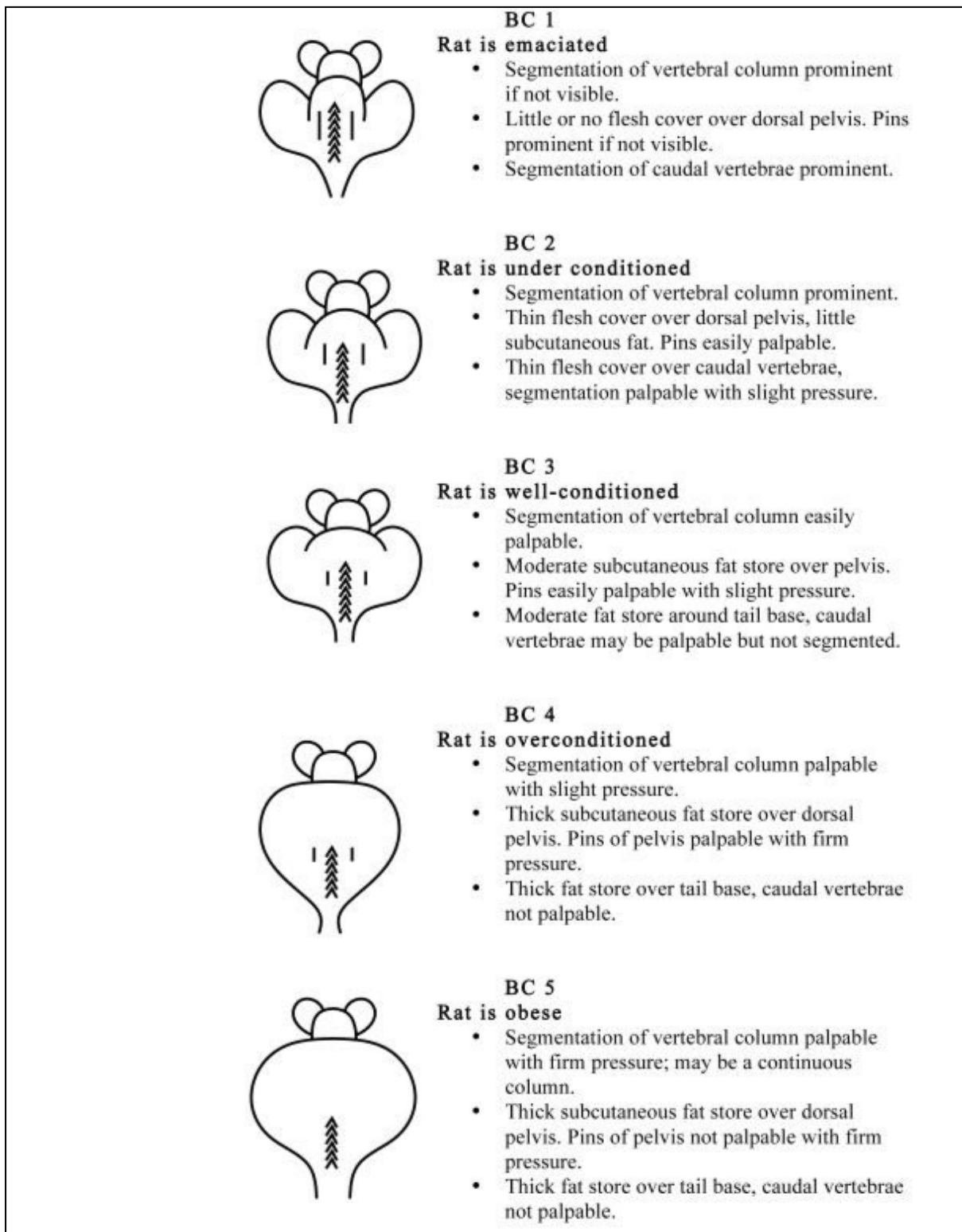
4.2.2.9 Bat echolocation recordings

Song Meter SM4 recording devices were used to record bat echolocation calls and target the regionally significant Western False Pipistrelle (P4) at 6 sites across the Newmont study area during the field survey (sites WFP01-WFP06; Figure 4-2; Figure 4-6). Recording devices were deployed at each site for 4-5 nights of recording for between 8 and 12 continuous hours per night. Devices were aimed at a 45° angle to the ground. The Song Meters were positioned in areas of habitat likely to have increased insect activity and to attract bats (i.e. likely foraging areas or movement corridors), and areas that represented potential roosting sites. A total of 28 nights of ultrasonic recordings were undertaken throughout the survey (Table 4-4).

4.2.2.10 Passive active searches and opportunistic records

While undertaking other survey methods, habitat assessments and signs of dispersing and foraging significant fauna were recorded, including observations while traversing the wider combined study area.

Figure 4-1 Visual representation of each body condition score per URM (2020)



4.2.2.11 Black Cockatoo habitat assessment

The Newmont study area is within the modelled distribution for Baudin's Cockatoo (*Calyptorhynchus baudinii*; VU), Carnaby's Cockatoo (*Calyptorhynchus latirostris*; EN) and Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*; VU). It is also within the modelled breeding range for the Forest Red-tailed Black Cockatoo and Carnaby's Cockatoo (DoEE 2017). The black cockatoo habitat assessment, therefore, entailed recording of breeding habitat for the Forest Red-tailed Black Cockatoo and Carnaby's Cockatoo, and assessment of foraging habitat quality for the Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo and Baudin's Cockatoo.

Breeding habitat for WA's 3 Threatened black cockatoo species consists of woodland or forest; however, they will also breed in areas of former woodland or forest habitats which consist of now fragmented patches of habitat and/or isolated trees. Breeding habitat is defined in DSEWPaC (2012) as "trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow." Depending on tree species, the suitable DBH ranges between 300 (Powderbark *Eucalyptus accendens*, Wandoo *E. wandoo*) and 500 mm (all other species, including *Eucalyptus* spp.). Known breeding tree species in the Jarrah Forest bioregion include Marri (*Corymbia calophylla*), Powderbark, York Gum (*E. loxophleba* subsp. *loxophleba*), Jarrah (*E. marginata*), Flooded Gum (*E. rudis*), Bullich (*E. megacarpa*), Blackbutt (*E. patens*), Salmon gum (*E. salmonophloia*) and Wandoo.

The location of all potential breeding trees for the Forest Red-tailed Black Cockatoo and Carnaby's Black Cockatoo was recorded on GPS. Tree species identifications were conducted in the field using tree descriptors and photographs. Trees that met the required DBH measurement were inspected for hollows and were assessed for any suitability of nesting and/or roosting. The number and size (aperture) of hollows at each tree were recorded. A total of 50 one-hectare quadrats were surveyed (50 x 50 m) and all eucalypt species within the quadrat were assessed to determine whether they met the required minimum DBH (Table 4-4, Appendix 19)

Where hollows could be observed, they were considered 'suitable' where the hollow entrance was estimated to be >100 mm in diameter, >300 mm deep and aligned near-vertical (typically the main trunk). Where it was not possible to confirm that the hollow met the assessment criteria from the ground, the hollow was assessed as possibly suitable. Hollows that did not meet the criteria were identified as unsuitable; however, were still recorded as PHTs meeting the minimum DBH. Trees with hollows suitable for current breeding were inspected for evidence of use by the species such as wear and/or chew marks around hollow entrances.

All trees with hollows ≥ 100 mm were further investigated using binoculars and pole camera to determine their overall suitability for nesting and identify (where possible):

- depth of hollows
- angle of hollows
- evidence or signs of any recent use
- suitability/evidence of hollow use.

The presence of known roosting species was recorded, and evidence of night roosting was searched for (presence of clipped leaves and branches and droppings under suitable trees). Observations of foraging habitat quality and feeding residues were recorded during the survey. This information, together with the fauna habitat mapping (reinterpreted from Mattiske (2024) vegetation mapping) was used to define quality foraging habitat areas for each black cockatoo species. Assessment of the quality of foraging habitat considered the importance of food plants present based on current available information on the food preferences of each species.

4.2.2.12 Foraging habitat determination

To the extent possible, data from the relevant layers were used to apply the foraging quality scoring tool from the black cockatoo referral guidelines (DAWE 2022a) for each of the 3 species, to each polygon distinguished in any of the previously mapped habitat areas by Mattiske (2024). Accordingly, habitats within the Newmont study area were assessed for black cockatoo species using the foraging habitat quality scoring tool in the guidelines to determine the quality of foraging habitat present for each species. The scoring tool considers the following:

- presence of feeding evidence
- vegetation present in the surrounding area, i.e. within 12 km, including proximity to any breeding habitat, roosting sites or watering points
- presence of disease, such as dieback (*Phytophthora* spp.) or Marri canker.

DAWE (2022) states that the scoring tool for foraging habitat quality assessment should be applied once to the entire impact area of a proposed action, except where the impact area includes more than one location. Due to the close proximity of the Waste dump expansion area and Offset area (this survey), and the known habitat similarities between the 2 survey areas, they have been treated collectively for the purpose of this assessment.

4.2.2.13 Breeding habitat determination

Breeding habitat value determination followed the methods adopted by Phoenix (2021) where the following criteria were used (where it has been assumed that all remnant vegetation provides foraging habitat, and whereby all potential breeding habitat is either within foraging habitat or within very close proximity to foraging habitat, i.e. within 6 km of foraging resource):

- High – vegetation complex/vegetation type or fauna habitat has been recorded within the JAF01 to contain trees with confirmed breeding trees, or trees with breeding evidence close to water and foraging habitat
- Medium – vegetation complex/vegetation type or fauna habitat has been recorded within the JAF01 to contain trees with breeding evidence, but no confirmed breeding
- Low – contains trees (dominant or otherwise) known to be used by black cockatoos within the JAF01 for breeding above the DAWE (2022) potential habitat tree criteria (>300/500 mm)
- None – vegetation complex/vegetation type or fauna habitat contains no trees known to support breeding.

4.2.2.14 PHTs and hollow records

The recording of habitat trees was used to extrapolate and estimate the density of habitat trees over the Newmont study area, where practical. Density was calculated by mean PHT and hollows per hectare of each habitat type.

The location of all PHTs for black cockatoo species was recorded using the GIS Pro on iPhone or iPad tablets (Appendix 19). Tree species identifications were conducted in the field using tree descriptors (such as fruit/nuts, bark), and photographs. Trees that met the required DBH measurement were inspected for hollows and were assessed for any suitability of nesting and/or roosting. The number of hollows at each tree was recorded and evidence of usage was observed. Evidence of breeding does not confirm a black cockatoo breeding event, as these may be signs of prospecting or may have been created by other species of parrots (e.g. galahs); however, they do indicate a suitable hollow. The following evidence of breeding was noted at each potentially suitable hollow:

- chewing (fresh)

- chewing (old)
- scarring below hollow
- presence of black cockatoo pairs in or very close to a hollow.

4.2.3 Likelihood of occurrence assessment

Following the field survey, the likelihood of occurrence (LOO) for each significant fauna species identified in the desktop review (relevant to the survey scope) was assessed and assigned to one of 4 ratings:

- Recorded – species recorded within the Newmont study area by previous or current survey
- Likely – Newmont study area within the current known range of species, suitable habitat within the Newmont study area and home range of the species intersects the Newmont study area based on known records
- Possible – Newmont study area within the current known range of species, suitable habitat within the Newmont study area and the home range of species does not intersect the Newmont study area based on known records
- Unlikely – Newmont study area outside the current known range of species or no suitable habitat present in the Newmont study area.

4.2.4 Survey personnel

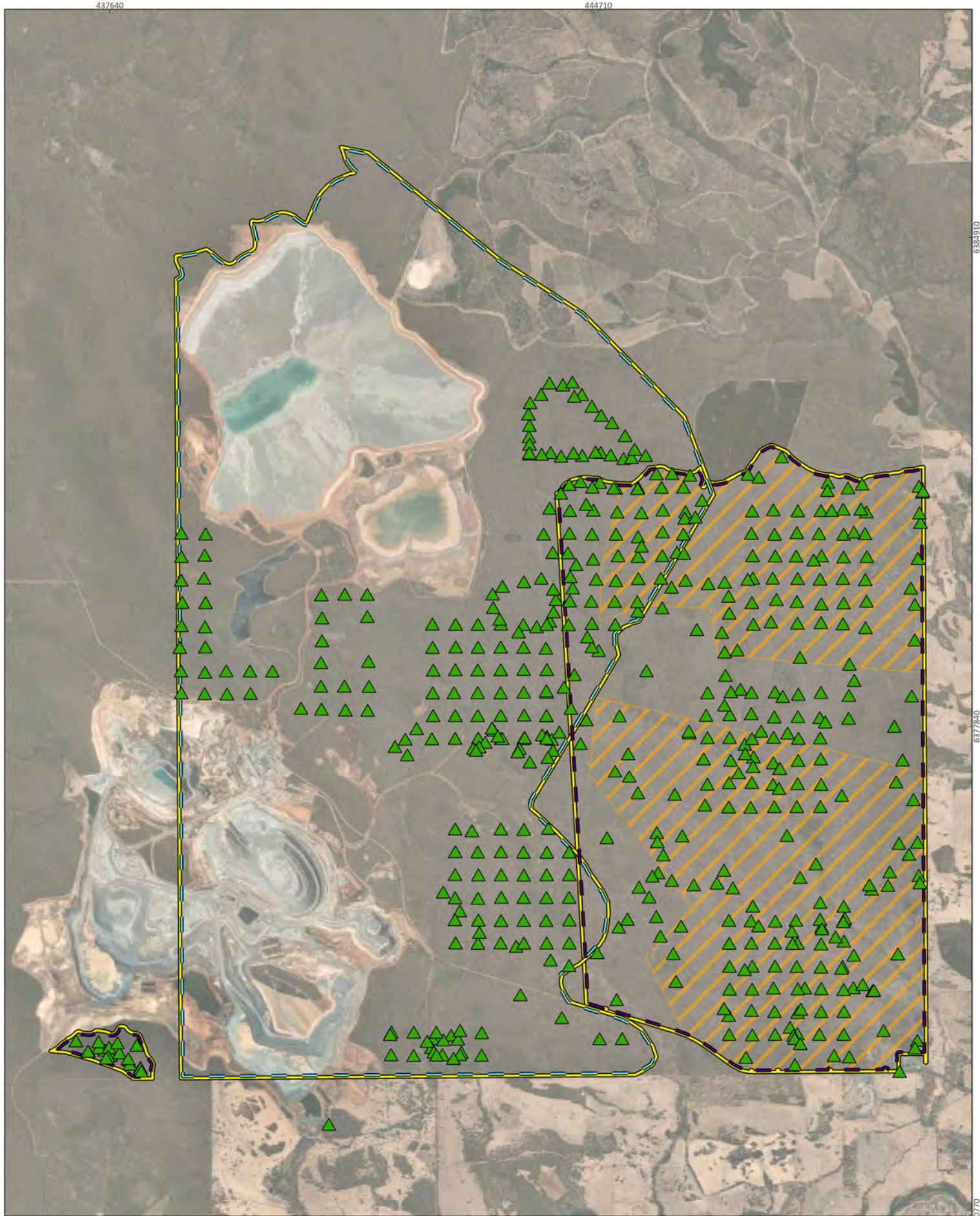
The personnel involved in the surveys are listed in Table 4-6. All survey work was carried out under relevant licences issued by DBCA under the BC Act, as well as the Phoenix Wildlife Animal Ethics Committee (WAEC) scientific use license issued by DPIRD (Table 4-6).

Table 4-6 Survey personnel

Name	Permit	Company/Qualifications	Role/s
Will Purser	Fauna taking (biological assessment) licence no. BA27001152 Authorisation to take or disturb Threatened species licence no TFA-2425-0068 WAEC Scientific Use Licence no. U304/2022-2024.	MSc Biological Sciences (Zoology)	Project management and logistics, field survey, data management and analysis, camera image analysis, reporting
Deon Loo		BSc Science (Zoology)	Field survey, camera image analysis
Kerryn Fox		MSc Veterinary Sciences	Field survey, data management and analysis, camera image analysis
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
Anna Jacks		BSc Environmental Sciences (Hons)	Field survey, project advise
Paula Strickland		MSc Zoology and Conservation Biology	Field survey, camera image analysis

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Name	Permit	Company/Qualifications	Role/s
Tamara Wilkes-Jones		Numbat Niche Consulting, BSc Environmental Management	Field survey (targeted Numbat survey), camera image analysis
Caitlin Nagle		MSc Zoology and Conservation Biology	Project oversight, camera image analysis, reporting
Tom Ferries		BSc Science (Conservation and Wildlife Biology)	Camera image analysis
Siyung Jung		BSc Zoology candidate	Camera image analysis
Karen Crews		BSc Environmental Biology (Honours)	Project advise, reporting
Jacob Anderson		BSc Liberal Arts and Sciences (Biology)	Camera image analysis
Brigitte Kovar		MSc Geographic Information Systems (GIS)	GIS and cartography
Bob Bullen		Bat Call WA	Ultrasonic recorder analysis



Newmont Australia
Boddington Gold Project

Project No 1679
Date 26/02/2025
Drawn by BK
Map author WP



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Kilometers

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GDA 1994 MGA Zone 50

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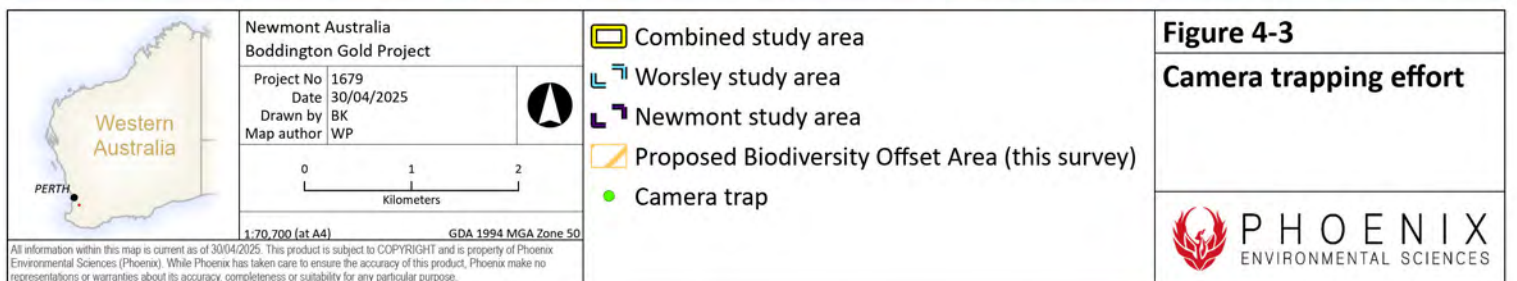
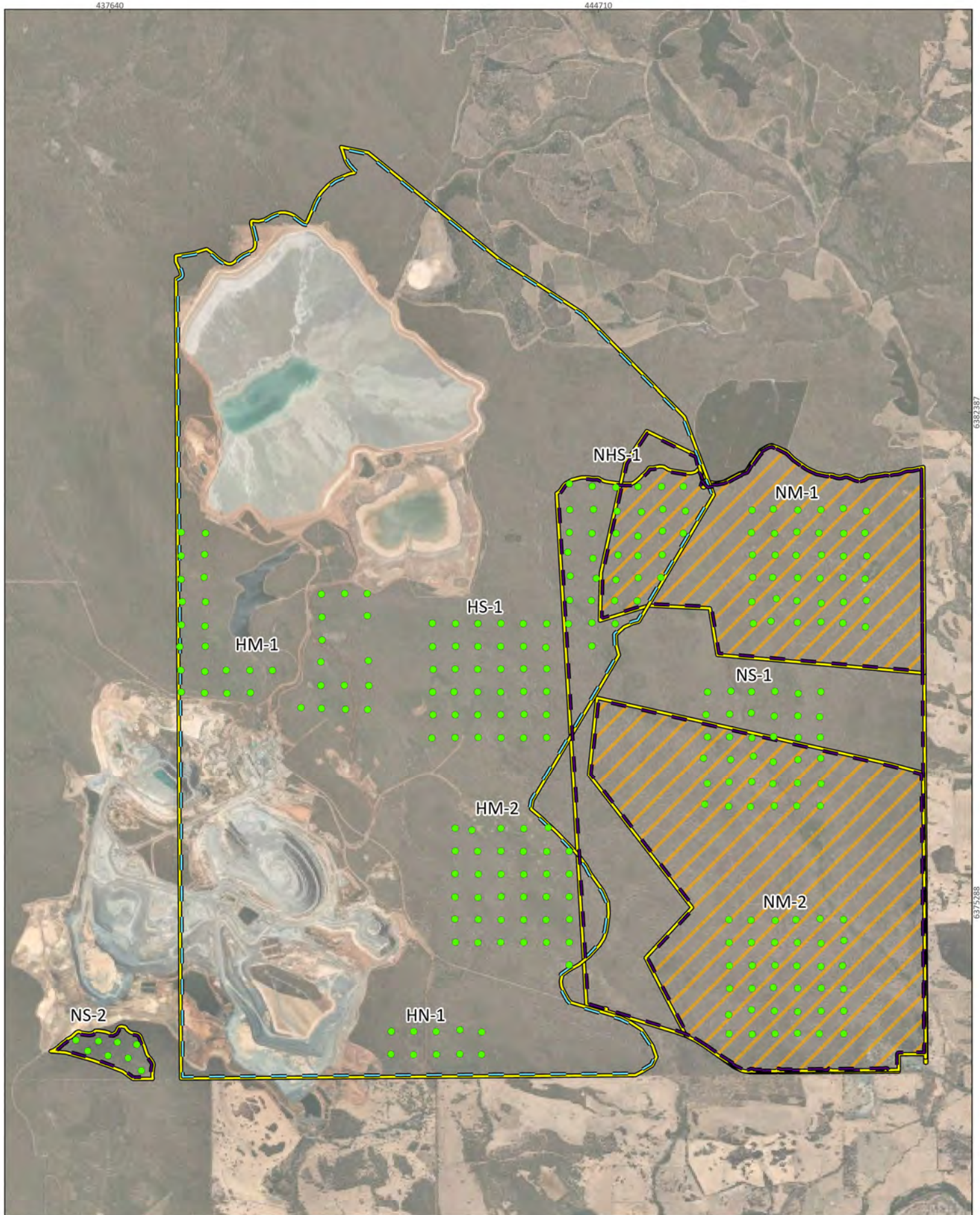
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- Worsley study area
- Newmont study area
- Proposed Biodiversity Offset Area (this survey)
- Sites

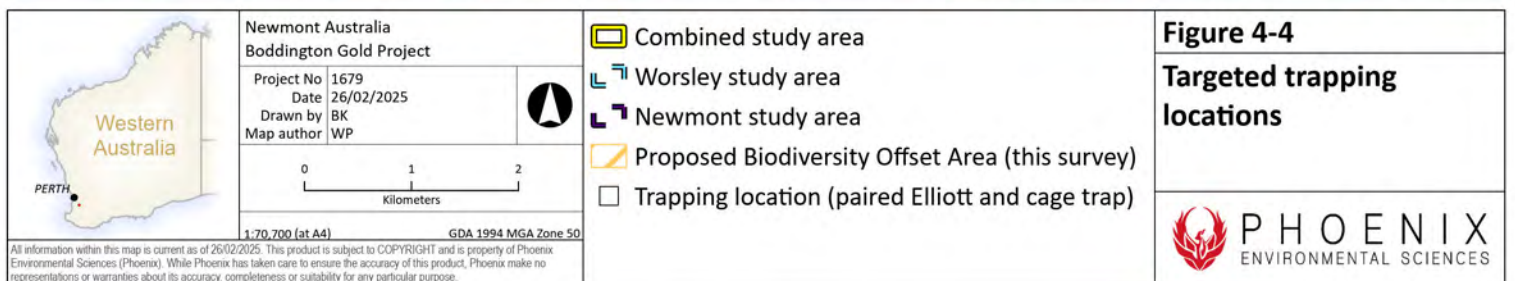
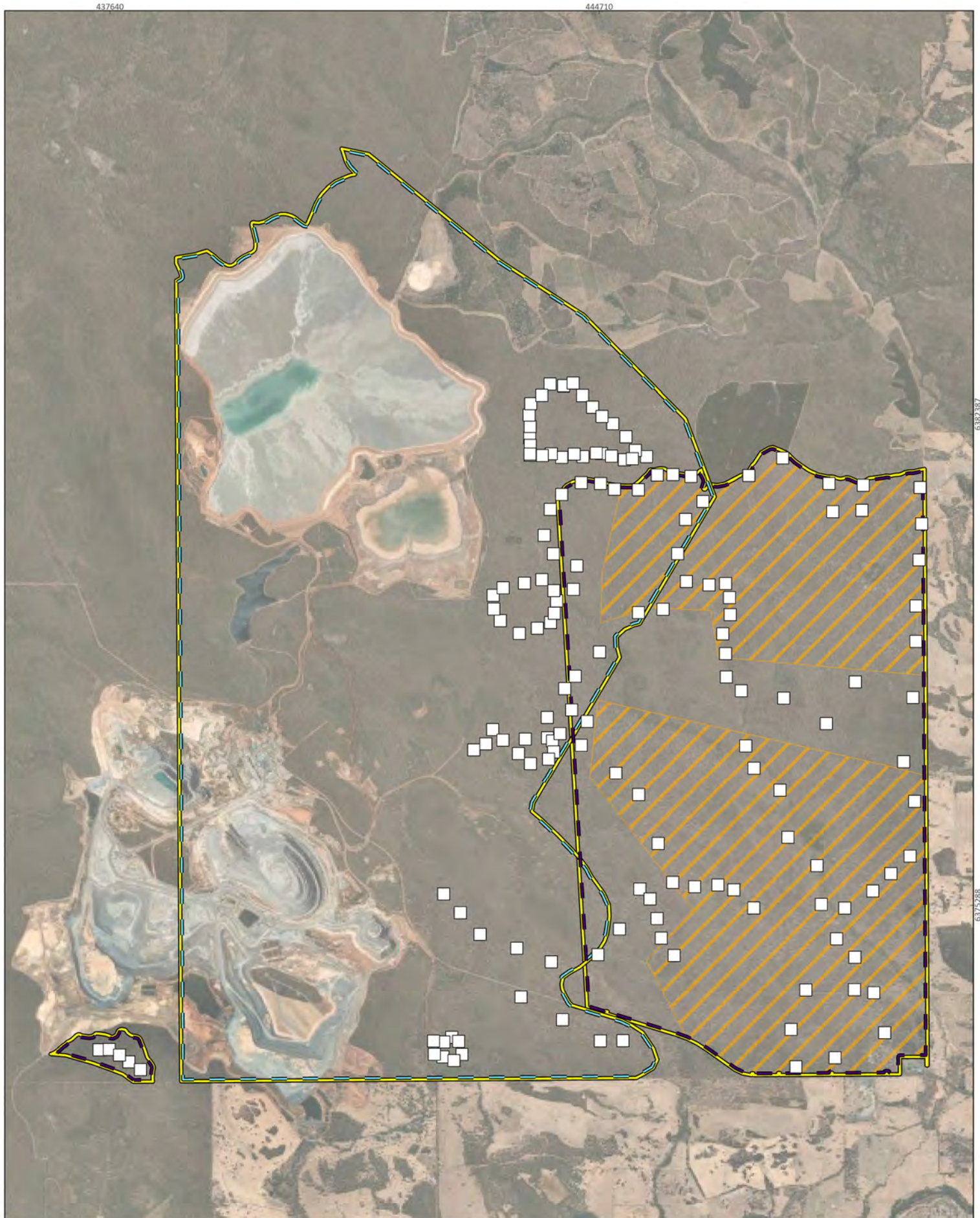
Figure 4-2

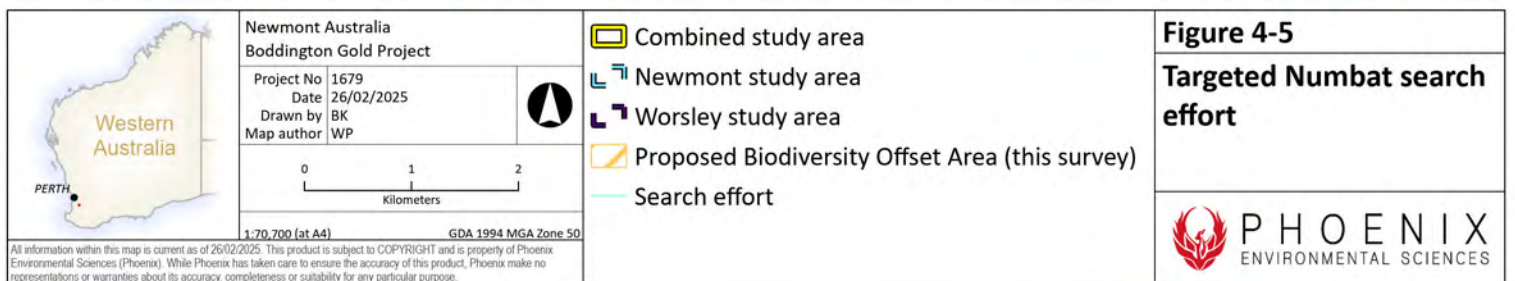
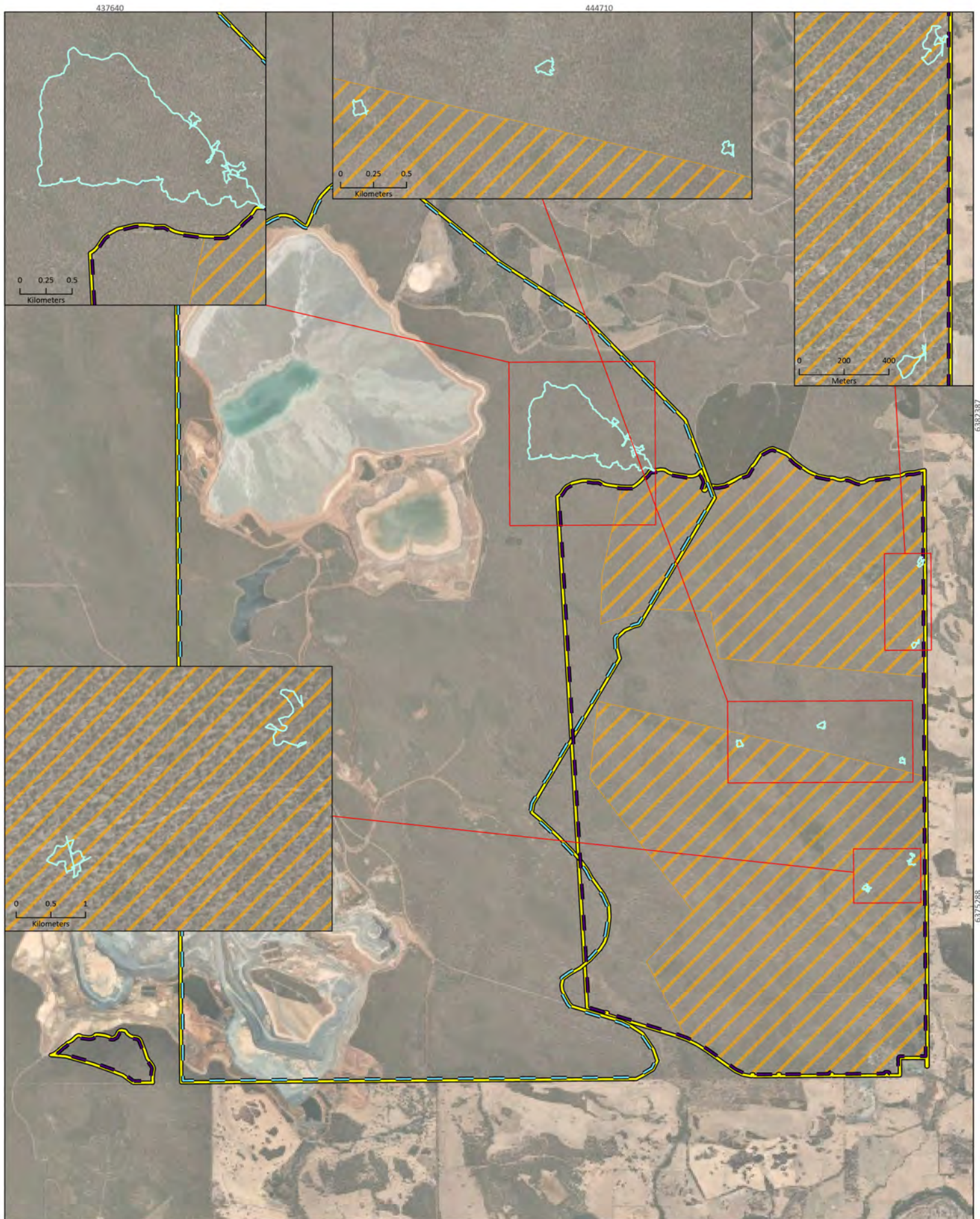
Combined survey site locations

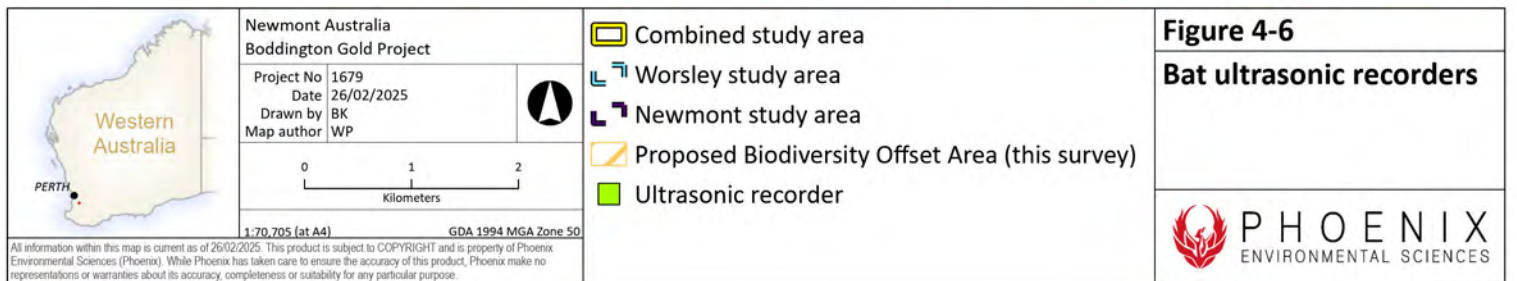
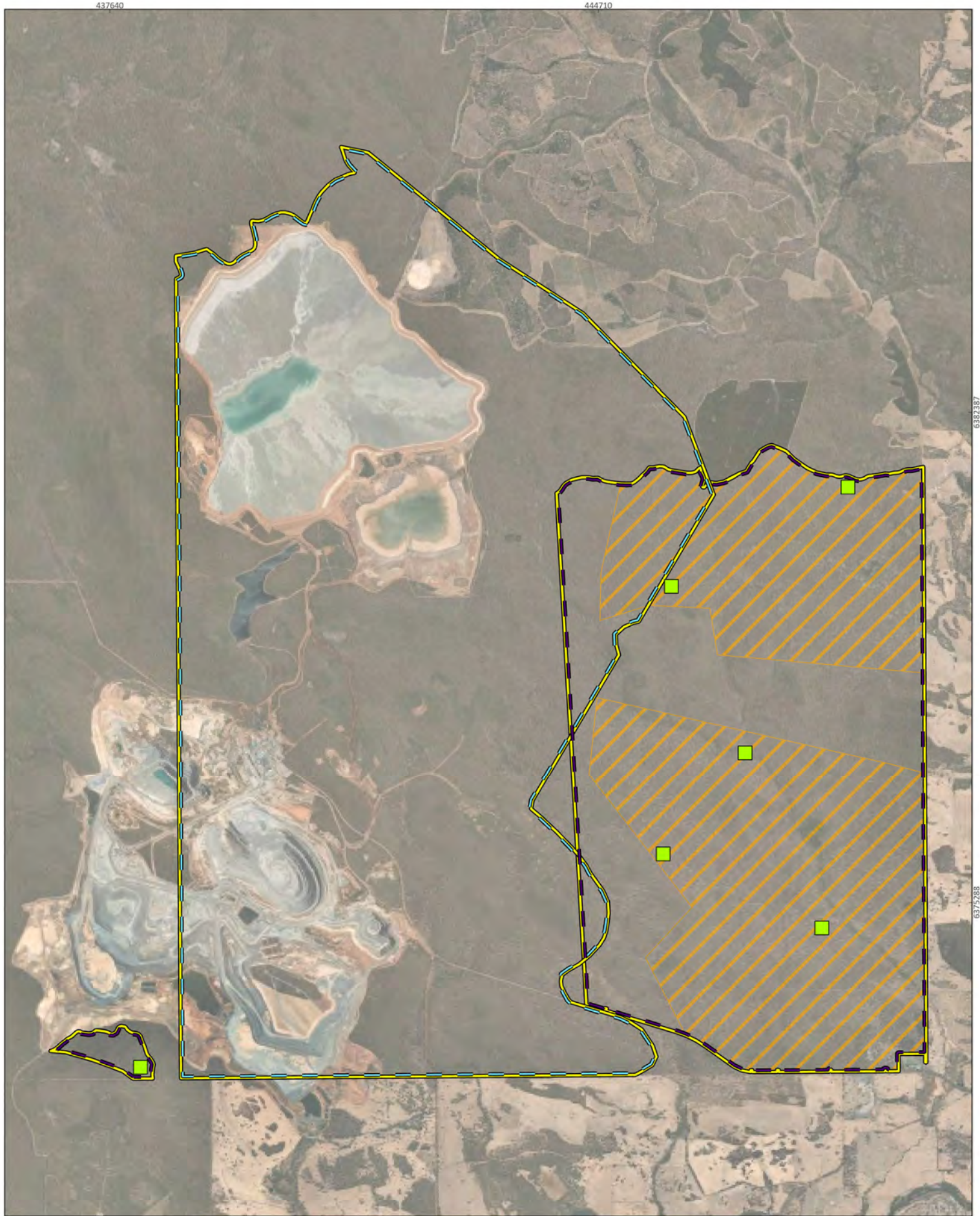


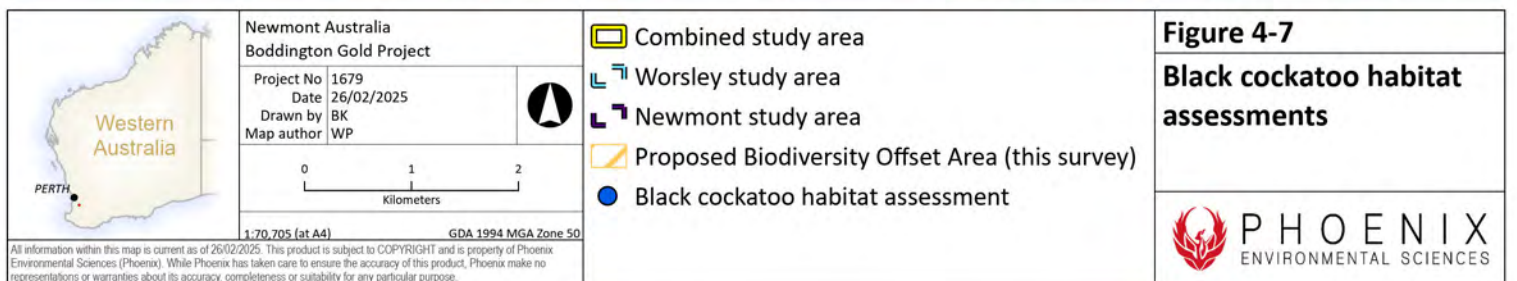
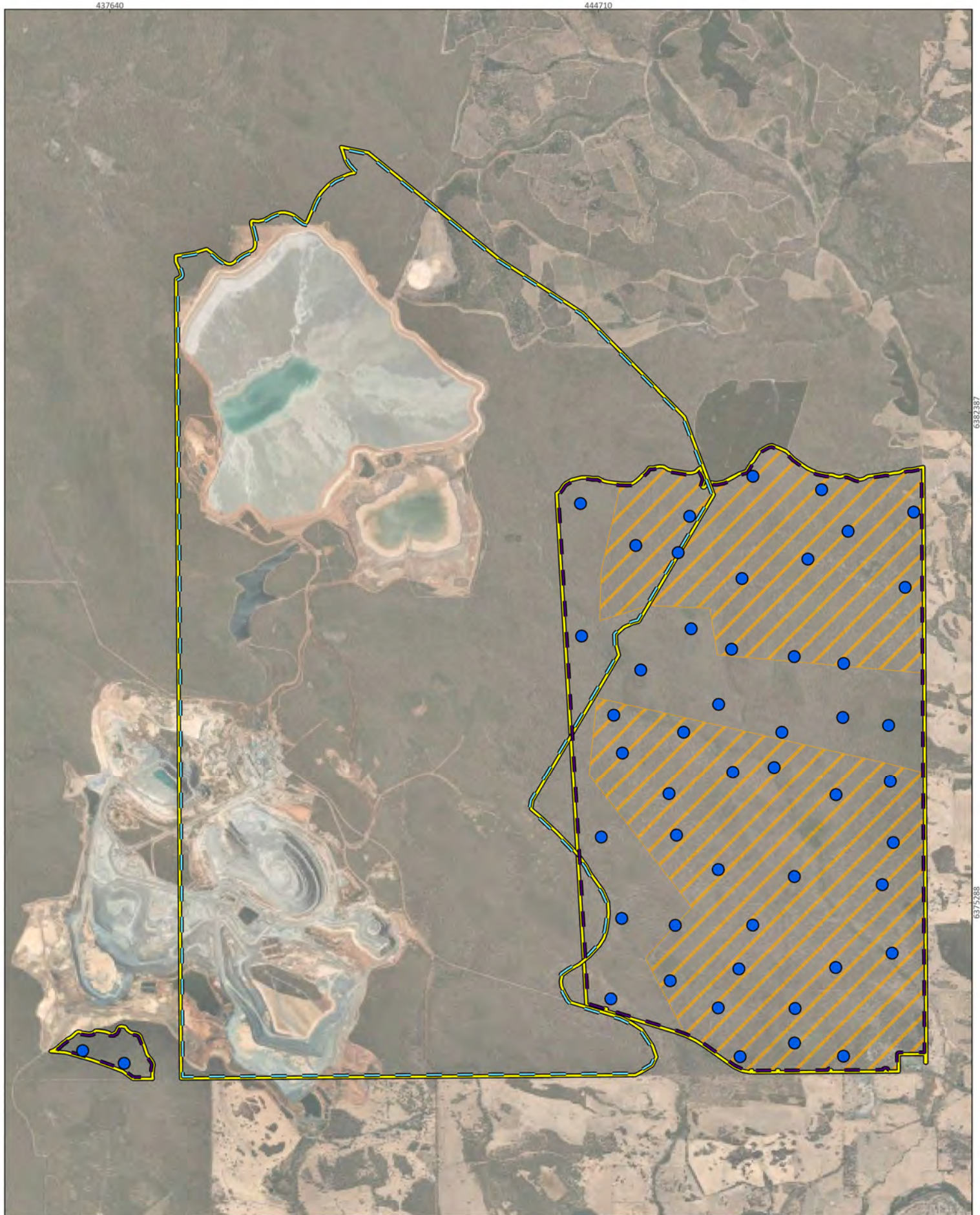
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5 RESULTS

5.1 DESKTOP REVIEW

5.1.1 Desktop assemblage

The desktop review identified records of 42 significant vertebrate taxa and one keystone species within the 40 km desktop search extent for the Newmont study area. The list comprised 26 birds, 15 mammals and 2 reptiles (Table 5-1, Appendix 3). The list includes sources that do not provide record locations (such as NatureMap and EPBC Protected Matters Search Tool) and include instances where suitable habitat either may, is likely or known to occur but the species has not necessarily been observed.

The desktop review assemblage comprised 21 species listed as Threatened, CD or OS under the EPBC Act and/or BC Act, 12 avifauna species listed as Migratory under the EPBC Act and BC Act, and a further 11 species listed as Priority by DBCA (Table 5-2). The assemblage includes one EX species, Burrowing Bettong (*Bettongia lesueur graili*), one locally extinct species, Greater Bilby (*Macrotis lagotis*, VU), and one keystone species, Honey Possum (*Tarsipes rostratus*). This assemblage includes significant vertebrate taxa that fall outside the scope of this survey; taxa not within the scope of this survey are highlighted in grey in Table 5-2 and are not considered in detail beyond the desktop component of this survey.

The significant mammal assemblage includes 8 taxa listed as Threatened, CD or OS under the EPBC Act and/or BC Act, 5 species listed as Priority by DBCA, one species listed as EX under the EPBC and BC Acts, and one keystone species (Table 5-1; Table 5-2). Of the 3 black cockatoo species identified in the desktop review, 2 are listed as EN under the EPBC and BC Acts (Baudin's Cockatoo and Carnaby's Cockatoo), and one is listed as VU under the EPBC and BC Acts (Forest Red-tailed Black Cockatoo). Desktop records were also returned for White-tailed Black Cockatoo (*Zanda* sp.), which represents either Baudin's Cockatoo or Carnaby's Cockatoo.

The review identified 6 significant vertebrate species (potentially 7; *Zanda* sp.) that have previously been recorded within the Newmont study area (Figure 5-1):

- Forest Red-tailed Black Cockatoo (VU; EPBC and BC Acts), 13 records located in the northeast, northwest and south of the Offset area (this survey). Records were sourced from the Phoenix Biological Database (5 records) and Threatened and Priority Fauna Database (8 records) (DBCA 2024b; Phoenix 2024b).
- Carnaby's Cockatoo (EN; EPBC and BC Acts), 19 records located in the southeast and northwest of the Offset area (this survey). Records were sourced from the Threatened and Priority Fauna Database (DBCA 2024b).
- White-tailed Black Cockatoo (EN; EPBC and BC Acts), 2 records in the west of the Offset area (this survey), which either represent the Baudin's Cockatoo or Carnaby's Cockatoo. Records were sourced from the Threatened and Priority Fauna Database (DBCA 2024b).
- Chuditch (VU; EPBC & BC Acts), 9 records located in the south, southwest and northwest of the Offset area (this survey). Records were sourced from the Phoenix Biological Database (3 records) and the Threatened and Priority Fauna Database (6 records) (DBCA 2024b).
- Quenda (P4; DBCA list), 4 records located in the north, northwest and south of the Offset area (this survey). Records were sourced from the Phoenix Biological Database (Phoenix 2024b).
- Western Brush-tail Wallaby (P4; DBCA list), 22 records located in the centre of the interface between the two surveyed portions of the Offset area (this survey). Records were sourced from the Phoenix Biological Database (1 record) and the Threatened and Priority Fauna Database (21 record) (DBCA 2024b; Phoenix 2024b).

- Woylie (EN/CR; EPBC & BC Acts), 89 records across 3 locations in the northeast, southeast and southwest of the Offset area (this survey). Records were sourced from the Threatened and Priority Fauna Database (DBCAs 2024b).

Table 5-1 Summary of terrestrial fauna desktop results for the Newmont study area

Class	Native	Introduced	Total	% Total
Overall				
Birds	26	0	26	60.5
Mammals	15	0	15	34.9
Reptiles	2	0	2	4.7
Total	43	0	43	100.0
Relevant to Newmont study area				
Birds	3	0	3	18.8
Mammals	13	0	13	81.2
Total	16	0	16	100.0

Table 5-2 Significant vertebrate fauna identified in the desktop review

Species	Status	Proximity to Newmont study area	Habitat
Birds (26)			
<i>Actitis hypoleucos</i> Common Sandpiper	Mig. (EPBC & BC Acts)	0.7 km SE	Breeds in temperate Eurasia during summer in the northern hemisphere. A small population winters in Australia (3000 individuals). They are found across a wide range of wetlands, mostly coastal with some inland records (Geering <i>et al.</i> 2007). Feeds predominately on insects, actively chasing prey, snatching them from rock crevices, leaves and cracks in soil (Menkhorst <i>et al.</i> 2017).
<i>Aphelocephala leucopsis</i> Southern Whiteface	VU (EPBC Act)	Modelled distribution	Occurs over most of Australia south of the tropics (Schodde & Mason 1999). Two subspecies occur with a hybridisation zone extending northern from the western boundary of the Nullarbor Plain (DCCEEW 2023a). Inhabits a range of open woodlands and shrublands with an understory of grasses and/or shrubs, generally characterised by acacias or eucalypts on ranges, foothills and lowlands, and plains (Higgins & Peter 2002). Forage on insects, spiders, and seeds almost exclusively on the ground (Higgins & Peter 2002). Semi-gregarious with parties of generally 2–8 individuals, sometimes larger flocks in the non-breeding season (Higgins & Peter 2002). Critical habitats for the species include (DCCEEW 2023a): - relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both - habitat with low tree densities and an herbaceous understory litter cover which provides an essential foraging habitat - living and dead trees with hollows and crevices which are essential for roosting and nesting.
<i>Apus pacificus</i> Fork-tailed Swift	Mig. (EPBC & BC Acts)	Modelled distribution	Widespread migratory species that winter in Australia and is found across most of WA. Occur in a wide range of dry or open habitats, including riparian woodlands, tea-tree swamps, low scrub, heathland, salt marsh, grassland and spinifex sandplains, open farmland, and inland and coastal sand dunes. Often found in areas that experience updraughts around cliffs, and normally forage several hundred metres above ground level (DSEWPac 2011a). Insectivorous (Menkhorst <i>et al.</i> 2017).
<i>Atrichornis clamosus</i> Noisy Scrub-bird	EN (EPBC & BC Acts)	15.9 km WSW	Found in dense vegetation, including low forest, scrub thicket and (rarely) heath. These vegetation formations generally occur in the gullies and drainage lines of hills and granite mountains and lowland areas, in overgrown swamps, lake margins and beside streams. Most abundant in vegetation more than 10 years post-fire (DPaW 2014). Breeding habitat is wetter areas characterised by a dense ground cover of sedges (mostly <i>Lepidosperma</i>) and/or small shrubs which provide a source of nest material, nest sites and cover (Danks <i>et al.</i> 1996). Foraging habitat comprises drier, and more elevated areas is characterised by a less dense ground cover, a dense layer of leaf litter and an abundant population of litter-dwelling invertebrates (Smith 1996).

Species	Status	Proximity to Newmont study area	Habitat
<i>Botaurus poiciloptilus</i> Australasian Bittern	EN (EPBC & BC Acts)	22.9 km NNE	Found across most of southern Australia; 3 subpopulations are distinguished: Tasmania, southeast Australia and WA, with a total estimate of <2,500 individuals (Garnett <i>et al.</i> 2011a). Found in freshwater or brackish swamps with dense vegetation; occasionally feeds in more open habitats, often at night (McKilligan 2005). The species range in WA has contracted in the last few decades, with most of the State's population now concentrated around the Lake Muir wetlands. Destruction and degradation of wetland vegetation, salinisation and drainage of inland water are responsible for the alarming decline of the species; a population decline of 38% has occurred over the last 3 generations (IUCN 2019).
<i>Calidris acuminata</i> Sharp-tailed Sandpiper	VU/Mig. (EPBC Act); Mig. (BC Act)	Modelled distribution	One of the most common Australian shorebirds. A large majority of the world population (155,000 individuals) winters in Australia (Bamford <i>et al.</i> 2008). The species distribution in Australia depends on water quantity conditions; some large wetlands may occasionally be available inland after important rainfall. Their distribution on the coast is more regular with the conditions being more consistent. Semi-gregarious and occurs in scattered flocks, mainly on non-tidal flats, often inland. Forages by probing in shallow water for insects, worms and aquatic vegetation.
<i>Calidris ferruginea</i> Curlew Sandpiper	CR/Mig. (EPBC Act); CR (BC Act)	Modelled distribution	Common summer migrant to Australia; are mostly found on the coast but can also forage inland in open shallow wetlands, intertidal mudflats of estuaries, mangrove channels, lakes and dams, among other temporary and permanent water sources (Morcombe 2004). In WA, they are widespread around coastal and subcoastal plains from Cape Arid to southwest Kimberley Division (DCCEEW 2024h). Feeds on insects, worms and crustaceans by pecking and probing the substrate.
<i>Calidris melanotos</i> Pectoral Sandpiper	Mig. (EPBC & BC Acts)	Modelled distribution	Shallow fresh to saline wetlands such as coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (DCCEEW 2024b).
<i>Calyptrorhynchus banksii naso</i> Forest Red-tailed Black Cockatoo	VU (EPBC & BC Acts)	Inside Newmont study area	Occurs in dense Jarrah, Karri and Marri forests, mainly in the hilly interior, and a range of other forest and woodland types (DCCEEW 2024b). May also be a casual visitor to Perth's southern suburbs in search of Cape Lilac (Johnstone <i>et al.</i> 2013b). Habitat critical for survival and important populations of Forest Red-tailed Black Cockatoo comprises all Marri, Karri and Jarrah forests, and woodlands and remnants in the southwest of WA receiving more than 600 mm of annual average rainfall (DEC 2007).
<i>Falco hypoleucos</i> Grey Falcon	VU (EPBC & BC Acts)	Modelled distribution	Widespread but rare species; inhabits much of the semi-arid interior of Australia. Its distribution is centred on inland treed drainage systems. It has a large foraging range extending from timbered plains, such as <i>Acacia</i> shrublands, into open grasslands (Garnett & Crowley 2000).
<i>Falco peregrinus</i> Peregrine Falcon	OS (BC Act)	0.7 km SE	Widespread species found across Australia; in WA, it can be rare to moderately common. Preferred habitat includes cliffs and wooded watercourses with a recorded 3,000 ha home range.

Species	Status	Proximity to Newmont study area	Habitat
<i>Leipoa ocellata</i> Malleefowl	VU (EPBC & BC Acts)	10.3 km ESE	Found across the southern half of the Australian continent and is the only megapode in the Southwest region. In WA, the majority of the population is found south of the line from Shark Bay to the Nullarbor Plain. There has been a substantial contraction of their distributional range in WA (~30%) (Parsons <i>et al.</i> 2008). Typically found in mallee woodlands but also eucalypt woodlands, shrublands and habitats supporting she-oak (<i>Casuarina</i> , <i>Allocasuarina</i>) and Mulga vegetation assemblages. Habitat critical to the survival of Malleefowl, as defined by the National Recovery Plan (Benshemesh 2007), includes features such as sandy substrates and abundant leaf litter for mound building and dense shrub and canopy cover for foraging and screening from aerial and terrestrial predators.
<i>Limosa lapponica</i> Bar-tailed Godwit	Mig. (EPBC & BC Acts)	Modelled distribution	Occupies a variety of aquatic habitats such as intertidal sandflats, banks, mudflats, estuaries coastal lagoons and harbours. They have also been found in saltmarshes and brackish coastal wetlands (DCCEEW 2024i)
<i>Motacilla cinerea</i> Grey Wagtail	Mig. (EPBC & BC Acts)	Modelled distribution	Small vagrant passerine in Australia; inhabits fast-flowing streams and rivers (IUCN 2019). The global population trend is thought to be stable (IUCN 2019).
<i>Ninox connivens connivens</i> Barking Owl (southwest pop.)	VU (EPBC & BC Acts)	40.0 km E	Found in open forests, woodlands, dense scrubs, large trees near watercourses, and paperbark woodlands.
<i>Numenius madagascariensis</i> Eastern Curlew	CR/Mig. (EPBC Act); CR (BC Act)	Modelled distribution	Only the Siberian subspecies is a regular migrant to Australia, arriving in September and departing in May. Forages on tidal mudflats, beaches, and low-salinity saltwork ponds (Johnstone <i>et al.</i> 2013a) by probing mostly for small crabs, but also other crustaceans, worms and molluscs. Declared Critically Endangered due to the loss of habitat along their migratory stages between China and Korea.
<i>Tringa brevipes</i> Grey-tailed Tattler	Mig. (EPBC & BC Acts); P4 (DBCA list)	Modelled distribution	The species is explicitly coastal across its Australian distribution. Inhabits large tidal flat systems and rocky shorelines (Menkhorst <i>et al.</i> 2017).
<i>Oxyura australis</i> Blue-billed Duck	P4 (DBCA list)	3.7 km SE	Mainly aquatic. Shows fairly regular seasonal movements between breeding sites on inland ephemeral wetlands (winter and spring), and permanent wetlands closer to the coast (summer and autumn) (Guay <i>et al.</i> 2010).
<i>Pandion cristatus</i> Osprey	Mig. (EPBC & BC Acts)	Modelled distribution	Mostly found in littoral and coastal habitats, sometimes in terrestrial wetlands or along major rivers (DoEE 2019; Johnstone & Storr 1998). In south coastal WA, they extend as far east as Esperance. The nest is a large and high solid cone of sticks and branches built on the ground or in trees, sometimes on human infrastructures (Johnstone & Storr 1998). A pair can raise one to 3 broods (up to 3 chicks) in one year depending on food availability and climatic conditions. Parents will forage up to 10 km from the nest (Poole <i>et al.</i> 2002).
<i>Platycercus icterotis xanthogenys</i>	P4 (DBCA list)	1.5 km E	Inhabits open eucalypt woodland, forests, treed farmland and parks (Cork 2020; Menkhorst <i>et al.</i> 2017). Often seen foraging on the ground among other groups of birds and in the tree canopy. Two subspecies occur in southwest WA; the

Targeted significant mammal and black cockatoo survey for the Boddington Gold Project
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Species	Status	Proximity to Newmont study area	Habitat
Western Rosella (inland)			nominate subspecies <i>P. i. icterotis</i> inhabits the southwest forested and higher rainfall areas, and the other (significant) subspecies is confined to the drier woodlands in the Wheatbelt region with a heathy understory (Cork 2020; Menkhorst <i>et al.</i> 2017). The Newmont study area occurs in the hybridisation region between the 2 subspecies.
<i>Rostratula australis</i> Australian Painted Snipe	EN (EPBC & BC Acts)	Modelled distribution	Wide but scattered distribution across Australia; some populations appear resident and others nomadic. Inhabits permanent and ephemeral shallow inland wetlands, either freshwater or brackish.
<i>Thalasseus bergii</i> Crested Tern	Mig. (EPBC & BC Acts)	Modelled distribution	Inhabits tropical and subtropical coastlines. Found along the entire Australian coast (IUCN 2019) but mainly a resident in the Pilbara region, breeding on islands from March to May. Favours sheltered seas, estuaries and saltwork ponds, only rarely inland after storms (DoEE 2019; IUCN 2019; Johnstone <i>et al.</i> 2013a).
<i>Tringa nebularia</i> Common Greenshank	EN/Mig. (EPBC Act); Mig. (BC Act)	39.3 km WSW	Found mostly on the coast but sometimes inland; uses a wide variety of habitats including permanent and ephemeral terrestrial wetlands (including inland), sheltered coastal habitats of varying salinity, coastal mudflats, saltmarsh and mangroves (DCCEEW 2023c).
<i>Zanda baudinii</i> Baudin's Black Cockatoo	EN (EPBC & BC Acts)	1.9 km W	Mainly occurs in eucalypt forests of far south-west WA, especially Jarrah, Marri and Karri Forest. Breeds predominately in forests averaging more than 750 mm of rainfall annually. During the non-breeding season, the range is determined by the distribution of Marri (DCCEEW 2024b). Habitat critical for survival and important populations of Baudin's Cockatoo comprises all Marri, Karri and Jarrah forests, and woodlands and remnants in the southwest of WA receiving more than 600 mm of annual average rainfall (DEC 2007).
<i>Zanda latirostris</i> Carnaby's Black Cockatoo	EN (EPBC & BC Acts)	Inside Newmont study area	Occurs in uncleared or remnant native eucalypt woodlands of southwest WA. During the breeding season, it occurs mainly in eucalypt woodlands with suitable hollow-bearing trees in the wheatbelt. In the non-breeding season, they occur on coastal plains. Foraging habitat includes native vegetation surrounding breeding areas during the breeding season, and <i>Banksia</i> heath and woodlands in the non-breeding season (DCCEEW 2024b). Habitat critical to the survival of Carnaby's Cockatoo comprises (DPaW 2013): - eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding - woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established - in the non-breeding season, the vegetation that provides food resources as well as the sites for nearby watering and night roosting enable the cockatoos to effectively utilise the available food resources.
<i>Zanda sp.</i> White-tailed Black Cockatoo	EN (EPBC & BC Acts)	Inside Newmont	See Baudin's Black Cockatoo and Carnaby's White-tailed Black Cockatoo above.

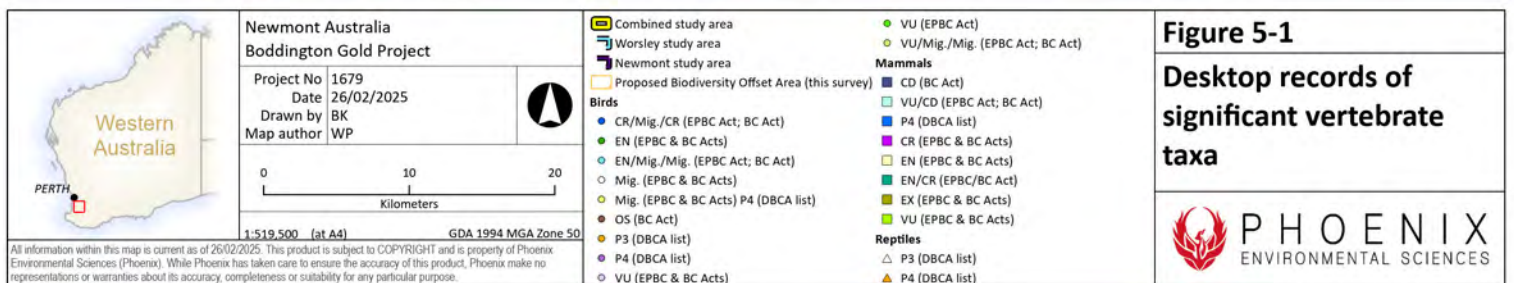
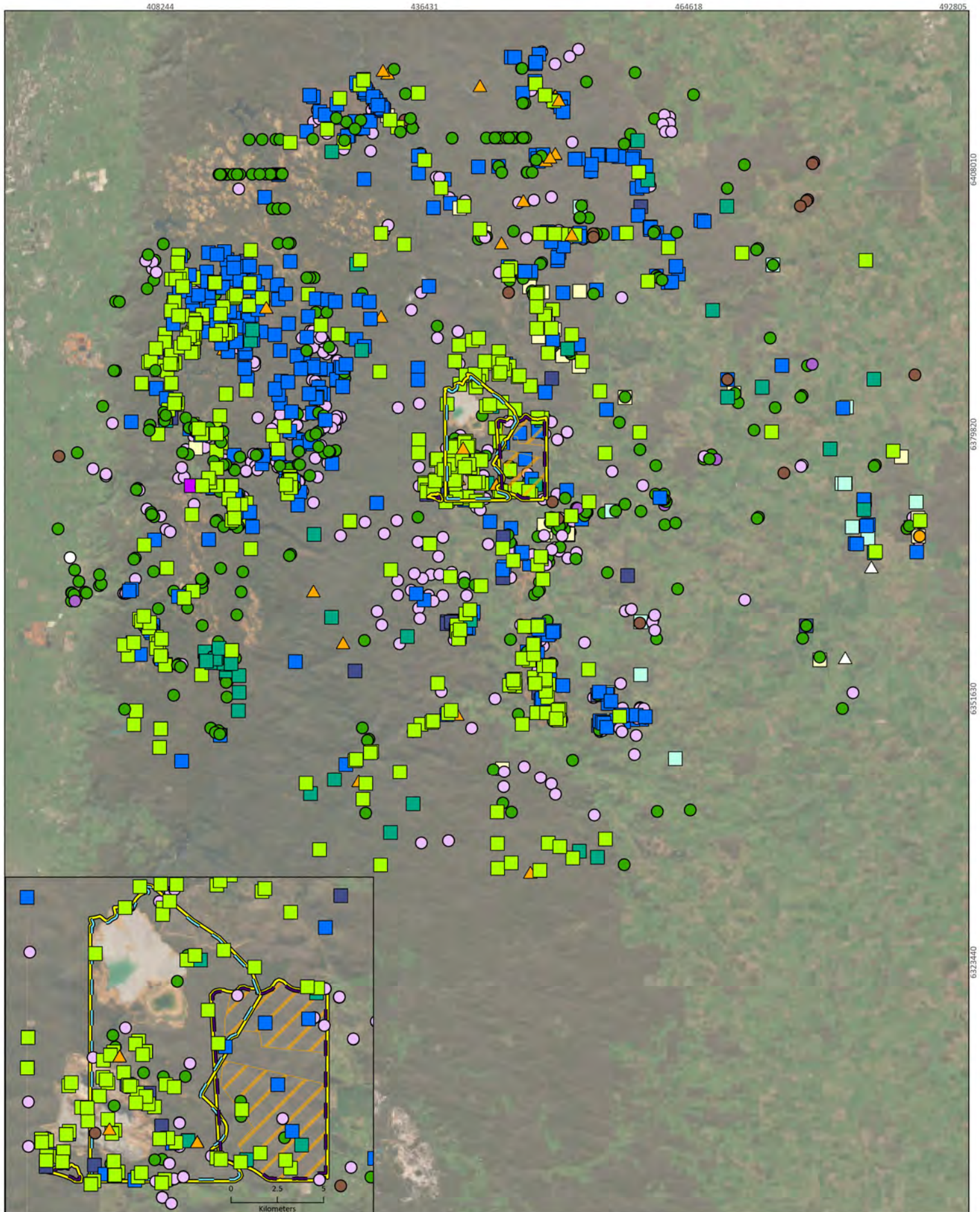
Species	Status	Proximity to Newmont study area	Habitat
		study area	
Mammals (15)			
<i>Dasyurus geoffroii</i> Chuditch, Western Quoll	VU (EPBC & BC Acts)	Inside Newmont study area	The Chuditch is now confined to southwest WA, occurring in only 5% of its former range. Before European settlement, the species occupied approximately 70% of continental Australia (Smith <i>et al.</i> 2004; Van Dyck & Strahan 2008). The species is now mostly found in Jarrah Forest and woodland of the southwest or heath and mallee habitats along the south coast. Remnant populations still occur in the broader Wheatbelt and Goldfields region. In the southwest, it uses horizontal hollow logs or earth burrows as refugia and dens (DEC 2012b). Habitat considered critical to the survival of important Chuditch populations includes (DEC 2012b): • areas currently occupied by Chuditch • areas of natural vegetation in which Chuditch breed • areas of natural vegetation in which Chuditch forage • areas of natural vegetation that Chuditch use to move from one area to another • areas of suitable vegetation within the recorded range in which undiscovered Chuditch populations may exist • areas not currently occupied by Chuditch due to recent fire but are capable of supporting Chuditch populations when sufficiently recovered • areas previously occupied and that still provide suitable habitat into which Chuditch can be reintroduced.
<i>Macrotis lagotis</i> Greater Bilby	VU (EPBC & BC Acts)	3.2 km SE	Locally extinct. Since European settlement, the Greater Bilby has disappeared from over three-quarters of their former range and is now only found in the northern parts of their original distribution. The species prefers hummock grasslands in plains and alluvial areas, <i>Triodia</i> and <i>Acacia</i> on sand plains and dune systems, open tussock grassland on uplands and hills, and Mulga woodland/shrubland on ridges and rises (DCCEEW 2023b; Pavey 2006), but areas where it now regionally extinct include many other (mostly open/exposed) habitat types.
<i>Tarsipes rostratus</i> Honey Possum	Keystone species	Modelled distribution	Endemic to southwest WA. The range of the Honey Possum has contracted considerably since European settlement (Bradshaw 2014) where it was once widespread in <i>Banksia</i> woodlands, sandplain heathlands, shrublands and low open forests.
<i>Pseudocheirus occidentalis</i> Western Ringtail Possum	CR (EPBC & BC Acts)	2.3 km SSE	Formerly found in several types of forest and woodland (DPaW 2017b), the species is now mostly restricted to long-unburned mature peppermint/Tuart closed forest and relatively unburned Jarrah and Marri forests and woodlands with limited disturbance. It also occurs in coastal heath, peppermint woodland, myrtaceous heaths and shrubland, riparian zones and Karri forest (DPaW 2017b). Habitat critical to the survival of Western Ringtail Possum is not well-understood but tends to include high nutrient foliage availability for food, suitable structures for protection/nesting, canopy continuity to avoid/escape predation and other threats, and linkages between suitable habitat (DPaW 2017b).

Species	Status	Proximity to Newmont study area	Habitat
			Vegetation communities critical to the species include (DPaW 2017b): • long-unburned mature remnants of peppermint (<i>Agonis flexuosa</i>) woodlands with high canopy continuity and high foliage nutrients (high in nitrogen and low toxin levels) • Jarrah (<i>Eucalyptus marginata</i>)/Marri (<i>Corymbia calophylla</i>) forests and woodlands with limited anthropogenic disturbance (unlogged or lightly logged, and a low intensity and low-frequency fire history), that are intensively fox-baited and have low indices of fragmentation • coastal heath, Jarrah/Marri woodland and forest, peppermint woodlands, myrtaceous heaths and shrublands, Bullich (<i>Eucalyptus megacarpa</i>) dominated riparian zones and Karri Forest Any habitat where Western ringtail possums occur naturally is considered critical and worthy of protection.
<i>Myrmecobius fasciatus</i> Numbat	EN (EPBC & BC Acts)	2.7 km ESE	Numbats have historically been present in a large variety of habitat types, including eucalypt forest, eucalypt woodland, <i>Acacia</i> woodland and <i>Triodia</i> grassland (DPaW 2017a), as well as Mulga woodland (in central Australia) and mallee woodland in South Australia/New South Wales (Van Dyck <i>et al.</i> 2013). The species is now restricted to 2 isolated wild populations in southwest WA where they nest in and nests in hollow logs, trees or burrows (DCCEE 2024b). Some key characteristics of suitable habitats where native subpopulations persist include (DPaW 2017a): • presence of termites in sufficient abundance • presence of eucalypt species • adequate cover near ground level, such as hollow logs for shelter • a sufficiently open understorey is required for feeding sites. Additionally, habitats that allow for the natural expansion of the species distribution; habitats linking existing subpopulations; and areas that do not currently contain the species but did so historically and are suitable for translocation now or in the future if threat abatement occurs are also considered important. All current subpopulations are considered as important and necessary for the long-term survival of the species (DPaW 2017a).
<i>Phascogale tapoatafa wambenger</i> South-western Brush-tailed Phascogale	CD (BC Act)	0.3 km WNW	Occurs in mature dry sclerophyll forests and open woodlands that contain hollow-bearing trees. These nocturnal, arboreal carnivores forage for food under the bark of trees (DEC 2012a) and nest in the hollows of dead and mature Jarrah and Marri trees (Burbidge & Woinarski 2020).
<i>Notamacropus eugenii</i> Tamar Wallaby	P4 (DBC list)	Modelled distribution	The Tamar Wallaby was formerly distributed across most of southwest WA and coastal South Australia, however, has undergone significant declines. In WA, the species is currently known from 3 islands in the Houtman Abrolhos group, Garden Island (Perth), Middle and North Twin Peak Island (Archipelago of the Recherche) and at least 9 mainland sites including Dryandra, Boyagin, Tutanning, Batalling (reintroduced), Perup, private property near Pingelly, Jaloran Road timber reserve near Wagin, Hopetoun, Stirling Range National Park, and Fitzgerald River National Park (DEC 2012g). It

Species	Status	Proximity to Newmont study area	Habitat
			inhabits coastal scrub and heath, dry sclerophyll forest and thickets in mallee and woodland, requiring dense low vegetation for daytime shelter and open grassy areas for foraging (DEC 2012g).
<i>Isoodon fusciventer</i> Quenda, Western Brown Bandicoot	P4 (DBC list)	Inside Newmont study area	Found in scrubby vegetation with dense cover, often around swamps, wetlands or in <i>Banksia</i> and Jarrah woodland. Feeds in frequently burned forest and woodland close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses. Also occurs in more open habitats if it is subjected to introduced predator control (DBC 2017a).
<i>Setonix brachyurus</i> Quokka	VU (EPBC & BC Acts)	15.1 km W	Quokkas inhabit dense riparian vegetation and use a range of other habitats on the mainland such as heath and shrublands, swamps, and forests (DCCEEW 2024b). Habitat critical to the survival of the Quokka has been documented across various subpopulations and is considered well-defined for the JAF01 subpopulation and comprises (DEC 2013; Hayward <i>et al.</i> 2008): • <i>Taxandria linearifolia</i> swamps; and • areas of natural vegetation where the understorey is sufficiently thick and complex to provide a predation refuge close to more open, recently burned vegetation which is used as a food source. Habitat preferences change seasonally, where in the wetter months after wetlands become inundated, the Quokka core home range shifts towards the periphery of the swamp.
<i>Hydromys chrysogaster</i> Rakali, Water Rat	P4 (DBC list)	3.3 km SSW	In southwest WA, the Rakali occupies habitats in the vicinity of permanent water, favouring areas with dense, low-lying vegetation, low-density canopy cover, good water quality, narrow water bodies and some habitat complexity (DEC 2012h; Speldewinde <i>et al.</i> 2013). Woody debris, rock ledges and wetland islands are likely important for refuge and feeding (DEC 2012g). Can also occur in mangrove and estuarine areas (IUCN 2019).
<i>Phascogale calura</i> Red-tailed Phascogale	VU (EPBC Act); CD (BC Act)	3.2 km SE	Occurs in <i>Allocasuarina</i> woodlands with hollow-containing eucalypts. Prefers vegetation that is unburned for a long time, which provides continuous canopy cover to assist their arboreal habits (DCCEEW 2024b).
<i>Notamacropus irma</i> Western Brush-tail Wallaby	P4 (DBC list)	Inside Newmont study area	A grazing species that occurs in open forest or woodland with low grasses and scrubby thickets, and is also found in some areas of mallee and heathland (DEC 2012i). Prefer open grassy areas and are absent in Karri forests with dense understorey (Woinarski & Burbidge 2016).
<i>Falsistrellus mackenziei</i> Western False Pipistrelle	P4 (DBC list)	12.1 km ESE	Restricted to areas in or adjacent to high rainfall old-growth forest. This includes wet sclerophyll dominated by Karri and Marri, and in Jarrah and Tuart in higher rainfall areas (Armstrong <i>et al.</i> 2017).
<i>Bettongia penicillata ogilbyi</i> Woylie, Brush-tailed Bettong	EN (EPBC Act); CR (BC Act)	Inside Newmont	Inhabited a wide range of landscapes prior to European colonisation. Remnant subpopulations inhabit woodlands and adjacent heaths with a dense understorey of shrubs, particularly <i>Gastrolobium</i> spp. (poison pea) (TSSC 2018). Habitat

Species	Status	Proximity to Newmont study area	Habitat
	Act)	study area	critical for the survival of Woylie comprises (Yeatman & Groom 2011): • tall eucalypt forest and woodland • dense myrtaceous shrubland • kwongan (proteaceous) or mallee heath. All habitats meeting these key requirements within the current range, which is either known to be occupied by Woylies or to have the identified potential to be occupied by Woylies and which have adequate introduced predator (fox and cat) control or exclusion, are considered critical to the survival of the species (Yeatman & Groom 2011).
<i>Bettongia lesueur graii</i> Boodie, Burrowing Bettong	EX (EPBC & BC Acts)	Modelled distribution	Extinct.
Reptiles (2)			
<i>Acanthophis antarcticus</i> Southern Death Adder	P3 (DBCA list)	33.2 km ESE	Inhabits a range of habitats from rainforests and woodlands to grasslands and heath (Wilson & Swan 2021).
<i>Ctenotus delli</i> Darling Range Heath Ctenotus	P4 (DBCA list)	1.4 km WSW	Occurs in Jarrah and Marri forests and woodlands on lateritic, clay and sandy soils (Wilson & Swan 2021).

*Rows highlighted in grey indicate significant vertebrate fauna returned in the desktop review that are outside the scope of this survey. Rows highlighted in red indicate significant vertebrate fauna that are relevant to the scope of work but are considered locally extinct or EX.



5.1.2 Black cockatoos

5.1.2.1 Desktop records

The Newmont study area is within the modelled distribution for Carnaby's Cockatoo (*Zanda latirostris*, EN), Baudin's Cockatoo (*Zanda baudinii*, EN) and the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*, VU). The Newmont study area is also within the modelled breeding range for Carnaby's Cockatoo and the Forest Red-tailed Black Cockatoo (DAWE 2022).

A review of DBCA Threatened and Priority fauna records (DBCA 2024b), in combination with the interrogation of Phoenix's internal database (Phoenix 2024b) and reviewed survey reports (Table 4-2), indicate all 3 species of black cockatoos that occur in southwest WA have been recorded within the 40 km desktop search extent (Figure 5-2). The desktop records (represented by the number of individuals documented in each species record) comprise 3,771 Forest Red-tailed Black Cockatoos, 1,966 Baudin's Cockatoos and 5,504 Carnaby's Cockatoos, with an additional 1,771 records of unconfirmed White-tailed Black Cockatoos (representing either Baudin's Cockatoo or Carnaby's Cockatoo). Records for Baudin's Cockatoo and Carnaby's Cockatoo are nearly evenly distributed throughout the 40 km desktop search extent, whereas records for the Forest Red-tailed Black Cockatoo are concentrated around NB, Quindanning Forest, Worsley Alumina Saddleback mine, east of South Dandalup Dam and northeast of Alcoa Myara site (Figure 5-2). The majority of black cockatoo records occur throughout the more continuous Jarrah Forest and the remnant satellite reserves as opposed to the extensively cleared agricultural land east of the Newmont study area.

According to the DBCA black cockatoo roost sites dataset (DBCA 2019b), roosts are common throughout the Swan Coastal Plain and along the periphery of the Jarrah forest in the Southwest. The highest concentrations of roost sites appear in developed areas, such as the Perth metropolitan area, Bunbury, Margaret River and Dunsborough. However, this is likely the result of sampling bias rather than a lower proportion of roosts occurring in undeveloped areas. The Newmont study area does not intersect any recognised black cockatoo roosting sites (DBCA 2019b). Three confirmed Carnaby's Cockatoo roost sites occur within the 40 km desktop search extent, the nearest situated 12 km east of the Newmont study area (within the 12 km local buffer area). An additional unconfirmed roost site also occurs 11 km east of the Newmont study area.

According to the DBCA Carnaby's Cockatoo confirmed breeding areas dataset (DBCA 2019c), the Newmont study area intersects a confirmed Carnaby's Cockatoo breeding area (DBCA 2019c) (see below, Figure 5-2). Confirmed breeding areas for Carnaby's Cockatoo predominately occur to the north of the Perth Metropolitan Region and in the far southwest around areas such as the Stirling Ranges National Park, with a small hiatus between these areas. However, areas of unconfirmed Carnaby's Cockatoo breeding occur to the north, west and southwest of the Newmont study area, with the nearest occurring approximately 20 km to the north-northwest (DBCA 2019d).

5.1.2.2 Newmont nest monitoring

Monitoring of natural nest hollows (NNH) and artificial nest hollows (ANH) has been undertaken by Newmont on an intermittent basis from 2012 up until 2022 (Table 5-3; Figure 5-3). Thirty ANHs and 11 NNHs comprised this monitoring program, of which 9 ANHs and 3 NNHs occur in the Newmont study area (highlighted in grey in Table 5-3), with the remaining found further west, in forested areas surrounding current operations. Over the 11 years of monitoring, limited evidence of nest occupancy and breeding was documented, with 4 hollows showing either signs of use (including potential use) or breeding activity between 2018– 2021:

- Nest01
 - December 2018 – 2 Carnaby's sitting in the crown of stag. One bird was visible on approach, the other came out of the hollow shortly after.

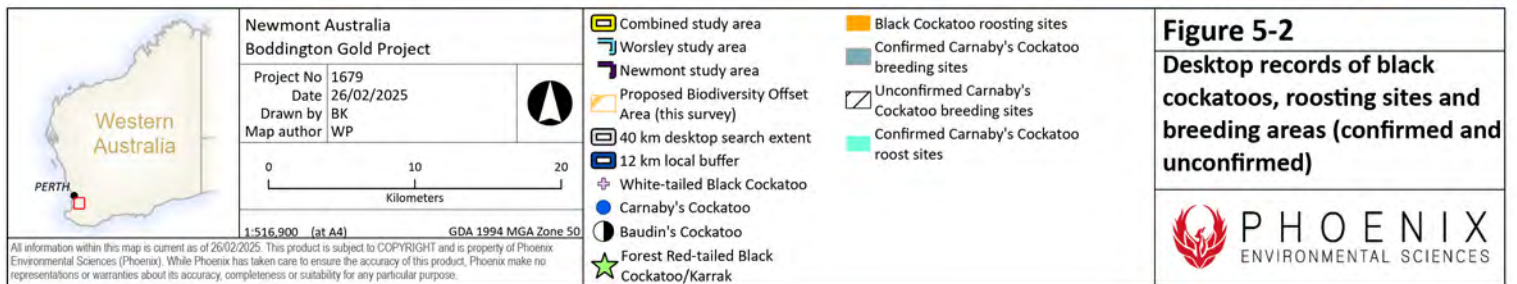
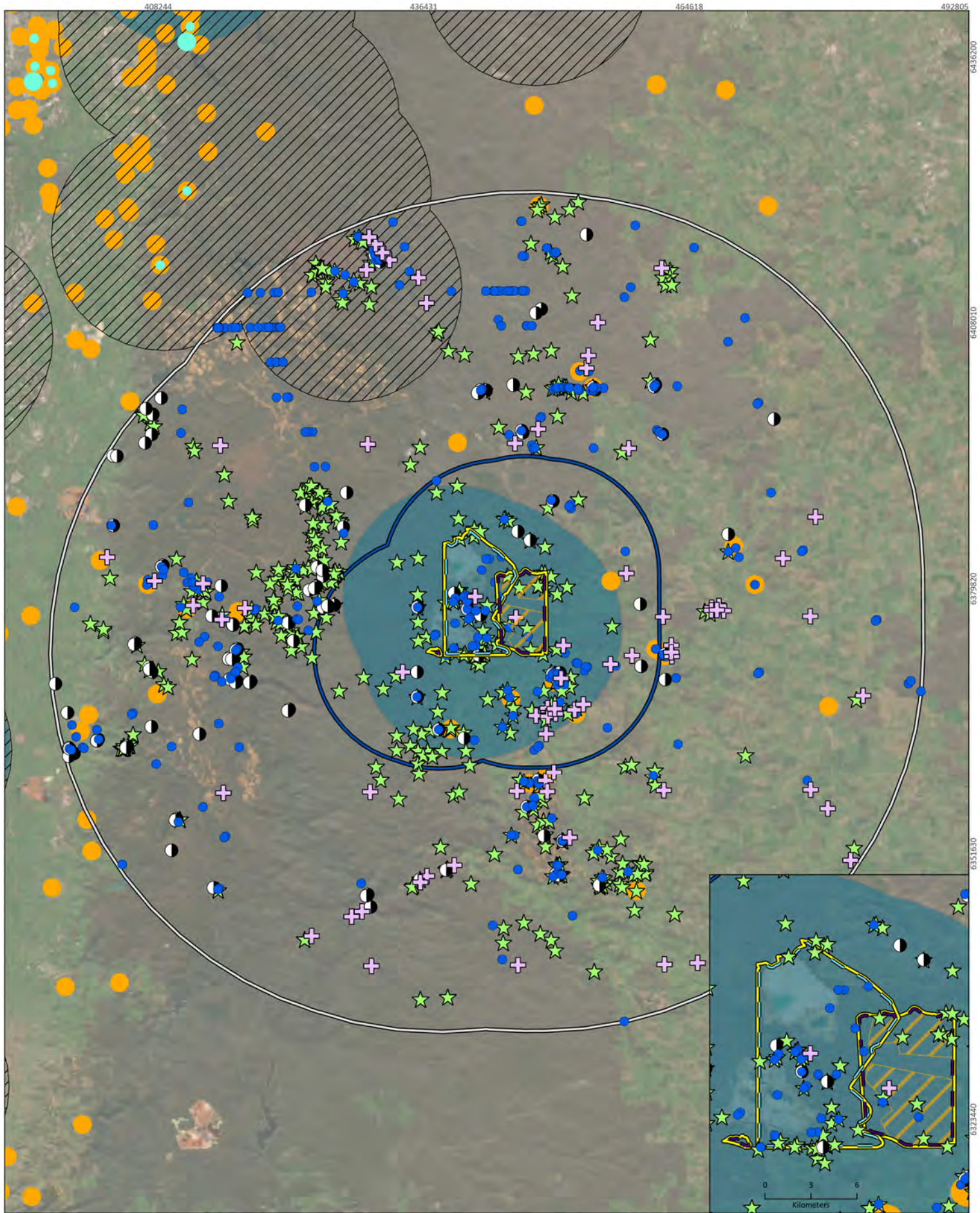
- o September 2020 – White-tailed black cockatoos (likely Carnaby's Cockatoo) appeared after knocking.
- o October 2020 –feeding residue at the base of the tree, however, the branch had fallen off and unsure if the hollow is still intact. No subsequent use of hollow was documented up until monitoring ceased in 2022.
- Nest08
 - o September/October 2019 – a small white feather caught on the entrance to the but no confirmed occupancy (ID unconfirmed).
 - o October 2020 – Forest Red-tailed Black Cockatoo emerged from the hollow after knocking.
 - o November 2020 – Forest Red-tailed Black Cockatoo flushed from the hollow; 2 eggs and one chick were seen in the hollow.
- Nest011
 - o September 2020, September/October 2021 – Forest Red-tailed Black Cockatoo occupying hollow but no evidence of breeding.
- ANH010
 - o January 2019 – Potential black cockatoo chewing marks, but no confirmed occupancy throughout monitoring.

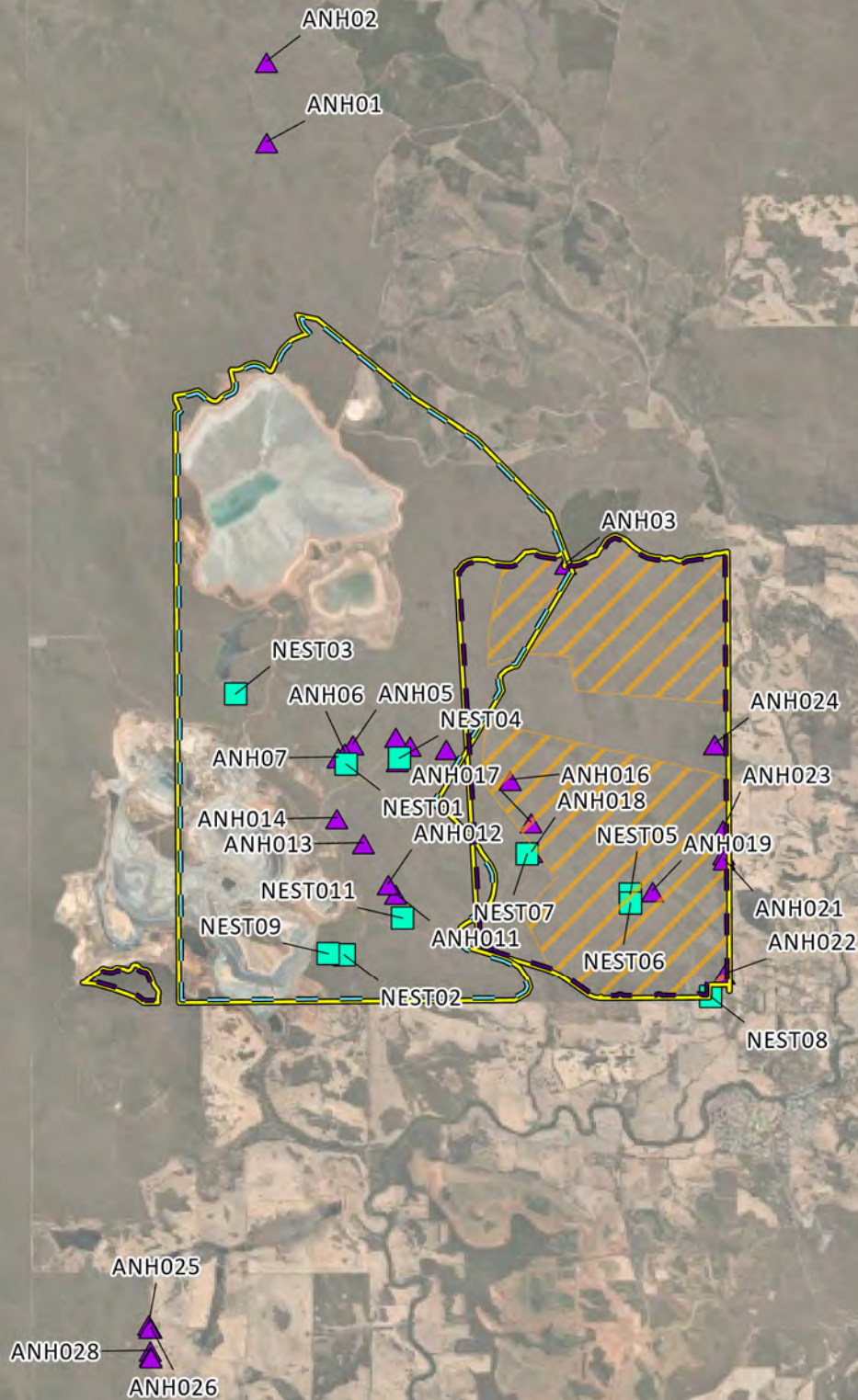
Table 5-3 Artificial and natural nest hollow monitoring locations

WPT NO	Monitoring start	Monitoring closure	Nest type	Tree species	Occupancy / Evidence of use	Easting	Northing
ANH01	2012	2020	PVC	Marri	No	440385	6389616
ANH02	2012	2020	PVC	Marri	No	440381	6391190
ANH03	2015	2020	PVC	Jarrah	No	446240	6381371
ANH04	No data available						
ANH05	2012	2020	PVC	Marri	No	442075	6377832
ANH06	2012	2020	PVC	Marri	No	441916	6377670
ANH07	2012	2020	PVC	Marri	No	441786	6377578
ANH08	2012	2020	PVC	Jarrah	No	442915	6377979
ANH09	2012	2020	PVC	Jarrah	No	442945	6377505
ANH010	2012	2020	PVC	Marri	Potential chew marks (January 2019)	443194	6377805
ANH011	2012	2020	Wood	Jarrah	No	442911	6374906
ANH012	2012	2020	Wood	Jarrah	No	442767	6375092
ANH013	2012	2020	Wood	Jarrah	No	442282	6375896
ANH014	2012	2020	Wood	Jarrah	No	441760	6376386
ANH015	2012	2020	Wood	Jarrah	No	443902	6377742
ANH016	2012	2020	Wood	Jarrah	No	445156	6377136
ANH017	2012	2020	Wood	Jarrah	No	445562	6376304
ANH018	2012	2020	Wood	Jarrah	No	445578	6375726
ANH019	2012	2020	Wood	Wandoo	No	447942	6374956
ANH020	2012	2020	Wood	Marri	No	449338	6375679

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WPT NO	Monitoring start	Monitoring closure	Nest type	Tree species	Occupancy / Evidence of use	Easting	Northing
ANH021	2012	2020	Wood	Jarrah	No	449345	6375578
ANH022	2012	2020	Wood	Wandoo	No	449345	6373324
ANH023	2012	2020	Wood	Jarrah	No	449326	6376167
ANH024	2012	2020	Wood	Jarrah	No	449158	6377837
ANH025	2019	2022	PVC	Marri	No	438076	6366452
ANH026	2019	2022	PVC	Marri	No	438122	6366387
ANH027	2019	2022	PVC	Marri	No	438097	6366387
ANH028	2019	2022	PVC	Jarrah	Possum (December 2020)	438107	6365938
ANH029	2019	2022	PVC	Jarrah	No	438112	6365839
ANH030	2019	2022	PVC	Marri	No	438120	6365810
NEST01	2012	2022	Natural	Marri	December 2018, September 2020	441943	6377435
NEST02	2012	2022	Natural	Marri	No	441905	6373698
NEST03	2012	2022	Natural	Wandoo	No	439781	6378811
NEST04	2012	2016	Natural	Marri	No	442988	6377552
NEST05	2012	2022	Natural	Wandoo	Owl (December 2020)	447507	6374890
NEST06	2012	2022	Natural	Wandoo	No	447513	6374715
NEST07	2012	2022	Natural	Marri	No	445489	6375678
NEST08	2012	2022	Natural	Wandoo	October/November 2020	449079	6372867
NEST09	2012	2022	Natural	Marri	No	441592	6373722
NEST010			Natural	Fell in 2007			
NEST011	2012	2022	Natural	Marri	September 2020, September/October 2021	443046	6374419





Newmont Australia
Boddington Gold Project

Project No 1679
Date 26/02/2025
Drawn by BK
Map author WP



0 2 4
Kilometers

1:135,200 (at A4)

GDA 1994 MGA Zone 50

All information within this map is current as of 26/02/2025. 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.

Combined study area

Worsley study area

Newmont study area

Proposed Biodiversity Offset Area (this survey)

Nest type

Artificial

Natural

Figure 5-3

**Newmont nest
monitoring locations**



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5.1.3 Literature review

5.1.3.1 Fauna assemblage

Three comprehensive terrestrial fauna surveys have been undertaken in the vicinity of the Project. These include a detailed (formerly level 2) and targeted terrestrial fauna survey undertaken from 15–22 September and 20–24 November 2023 (spring) by Ecologia (2024); a detailed terrestrial fauna survey undertaken from 21–27 November 2001 (spring), 23–28 March 2002 (autumn) and 5–11 July 2002 (winter) by Ninox Wildlife Consulting (2003); and a detailed terrestrial fauna survey undertaken from 8–16 May 2011 (autumn) and 10–18 January 2012 (summer) by Ninox Wildlife Consulting (2012). A Numbat habitat assessment for NB and offset properties was undertaken from 24–27 October 2022 by Biologic (2023). Additional basic (formerly level 1) and targeted terrestrial fauna surveys relevant to the Newmont study area have been undertaken including a basic fauna assessment of the Worsley mining extension (Biostat 2017) and a targeted fauna survey for the Quindanning Gibbs offset property (Biologic 2024a).

The Ecologia (2024) detailed terrestrial vertebrate fauna survey recorded a total of 86 vertebrate species from a total survey effort of 1,120 trap nights (pitfall, funnel, Elliott and cage traps), 6 hours of avifauna census, 104 hours of active searches and 11 nights of ultrasonic recordings. The recorded assemblage included 7 conservation significant vertebrate species (as of November 2024) comprising 3 mammals and 4 birds (Table 5-4; Table 5-5): Chuditch, Western Brush Wallaby, Quenda, Forest Red-tailed Black Cockatoo, Baudin's Cockatoo, Carnaby's Cockatoo and Western Rosella.

The Ninox Wildlife Consulting (2003) detailed terrestrial fauna vertebrate survey recorded a total of 112 vertebrate species from a total survey effort of 9,610 trap nights (pitfall, Elliott, cage and harp traps), a minimum of 150 hours of avifauna census, a minimum of 130 hours of active searches, a minimum of 30 hours of targeted possum scat searches, and a minimum of 30 hours of black cockatoo nest searches. The recorded assemblage includes 8 conservation significant vertebrate species (as of November 2024) comprising 4 mammals, 3 birds and one reptile (Table 5-4; Table 5-5): Chuditch, Brush-tailed Phascogale, Quenda, Western Brush Wallaby, Peregrine Falcon, Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo and Darling Range Health Ctenotus.

The Ninox Wildlife Consulting (2012) detailed terrestrial vertebrate fauna survey recorded a total of 98 vertebrate species from a total survey effort of 8,960 trap-nights (pitfall, funnel, Elliott, and cage traps), a minimum of 150 hours of avifauna census, an unknown number of ultrasonic recordings nights, and 36 hours of black cockatoo nest searches. The recorded assemblage includes 8 conservation-significant vertebrate species (as of November 2024) comprising 5 mammals and 3 birds (Table 5-4; Table 5-5): Chuditch, Brush-tailed Phascogale, Quenda, Woylie, Western Brush Wallaby, Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo and Baudin's Cockatoo.

Table 5-4 Previous detailed terrestrial vertebrate fauna survey effort relevant to the Newmont study area

Survey method	Ecologia (2024)	Ninox Wildlife Consulting (2003)	Ninox Wildlife Consulting (2012)
Pitfall (trap-nights)	280	2,400	4,480
Funnel (trap-nights)	448		2,240
Elliott (trap-nights)	280	4,800	1,680
Cage (trap-nights)	112	2,400	560
Harp trap (trap-nights)		10	
Avifauna census (hours)	6	minimum 150	minimum 150
Active searches (hours)	104	minimum 130	
Ultrasonic recordings (trap-nights)	11		unknown number

Survey method	Ecologia (2024)	Ninox Wildlife Consulting (2003)	Ninox Wildlife Consulting (2012)
Motion-sensitive camera (trap-nights)	915		
Possum scat searches (hours)		minimum 30	
Black cockatoo nest searches (hours)		minimum 30	36

Table 5-5 Significant terrestrial vertebrate fauna recorded in previous detailed surveys relevant to the Newmont study area (as of November 2024)

Species	Ecologia (2024)	Ninox Wildlife Consulting (2003)	Ninox Wildlife Consulting (2012)
Mammal (5)			
Chuditch, Western Quoll	•	•	•
Western Brush Wallaby	•	•	•
Quenda, Southern Brown Bandicoot	•	•	•
Brush-tailed Phascogale		•	•
Woylie, Brush-tailed Bettong			•
Reptiles (1)			
Darling Range Heath Ctenotus		•	
Birds (5)			
Forest Red-tailed Black Cockatoo	•	•	•
Baudin's Cockatoo	•		•
Carnaby's Cockatoo	•	•	•
Western Rosella	•		
Peregrine Falcon		•	

5.1.3.2 Fauna habitats

Vegetation surveys have previously been undertaken by Mattiske (2024) across most of the Newmont study area and wider combined study area, with a small area of the southern and western boundary of the Offset area (this survey) not mapped (Figure 5-4). The surveys identified 33 vegetation complexes, including disturbed and rehabilitated areas, and artificial water sources (Table 5-6). The most dominant vegetation assemblages in the Newmont study area comprises 'M' (1,254.7 ha), 'H' (996.9 ha), 'PS' (494.8 ha) and Y (481.1 ha). These vegetation assemblages comprise more than half of the Newmont study area (64.4%) and are broadly characterised by varying proportions of Wandoo (*Eucalyptus wandoo*), Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) woodlands/forest on slopes, ridges and valley floors. A small portion of the Newmont study area has been subject to disturbance represented by cleared land for agricultural purposes, access tracks and infrastructure. Three of the vegetation assemblages that occur throughout the Newmont study area do not occur in the Offset area (this survey): 'AX', 'PI-Ag' and 'SP', whereas the Waste dump expansion area is exemplified by only 3 vegetation assemblages ('S', 'SP' and 'Z'). The wider combined study area has been subject to more widespread disturbance from mining operations but contain largely similar vegetation complexes and proportions to the Newmont study area.

Table 5-6 Mattiske (2024) vegetation assemblages in the study areas

Veg. code	Description	Newmont study area		Offset area (this survey)		Waste dump expansion area		Combined study areas	
		Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
A	Tall shrubland of <i>Melaleuca lateritia</i> , <i>Hakea varia</i> , <i>M. viminea</i> and <i>M. incana subsp. incana</i> on clay loams in seasonally wet valley floors.	43.6	1.0	30.5	1.0	0.0	0.0	92.1	0.8
A2	Low open woodland of <i>Melaleuca raphiophylla</i> over <i>Astartea scoparia</i> and low herbs on seasonally water-logged clays and clay loams in seasonally wet valley floors.	0.0	0.0	0.0	0.0	0.0	0.0	1.6	<0.1
AD	Low open woodland of <i>Eucalyptus rudis</i> and <i>E. marginata</i> over <i>Banksia littoralis</i> , <i>Hakea prostrata</i> and <i>Pericalymma ellipticum</i> over low shrubs and herbs on leached sands over sandy gravel on lower slopes.	5.7	0.1	3.4	0.1	0.0	0.0	5.7	0.1
AX	Open woodland of <i>Eucalyptus rudis</i> over <i>Acacia saligna</i> , <i>Melaleuca incana subsp. incana</i> and <i>Hypocalymma angustifolium</i> on clay- loams on valley floors.	12.2	0.3	0.0	0.0	0.0	0.0	32.7	0.3
AY	Open woodland of <i>Eucalyptus rudis</i> and <i>E. wandoo</i> over <i>Acacia saligna</i> , <i>Hakea prostrata</i> and <i>Hypocalymma angustifolium</i> on clay loams on valley floors.	210.8	4.9	181.2	5.8	0.0	0.0	441.7	3.8
CL	Cleared Land	7.8	0.2	5.9	0.2	0.0	0.0	3,053.0	26.2
D	Open forest of <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over <i>Hakea lissocarpha</i> , <i>Macrozamia riedlei</i> , <i>Acacia alata</i> , <i>Babingtonia camphorosmae</i> , <i>Hypocalymma angustifolium</i> and <i>Phyllanthus calycinus</i> on clay-loams on lower slopes.	143.7	3.3	139.1	4.5	0.0	0.0	280.5	2.4
DAM	Dam	0.0	0.0	0.0	0.0	0.0	0.0	104.1	0.9
DG	Open forest of <i>Corymbia calophylla</i> and <i>Eucalyptus marginata</i> over <i>Hakea lissocarpha</i> , <i>Macrozamia riedlei</i> , <i>Pericalymma ellipticum</i> , <i>Grevillia bipinnatifida</i> , <i>Allocasuarina humilis</i> , <i>Acacia alata</i> , <i>Babingtonia camphorosmae</i> , <i>Hypocalymma angustifolium</i>	9.6	0.2	9.2	0.3	0.0	0.0	12.1	0.1
G1	Mosaic of open heath of Proteaceae and Myrtaceae spp. with emergent patches of <i>Eucalyptus drummondii</i> on shallow soils on slopes.	1.0	<0.1	0.9	<0.1	0.0	0.0	1.0	<0.1

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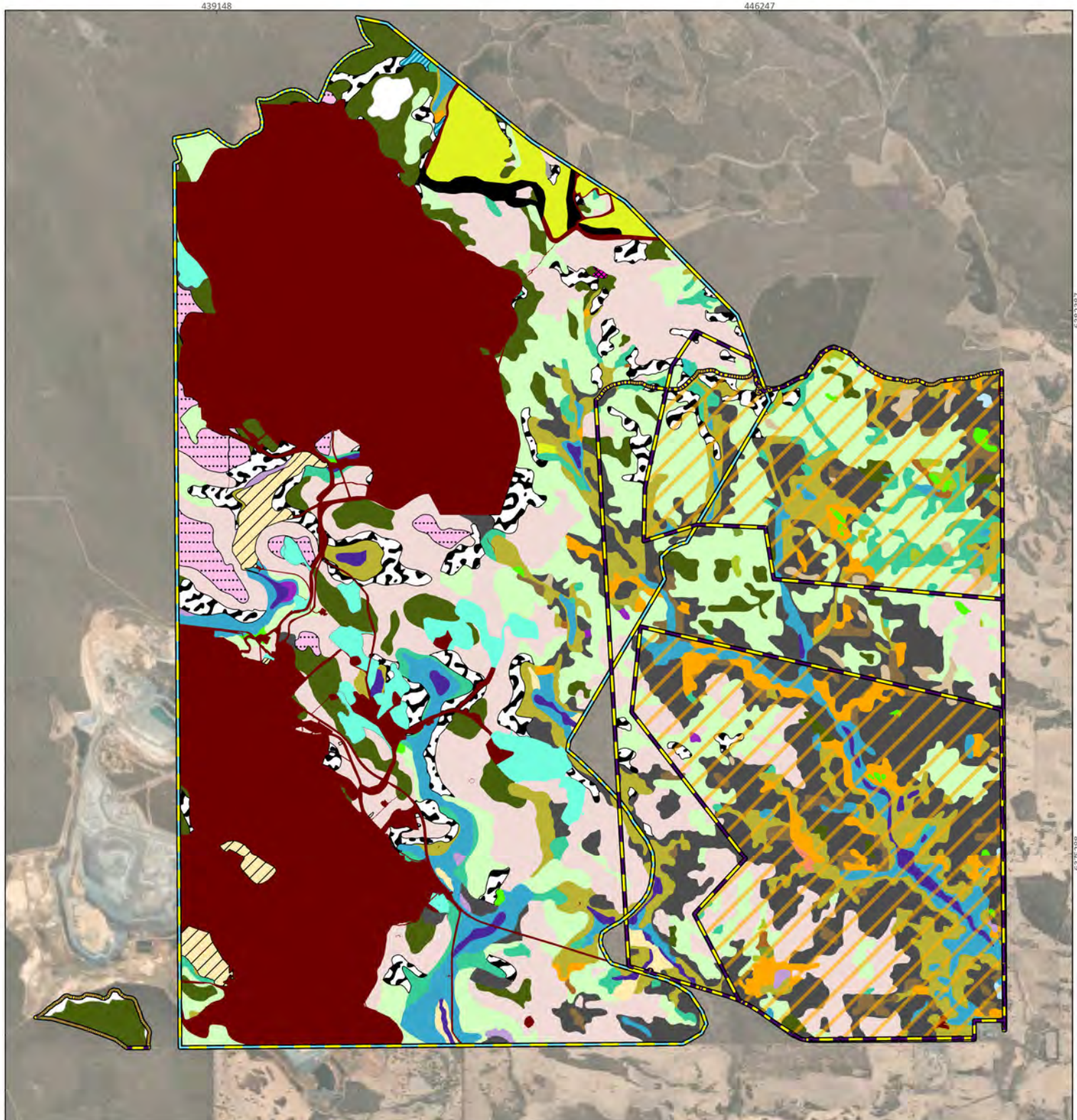
Veg. code	Description	Newmont study area		Offset area (this survey)		Waste dump expansion area		Combined study areas	
		Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
G2	Mosaic of open woodland of <i>Allocasuarina huegeliana</i> and closed heath of Proteaceae and Myrtaceae spp. to lithic complex on exposed or shallow granite outcrops.	6.0	0.1	5.7	0.2	0.0	0.0	6.0	0.1
G3	Open heath of <i>Banksia squarrosa</i> subsp. <i>squarrosa</i> , <i>Hakea incrassata</i> , <i>H. undulata</i> , <i>Petrophile heterophylla</i> and <i>P. serruriae</i> on shallow soils over granite outcrops on slopes with occasional emergent mallee species including <i>Eucalyptus drummondii</i> .	16.9	0.4	15.0	0.5	0.0	0.0	23.2	0.2
G4	Open scrub and tall shrubland of <i>Hakea trifurcata</i> and <i>H. undulata</i> with admixtures of mallee species including <i>Eucalyptus latens</i> and <i>E. aspersa</i> on clay to clay-loam soils over outcrops on slopes.	2.9	0.1	1.5	<0.1	0.0	0.0	6.8	0.1
G5	Low woodland of eucalypt mallee species including <i>Eucalyptus aspersa</i> , <i>E. latens</i> , <i>E. longicornis</i> and <i>E. drummondii</i> with occasional <i>E. wandoo</i> over low shrubs of <i>Allocasuarina humilis</i> , <i>Hakea incrassata</i> , <i>Synaphea damopsis</i> .	4.4	0.1	4.4	0.1	0.0	0.0	4.4	<0.1
H	Open forest to woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over <i>Petrophile striata</i> , <i>Daviesia decurrens</i> , <i>D. longifolia</i> and <i>D. rhombifolia</i> on sandy loam to sandy gravels on slopes and ridges.	996.9	23.0	642.8	20.7	0.0	0.0	1,627.2	14.0
H2	Open forest to woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> with occasional admixtures of <i>Banksia grandis</i> and <i>Petrophile longifolia</i> over <i>Acacia celastrifolia</i> , <i>Daviesia preissii</i> , <i>Leucopogon capitellatus</i> and <i>Styphelia tenuiflora</i> on gravel.	1.6	<0.1	2.2	0.1	0.0	0.0	4.1	<0.1
HG	Open forest to woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over <i>Petrophile striata</i> , <i>Lepidosperma squamatum</i> , <i>Styphelia tenuiflora</i> , <i>Daviesia preissii</i> , <i>D. decurrens</i> , <i>Grevillia bipinnatifida</i> , <i>Allocasuarina humilis</i> and <i>Hakea undulata</i> .	21.5	0.5	18.5	0.6	0.0	0.0	21.5	0.2
L	Open woodland of <i>Eucalyptus patens</i> with some <i>E. 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.	4.8	0.1	4.8	0.2	0.0	0.0	17.0	0.2

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Veg. code	Description	Newmont study area		Offset area (this survey)		Waste dump expansion area		Combined study areas	
		Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
M	Open woodland of <i>Eucalyptus wandoo</i> over <i>Trymalium ledifolium</i> , <i>Trymalium riedlei</i> and <i>Hakea lissocarpa</i> on clay loam with some gravel on mid to upper slopes and ridges.	1,254.7	28.9	959.4	30.9	0.0	0.0	1,442.4	12.4
M2	Woodland to open woodland of <i>Eucalyptus accedens</i> , <i>E. wandoo</i> , <i>E. marginata</i> , <i>Corymbia calophylla</i> over <i>Hakea lissocarpa</i> , <i>Macrozamia riedlei</i> , <i>Banksia squarrosa</i> subsp. <i>squarrosa</i> , <i>Hypocalymma angustifolium</i> , <i>Babingtonia camphorosmae</i> .	51.7	1.2	33.8	1.1	0.0	0.0	53.1	0.5
MG	Open woodland of <i>Eucalyptus wandoo</i> over <i>Trymalium ledifolium</i> , <i>Macrozamia riedlei</i> , <i>Pericalymma ellipticum</i> , <i>Hypocalymma angustifolium</i> , <i>Grevillia bipinnatifida</i> , <i>Allocasuarina humilis</i> and <i>Hakea lissocarpa</i> on clay-loams over shallow granite on mid to upper slopes.	144.4	3.3	105.3	3.4	0.0	0.0	150.7	1.3
PL	Plantation and Planted Trees.	0.0	0.0	0.0	0.0	0.0	0.0	49.0	0.4
PL - Ag	Plantation and planted trees on agricultural land.	0.1	<0.1	0.0	0.0	0.0	0.0	166.3	1.4
PS	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.	494.8	11.4	306.6	9.9	0.0	0.0	1,698.8	14.6
PW	Open forest of <i>Allocasuarina fraseriana</i> , <i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i> , <i>Banksia grandis</i> with scattered understorey including <i>Adenanthos barbiger</i> , <i>Leucopogon capitellatus</i> and <i>Hypocalymma angustifolium</i> on seasonally moister and sandy gravels.	0.1	<0.1	2.5	0.1	0.0	0.0	2.5	<0.1
Rehab	Rehabilitation Areas	0.0	0.0	0.0	0.0	0.0	0.0	202.7	1.7
S	Open forest of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> with admixtures of <i>Allocasuarina fraseriana</i> , <i>Banksia grandis</i> and <i>Persoonia longifolia</i> over <i>Acacia celastriifolia</i> , <i>Hovea chorizemifolia</i> , <i>Daviesia preissii</i> , <i>Leucopogon capitellatus</i> and <i>Styphelia tenuiflora</i>	142.1	3.3	35.8	1.2	48.7	81.6	581.7	5.0

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Veg. code	Description	Newmont study area		Offset area (this survey)		Waste dump expansion area		Combined study areas	
		Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
SP	Open forest of <i>Eucalyptus marginata</i> , <i>Corymbia calophylla</i> and <i>Allocasuarina fraseriana</i> with admixtures of <i>Banksia grandis</i> over <i>Lasiopetalum cardiophyllum</i> , <i>Acacia celastrifolia</i> , <i>Styphelia tenuiflora</i> , <i>Daviesia decurrens</i> and <i>Trymalium ledifolium</i> on sandy gravel.	10.9	0.3	0.0	0.0	10.9	18.3	33.5	0.3
ST	Open forest of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> with admixtures of <i>Allocasuarina fraseriana</i> , <i>Persoonia longifolia</i> and <i>Banksia grandis</i> over <i>Stylidium dichotomum</i> , <i>Acacia urophylla</i> , <i>A. celastrifolia</i> , <i>Leucopogon verticillatus</i>	0.0	0.0	0.0	0.0	0.0	0.0	146.6	1.3
SW	Open forest of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over <i>Hypocalymma angustifolium</i> , <i>Babingtonia camphorosmae</i> , <i>Acacia celastrifolia</i> , <i>Hovea chorizemifolia</i> , <i>Daviesia preissii</i> , <i>Leucopogon capitellatus</i> and <i>Styphelia tenuiflora</i> on seasonally moister	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.1
Y	Open woodland of <i>Eucalyptus wandoo</i> over <i>Gompholobium marginatum</i> , <i>Acacia nervosa</i> , <i>Babingtonia camphorosmae</i> , <i>Hypocalymma angustifolium</i> , <i>Macrozamia riedlei</i> , <i>Phyllanthus calycinus</i> and <i>Gastrolobium calycinum</i> on clay and clay-loam soils on lower slopes.	481.1	11.1	373.8	12.0	0.0	0.0	702.3	6.0
YG	Open woodland of <i>Eucalyptus wandoo</i> over <i>Gompholobium marginatum</i> , <i>Acacia nervosa</i> , <i>Babingtonia camphorosmae</i> , <i>Hypocalymma angustifolium</i> , <i>Macrozamia riedlei</i> , <i>Pericalymma ellipticum</i> , <i>Grevillia bipinnatifida</i> , <i>Allocasuarina humilis</i> , <i>Phyllanthus calycinus</i>	189.4	4.4	164.2	5.3	0.0	0.0	206.9	1.8
Z	Open forest of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> over <i>Macrozamia riedlei</i> , <i>Xanthorrhoea preissii</i> , <i>Hakea lissocarpa</i> and <i>Phyllanthus calycinus</i> on sandy-loam to sandy-loam gravel soils on slopes.	80.6	1.9	57.0	1.8	0.07	0.1	468.6	4.0
Total		4,339.2	100.0	3,103.5	100.0	59.7	100.0	11,648.1	100.0



Vegetation complex			
A	DG	H2	PS
AD	G1	HG	PW
AX	G2	L	S
AY	G3	M	SP
CL	G4	M2	Y
D	G5	MG	YG
	H	PL - Ag	Z
			A2
			DAM
			ST
			SW
			Rehab
			PL



Western Australia

PERTH

**Newmont Australia
Boddington Gold Project**

Project No	1679
Date	28/04/2025
Drawn by	BK
Map author	WP

0 1 2
Kilometers

1:70,477 (at A4) GDA 1994 MGA Zone 50

- Combined study area
- Worsley study area
- Newmont study area
- Proposed Biodiversity Offset Area (this survey)

**Figure 5-4
Mattiske (2024)
vegetation mapping of
the study areas'**

PHOENIX
ENVIRONMENTAL SCIENCES

All information within this map is current as of 28/04/2025. 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 FIELD SURVEY

5.2.1 Fauna habitats

Seven broad fauna habitat types were identified in the Newmont study area, comprising:

- Wandoo woodland (2,080.9 ha, 47.9%)
- Jarrah/Marri woodland (1,311.2 ha, 30.2%)
- Jarrah/Marri/*Allocasuarina* woodland (651.4 ha, 15.0%)
- *Eucalyptus* woodland on valley floors (223.2 ha, 5.1%)
- *Melaleuca* shrubland (43.7 ha, 1.0%)
- Heathland (24.1 ha, 0.6%)
- Plantation (0.1 ha, <0.1%).

A small proportion of the Newmont study area has been subject to disturbance (7.1 ha, 0.2%) comprising agricultural land, infrastructure and access tracks. Numerous access tracks innervate the Newmont study area but were not mapped. Of the 7 broad-scale fauna habitat types that were identified in the Newmont study area, 6 occur in the Offset area (this survey):

- Wandoo woodland (1,611.9 ha, 52.7%)
- Jarrah/Marri woodland (888.2 ha, 29.0%)
- Jarrah/Marri/*Allocasuarina* woodland (320.3 ha, 10.5%)
- *Eucalyptus* woodland on valley floors (181.2 ha, 5.9%)
- *Melaleuca* shrubland (30.5 ha, 1.0%)
- Heathland (21.6 ha, 1.0%).

The entirety of the Waste dump expansion is characterised by Jarrah/Marri/*Allocasuarina* woodland (59.7 ha). Rehabilitated Areas and Dam habitat also occurs across the wider combined study area.

Of the 63 site descriptions completed across the Newmont study area (from a total of 68 across the combined study area), fauna habitat quality was assessed as excellent at 58 sites and very good at 5 sites (Appendix 2). Sixty-one (96.8%) of 63 sites were long-unburned (>10 years), with 2 sites showing evidence of burn scars within 1-5 years, both of which occurred in the Offset area (this survey) (Appendix 2). Evidence of disturbance recorded across the Newmont study area (inclusive of the Offset area – this survey, and Waste dump expansion area) was minor, comprising varying proportions of feral animal evidence, weed infestations, minor revegetation, vehicle tracks, excavation, litter, historic clearing/lopping, and access tracks. The presence of *Phytophthora* dieback disease was observed throughout the Newmont study area, appearing locally associated with the valleys and lowlands dissecting the upper slopes.

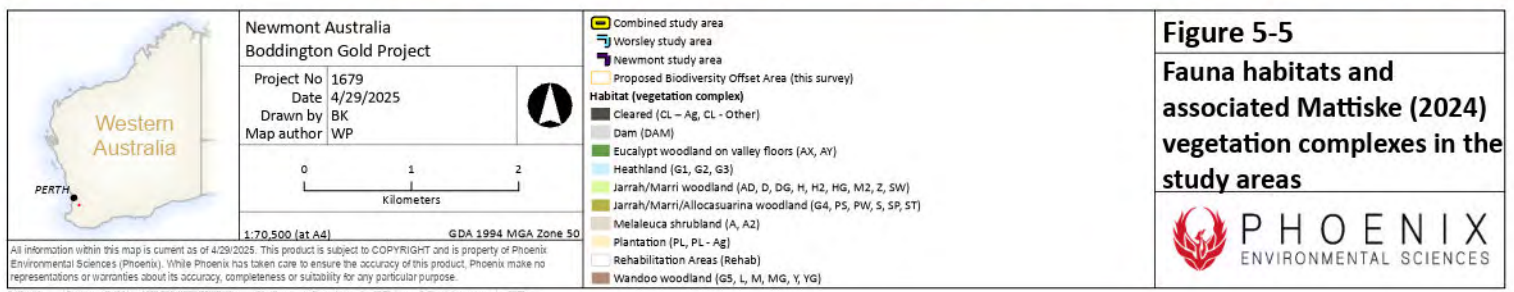
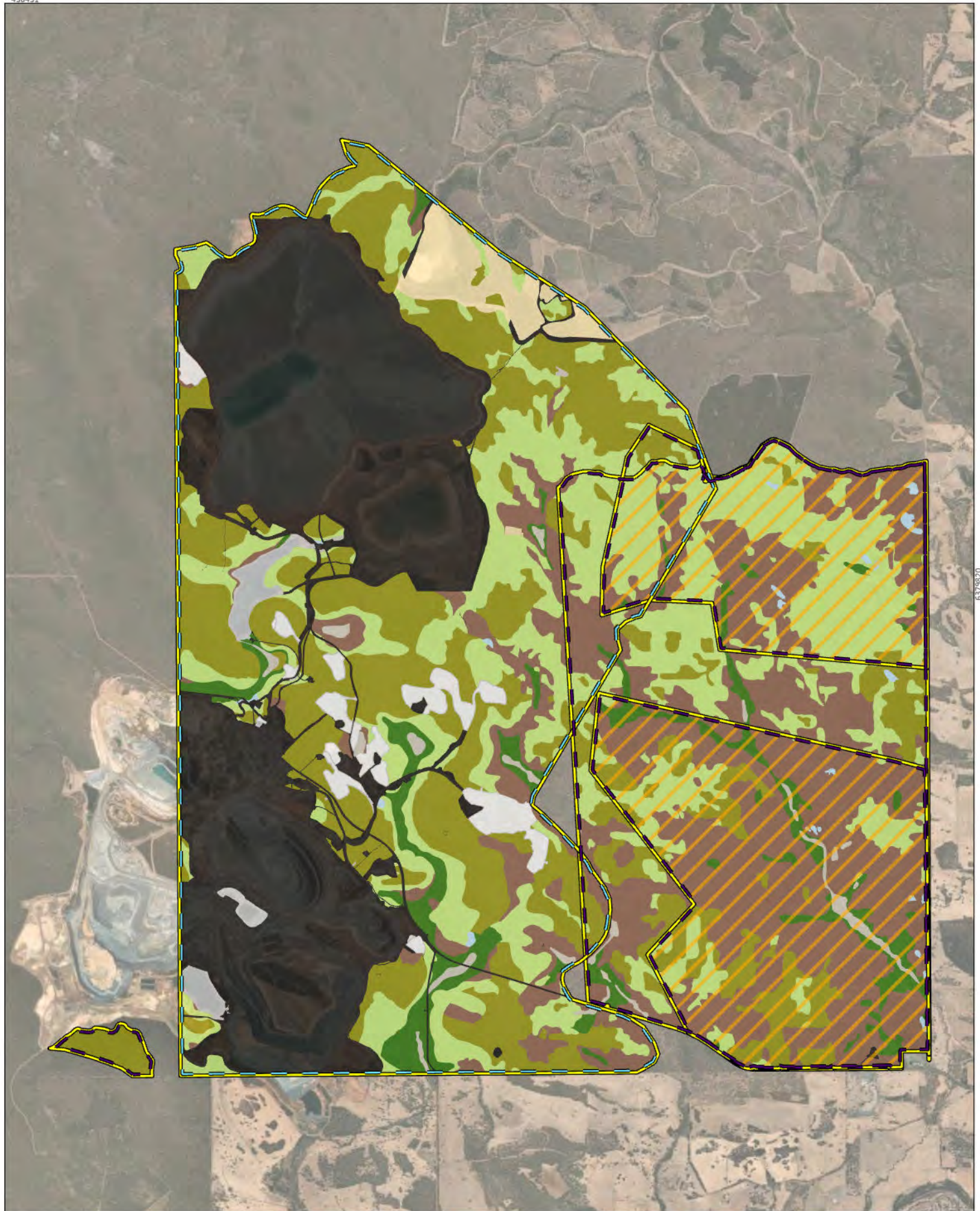
Most habitats described and mapped across the combined study area represent a mixture of eucalypt-dominated woodlands and forests exemplified by Wandoo, Jarrah and Marri. These habitats differ predominantly by the dominant eucalypt assemblage present, understory vegetation associations and the associated topography (such as their relationship with the valleys and uplands). None of the habitats identified in the Newmont study area or combined study areas are restricted. *Melaleuca* shrubland and Heathland are limited in their extent and distribution across the Newmont study area and have a more noticeable disparity from the other described habitats (i.e. not eucalypt-dominated woodlands/forests). Within the combined study area, Dams and Rehabilitated areas are restricted to the Worsley study area. Some level of fragmentation/isolation exists between the Newmont study area, the combined study area and the more continuous Jarrah Forest on the Darling Scarp. Intensive mining operations (and associated infrastructure) occur in the west of the Worsley study area, and cleared agricultural land occurs to the east and south of the combined study area.

Table 5-7 Extent and description of each fauna habitat in the Newmont study area and combined study area

Habitat type	Desktop veg. codes	Site/s	Description	Extent and % in Newmont study area	Extent and % in the Offset area (this survey)	Extent and % in the Waste dump expansion area	Extent and % in combined study area	Representative photograph
Wandoo woodland Open woodland of Wandoo with occasional Jarrah/Marri on clay and clay-loam soils on lower slopes. Suitable habitat for: Chuditch, Quenda, South-western Brush-tailed Phascogale, Western Brush Wallaby, Woylie, Numbat, Red-tailed Phascogale, Western False Pipistrelle, Western Ringtail Possum, Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black Cockatoo.	G5, L, M, MG, Y, YG	BCQ (01-10, 12-15, 28, 35-38, 42-43, 47), HM-1-20, HM-2 (14, 17, 21, 25, 28, 30-31), HS-1 (13, 24, 27-28, 30-31, 34-35), NHS-1 (01, 05-07, 14-15, 21, 38, 30, 33-34), NM-1 (03-05, 09-10, 12, 16, 19, 25, 31), NM-2 (01-03, 05-07, 10, 12-13, 15-16, 20-21, 24-27, 30, 32-36), NS-1 (04, 08-10, 13, 15, 18-22, 24-29, 32, 34-36), B (01, 03-10, 12-15, 17-18), C (04-05, 16-20, 24-28), P (05, 08, 10, 12-13, 15, 17, 19, 21, 26, 30-33), Q (08, 11, 14, 22, 25), W (18-19, 22-26), WFP (03, 05), Newmont-ANH (10, 16, 19, 22, 23), Newmont-Nest (05, 06), Opp (02-04, 08-11, 19-21).	Open woodland of <i>Eucalyptus wandoo</i> with occasional emergent <i>E. aspersa</i> , <i>E. latens</i> , <i>E. longicornis</i> and <i>E. drummondii</i> over <i>Allocasuarina humilis</i> , <i>Acacia saligna</i> , <i>A. nervosa</i> , <i>Babingtonia camphorosmae</i> , <i>Grevillea bipinnatifida</i> , <i>Gompholobium marginatum</i> , <i>G. calycinum</i> , <i>Hakea incrassata</i> , <i>H. prostrata</i> , <i>H. lissocarpa</i> , <i>Hypocalymma angustifolium</i> , <i>Macrozamia riedlei</i> , <i>Phyllanthus calycinus</i> , <i>Pericalymma ellipticum</i> , <i>Synaphea damopsis</i> , <i>Trymalium ledifolium</i> and <i>Xanthorrhoea preissii</i> overlying areas of shallow granite on clay-loams with some gravel on slopes and ridges. Wandoo woodland provides hollow-bearing trees, fallen logs, and understorey cover essential for fauna shelter, and contributes to prey availability.	2,080.9 ha (47.9%)	1,611.9 ha (52.7%)	0.0 ha (0.0%)	2,524.7 ha (21.7%)	
Jarrah/Marri woodland Open woodland/forest of Jarrah/Marri with occasional Wandoo on sandy-loam-gravel soils on slopes, ridges and valley floors. Suitable habitat for: Chuditch, Quenda, South-western Brush-tailed Phascogale, Western Brush Wallaby, Woylie, Numbat, Red-tailed Phascogale, Western False Pipistrelle, Western Ringtail Possum, Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black Cockatoo.	AD, D, DG, H, H2, HG, M2, Z, SW	BCQ (11, 16-25, 34, 41, 44-46), HM-1 (07, 11, 15), HM-1 (11, 15), HM-2 (03-06, 11, 22-24, 29, 34), HN-1 (01, 05-06, 08, 10), HS-1 (02, 06-07, 14-15, 20-21, 26, 29, 32-33, 36), NHS-1 (02, 04, 08-13, 16-20, 22-27, 29, 31, 35, 36), NM-1 (01-02, 06-08, 13-14, 17-18, 20, 22-24, 26-30, 32-36), NM-2 (14, 22-23), NS-1 (01-02, 05, 31, 33), B (02, 10, 16), C (02-03, 07, 10, 11, 13, 15), N (10, 14-22, 26-27) Q (01-07, 12-13, 15, 17-18, 23, -24), W (06-09, 12-15, 17, 21), WFP01, Newmont-ANH (05, 15, 17, 20, 21), Newmont-Nest07, Opp15, P (01-04, 06-07, 22, 25, 27-29)	Open to closed forest/woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> with admixtures of <i>E. wandoo</i> , <i>E. rudis</i> , <i>E. accedens</i> , <i>Allocasuarina fraseriana</i> and <i>A. humilis</i> over <i>Banksia grandis</i> , <i>B. littoralis</i> , <i>B. s. subsp. squarrosa</i> , <i>Persoonia longifolia</i> , <i>A. celastriifolia</i> , <i>A. alata</i> , <i>Trymalium ledifolium</i> , <i>Macrozamia riedlei</i> , <i>Hakea lissocarpa</i> , <i>H. undulata</i> , <i>H. prostrata</i> , <i>Petrophile striata</i> , <i>Daviesia decurrens</i> , <i>D. longifolia</i> , <i>D. rhombifolia</i> , <i>D. preissii</i> , <i>H. angustifolium</i> , <i>Hovea chorizemifolia</i> , <i>Adenanthos barbiger</i> , <i>Phyllanthus calycinus</i> , <i>Lepidosperma squamatum</i> , <i>Leucopogon capitellatus</i> , <i>Grevillea bipinnatifida</i> , <i>Babingtonia camphorosmae</i> , <i>P. ellipticum</i> , <i>Lasiopetalum cardiophyllum</i> and <i>Styphelia tenuiflora</i> on (seasonally moister) sandy-loam, sandy gravels and clay-loams on slopes and ridges overlying areas of shallow granite outcropping. Jarrah/Marri woodland provides a complex habitat structure with hollow-bearing trees, fallen logs and understorey cover essential for shelter, and contributed to prey availability.	1,311.2 (30.2%)	888.2 ha (29.0%)	0.0 ha (0.0%)	2,480.0 ha (21.3%)	
Jarrah/Marri/Allocasuarina woodland Open to closed forest/woodland of Jarrah/Marri with variable proportions of <i>Allocasuarina</i> on slopes. Suitable habitat for: Chuditch, Quenda, South-western Brush-tailed Phascogale, Western Brush Wallaby, Woylie, Numbat, Red-tailed Phascogale, Western False Pipistrelle, Western Ringtail Possum, Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black Cockatoo.	G4, PS, PW, S, SP, ST	BCQ (29-33, 40, 48, 50), HM-1 (01-06, 09-10, 12-14, 18-19, 21-23, 26-28, 30-34, 36), HM-2 (01-02, 07-10, 15-16, 20, 26-27, 32-33, 35), HN-1 (07, 09), HS-1 (01, 03, 08, 09, 12, 17-19, 22-23, 25), NHS-1-03, NM (1-15, 21), NM-2 (04, 08-09, 11, 17-18, 28-29), NS-1 (06, 11-12, 17), NS-2 (01-08), B11, C (01, 08-09, 14, 21-23), N (01-09, 11-13, 23-25), P (23-24), Q (09, 16, 19-21), W (01-05, 10-11, 16, 20), WFP (04, 06), Newmont-ANH (09, 18), Newmont-Nest04, Opp (01-02, 16, 17).	Open to closed forest/woodland of <i>Eucalyptus marginata</i> and <i>Corymbia calophylla</i> with variable admixtures of <i>Allocasuarina fraseriana</i> and an understory of <i>Banksia grandis</i> , <i>Persoonia longifolia</i> , <i>Acacia celastriifolia</i> , <i>Hovea chorizemifolia</i> , <i>Daviesia preissii</i> , <i>D. decurrens</i> , <i>Leucopogon capitellatus</i> , <i>Adenanthos barbiger</i> , <i>Lasiopetalum cardiophyllum</i> , <i>Styphelia tenuiflora</i> , <i>Trymalium ledifolium</i> and <i>Hypocalymma angustifolium</i> on slopes and ridges. Jarrah/Marri/ <i>Allocasuarina</i> woodland provides a lower concentration of hollow-bearing trees and fallen logs compared to Jarrah/Marri and Wandoo woodland but offers a dense understory for protection and additional foraging resources with <i>Allocasuarina</i> providing seasonal food sources.	651.4 ha (15.0%)	320.3 ha (10.5%)	59.7 ha (100.0%)	2,470.0 ha (21.2%)	

Habitat type	Desktop veg. codes	Site/s	Description	Extent and % in Newmont study area	Extent and % in the Offset area (this survey)	Extent and % in the Waste dump expansion area	Extent and % in combined study area	Representative photograph
<i>Eucalyptus</i> woodland on valley floors Mixed <i>Eucalyptus</i> woodlands (wet) on sands, clay-loam or sandy-gravel on lower slopes and valley floors Suitable habitat for: Chuditch, Quenda, South-western Brush-tailed Phascogale, Western Brush Wallaby, Woylie, Quokka, Rakali, Red-tailed Phascogale, Western False Pipistrelle, Western Ringtail Possum, Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black Cockatoo.	AX, AY	BCQ (26-27, 39, 49), HM-1 (08. 16, 24, 29), HM-2 (12, 18), HN-1 (02-04), NHS-1-32, NM-2-19, NS-1 (03, 07, 14, 16, 23, 30), B19, C (06, 12), P (09, 11, 14, 18), Q10, WFP02, Newmont-ANH (06, 07), Newmont-Nest01, Opp (12, 18).	Open woodland of <i>Eucalyptus patens</i> , <i>E. rudis</i> and <i>E. wandoo</i> over <i>Xanthorrhoea preissii</i> , <i>Macrozamia riedlei</i> , <i>Trymalium ledifolium</i> , <i>Acacia saligna</i> , <i>Hakea prostrata</i> , <i>Hypocalymma angustifolium</i> and <i>M. i.</i> subsp. <i>incana</i> on clay and clay-loam soils on lower slopes and valley floors. <i>Eucalyptus</i> woodland on valley floors provided a locally mesic area supporting a seasonal source of water, provides hollow-bearing trees, fallen logs, and understorey cover essential for shelter, and contributes to prey availability.	223.2 ha (5.1%)	181.2 ha (5.9%)	0.0 ha (0.0%)	474.4 ha (4.1%)	
<i>Melaleuca</i> shrubland <i>Melaleuca</i> woodland/shrubland on seasonally wet or water-logged clays and clay-loams on valley floors. Suitable habitat for: Quokka and Rakali, potential foraging habitat for Baudin's Cockatoo and Carnaby's Cockatoo (<i>Hakea</i> sp.).	A, A2	HM-1-35, HM-2-36, NM-2-31, P (16, 20), Opp (06, 22)	Tall shrubland of <i>Melaleuca lateritia</i> , <i>M. viminea</i> , <i>M. incana</i> subsp. <i>incana</i> and <i>Hakea varia</i> on clay-loams on seasonally wet valley floors. Seasonally inundated areas or permanent water-logged, low-lying swamps and depressions. Dominated by <i>Melaleuca</i> woodlands and scattered areas of shrubland. <i>Melaleuca</i> shrubland provides a dense understory for refuge and a seasonal water source for fauna.	43.7 (1.0%)	30.5 ha (1.0%)	0.0 ha (0.0%)	93.8 ha (0.8%)	
Heathland Heath/shrubland on shallow soils on granite or outcrops Suitable habitat for: Chuditch, Quenda, Western Brush Wallaby, Woylie, as well as Baudin's Cockatoo, Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo (mostly foraging).	G1, G2, G3	No sites	Open heath-dominated assemblage of <i>Banksia squarrosa</i> subsp. <i>squarrosa</i> , <i>Hakea incrassata</i> , <i>H. undulata</i> , <i>H. trifurcata</i> , <i>Petrophile heterophylla</i> , <i>P. serruriae</i> and <i>Synaphea damopsis</i> with occasional emergent mallee species including <i>Eucalyptus latens</i> , <i>E. drummondii</i> , <i>E. aspersa</i> , <i>E. longicornis</i> , <i>E. wandoo</i> with admixtures of <i>Allocasuarina humilis</i> and <i>A. huegeliana</i> on shallow clay-loam to loam soils over granite outcrops on slopes. Mixed shrubland with scattered eucalypts offering a range middle and lower storey habitats. Heathland provides rocky (granitic) outcrops and dense vegetation that provide shelter and alternative denning/refuge sites for fauna.	24.1 (0.6%)	21.6 ha (1.0%)	0.0 ha (0.0%)	30.1 ha (0.3%)	

Habitat type	Desktop veg. codes	Site/s	Description	Extent and % in Newmont study area	Extent and % in the Offset area (this survey)	Extent and % in the Waste dump expansion area	Extent and % in combined study area	Representative photograph
Cleared Disturbed land. Not considered suitable habit for conservation significant fauna.	CL – Ag, CL - Other	Opp (07, 13, 14)	Areas cleared of almost all native vegetation. Land use consists of mining activities, vehicle tracks (pictured) and associated infrastructure.	7.1 ha (0.2%)	5.4 ha (0.2%)	0.0 ha (0.0%)	3,053.0 (26.2%)	
Plantation Pine plantation Suitable habitat for: Suitable foraging habitat for Baudin's Cockatoo and Carnaby's Cockatoo.	PL, PL - Ag	No sites	Plantation and planted trees on agricultural land. Plantation is a low complexity habitat providing little shelter and foraging opportunity excluding for exotic foraging by white-tailed black cockatoos.	0.1 (<0.1%)	0.0 ha (0.0%)	0.0 ha (0.0%)	215.3 ha (1.8%)	Photo unavailable.
Rehabilitated areas Rehabilitated areas of vegetation following mining-related disturbances. Suitable habitat for: Quenda, Western Brush Wallaby, Woylie, as well as Baudin's Cockatoo and Carnaby's Cockatoo (foraging habitat).	Rehab	HM-1 (17, 25), HM-2 (13, 19), HS-1 (04, 05, 10, 11, 16).	Areas of regenerating native vegetation. Substrate previously ripped to promote growth. These areas are dense and lack mature, old-growth canopy. However, provides a dense understory for protection and contributes to landscape connectivity, facilitating movement between key habitat areas and supporting long-term population stability.	0.0 ha (0.0%)	0.0 ha (0.0%)	0.0 ha (0.0%)	202.7 ha (1.7%)	
Dam Artificial water source Potentially suitable habitat for: Rakali	DAM	No sites.	Artificial dams and water sources. Dams provide a permanent source of water for the local fauna assemblage, supports prey diversity and richness, and contributes to overall ecosystem stability.	0.0 ha (0.0%)	0.0 ha (0.0%)	0.0 ha (0.0%)	104.1 ha (0.9%)	Photo unavailable.
Total				4,341.6 ha (100.0%)	3,059.1 ha (100.0%)	59.7 ha (100%)	11,648.1 ha (100.0%)	



5.2.2 Significant fauna records

A total of 5 Threatened, one CD and 2 Priority vertebrate species were recorded in the field survey across the Newmont study area and wider combined study area (Table 5-9):

- Chuditch (VU; Figure 5-6, Figure 5-7)
- Quenda (P4; Figure 5-8).
- South-western Brush-tailed Phascogale (CD; Figure 5-9)
- Woylie (EN/CR; Figure 5-11)
- Western Brush Wallaby (P4; Figure 5-10)
- Carnaby's Cockatoo (EN; Figure 5-15)
- Baudin's Cockatoo (EN; Figure 5-15)
- Forest Red-tailed Black Cockatoo (VU; Figure 5-15).

All of the above significant fauna were recorded inside the Newmont study area. Of the 8 conservation-significant species recorded in the field survey, all were recorded inside the Offset area (this survey), and 5 (potentially 6, *Zanda* sp.) were recorded inside the Waste dump expansion area (Table 5-9). One additional potentially significant species, Western Rosella, was recorded inside the Newmont study area but falls outside the scope of this survey. Whether these records represent the Priority 4 subspecies is uncertain.

Camera traps were the most effective survey method of the Threatened mammal assemblage during the survey with a total of 1,717 detections across the Newmont study area (1,733 detections inclusive of cockatoos), including 1,134 detections in the Offset area (this survey), 51 detections in the Waste dump expansion area and 548 in the intervening landscape (in accordance with the methods detailed in section 4.2.2.7). Woylie had the highest number of camera detections across the entirety of the Newmont study area (671), followed by Chuditch (546), Western Brush Wallaby (364), South-western Brush-tailed Phascogale (71) and Quenda (65). Similar trends were observed in the Offset area (this survey). There was disparity in detection method and diversity in the Waste dump expansion area, with Chuditch (21 detections), South-western Brush-tailed Phascogale (16) and Western Brush Wallaby (14) being recorded only using camera traps. However, the Waste dump expansion area covers a significantly smaller area than the remainder of the Newmont study area and was subject to comparatively lower survey effort.

In comparison, only 20 animals (Chuditch and Woylie) were recorded using systematic cage and Elliott trapping in the Newmont study area, with 18 occurring in the Offset area (this survey), none in the Waste dump expansion area, and 2 in the intervening landscape. Opportunistic records (i.e., direct sightings and secondary evidence) of Woylie (7), Western Brush Wallaby (7) and Quenda (2) were noted across the Newmont study area; secondary evidence of Chuditch was only recorded in the wider combined study area. South-western Brush-tailed Phascogale was only recorded using camera traps in the field survey. Quenda was also recorded by physical trapping in the survey, but all of these records (4) occurred outside of the Newmont study area.

A site by species matrix is provided in Appendix 4 to Appendix 14, including records of non-conservation significant fauna opportunistically recorded during the survey using the methods described in section 4.2.

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

Table 5-8 Significant fauna records (detections) in the Newmont study area, by survey area

Species	Total No. detections in the Newmont study area			No. detections in the Offset area (this survey)			No. detections in the Waste dump expansion area		
	Camera trap	Cage/Elliott trap	Opp	Camera trap	Cage/Elliott trap	Opp	Camera trap	Cage/Elliott trap	Opp
White-tailed Black Cockatoo	16	0	0	0	0	5	0	0	1
Baudin's Cockatoo	0	0	6	0	0	5	0	0	0
Carnaby's Cockatoo	0	0	10	0	0	8	0	0	2
Forest Red-tailed Black Cockatoo	0	0	62	0	0	41	0	0	11
Chuditch, Western Quoll	546	16	0	349	14	0	21	0	0
Woylie, Brush-tailed Bettong	671	4	7	505	4	5	0	0	0
Quenda, Southern Brown Bandicoot	65	0	2	43	0	2	0	0	0
South-western Brush-tailed Phascogale	71	0	0	49	0	0	16	0	0
Western Brush Wallaby	364	0	7	188	0	4	14	0	0
Total	1,733	20	94	1,134	18	70	51	0	14

5.2.3 Introduced and other fauna records

Five introduced fauna species were recorded in the survey: pig, cat, European rabbit, European fox and laughing kookaburra (Table 5-9; Figure 5-12). All of these introduced species were recorded inside the Newmont study area excluding European rabbit. Pig was recorded across both the Offset area (this survey) and Waste dump expansion area, whereas the remaining introduced species were recorded only inside the Offset area (this survey).

Table 5-9 Details of significant and introduced vertebrate fauna recorded during the field survey

Species	Status	Distribution and ecology	Survey records	Photograph
Significant fauna				
<i>Zanda sp.</i> White-tailed Black Cockatoo	EN (EPBC & BC Acts)	Represent either Carnaby's Cockatoo or Baudin's Cockatoo (see below).	32 records (from 18 locations) across the combined study area; 11 from calling, 16 direct sightings (including 2 flying over), and one evidence of foraging. A total of 16 records (from 7 locations) from the Newmont study area (Offset area – this survey, and Waste dump expansion area).	Photo unavailable
<i>Zanda baudinii</i> Baudin's Cockatoo	EN (EPBC & BC Acts)	Endemic to higher rainfall parts of WA, generally bounded to the 750 mm isohyet (Department of Agriculture 2021). Their extent of occurrence is ~70,000 km ² and their area of occupancy is ~25,000 km ² (declining trend), with low reliability (Garnett <i>et al.</i> 2011b). Their distribution extends from Albany, north to Gidgegannup and Mundaring, and inland to the Stirling Ranges and near Kojonup. Their range varies between the breeding and non-breeding seasons. In the breeding season (October to January), the species nests in far southwest WA including around Augusta, Northcliffe, Walpole, Denmark and Albany. In the non-breeding season (February to September), they congregate on the central and northern parts of the Darling Plateau, as well as the southern Swan Coastal Plain and south coast (DCCEEW 2024f). The Baudin's Cockatoo inhabits moist eucalypt forests. Breeding occurs in old-growth woodland or forest of live or dead eucalypts (Karri, Marri, Wandoo, Tuart, Jarrah, Bullich, Tasmanian Bluegum), but mostly in tall Karri Forests on the south coast (DAWE 2022; Menkhorst <i>et al.</i> 2017). They feed on the seeds of Karri and Marri, and occasionally wood-boring insect larvae and pastoral seeds (Menkhorst <i>et al.</i> 2017).	7 records (from 5 locations) from the combined study area; one on camera trap HS-1-24, 3 from foraging evidence and one record (3 individuals) opportunistic sighted flying over. A total of 6 records (from 4 locations) from the Newmont study area (Offset area – this survey).	

Species	Status	Distribution and ecology	Survey records	Photograph
<i>Zanda latirostris</i> Carnaby's Cockatoo	EN (EPBC & BC Acts)	Endemic and widespread in southwest WA. Their range roughly extends south of the line from Geraldton to Esperance (including the Wheatbelt, areas with 300-750 mm annual rainfall, and the wetter regions in the extreme southwest WA including the Swan Coastal Plain and the southern coast). Their extent of occurrence is ~180 000 km ² , and the most recent estimate of area of occupancy (2010) is 34,500 km ² -86,800 km ² (DCCEEW 2024g). Breeding mostly occurs in the Wheatbelt, from the Stirling Ranges north-west to near Three Springs, but has also been recorded on the coastal plain to the southwest. Breeding habitat in the Wheatbelt has become severely fragmented since the 20 th century with much of the habitat occurring in remnant patches. Recently, the species distribution has shifted westwards and southwards, indicating the species may be expanding its breeding range into the far south-east (DCCEEW 2024g). Carnaby's Cockatoo nest in older eucalypt species with well-formed hollows including Salmon gum, Wandoo, Tuart, Jarrah, Flooded Gum, York Gum, Powderbark, Karri and Marri. Carnaby's Cockatoo most commonly occurs in woodland, shrubland and kwongan health dominated by proteaceous species. They feed on a range of proteaceous and myrtaceous species, including opportunistically foraging in fruit and nut orchards.	32 records (from 20 locations) across the combined study area; 3 on camera traps (HM-1-16, HM-1-19, HS-1-06) and 29 individuals recorded opportunistically, some foraging records and others flying over. A total of 10 records (from 7 locations) from the Newmont study area (Offset area and Waste dump expansion area)	
<i>Calyptrorhynchus banksii naso</i> Forest Red-tailed Black Cockatoo	VU (EPBC & BC Acts)	Endemic to the southwest of WA, primarily found in Jarrah, Marri, and Karri forests. Forest Red-tailed Black Cockatoos rely 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, travelling long distances in search of food and water, and is considered vulnerable due to habitat loss and reduced availability of nesting hollows (DCCEEW 2024e).	94 records (from 60 locations) across the combined study area including calling, foraging evidence and direct sightings (flying over or perched). A total of 62 records (from 44 locations) from the Newmont study area (Offset area – this survey, and Waste dump expansion area).	

Targeted significant mammal and black cockatoo survey for the Boddington Gold Project
Prepared for Newmont Australia Ltd

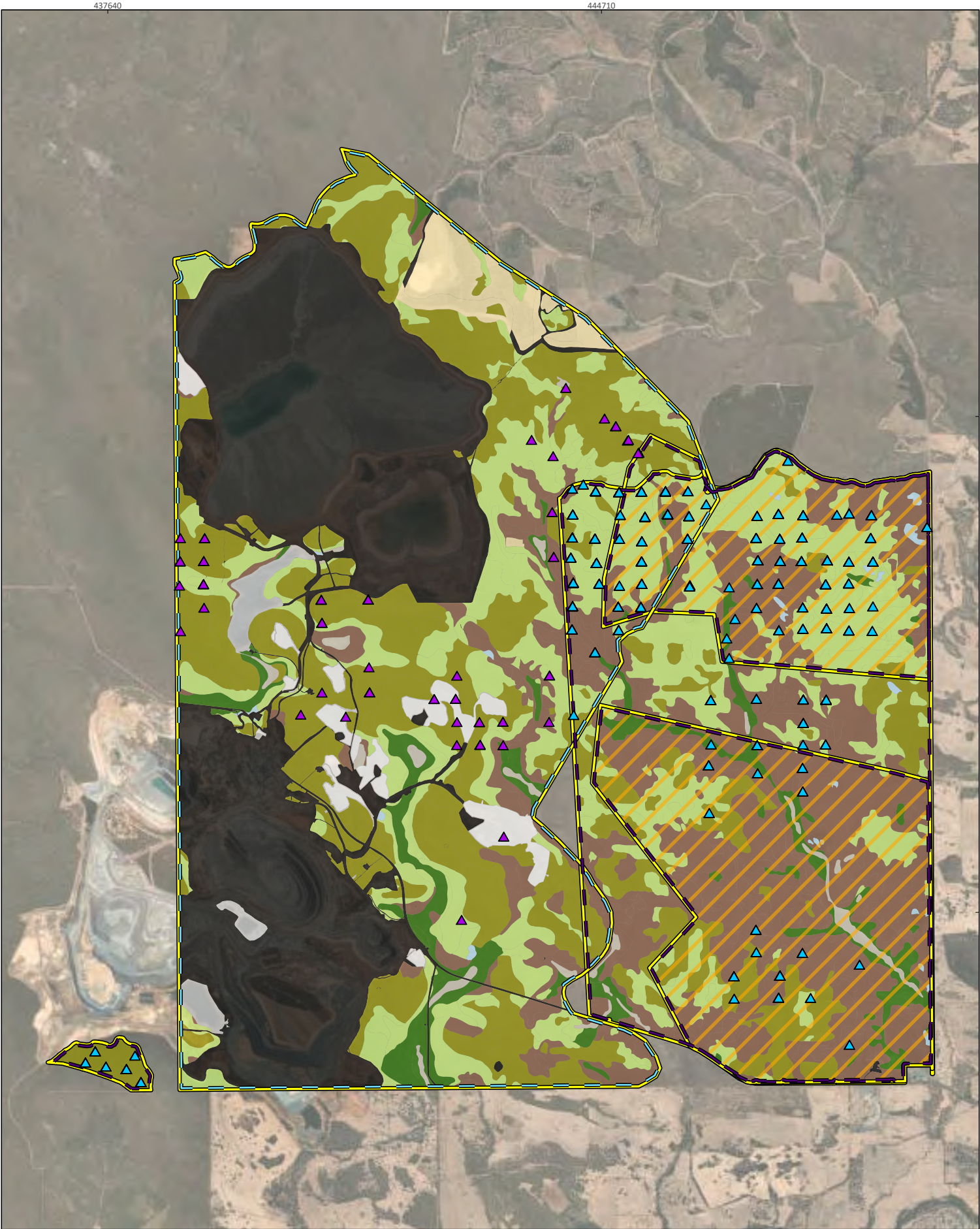
Species	Status	Distribution and ecology	Survey records	Photograph
<i>Dasyurus geoffroii</i> Chuditch, Western Quoll	VU (EPBC & BC Acts)	Australia's largest carnivorous marsupial. Chuditch were formerly widespread (~70% of the continent) but are now restricted to the Southwest region, with relictual populations in the Midwest, Wheatbelt, Goldfields and South Coast, and some translocated populations (DBCA 2017d; DEC 2012b). Mostly nocturnal and solitary (DEC 2012b). Population densities are highest in the Southwest region. Inhabits Jarrah and other eucalypt forests and woodlands, mallee heath and shrublands (DEC 2012b). Opportunistic foragers, feeding mostly on large invertebrates but also small mammals, birds, lizards, frogs and eggs (DEC 2012b). Sexually dimorphic home ranges; males occupy up to 15 km ² (dependent on the time of year) and females 3-4 km ² (Serena & Soderquist 1989).	646 detections across the combined study area; 34 from physical captures (including recaptures) in cage and Elliot traps, the remaining records from camera images. A total of 546 detections from the Newmont study area (Offset area – this survey, and Waste dump expansion area).	
<i>Bettongia penicillata ogilbyi</i> Woylie, Brush-tailed Bettong	EN/CR (EPBC/BC Act)	Small native marsupial of the family Potoroidae. Now found in 2 areas in southwest WA (Upper Warren and Dryandra Woodland) comprising 4 remaining indigenous populations: Perup, Kingston, Dryandra Woodland and Tutanning Nature Reserve (DBCA 2017c; Yeatman & Groom 2011). Translocation population have been established in at least 22 additional locations. Historically inhabited semi-arid scrub, mallee woodland and open forest, but now mostly restricted to dry sclerophyll forests and woodlands dominated by Jarrah and Wandoo with an understorey of scrub or tussock grass, as well as dense myrtaceous shrubland, kwongan or mallee heath (DBCA 2017c; Yeatman & Groom 2011). Nests are well-concealed and built over shallow depressions; commonly constructed from long strands (preferably grasses) but also strips of bark or dried seagrass and/or <i>Triodia</i> (dependent on location). Mycophagists, consuming the fruiting bodies of hypogaeal fungi, as well as seeds, leaves and stems, roots and tubers, gum exudate and invertebrates.	707 records across the combined study area; 4 records from cage trapping, 10 opportunistic sightings, and 691 records from camera images. A total of 671 records from the Newmont study area (Offset area – this survey).	

Species	Status	Distribution and ecology	Survey records	Photograph
<i>Isodon fusciventer</i> Quenda, Southern Brown Bandicoot	P4 (DBCA list)	Quendas are widely but patchily distributed across their range. Inhabits dense shrublands and forests along the Swan Coastal Plain, specifically Jarrah and Karri Forests north of Perth to the east of Esperance (DBCA 2018c; DEC 2012e; Van Dyck <i>et al.</i> 2013; Van Dyck & Strahan 2008). Sites generally display a combination of sandy soils, scrubby (often swampy) vegetation with low and dense cover up to 1 m high (DEC 2012e; Van Dyck <i>et al.</i> 2013; Van Dyck & Strahan 2008). Populations inhabiting Jarrah and Wandoo forests usually associated with watercourses (DEC 2012e). They will often feed in adjacent forest and woodland that is burned on a regular basis and in areas of pasture and cropland lying close to dense cover. Mostly nocturnal and crepuscular, sometimes diurnal, and are solitary. They are omnivorous; diet changes seasonally but broadly includes invertebrates, fungi and subterranean plant material, rarely small vertebrates (DBCA 2018c; Van Dyck <i>et al.</i> 2013; Van Dyck & Strahan 2008). Annual and opportunistic breeders, beginning in winter and generally peaking in spring, lasting approximately 6-8 months.	332 detections across the combined study area; 4 records from captures in either cage or Elliot traps (including recaptures) and the remaining from camera images and foraging evidence. A total of 65 detections from the Newmont study area (Offset area – this survey).	
<i>Phascogale tapoatafa wambenger</i> South-western Brush-tailed Phascogale	CD (BC Act)	Nocturnal, arboreal carnivorous marsupial (Van Dyck & Strahan 2008). Distribution of the southwest population (<i>P. t. wambenger</i>) extends between Perth and Albany. Densities are highest near Perup/Kingston, Collie River Valley, near Margaret River and Busselton, less common in high rainfall areas. (DEC 2012d). Inhabits dry sclerophyll forests and open woodlands that contain hollow-bearing trees (DEC 2012d). Generally prefer open forests with sparse ground cover (Van Dyck <i>et al.</i> 2013). Territorial, maintaining home ranges of over 20 ha; female territories are exclusive and altruistic, ranging from 20-70 ha; males have larger home ranges which overlap with conspecific and increase in the breeding season (DEC 2012a). Populations are fragmented and undergo major fluctuations between years (Van Dyck <i>et al.</i> 2013). Breeding season is dependent on location, but is generally from mid-May to early July (DEC 2012d). They are a short-lived species; males undergo mass facultative die-off at the end of the breeding season, females live 2-3 years (Rhind & Bradley 2002). Gestation last approximately 30 days. Opportunistic feeders; diet consists mostly of large insects, flower nectar and spiders, but also small birds and mammals (DEC 2012d).	79 detections across the combined study area, all from camera trap images. A total of 71 detections from the Newmont study area (Offset area – this survey, and Waste dump expansion area).	

Species	Status	Distribution and ecology	Survey records	Photograph
<i>Notamacropus irma</i> Western Brush Wallaby	P4 (DBCA list)	Contemporarily distributed north of Kalbarri to Cape Arid, with an isolated population in the Goldfields region. Inhabit open forest or woodland, and occasionally mallee, heathland and Karri Forests. Mostly diurnal, activity levels are highest in early morning and late afternoon. Diet preferences are broad; known to graze on at least 29 species of plant. Breeding season not clearly defined, but young are born between April and May and emerge from the pouch from October to November.	768 detections across the combined study area from camera trap images and seen opportunistically when traversing the study area. A total of 364 records from the Newmont study area (Offset area – this survey, Waste dump expansion area).	
Introduced fauna				
<i>Sus scrofa</i> Pig	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 across the combined study area, including 5 opportunistic sightings of pigs, scats, remains or foraging evidence, and 28 records from camera trap images. A total of 27 records from the Newmont study area (Offset area – this survey, and Waste dump expansion area).	

Species	Status	Distribution and ecology	Survey records	Photograph
<i>Dacelo novaeguineae</i> Laughing kookaburra	Introduced	Introduced from eastern Australia, this predatory bird has expanded its range across Southwest WA. 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 across the combined study area from camera trap images at sites HM-1-16, HM-1-02, NHS-1-16, NS-1-28 and NHS-1-25. A total of 3 records from the Newmont study area (Offset area – this survey).	
<i>Felis catus</i> Cat	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 across the combined study area; camera images at sites HS-1-35, HM-1-08, HM-1-22, NHS-1-17. A total of one record from the Newmont study area. (Offset area – this survey).	
<i>Oryctolagus cuniculus</i> European rabbit	Introduced	Introduced near Anglesea (Victoria) for hunting, the European Rabbit has become a serious environmental pest across much of the southwest. They compete with native herbivores for food, contribute to soil erosion through overgrazing, ring-bark trees 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 across the combined study area from camera trap images at site HM-2-27. Not recorded in the Newmont study area.	

Species	Status	Distribution and ecology	Survey records	Photograph
<i>Vulpes vulpes</i> European red fox	Introduced	One of the most destructive invasive predators in the region, the European fox has 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 across the combined study area; one opportunistic sighting of scat and 13 camera trap image records. A total of 6 records from the Newmont study area (Offset area – this survey).	



Newmont Australia
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Project No	1679
Date	16/04/2025
Drawn by	BK
Map author	WP

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Kilometers

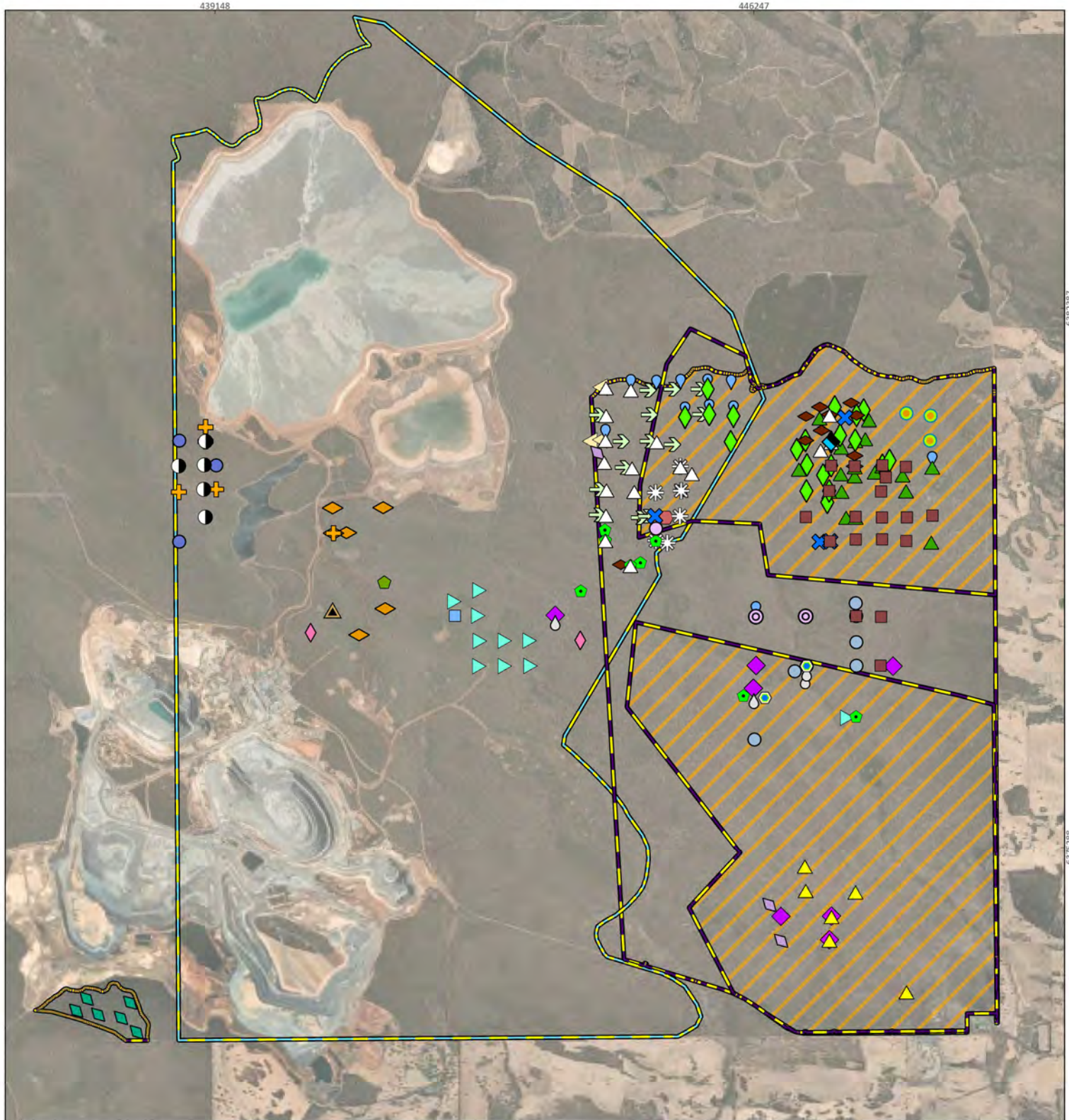
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- Legend**
- Combined study area
 - Worsley study area
 - Newmont study area
 - Proposed Biodiversity Offset Area (this survey)
- Worsley**
- Species, status**
- Chuditch, VU (EPBC & BC Acts)
- Newmont**
- Species, status**
- Chuditch, VU (EPBC & BC Acts)

- Habitat**
- Cleared
 - Dam
 - Eucalypt woodland on valley floors
 - Heathland
 - Jarrah/Marri woodland
 - Jarrah/Marri/Allocasuarina woodland
 - Melaleuca shrubland
 - Plantation
 - Rehabilitation Areas
 - Wandoo woodland

Figure 5-6
Chuditch records in the combined study area





Chuditch records

- ▲ Aberforth
- ◀ Albus
- ◀ Arthur
- ⇒ Bill
- ◀ Buckbeak
- ◀ Cha Cha

- ▲ Dobby
- ◀ Firenze
- ◀ Fleur
- ◀ Fluffy
- ◀ Ginny
- ◀ Harry
- ◀ Hedwig

- ◀ Hermione
- ◀ Jim
- ◀ Luna
- ◀ Lupin
- ◀ Malfoy
- ◀ Minerva
- ◀ Neville

- ◀ Newt
- ◀ Ronald
- ◀ Rubeus
- ◀ Scabbers
- ◀ Severus
- ◀ Sgt Johnson
- ◀ Sirius

- ◀ Slim
- ◀ Slughorn
- ◀ Sprout
- ◀ Tim
- ◀ Tom R
- ◀ Tonks



Newmont Australia
Boddington Gold Project

Project No 1679
Date 28/04/2025
Drawn by BK
Map author WP



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Kilometers

1:70,477(at A4) GDA 1994 MGA Zone 50

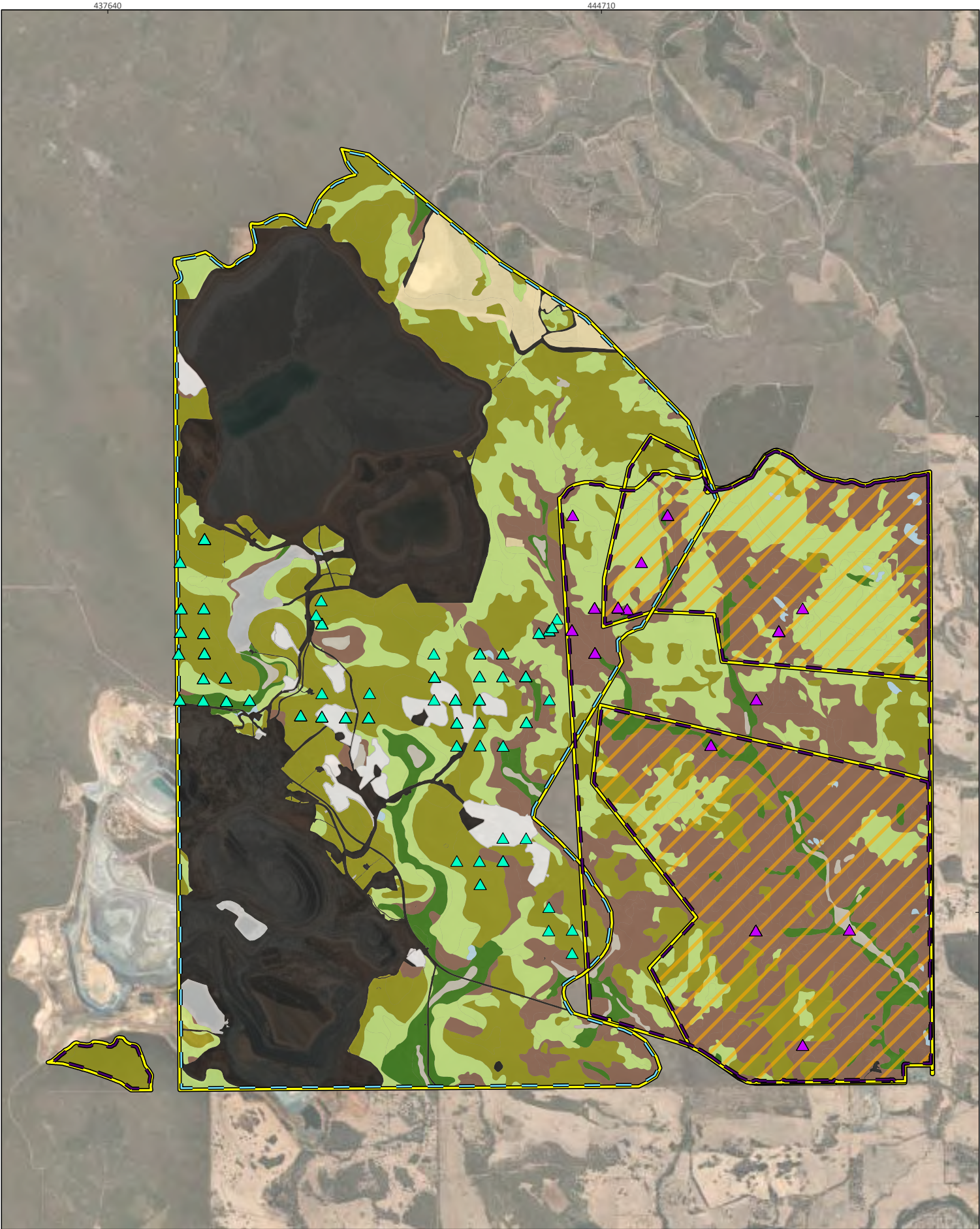
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- ◀ Combined study area
- ◀ Worsley study area
- ◀ Newmont study area
- ◀ Proposed Biodiversity Offset Area (this survey)

Figure 5-7

Individual Chuditch recorded from cameras in the field survey





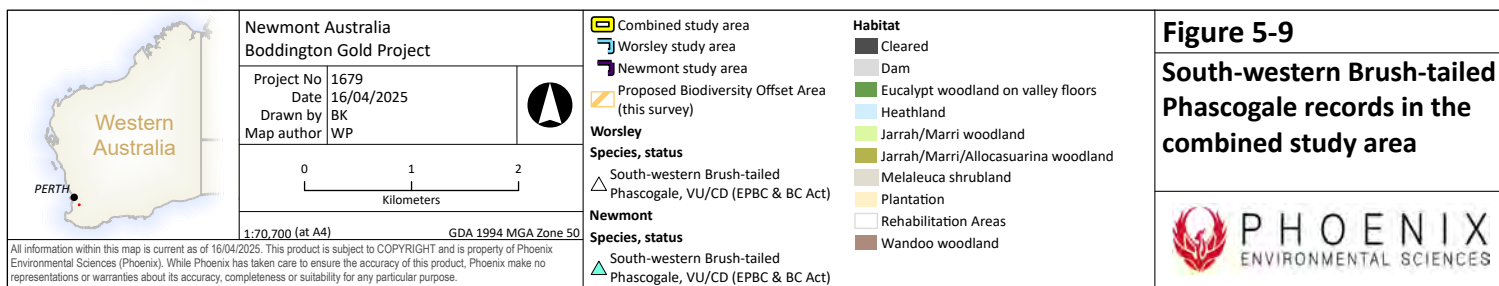
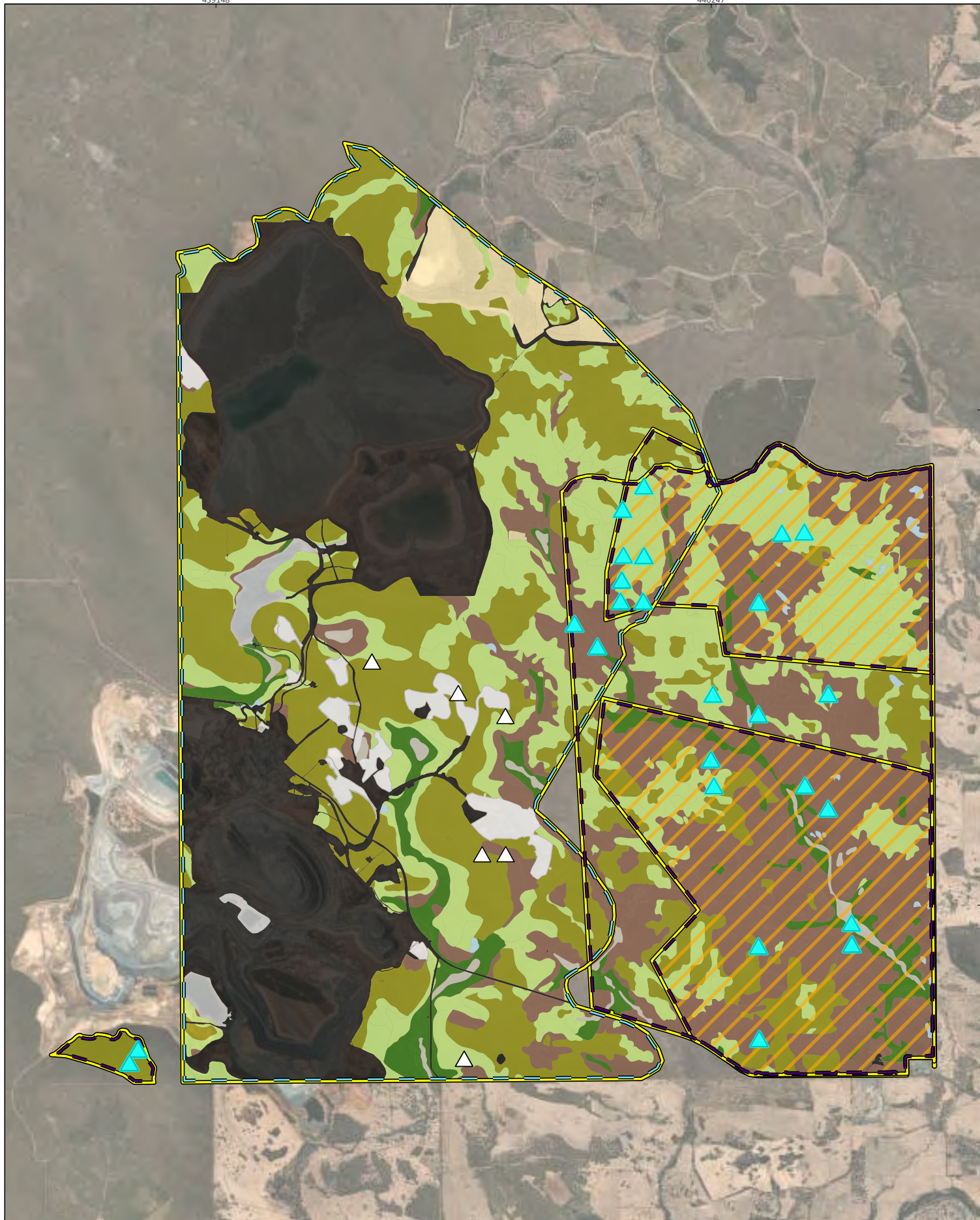
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Project No	1679	
Date	16/04/2025	
Drawn by	BK	
Map author	WP	
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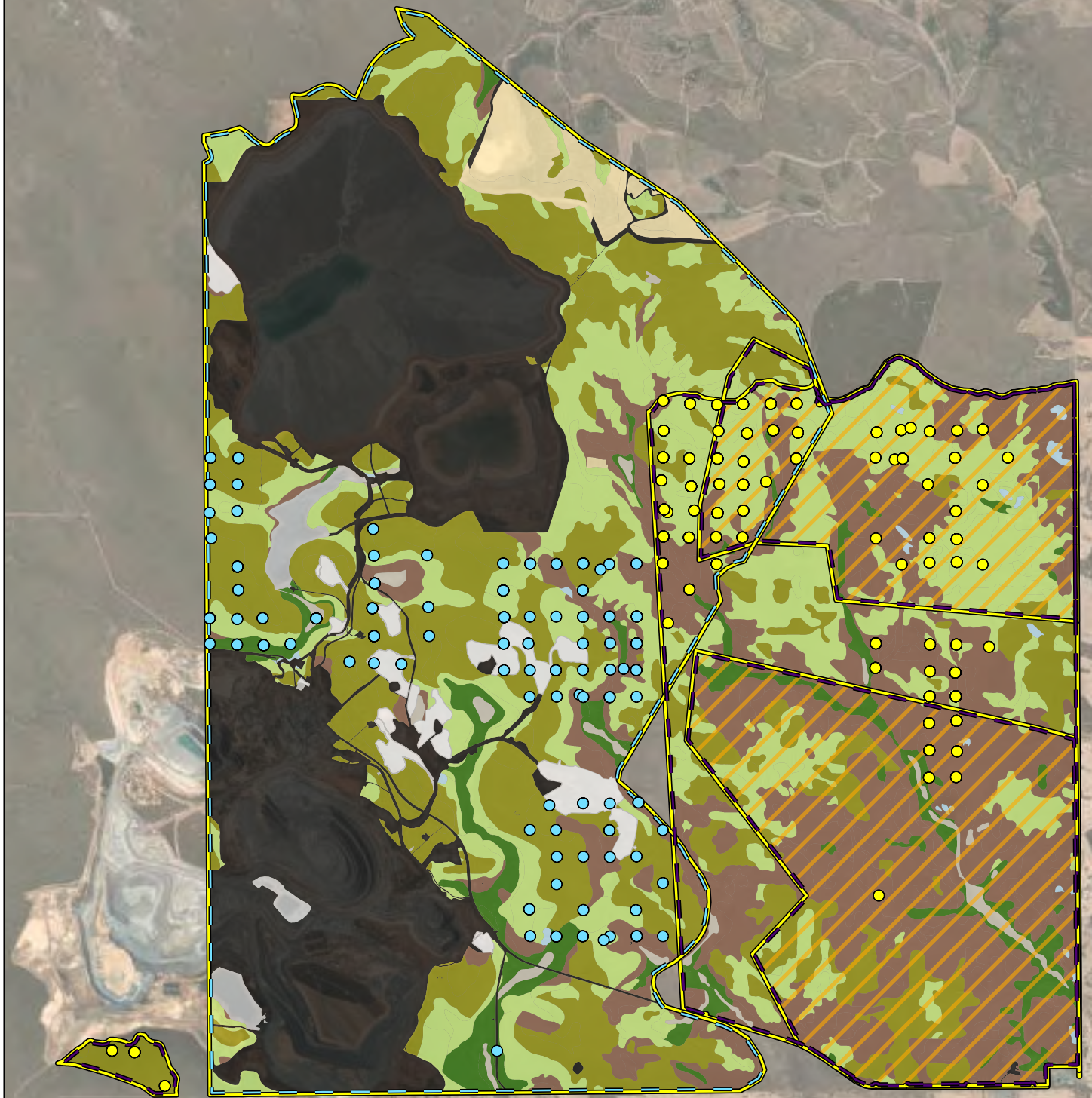
- Combined study area
 Worsley study area
 Newmont study area
 Proposed Biodiversity Offset Area (this survey)
- Worsley**
Species, status
 Quenda, P4 (DBCA list)
- Newmont**
Species, status
 Quenda, P4 (DBCA list)

- Habitat**
- Cleared
 - Dam
 - Eucalypt woodland on valley floors
 - Heathland
 - Jarrah/Marri woodland
 - Jarrah/Marri/Allosuarina woodland
 - Melaleuca shrubland
 - Plantation
 - Rehabilitation Areas
 - Wandoo woodland

Figure 5-8
Quenda records in the combined study area







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Kilometers

1:70,700 (at A4)

GDA 1994 MGA Zone 50

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- Combined study area
- Worsley study area
- Newmont study area
- Proposed Biodiversity Offset Area (this survey)

Worsley

Species, status

- Western Brush Wallaby, P4 (DBCA list)

Newmont

Species, status

- Western Brush Wallaby, P4 (DBCA list)

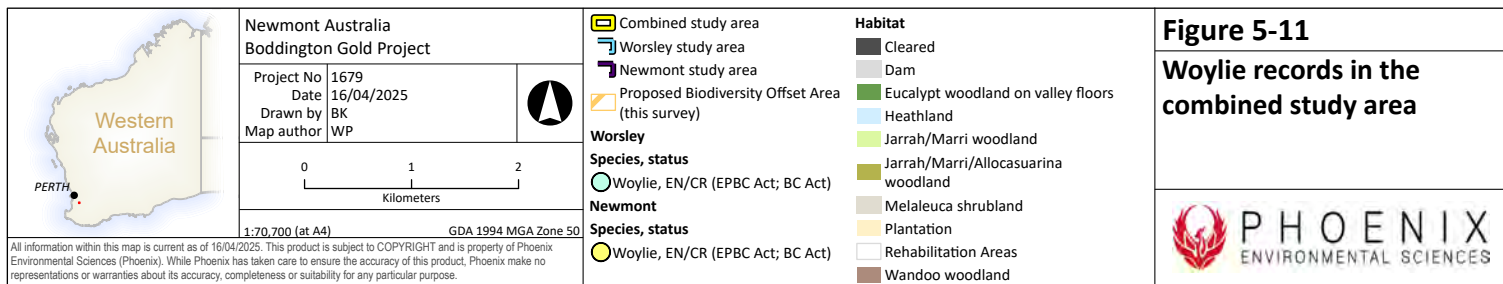
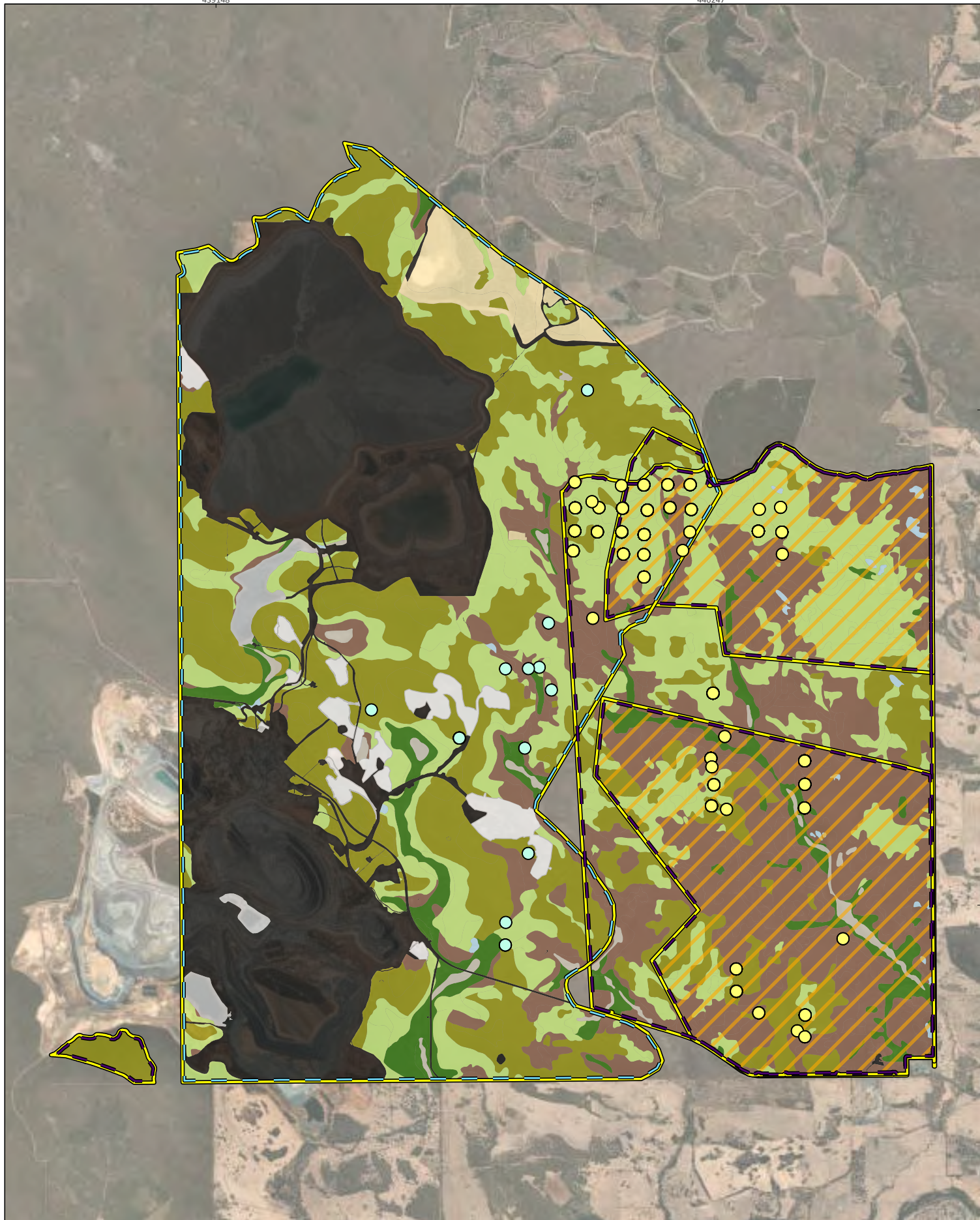
Habitat

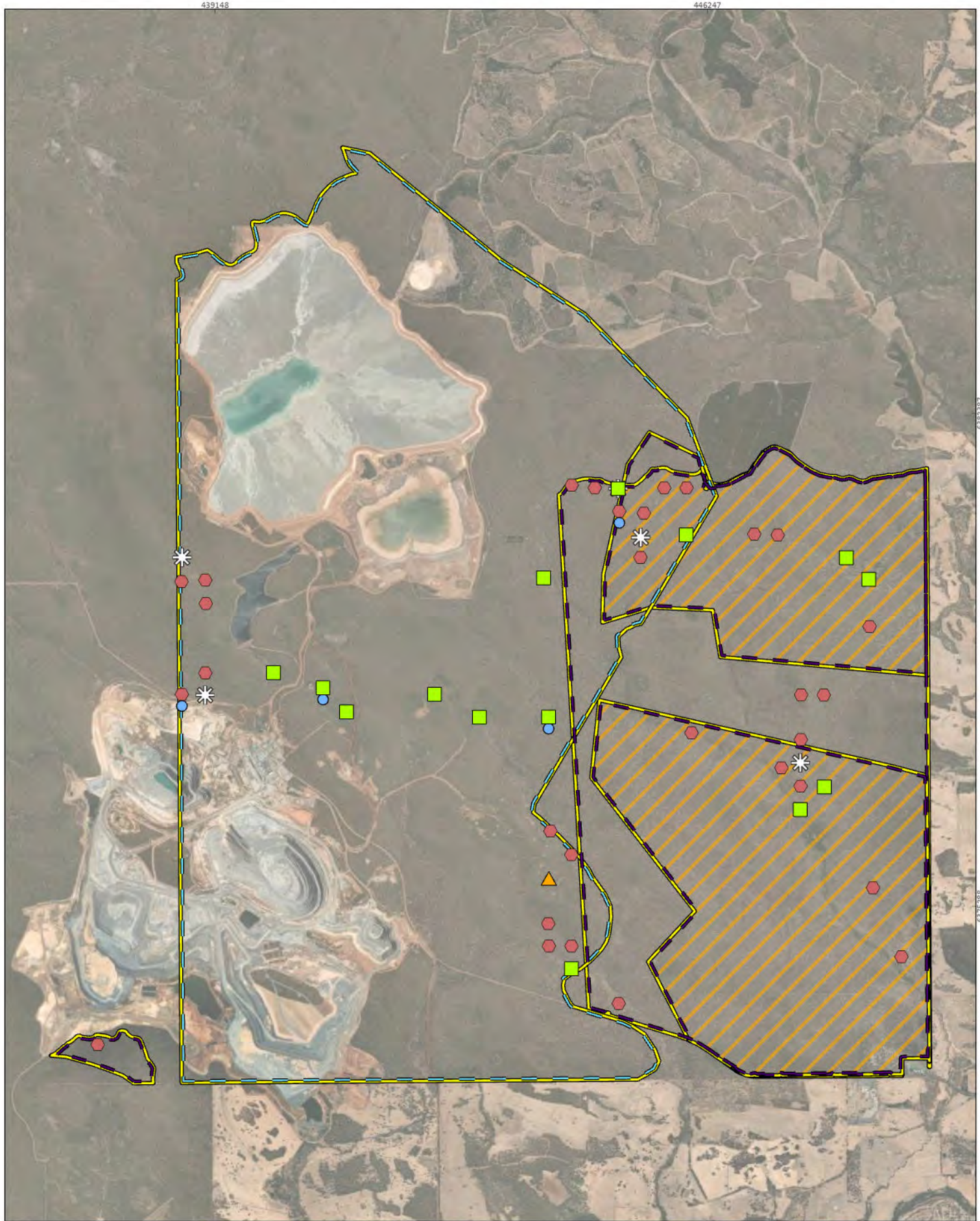
- Cleared
- Dam
- Eucalypt woodland on valley floors
- Heathland
- Jarrah/Marri woodland
- Jarrah/Marri/Allocasuarina woodland
- Melaleuca shrubland
- Plantation
- Rehabilitation Areas
- Wandoo woodland

Figure 5-10

Western Brush Wallaby records in the combined study area







Western Australia PERTH	Newmont Australia Boddington Gold Project <table border="1"> <tr> <td>Project No</td> <td>1679</td> </tr> <tr> <td>Date</td> <td>4/29/2025</td> </tr> <tr> <td>Drawn by</td> <td>BK</td> </tr> <tr> <td>Map author</td> <td>WP</td> </tr> </table> 0 1 2 Kilometers 1:70,700 (at A4) GDA 1994 MGA Zone 50	Project No	1679	Date	4/29/2025	Drawn by	BK	Map author	WP	- Combined study area - Worsley study area - Newmont study area - Proposed Biodiversity Offset Area (this survey) Worsley Species - Cat - Laughing Kookaburra - Pig - Rabbit - Red Fox	Figure 5-12 Introduced fauna records in the combined study area PHOENIX ENVIRONMENTAL SCIENCES
	Project No	1679									
Date	4/29/2025										
Drawn by	BK										
Map author	WP										
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5.2.4 Population estimates and likelihood of occurrence assessment

Population modelling was undertaken to determine whether viable populations of the recorded conservation significant mammal fauna are present within the combined study area. While 3 species of conservation significant black cockatoos were recorded during the surveys, population estimates for Threatened birds were outside the scope of this report. Therefore, they are not discussed in the context of abundance estimates.

For the context of this report, the term 'viable population' refers to the definition within the Worsley Alumina Conservation Significant Fauna Environmental Management Plan as *"a self-sustaining population with a high probability of survival because it has sufficient numbers and reproductive potential"*. Population estimates were provided for both the physical trapping (cage and Elliot) data and camera trapping data, where sufficient capture rates allowed for meaningful estimates. For this reason, modelling was only able to be completed for Chuditch (Table 5-10). For all other significant mammal fauna, estimates were based on detection rates, number of individual photographed and records outside of species-specific home range buffers (Table 5-10 cf. section 4.2.2.7).

The LOO assessment (section 4.2.3) for the remaining significant species identified in the desktop review (section 5.1.1) determined 3 are likely to occur in the Newmont study area, 4 may possibly occur and one is unlikely to occur (Table 5-10). Species identified in the desktop review that fall outside the scope of this survey (see section 5.1.1), are listed as EX or are locally extirpated (Table 5-2) have been disregarded from the LOO assessment.

Table 5-10 Population estimates and likelihood of occurrence assessment of conservation significant fauna recorded in the study area and desktop search extent

Species and status	Physical trapping			Camera trapping			Viable population	Comment	Habitats								
	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)			Wandoo woodland	Jarrah/Marri woodland	Jarrah/Marri/Allocasuarina woodland	Eucalyptus woodland on valley floors	Melaleuca shrubland	Heathland	Plantation	Rehab	Dam
Recorded species (5)																	
<i>Dasyurus geoffroii</i> Chuditch VU (EPBC Act; BC Act)	22	1.55 (95% CI 0.80 - 3.00)	96 (95% CI 47 - 195)	648, 33	2.31 (95% CI 1.6 - 3.2)	60.8 (95% CI 42.8 - 86.4)	Present	Recorded. Critical habitat widespread. Both population densities and estimate have a sufficient number of individuals to be considered self-sufficient.	✓	✓	✓	✓		✓			
<i>Isodon fusciventer</i> Quenda P4 (DBCA list)	3	N/A	N/A	319, 56	1.4 (95% CI 0.8 - 2.5)	31 (95% CI 18.6 - 51.9)	Present	Recorded. Suitable habitat widespread. Capture rates too low during physical trapping. Multiple detections across combined study area over multiple surveys. Fifty-six clearly defined independent buffers (Appendix 15).	✓	✓	✓	✓		✓		✓	
<i>Phascogale tapoatafa wambenger</i> South-western Brush-tailed Phascogale CD (BC Act)	0	N/A	N/A	79, 17	1.5 (95% CI 0.88 - 2.4)	22.7 (95% CI 13 - 40.0)	Present	Recorded. Suitable habitat widespread. Capture rates too low during physical trapping. Multiple detections across combined study area over multiple surveys. Sixteen clear buffers (Appendix 16) and 2 individuals identified within the same buffer more than 2 km apart within 1 minute.	✓	✓	✓	✓					
<i>Notamacropus Irma</i> Western Brush Wallaby P4 (DBCA list)	0	N/A	N/A	730, 38	3.9 (95% CI 2.2 - 4.3)	52.5 (95% CI 38.0 - 72.6)	Present	Recorded. Suitable habitat widespread. Physical trapping was not attempted during the survey. Multiple detections across combined study area over multiple surveys. Approximately 30 buffers evident (Appendix 17) as well as 8 images with multiple animals per photo.	✓	✓	✓	✓		✓		✓	
<i>Bettongia penicillata ogilbyi</i> Woylie 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	Recorded. Critical habitat widespread. Capture rates too low during physical trapping. Multiple detections across combined study area over multiple surveys. Thirteen clear buffers evident (Appendix 18) with 7 individuals detected from multiple images. Multiple individuals detected less than 1 minute apart over 1.5 km spacing.	✓	✓	✓	✓		✓		✓	
<i>Calyptorhynchus banksii naso</i> Forest Red-tailed Black Cockatoo VU (EPBC & BC Acts)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Recorded. Suitable foraging and breeding habitat present (discussed in section 5.2.5).	✓	✓	✓	✓		✓			
<i>Zanda baudinii</i>	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Recorded. Suitable foraging and breeding habitat	✓	✓	✓	✓	✓	✓	✓	✓	

Species and status	Physical trapping			Camera trapping			Viable population	Comment	Habitats								
	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)			Wandoo woodland	Jarrah/Marri woodland	Jarrah/Marri/Allocasuarina woodland	Eucalyptus woodland on valley floors	Melaleuca shrubland	Heathland	Plantation	Rehab	Dam
Baudin’s Cockatoo EN (EPBC & BC Acts)								present (discussed in section 5.2.5).									
Zanda latirostris Carnaby’s Cockatoo EN (EPBC & BC Acts)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Recorded. Suitable foraging and breeding habitat present (discussed in section 5.2.5).	✓	✓	✓	✓	✓	✓	✓	✓	
Remaining desktop species (11)																	
Myrmecobius fasciatus Numbat EN (EPBC Act; BC Act)	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Likely. Critical habitat present. 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 Newmont study area, most recently from 2021 (Biologic 2023; DBCA 2024b; Phoenix 2025b).	✓	✓	✓	✓					
Setonix brachyurus Quokka VU (EPBC Act; BC Act)	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Possible. No critical or wetland habitat in the Newmont study area, suitable heath and forest habitat. Quokka was not detected during the surveys. The most recent record (2023) is >20 km northwest of the Newmont study area, whereas the nearest is 15 km west of the Newmont study area and was recorded in 2020 (DBCA 2024b).	✓	✓	✓	✓	✓			✓	
Hydromys chrysogaster Rakali, Water Rat P4 (DBCA list)	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Possible. Suitable habitat limited – most prospective habitat is the artificial dam and surrounding area in the Worsley study area. No permanent water bodies in the Newmont study area. Rakali was most recently recorded 12 km northwest of the Newmont study area in 2020, however, has historically been recorded as close as 3 km southwest at the Hotham River in 2017 (DBCA 2024b).				✓	✓				✓
Phascogale calura Red-tailed Phascogale VU/CD (EPBC Act; BC Act)	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Likely. Suitable woodland habitat present. Red-tailed Phascogale was not detected during the surveys. This species was recently recorded 3.2 km southeast of the Newmont study area in 2021 (DBCA 2024b).	✓	✓	✓	✓					
Falsistrellus mackenziei Western False Pipistrelle	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Possible. Suitable roosting and foraging habitat widespread. Western False Pipistrelle was not recorded during the field survey. The nearest	✓	✓	✓	✓					

Species and status	Physical trapping			Camera trapping			Viable population	Comment	Habitats								
	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)			Wandoo woodland	Jarrah/Marri woodland	Jarrah/Marri/Allocasuarina woodland	Eucalyptus woodland on valley floors	Melaleuca shrubland	Heathland	Plantation	Rehab	Dam
P4 (DBCA list)								records (12.1 km) are from 2011, while the most recent record (2018) is <25 km from the northern boundary of the Newmont study area (DBCA 2025).									
<i>Pseudocheirus occidentalis</i> Western Ringtail Possum CR (EPBC Act; BC Act)	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Unlikely. Western Ringtail Possum was not recorded during the surveys. Critical habitat present but no peppermint woodland. Only 2 records occur within 40 km of the Newmont study area: one outdated record within 3 km of the Newmont study area from 1998, and one over 30 km west of the Newmont study area from 2020 (DBCA 2024b).	✓	✓	✓	✓					
<i>Tarsipes rostratus</i> Honey Possum Keystone species	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Likely. Honey Possum was not recorded during the surveys. Trapping methods used in the field survey were not suitable for Honey Possums. Suitable habitat present in the Newmont study area, no spatial data but numerous desktop records (no geometry) (DBCA 2024a).	✓	✓	✓	✓		✓			
<i>Notamacropus eugenii</i> Tammar Wallaby P4 (DBCA list)	N/A	N/A	N/A	N/A	N/A	N/A	Unlikely	Possible. Tammar Wallaby was not detected during the survey. Suitable habitat present. No desktop records with geometry, but recorded around Project operations in 2024 (Bamford 2004). The nearest indigenous population is ~40 km from the Newmont study area at Dryandra Woodland and Boyagin Nature Reserve.	✓	✓	✓	✓	✓			✓	

5.2.5 Black cockatoos

5.2.5.1 Black cockatoo survey records

All 3 black cockatoo species that occur in southwest WA were recorded in the Newmont study area during the field survey (Table 5-11; Figure 5-15). The Forest Red-tailed Black Cockatoo (VU) was the most commonly recorded species, with 62 individuals recorded from 44 instances from foraging evidence, direct sightings, calling and flying over (Figure 5-13). Ten Carnaby's Cockatoo (EN) were recorded from 7 instances from direct sightings, calling and foraging evidence and 6 Baudin's Cockatoo (EN) were recorded from 4 instances from foraging evidence and direct sighting (Figure 5-13). There were several non-discernible records that either represent Baudin's Cockatoo or Carnaby's Cockatoo (EN; listed as White-tailed Black Cockatoo in Table 5-11; 16 individuals from 7 instances from direct sightings, calling and foraging evidence).

Table 5-11 Details of black cockatoo records in the Newmont study area from the field survey

Species	Count	Sites	Latitude	Longitude	Record type
Forest Red-tailed Black Cockatoo	1	B15	-32.7567	116.4518	C
Forest Red-tailed Black Cockatoo	1	BCQ15	-32.7348	116.4485	FE
Forest Red-tailed Black Cockatoo	1	BCQ17	-32.723	116.4252	FE
Forest Red-tailed Black Cockatoo	1	BCQ19	-32.7086	116.4252	FE
Forest Red-tailed Black Cockatoo	1	BCQ20	-32.7029	116.4346	FE
Forest Red-tailed Black Cockatoo	3	BCQ20	-32.7029	116.4346	C
Forest Red-tailed Black Cockatoo	1	BCQ21	-32.7279	116.4487	FE
Forest Red-tailed Black Cockatoo	1	BCQ22	-32.7511	116.4562	FE
Forest Red-tailed Black Cockatoo	2	BCQ22	-32.7511	116.4562	C
Forest Red-tailed Black Cockatoo	1	BCQ23	-32.7691	116.4217	FE
Forest Red-tailed Black Cockatoo	1	BCQ29	-32.7796	116.3375	DS
Forest Red-tailed Black Cockatoo	1	BCQ29	-32.7796	116.3375	FE
Forest Red-tailed Black Cockatoo	1	BCQ30	-32.7777	116.3308	FE, C
Forest Red-tailed Black Cockatoo	1	BCQ31	-32.7619	116.4225	FE
Forest Red-tailed Black Cockatoo	1	BCQ32	-32.7141	116.4433	FE
Forest Red-tailed Black Cockatoo	1	BCQ33	-32.7356	116.4559	FE
Forest Red-tailed Black Cockatoo	2	BCQ34	-32.733	116.4293	DS
Forest Red-tailed Black Cockatoo	1	BCQ37	-32.745	116.4474	FE
Forest Red-tailed Black Cockatoo	1	BCQ39	-32.7167	116.4328	C
Forest Red-tailed Black Cockatoo	1	BCQ41	-32.7365	116.4386	FE
Forest Red-tailed Black Cockatoo	1	BCQ42	-32.7432	116.4558	FE
Forest Red-tailed Black Cockatoo	1	BCQ45	-32.7124	116.4168	FE
Forest Red-tailed Black Cockatoo	1	BCQ48	-32.7422	116.4315	C, FE
Forest Red-tailed Black Cockatoo	1	C23	-32.7655	116.4209	FE
Forest Red-tailed Black Cockatoo	1	C25	-32.7568	116.4244	FE
Forest Red-tailed Black Cockatoo	1	Newmont-Nest07	-32.7551	116.4185	FE
Forest Red-tailed Black Cockatoo	2	NHS-1-14	-32.7219	116.408	DS
Forest Red-tailed Black Cockatoo	2	NM-1-01	-32.7078	116.4338	DS
Forest Red-tailed Black Cockatoo	5	NM-1-22	-32.7157	116.4459	DS

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Species	Count	Sites	Latitude	Longitude	Record type
Forest Red-tailed Black Cockatoo	1	NM-2-28	-32.7702	116.4439	C
Forest Red-tailed Black Cockatoo	2	NS-1-05	-32.7434	116.4267	DS
Forest Red-tailed Black Cockatoo	1	NS-1-16	-32.7401	116.4337	DS
Forest Red-tailed Black Cockatoo	1	NS-1-17	-32.7433	116.4351	DS
Forest Red-tailed Black Cockatoo	1	Opp01	-32.7786	116.3336	FE
Forest Red-tailed Black Cockatoo	1	Opp02	-32.7778	116.3308	FE
Forest Red-tailed Black Cockatoo	1	Opp04	-32.7773	116.4577	DS
Forest Red-tailed Black Cockatoo	5	Opp13	-32.7053	116.4602	FO (DS)
Forest Red-tailed Black Cockatoo	1	Opp16	-32.7777	116.3334	FE
Forest Red-tailed Black Cockatoo	4	Opp17	-32.7783	116.3343	DS
Forest Red-tailed Black Cockatoo	1	Opp17	-32.779	116.3357	FE
Forest Red-tailed Black Cockatoo	1	P12	-32.7262	116.4294	C
Forest Red-tailed Black Cockatoo	1	P19	-32.7503	116.4392	DS
Forest Red-tailed Black Cockatoo	1	P22	-32.7442	116.4164	FE
Forest Red-tailed Black Cockatoo	1	P33	-32.7203	116.4198	C
Baudin's Cockatoo	1	BCQ37	-32.745	116.4474	FE
Baudin's Cockatoo	1	BCQ41	-32.7365	116.4386	FE
Baudin's Cockatoo	1	BCQ45	-32.7124	116.4168	FE
Baudin's Cockatoo	3	Opp02	-32.7763	116.4398	DS
Carnaby's Cockatoo	2	BCQ04	-32.7568	116.4544	DS
Carnaby's Cockatoo	1	BCQ21	-32.7279	116.4487	FE
Carnaby's Cockatoo	1	BCQ29	-32.7796	116.3375	FE
Carnaby's Cockatoo	1	BCQ37	-32.745	116.4474	FE
Carnaby's Cockatoo	2	Newmont-Nest05	-32.7629	116.4395	DS
Carnaby's Cockatoo	2	Opp08	-32.7766	116.4399	DS
Carnaby's Cockatoo	1	W04	-32.7773	116.334	C
White-tailed Black Cockatoo	1	B01	-32.7041	116.4455	C
White-tailed Black Cockatoo	1	B10	-32.732	116.4584	C
White-tailed Black Cockatoo	7	B17	-32.7353	116.4449	DS
White-tailed Black Cockatoo	2	P17	-32.7502	116.439	C
White-tailed Black Cockatoo	2	P18	-32.7539	116.4433	FO (DS)
White-tailed Black Cockatoo	2	Q25	-32.7194	116.4048	DS
White-tailed Black Cockatoo	1	W02	-32.779	116.337	DS

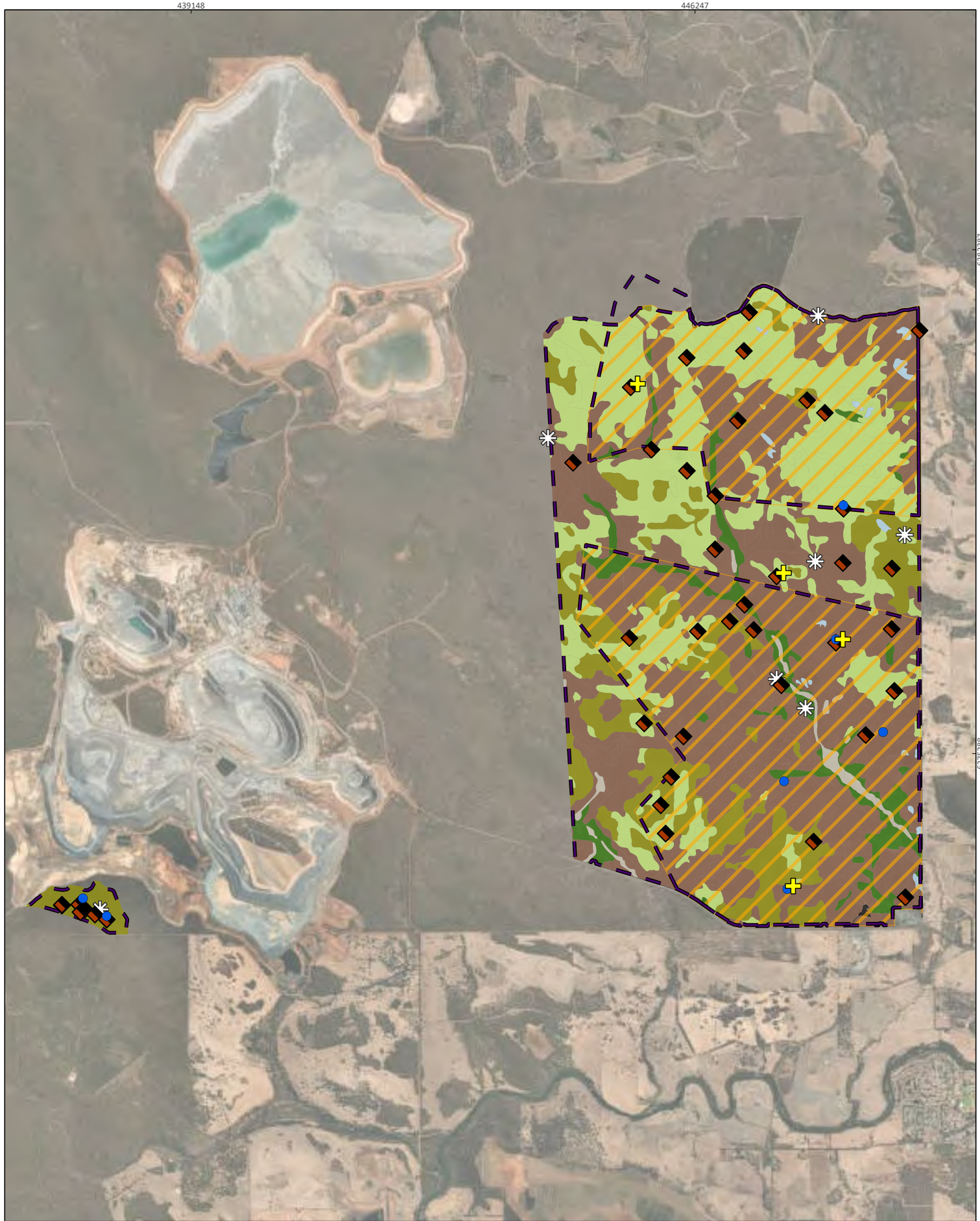
*FE = Foraging evidence; DS = Direct sighting, FO = Flying over, C = Calling.



Figure 5-13 Examples of black cockatoo foraging evidence: Forest Red-tailed Black Cockatoo (Jarrah – recent; left); Baudin's Cockatoo (Jarrah – recent to old; centre); Carnaby's Cockatoo (Banksia clippings; right)



Figure 5-14 Known Carnaby's Cockatoo breeding hollow (Newmont-Nest01) showing chew marks



	Newmont Australia Boddington Gold Project			Habitat Cleared Eucalypt woodland on valley floors Heathland Jarrah/Marri woodland Jarrah/Marri/Allocasuarina woodland Melaleuca shrubland Plantation Wandoo woodland	Figure 5-15 Black cockatoo records from the field survey recorded in the Newmont study area	
	Project No 1679 Date 16/04/2025 Drawn by BK Map author WP	White-tailed Black Cockatoo Forest Red-tailed Black Cockatoo/Karrak Baudin's Cockatoo Carnaby's Cockatoo				Legend Newmont study area Proposed Biodiversity Offset Area (this survey)

1:69,103 (at A4) GDA 1994 MGA Zone 50

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5.2.5.2 Black cockatoo potential habitat trees

A total of 1,169 PHTs were surveyed across a 50 ha sampling area (represented by x50 100x100 m quadrats) across 4 broad fauna habitats (Figure 5-16). The abundance and densities of these PHT species are expected to fluctuate depending on the dominant fauna habitat present. As expected, the highest number of PHTs were recorded in the most frequently sampled habitat types: Wandoo woodland (535 PHTs, 22 ha sampled), Jarrah/Marri woodland (438 PHTs, 16 ha) and Jarrah/Marri/Allocasuarina woodland (154 PHTs, 8 ha). *Eucalyptus* woodland on valley floors recorded the lowest number of PHTs (42, 4 ha), however represented the highest proportion of sampled habitat across the Newmont study area (1.8%). Five species of PHT were recorded across the 4 habitats surveyed: Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), Wandoo (*Eucalyptus wandoo*), Powderbark (*Eucalyptus accedens*) and Salmon Gum (*Eucalyptus salmonophloia*). Jarrah was the most abundant species recorded (792), followed by Wandoo (227), Marri (68), Powderbark (28) and Salmon gum (1) (Table 5-12). A total of 53 unidentified eucalypt tree species (*Eucalyptus* sp.) were also recorded as a result of the tree showing no obvious diagnostic characteristics (including dead trees). All identified eucalypt species were recorded in a variety of DBH measurements, excluding Salmon Gum which was represented by only one outlier sample. The largest PHT recorded was a Jarrah with a DBH of 1,680 mm.

Table 5-12 Summary of DBH (mm) per potential hollow tree species

Scientific name	Vernacular	Tree count	Min DBH (mm)	Max DBH (mm)	Range DBH (mm)	Mean DBH (mm)
<i>Eucalyptus marginata</i>	Jarrah	792	500	1,680	1,180	657
<i>Corymbia calophylla</i>	Marri	68	500	1,100	600	647
<i>Eucalyptus wandoo</i>	Wandoo	227	300	1,100	800	420
<i>Eucalyptus</i> sp.	Unknown eucalypt	53	500	1,320	820	674
<i>Eucalyptus accedens</i>	Powderbark	28	300	1,000	700	432
<i>Eucalyptus salmonophloia</i>	Salmon Gum	1	520	520	0	520
Total		1,169	300	1,680	1,180	558

To compare the densities of PHTs between fauna habitats and vegetation complexes, the mean PHT/ha has been summarised (Table 5-13). Jarrah/Marri woodland had the highest mean number of PHTs per hectare, followed by Wandoo woodland and Jarrah/Marri/Allocasuarina woodland. *Eucalyptus* woodland on valley floors had the lowest mean density of PHTs (10.5 PHTs/ha). Extrapolating the results of the survey, it is estimated that 101,408 PHTs occur within the Newmont study area of which 71,590 occur within the Offset area (this survey) and 1,152 in the Waste dump expansion area (Table 5-13). Additional PHTs may occur sporadically in cleared areas, however, are expected to represent a very small proportion of the total compared to forest remnants. Additionally, the *Melaleuca* shrubland, Heathland and Pine plantation were not surveyed for PHTs, either due to their proportionally low area within the Newmont study area, or comparatively low value for PHTs compared to other eucalypt-dominant habitats. These habitats are expected to represent a low proportion of the PHTs in the Newmont study area.

Table 5-13 Total and extrapolated numbers of potential hollow trees and hollows recorded in the Newmont study area, by habitat type

Habitat type Vegetation code (Mattiske 2024)	Survey area				Number of PHTs					% of habitat type surveyed in Newmont study area	% of habitat type surveyed in Offset area (this survey)	% of habitat type surveyed in Waste dump expansion area
	Surveyed area (ha)	Total area (ha) within Newmont study area	Total area (ha) within Offset area (this survey)	Total area (ha) within Waste dump expansion area	Total surveyed (#)	PHTs/ha	Newmont study area extrapolated	Offset area (this survey) extrapolated	Waste dump expansion area extrapolated			
Wandoo woodland (G5, L, M, MG, Y, YG)	22	2,080.9	1,611.9	0.0	535	24.3	50,565.9	39,169.2	NA	1.1	1.4	NA
Pine plantation (PL, PL – Ag)	0	0.1	0.0	0.0	0	NA	NA	NA	NA	NA	NA	NA
<i>Melaleuca</i> shrubland (A, A2)	0	43.7	30.5	0.0	0	NA	NA	NA	NA	NA	NA	NA
Jarrah/Marri/ <i>Allocasuarina</i> woodland (G4, PS, PW, S, SP, ST)	8	651.4	320.3	59.7	154	19.3	12,572.0	6,181.8	1,152.2	1.2	2.5	13.4
Jarrah/Marri woodland (AD, D, DG, H, H2, HG, M2, Z, SW)	16	1,311.2	888.2	0.0	438	27.4	35,926.9	24,336.7	NA	1.2	1.8	NA
Heathland (G1, G2, G3)	0	24.1	21.6	0.0	0	NA	NA	NA	NA	NA	NA	NA
<i>Eucalyptus</i> woodland on valley floors (AX, AY)	4	223.2	181.2	0.0	42	10.5	2,343.6	1,902.6	NA	1.8	1.8	NA
Total	50	4,341.60	3,053.7	59.7	1,169	Av. 20.4	101,408.4	71,590.3	1,152.2	5.3	7.5	13.4

5.2.5.3 Breeding hollows

A total of 290 hollows from 213 trees were recorded from the 1,169 PHTs recorded during the survey (Table 5-14). Consistent with the average number of PHTs recorded in the Newmont study area, Jarrah/Marri woodland recorded the highest number of trees per hectare containing hollows. Jarrah/Marri/*Allocasuarina* woodland and Wandoo woodland recorded the next highest with an almost identical average number of hollows per hectare (Table 5-13 cf. Table 5-14).

Despite the above 3 habitats being sampled almost equally in consideration of their proportion across the Newmont study area, Jarrah/Marri woodland recorded a noticeably higher average number of hollows per hectare. This is surprising as Wandoo woodland is dominated by a high proportion of *Eucalyptus wandoo*, which have a lower minimum DBH ($\geq 300\text{mm}$) required for potential hollow forming and this would possibly increase the sample size. In contrast, all other eucalypts (aside from Powderbark) have a minimum DBH of $\geq 500\text{ mm}$. However, this is partially explainable by the slightly lower number of PHTs per hectare observed in the Wandoo woodland, and that Wandoo is considered a hardwood which takes longer to form hollows. Generally (dependent on the species), hollow formation can take a minimum of 120-150 years in trees such as Jarrah, Marri and Wandoo, however suitable hollows for fauna like black cockatoos can take significantly longer. The *Eucalyptus* woodland on valley floors recorded a substantially lower average number of 2.0 hollows/ha; however, this may be the product of a comparably lower sample size resulting in both a non-representative sample of the habitat type and a larger margin of error, despite being surveyed proportionally more than other habitats.

Extrapolating the results of the survey, it is estimated that 25,133 hollows occur within the Newmont study area (Table 5-15) of which 17,537 occur within the Offset area (this survey) and 346 in the Waste dump expansion area. While this is an estimate, it is likely to differ from the true representation of the Newmont study area due to the Heathland, *Melaleuca* shrubland and Pine plantation habitats not being sampled. However, these habitats are expected to contribute a substantially lower number of PHTs and number of hollows compared to other eucalypt-dominant habitat types. A large proportion of the hollow-bearing PHTs assessed within the Newmont study area are likely unsuitable for black cockatoo nesting based on the nesting requirements for the species.

Table 5-14 Total numbers of hollows recorded per eucalypt species

Tree species	Trees with hollows (#)	Hollows (#)
Jarrah	166	231
Marri	12	12
Wandoo	11	19
<i>Eucalyptus</i> sp.	21	24
Powderbark	3	4
Salmon Gum	0	0
Total	213	290

Table 5-15 Total and extrapolated numbers of hollows recorded in the Newmont study area, by habitat type

Habitat type Vegetation code (Mattiske 2024)	Survey area				Number of hollows					% of habitat type surveyed in Newmont study area	% of habitat type surveyed in Offset area (this survey)	% of habitat type surveyed in Waste dump expansion area
	Surveyed area (ha)	Total area (ha) within Newmont study area	Total area (ha) within the Offset area (this survey)	Total area (ha) within the Waste dump expansion area	Total surveyed (#)	Hollows/ha	Newmont study area extrapolated	Offset area (this survey) extrapolated	Waste dump expansion area extrapolated			
Wandoo woodland (G5, L, M, MG, Y, YG)	22	2,080.9	1,611.9	NA	126	5.7	11,861.1	9,187.8	NA	1.1	1.4	NA
Pine plantation (PL, PL – Ag)	0	0.1	0.0	NA	0	NA	NA	NA	NA	0.0	NA	NA
<i>Melaleuca</i> shrubland (A, A2)	0	43.7	30.5	NA	0	NA	NA	NA	NA	0.0	NA	NA
Jarrah/Marri/ <i>Allocasuarina</i> woodland (G4, PS, PW, S, SP, ST)	8	651.4	320.3	59.7	46	5.8	3,778.1	1,857.7	346.3	1.2	2.5	13.4
Jarrah/Marri woodland (AD, D, DG, H, H2, HG, M2, Z, SW)	16	1,311.2	888.2	NA	110	6.9	9,047.3	6,128.6	NA	1.2	1.8	NA
Heathland (G1, G2, G3)	0	24.1	21.6	NA	0	NA	NA	NA	NA	0.0	NA	NA
<i>Eucalyptus</i> woodland on valley floors (AX, AY)	4	223.2	181.2	NA	8	2.0	446.4	362.4	NA	1.8	1.8	NA
Total	50	4,341.6	3,053.7	59.7	290	Av. 5.1	25,132.9	17,536.6	346.3	5.3	7.5	13.4

5.2.5.4 Hollow use evidence

Of the 213 trees with hollows (amounting to 290 hollows), none showed evidence of hollow use by cockatoos or other vertebrate fauna during the initial inspection in September, and none appeared to be occupied. Ninety-seven PHTs with prospective hollows were further inspected with a pole camera during subsequent surveys in November, none of which showed signs of use.

Fourteen ANH and 6 NNH were opportunistically inspected during the survey, including in the Newmont and Worsley study areas. Of the 11 NNH/ANH that occurred in the Newmont study area, none showed evidence of occupancy or use by black cockatoos or any other fauna. A large proportion of the ANH sampled were in suboptimal condition. If additional ANH are intended to be installed as part of Newmont's offset strategy, it is advised to adopt the current recommended DBCA designs.

Nest01 (Figure 5-14), located approximately 2.8 km west of the Newmont study area in the Worsley study area, showed evidence of chewing around the hollow entrance, despite no occupancy. Hollow activity was last documented in September 2020 when an unspecific White-tailed Black Cockatoo (likely Carnaby's Cockatoo based on breeding range and historical usage) emerged after knocking. A Forest Red-tailed Black Cockatoo fledgling was opportunistically recorded at site Opp15 in November, approximately 3.4 km west-southwest of the Newmont study area in the Worsley study area, adjacent to Sidings Road. The fledgling was accompanied by an adult female perched above in the canopy. ANHs Nest02 and Nest09 are located near to the record and the animal sighted may have fledged from one of these.

5.2.5.5 Habitat quality assessment

5.2.5.5.1 Foraging

The foraging habitats differ slightly between species of black cockatoo. Carnaby's Cockatoo will forage in native shrubland, kwongan heathland and woodland, primarily on seeds, flowers and nectar of native proteaceous plant species (*Banksia* spp., *Hakea* spp. and *Grevillea* spp.), among other vegetation including Marri and also the seeds of introduced species such as *Pinus* spp. In comparison, Baudin's Cockatoo primarily forages on the seeds of Marri, on native proteaceous plant species (for example, *Banksia* spp. and *Hakea* spp.) and introduced species such as *Pinus* spp. The Forest Red-tailed Black Cockatoo forages primarily on the seeds of Jarrah and Marri, *Allocasuarina* cones, Wandoo, and Blackbutt, among other fruits and introduced species (DAWE 2022).

Based on the known values within the Newmont study area, the habitat scoring tool (DAWE 2022) suggests that the Newmont study area is of high quality for all 3 species of black cockatoo (Table 5-16). Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo scored the highest due to the high number of records through the desktop search extent, and the known breeding range occurring within 12 km of the Newmont study area, as stipulated in DAWE (2022). Baudin's Cockatoo achieved a slightly lower score given the known breeding range (DAWE 2022) is not within 12 km of the Newmont study area.

Most of the major habitat types within the Newmont study area, including the Offset area (this survey) and Waste dump expansion area, contain known foraging species, including Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), *Banksia* spp., *Allocasuarina* spp. and *Hakea* spp. *Melaleuca* shrubland is the only habitat type that does not contain known foraging species, as per Matiske (2024) vegetation mapping. However, it is likely some occur due to the narrow breadth of the habitat type, and it is flanked by native habitat types which are rich in known foraging species. A small portion of Pine plantation occurs in the Newmont study area (outside of the Offset area – this survey), which will likely provide a suitable foraging habitat for Carnaby's Cockatoo and Baudin's Cockatoo which are known to forage on exotic *Pinus* spp.

Given the above, we can extrapolate from the areas of native vegetation within the Newmont study area, that approximately 4,334.5 ha of high-quality native foraging habitat is present in the Newmont study area, with 3,053.7 ha occurring in the Offset area (this survey) and 59.7 ha in the Waste dump expansion area (Table 5-17).

No low-quality foraging habitat occurs throughout the Newmont study area. However, areas of low-quality foraging occur nearby in the Worsley study area, represented by Rehabilitated areas which, when mature, produce forage resources that may be a valuable source of nutrition. Exotic foraging habitats (represented by Pine plantations) occupy 0.1 ha of the Newmont study area, with none occurring in the Offset area (this survey) or Waste dump expansion area. A total of 7.1 ha in the Newmont study area and 5.4 ha in the Offset area (this survey) is cleared land, which is of negligible foraging value. There may still be isolated foraging plant species present in these disturbed areas.

Dieback is known from the Newmont study area. While the extent of occurrence is unknown; it does intersect a large proportion of the low-lying valleys that promote water drainage and surface runoff. A conservative approach for this habitat quality score was taken whereby it was assumed all areas may potentially be affected.

Table 5-16 Indicative black cockatoo foraging habitat quality score for the remnant native vegetation in the Newmont study area based on desktop data and field results, in accordance with DAWE (2022)

Attribute	Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black Cockatoo
Starting score	10	10	10
Foraging potential	- 0	- 0	- 0
Connectivity	- 0	- 0	- 0
Proximity to breeding	- 0 to - 2	- 0	- 0
Proximity to roosting	- 0 to - 1	- 0	- 0
Impact from significant plant disease	- 0 to - 1	- 0 to - 1	- 0 to - 1
Total score	6-10	9-10	9-10

Table 5-17 Foraging habitat coverage in the Newmont study area, including the Offset area (this survey) and Waste dump expansion area

Foraging score	Extent and % within the Newmont study area	Extent and % within the Offset area (this survey)	Extent and % within the Waste dump expansion area
High	4,334.5 ha (99.8%)	3,053.7 ha (99.8%)	59.7 (100.0%)
Low	0.0 ha (0.0%)	0.0 ha (0.0%)	0.0 ha (0.0%)
Exotic	0.1 ha (<0.1%)	0.0 ha (0.0%)	0.0 ha (0.0%)
Negligible	7.1 ha (0.2%)	5.4 ha (0.2%)	0.0 ha (0.0%)

5.2.5.5.2 Breeding

Evidence of breeding by Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo occurs within the desktop search area. Breeding habitat value determination implemented by Phoenix (2021) takes into account habitat vegetation structure (contains PHTs) and whether confirmed records or evidence of breeding is present from the field survey, desktop results or state guidelines (DAWE 2022).

Approximately 4,266.7 ha (98.3%) of the Newmont study area is considered to have breeding potential for Carnaby's Cockatoo, all of which is considered high value (Table 5-18; Table 5-19).

Similarly, the Offset area (this survey) contains approximately 3001.6 ha (98.1%) of habitat with breeding potential, and the Waste dump expansion area 59.7 ha (100.0%), both of which are also considered high value (Table 5-18; Table 5-19). Carnaby's Cockatoos are known to breed primarily in Wandoo and Marri, however nesting hollows in other species such as Jarrah and Flooded Gum have been recorded (Phoenix 2015). Given Jarrah, Marri and Wandoo dominate the remnant vegetation within the Newmont study area, the majority of this vegetation is considered high-value breeding habitat for this species. No habitat assessments were undertaken within the *Melaleuca* shrubland and Heathland habitat types. However, based on the Mattiske (2024) vegetation mapping, Heathland does contain sparse eucalypt species known to be used for breeding. In combination with the exotic plantations and cleared areas, these habitats may contain isolated eucalypt trees suitable for breeding.

Forest Red-tailed Black Cockatoo breeding habitat occupies 4,266.7 ha within the Newmont study area, all of which are considered high-value breeding habitat (Table 5-18; Table 5-19). The Offset area (this survey) contains 3001.6 ha of breeding habitat, and the Waste dump expansion area 59.7 ha (100.0%), both of which are considered high value (Table 5-18; Table 5-19). The Forest Red-tailed Black Cockatoo is well known to breed within the area; however, in contrast to Carnaby's Cockatoo, it is a more opportunistic breeding species. It also has a broader breeding season with 2 peaks throughout the year (in the JAF bioregion), once from April to June and again from August to December (DAWE 2022). It also has a larger known breeding range than the Carnaby's Cockatoo.

Baudin's Cockatoo breeding habitat within the Newmont study area comprises 4,266.7 ha, all of which is considered low-value (Table 5-18; Table 5-19, Figure 5-20). Similarly, all of the breeding habitat within the Offset area (this survey) and Waste dump expansion area is considered low value, covering 3,001.6 ha and 59.7 ha, respectively (Table 5-18). The Newmont study area is outside of the known and predicted breeding area for Baudin's Cockatoo (DAWE 2022b) and as such, all of the habitat is considered low value despite predominately comprising native vegetation. Baudin's Cockatoo may nest in a range of eucalypt species including isolated trees; however, generally nest in forest and woodland in the hollows of Karri, Marri, Jarrah, Wandoo, Bullich and Tuart (DAWE 2022).

Of the 30 ANHs installed within and around the Newmont study area which were monitored from 2012-2022, no evidence of breeding has been recorded (see section 5.1.2.2). Three of these nest boxes are located within 200 – 400 m of a confirmed Carnaby's natural nest hollow (Nest01), and a further 6 within 1.5 km of a confirmed breeding location. The confirmed Carnaby's nest hollow has had low breeding usage, with only one breeding attempt (in 2018) being made since 2012. Also incorporated into the monitoring program were 11 NNHs, which despite showing limited evidence of breeding, has showed some evidence of occupancy. Three of the hollows had evidence of occupancy from 2018-2022, and one hollow showed evidence of breeding in November 2020 where 2 Forest Red-tailed Black Cockatoo eggs and one chick were observed.

Table 5-18 Summary of the extent (ha) of black cockatoo breeding habitat values within the Newmont study area and Offset area (this survey)

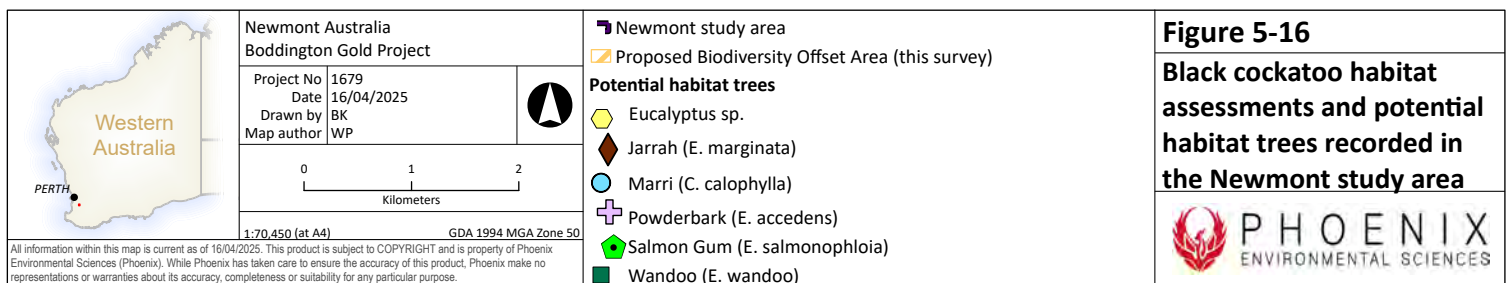
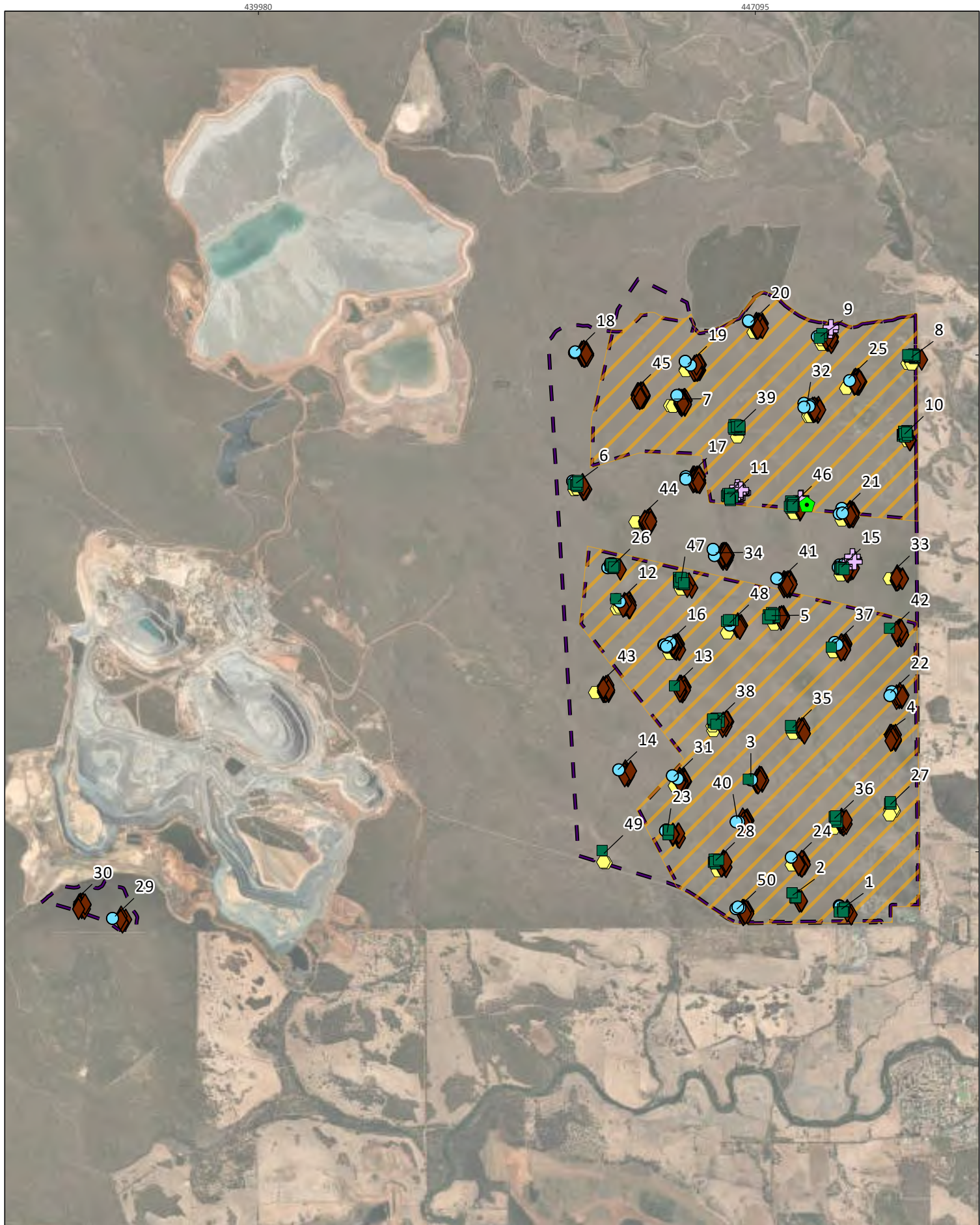
Breeding value/ species	Newmont study area			Offset area (this survey)			Waste dump expansion area		
	CC	BC	FRTBC	CC	BC	FRTBC	CC	BC	FRTBC
High	4,266.7	0.0	4,266.7	3,001.6	0.0	3,001.6	59.7	0.0	59.7
Medium	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Low	0.0	4,266.7	0.0	0.0	3,001.6	0.0	0.0	59.7	0.0
Total breeding value	4,266.7	4,266.7	4,266.7	3,001.6	3,001.6	3,001.6	59.7	59.7	59.7

Targeted significant mammal and black cockatoo survey for the Boddington Gold Project
Prepared for Newmont Australia Ltd

Breeding value/ species	Newmont study area			Offset area (this survey)			Waste dump expansion area		
	CC	BC	FRTBC	CC	BC	FRTBC	CC	BC	FRTBC
(H, M & L)									
N/A – may contain isolated trees suitable for breeding	75.0	75.0	75.0	57.5	57.5	57.5	0.0	0.0	0.0

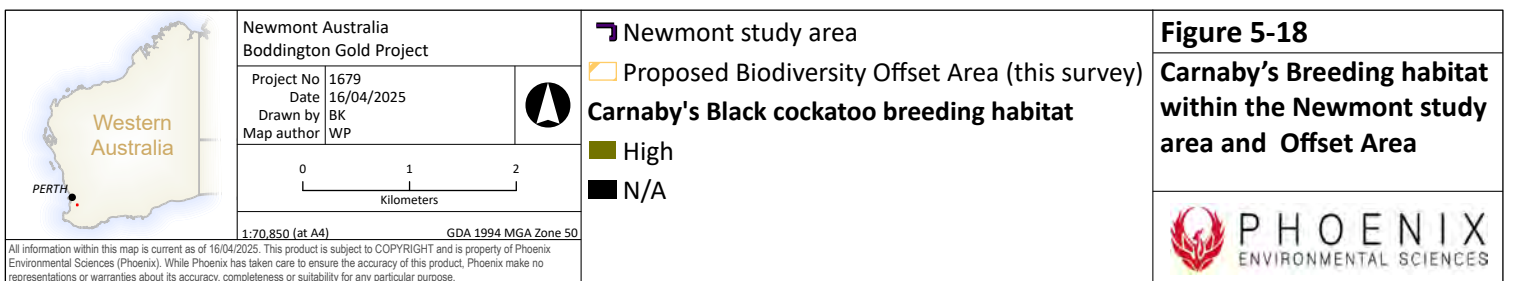
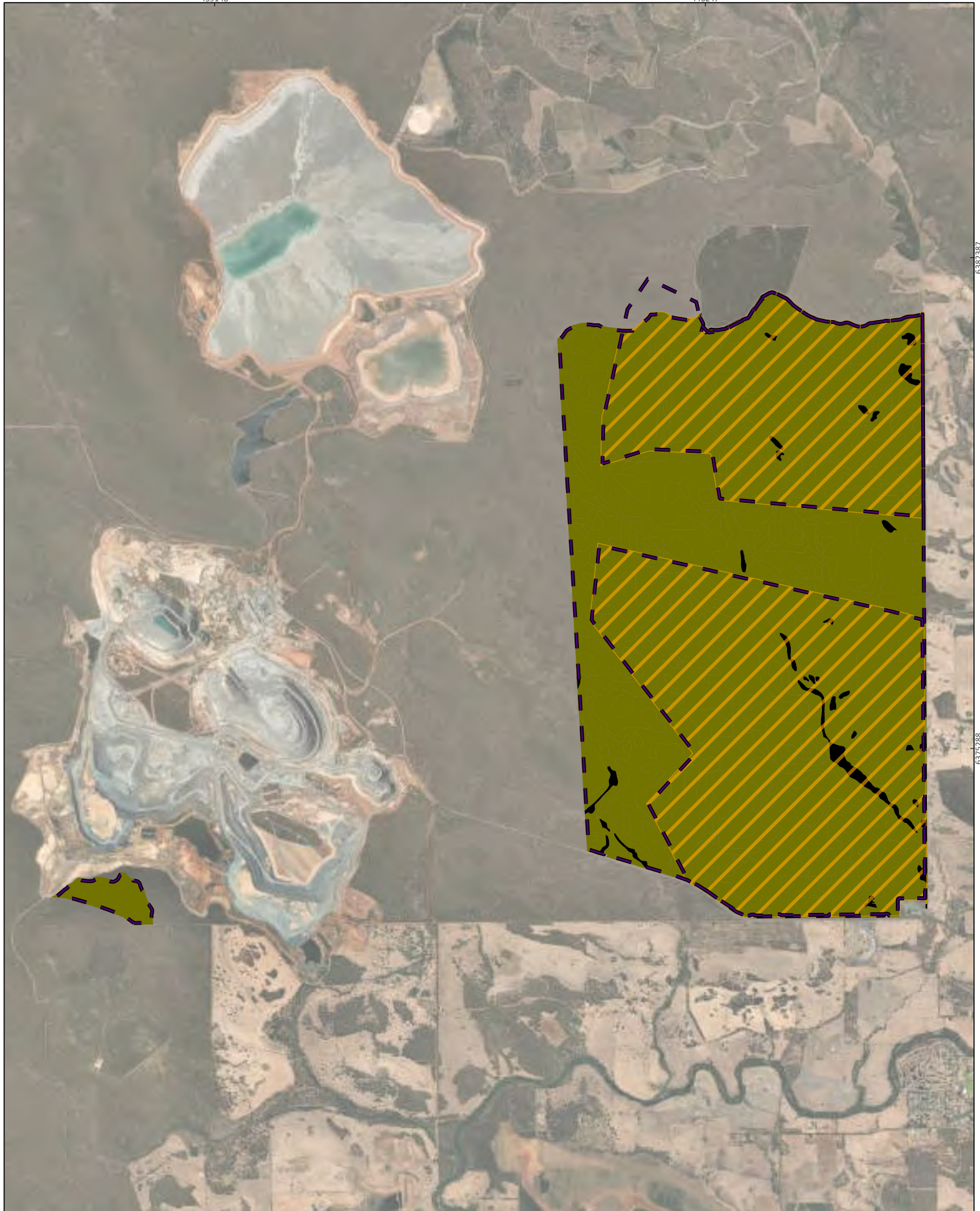
Table 5-19 Predicted breeding habitat value and extent within the Newmont study area and Offset area (this survey)

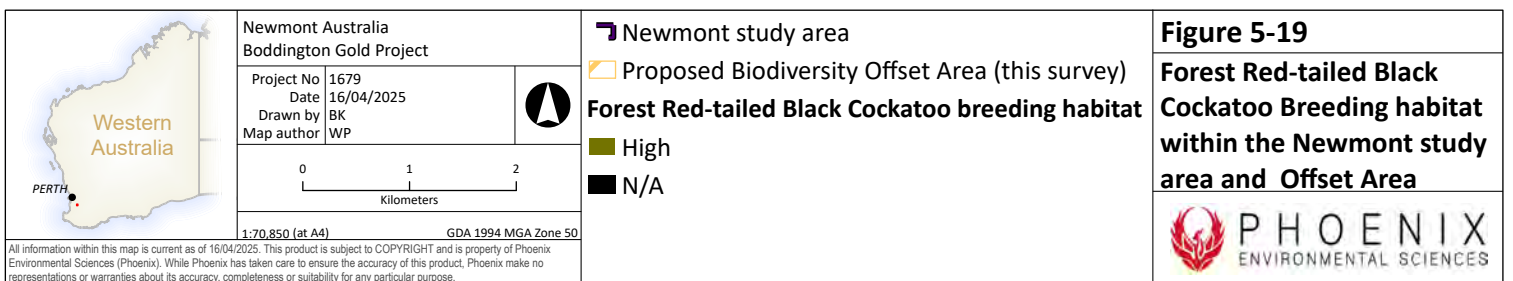
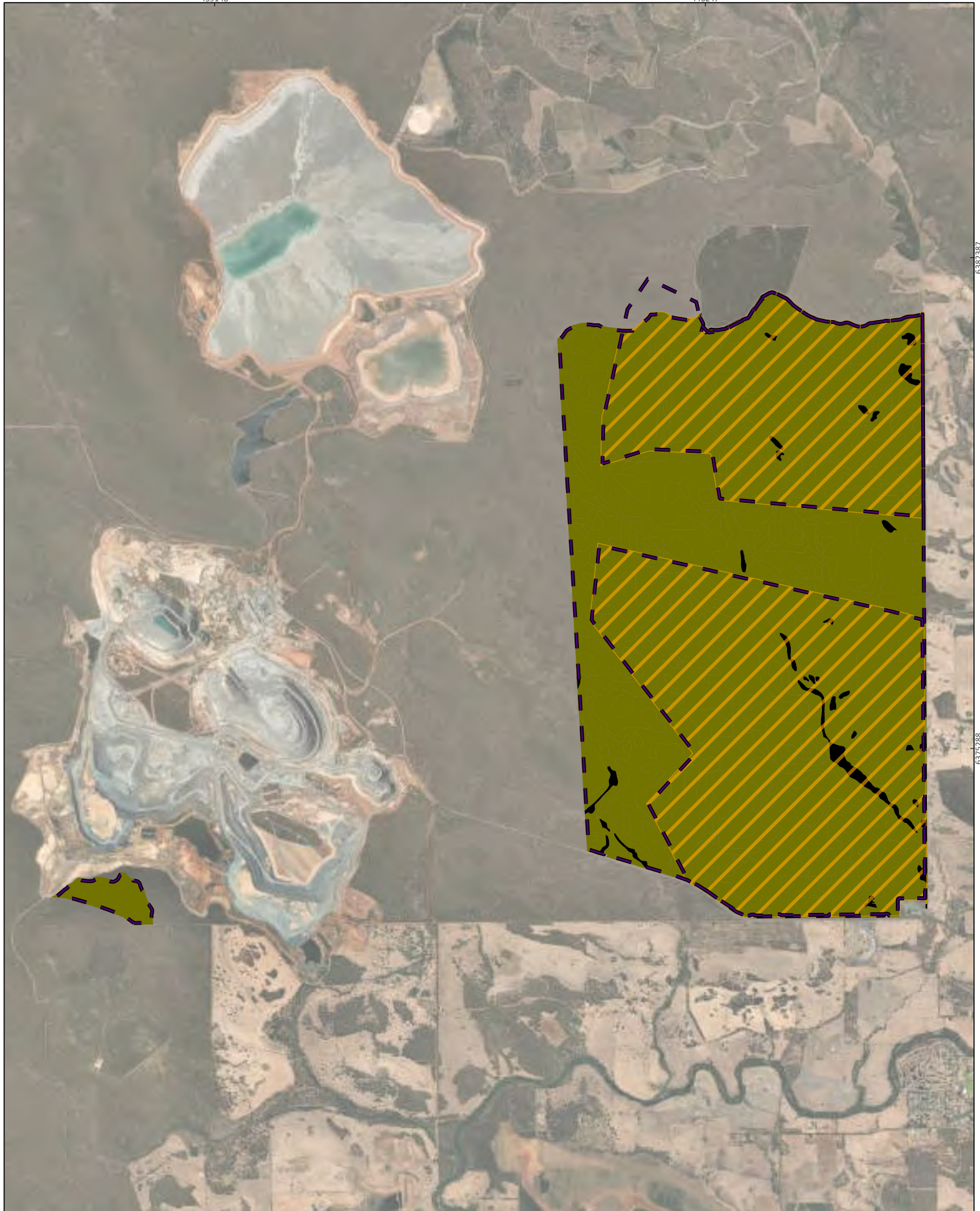
Fauna habitats (Vegetation codes, (Matisse 2024))	CC	BC	FRTBC	Extent and % within the Newmont study area	Extent and % within the Offset area (this survey)	Extent and % within the Waste dump expansion area
Wandoo Woodland (G5, L, M, MG, Y, YG)	H	L	H	2,080.9 ha (47.9%)	1,611.9 ha (52.7%)	NA
Jarrah/Marri woodland (AD, D, DG, H, H2, HG, M2, Z, SW)	H	L	H	1,311.2 (30.2%)	888.2 ha (29.0%)	NA
Jarrah/Marri/ <i>Allocasuarina</i> woodland (G4, PS, PW, S, SP, ST)	H	L	H	651.4 ha (15.0%)	320.3 ha (10.5%)	59.7 ha (100%)
<i>Eucalyptus</i> woodland on valley floors (AX, AY)	H	L	H	223.2 ha (5.1%)	181.2 ha (5.9%)	NA
<i>Melaleuca</i> shrubland (A, A2)	N/A	N/A	N/A	24.1 (0.6%)	30.5 ha (1.0%)	NA
Heathland (G1, G2, G3)	N/A	N/A	N/A	43.7 (1.0%)	21.6 ha (1.0%)	NA
Plantation (PL, PL – Ag)	N/A	N/A	N/A	0.1 (<0.1%)	0 ha (0.0%)	NA
Cleared (CI – Ag, CI – other)	N/A	N/A	N/A	7.1 ha (0.2%)	5.4 ha (0.2%)	NA
Total				4,341.6 ha (100.0%)	3,059.1 ha (100.0%)	59.7 ha (100%)

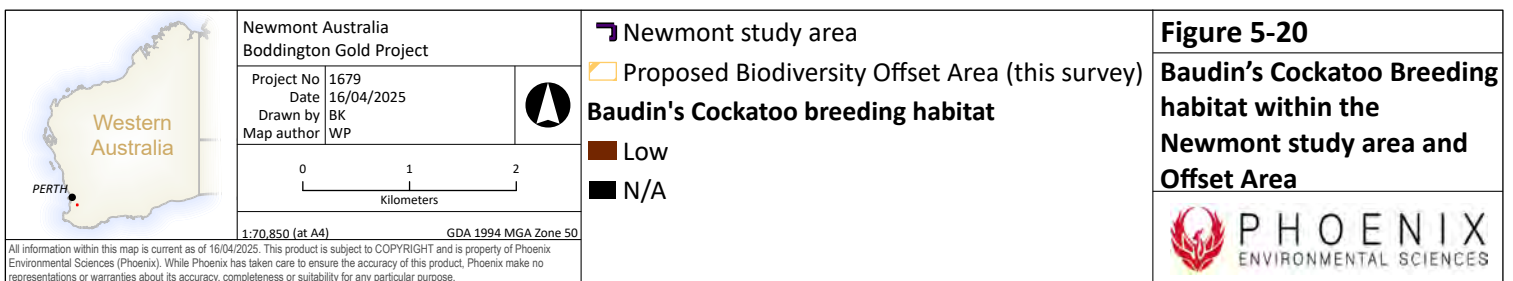
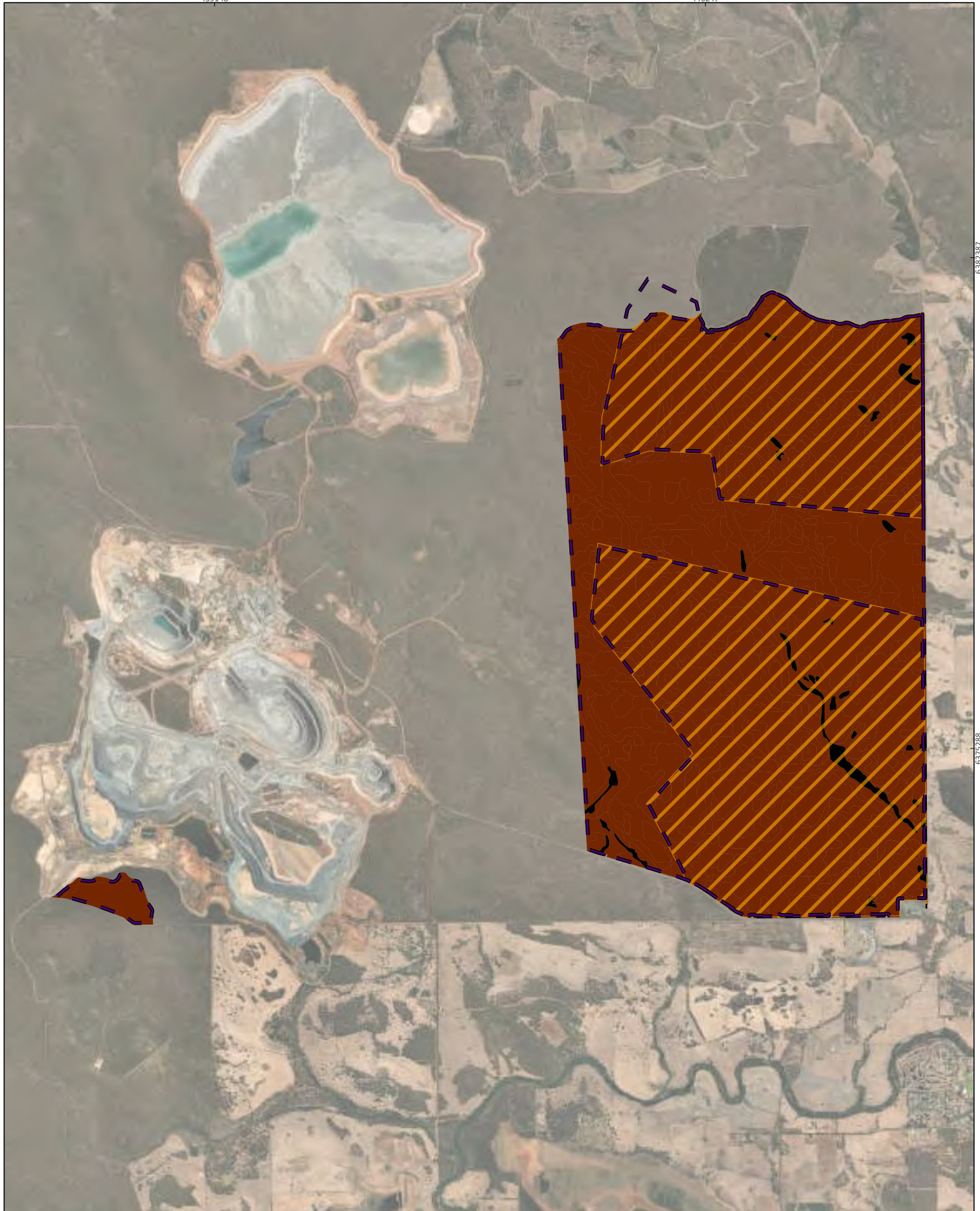




	Newmont Australia Boddington Gold Project Project No 1679 Date 16/04/2025 Drawn by BK Map author WP 0 1 2 Kilometers 1:70,850 (at A4) GDA 1994 MGA Zone 50	Newmont study area Proposed Biodiversity Offset Area (this survey) Black cockatoo foraging habitat High Exotic foraging habitat Negligible	Figure 5-17 Black cockatoo foraging habitat within the Newmont study area and Offset Area PHOENIX ENVIRONMENTAL SCIENCES
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5.3 SURVEY LIMITATIONS

The limitations of the survey have been considered in accordance with EPA (EPA 2020) and DAWE (2022) (Table 5-20).

Table 5-20 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. Some discrepancies were identified between the vegetation mapping undertaken by Mattiske (2024) and habitat observations made during the survey.
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 survey. All aspects of the scope were completed with the available data gathered during the field survey and that Newmont provided. Where limited data was collected via trapping, the comprehensive camera trapping survey supplemented the trapping survey resulting in the completed scope. The survey leveraged data from a concurrent survey undertaken for South 32, creating a more comprehensive and robust interpretation of the fauna values of the area. Newmont is still refining its offset strategy, resulting in an amendment following the field survey and some areas of the Offset area (referred to as the extended Offset area) not being sampled, however are anticipated to be surveyed in 2025.
Proportion of 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 Newmont and Worsley study area	No	There were no access limitations across the Newmont study area or combined study area. Areas surrounding the dam in the Worsley study area had limited ease of access and therefore were surveyed only using camera traps and not systematic trapping. Additionally, restricted access to the combined study area to prevent the spread of <i>Phytophthora</i> 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 (EPA 2020).
Disturbance that may have affected the results of the survey	No	No disturbance was observed which may have impacted the results of the survey.

6 DISCUSSION

6.1 FAUNA HABITATS

Seven broad-scale fauna habitat types were identified and mapped in the Newmont study area, comprising Heathland; *Melaleuca* shrubland; *Eucalyptus* woodland on valley floors; Jarrah/Marri woodland; Jarrah/Marri/*Allocasuarina* woodland; Wandoo woodland; and Pine plantation. The Worsley study area contains an additional 2 fauna habitats, Revegetated areas and Dam. A small portion of the Newmont study area was subject to disturbance, comprising land cleared for agriculture, infrastructure and access tracks. Disturbance was much more extensive across the Worsley study area from current operations.

Fauna habitats identified and mapped in the Newmont study area broadly align with those described in previous surveys for the proposed RDA2 footprint (Ecologia 2024) and previous surveys for NB by Ninnox Wildlife Consulting (2003, 2012), and are typical of the land systems which comprise the study areas (Table 5-7 cf. Table 3-1) and the broader southwest region of WA. The dominant habitats, including Jarrah/Marri woodland, Jarrah/Marri/*Allocasuarina* woodland and Wandoo woodland are widespread across the region, providing important resources for a variety of fauna. Generally, the land systems that comprise the Newmont and combined study areas are exemplified by a mosaic of forest and woodland dominated by Jarrah-Marri-Wandoo eucalypts and varying proportions of *Allocasuarina*, and are further delineated by the local topography. At the finer-scale, additional fauna habitats were identified that are associated with either the valley floors dissecting the uplands, the exposed granite formations, and modified landscapes for plantations or artificial water sources.

None of the fauna habitats mapped are restricted to the Newmont study area. A review of aerial imagery, survey literature and broad-scale vegetation mapping in the southwest of WA by Mattiske and Havel (1998) indicate habitats of limited extent within the Newmont study area (Heathland and *Melaleuca* shrubland) occur across the broader landscape, including within the proposed RDA2 footprint (Ecologia 2024) and Worsley study area. These habitats appear locally associated with the exposed granitic outcropping which is typical of the Quindanning land system in the northern and central Eastern Darling Range (Table 3-1) or spatially confined to the valley floors dissecting the uplands of the ranges, respectively. Neither of these habitat types are restricted to any one land system but rather the general landscape, surface geologies and topography of the region. The significant mammals and black cockatoos recorded in the survey may use these spatially confined habitat types for foraging and dispersal, but none are explicitly dependent on them. The only exception may be Rakali (considered possible to occur), which is regularly associated with permanent water bodies, however, tends to favour narrow, high-quality water sources (i.e. rivers and streams).

Habitats within the combined study area most likely to represent important life-history stages (e.g., breeding, dispersal, refuge and foraging) for significant fauna are those with high productivity and structural complexity, and are considered critical to the species' survival (DoE 2013). All fauna habitats in the Newmont study area serve these life-history stages and represent critical habitat for the significant fauna assemblage recorded (where applicable) and which are considered likely to occur. The Jarrah/Marri woodland, Jarrah/Marri/*Allocasuarina* woodland and Wandoo woodland provide essential habitat for recorded species such as Chuditch, Quenda, South-western Brush-tailed Phascogale, Western Brush Wallaby and Woylie, offering foraging, denning and dispersal opportunities. Some areas within these broader habitat types are of higher fauna value. For example, within the broader eucalypt-dominant habitat types, areas that have a denser shrubby understory or abundance of hollow logs are important for refuge, nesting and denning by species such as Numbat, Woylie, Quenda and Chuditch. Habitat components such as a denser canopy (i.e. woodland vs. forest) are also important for aerial screening from potential predators. Areas that

contain older-growth forests may provide a higher density of mature hollows for nesting and diurnal refuge.

An important feature of the Newmont and wider combined 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 by allowing movement between resource-rich areas, facilitating gene flow, and supporting species with large home ranges such as Chuditch. The presence of intact habitat corridors between the combined study area and adjacent forested regions is particularly valuable for arboreal species like South-western Brush-tailed Phascogale, which rely on canopy continuity for safe movement, and also Numbat which research suggests are reliant on intact vegetation corridors for dispersal.

While the majority of the Newmont study area remains suitable for fauna, historical and ongoing disturbances throughout the combined study area, 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, though they currently lack the mature canopy structure necessary for some arboreal species. Maintaining and enhancing habitat connectivity within the landscape, as well as canopy cover and moderate density understory for aerial screen, refuge, foraging and breeding resources has been recognised as critical for maintaining gene flow between spatially-isolated populations and ensuring the persistence of Threatened and other conservation significant species in the region (DEC 2012b; FitzGibbon *et al.* 2007; Pacioni *et al.* 2011; Peterson & Margaret 2025).

6.2 FAUNA ASSEMBLAGE

The desktop review identified 43 significant vertebrate taxa comprising 26 birds, 15 mammals (including one keystone species) and 2 reptiles (Appendix 3). Twenty-four of the significant species identified in the desktop review are not considered in the scope of this survey, comprising 2 reptiles and 22 birds (highlighted in grey in Table 5-2), leaving an assemblage comprising 15 mammals and 3 black cockatoos relevant to the survey. The assemblage comprises 17 state and/or nationally listed species of conservation significance and one keystone species (section 5.1.1; Table 5-2). Of the mammal assemblage, 15 of the species have contemporary distributions that intersect the location of the Newmont study area and/or are not considered EX and could therefore potentially occur (Table 5-2).

The combined study area supports a high diversity of conservation significant species, with 5 significant mammals and all 3 black cockatoo species that occur in southwest WA recorded in the field survey: Chuditch (VU, EPBC & BC Acts), Woylie (EN/CR, EPBC & BC Acts), Quenda (P4, DCBA list), South-western Brush-tailed Phascogale (CD, BC Act), Western Brush Wallaby (P4, DBCA list), Forest Red-tailed Black Cockatoo (VU, EPBC & BC Acts), Carnaby's Cockatoo (EN, EPBC & BC Acts) and Baudin's Cockatoo (EN, EPBC & BC Acts). All of these species were recorded in the Offset area (this survey), and 5 (potentially 6) were recorded in the Waste dump expansion area. All species were expected to occur based on the results of the desktop review (e.g. species distributions, desktop records and habitats).

Based on the results of the desktop review, no other conservation-significant species have been recorded inside the Newmont study area. An additional 4 significant species (relevant to the scope of work) have been recorded within 10 km of the Newmont study area: Western Ringtail Possum (CR, EPBC & BC Acts), Numbat (EN, EPBC & BC Acts), Rakali/Water Rat (P4, DBCA list) and Red-tailed Phascogale (VU/CD, EPBC & BC Acts); however, some records are either outdated or spatially confined to specialist habitats. The LOO assessment indicated 3 significant mammals are likely to occur, 4 may occur and one is unlikely to occur, based on the proximity of desktop records, fauna habitats present in the Newmont study area, the home ranges of species and the contemporary

distributions of the species (see section 4.2.3; Table 5-10). Western Rosella was also recorded during the survey; however, the species falls outside the scope of this survey and it is unknown whether the records represent the Priority 4 subspecies *Platycercus icterotis xanthogenys* as the Newmont study area occurs within the species hybridisation zone (Shipham *et al.* 2008).

The Newmont study area and wider combined study area does contain critical habitat for significant species either recorded during this survey, during previous survey efforts, or considered likely to occur as defined by state or federal legislation, conservation advice or recovery plans (refer to section 2). The Newmont study area and wider combined study area does not represent critical or important habitat to the remaining significant vertebrate species considered unlikely to occur, asides from Western Ringtail Possum which is considered unlikely to occur based on its contemporary distribution (Table 5-2). None of the significant fauna recorded are restricted (endemic) to the Newmont or combined study area. Woylie and Numbat have limited and/or isolated indigenous ranges in the Southwest. However, stronghold source populations do not intersect the Newmont or combined study area. The remaining taxa have distributions that extend outside the JAF1 subregion.

Some conservation-significant mammals were recorded in relatively high concentrations throughout the survey, such as Western Brush Wallaby (768 records in the combined study area, 364 in the Newmont study area), Woylie (707 and 671 records, respectively), and Chuditch (646 records and 546 records, respectively). These species, along with others such as Quenda (332 and 65 records, respectively) and South-western Brush-tailed Phascogale (79 records and 71 records, respectively; Table 5-9), indicate that both the Newmont and wider combined study areas provides suitable habitat with ample resources for foraging, denning, and shelter. However, these fauna may be locally concentrated in the higher quality patches of habitat which align with their niche. For example, in the Southwest, Quenda that inhabit Jarrah Forest are typically associated with watercourses, represented here by the Dam in the Worsley study area. It is therefore unsurprising that a majority of the survey records are concentrated to the west in the Worsley study area (Figure 5-8). While population estimates and modelling indicate the entire significant mammal assemblage recorded in the survey meet the industry benchmark standard of 20-50 individuals to establish a translocated population, these populations form part of a larger, more continuous population which extends beyond the boundaries of the study areas, and therefore it is not clear whether these populations would be viable and self-sustaining in isolation.

The high number of conservation significant species recorded suggests the Newmont study area, including the Offset area (this survey) and Waste rock expansion area, provides valuable habitat with structurally diverse vegetation, abundant food resources, and connectivity to surrounding ecosystems. The prevalence of species like Chuditch (in all areas) and Woylie (in the Offset area - this survey) indicates that ground-dwelling mammals are still able to persist despite the presence of introduced predators. The abundance of Western Brush Wallabies further highlights the availability of suitable vegetation for foraging.

One important consideration is that the survey effort and detection probability vary between species. For example, highly mobile species, such as the Forest Red-tailed Black Cockatoo (49 records), Baudin's Cockatoo (5 records), and Carnaby's Cockatoo (20 records), were primarily recorded opportunistically during the field survey. These species move over large areas and are highly vocal, meaning the field records may underestimate their true presence in the study area.

In contrast, introduced species were recorded far less frequently. Feral cats (4 records in the combined study area, one record in the Newmont study area), red foxes (14 and 6 records, respectively), laughing kookaburras (5 and 3 records, respectively), and rabbits (1 record, none which occur in the Newmont study area) had relatively low detection rates, suggesting that their populations may not be as locally widespread as in other disturbed environments. The number of detections of feral Pigs is on the other hand concerning, as they were detected across multiple locations. Feral pigs contribute to widespread habitat degradation (Dall 2010), whereas predatory species like cats and foxes are known to exert high predation pressure on ground-dwelling

marsupials and small mammals, particularly those in the critical weight range of ~36-5,500 g (Johnson & Isaac 2009). Although the number of foxes and cats recorded was not alarming over the total survey period, and they were recorded in substantially lower numbers compared to native significant species, their impact can be disproportionately high due to their hunting efficiency and the vulnerability of native prey species (Doherty *et al.* 2017; Legge *et al.* 2017). The absence of rabbit records suggests they are not currently a major ecological driver across the Newmont study area. However, their local presence in the surrounding landscape could provide a secondary food source for foxes and cats, indirectly sustaining predator populations. The presence of these introduced predatory species, as well as herbivorous pests, poses challenges for the long-term viability of these native mammal populations.

6.2.1 Significant mammals

6.2.1.1 Recorded species

6.2.1.1.1 Chuditch, Western Quoll (*Dasyurus geoffroii*, VU, recorded)

Chuditch are state and nationally listed as VU under the EPBC and BC Acts. Chuditch are medium-sized carnivorous marsupials and are the largest dasyurid in WA. They are predominately nocturnal but may be seasonally diurnal dependent on local conditions (DEC 2012b). Chuditch formerly ranged across approximately 70% of the continent and were considered relatively abundant; however, indigenous populations are now restricted to southwest WA and occupy approximately 5% of their former distribution (DEC 2012b; Van Dyck *et al.* 2013). Their range contraction is largely attributed to the introduction of feral predators (cats and foxes), and habitat loss (DEC 2012b).

In the Southwest, their diet primarily consisting of larger invertebrates, but smaller mammals, birds and lizards are occasionally consumed. They will also forage on the pulp surrounding *Macrozamia riedlei*, as well as around campsites and on the remains of animals killed on roads (DEC 2012b; Serena *et al.* 1991). Males have larger home ranges than females, particularly during the breeding season. Chuditch are supernumerary breeders - in the Southwest, females enter oestrous and mating occurs from late April to early July (DEC 2012b). Young are born between May and September with only 2-6 young successfully weaned over a 4-to-5-month period. The lifespan of wild Chuditch is 4 years, with the average being 2 years (Soderquist & Serena 2000). Population sex ratios are close to parity including both pouch young and breeding adults (DEC 2012b).

Chuditch are important for rebalancing local ecosystems in favour of native species, acting as an umbrella species to improve ecosystem function for the benefit of other native species (DCCEEV 2024d). They require extensive areas of structurally diverse habitat, typically occupying dry sclerophyll forests, woodlands, and riparian zones with dense ground cover for shelter (DEC 2012b, c). Habitat critical to the survival of Chuditch is defined as areas of natural vegetation where they breed, forage, use as movement corridors, and additionally areas which are currently occupied or may be potentially occupied by Chuditch (DEC 2012b). Key niche characteristics include adequate denning resources (hollow logs, burrows or rock crevices), adequate prey resources (particularly large invertebrates) and sizeable areas (>20,000 ha.) (DEC 2012b). Given these key habitat characteristics, important management practices for Chuditch have been identified as:

- retention of den logs during logging and burning operations (for denning and refuge)
- feral predator baiting programs (for cats and foxes which predate Chuditch and/or complete for food sources)
- conduct cooler and controlled prescribed burnings over areas of 2,000-4,000 ha, which are likely beneficial for maintaining prey resources and preventing uncontrolled, high-intensity bushfires
- maintain habitat corridors and linkages between larger reserves.

Chuditch are well-represented throughout the desktop search extent. Desktop data indicates a high abundance of records within and around the Newmont study area. Most records occur within the DBCA-managed lands Darling Scarp Jarrah Forest, as well throughout satellite reserves to the east. Most desktop records are concentrated around the Newmont and Worsley mining operations (including the proposed RDA2 footprint to the north), Worsley Alumina Saddleback mine to the south, and also surrounding South Dandalup Dam (Figure 5-1), some of which are likely a result of sampling bias. Desktop records range from 1899-2024, with the aggregation of records around combined study area ranging from 1965-2024.

The combined study area provides an abundance of suitable habitat for Chuditch, particularly within eucalypt-dominant habitats which offer denning and foraging opportunities. Key habitat features such as fallen logs, hollow-bearing trees, and dense understorey vegetation provide essential refuge from predators and adverse weather conditions, while rocky outcrops (predominantly granitic) and an abundance of leaf litter support a diverse prey base of invertebrates, small mammals, and reptiles. The seasonally inundated and moister habitats, and the presence of permanent water sources in the surrounding landscape, contribute to a reliable prey availability and to broader ecosystem stability. Given the species habitat preference, it is unsurprising that Chuditch were recorded from the following habitat types:

- Jarrah/Marri woodland
- Jarrah/Marri/*Allocasuarina* woodland
- *Eucalyptus* woodland on valley floors
- Rehabilitated areas
- Wandoo woodland.

These 5 habitat types comprise 4,266.7 ha (98.3%) of the Newmont study area, 3,001.6 ha (98.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 8,151.8 ha (70.0%) of the combined study area.

During these surveys, 22 individual Chuditch were captured in trapping efforts, while camera traps recorded 33 individuals from 648 independent detections (546 of which occurred in the Newmont study area; 349 from the Offset area (this survey), and 21 from the Waste dump expansion area; Table 5-8). Population estimates based on trapping data indicate a density of 1.55 individuals per hectare (95% CI: 0.80-3.00), with an estimated total population of 96 (95% CI: 47-195). In contrast, estimates from camera data suggest a density of 2.31 individuals per hectare (95% CI: 1.6-3.2) and a total population size of 60.8 (95% CI: 42.8-86.4). These differences are likely due to variations in sampling effort across camera traps. Static camera arrays were deployed for approximately 2 months, whereas mobile arrays were in place for about one month. Longer deployment periods increased the likelihood of detecting Chuditch from a greater distance, which may have inflated density estimates from camera data. Camera trapping units also allow for more than one detection per night, as opposed to cage and Elliott trapping which allows only one detection per night per trap. Furthermore, camera traps were sampling at a greater density compared to physical traps. Given the species large home range (15 km²; (DEC 2012c)), extended camera deployments provided more opportunities to lure Chuditch from beyond their immediate range, potentially exaggerating density calculations. Consequently, trapping data likely provides a more representative reflection of Chuditch density at a given time at the local scale. However, given the higher number of individuals recorded over longer camera deployments, the population estimate from camera data may better represent the overall population size within the combined study area.

Population estimates were not undertaken independently for the Newmont study area as the combined study area is considered to be form part of one continuous population extending beyond the boundaries of the study areas. However, the spread of records and number of detections between the Newmont study area (546 detections) and combined study area (648 detections) offer

insight into how they may be utilising certain areas of the study areas. Field results indicate Chuditch use the entirety of the study area however appear locally concentrated in the north of the Newmont study area and the overlap between the Newmont and Worsley study areas (Figure 5-6, Figure 5-7). Camera trapping identified 24 individuals in the Newmont study areas (21 in the Offset area – this survey). In contrast, the Waste dump expansion area recorded a lower number of camera detections (21) and only detected one individual quoll; however, this area had a reduced camera trapping effort due to the comparatively smaller size. In consideration of the absence of physically trapped individuals and the adjacent disturbance, the Waste dump expansion area likely forms part of the detected individual's ('Newt', Appendix 22) larger home range, and may have been lured from the adjacent DBCA-managed lands.

Determining whether the Newmont study area and wider combined study area supports a viable Chuditch 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 Newmont and combined study area, and its connectivity to the surrounding region, it is likely that the Chuditch population in the combined 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 in the long-term. While the Chuditch population estimates exceed this threshold at the local scale, they are likely part of a broader, interconnected population. This suggests that the combined study area supports a viable Chuditch subpopulation which may be self-sustaining, with sufficient numbers and reproductive potential to ensure long-term persistence contingent on its connectivity to the surrounding landscape.

6.2.1.1.2 Woylie, Brush-tailed Bettong (*Bettongia penicillata* subsp. *ogilbyi*, EN/CR, recorded)

Woylies are state and nationally listed as EN/CR under the EPBC and BC Acts. Woylie are small potoroid marsupials which rely on structurally complex habitats, including open forests with dense understorey and shrubland, which provide essential resources for foraging, nesting, and predator avoidance (DCCEEW 2024c). Habitat critical to the survival of Woylie (where adequate cat and fox control measures are implemented) is defined as tall eucalypt forest and woodland; dense myrtaceous shrubland; and kwongan (proteaceous) or mallee heath which is either known to be occupied by Woylies or to have the potential to be occupied by Woylies (Yeatman & Groom 2011). The presence of *Gastrolobium* thickets is also considered important for Woylies because it contains monofluoroacetic acid, the compound present in sodium monofluoroacetate in the toxin '1080'. This toxin bioaccumulates through trophic levels and reduces the number of introduced predator by secondary poisoning from the consumption of native species. Additionally, the plant genus is structurally complex such that the animals can physically hide in the thickets (Short *et al.* 2005).

Woylies were once widespread across mainland Australia, south of the tropics throughout central and southern Australian mainland and throughout the arid and semi-arid zones (TSSC 2018; Van Dyck *et al.* 2013; Yeatman & Groom 2011). They are predominately solitary animals but will occasionally share nests. Their home range varies with local population densities (15-141 ha), where higher densities generally result in smaller home range sizes (Hide 2006). Males generally have larger home ranges, and individuals have been observed moving 3-9 km (DBCA 2017c; Pacioni *et al.* 2011).

Females become sexually mature at 6 months of age and breed continuously throughout the year dependent on environmental conditions and resource availability. Similar to macropods, they exhibit embryonic diapause where an early-stage embryo refrains from implanting in the uterus. This

evolutionary breeding strategy, coupled with a weaning period of 90-100 days, allows Woylies to produce up to 3 young per year (Serventy 1970).

Woylies have been documented to forage on leaf material, seasonal fruits and berries, tubers, bark, roots and invertebrates. In southwest WA, they are predominately mycophagous, foraging extensively on hypogeous fruiting bodies of ectomycorrhizal (symbiotic) fungi (Christensen & Leftwich 1980; Lamont *et al.* 1985; Zozky *et al.* 2010). The proportion and diversity of fungi consumed is highest in autumn and winter (Zoskym K. L. *et al.* 2018). Woylie are considered important ecosystem engineers - through the excavation and ingestion of these sequestered fungal sporocarps (specialised structure which produce and release spores), they contribute to increased ecosystem health and function by dispersing and activating mycorrhizal fungal spores, thereby improving nutrient turnover and water penetration soil (Garkaklis 2001; Lamont *et al.* 1985).

The last 4 remaining indigenous Woylie populations comprise 4 genetically distinct populations located at Dryandra Woodland, Tutanning Nature Reserve, Perup and Kingston (Pacioni *et al.* 2011). These populations are considered important as they have the potential to be used as translocation source populations. Past threats which led to the decline of the species included predation by foxes and cats, habitat destruction and altered fire regimes. Large-scale baiting for foxes and translocations to baited areas resulted in dramatic population recoveries and subsequently removal from Threatened fauna lists in 1996 (Yeatman & Groom 2011). During this period, populations peaked and were estimated at >250,000 individuals across all populations. A sudden and dramatic decline in the species since 2001 in southwest WA resulted in a second review of its conservation status (Freegard 2007; Groom 2010; Wayne *et al.* 2013). Research suggests that an increase in the number of cats following sustained fox control was the most likely cause of this decline (Marlow *et al.* 2015). Other likely threats include fox predation, habitat alterations from *Phytophthora* dieback, introduced disease, inappropriate fire regimes, loss of terrestrial climatic habitat and land clearance from the agricultural and mining industries (Wayne 2006, 2008; Wayne *et al.* 2006; Yeatman & Groom 2011).

A total of 1,266 Woylie records were returned within the desktop search extent from 110 instances (Biostat 2017; DBCA 2024a, b; Ninox Wildlife Consulting 2012). Most records occur inside DBCA managed lands across the Darling Scarp Jarrah Forest, with less records in satellite reserves east of the Newmont study area (such as Dryandra Woodland and Lupton Conservation Park; Figure 5-1). Desktop records are concentrated around the Alcoa Larego mine site, southwest of the combined study area. Woylie records around current and proposed Project operations span from 1995 to 2019, with the most recent record inside the Newmont study area from 1995. Despite recent intensive survey effort at the proposed RDA2 footprint by Ecologia (2024), Woylie was not recorded but considered likely to occur.

Trapping efforts in this survey resulted in the capture of 4 individuals (no recaptures), while camera surveys recorded 691 independent detections, identifying 22 unique individuals based on home range estimates. Population estimates from camera data suggest a density of 1.7 individuals per hectare (95% CI: 1.1-2.7) and a total population estimate of 25.5 (95% CI: 16.4-39.8). This population meets the industry benchmark of 20-50 individuals required to establish a translocated population, suggesting that the combined study area supports may support a viable and self-sustaining population.

Field results indicate Woylie were most frequently detected inside the Newmont study area (671 detections), with 75.3% (505 records) of the detections originating from the Offset area (this survey). They were most commonly recorded in the overlap between the Newmont and Worsley study areas (Figure 5-11). No records of Woylie were detected in the Waste rock expansion area despite intensive camera trapping, physical trapping and targeted searches.

In the current survey, Woylies were recorded in a range of habitats:

- Wandoo woodland
- Jarrah/Marri/*Allocasuarina* woodland
- Jarrah/Marri woodland
- *Eucalyptus* woodland on valley floors.

These 4 habitat types comprise 4,266.7 ha (98.3%) of the Newmont study area, 3,001.6 ha (98.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 7,949.1 ha (68.2%) of the combined study area. Woylies will also use the *Melaleuca* shrubland and Rehabilitated areas within the combined study area.

The Newmont study area and combined 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 combined study area is likely part of a larger metapopulation extending into the surrounding landscape. The high detection rates, strong population estimates, and extensive habitat availability indicate that this population is stable and contributes to the ongoing persistence of the species in the region, however it is uncertain whether it would be self-sustainable in isolation.

6.2.1.1.3 Quenda, Southwestern Brown Bandicoot (*Isoodon fusciventer*, P4, recorded)

Quenda are state listed as a Priority 4 species under the BC Act, meaning the species is either rare, near Threatened or in need of monitoring (DBCA 2020). Quenda were formerly a subspecies of the more widely-distributed Southern Brown Bandicoot before being elevated to full species status in 2018 (Jackson *et al.* 2022). As a result, Quenda are recognised as a WA southwest endemic with their range extending from Guilderton to east of Esperance and inland to Hyden. Throughout the Swan Coastal Plain, they have a patchy distribution (DEC 2012e).

Quendas are predominately nocturnal and crepuscular but are occasionally diurnal during the cooler winter months. Their diet includes a variety of invertebrates and plant material including mycorrhizal fungi, tubers and bulbs (DBCA 2017a; Kristancic *et al.* 2017). They are opportunistic breeders mainly dependent on resources availability. Females birth up to 6 young 2 weeks post-mating, and are weaned after around 2 months (DBCA 2017a).

Quendas are habitat generalists and can persist in a variety of vegetation types, particularly areas with dense understory which they use for refuge and constructing nests. Such habitats include swamps, Banksia and Jarrah woodlands. They are also frequent visitors of urban and suburban bushlands, parks and backyards (DBCA 2017a). Quendas are ecosystem engineers, playing an important role in maintaining ecosystem health. Their distinctive conical-shaped digs alter the physical surroundings of environments, improve soil quality by increasing local water infiltration, increase the capture and breakdown of organic matter, and ultimately improve the resource availability and survivability for plants and animals (Kristancic *et al.* 2017). Estimates indicate individual Quenda dig around 45 holes per day while foraging and displace up to nearly 4 tonnes of soil annually (Kristancic *et al.* 2017). Quenda also serve as important dispersers of fungi spores which form symbiotic-relationships with the root systems of eucalypts, contributing to nutrient and water uptake, as well as effectively reduce the available fuel-load for bushfires (Kristancic *et al.* 2017).

Since European settlement, Quenda have undergone major range contractions to mesic coastal and forest zones (Short 2024). They are threatened by several factors including habitat loss, predation from the foxes and cats, and increased fire frequency that reduces understory density (Short 2024). Key recovery actions include broad-scale fox and cat control and reintroductions (Short 2024).

Quendas are well-represented within the desktop search extent, with a total of 317 records identified through database searches and previous survey efforts. A large number of these records are situated around the Newmont mining operations, the proposed RDA2 footprint and the Offset

area (this survey; Figure 5-1). Remaining records occur in pockets throughout the Darling Range Jarrah Forest, the Worsley Alumina Saddleback mine, satellite reserves to the east of the Darling Scarp, and throughout the intervening agricultural landscape.

Trapping efforts captured 3 individual Quenda, while camera traps recorded 319 independent detections, identifying 56 unique individuals based on home range estimates. Population estimates derived from camera data suggest a density of 1.4 individuals per hectare (95% CI: 0.8-2.5) and a total estimated population of 31 (95% CI: 18.6-51.9).

The discrepancy between trapping and camera survey results is most likely a result of the cryptic nature of Quenda, which makes them less susceptible to capture in standard trapping methods (Valentine 2021). Camera trapping provides a more reliable measure of activity and population size as it allows for continuous monitoring over extended periods. Furthermore, there was a noticeable disparity in Quenda detections between study areas, with less than 20% (65 records) of the detections inside the Newmont study area (66.2% of which occurred inside the Offset area – this survey). This asymmetrical distribution of Quenda records suggest that while the Newmont study area (inclusive of the Offset area – this survey) contains important habitat for Quenda and is utilised, the majority of the population resides in the Worsley component of the study area. This may be partially explainable by Quendas association with water courses and wetland habitat within the broader Jarrah Forest habitat, represented here by the Dam in the Worsley study area. Nonetheless, Quenda records span the length of the Newmont study area, excluding the Waste dump expansion area.

Given that Quenda are habitat generalists, it is unsurprising they were recorded in a range of habitats in the survey including:

- Wandoo woodland
- Jarrah/Marri woodland
- Jarrah/Marri/*Allocasuarina* woodland
- *Eucalyptus* woodland on valley floors
- *Melaleuca* shrubland
- Rehabilitated areas.

These 6 habitat types comprise 4,310.4 ha (99.3%) of the Newmont study area, 3,032.1 ha (99.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 8,245.5 ha (70.8%) of the combined study area.

While a formal PVA would be required to determine whether this population is self-sustaining in isolation, the presence of extensive suitable habitat and connectivity to surrounding regions suggests that Quenda within the combined study area are part of a broader regional population. Population estimates for Quenda exceed the conservation and wildlife management industry benchmark of typically 20-50 individuals to establish a new self-sufficient population (Morris 2021). However, it is important to reiterate that a large proportion of the Quenda records from the field survey were located in the Worsley study area and were more sparsely distributed throughout the Newmont study area.

6.2.1.1.4 South-western Brush-tailed Phascogale (*Phascogale tapoatafa* subsp. *wambenger*, CD, recorded)

South-western Brush-tailed Phascogales are state listed as a CD species under the BC Act, meaning the species is either rare, near Threatened or in need of monitoring (DBCA 2020). They inhabit dry sclerophyll forests and open woodlands that contain hollow-bearing trees (DEC 2012d). They are

carnivorous, primarily consuming invertebrates but are known to predate on small mammals, birds and reptiles.

South-western Brush-tailed Phascogales are well-represented within the desktop search extent. Concentrations of desktop records occur immediately around Project operations, to the south at Worsley Saddleback mine and in the surrounding reserves (Figure 5-1).

Despite no individuals being captured during physical trapping, the camera survey recorded 79 independent detections, identifying 17 unique individuals based on home range estimates. Population estimates derived from camera data suggest a density of 1.5 individuals per hectare (95% CI: 0.88-2.4) and a total estimated population of 22.7 (95% CI: 13-40). The discrepancy between trapping and camera data is unsurprising. Due to their highly arboreal and mobile lifestyle, camera traps tend to be a more effective method for detecting the species.

The population estimate derived from camera data falls within the industry benchmark of 20-50 individuals required to establish a translocated population (Morris 2021), therefore suggesting that the combined study area supports a viable, self-sustaining population. The situation of desktop records and habitat connectivity suggest the local population is part of a broader, interconnected regional population. Results from the field survey indicate almost 90% (71 of 79 detections) of South-western Brush-tailed Phascogale detections occurred inside the Newmont study area, with 69% (49 detections) of these records inside the Offset area (this survey), and 32.7% (16 detection) of records inside the Waste rock expansion area. The species was detected across the length of the Newmont study area with a higher proportion occurring in the north.

The combined study area provides important niche resources and sufficient prey availability for the species. They were recorded in several habitat types including:

- Jarrah/Marri woodland
- Jarrah/Marri/*Allocasuarina* woodland
- Wandoo woodland
- *Eucalyptus* woodland on valley floors
- *Melaleuca* shrubland
- Rehabilitated areas.

These 6 habitat types comprise 4,310.4 ha (99.3%) of the Newmont study area, 3,032.1 ha (99.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 8,245.5 ha (70.8%) of the combined study area.

Given the presence of suitable habitat and the connectivity to larger areas of forest in the region, the South-western Brush-tailed Phascogale population is likely to be self-sustaining and contribute to the long-term persistence of the species in the landscape. However, it is unsure whether the population would be self-sustaining in isolation.

6.2.1.1.5 Western Brush Wallaby (*Notamacropus irma*, P4, recorded)

The Western Brush Wallaby is a state listed Priority 4 species under the BC Act, meaning the species is either rare, near Threatened or in need of monitoring (DBCA 2020). The Western Brush Wallaby inhabits areas typified by a mosaic of open forest, woodland, and shrubland. In particular, they occur in seasonally wet flats with low grasses and open scrubby thickets, but also occasionally mallee, heathland and Karri forest (DEC 2012i).

The Western Brush Wallaby was historically common across southwest WA but has undergone significant declines since European settlement. Now, the species occurs patchily from north of Kalbarri to Cape Arid. Population declines are largely attributed to habitat clearing and

fragmentation for agriculture, and the introduction of the European fox. In areas where fox control is implemented, populations appear to increase (DEC 2012i). Few biological studies have been aimed at understanding the ecology of this WA endemic. Management actions are aimed at monitoring the abundance of the species at selected sites throughout the species range, and investigating the reasons for species decline (DEC 2012i). In 2015, a local translocation study was undertaken at Harry Waring Marsupial Reserve (Povh *et al.* 2019). Results showed males and females have a comparable home range size, and males had up to 70% overlap but maintained distance from conspecifics, reiterating their solitary nature. They appeared to favour *Banksia* woodlands within the reserve, either due to the availability of canopy cover, or the presence of understory vegetation associations that form part of their diet (Povh *et al.* 2019). Several fatalities were recorded during the study, suggesting they may be sensitive to large-distance translocations.

Western Brush Wallabies are well-represented within the desktop search extent with a near continuous spread of records throughout the DBCA forested areas, as well as surrounding Project operations and the Worsley Saddleback tree mine to the south.

Physical trapping was not attempted for this species during the field survey. Camera surveys recorded 730 independent detections, identifying 38 unique individuals based on home range estimates. Population estimates derived from camera data indicate a density of 3.9 individuals per hectare (95% CI: 2.2=4.3) and a total estimated population of 52.5 (95% CI: 38.072.6). The population estimate falls within and exceeds the industry benchmark of 20-50 individuals required to establish a translocated population (Morris 2021), suggesting that the combined study area supports a viable and self-sustaining population. However, a formal PVA would be required to determine whether the population is self-sustaining in isolation.

The Western Brush Wallaby was detected a large number of times across the combined study area (768 records), with approximately half (47.4%, 364 records) located inside the Newmont study area. Of these records, 51.6% (188 records) were located inside the Offset area (this survey), and 3.8% (14 records) inside the Waste dump expansion area. There appeared to be an asymmetrical distribution of records across the Newmont study area, with almost all records occurring in the north. The combined study area provide a connected network of suitable habitat, offering both areas of refuge, foraging habitat and movement corridors essential for the species' persistence (DEC 2012i). These habitat preferences are aligned with the field surveys, as Western Brush Wallaby was recorded in almost all habitat types including:

- Wandoo woodland
- Jarrah/Marri woodland
- Jarrah/Marri/*Allocasuarina* woodland
- *Melaleuca* shrubland
- Rehabilitated areas
- *Eucalyptus* woodland on valley floors.

These 6 habitat types comprise 4,310.4 ha (99.3%) of the Newmont study area, 3032.1 ha (99.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 8,245.5 ha (70.8%) of the combined study area.

6.2.1.2 Remaining desktop species

6.2.1.2.1 Numbat (*Myrmecobius fasciatus*, EN, Likely)

The Numbat is state and nationally listed as EN under the EPBC and BC Acts, following an upgrade in conservation status in 2015 from recommendations detailed in the 2014 Action Plan for Australian

Mammals (Woinarski *et al.* 2014). Numbats exhibit a highly-adapted and specialised diet of termites (*Isoptera* spp.), although ants will occasionally be taken (Calaby 1960; DPaW 2017a). The foraging strategy of Numbats is to intercept the deeding galleries of termites rather than termite mounds/nests. Termite galleries are exposed by excavating the upper 50 mm of substrate, along with turning over small pieces of dead wood, and scratching bark and decaying wood from fallen tree limbs, old logs and stumps (Calaby 1960; Christensen *et al.* 1984).

Numbats will use hollows and burrows for nesting at night, resting during the day and refuges when under the threat of predation. Nests have a single entrance and internal diameter of 60-80 mm filled with plant material such as grass, leaves, or shredded eucalypt bark (Christensen 1975, 1980; Christensen *et al.* 1984; Friend 1993). They can be located in hollows up to 5 m off the ground, or at ground level (DPaW 2017a). Numbats will also construct their own burrows, consisting of a single, gently sloping shaft 1-2 m long, widening out into a roughly spherical terminal chamber about 25 cm in diameter (Bester & Rusten 2009; DPaW 2017a).

Young are born in January to early February (DPaW 2017a). The female will use a number of nests in trees, fallen logs or other available burrows within her home range (DPaW 2017a). Dispersal occurs from November to early December, making this optimal survey period for detecting Numbats. Dispersal appears to occur in a straight-line trajectory and they rarely cross farmland boundaries but often establish home ranges at the boundaries at these farmland areas, indicating the interface between these farmland-forest areas act as a barrier to dispersing Numbats.

Habitat use by Numbats is sexually dimorphic and changes during the year, whereby females contract their area of movement in summer, and males in winter. Overall there is approximately one pair of established adults per 50 ha in high-quality habitat in areas where Numbats are well-established (Christensen *et al.* 1984; DPaW 2017a). The home ranges of Numbats are exclusive between individuals of the same sex.

Numbats were historically present in a range of habitats such as eucalypt forest and woodland dominated by Jarrah, Marri, York Gum and mallee (*Eucalyptus* spp.), *Acacia* woodland and *Triodia* grassland (Baker & Gynther 2023; DPaW 2017a). At Dryandra Woodland, the dominant habitat comprises brown mallet (*E. astringens*) plantations. Key habitat characteristics where subpopulations currently exist or have historically existed include:

- Presence of termites in sufficient abundance - all evidence relating to the diet of the Numbat throughout its range indicates an almost complete dependence on termites (Calaby 1960).
- Presence of eucalypt species – the majority of sites where Numbats occur and were recorded in the past are characterised by the presence of eucalypt species, thus providing logs and hollows and possibly higher termite densities. An exception to this may be the apparent existence of Numbat subpopulations in *Triodia* tussock grasslands in the arid zone, but these may have been in close proximity to woodland patches.
- Sufficient cover – adequate cover near ground level is required to provide refuge from predators. Cover may be provided by thickets or a combination of thickets, hollows logs and other fallen debris.
- Sufficient openness – although a degree of cover is required for refuge from predators, a sufficiently open understory is required for feeding sites. A combination of an open understory interspersed with thickets and hollows logs is considered ideal.

Given the niche and nesting requirements of Numbats, and the potential threats, incorporation of management practices such as the retention of logs and hollows during timber harvesting and burning operations, and implementation of introduced predator programs, are important to the conservation of the Numbat (DPaW 2017a). Retention of habitat that allows for natural expansion of the species distribution and ecological corridors linking existing subpopulations are considered

critical. All current subpopulations are considered as important and necessary for long-term survival of the Numbat (DPaW 2017a).

Numbat was not recorded during the current survey but is considered likely to occur based on the presence of suitable habitat and the proximity of recent desktop records. Unsurprisingly, a depauperated number of Numbat records were identified in the desktop search extent, represented by 55 records from 46 instances (Biologic 2023; DBCA 2024a, b; Phoenix 2024b). Most records occur northeast of the proposed RDA2 footprint in the Youraling State Forest (records range from 1960 to 2008). A cluster of records occur around the Boddington township from 2021. The nearest and most relevant record to the Newmont study area is from 2021, located >3 km west within the Newmont study area (around mining operations). Subsequent target surveys and habitat assessments undertaken by Biologic (2023) recorded evidence of Numbat and determined the area supports critical habitat elements required to support Numbat.

Despite Numbat not being recorded, the combined study area hosts an abundance of suitable habitat for Numbats in:

- Jarrah/Marri woodland
- Jarrah/Marri/*Allocasuarina* woodland
- *Eucalyptus* woodland on valley floors
- Wandoo woodland.

These 4 habitat types comprise 4,266.7 ha (98.3%) of the Newmont study area, 3001.6 ha (98.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 7,949.1 ha (68.2%) of the combined study area. It is expected that any Numbats which may occur within the Newmont study area are dispersing individuals and that it is unlikely that the Newmont study area and wider combined study area supports a viable Numbat population.

6.2.1.2.2 Honey Possum (*Tarsipes rostratus*, Keystone species, Likely)

The Honey Possum is not a state or nationally listed species under the EPBC and/or BC Acts but is considered a keystone species in the southwest of WA of public interest and charisma. The Honey Possum is a small nectivorous marsupial endemic to southwestern Australia (Baker & Gynther 2023). Due to its small size, lack of distinctive nest or refuge structures, and mainly crepuscular activity (Arrese & Runham 2002), they are difficult to detect by low-impact methods, and almost all reported survey records come from pit trapping. It is considered an important pollinator of many plant species in the region and may be a significant indicator of vegetation health and fire recovery of kwongan (Proteaceae/Myrtaceae heath) and *Banksia* woodland habitats. Feeding takes place mainly in shrubs and low trees, but movement between food plants is often at ground level. Honey possums can be highly abundant at times but fires kill most resident individuals and full recovery can take 20-25 years (Bradshaw 2014). Suitable Honey Possum habitat is generally fragmented due to land clearance and their dependent on flow-rich areas for nectar.

The Honey Possum was not detected during the current survey but is considered likely to occur based on the situation of desktop records (DBCA 2024a) (no spatial data) and the presence of suitable habitat. The lack of detections is likely a result of the survey methods employed and therefore it is unknown whether the study area supports a viable population of Honey Possums.

The combined study area contains the following suitable habitat which may be seasonally suitable Honey Possums:

- Wandoo woodland
- *Eucalyptus* woodland on valley floors
- Jarrah/Marri woodland

- Jarrah/Marri/*Allocasuarina* woodland
- Heathland.

These 5 habitat types comprise 4,290.7 ha (98.8%) of the Newmont study area, 3023.2 ha (98.8%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 7,979.2 ha (68.5%) of the combined survey area.

6.2.1.2.3 Red-tailed Phascogale (*Phascogale calura*, VU/CD, Likely)

The Red-tailed Phascogale is nationally listed as VU/CD under the EPBC and BC Acts. Red-tailed Phascogales occupy a similar ecological niche to South-western Brush-tailed Phascogales. Both species favour old-growth forests, particularly those dominated by Wandoo and *Allocasuarina* which are long-unburned with a semi-continuous canopy (DEC 2012f).

The species was not recorded during the current survey but is considered likely to occur based on the presence of suitable habitat and the proximity of recent desktop records (Table 5-10). The nearest desktop record to the Newmont study area was recorded in 2018, located 3.2 km southeast; however, there are records of the species from 2024 which occur less than 5 km from the Newmont study area.

Despite the absence of both survey and desktop records within the combined study area, an abundance of suitable habitat occurs for Red-tailed Phascogales in:

- Jarrah/Marri woodland
- Jarrah/Marri/*Allocasuarina* woodland
- Wandoo woodland
- *Eucalyptus* woodlands on valley floors.

These 4 habitat types comprise 4,266.7 ha (98.3%) of the Newmont study area, 3001.6 ha (98.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 7,949.1 ha (68.2%) of the combined study area.

While they are predominately arboreal, Red-tailed Phascogale have a preference for foraging on the ground (DEC 2012f). Therefore, it would be expected that if a viable population were present in the study areas, they would likely be detected by the baited cameras. Given the recent number of nearby records, it is possible that dispersing individuals occasionally traverse the Newmont study area or combined study area. However, the absence of detections during targeted surveys suggests that if Red-tailed Phascogales do occur, they are likely present at very low densities and do not form a viable population.

6.2.1.2.4 Western False Pipistrelle (*Falsistrellus mackenziei*, P4, Possible)

The Western False Pipistrelle is state listed as Priority 4 under the BC Act, meaning the species is either rare, near Threatened or in need of monitoring (DBCA 2020). Up until 1986, the Western False Pipistrelle was regarded as conspecific with the closely related and similar Eastern False Pipistrelle (*Falsistrellus tamminensis*) before being recognised as a distinct species. It favours wet sclerophyll forest, semi-woodland of the Southwest region, particularly old-growth forests abundant in tree hollows and stumps for roosting (ALA 2024). The majority of the records have come from Karri wet sclerophyll forest or in the high rainfall zones of Jarrah dry sclerophyll forest; it has also been recorded in Tuart forest along the Swan Coastal Plain (Baker & Gynther 2023). In areas where the species is recorded, detections are more frequent near watercourses or along tracks innervating the forest. The species roosts gregariously, and available data suggest the sexes may segregate while foraging and roosting, at least during spring and early summer.

Historically, the Western False Pipistrelle occupied a 54,000 km² area across southwest Australia, extending north nearly to Perth and eastward to the western margin of the Wheatbelt (Baker & Gynther 2023). However, the species appears to be declining in recent years, with the northern third of its range coinciding with the declining rainfall in the southwest corner of WA. Primary threats to the species are loss of roosting habitat from clearing, timber harvesting and hive establishment by feral honey bees (Baker & Gynther 2023). The Western False Pipistrelle was not detected during the field survey but is considered possible to occur based on the presence of suitable habitat and proximity of desktop records. Desktop records indicate the species has been found directly south and northwest of the combined study area at the Worsley Saddleback tree farm and north of Dwellingup, respectively. The most recent desktop record is from 2018, located <25 km northwest of the Newmont study area, whereas the nearest (from 2011) is situated 12.1 km to the east-southeast.

An abundance of suitable roosting and foraging habitat occurs in the combined study area, including:

- Jarrah/Marri woodland
- Jarrah/Marri/*Allocasuarina* woodland
- *Eucalyptus* woodland on valley floors
- Wandoo woodland.

These 4 habitat types comprise 4,266.7 ha (98.3%) of the Newmont study area, 3001.6 ha (98.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 7,949.1 ha (68.2%) of the combined study area.

The combined study area offers the necessary features to support this species. Despite this availability of suitable habitat, the absence of recent records near the combined study area and the lack of detections during the field survey suggest that a viable population is unlikely to persist within the Newmont study area. However, the study areas may occasionally support foraging or dispersing individuals.

6.2.1.2.5 Rakali (*Hydromys chrysogaster*, P4, Possible)

The Rakali is a state listed Priority 4 species under the BC Act, meaning the species is either rare, near Threatened or in need of monitoring (DBCA 2020). Rakali typically inhabit areas near permanent water sources (fresh, brackish, or marine), favouring riparian zones with areas with dense, low-lying and sufficient habitat complexity, good water quality and generally narrow water bodies.

Rakali was not detected during the field survey and is considered possible to occur based on the (limited) presence of the suitable habitat and the proximity of desktop records. However, the combined study area itself lacks an abundance of suitable Rakali habitat. Desktop records indicate the species has been recorded surrounding the combined study area, with the most recent record in 2020, approximately 12 km northwest. Historical records from 1981 exist within 3 km along the Hotham River (Phoenix 2025b).

Despite the Newmont study area occurring near to the Hotham River, it does not contain natural permanent water bodies or areas of seasonal inundation. Permanent water bodies represented by artificial and disturbed dams occur in the Worsley study area. Together, permanent water sources and seasonally inundated and/or moister habitats are marginally represented in the combined study area, covering 43.7 ha (1.0%) in the Newmont study area, 30.5 ha (1.0%) of the Offset area (this survey), none of the Waste dump expansion area and 197.8 ha (1.7%) in the combined study area.

Given the paucity of recent nearby records, the lack of detections during the survey, and the limited suitable habitat within the Newmont study area, it is unlikely that a viable Rakali population occurs.

Dispersing individuals may rarely occur near to or within the Worsley study area following substantial rainfall, however, they are far less likely to occur within the Newmont study area.

6.2.1.2.6 Western Ringtail Possum (*Pseudocheirus occidentalis*, CR, Possible)

The Western Ringtail Possum is state and nationally listed as CR under the EPBC and BC Acts. The species is patchy distributed and largely restricted to the moister south-western corner of WA, especially near coastal areas of peppermint woodland and peppermint/Tuart associations (DBCA 2017b). Western Ringtail Possums primarily inhabit 3 regions designated as critical by commonwealth legislation:

- Swan Coastal Plain, favouring peppermint (*Agonis flexuosa*) woodlands and Tuart (*E. gomphocephala*) forests.
- Southern Jarrah (*Eucalyptus marginata*) Forest zone near Manjimup lacking an abundance of peppermint.
- South Coast in a range of vegetation types including Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), peppermint woodland, thicket and riparian zones (DBCA 2017b).

The combined study area falls outside of these 3 critical regions. Habitat critical to the survival of Western Ringtail Possum is not well-understood but frequently includes high nutrient foliage availability for food, suitable structures for protection/nesting, canopy continuity to avoid/escape predation and other threats, and linkages between suitable habitat (DPaW 2017b)

The Western Ringtail Possum was not detected during the field survey and is considered possible to occur based on the situation of the suitable habitat. The species is poorly represented within the desktop search extent, with only 2 locatable records identified through database searches (DBCA 2024b). The nearest is outdated, being recorded in 1998 from the Boddington township, while the next nearest is over 30 km west of the combined study area from 2020. The paucity of desktop records and absence of records during the survey support our current knowledge concerning the species distribution.

The combined study area contains habitat which aligns with Western Ringtail Possum critical habitat, including:

- Jarrah/Marri woodland
- Jarrah//Marri/*Allocasuarina* woodland
- Wandoo woodland
- *Eucalyptus* woodland on valley floors.

These 4 habitat types comprise 4,266.74 ha (98.3%) of the Newmont study area, 3,001.6 ha (98.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 7,949.1 ha (68.2%) of the combined study area. Given the absence of field records and knowledge concerning the species distribution, the Newmont study area and wider combined study area are unlikely to support a viable, self-sustaining population of Western Ringtail Possum.

6.2.1.2.7 Quokka (*Setonix brachyurus*, VU, Possible)

The Quokka is state and nationally listed as VU under the EPBC and BC Acts. Quokkas typically inhabit dense riparian vegetation, heath, shrublands, swamps and forest (DCCEEW 2024b). Habitat critical to the survival of the Northern Jarrah Forest Quokka subpopulation includes *Taxandria linearifolia* swamps, and areas of natural vegetation where the understorey is sufficiently thick and complex to provide a predation refuge close to more open, recently burned vegetation which is used as a food source (DEC 2013; Hayward *et al.* 2008).

Quokka was not detected during the field survey and is considered possible to occur based on the presence of the suitable habitat and nearby desktop records. Quokkas are well-represented within the desktop search extent, predominately to the west throughout the Darling Scarp Jarrah Forest. The nearest and most relevant record is situated 15 km west from 2020, whereas the most recent desktop record is from 2023, located >20 km northwest of the combined study area.

The combined study area contains ample suitable habitat for Quokkas, including:

- Wandoo woodland
- Jarrah/Marri woodland
- *Eucalyptus* woodland on valley floors
- Rehabilitated areas
- *Melaleuca* shrubland
- Jarrah/Marri/*Allocasuarina* woodland.

These 6 habitat types comprise 4,310.4 ha (99.3%) of the Newmont study area, 3,032.1 ha (99.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 8,245.5 ha (70.8%) of the combined study area. Given the availability of suitable habitat, the absence of detections during the field survey, and the proximity of desktop records, it is unlikely that the Newmont study area and wider combined study area supports a viable, self-sustaining Quokka population.

6.2.1.2.8 Tammar Wallaby (*Notamacropus eugenii*, P4, Possible)

The Tammar Wallaby is a state listed Priority 4 species under the BC Acts. It was formerly distributed across southwest WA from Kalbarri National Park to Cape Arid. Currently, the species is known from several islands including from Houtman Abrolhos group and near Perth, and at least 9 mainland sites including nearby at Dryandra Woodland and Boyagin Nature Reserve (DEC 2012g). It inhabits several habitats characterised by dense vegetation due to its requirement for daytime sheltering such as coastal scrub and heath, dry sclerophyll forest and thickets in mallee and woodland, as well as open grassy areas for foraging (DEC 2012g).

The Tammar Wallaby was not detected during the field survey but is considered possible to occur based on the presence of the suitable habitat. No locatable records of the species were identified in the desktop search extent; however, Bamford (2004) recorded a single specimen near Project operations in 2004.

The combined study area contains ample suitable habitat for the Tammar Wallaby, including:

- Jarrah/Marri/*Allocasuarina* woodland
- Wandoo woodland
- *Eucalyptus* woodland on valley floors
- Rehabilitated areas
- *Melaleuca* shrubland
- Jarrah/Marri woodland.

These 6 habitat types comprise 4,310.4 ha (99.3%) of the Newmont study area, 3,032.1 ha (99.1%) of the Offset area (this survey), 59.7 ha (100.0%) of the Waste dump expansion area and 8,245.6 ha (72.7%) of the combined study area. Given the availability of suitable habitat, the absence of detections during the field survey and the proximity of (non-locatable) desktop records, it is unlikely the Newmont study area and wider combined study area supports a viable the Tammar Wallaby population.

6.2.2 Black cockatoos

6.2.2.1 Habitats

Seven broad-scale fauna habitats were identified and mapped inside the Newmont study area (see section 6.1, and Table 5-7). An additional 2 fauna habitats were identified in the Worsley study area, however, were not surveyed. Each fauna habitat within the Newmont study area was intended to be surveyed proportionally for equal and representative sampling; however, minor discrepancies in fauna habitats reattributed from the Mattiske (2024) vegetation mapping and field survey observation, resulted in non-equal sampling of habitats (Table 5-20).

6.2.2.2 Black cockatoo records

Forest Red-tailed Black Cockatoo was the most frequently observed species recorded during the survey, detected at 44 sites inside the Newmont study area. Evidence comprised foraging evidence, direct sightings and calling. Carnaby's Cockatoo records were much fewer being recorded at 7 sites from direct sightings, calling and foraging evidence. Records of Baudin's Cockatoo were fewest which was recorded at 4 sites from direct sighting and foraging evidence.

The results of the survey align with the results of the desktop review and our knowledge concerning the species in the JAF01 subregion. The Forest Red-tailed Black Cockatoo and Carnaby's Cockatoo were expected to occur in higher abundance based on the breeding and wider distributions of the species. The Baudin's Cockatoo was expected to occur less frequently due to the breeding range not intersecting the desktop search area and occurring on the boarder of the species broader distribution.

6.2.2.3 Potential habitat trees

A total of 1,169 PHTs were surveyed across 50 ha, allowing for the extrapolation of PHT density within sampled habitat types found inside the Newmont study area. The data gathered from the field survey estimated a total number of PHTs across the Newmont study area of 101,408 trees. Given the discrepancies in fauna habitats derived from desktop vegetation assemblages (Table 5-6 cf. Table 5-20), and the disproportionate sampling of fauna habitats resulting in marginal sampling bias, the extrapolated number of PHTs across the Newmont study area may vary. Heathland, *Melaleuca* shrubland and Pine plantation were not sampled during the survey but are considered lower breeding value compared to the eucalypt-dominant habitats. However, considerable survey effort was expended over a small area, therefore placing higher confidence on the overall PHT density of the Newmont study area.

Wandoo woodland was the highest surveyed habitat in the Newmont study area, represented by 1,100 ha, followed by Jarrah/Marri woodland (800 ha), Jarrah/Marri/*Allocasuarina* woodland (400 ha) and *Eucalyptus* woodland on valley floors (200 ha). The highest density of PHTs across the Newmont study area was Jarrah/Marri woodland with an estimates 27.4 trees per hectare, followed by Wandoo woodland (24.3 trees per hectare), Jarrah/Marri/*Allocasuarina* woodland (19.3 trees per hectare) and *Eucalyptus* woodland on valley floors (10.5 trees per hectare; Table 5-13).

6.2.2.4 Breeding hollows

The field survey recorded a total of 290 tree hollows in the Newmont study area (Table 5-14; Table 5-15). Of these, 97 tree hollows were marked for follow up inspection with a pole camera. None of the hollows identified from survey quadrats showed evidence of use by black cockatoos or appeared occupied by any non-target species.

All phases of the survey were conducted within the expected breeding period for Carnaby's Cockatoo (July to December). The survey was conducted within the expected breeding period for Baudin's Cockatoo; however, the Newmont study area occurs outside the presumed breeding range for the species (DAWE 2022). Forest Red-tailed Black Cockatoo breeding can occur throughout the year dependent on local conditions and resource availability, but peaks in April to June and again in August to October (DAWE 2022). Therefore, the initial black cockatoo habitat assessments were undertaken during the secondary peak in the breeding season, while inspection of potential tree hollows using the pole camera occurred outside of this period. The lack of primary or secondary breeding evidence from the extensive survey effort, in combination with the desktop monitoring results, suggest black cockatoos are unlikely using the area currently for breeding. However, results of monitoring across the Newmont study area indicate Forest Red-tailed Black Cockatoo breeding has been recorded previously in 2020 in a NNH on the southeastern boarder of the Newmont study area.

Hollow density was highest in Jarrah/Marri woodland, with a mean hollow density per hectare of 6.9 ($n = 110$). This was followed closely by Jarrah/Marri/*Allocasuarina* woodland and Wandoo woodland which had mean hollow densities of 5.8 ($n = 46$) and 5.7 ($n = 126$) hollows per hectare, respectively. Eucalypt woodland on valley floors showed the lowest average density of hollows (2.0 hollows per hectare, $n=4$), which may be the result of significantly lower over sampling effort despite being surveyed proportionally higher than other habitats. The total extrapolated number of hollows across the Newmont study area is 25,133, with an average density of 5.1 hollows per hectare. However, black cockatoos have specific nesting requirements, and it is expected that most of these hollows will not meet the necessary requirements for breeding. There is no standard number of hollow density considered acceptable for black cockatoo breeding, and it is important to consider that only a small proportion of the total survey area and habitat has been sampled, and actual densities may differ at the local scale. However, having a guide on the potential number of hollows in each hectare of habitat will assist in minimising the potential impacts of clearing, as well as assisting in the selection of artificial hollow placement and quantities.

6.2.2.5 Habitat quality assessment

Habitat critical for survival and important populations of Forest Red-tailed Black Cockatoo and Baudin's Cockatoo comprises all Marri, Karri and Jarrah forests, and woodlands and remnants in the southwest of WA receiving more than 600 mm of annual average rainfall (DEC 2007). Habitat critical to the survival of Carnaby's Cockatoo comprises (DPaW 2013): eucalypt woodlands that provide nest hollows used for breeding, together with nearby vegetation that provides feeding, roosting and watering habitat that supports successful breeding; woodland sites known to have supported breeding in the past and which could be used in the future, provided adequate nearby food and/or water resources are available or are re-established; and in the non-breeding season, the vegetation that provides food resources as well as the sites for nearby watering and night roosting that enable the cockatoos to effectively utilise the available food resources.

The results of the field survey indicate that the Newmont study area, inclusive of the Waste dump expansion area and the Offset area (this survey), contains extensive, high-quality habitat for all 3 species of black cockatoo, independent of desktop data associations which meets the definition of critical habitat for each species. A total of 4,334.5 ha of high-quality foraging habitat occurs across the Newmont study area inclusive of the Waste dump expansion area (59.7 ha) and Offset area (this survey; 3,053.7 ha). Exotic foraging habitat (represented by Pine plantation) makes up a mere 0.1 ha of the Newmont study area, none of which occurs in the Offset area (this survey). This exotic foraging habitat may provide foraging opportunities for both species of white-tailed black cockatoo but unlikely for the Forest Red-tailed Black Cockatoo. A small proportion of the area represents foraging habitat of negligible value, represented by cleared land. The overall extent and quality of black cockatoo foraging habitat is unsurprising as almost all of it the Newmont study area comprises

native vegetation of excellent condition and minimal disturbance. In accordance with DAWE (2022), the overall foraging habitat quality scores were highest for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo. These species scored a conservative 9-10 indicative foraging score, losing one point for the variable presence of dieback across the Newmont study area. The presence of dieback appears locally associated with the depressions and valleys which facilitate water runoff. In contrast, Baudin's Cockatoo scored a lower 6-10, considering not only the variable presence of dieback, but the absence of confirmed roosting and breeding locations in the desktop search area.

Similar trends in the assessment and resultant scores of breeding habitat are seen for each species of black cockatoo. All habitat surveyed during the field survey is considered high value for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo, which provide known nesting species of PHTs of suitable DBH. These habitats make up 4,266.7 ha of the Newmont study area of which 3,001.6 ha occurs in the Offset area (this survey). Habitats which were not surveyed make up 75.0 ha of the Newmont study area of which 57.7 ha occur inside the Offset area (this survey), and are expected to provide comparably lower-value breeding habitat based on the overall vegetation structure described by Mattiske (2024). All habitats surveyed are considered low-quality for Baudin's Cockatoo but of equal proportion to Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo habitat, due to the known breeding range of the species not intersecting desktop review area (DAWE 2022).

6.2.2.6 Artificial nest boxes

No evidence of Forest Red-tailed Black Cockatoo or Carnaby's Cockatoo breeding was recorded during the survey inside the Newmont study area, and no cockatoos were observed occupying any NNH or ANHs comprising the 2012-2022 Newmont nest monitoring program. However, field observations made outside the Newmont study area, in combination with desktop data, indicate both species breed within the broader JAF01 subregion and also the immediate vicinity surrounding Project operations.

Some of the primary threats to black cockatoos include nest hollow shortages due to habitat loss and degradation, competition with other hollow-nesting/utilising species (such as galahs, corellas and feral European honeybees), and lack of recruitment of new hollow-bearing trees (DBCA 2023). In areas where these hollow-bearing trees may be limited, the installation of ANHs may assist black cockatoos to breed. Examples of this include nest monitoring undertaken by Phoenix (2024a, 2025a) for the Main Roads Muchea North Offset. Carnaby's Cockatoos have strong fidelity to established breeding areas and in some cases hollows, and it takes at least 4 years for Carnaby's Cockatoo to reach sexual maturity (DCCEE 2024g). Within this offset area, Carnaby's Cockatoos have been documented occupying and breeding in the installed ANHs, indicating the birds have preferentially chosen ANH over NNH in some instances. For the most part, breeding has steadily increased over the duration of the monitoring period.

There are only a few known examples of Forest Red-tailed Black Cockatoos utilising ANHs in the southwest (DBCA 2023), however ANHs have been more successfully used with other Red-tailed Black Cockatoo subspecies in eastern Australia and it likely they could provide some value in areas where natural hollows are limited.

While ANHs are a relatively new concept for offset areas, trials indicate their success is dependent on several key factors which if not met, may require alternative conservation actions (DBCA 2023). ANH placement should consider several factors including previous breeding areas, habitat use, accessibility and artificial hollow density (DEC 2010). However, it is important to note that the retention of old and dead trees (stags) which contain suitable hollows for black cockatoos is important for breeding, and the natural replacement of hollow-bearing trees for future breeding is pivotal for the long-term survival of the species (DBCA 2023). The following core criteria determine whether a site is suitable for ANHs:

- The site is eucalypt woodland or forest within the known breeding range of the species.

- Breeding by black cockatoos is known or suspected at the site. This is important as adults typically return to their natal areas to breed. There must also be evidence that a lack of suitable available tree hollows is preventing breeding that would otherwise occur in the area.
- The ANH can be located in close proximity to adequate feeding areas (within a 12 km radius).
- The hollows are placed in secure locations and the owner/manager of these areas is supportive and willing to provide the necessary long-term security and annual maintenance the entire time that the artificial hollow(s) will be in place.
- A suitable ANH design is used.

Additionally, competition for hollows is high within populations and between different species. Female black cockatoos deter other females near their nesting sites, and therefore, ANHs need to be adequately dispersed to promote breeding success and adequate intergenerational recruitment. Land use and topography of the area should also be considered, as physically placing hollows on a tree at heights between 3 and 14 m is difficult. Ladders and cherry pickers can be difficult to use on obstructed and undulating ground. Tree selection should also favour inconspicuous locations to mitigate the threat of poaching or public interaction with nests (DEC 2010).

Where the above criteria cannot be met, alternative conservation actions include:

- protecting habitat by fencing and/or rabbit and stock control to encourage regeneration of native vegetation
- controlling competitive species, such as galahs, corellas and feral bees that may occupy hollows
- repairing old and damaged natural nesting hollows
- providing access to fresh water
- revegetating with preferred food species and nesting trees
- creating linkages of vegetation between nesting and feeding areas.

The design of ANHs has changed and developed over the years through trial and error. The ANHs opportunistically checked during the field survey are older, less optimised designs that are likely to be less attractive to black cockatoos than current designs. Any new ANH installed across the Newmont study area (in particular used for the proposed offset strategy) should meet the current design standards recommended by the DBCA. Research results show that the most effective artificial hollows are made of plastic culvert pipe, and this design is currently recommended by the DBCA.

6.3 CONCLUSION

The high number of conservation significant fauna recorded suggests that the Newmont study area, including the Offset area (this survey), as well as the wider combined study area serves as an important ecological refuge. Habitat connectivity has been recognised as a key factor in supporting viable populations of significant mammals. The maintenance of high-quality ecological corridors will assist in promoting gene flow and ecological continuity between populations in a partially fragmented landscape.

The Newmont study area (including the Offset area – this survey) provides extensive, high-quality foraging habitat of native vegetation for all 3 species black cockatoos. Despite no evidence of breeding recorded in the field survey, Forest Red-tailed Black Cockatoo and Carnaby's Cockatoo are known to breed in the JAF01 subregion and within the desktop search extent which provide ample habitat for breeding opportunities. The installation of modern ANH designs may provide additional nesting opportunities for the species.

The presence of introduced species, even in low numbers, suggests the need for ongoing management, particularly for feral pigs, foxes and cats. The control feral predators will benefit the significant mammals within the critical weight range and increase the cumulative environmental value of the area.

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Appendix 1 Survey site locations

Site name	Sample type	Latitude	Longitude
BCQ01	BCQ	-32.7791	116.4484
BCQ02	BCQ	-32.7773	116.4408
BCQ03	BCQ	-32.7619	116.4345
BCQ04	BCQ	-32.7567	116.4545
BCQ05	BCQ	-32.7413	116.4379
BCQ06	BCQ	-32.7240	116.4083
BCQ07	BCQ	-32.7132	116.4232
BCQ08	BCQ	-32.7081	116.4596
BCQ09	BCQ	-32.7051	116.4454
BCQ10	BCQ	-32.7179	116.4583
BCQ11	BCQ	-32.7258	116.4314
BCQ12	BCQ	-32.7393	116.4145
BCQ13	BCQ	-32.7501	116.4227
BCQ14	BCQ	-32.7610	116.4142
BCQ15	BCQ	-32.7348	116.4485
BCQ16	BCQ	-32.7447	116.4216
BCQ17	BCQ	-32.7231	116.4252
BCQ18	BCQ	-32.7067	116.4082
BCQ19	BCQ	-32.7085	116.4250
BCQ20	BCQ	-32.7033	116.4348
BCQ21	BCQ	-32.7278	116.4487
BCQ22	BCQ	-32.7513	116.4562
BCQ23	BCQ	-32.7691	116.4216
BCQ24	BCQ	-32.7728	116.4409
BCQ25	BCQ	-32.7105	116.4495
BCQ26	BCQ	-32.7344	116.4132
BCQ27	BCQ	-32.7657	116.4560
BCQ28	BCQ	-32.7727	116.4290
BCQ29	BCQ	-32.7795	116.3372
BCQ30	BCQ	-32.7778	116.3308
BCQ31	BCQ	-32.7619	116.4225
BCQ32	BCQ	-32.7141	116.4433
BCQ33	BCQ	-32.7359	116.4556

Site name	Sample type	Latitude	Longitude
HM-2-06	CT	-32.7639	116.3876
HM-2-07	CT	-32.7493	116.3903
HM-2-08	CT	-32.7521	116.3911
HM-2-09	CT	-32.7551	116.3912
HM-2-10	CT	-32.7581	116.3912
HM-2-11	CT	-32.7610	116.3912
HM-2-12	CT	-32.7640	116.3911
HM-2-13	CT	-32.7491	116.3947
HM-2-14	CT	-32.7521	116.3947
HM-2-15	CT	-32.7551	116.3947
HM-2-16	CT	-32.7580	116.3947
HM-2-17	CT	-32.7611	116.3947
HM-2-18	CT	-32.764	116.3946
HM-2-19	CT	-32.7492	116.3983
HM-2-20	CT	-32.7521	116.3982
HM-2-21	CT	-32.7551	116.3982
HM-2-22	CT	-32.7581	116.3982
HM-2-23	CT	-32.7611	116.3982
HM-2-24	CT	-32.7640	116.3982
HM-2-25	CT	-32.7491	116.4021
HM-2-26	CT	-32.7522	116.4018
HM-2-27	CT	-32.7551	116.4018
HM-2-28	CT	-32.7581	116.4017
HM-2-29	CT	-32.7611	116.4016
HM-2-30	CT	-32.7640	116.4017
HM-2-31	CT	-32.7522	116.4053
HM-2-32	CT	-32.7551	116.4053
HM-2-33	CT	-32.7581	116.4052
HM-2-34	CT	-32.7610	116.4052
HM-2-35	CT	-32.7640	116.4052
HM-2-36	CT	-32.7670	116.4052
HN-1-01	CT	-32.7755	116.3776
HN-1-02	CT	-32.7785	116.3776

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Site name	Sample type	Latitude	Longitude
BCQ34	BCQ	-32.7330	116.4294
BCQ35	BCQ	-32.7556	116.4409
BCQ36	BCQ	-32.7675	116.4472
BCQ37	BCQ	-32.7450	116.4474
BCQ38	BCQ	-32.7547	116.4292
BCQ39	BCQ	-32.7166	116.4331
BCQ40	BCQ	-32.7676	116.4323
BCQ41	BCQ	-32.7367	116.4391
BCQ42	BCQ	-32.7432	116.4558
BCQ43	BCQ	-32.7503	116.4111
BCQ44	BCQ	-32.7285	116.4174
BCQ45	BCQ	-32.7122	116.4167
BCQ46	BCQ	-32.7268	116.4411
BCQ47	BCQ	-32.7366	116.4239
BCQ48	BCQ	-32.7419	116.4315
BCQ49	BCQ	-32.7714	116.4125
BCQ50	BCQ	-32.7791	116.4324
NHS-1-01	CT	-32.7042	116.4057
NHS-1-02	CT	-32.7075	116.4057
NHS-1-03	CT	-32.7104	116.4056
NHS-1-04	CT	-32.7130	116.4054
NHS-1-05	CT	-32.7163	116.4057
NHS-1-06	CT	-32.7193	116.4056
NHS-1-07	CT	-32.7223	116.4055
NHS-1-08	CT	-32.7045	116.4092
NHS-1-09	CT	-32.7075	116.4093
NHS-1-10	CT	-32.7106	116.4090
NHS-1-11	CT	-32.7137	116.4093
NHS-1-12	CT	-32.7165	116.4096
NHS-1-13	CT	-32.7195	116.4089
NHS-1-14	CT	-32.7223	116.4089
NHS-1-15	CT	-32.7253	116.409
NHS-1-16	CT	-32.7046	116.4128
NHS-1-17	CT	-32.7075	116.413

Site name	Sample type	Latitude	Longitude
HN-1-03	CT	-32.7755	116.3811
HN-1-04	CT	-32.7786	116.3810
HN-1-05	CT	-32.7756	116.3846
HN-1-06	CT	-32.7786	116.3846
HN-1-07	CT	-32.7754	116.3882
HN-1-08	CT	-32.7785	116.3882
HN-1-09	CT	-32.7757	116.3916
HN-1-10	CT	-32.7786	116.3916
HS-1-01	CT	-32.7222	116.3843
HS-1-02	CT	-32.7253	116.3844
HS-1-03	CT	-32.7282	116.3844
HS-1-04	CT	-32.7312	116.3843
HS-1-05	CT	-32.7342	116.3844
HS-1-06	CT	-32.7372	116.3842
HS-1-07	CT	-32.7223	116.3879
HS-1-08	CT	-32.7252	116.3879
HS-1-09	CT	-32.7282	116.3878
HS-1-10	CT	-32.7312	116.3876
HS-1-11	CT	-32.7342	116.3878
HS-1-12	CT	-32.7372	116.3877
HS-1-13	CT	-32.7223	116.3914
HS-1-14	CT	-32.7253	116.3914
HS-1-15	CT	-32.7283	116.3913
HS-1-16	CT	-32.7312	116.3913
HS-1-17	CT	-32.7342	116.3913
HS-1-18	CT	-32.7372	116.3913
HS-1-19	CT	-32.7223	116.3949
HS-1-20	CT	-32.7253	116.3949
HS-1-21	CT	-32.7282	116.3949
HS-1-22	CT	-32.7313	116.3948
HS-1-23	CT	-32.7342	116.3948
HS-1-24	CT	-32.7372	116.3949
HS-1-25	CT	-32.7224	116.3984
HS-1-26	CT	-32.7253	116.3984

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Site name	Sample type	Latitude	Longitude
NHS-1-18	CT	-32.7106	116.4128
NHS-1-19	CT	-32.7135	116.413
NHS-1-20	CT	-32.7167	116.4126
NHS-1-21	CT	-32.7195	116.4125
NHS-1-22	CT	-32.7224	116.4126
NHS-1-23	CT	-32.7045	116.4162
NHS-1-24	CT	-32.7078	116.4168
NHS-1-25	CT	-32.7110	116.4162
NHS-1-26	CT	-32.7136	116.4161
NHS-1-27	CT	-32.7165	116.4162
NHS-1-28	CT	-32.7195	116.4160
NHS-1-29	CT	-32.7045	116.4200
NHS-1-30	CT	-32.7075	116.4202
NHS-1-31	CT	-32.7103	116.4201
NHS-1-32	CT	-32.7135	116.4199
NHS-1-33	CT	-32.7164	116.4197
NHS-1-34	CT	-32.7046	116.4233
NHS-1-35	CT	-32.7077	116.4236
NHS-1-36	CT	-32.7107	116.4232
NM-1-01	CT	-32.7078	116.4338
NM-1-02	CT	-32.7106	116.4337
NM-1-03	CT	-32.7135	116.4339
NM-1-04	CT	-32.7166	116.4338
NM-1-05	CT	-32.7197	116.4337
NM-1-06	CT	-32.7226	116.4337
NM-1-07	CT	-32.7076	116.4371
NM-1-08	CT	-32.7108	116.4373
NM-1-09	CT	-32.7136	116.4373
NM-1-10	CT	-32.7166	116.4370
NM-1-11	CT	-32.7192	116.4375
NM-1-12	CT	-32.7226	116.4371
NM-1-13	CT	-32.7077	116.4409
NM-1-14	CT	-32.7106	116.4407
NM-1-15	CT	-32.7137	116.4406

Site name	Sample type	Latitude	Longitude
HS-1-27	CT	-32.7282	116.3984
HS-1-28	CT	-32.7312	116.3984
HS-1-29	CT	-32.7342	116.3984
HS-1-30	CT	-32.7373	116.3983
HS-1-31	CT	-32.7224	116.4020
HS-1-32	CT	-32.7255	116.4019
HS-1-33	CT	-32.7283	116.4020
HS-1-34	CT	-32.7312	116.4019
HS-1-35	CT	-32.7342	116.4019
HS-1-36	CT	-32.7372	116.4019
B01	TL	-32.7040	116.4455
B02	TL	-32.7077	116.4461
B03	TL	-32.7075	116.4506
B04	TL	-32.7043	116.4508
B05	TL	-32.7046	116.4596
B06	TL	-32.7093	116.4598
B07	TL	-32.7140	116.4594
B08	TL	-32.7200	116.4589
B09	TL	-32.7246	116.4588
B10	TL	-32.7320	116.4583
B11	TL	-32.7403	116.4568
B12	TL	-32.7456	116.4585
B13	TL	-32.7527	116.4577
B14	TL	-32.7550	116.4548
B15	TL	-32.7572	116.4520
B16	TL	-32.7299	116.4494
B17	TL	-32.7353	116.4449
B18	TL	-32.7320	116.4384
B19	TL	-32.7382	116.4325
C01	TL	-32.7385	116.3905
C02	TL	-32.7377	116.3924
C03	TL	-32.7358	116.3935
C04	TL	-32.7372	116.3950
C05	TL	-32.7371	116.3985

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Site name	Sample type	Latitude	Longitude
NM-1-16	CT	-32.7167	116.4408
NM-1-17	CT	-32.7197	116.4407
NM-1-18	CT	-32.7224	116.4407
NM-1-19	CT	-32.7076	116.4445
NM-1-20	CT	-32.7107	116.4442
NM-1-21	CT	-32.7136	116.4445
NM-1-22	CT	-32.7167	116.4443
NM-1-23	CT	-32.7198	116.4444
NM-1-24	CT	-32.7224	116.4444
NM-1-25	CT	-32.7075	116.4479
NM-1-26	CT	-32.7108	116.4479
NM-1-27	CT	-32.7138	116.4478
NM-1-28	CT	-32.7166	116.4478
NM-1-29	CT	-32.7198	116.4479
NM-1-30	CT	-32.7226	116.4478
NM-1-31	CT	-32.7078	116.4513
NM-1-32	CT	-32.7107	116.4512
NM-1-33	CT	-32.7138	116.4515
NM-1-34	CT	-32.7166	116.4512
NM-1-35	CT	-32.7196	116.4515
NM-1-36	CT	-32.7227	116.4513
NM-2-01	CT	-32.7612	116.4299
NM-2-02	CT	-32.7643	116.4299
NM-2-03	CT	-32.7672	116.4299
NM-2-04	CT	-32.7701	116.4299
NM-2-05	CT	-32.7734	116.4298
NM-2-06	CT	-32.7761	116.4298
NM-2-07	CT	-32.7612	116.4333
NM-2-08	CT	-32.7641	116.4334
NM-2-09	CT	-32.7672	116.4334
NM-2-10	CT	-32.7702	116.4334
NM-2-11	CT	-32.7729	116.4333
NM-2-12	CT	-32.7762	116.4334
NM-2-13	CT	-32.7613	116.4370

Site name	Sample type	Latitude	Longitude
C06	TL	-32.7390	116.3974
C07	TL	-32.7403	116.3993
C08	TL	-32.7397	116.4021
C09	TL	-32.7388	116.4029
C10	TL	-32.7374	116.4027
C11	TL	-32.7370	116.4019
C12	TL	-32.7573	116.3858
C13	TL	-32.7598	116.3883
C14	TL	-32.7626	116.3913
C15	TL	-32.7644	116.3970
C16	TL	-32.7662	116.4023
C17	TL	-32.7653	116.4095
C18	TL	-32.7620	116.4128
C19	TL	-32.7568	116.4160
C20	TL	-32.7581	116.4176
C21	TL	-32.7607	116.4187
C22	TL	-32.7632	116.4193
C23	TL	-32.7655	116.4213
C24	TL	-32.7560	116.4211
C25	TL	-32.7565	116.4245
C26	TL	-32.7563	116.4281
C27	TL	-32.7570	116.4305
C28	TL	-32.7593	116.4336
N01	TL	-32.7004	116.4174
N02	TL	-32.6996	116.4157
N03	TL	-32.6978	116.4143
N04	TL	-32.6961	116.4123
N05	TL	-32.6951	116.4106
N06	TL	-32.6939	116.4092
N07	TL	-32.6924	116.4076
N08	TL	-32.6908	116.4062
N09	TL	-32.6911	116.4047
N10	TL	-32.6909	116.4026
N11	TL	-32.6924	116.4013

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Site name	Sample type	Latitude	Longitude
NM-2-14	CT	-32.7642	116.4369
NM-2-15	CT	-32.7672	116.4370
NM-2-16	CT	-32.7700	116.4367
NM-2-17	CT	-32.7731	116.4369
NM-2-18	CT	-32.7762	116.4369
NM-2-19	CT	-32.7613	116.4403
NM-2-20	CT	-32.7643	116.4404
NM-2-21	CT	-32.7673	116.4405
NM-2-22	CT	-32.7702	116.4405
NM-2-23	CT	-32.7732	116.4404
NM-2-24	CT	-32.7761	116.4404
NM-2-25	CT	-32.7611	116.4439
NM-2-26	CT	-32.7644	116.4441
NM-2-27	CT	-32.7673	116.4441
NM-2-28	CT	-32.7702	116.444
NM-2-29	CT	-32.7731	116.4439
NM-2-30	CT	-32.7761	116.4437
NM-2-31	CT	-32.7612	116.4476
NM-2-32	CT	-32.7640	116.4477
NM-2-33	CT	-32.7673	116.4474
NM-2-34	CT	-32.7703	116.4475
NM-2-35	CT	-32.7731	116.4475
NM-2-36	CT	-32.7762	116.4475
NS-1-01	CT	-32.7315	116.4266
NS-1-02	CT	-32.7344	116.4265
NS-1-03	CT	-32.7373	116.4266
NS-1-04	CT	-32.7400	116.4262
NS-1-05	CT	-32.7434	116.4267
NS-1-06	CT	-32.7461	116.4263
NS-1-07	CT	-32.7314	116.4304
NS-1-08	CT	-32.7343	116.4301
NS-1-09	CT	-32.7373	116.4301
NS-1-10	CT	-32.7403	116.4302
NS-1-11	CT	-32.7432	116.4301

Site name	Sample type	Latitude	Longitude
N12	TL	-32.6934	116.3996
N13	TL	-32.6949	116.3994
N14	TL	-32.6964	116.3995
N15	TL	-32.6979	116.3994
N16	TL	-32.6988	116.3995
N17	TL	-32.7001	116.3995
N17	TL	-32.7000	116.3995
N18	TL	-32.7002	116.4014
N19	TL	-32.7000	116.4027
N20	TL	-32.7004	116.4044
N21	TL	-32.7000	116.4063
N22	TL	-32.7003	116.4076
N23	TL	-32.6999	116.4097
N24	TL	-32.7000	116.4105
N25	TL	-32.7003	116.4120
N26	TL	-32.7008	116.4140
N27	TL	-32.7007	116.4152
P01	TL	-32.7007	116.4384
P02	TL	-32.7029	116.4332
P03	TL	-32.7063	116.4261
P04	TL	-32.7086	116.4234
P05	TL	-32.7131	116.4222
P06	TL	-32.7167	116.4235
P07	TL	-32.7172	116.4270
P08	TL	-32.7170	116.4295
P09	TL	-32.7188	116.4301
P10	TL	-32.7210	116.4302
P11	TL	-32.7235	116.4290
P12	TL	-32.7261	116.4294
P13	TL	-32.7292	116.4295
P14	TL	-32.7310	116.4318
P15	TL	-32.7411	116.4337
P16	TL	-32.7440	116.4377
P17	TL	-32.7502	116.4389

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Site name	Sample type	Latitude	Longitude
NS-1-12	CT	-32.7463	116.4299
NS-1-13	CT	-32.7315	116.4336
NS-1-14	CT	-32.7345	116.4335
NS-1-15	CT	-32.7374	116.4337
NS-1-16	CT	-32.7401	116.4337
NS-1-17	CT	-32.7432	116.4336
NS-1-18	CT	-32.7464	116.4334
NS-1-19	CT	-32.7314	116.4372
NS-1-20	CT	-32.7346	116.4371
NS-1-21	CT	-32.7372	116.4370
NS-1-22	CT	-32.7406	116.4368
NS-1-23	CT	-32.7435	116.4368
NS-1-24	CT	-32.7464	116.4370
NS-1-25	CT	-32.7315	116.4407
NS-1-26	CT	-32.7346	116.4407
NS-1-27	CT	-32.7374	116.4407
NS-1-28	CT	-32.7404	116.4406
NS-1-29	CT	-32.7434	116.4406
NS-1-30	CT	-32.7464	116.4404
NS-1-31	CT	-32.7316	116.4442
NS-1-32	CT	-32.7347	116.4440
NS-1-33	CT	-32.7374	116.4441
NS-1-34	CT	-32.7401	116.4442
NS-1-35	CT	-32.7435	116.4442
NS-1-36	CT	-32.7464	116.4441
NS-2-01	CT	-32.7764	116.3290
NS-2-02	CT	-32.7765	116.3322
NS-2-03	CT	-32.7766	116.3352
NS-2-04	CT	-32.7770	116.3383
NS-2-05	CT	-32.7779	116.3307
NS-2-06	CT	-32.7784	116.3338
NS-2-07	CT	-32.7788	116.3370
NS-2-08	CT	-32.7805	116.3392
HM-1-01	CT	-32.7102	116.3457

Site name	Sample type	Latitude	Longitude
P18	TL	-32.7539	116.4434
P19	TL	-32.7589	116.4440
P20	TL	-32.7594	116.4476
P21	TL	-32.7509	116.4189
P22	TL	-32.7445	116.4159
P23	TL	-32.7416	116.4124
P24	TL	-32.738	116.4071
P25	TL	-32.7364	116.4038
P26	TL	-32.7343	116.4019
P27	TL	-32.7306	116.4046
P28	TL	-32.7348	116.4080
P29	TL	-32.7333	116.4057
P30	TL	-32.7289	116.4062
P31	TL	-32.7258	116.4100
P32	TL	-32.7207	116.4161
P33	TL	-32.7203	116.4198
Q01	TL	-32.703	116.4243
Q02	TL	-32.7028	116.4215
Q03	TL	-32.7028	116.4191
Q04	TL	-32.7047	116.4161
Q05	TL	-32.7046	116.4125
Q06	TL	-32.7039	116.4103
Q07	TL	-32.7037	116.4073
Q08	TL	-32.7053	116.4043
Q09	TL	-32.7072	116.4025
Q10	TL	-32.7106	116.4016
Q11	TL	-32.7130	116.4030
Q12	TL	-32.7146	116.4066
Q13	TL	-32.7176	116.4060
Q14	TL	-32.7178	116.4030
Q15	TL	-32.7163	116.4012
Q16	TL	-32.7168	116.3985
Q17	TL	-32.7174	116.3952
Q18	TL	-32.7184	116.3937

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Site name	Sample type	Latitude	Longitude
HM-1-02	CT	-32.7132	116.3456
HM-1-03	CT	-32.7163	116.3456
HM-1-04	CT	-32.7192	116.3457
HM-1-05	CT	-32.7222	116.3456
HM-1-06	CT	-32.7251	116.3453
HM-1-07	CT	-32.7282	116.3455
HM-1-08	CT	-32.7310	116.3455
HM-1-09	CT	-32.7103	116.3494
HM-1-10	CT	-32.7131	116.3492
HM-1-11	CT	-32.7160	116.3491
HM-1-12	CT	-32.7193	116.3493
HM-1-13	CT	-32.7224	116.3492
HM-1-14	CT	-32.7251	116.3493
HM-1-15	CT	-32.7284	116.3492
HM-1-16	CT	-32.7311	116.3491
HM-1-17	CT	-32.7332	116.3671
HM-1-18	CT	-32.7183	116.3672
HM-1-19	CT	-32.7213	116.3673
HM-1-20	CT	-32.7243	116.3673
HM-1-21	CT	-32.7272	116.3671
HM-1-22	CT	-32.7303	116.3671
HM-1-23	CT	-32.7282	116.3525
HM-1-24	CT	-32.7312	116.3526
HM-1-25	CT	-32.7334	116.3708
HM-1-26	CT	-32.7183	116.3708
HM-1-27	CT	-32.7303	116.3707
HM-1-28	CT	-32.7282	116.3561
HM-1-29	CT	-32.7311	116.3562
HM-1-30	CT	-32.7334	116.3743
HM-1-31	CT	-32.7183	116.3743
HM-1-32	CT	-32.7212	116.3743
HM-1-33	CT	-32.7271	116.3744
HM-1-34	CT	-32.7303	116.3745
HM-1-35	CT	-32.7283	116.3596

Site name	Sample type	Latitude	Longitude
Q19	TL	-32.7201	116.3937
Q20	TL	-32.7217	116.3947
Q21	TL	-32.7233	116.3977
Q22	TL	-32.7227	116.4004
Q23	TL	-32.7219	116.4025
Q24	TL	-32.7207	116.4031
Q25	TL	-32.7191	116.4034
W01	TL	-32.7799	116.3388
W02	TL	-32.7789	116.3370
W03	TL	-32.7780	116.3356
W04	TL	-32.7773	116.3340
W05	TL	-32.7773	116.3324
W06	TL	-32.7782	116.3842
W07	TL	-32.7785	116.3855
W08	TL	-32.7790	116.3872
W09	TL	-32.7782	116.3884
W10	TL	-32.7765	116.3879
W11	TL	-32.7760	116.3869
W12	TL	-32.7766	116.3857
W13	TL	-32.7764	116.3841
W14	TL	-32.7708	116.3976
W15	TL	-32.7738	116.4040
W16	TL	-32.7765	116.4098
W17	TL	-32.7765	116.4133
W18	TL	-32.7789	116.446
W19	TL	-32.7801	116.4400
W20	TL	-32.7752	116.4392
W21	TL	-32.7701	116.4416
W22	TL	-32.7701	116.4491
W23	TL	-32.7705	116.4520
W24	TL	-32.7658	116.4491
W25	TL	-32.7634	116.4463
W26	TL	-32.7757	116.4537
WFP01	UR	-32.7048	116.4486

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Site name	Sample type	Latitude	Longitude	Site name	Sample type	Latitude	Longitude
HM-1-36	CT	-32.7331	116.3640	WFP02	UR	-32.7394	116.4325
HM-2-01	CT	-32.7491	116.3877	WFP03	UR	-32.7176	116.4213
HM-2-02	CT	-32.7520	116.3877	WFP04	UR	-32.7526	116.4198
HM-2-03	CT	-32.7550	116.3876	WFP05	UR	-32.7624	116.4442
HM-2-04	CT	-32.7580	116.3876	WFP06	UR	-32.7800	116.3388
HM-2-05	CT	-32.7609	116.3876	Opp11	Opp	-32.7385	116.4
Opp01	Opp	-32.7787	116.33	Opp12	Opp	-32.7369	116.39
Opp01	Opp	-32.6926	116.41	Opp13	Opp	-32.7054	116.46
Opp02	Opp	-32.7762	116.44	Opp14	Opp	-32.7768	116.38
Opp02	Opp	-32.7778	116.33	Opp15	Opp	-32.7758	116.38
Opp03	Opp	-32.7696	116.45	Opp16	Opp	-32.7776	116.33
Opp04	Opp	-32.778	116.46	Opp17	Opp	-32.7783	116.33
Opp05	Opp	-32.7875	116.37	Opp18	Opp	-32.7776	116.38
Opp06	Opp	-32.7614	116.45	Opp19	Opp	-32.7319	116.45
Opp07	Opp	-32.7052	116.46	Opp20	Opp	-32.7567	116.45
Opp08	Opp	-32.7766	116.44	Opp21	Opp	-32.7704	116.45
Opp09	Opp	-32.7413	116.44	Opp22	Opp	-32.761	116.45
Opp10	Opp	-32.7364	116.42				

CT = Camera trap; TL = Trapping location; UR = Ultrasonic recorder; Opp = Opportunistic sample. Survey sites in dark grey are located only in the Worsley study area; survey sites in light grey span across both the combined study area; survey sites not highlighted are located only in the Newmont study area.

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



Appendix 3 Significant vertebrate fauna desktop and field survey results

Species	Species	Common name	Status	Database searches					Unpublished reports								This survey	
				EPBC (2024)	NM (2024)	TFA (2024)	PESDB (2024)	BL (2024)	NWC (2003)	NWC (2012)	Biostat (2017)	Ecologic (2024)	Biologic (2024a)	Biologic (2024b)	BCE (2023)	BCE (2004)		
Birds (26)																		
Acanthizidae	<i>Aphelocephala leucopsis</i>	Southern Whiteface	VU (EPBC Act)	M														
Accipitridae	<i>Pandion cristatus</i>	Osprey	Mig. (EPBC & BC Acts)	L	1													
Anatidae	<i>Oxyura australis</i>	Blue-billed Duck	P4 (DBCA list)					10										
Apodidae	<i>Apus pacificus</i>	Fork-tailed Swift	Mig. (EPBC & BC Acts)	L														
Ardeidae	<i>Botaurus poiciloptilus</i>	Australasian Bittern	EN (EPBC & BC Acts)	K	1													
Atrichornithidae	<i>Atrichornis clamosus</i>	Noisy Scrub-bird	EN (EPBC & BC Acts)	M	43	36		16										
	<i>Falco hypoleucos</i>	Grey Falcon	VU (EPBC & BC Acts)	M														
Falconidae	<i>Falco peregrinus</i>	Peregrine Falcon	OS (BC Act)		15	19		19	✓		✓		✓		✓			
	<i>Thalasseus bergii</i>	Crested Tern	Mig. (EPBC & BC Acts)					1										
Megapodiidae	<i>Leipoa ocellata</i>	Malleefowl	VU (EPBC & BC Acts)	K	21	30												
Motacillidae	<i>Motacilla cinerea</i>	Grey Wagtail	Mig. (EPBC & BC Acts)	M														
Psittacidae	<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black Cockatoo	VU (EPBC & BC Acts)	K	638		139		✓	✓	✓	✓	✓	✓	✓	✓	✓	
	<i>Platycercus icterotis xanthogenys</i>	Western Rosella (inland)	P4 (DBCA list)		3				?			?					?	
	<i>Zanda baudinii</i>	Baudin's Cockatoo	EN (EPBC & BC Acts)	K	92	95	71	645		✓	✓	✓	✓	✓	✓	✓	✓	
	<i>Zanda latirostris</i>	Carnaby's Cockatoo	EN (EPBC & BC Acts)	K	385	407	75	449	✓	✓	✓	✓		✓		✓	✓	
	<i>Zanda sp.</i>	White-tailed Black Cockatoo	EN (EPBC & BC Acts)		79	121	7			✓							✓	
Rostratulidae	<i>Rostratula australis</i>	Australian Painted Snipe	EN (EPBC & BC Acts)	L														
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper	Mig. (EPBC & BC Acts)	L	2			4			✓							
	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	VU/Mig./Mig. (EPBC Act; BC Act)	M														
	<i>Calidris ferruginea</i>	Curlew Sandpiper	CR/Mig./CR (EPBC Act; BC Act)	L														
	<i>Calidris melanotos</i>	Pectoral Sandpiper	Mig. (EPBC & BC Acts)	M														
	<i>Limosa lapponica</i>	Bar-tailed Godwit	Mig. (EPBC & BC Acts)		1													
	<i>Numenius madagascariensis</i>	Eastern Curlew	CR/Mig./CR (EPBC Act; BC Act)	M	1													
	<i>Tringa brevipes</i>	Grey-tailed Tattler	Mig. (EPBC & BC Acts) P4 (DBCA list)		1													
	<i>Tringa nebularia</i>	Common Greenshank	EN/Mig./Mig. (EPBC Act; BC Act)					2										
Tytonidae	<i>Tyto novaehollandiae novaehollandiae</i>	Masked Owl (southwest pop.)	P3 (DBCA list)		5										✓			
Mammals (15)																		
Dasyuridae	<i>Dasyurus geoffroii</i>	Chuditch, Western Quoll	VU (EPBC & BC Acts)	K	518	557	28		✓	✓	✓	✓				✓	✓	
	<i>Phascogale calura</i>	Red-tailed Phascogale	VU/CD (EPBC Act; BC Act)	K	49	58												
	<i>Phascogale tapoatafa wambenger</i>	South-western Brush-tailed Phascogale	CD (BC Act)		83		4		✓	✓	✓				✓		✓	
Macropodidae	<i>Notamacropus eugenii</i>	Tammar Wallaby	P4 (DBCA list)													✓		
	<i>Notamacropus irma</i>	Western Brush Wallaby	P4 (DBCA list)		201	295	52		✓	✓	✓	✓			✓	✓	✓	
	<i>Setonix brachyurus</i>	Quokka	VU (EPBC & BC Acts)	K		42								✓	✓			

Species	Species	Common name	Status	Database searches					Unpublished reports								This survey
				EPBC (2024)	NM (2024)	TFA (2024)	PESDB (2024)	BL (2024)	NWC (2003)	NWC (2012)	Biostat (2017)	Ecologic (2024)	Biologic (2024a)	Biologic (2024b)	BCE (2023)	BCE (2004)	
Muridae	<i>Hydromys chrysogaster</i>	Rakali, Water Rat	P4 (DBCA list)		17						✓						
Myrmecobiidae	<i>Myrmecobius fasciatus</i>	Numbat	EN (EPBC & BC Acts)	K	38	46											
Peramelidae	<i>Isoodon fusciventer</i>	Quenda	P4 (DBCA list)		122	148	26		✓	✓	✓	✓			✓		✓
Potoroidae	<i>Bettongia lesueur graii</i>	Burrowing Bettong, Boodie	EX (EPBC & BC Acts)		3												
	<i>Bettongia penicillata ogilbyi</i>	Woylie, Brush-tailed Bettong	EN/CR (EPBC/BC Act)	K	102					✓	✓						✓
Pseudocheiridae	<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	CR (EPBC & BC Acts)	M	1	2								✓	✓		
Tarsipedidae	<i>Tarsipes rostratus</i>	Noolbenger, Honey Possum	Keystone species		63												
Thylacomyidae	<i>Macrotis lagotis</i>	Greater Bilby	VU (EPBC & BC Acts)	T.	8	8											
Vespertilionidae	<i>Falsistrellus mackenziei</i>	Western False Pipistrelle	P4 (DBCA list)		304						✓						
Reptiles (2)																	
Elapidae	<i>Acanthophis antarcticus</i>	Southern Death Adder	P3 (DBCA list)		7	4											
Scincidae	<i>Ctenotus delli</i>	Darling Range Heath Ctenotus	P4 (DBCA list)		42	42			✓	✓							

K = Known; L = Likely; M = May, Trans = Translocated population

Appendix 4 Site by species matrix A

Vernacular	Species	B01	B02	B06	B09	B10	B11	B15	B17	B18	B19	BCQ04	BCQ15	BCQ17	BCQ18	BCQ19	BCQ20	BCQ21	BCQ22	BCQ23	BCQ27	BCQ29	BCQ30	BCQ31	BCQ32	BCQ33	BCQ34	BCQ37	BCQ39	BCQ41	BCQ42	BCQ45	BCQ48	BCQ49	C03	C04	C07	C08	C10
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>																																						
Brown Goshawk	<i>Accipiter fasciatus</i>																																						
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>																																						
Dusky Woodswallow	<i>Artamus cyanopterus</i>																																						
Australian Ringneck	<i>Barnardius zonarius</i>																																						
Forest Red-tailed Black Cockatoo	<i>Calyptrorhynchus banksii naso</i>							1					1	1		1	4	1	3	1		2	1	1	1	1	2	1	1	1	1	1	1		1		1		
Rufous Treecreeper	<i>Climacteris rufa</i>																																						
Australian Raven	<i>Corvus coronoides</i>																																						
Australian Magpie	<i>Cracticus tibicen</i>																																						
Laughing Kookaburra	<i>Dacelo novaeguinea</i>																																						
Emu	<i>Dromaius novaehollandiae</i>																																						
Western Yellow Robin	<i>Eopsaltria australis griseogularis</i>																																						
Western gerygone	<i>Gerygone fusca</i>																							1															
Little Eagle	<i>Aquila morphnoides</i>																																						
Western Golden Whistler	<i>Pachycephala occidentalis</i>																							1															
Striated Pardalote	<i>Pardalotus striatus</i>															1																							
Red-capped Robin	<i>Petroica goodenovii</i>																																						
Common Bronzewing	<i>Phaps chalcoptera</i>																																						
Western Rosella	<i>Platycercus icterotis</i>																																						
Tawny Frogmouth	<i>Podargus strigoides</i>																																						
Red-capped Parrot	<i>Platycercus spurius</i>																																						
Grey Fantail	<i>Rhipidura albiscapa</i>																																						
Grey Currawong	<i>Strepera versicolor</i>																																						
Painted Button-quail	<i>Turnix varia</i>																																						
Baudin's Cockatoo	<i>Zanda baudinii</i>																											1		1		1							
Carnaby's Cockatoo	<i>Zanda latirostris</i>											2						1				1					1								1			2	
White-tailed Black Cockatoo	<i>Zanda sp.</i>	1				1			7																											1	1		2
Yellow-footed Antechinus	<i>Antechinus flavipes</i>						2				1																												
White-striped Free-tailed Bat	<i>Austronomus australis</i>																																						

Vernacular	Species	B01	B02	B06	B09	B10	B11	B15	B17	B18	B19	BCQ04	BCQ15	BCQ17	BCQ18	BCQ19	BCQ20	BCQ21	BCQ22	BCQ23	BCQ27	BCQ29	BCQ30	BCQ31	BCQ32	BCQ33	BCQ34	BCQ37	BCQ39	BCQ41	BCQ42	BCQ45	BCQ48	BCQ49	C03	C04	C07	C08	C10
Greater Long-eared Bat	<i>Nyctophilus major</i>																																						
Rabbit	<i>Oryctolagus cuniculus</i>																																						
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																						
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>																																						
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																																						
Pig	<i>Sus scrofa</i>				6																1													1					
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>																																						
Common Brushtail Possum	<i>Trichosurus vulpecula</i>						1			1																													
Southern Forest Bat	<i>Vespadelus regulus</i>																																						
Red Fox	<i>Vulpes vulpes</i>																																						
Southwestern Crevice-skink	<i>Egernia napoleonis</i>																																						
South-west Carpet Python	<i>Morelia imbricata</i>																																						
Bobtail	<i>Tiliqua rugosa</i>																																		1				
Barking Gecko	<i>Nephurus milii</i>																																						
Bungarra or Sand Monitor	<i>Varanus gouldii</i>																																						
Heath Monitor	<i>Varanus rosenbergi</i>																																						

Appendix 5 Site by species matrix B

Vernacular	Species	C11	C12	C13	C19	C23	C25	C26	C28	Delete	HM-1-01	HM-1-02	HM-1-03	HM-1-04	HM-1-05	HM-1-06	HM-1-07	HM-1-08	HM-1-09	HM-1-10	HM-1-11	HM-1-12	HM-1-13	HM-1-14	HM-1-15	HM-1-16	HM-1-17	HM-1-18	HM-1-19	HM-1-20	HM-1-21	HM-1-22	HM-1-23	HM-1-24	HM-1-25	HM-1-29	HM-1-30	HM-1-31	HM-1-32	
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>																																						1	
Brown Goshawk	<i>Accipiter fasciatus</i>																																							
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>																																							
Dusky Woodswallow	<i>Artamus cyanopterus</i>																																							
Australian Ringneck	<i>Barnardius zonarius</i>																	1																						
Forest Red-tailed Black Cockatoo	<i>Calyptrorhynchus banksii naso</i>					1	1					1		4						2		1																		
Rufous Treecreeper	<i>Climacteris rufa</i>																																							
Australian Raven	<i>Corvus coronoides</i>																					1			1	1	1	1				1							1	1
Australian Magpie	<i>Cracticus tibicen</i>																									1	1	1											1	
Laughing Kookaburra	<i>Dacelo novaeguinea</i>											1													1															
Emu	<i>Dromaius novaehollandiae</i>											1					1	1			1								1	1	1		1	1				1	1	1
Western Yellow Robin	<i>Eopsaltria australis griseogularis</i>																																							
Western gerygone	<i>Gerygone fusca</i>																																							
Little Eagle	<i>Aquila morphnoides</i>																																							
Western Golden Whistler	<i>Pachycephala occidentalis</i>																																							
Striated Pardalote	<i>Pardalotus striatus</i>																																							
Red-capped Robin	<i>Petroica goodenovii</i>																																							
Common Bronzewing	<i>Phaps chalcoptera</i>																																			1				
Western Rosella	<i>Platycercus icterotis</i>																																							
Tawny Frogmouth	<i>Podargus strigoides</i>																																							
Red-capped Parrot	<i>Platycercus spurius</i>																																							
Grey Fantail	<i>Rhipidura albiscapa</i>																																							
Grey Currawong	<i>Strepera versicolor</i>																						1					1	1		1	1	1					1	1	1
Painted Button-quail	<i>Turnix varia</i>																																							
Baudin's Cockatoo	<i>Zanda baudinii</i>																																							
Carnaby's Cockatoo	<i>Zanda latirostris</i>		2																						1			1												
White-tailed Black Cockatoo	<i>Zanda sp.</i>	3																																						
Yellow-footed Antechinus	<i>Antechinus flavipes</i>							1																					1	1					1	1	1			
White-striped Free-tailed Bat	<i>Austronomus australis</i>																																							
Brush-tailed Bettong	<i>Bettongia penicillata ogilbyi</i>									1																												1		
Western Pygmy-possum	<i>Cercartetus concinnus</i>																																							
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>																																							
Chocolate Wattled Bat	<i>Chalinolobus morio</i>																																							
Chuditch	<i>Dasyurus geoffroyi</i>			2							1	5	1		1				3	3	5	1							4	3			1			1			7	
Cat	<i>Felis catus</i>																	1														1								
Quenda	<i>Isoodon fusciventer</i>											2		16	5	6		3	15			3	5	15	8	1	8	1	21			1	5	5	11	3	10			
Western Grey Kangaroo	<i>Macropus fuliginosus</i>										1	1	1	1		1	1	1		1	1	1	1	1	1	1	1	1	1	1	1		1		1	1	1	1	1	1
Western Brush Wallaby	<i>Macropus irma</i>								1		4	4	1	1			20	3	4	1	1		11	3	3	6	1	1	2	6	8	10	4	6	2	2				2
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>																																							
Holt's Long-eared Bat	<i>Nyctophilus holtorum</i>																																							

Vernacular	Species	C11	C12	C13	C19	C23	C25	C26	C28	Delete	HM-1-01	HM-1-02	HM-1-03	HM-1-04	HM-1-05	HM-1-06	HM-1-07	HM-1-08	HM-1-09	HM-1-10	HM-1-11	HM-1-12	HM-1-13	HM-1-14	HM-1-15	HM-1-16	HM-1-17	HM-1-18	HM-1-19	HM-1-20	HM-1-21	HM-1-22	HM-1-23	HM-1-24	HM-1-25	HM-1-29	HM-1-30	HM-1-31	HM-1-32	
Greater Long-eared Bat	<i>Nyctophilus major</i>																																							
Rabbit	<i>Oryctolagus cuniculus</i>																																							
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																							
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>																																							
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																																							
Pig	<i>Sus scrofa</i>												1					1			1	1			1															
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>										1	1		1	1	1	1	1	1	1	1	1		1		1	1	1	1	1	1	1	1	1	1	1			1	1
Common Brushtail Possum	<i>Trichosurus vulpecula</i>	1			1	1														1				1				1	1	1	1	1	1		1	1		1		1
Southern Forest Bat	<i>Vespadelus regulus</i>																																							
Red Fox	<i>Vulpes vulpes</i>																																							
Southwestern Crevice-skink	<i>Egernia napoleonis</i>				1																																			
South-west Carpet Python	<i>Morelia imbricata</i>																																							
Bobtail	<i>Tiliqua rugosa</i>	1					1				1						1		1	1	1					1									1					
Barking Gecko	<i>Nephurus milii</i>				1																																			
Bungarra or Sand Monitor	<i>Varanus gouldii</i>										1			1		1	1	1									1			1	1	1	1	1					1	
Heath Monitor	<i>Varanus rosenbergi</i>																																							

Appendix 6 Site by species matrix C

[illegible]

Vernacular	Species	HM-1-33	HM-1-34	HM-1-35	HM-1-36	HM-2-01	HM-2-02	HM-2-03	HM-2-04	HM-2-05	HM-2-06	HM-2-07	HM-2-08	HM-2-09	HM-2-10	HM-2-11	HM-2-12	HM-2-13	HM-2-14	HM-2-15	HM-2-16	HM-2-17	HM-2-18	HM-2-19	HM-2-20	HM-2-21	HM-2-22	HM-2-23	HM-2-24	HM-2-25	HM-2-27	HM-2-28	HM-2-29	HM-2-30	HM-2-31	HM-2-32	HM-2-33	HM-2-34	HM-2-35	
Greater Long-eared Bat	<i>Nyctophilus major</i>																																							
Rabbit	<i>Oryctolagus cuniculus</i>																													1										
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																							
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>	2											1						1																					
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																																							
Pig	<i>Sus scrofa</i>			2																										1			1	1	1					1
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	1	1	1				1					1	1	1	1	1	1	1	1		1		1	1	1			1			1	1	1	1				1	
Common Brushtail Possum	<i>Trichosurus vulpecula</i>	1	1	1	1			1	1	1	1	1	1			1	1		1		1		1	1	1	1			1	1	1	1	1	1	1	1	1	1		1
Southern Forest Bat	<i>Vespadelus regulus</i>																																							
Red Fox	<i>Vulpes vulpes</i>			1																																				
Southwestern Crevice-skink	<i>Egernia napoleonis</i>																																							
South-west Carpet Python	<i>Morelia imbricata</i>																																							
Bobtail	<i>Tiliqua rugosa</i>																																							
Barking Gecko	<i>Nephurus milii</i>																																							
Bungarra or Sand Monitor	<i>Varanus gouldii</i>																		1																					
Heath Monitor	<i>Varanus rosenbergi</i>	1																																						

Appendix 7 Site by species matrix D

[illegible]

Vernacular	Species	HM-2-36	HN-1-08	HS-1-01	HS-1-02	HS-1-03	HS-1-04	HS-1-05	HS-1-06	HS-1-07	HS-1-08	HS-1-09	HS-1-10	HS-1-11	HS-1-12	HS-1-13	HS-1-14	HS-1-15	HS-1-16	HS-1-17	HS-1-18	HS-1-19	HS-1-20	HS-1-21	HS-1-22	HS-1-23	HS-1-24	HS-1-25	HS-1-26	HS-1-27	HS-1-28	HS-1-29	HS-1-30	HS-1-31	HS-1-32	HS-1-33	HS-1-34	HS-1-35	HS-1-36	
Greater Long-eared Bat	<i>Nyctophilus major</i>																																							
Rabbit	<i>Oryctolagus cuniculus</i>																																							
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																							
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>		2										1													1														
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																																							
Pig	<i>Sus scrofa</i>																																							
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	1			1	1	1	1		1	1	1	1	1	1	1		1		1	1	1	1	1	1	1		1	1		1	1				1	1	1	1	
Common Brushtail Possum	<i>Trichosurus vulpecula</i>				1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1
Southern Forest Bat	<i>Vespadelus regulus</i>																																							
Red Fox	<i>Vulpes vulpes</i>	1					1													1																		1		
Southwestern Crevice-skink	<i>Egernia napoleonis</i>																																							
South-west Carpet Python	<i>Morelia imbricata</i>																																							
Bobtail	<i>Tiliqua rugosa</i>																	1						1			1								1			1		
Barking Gecko	<i>Nephurus milii</i>																																							
Bungarra or Sand Monitor	<i>Varanus gouldii</i>						1	1		1		1								1					1	1	1					1			1					
Heath Monitor	<i>Varanus rosenbergi</i>																																				1			

Appendix 8 Site by species matrix E

Vernacular	Species	N01	N02	N03	N04	N05	N07	N08	N09	N11	N15	N18	N19	N24	N26	N27	Newmont-ANH09	Newmont-ANH18	Newmont-Nest01	Newmont-Nest04	Newmont-Nest05	Newmont-Nest07	NHS-1-01	NHS-1-02	NHS-1-03	NHS-1-04	NHS-1-05	NHS-1-06	NHS-1-07	NHS-1-08	NHS-1-09	NHS-1-10	NHS-1-11	NHS-1-12	NHS-1-13	NHS-1-14	NHS-1-15	NHS-1-16	NHS-1-17
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>																																						
Brown Goshawk	<i>Accipiter fasciatus</i>																																						
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>																									1								1	2				
Dusky Woodswallow	<i>Artamus cyanopterus</i>																																						
Australian Ringneck	<i>Barnardius zonarius</i>																																	1	1		1		
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>							3						2						3		1													2				
Rufous Treecreeper	<i>Climacteris rufa</i>																							1															
Australian Raven	<i>Corvus coronoides</i>																						1	1		1			1	1				1	1		1	1	1
Australian Magpie	<i>Cracticus tibicen</i>																											1											
Laughing Kookaburra	<i>Dacelo novaeguinea</i>																																				1		
Emu	<i>Dromaius novaehollandiae</i>																										1										1		
Western Yellow Robin	<i>Eopsaltria australis griseogularis</i>																																						
Western gerygone	<i>Gerygone fusca</i>																																						
Little Eagle	<i>Aquila morphnoides</i>																																						
Western Golden Whistler	<i>Pachycephala occidentalis</i>																																						
Striated Pardalote	<i>Pardalotus striatus</i>																																						
Red-capped Robin	<i>Petroica goodenovii</i>																									1													
Common Bronzewing	<i>Phaps chalcoptera</i>																																						
Western Rosella	<i>Platycercus icterotis</i>																																						
Tawny Frogmouth	<i>Podargus strigoides</i>																										1												1
Red-capped Parrot	<i>Platycercus spurius</i>																																						
Grey Fantail	<i>Rhipidura albiscapa</i>																																						
Grey Currawong	<i>Strepera versicolor</i>																						1	1	1			1	1	1		1	1	1	1		1	1	1
Painted Button-quail	<i>Turnix varia</i>																																						
Baudin's Cockatoo	<i>Zanda baudinii</i>																																						
Carnaby's Cockatoo	<i>Zanda latirostris</i>	2															2		1		2																		
White-tailed Black Cockatoo	<i>Zanda sp.</i>				1					1																													
Yellow-footed Antechinus	<i>Antechinus flavipes</i>																											1				1	1		1		1	1	
White-striped Free-tailed Bat	<i>Austronomus australis</i>																																						
Brush-tailed Bettong	<i>Bettongia penicillata ogilbyi</i>						1																2	45	61	21					3	18				1		1	36
Western Pygmy-possum	<i>Cercartetus concinnus</i>																											1											
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>																																						
Chocolate Wattled Bat	<i>Chalinolobus morio</i>																																						
Chuditch	<i>Dasyurus geoffroii</i>		5	3	3	1			1		1		1										3	11	13	7	13	11	6	16		10	13	4			4	24	3
Cat	<i>Felis catus</i>																																						1
Quenda	<i>Isoodon fusciventer</i>																							1					5					6		7			
Western Grey Kangaroo	<i>Macropus fuliginosus</i>																						1	1	1	1	1	1	1	1			1		1	1	1	1	1

Vernacular	Species	N01	N02	N03	N04	N05	N07	N08	N09	N11	N15	N18	N19	N24	N26	N27	Newmont-ANH09	Newmont-ANH18	Newmont-Nest01	Newmont-Nest04	Newmont-Nest05	Newmont-Nest07	NHS-1-01	NHS-1-02	NHS-1-03	NHS-1-04	NHS-1-05	NHS-1-06	NHS-1-07	NHS-1-08	NHS-1-09	NHS-1-10	NHS-1-11	NHS-1-12	NHS-1-13	NHS-1-14	NHS-1-15	NHS-1-16	NHS-1-17
Western Brush Wallaby	<i>Macropus irma</i>																						7	2	12	8	10	14	5	6		5	10	3	5		9	3	2
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>																																						
Holt's Long-eared Bat	<i>Nyctophilus holtorum</i>																																						
Greater Long-eared Bat	<i>Nyctophilus major</i>																																						
Rabbit	<i>Oryctolagus cuniculus</i>																																						
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																						
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>																											1									1		2
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																																						
Pig	<i>Sus scrofa</i>																						1							1									1
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>															1							1	1	1	1	1	1	1	1	1		1		1		1	1	1
Common Brushtail Possum	<i>Trichosurus vulpecula</i>																	1					1	1	1	1	1	1	1	1			1	1	1		1		
Southern Forest Bat	<i>Vespadelus regulus</i>																																						
Red Fox	<i>Vulpes vulpes</i>																																					1	
Southwestern Crevice-skink	<i>Egernia napoleonis</i>														1																		1						
South-west Carpet Python	<i>Morelia imbricata</i>																																						
Bobtail	<i>Tiliqua rugosa</i>																						1	1															
Barking Gecko	<i>Nephrurus milii</i>																																						
Bungarra or Sand Monitor	<i>Varanus gouldii</i>											1											1	1					1				1				1	1	
Heath Monitor	<i>Varanus rosenbergi</i>																											1					1		1				1

Appendix 9 Site by species matrix F

[illegible]

Vernacular	Species	NHS-1-18	NHS-1-19	NHS-1-20	NHS-1-21	NHS-1-22	NHS-1-23	NHS-1-24	NHS-1-25	NHS-1-26	NHS-1-27	NHS-1-28	NHS-1-29	NHS-1-30	NHS-1-32	NHS-1-34	NHS-1-35	NHS-1-36	NM-1-01	NM-1-02	NM-1-03	NM-1-04	NM-1-05	NM-1-07	NM-1-08	NM-1-09	NM-1-10	NM-1-11	NM-1-12	NM-1-13	NM-1-14	NM-1-15	NM-1-16	NM-1-17	NM-1-18	NM-1-19	NM-1-20	NM-1-21	NM-1-22		
Greater Long-eared Bat	<i>Nyctophilus major</i>																																								
Rabbit	<i>Oryctolagus cuniculus</i>																																								
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																								
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>		1	18	2		1				9	2											1		2						1										
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																																								
Pig	<i>Sus scrofa</i>							1		1			1			1				1					1																
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	1	1	1	1	1	1	1	1	1	1	1				1	1	1		1		1	1		1	1		1	1	1	1	1	1	1	1	1		1		1	
Common Brushtail Possum	<i>Trichosurus vulpecula</i>	1	1	1	1	1	1	1	1	1	1	1				1	1	1		1		1	1	1	1	1	1		1			1	1	1	1					1	
Southern Forest Bat	<i>Vespadelus regulus</i>																																								
Red Fox	<i>Vulpes vulpes</i>																	1																							
Southwestern Crevice-skink	<i>Egernia napoleonis</i>																																								
South-west Carpet Python	<i>Morelia imbricata</i>																																								
Bobtail	<i>Tiliqua rugosa</i>	1				1		1													1						1	1		1											
Barking Gecko	<i>Nephrurus milii</i>																																								
Bungarra or Sand Monitor	<i>Varanus gouldii</i>			1																		1					1	1	1												
Heath Monitor	<i>Varanus rosenbergi</i>						1																				1														

Appendix 10 Site by species matrix G

Vernacular	Species	NM-1-23	NM-1-24	NM-1-25	NM-1-27	NM-1-28	NM-1-29	NM-1-30	NM-1-31	NM-1-32	NM-1-33	NM-1-34	NM-1-35	NM-1-36	NM-2-03	NM-2-04	NM-2-07	NM-2-08	NM-2-11	NM-2-12	NM-2-15	NM-2-16	NM-2-20	NM-2-23	NM-2-24	NM-2-28	NM-2-31	NM-2-32	NM-2-36	NS-1-01	NS-1-03	NS-1-04	NS-1-05	NS-1-06	NS-1-12	NS-1-13	NS-1-14	NS-1-15	NS-1-16	
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>																																							
Brown Goshawk	<i>Accipiter fasciatus</i>																																							
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>																																				1			
Dusky Woodswallow	<i>Artamus cyanopterus</i>																																				1			
Australian Ringneck	<i>Barnardius zonarius</i>																																				1			
Forest Red-tailed Black Cockatoo	<i>Calyptrorhynchus banksii naso</i>																									1							2					1		
Rufous Treecreeper	<i>Climacteris rufa</i>								1																												1			
Australian Raven	<i>Corvus coronoides</i>	1	1		1		1			1		1																									1			
Australian Magpie	<i>Cracticus tibicen</i>																																							
Laughing Kookaburra	<i>Dacelo novaeguinea</i>																																							
Emu	<i>Dromaius novaehollandiae</i>									1			1																								1			
Western Yellow Robin	<i>Eopsaltria australis griseogularis</i>																																							
Western gerygone	<i>Gerygone fusca</i>																																							
Little Eagle	<i>Aquila morphnoides</i>																																							
Western Golden Whistler	<i>Pachycephala occidentalis</i>																																							
Striated Pardalote	<i>Pardalotus striatus</i>																																							
Red-capped Robin	<i>Petroica goodenovii</i>																																							
Common Bronzewing	<i>Phaps chalcoptera</i>																																							
Western Rosella	<i>Platycercus icterotis</i>																																							
Tawny Frogmouth	<i>Podargus strigoides</i>																																							
Red-capped Parrot	<i>Platycercus spurius</i>																																							
Grey Fantail	<i>Rhipidura albiscapa</i>																																							
Grey Currawong	<i>Strepera versicolor</i>																																							
Painted Button-quail	<i>Turnix varia</i>																																							
Baudin's Cockatoo	<i>Zanda baudinii</i>																																							
Carnaby's Cockatoo	<i>Zanda latirostris</i>																																							
White-tailed Black Cockatoo	<i>Zanda sp.</i>																																							
Yellow-footed Antechinus	<i>Antechinus flavipes</i>		1					1	1			1																									1			
White-striped Free-tailed Bat	<i>Austronomus australis</i>																																							
Brush-tailed Bettong	<i>Bettongia penicillata ogilbyi</i>														5	14			4						8	2					15	1	21	22	50	1				
Western Pygmy-possum	<i>Cercartetus concinnus</i>																																							
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>																																							
Chocolate Wattled Bat	<i>Chalinolobus morio</i>																																							
Chuditch	<i>Dasyurus geoffroii</i>	5	7	3	4	4	2	3	4	4	6		1	1	6	1	2	1			6	3	2							1	5	1	4		1		2		6	
Cat	<i>Felis catus</i>																																							
Quenda	<i>Isodon fusciventer</i>																10									3		1						3				3		
Western Grey Kangaroo	<i>Macropus fuliginosus</i>	1	1		1	1	1	1	1	1	1	1	1	1																							1	1		
Western Brush Wallaby	<i>Macropus irma</i>	7	3	5	2			1		1																											6	5		
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>																																							
Holt's Long-eared Bat	<i>Nyctophilus holtorum</i>																																							

Vernacular	Species	NM-1-23	NM-1-24	NM-1-25	NM-1-27	NM-1-28	NM-1-29	NM-1-30	NM-1-31	NM-1-32	NM-1-33	NM-1-34	NM-1-35	NM-1-36	NM-2-03	NM-2-04	NM-2-07	NM-2-08	NM-2-11	NM-2-12	NM-2-15	NM-2-16	NM-2-20	NM-2-23	NM-2-24	NM-2-28	NM-2-31	NM-2-32	NM-2-36	NS-1-01	NS-1-03	NS-1-04	NS-1-05	NS-1-06	NS-1-12	NS-1-13	NS-1-14	NS-1-15	NS-1-16		
Greater Long-eared Bat	<i>Nyctophilus major</i>																																								
Rabbit	<i>Oryctolagus cuniculus</i>																																								
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																								
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>																	1		1							1	2		1			2	1				1			
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																																								
Pig	<i>Sus scrofa</i>											1		1																											
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	1		1	1		1	1	1	1	1			1																					1		1	1			
Common Brushtail Possum	<i>Trichosurus vulpecula</i>	1	1	1	1	1	1		1	1				1																			1			1	1				
Southern Forest Bat	<i>Vespadelus regulus</i>																																								
Red Fox	<i>Vulpes vulpes</i>				1							1																													
Southwestern Crevice-skink	<i>Egernia napoleonis</i>																																				1	1			
South-west Carpet Python	<i>Morelia imbricata</i>			1																																					
Bobtail	<i>Tiliqua rugosa</i>				1	1						1		1																											
Barking Gecko	<i>Nephurus milii</i>																																								
Bungarra or Sand Monitor	<i>Varanus gouldii</i>		1										1																									1	1		
Heath Monitor	<i>Varanus rosenbergi</i>																																								

Appendix 11 Site by species matrix H

Vernacular	Species	NM-1-17	NM-1-18	NM-1-19	NM-1-20	NM-1-21	NM-1-22	NM-1-23	NM-1-24	NM-1-25	NM-1-27	NM-1-28	NM-1-29	NM-1-30	NM-1-31	NM-1-32	NM-1-33	NM-1-34	NM-1-35	NM-1-36	NM-2-03	NM-2-04	NM-2-07	NM-2-08	NM-2-11	NM-2-12	NM-2-15	NM-2-16	NM-2-20	NM-2-23	NM-2-24	NM-2-28	NM-2-31	NM-2-32	NM-2-36	NS-1-01	NS-1-03	NS-1-04	NS-1-05
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>																																						
Brown Goshawk	<i>Accipiter fasciatus</i>																																						
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>			1																																			
Dusky Woodswallow	<i>Artamus cyanopterus</i>																																						
Australian Ringneck	<i>Barnardius zonarius</i>																																						
Forest Red-tailed Black Cockatoo	<i>Calyptrorhynchus banksii naso</i>						5																									1							2
Rufous Treecreeper	<i>Climacteris rufa</i>														1																								
Australian Raven	<i>Corvus coronoides</i>	1					1	1	1		1		1			1		1																					
Australian Magpie	<i>Cracticus tibicen</i>																																						
Laughing Kookaburra	<i>Dacelo novaeguinea</i>																																						
Emu	<i>Dromaius novaehollandiae</i>	1														1			1																				
Western Yellow Robin	<i>Eopsaltria australis griseogularis</i>																																						
Western gerygone	<i>Gerygone fusca</i>																																						
Little Eagle	<i>Aquila morphnoides</i>																																						
Western Golden Whistler	<i>Pachycephala occidentalis</i>																																						
Striated Pardalote	<i>Pardalotus striatus</i>																																						
Red-capped Robin	<i>Petroica goodenovii</i>																																						
Common Bronzewing	<i>Phaps chalcoptera</i>																																						
Western Rosella	<i>Platycercus icterotis</i>																																						
Tawny Frogmouth	<i>Podargus strigoides</i>																																						
Red-capped Parrot	<i>Platycercus spurius</i>																																						
Grey Fantail	<i>Rhipidura albiscapa</i>																																						
Grey Currawong	<i>Strepera versicolor</i>																																						
Painted Button-quail	<i>Turnix varia</i>																																					1	
Baudin's Cockatoo	<i>Zanda baudinii</i>																																						
Carnaby's Cockatoo	<i>Zanda latirostris</i>																																						
White-tailed Black Cockatoo	<i>Zanda sp.</i>																																						
Yellow-footed Antechinus	<i>Antechinus flavipes</i>					1			1					1	1			1																					
White-striped Free-tailed Bat	<i>Austronomus australis</i>																																						
Brush-tailed Bettong	<i>Bettongia penicillata ogilbyi</i>																				5	14			4					8	2					15	1	21	22
Western Pygmy-possum	<i>Cercartetus concinnus</i>																																					1	
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>																																						
Chocolate Wattled Bat	<i>Chalinolobus morio</i>																																						
Chuditch	<i>Dasyurus geoffroyi</i>	8	3			8	5	5	7	3	4	4	2	3	4	4	6		1	1	6	1	2	1			6	3	2						1	5	1	4	
Cat	<i>Felis catus</i>																																						
Quenda	<i>Isoodon fusciventer</i>	1																					10								3		1				3		
Western Grey Kangaroo	<i>Macropus fuliginosus</i>	1	1	1		1	1	1	1		1	1	1	1	1	1	1	1	1	1												3							
Western Brush Wallaby	<i>Macropus irma</i>	2	1	2	2		2	7	3	5	2			1		1																							
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>																																						
Holt's Long-eared Bat	<i>Nyctophilus holtorum</i>																																						

Vernacular	Species	NM-1-17	NM-1-18	NM-1-19	NM-1-20	NM-1-21	NM-1-22	NM-1-23	NM-1-24	NM-1-25	NM-1-27	NM-1-28	NM-1-29	NM-1-30	NM-1-31	NM-1-32	NM-1-33	NM-1-34	NM-1-35	NM-1-36	NM-2-03	NM-2-04	NM-2-07	NM-2-08	NM-2-11	NM-2-12	NM-2-15	NM-2-16	NM-2-20	NM-2-23	NM-2-24	NM-2-28	NM-2-31	NM-2-32	NM-2-36	NS-1-01	NS-1-03	NS-1-04	NS-1-05	
Greater Long-eared Bat	<i>Nyctophilus major</i>																																							
Rabbit	<i>Oryctolagus cuniculus</i>																																							
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																							
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>																							1		1								1	2		1		2	1
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																																							
Pig	<i>Sus scrofa</i>																	1		1																				
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	1	1		1		1	1		1	1		1	1	1	1	1			1																				
Common Brushtail Possum	<i>Trichosurus vulpecula</i>	1					1	1	1	1	1	1	1		1	1				1																				1
Southern Forest Bat	<i>Vespadelus regulus</i>																																							
Red Fox	<i>Vulpes vulpes</i>										1							1																						
Southwestern Crevice-skink	<i>Egernia napoleonis</i>																																							
South-west Carpet Python	<i>Morelia imbricata</i>									1																														
Bobtail	<i>Tiliqua rugosa</i>										1	1						1		1																				
Barking Gecko	<i>Nephurus milii</i>																																							
Bungarra or Sand Monitor	<i>Varanus gouldii</i>								1										1																					
Heath Monitor	<i>Varanus rosenbergi</i>																																							

Appendix 12 Site by species matrix I

Vernacular	Species	NS-1-06	NS-1-12	NS-1-13	NS-1-14	NS-1-15	NS-1-16	NS-1-17	NS-1-25	NS-1-26	NS-1-27	NS-1-28	NS-1-29	NS-1-30	NS-1-31	NS-1-32	NS-1-33	NS-1-34	NS-1-35	NS-1-36	NS-2-01	NS-2-02	NS-2-03	NS-2-04	NS-2-05	NS-2-06	NS-2-07	NS-2-08	Opp01	Opp02	Opp03	Opp04	Opp05	Opp06	Opp07	Opp08	Opp09	Opp10	Opp11		
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>																																								
Brown Goshawk	<i>Accipiter fasciatus</i>																																								
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>				1																																				
Dusky Woodswallow	<i>Artamus cyanopterus</i>				1																																				
Australian Ringneck	<i>Barnardius zonarius</i>				1						1																														
Forest Red-tailed Black Cockatoo	<i>Calyptrorhynchus banksii naso</i>						1	1																						4	1		1								
Rufous Treecreeper	<i>Climacteris rufa</i>				1							1																													
Australian Raven	<i>Corvus coronoides</i>				1															1																					
Australian Magpie	<i>Cracticus tibicen</i>																																								
Laughing Kookaburra	<i>Dacelo novaeguinea</i>											1																													
Emu	<i>Dromaius novaehollandiae</i>				1							1	1	1	1				1																						
Western Yellow Robin	<i>Eopsaltria australis griseogularis</i>																																								
Western gerygone	<i>Gerygone fusca</i>																																								
Little Eagle	<i>Aquila morphnoides</i>																																								
Western Golden Whistler	<i>Pachycephala occidentalis</i>																																								
Striated Pardalote	<i>Pardalotus striatus</i>																																								
Red-capped Robin	<i>Petroica goodenovii</i>												1							1	1																				
Common Bronzewing	<i>Phaps chalcoptera</i>																																								
Western Rosella	<i>Platycercus icterotis</i>																																								
Tawny Frogmouth	<i>Podargus strigoides</i>																																								
Red-capped Parrot	<i>Platycercus spurius</i>										1																														
Grey Fantail	<i>Rhipidura albiscapa</i>											1																													
Grey Currawong	<i>Strepera versicolor</i>												1							1																					
Painted Button-quail	<i>Turnix varia</i>																																								
Baudin's Cockatoo	<i>Zanda baudinii</i>																															3									
Carnaby's Cockatoo	<i>Zanda latirostris</i>																																		7			2			
White-tailed Black Cockatoo	<i>Zanda sp.</i>																																3								
Yellow-footed Antechinus	<i>Antechinus flavipes</i>			1					1	1	1	1			1		1	1	1	1			1			1	1														
White-striped Free-tailed Bat	<i>Austronomus australis</i>																																								
Brush-tailed Bettong	<i>Bettongia penicillata ogilbyi</i>	50	1									17	7	13																										1	
Western Pygmy-possum	<i>Cercartetus concinnus</i>																																								
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>																																								
Chocolate Wattled Bat	<i>Chalinolobus morio</i>																																								
Chuditch	<i>Dasyurus geoffroyi</i>	1		2		6			12	5	1	2	2		8		3					3			1	3	2	8	4												
Cat	<i>Felis catus</i>																																								
Quenda	<i>Isoodon fusciventer</i>			3																																					
Western Grey Kangaroo	<i>Macropus fuliginosus</i>			1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1		1	1													
Western Brush Wallaby	<i>Macropus irma</i>			6	5				6	3	10	11	8	2	3	11	15	9	4	2		6	6					2													
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>																																								
Holt's Long-eared Bat	<i>Nyctophilus holtorum</i>																																								

Vernacular	Species	NS-1-06	NS-1-12	NS-1-13	NS-1-14	NS-1-15	NS-1-16	NS-1-17	NS-1-25	NS-1-26	NS-1-27	NS-1-28	NS-1-29	NS-1-30	NS-1-31	NS-1-32	NS-1-33	NS-1-34	NS-1-35	NS-1-36	NS-2-01	NS-2-02	NS-2-03	NS-2-04	NS-2-05	NS-2-06	NS-2-07	NS-2-08	Opp01	Opp02	Opp03	Opp04	Opp05	Opp06	Opp07	Opp08	Opp09	Opp10	Opp11	
Greater Long-eared Bat	<i>Nyctophilus major</i>																																							
Rabbit	<i>Oryctolagus cuniculus</i>																																							
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																							
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>				1								1		2					1				12			4													
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																							1		1														
Pig	<i>Sus scrofa</i>								1		1		1		1							1															1	1		
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	1		1	1				1	1		1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1											
Common Brushtail Possum	<i>Trichosurus vulpecula</i>			1	1				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1									
Southern Forest Bat	<i>Vespadelus regulus</i>																																							
Red Fox	<i>Vulpes vulpes</i>													1						1																				
Southwestern Crevice-skink	<i>Egernia napoleonis</i>			1	1																			1																
South-west Carpet Python	<i>Morelia imbricata</i>																																							
Bobtail	<i>Tiliqua rugosa</i>														1		1	1		1			1			1														
Barking Gecko	<i>Nephrurus milii</i>																									1														
Bungarra or Sand Monitor	<i>Varanus gouldii</i>			1	1						1	1			1				1		1				1		1	1	1											
Heath Monitor	<i>Varanus rosenbergi</i>																						1																	

Appendix 13 Site by species matrix J

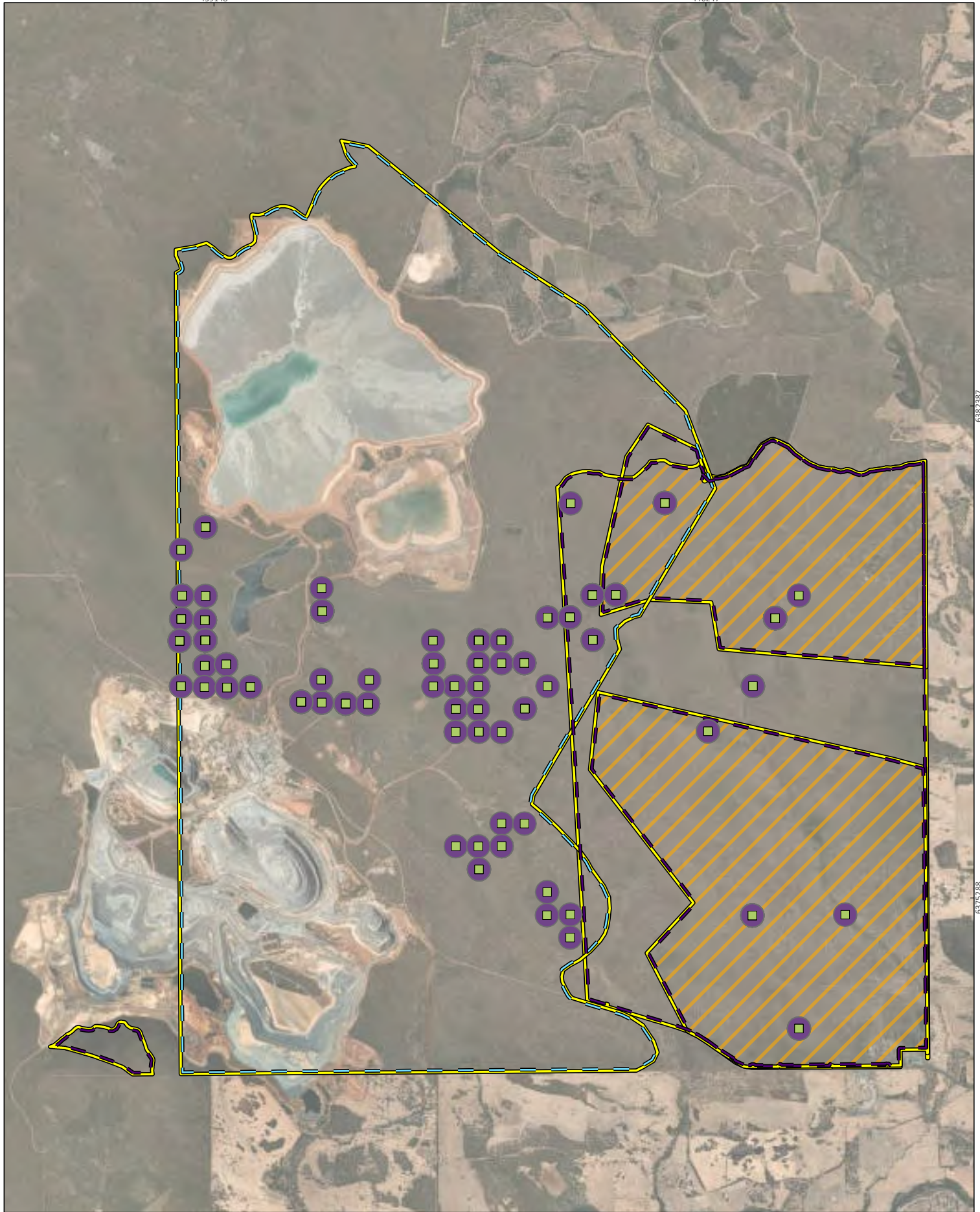
[illegible]

Vernacular	Species	Opp12	Opp13	Opp14	Opp15	Opp16	Opp17	Opp19	Opp20	Opp21	P01	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P14	P15	P17	P18	P19	P20	P22	P29	P33	Q04	Q06	Q07	Q09	Q10	Q11	Q15	Q20	Q21
Greater Long-eared Bat	<i>Nyctophilus major</i>																																						
Rabbit	<i>Oryctolagus cuniculus</i>																																						
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																																						
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>																																						
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																																						
Pig	<i>Sus scrofa</i>																																						
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>																						1																
Common Brushtail Possum	<i>Trichosurus vulpecula</i>												1									2									1								
Southern Forest Bat	<i>Vespadelus regulus</i>																																						
Red Fox	<i>Vulpes vulpes</i>																																					1	
Southwestern Crevice-skink	<i>Egernia napoleonis</i>																																						
South-west Carpet Python	<i>Morelia imbricata</i>																																						
Bobtail	<i>Tiliqua rugosa</i>															1		1									1												
Barking Gecko	<i>Nephurus milii</i>																																						
Bungarra or Sand Monitor	<i>Varanus gouldii</i>																								1														
Heath Monitor	<i>Varanus rosenbergi</i>																			1																			

Appendix 14 Site by species matrix K

Vernacular	Species	Q22	Q23	Q24	Q25	W02	W03	W04	W05	W06	W09	W10	W11	W12	W13	W14	W15	W16	W17	W19	W20	W21	W24	W25	W26	WFP01	WFP02	WFP03	WFP05
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>																												
Brown Goshawk	<i>Accipiter fasciatus</i>																												
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>																												
Dusky Woodswallow	<i>Artamus cyanopterus</i>																												
Australian Ringneck	<i>Barnardius zonarius</i>																												
Forest Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii naso</i>		1										1		1		5												
Rufous Treecreeper	<i>Climacteris rufa</i>																												
Australian Raven	<i>Corvus coronoides</i>																												
Australian Magpie	<i>Cracticus tibicen</i>																												
Laughing Kookaburra	<i>Dacelo novaeguinea</i>																												
Emu	<i>Dromaius novaehollandiae</i>																												
Western Yellow Robin	<i>Eopsaltria australis griseogularis</i>																												
Western gerygone	<i>Gerygone fusca</i>																												
Little Eagle	<i>Aquila morphnoides</i>																												
Western Golden Whistler	<i>Pachycephala occidentalis</i>																												
Striated Pardalote	<i>Pardalotus striatus</i>																												
Red-capped Robin	<i>Petroica goodenovii</i>																												
Common Bronzewing	<i>Phaps chalcoptera</i>																												
Western Rosella	<i>Platycercus icterotis</i>																												
Tawny Frogmouth	<i>Podargus strigoides</i>																												
Red-capped Parrot	<i>Platycercus spurius</i>																												
Grey Fantail	<i>Rhipidura albiscapa</i>																												
Grey Currawong	<i>Strepera versicolor</i>																												
Painted Button-quail	<i>Turnix varia</i>																												
Baudin's Cockatoo	<i>Zanda baudinii</i>																												
Carnaby's Cockatoo	<i>Zanda latirostris</i>							1		1																			
White-tailed Black Cockatoo	<i>Zanda sp.</i>		1		2	1																							
Yellow-footed Antechinus	<i>Antechinus flavipes</i>			1				1	1																				
White-striped Free-tailed Bat	<i>Austronomus australis</i>																									1	1		1
Brush-tailed Bettong	<i>Bettongia penicillata ogilbyi</i>																				1			2					
Western Pygmy-possum	<i>Cercartetus concinnus</i>																												
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>																									1	1	1	1
Chocolate Wattled Bat	<i>Chalinolobus morio</i>																										1	1	
Chuditch	<i>Dasyurus geoffroyi</i>																					1	1						
Cat	<i>Felis catus</i>																												
Quenda	<i>Isoodon fusciventer</i>	2	3	1																									
Western Grey Kangaroo	<i>Macropus fuliginosus</i>																												
Western Brush Wallaby	<i>Macropus irma</i>																												
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>																									1	1	1	1
Holt's Long-eared Bat	<i>Nyctophilus holtorum</i>																									1		1	

Vernacular	Species	Q22	Q23	Q24	Q25	W02	W03	W04	W05	W06	W09	W10	W11	W12	W13	W14	W15	W16	W17	W19	W20	W21	W24	W25	W26	WFP01	WFP02	WFP03	WFP05
Greater Long-eared Bat	<i>Nyctophilus major</i>																										1		
Rabbit	<i>Oryctolagus cuniculus</i>																												
South-western Free-tailed Bat	<i>Mormopterus kitcheneri</i>																									1	1	1	1
South-western Brush-tailed Phascogale	<i>Phascogale tapoatafa wambenger</i>																												
Gilbert's Dunnart	<i>Sminthopsis gilberti</i>																												
Pig	<i>Sus scrofa</i>																												
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>																												
Common Brushtail Possum	<i>Trichosurus vulpecula</i>					2	1		2				1			1			1			1	1	2					
Southern Forest Bat	<i>Vespadelus regulus</i>																									1	1	1	1
Red Fox	<i>Vulpes vulpes</i>																												
Southwestern Crevice-skink	<i>Egernia napoleonis</i>																												
South-west Carpet Python	<i>Morelia imbricata</i>																												
Bobtail	<i>Tiliqua rugosa</i>	1									1	1		1	1			1		2	1			1	1				
Barking Gecko	<i>Nephrurus milii</i>																												
Bungarra or Sand Monitor	<i>Varanus gouldii</i>					1											1												
Heath Monitor	<i>Varanus rosenbergi</i>																												



Newmont Australia
Boddington Gold Project

Project No 1679
Date 16/04/2025
Drawn by BK
Map author WP



0 1 2
Kilometers

1:70,700 (at A4)

GDA 1994 MGA Zone 50

- Combined study area
- Proposed Biodiversity Offset Area (this survey)
- Worsley study area
- Newmont study area
- Quenda home range buffer (9 ha)

Species, status

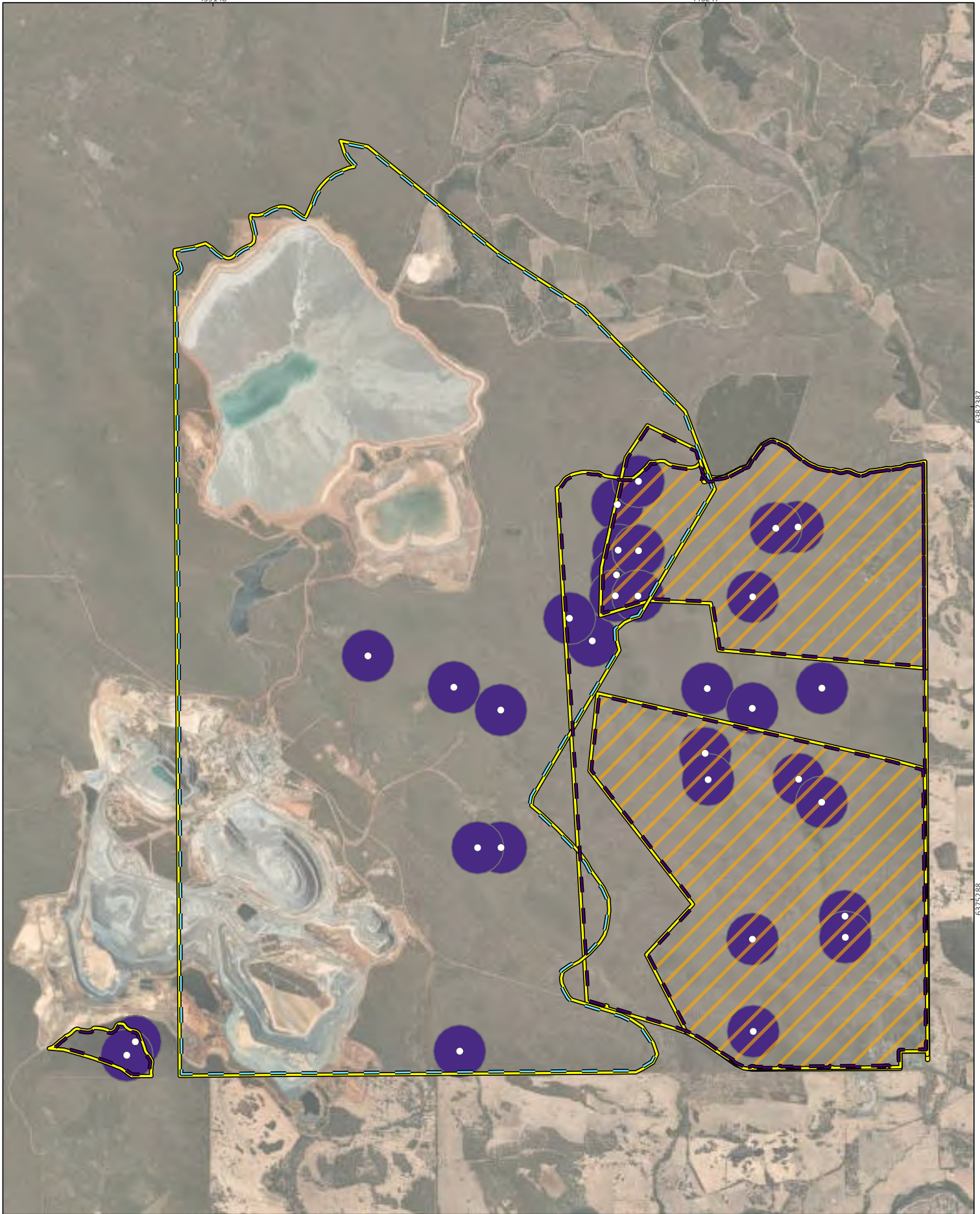
- Quenda, P4 (DBCA list)

Appendix 15

Quenda home range buffer



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Newmont Australia Boddington Gold Project

Project No 1679
Date 16/04/2025
Drawn by BK
Map author WP



0 1 2
Kilometers

1:70,700 (at A4)

GDA 1994 MGA Zone 50

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Combined study area

Proposed Biodiversity Offset Area (this survey)

Worsley study area

Newmont study area

South-western Brush-tailed Phascogale home range buffer (45 ha)

Species, status

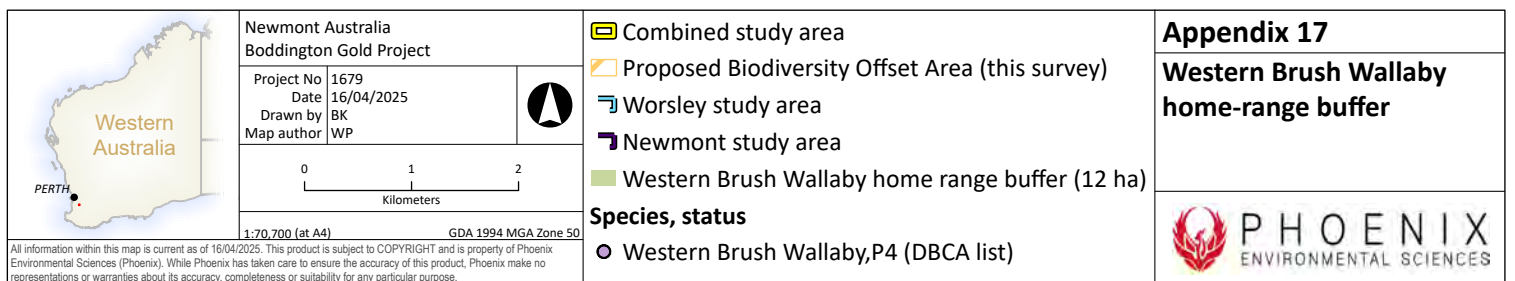
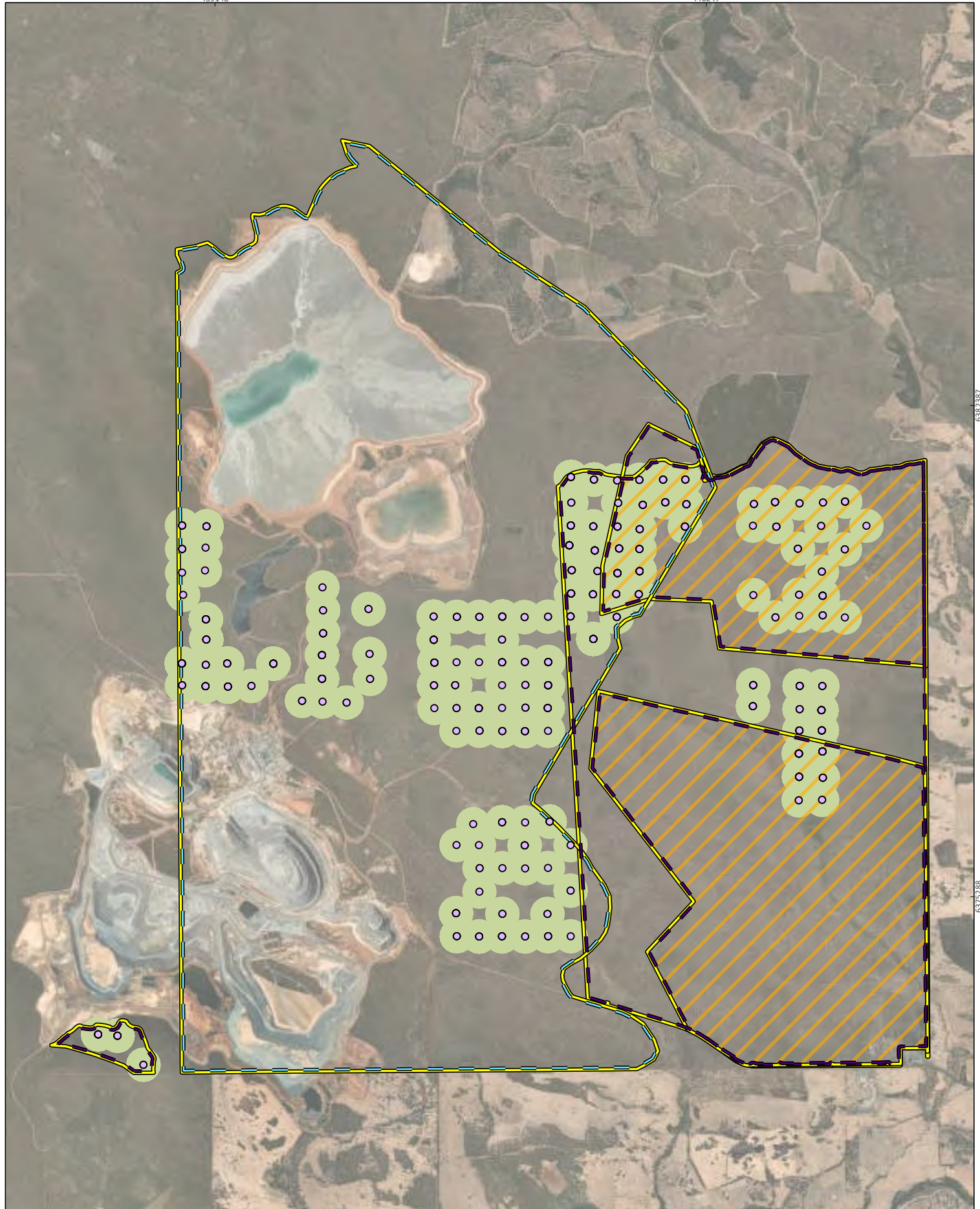
South-western Brush-tailed Phascogale, VU/CD (EPBC & BC Act)

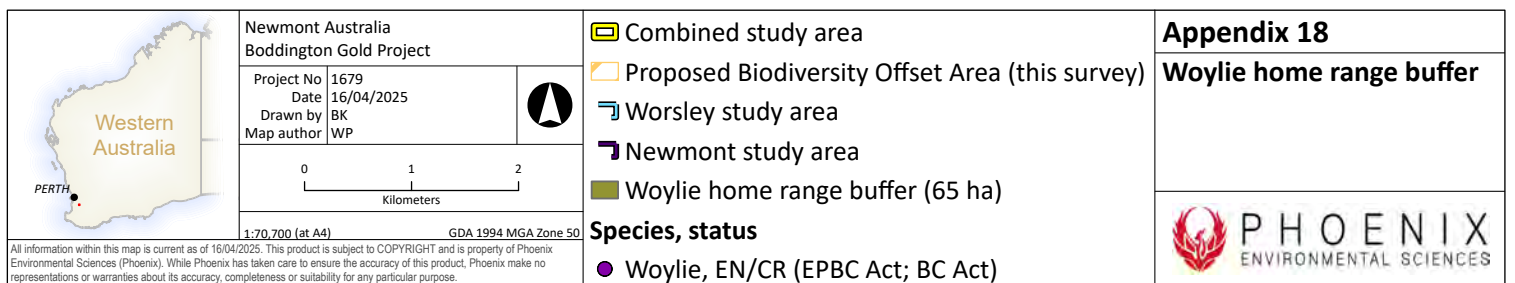
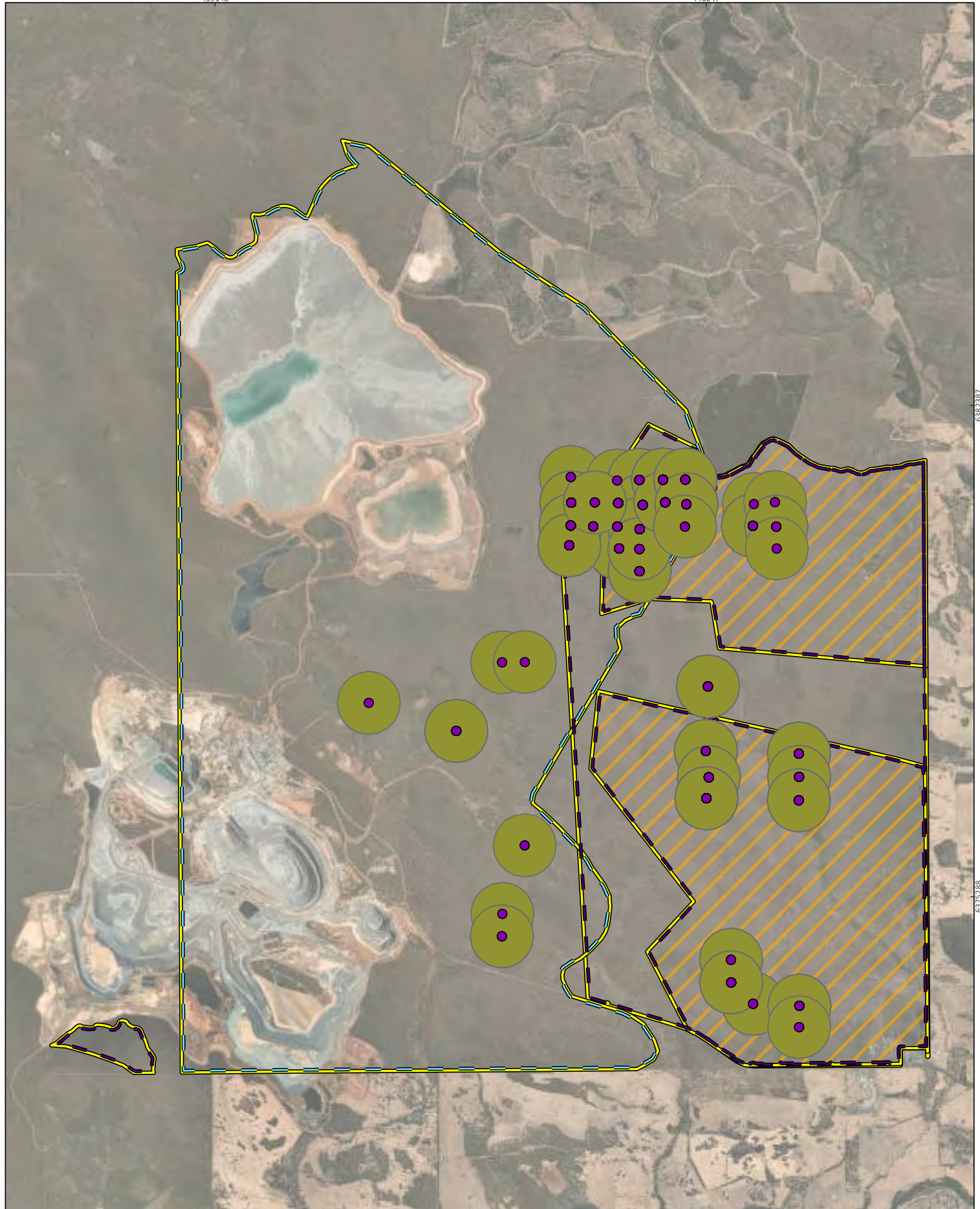
Appendix 16

South-western Brush-tailed Phascogale home range buffer



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Targeted significant mammal and black cockatoo survey for the Boddington Gold Project
Prepared for Newmont Australia Ltd

Appendix 19 Potential habitat trees recorded

Tree ID	Date	Latitude	Longitude	Tree Species	Life status	DBH (mm)	Hollows	Evidence Of Use
HT1_AJ	1/10/2024	-32.7795	116.3375	Jarrah	Alive	520	0	No
HT2_AJ	1/10/2024	-32.7798	116.3370	Jarrah	Alive	540	0	No
HT3_AJ	1/10/2024	-32.7799	116.3370	Jarrah	Alive	570	0	No
HT4_AJ	1/10/2024	-32.7798	116.3368	Marri	Alive	520	0	No
HT5_AJ	1/10/2024	-32.7795	116.3367	Jarrah	Dead	770	0	No
HT6_AJ	1/10/2024	-32.7791	116.3368	Jarrah	Alive	590	0	No
HT7_AJ	1/10/2024	-32.7781	116.3312	Jarrah	Alive	970	1	No
HT8_AJ	1/10/2024	-32.7776	116.3313	Jarrah	Alive	630	0	No
HT9_AJ	1/10/2024	-32.7775	116.3313	Jarrah	Alive	1200	0	No
HT10_AJ	1/10/2024	-32.7774	116.3310	Jarrah	Alive	860	0	No
HT11_AJ	1/10/2024	-32.7774	116.3309	Jarrah	Alive	600	0	No
HT12_AJ	1/10/2024	-32.7779	116.3308	Jarrah	Alive	900	0	No
HT13_AJ	1/10/2024	-32.7780	116.3308	Jarrah	Alive	840	0	No
HT14_AJ	1/10/2024	-32.7781	116.3303	Jarrah	Alive	1580	0	No
HT15_AJ	1/10/2024	-32.7781	116.3303	Jarrah	Alive	1680	0	No
HT16_AJ	1/10/2024	-32.7777	116.3304	Jarrah	Alive	1050	0	No
HT17_AJ	1/10/2024	-32.7774	116.3306	Jarrah	Alive	600	0	No
HT18_AJ	1/10/2024	-32.7775	116.3304	Jarrah	Dead	650	1	No
HT1_WP	29/09/2024	-32.7552	116.4292	Wandoo	Alive	680	0	No
HT2_WP	29/09/2024	-32.7551	116.4289	Jarrah	Alive	740	0	No
HT3_WP	29/09/2024	-32.7550	116.4288	Wandoo	Alive	330	0	No
HT4_WP	29/09/2024	-32.7547	116.4289	Wandoo	Alive	450	0	No
HT5_WP	29/09/2024	-32.7546	116.4287	Wandoo	Alive	340	0	No
HT6_WP	29/09/2024	-32.7545	116.4287	Eucalyptus sp.	Alive	0	0	No
HT7_WP	29/09/2024	-32.7545	116.4287	Wandoo	Alive	610	0	No
HT8_WP	29/09/2024	-32.7557	116.4412	Jarrah	Alive	610	0	No
HT9_WP	29/09/2024	-32.7556	116.4413	Jarrah	Alive	500	0	No
HT10_WP	29/09/2024	-32.7556	116.4410	Jarrah	Alive	500	0	No
HT11_WP	29/09/2024	-32.7557	116.4408	Wandoo	Alive	340	0	No
HT12_WP	29/09/2024	-32.7557	116.4407	Wandoo	Alive	320	0	No
HT13_WP	29/09/2024	-32.7557	116.4407	Wandoo	Alive	340	0	No
HT14_WP	29/09/2024	-32.7554	116.4406	Wandoo	Alive	370	0	No
HT15_WP	29/09/2024	-32.7553	116.4406	Jarrah	Alive	590	0	No
HT16_WP	29/09/2024	-32.7553	116.4410	Jarrah	Alive	500	0	No
HT17_WP	29/09/2024	-32.7555	116.4410	Eucalyptus sp.	Alive	620	0	No
HT18_WP	29/09/2024	-32.7555	116.4411	Jarrah	Alive	670	0	No
HT19_WP	29/09/2024	-32.7554	116.4411	Jarrah	Alive	550	0	No
HT20_WP	29/09/2024	-32.7416	116.4372	Wandoo	Alive	800	3	No
HT21_WP	29/09/2024	-32.7416	116.4376	Wandoo	Alive	330	0	No
HT22_WP	29/09/2024	-32.7415	116.4382	Wandoo	Alive	350	0	No
HT23_WP	29/09/2024	-32.7414	116.4383	Wandoo	Alive	410	0	No

Targeted significant mammal and black cockatoo survey for the Boddington Gold Project
Prepared for Newmont Australia Ltd

Tree ID	Date	Latitude	Longitude	Tree Species	Life status	DBH (mm)	Hollows	Evidence Of Use
HT24_WP	29/09/2024	-32.7414	116.4382	Eucalyptus sp.	Dead	500	0	No
HT25_WP	29/09/2024	-32.7411	116.4383	Jarraah	Alive	690	2	No
HT26_WP	29/09/2024	-32.7413	116.4379	Jarraah	Alive	700	2	No
HT27_WP	29/09/2024	-32.7414	116.4378	Wandoo	Alive	300	0	No
HT28_WP	29/09/2024	-32.7413	116.4378	Wandoo	Alive	370	0	No
HT29_WP	29/09/2024	-32.7413	116.4375	Wandoo	Alive	420	0	No
HT30_WP	29/09/2024	-32.7421	116.4317	Jarraah	Alive	800	0	No
HT31_WP	29/09/2024	-32.7424	116.4316	Jarraah	Alive	620	0	No
HT32_WP	29/09/2024	-32.7424	116.4316	Jarraah	Alive	820	0	No
HT33_WP	29/09/2024	-32.7424	116.4316	Jarraah	Alive	600	0	No
HT34_WP	29/09/2024	-32.7424	116.4316	Jarraah	Alive	550	0	No
HT35_WP	29/09/2024	-32.7424	116.4316	Jarraah	Alive	600	0	No
HT36_WP	29/09/2024	-32.7424	116.4314	Marri	Alive	600	0	No
HT37_WP	29/09/2024	-32.7421	116.4313	Jarraah	Alive	630	0	No
HT38_WP	29/09/2024	-32.7422	116.4312	Jarraah	Alive	750	1	No
HT39_WP	29/09/2024	-32.7422	116.4312	Jarraah	Alive	670	0	No
HT40_WP	29/09/2024	-32.7422	116.4312	Jarraah	Alive	670	0	No
HT41_WP	29/09/2024	-32.7425	116.4310	Eucalyptus sp.	Dead	670	3	No
HT42_WP	30/09/2024	-32.7371	116.4241	Wandoo	Alive	320	0	No
HT43_WP	30/09/2024	-32.7371	116.4243	Wandoo	Alive	340	0	No
HT44_WP	30/09/2024	-32.7371	116.4243	Jarraah	Alive	560	2	No
HT45_WP	30/09/2024	-32.7371	116.4244	Wandoo	Alive	360	0	No
HT46_WP	30/09/2024	-32.7371	116.4245	Wandoo	Alive	350	0	No
HT47_WP	30/09/2024	-32.7371	116.4245	Wandoo	Alive	370	0	No
HT48_WP	30/09/2024	-32.7369	116.4245	Wandoo	Alive	350	0	No
HT49_WP	30/09/2024	-32.7369	116.4244	Wandoo	Alive	890	1	No
HT50_WP	30/09/2024	-32.7370	116.4243	Wandoo	Alive	300	0	No
HT51_WP	30/09/2024	-32.7368	116.4240	Eucalyptus sp.	Dead	580	1	No
HT52_WP	30/09/2024	-32.7366	116.4241	Wandoo	Alive	340	0	No
HT53_WP	30/09/2024	-32.7366	116.4245	Eucalyptus sp.	Alive	550	0	No
HT54_WP	30/09/2024	-32.7363	116.4243	Wandoo	Alive	360	0	No
HT55_WP	30/09/2024	-32.7368	116.4384	Jarraah	Alive	500	0	No
HT56_WP	30/09/2024	-32.7368	116.4385	Jarraah	Alive	620	0	No
HT57_WP	30/09/2024	-32.7368	116.4386	Jarraah	Alive	820	0	No
HT58_WP	30/09/2024	-32.7368	116.4388	Jarraah	Alive	600	0	No
HT59_WP	30/09/2024	-32.7367	116.4389	Jarraah	Alive	520	0	No
HT60_WP	30/09/2024	-32.7368	116.4389	Jarraah	Alive	500	0	No
HT61_WP	30/09/2024	-32.7369	116.4389	Jarraah	Alive	650	0	No
HT62_WP	30/09/2024	-32.7368	116.4389	Jarraah	Alive	1220	1	No
HT63_WP	30/09/2024	-32.7369	116.4387	Jarraah	Alive	1100	0	No
HT64_WP	30/09/2024	-32.7371	116.4384	Jarraah	Alive	520	0	No
HT65_WP	30/09/2024	-32.7370	116.4388	Jarraah	Alive	610	0	No

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Tree ID	Date	Latitude	Longitude	Tree Species	Life status	DBH (mm)	Hollows	Evidence Of Use
HT66_WP	30/09/2024	-32.7371	116.4389	Jarrah	Alive	640	0	No
HT67_WP	30/09/2024	-32.7371	116.4389	Jarrah	Alive	780	0	No
HT68_WP	30/09/2024	-32.7371	116.4393	Jarrah	Alive	520	0	No
HT69_WP	30/09/2024	-32.7368	116.4394	Jarrah	Alive	980	0	No
HT70_WP	30/09/2024	-32.7367	116.4395	Jarrah	Alive	980	0	No
HT71_WP	30/09/2024	-32.7367	116.4393	Jarrah	Alive	500	0	No
HT72_WP	30/09/2024	-32.7369	116.4392	Jarrah	Alive	630	0	No
HT73_WP	30/09/2024	-32.7331	116.4297	Jarrah	Alive	890	0	No
HT74_WP	30/09/2024	-32.7330	116.4297	Jarrah	Alive	500	0	No
HT75_WP	30/09/2024	-32.7329	116.4299	Jarrah	Alive	530	0	No
HT76_WP	30/09/2024	-32.7329	116.4298	Jarrah	Alive	540	0	No
HT77_WP	30/09/2024	-32.7328	116.4298	Jarrah	Alive	730	2	No
HT78_WP	30/09/2024	-32.7328	116.4298	Jarrah	Alive	900	2	No
HT79_WP	30/09/2024	-32.7326	116.4296	Jarrah	Alive	600	2	No
HT80_WP	30/09/2024	-32.7326	116.4294	Jarrah	Alive	620	0	No
HT81_WP	30/09/2024	-32.7327	116.4294	Jarrah	Alive	940	0	No
HT82_WP	30/09/2024	-32.7328	116.4296	Jarrah	Alive	820	1	No
HT83_WP	30/09/2024	-32.7329	116.4296	Jarrah	Alive	1110	1	No
HT84_WP	30/09/2024	-32.7331	116.4294	Jarrah	Alive	720	2	No
HT85_WP	30/09/2024	-32.7331	116.4292	Jarrah	Alive	560	0	No
HT86_WP	30/09/2024	-32.7331	116.4291	Jarrah	Alive	760	0	No
HT87_WP	30/09/2024	-32.7329	116.4290	Jarrah	Alive	500	0	No
HT88_WP	30/09/2024	-32.7329	116.4290	Jarrah	Alive	500	0	No
HT89_WP	30/09/2024	-32.7329	116.4290	Jarrah	Alive	700	0	No
HT90_WP	30/09/2024	-32.7329	116.4291	Jarrah	Alive	550	0	No
HT91_WP	30/09/2024	-32.7328	116.4291	Marri	Alive	540	0	No
HT92_WP	30/09/2024	-32.7327	116.4289	Jarrah	Alive	570	0	No
HT93_WP	30/09/2024	-32.7326	116.4289	Marri	Alive	670	0	No
HT94_WP	30/09/2024	-32.7326	116.4293	Jarrah	Alive	910	1	No
HT95_WP	30/09/2024	-32.7329	116.4293	Jarrah	Alive	600	0	No
HT96_WP	30/09/2024	-32.7259	116.4314	Powderbark	Alive	450	2	No
HT97_WP	30/09/2024	-32.7260	116.4316	Powderbark	Alive	420	0	No
HT98_WP	30/09/2024	-32.7260	116.4316	Wandoo	Alive	370	0	No
HT99_WP	30/09/2024	-32.7259	116.4320	Wandoo	Alive	480	0	No
HT100_WP	30/09/2024	-32.7258	116.4320	Wandoo	Alive	300	0	No
HT101_WP	30/09/2024	-32.7256	116.4320	Wandoo	Alive	300	0	No
HT102_WP	30/09/2024	-32.7256	116.4319	Wandoo	Alive	320	0	No
HT103_WP	30/09/2024	-32.7258	116.4316	Powderbark	Alive	1000	1	No
HT104_WP	30/09/2024	-32.7257	116.4314	Wandoo	Alive	440	0	No
HT105_WP	30/09/2024	-32.7258	116.4311	Wandoo	Alive	300	0	No
HT106_WP	30/09/2024	-32.7259	116.4310	Powderbark	Alive	380	0	No
HT107_WP	30/09/2024	-32.7257	116.4310	Wandoo	Alive	380	0	No

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HT108_WP	30/09/2024	-32.7256	116.4311	Wandoo	Alive	300	0	No
HT109_WP	30/09/2024	-32.7256	116.4311	Wandoo	Alive	320	0	No
HT110_WP	30/09/2024	-32.7255	116.4311	Powderbark	Alive	340	0	No
HT111_WP	30/09/2024	-32.7255	116.4312	Wandoo	Alive	330	0	No
HT112_WP	30/09/2024	-32.7254	116.4312	Wandoo	Alive	390	0	No
HT113_WP	30/09/2024	-32.7256	116.4315	Wandoo	Alive	300	0	No
HT114_WP	30/09/2024	-32.7257	116.4314	Wandoo	Alive	440	0	No
HT115_WP	30/09/2024	-32.7254	116.4315	Wandoo	Alive	440	0	No
HT116_WP	30/09/2024	-32.7142	116.4437	Marri	Alive	870	0	No
HT117_WP	30/09/2024	-32.7142	116.4430	Jarrah	Alive	1300	1	No
HT118_WP	30/09/2024	-32.7141	116.4430	Jarrah	Alive	1160	1	No
HT119_WP	30/09/2024	-32.7143	116.4429	Marri	Alive	1000	1	No
HT120_WP	30/09/2024	-32.7145	116.4431	Jarrah	Alive	570	0	No
HT121_WP	30/09/2024	-32.7145	116.4430	Jarrah	Alive	1060	0	No
HT122_WP	30/09/2024	-32.7143	116.4432	Jarrah	Alive	1380	1	No
HT123_WP	30/09/2024	-32.7144	116.4433	Jarrah	Alive	530	0	No
HT124_WP	30/09/2024	-32.7144	116.4433	Jarrah	Alive	520	0	No
HT125_WP	30/09/2024	-32.7146	116.4436	Eucalyptus sp.	Alive	550	0	No
HT126_WP	30/09/2024	-32.7146	116.4437	Jarrah	Alive	740	0	No
HT127_WP	30/09/2024	-32.7145	116.4438	Jarrah	Alive	760	2	No
HT128_WP	30/09/2024	-32.7146	116.4439	Eucalyptus sp.	Dead	750	2	No
HT129_WP	30/09/2024	-32.7142	116.4440	Jarrah	Alive	1150	2	No
HT130_WP	30/09/2024	-32.7143	116.4436	Eucalyptus sp.	Dead	500	0	No
HT131_WP	30/09/2024	-32.7143	116.4435	Jarrah	Alive	800	0	No
HT132_WP	30/09/2024	-32.7110	116.4493	Jarrah	Alive	560	0	No
HT133_WP	30/09/2024	-32.7110	116.4494	Eucalyptus sp.	Alive	790	0	No
HT134_WP	30/09/2024	-32.7109	116.4494	Jarrah	Alive	730	0	No
HT135_WP	30/09/2024	-32.7108	116.4493	Jarrah	Alive	540	0	No
HT136_WP	30/09/2024	-32.7107	116.4493	Jarrah	Alive	650	0	No
HT137_WP	30/09/2024	-32.7109	116.4494	Jarrah	Alive	800	0	No
HT138_WP	30/09/2024	-32.7109	116.4496	Jarrah	Alive	770	1	No
HT139_WP	30/09/2024	-32.7109	116.4497	Jarrah	Alive	700	0	No
HT140_WP	30/09/2024	-32.7110	116.4498	Jarrah	Alive	690	0	No
HT141_WP	30/09/2024	-32.7110	116.4500	Jarrah	Alive	670	0	No
HT142_WP	30/09/2024	-32.7109	116.4499	Marri	Alive	520	0	No
HT143_WP	30/09/2024	-32.7108	116.4498	Jarrah	Alive	600	0	No
HT144_WP	30/09/2024	-32.7107	116.4495	Jarrah	Alive	500	0	No
HT145_WP	30/09/2024	-32.7107	116.4497	Jarrah	Alive	730	0	No
HT146_WP	30/09/2024	-32.7107	116.4498	Jarrah	Alive	500	0	No
HT147_WP	30/09/2024	-32.7169	116.4321	Wandoo	Alive	420	0	No
HT148_WP	30/09/2024	-32.7171	116.4322	Wandoo	Alive	400	0	No
HT149_WP	30/09/2024	-32.7171	116.4324	Marri	Alive	520	0	No

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HT150_WP	30/09/2024	-32.7169	116.4324	Wandoo	Alive	370	0	No
HT151_WP	30/09/2024	-32.7169	116.4327	Marri	Alive	550	0	No
HT152_WP	30/09/2024	-32.7172	116.4327	Eucalyptus sp.	Dead	600	0	No
HT153_WP	30/09/2024	-32.7171	116.4329	Wandoo	Alive	330	0	No
HT154_WP	30/09/2024	-32.7172	116.4329	Wandoo	Alive	360	0	No
HT155_WP	30/09/2024	-32.7172	116.4329	Wandoo	Alive	390	0	No
HT156_WP	30/09/2024	-32.7172	116.4331	Wandoo	Alive	310	0	No
HT157_WP	30/09/2024	-32.7171	116.4331	Wandoo	Alive	400	0	No
HT158_WP	30/09/2024	-32.7169	116.4331	Wandoo	Alive	340	0	No
HT159_WP	30/09/2024	-32.7169	116.4330	Wandoo	Alive	410	0	No
HT160_WP	1/10/2024	-32.7122	116.4172	Jarrah	Alive	720	0	No
HT161_WP	1/10/2024	-32.7121	116.4171	Jarrah	Alive	720	0	No
HT162_WP	1/10/2024	-32.7120	116.4169	Jarrah	Alive	660	0	No
HT163_WP	1/10/2024	-32.7119	116.4169	Jarrah	Alive	600	0	No
HT164_WP	1/10/2024	-32.7118	116.4170	Jarrah	Alive	700	0	No
HT165_WP	1/10/2024	-32.7121	116.4169	Jarrah	Alive	500	0	No
HT166_WP	1/10/2024	-32.7122	116.4167	Jarrah	Alive	500	0	No
HT167_WP	1/10/2024	-32.7118	116.4167	Jarrah	Alive	520	0	No
HT168_WP	1/10/2024	-32.7119	116.4167	Jarrah	Alive	540	0	No
HT169_WP	1/10/2024	-32.7119	116.4166	Jarrah	Alive	620	0	No
HT170_WP	1/10/2024	-32.7120	116.4164	Jarrah	Alive	900	1	No
HT171_WP	1/10/2024	-32.7119	116.4163	Jarrah	Alive	580	0	No
HT172_WP	1/10/2024	-32.7119	116.4162	Jarrah	Alive	560	0	No
HT173_WP	1/10/2024	-32.7120	116.4162	Jarrah	Alive	540	0	No
HT174_WP	1/10/2024	-32.7121	116.4161	Jarrah	Alive	720	0	No
HT175_WP	1/10/2024	-32.7122	116.4161	Jarrah	Alive	550	1	No
HT176_WP	1/10/2024	-32.7121	116.4163	Jarrah	Alive	620	0	No
HT177_WP	1/10/2024	-32.7131	116.4226	Jarrah	Alive	700	0	No
HT178_WP	1/10/2024	-32.7131	116.4225	Eucalyptus sp.	Dead	650	0	No
HT179_WP	1/10/2024	-32.7129	116.4226	Jarrah	Alive	550	0	No
HT180_WP	1/10/2024	-32.7127	116.4225	Jarrah	Alive	880	0	No
HT181_WP	1/10/2024	-32.7128	116.4227	Jarrah	Alive	600	0	No
HT182_WP	1/10/2024	-32.7130	116.4227	Jarrah	Alive	640	0	No
HT183_WP	1/10/2024	-32.7131	116.4228	Jarrah	Alive	600	0	No
HT184_WP	1/10/2024	-32.7131	116.4228	Jarrah	Alive	780	0	No
HT185_WP	1/10/2024	-32.7132	116.4229	Eucalyptus sp.	Dead	830	0	No
HT186_WP	1/10/2024	-32.7131	116.4230	Eucalyptus sp.	Dead	740	0	No
HT187_WP	1/10/2024	-32.7130	116.4230	Jarrah	Dead	800	0	No
HT188_WP	1/10/2024	-32.7129	116.4229	Jarrah	Alive	540	0	No
HT189_WP	1/10/2024	-32.7128	116.4229	Jarrah	Alive	640	0	No
HT190_WP	1/10/2024	-32.7128	116.4231	Jarrah	Alive	580	0	No
HT191_WP	1/10/2024	-32.7127	116.4233	Jarrah	Alive	570	0	No

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HT192_WP	1/10/2024	-32.7127	116.4234	Jarrah	Alive	500	0	No
HT193_WP	1/10/2024	-32.7127	116.4235	Marri	Alive	820	1	No
HT194_WP	1/10/2024	-32.7129	116.4236	Jarrah	Alive	620	0	No
HT195_WP	1/10/2024	-32.7129	116.4234	Jarrah	Alive	520	0	No
HT196_WP	1/10/2024	-32.7131	116.4234	Jarrah	Alive	510	0	No
HT197_WP	1/10/2024	-32.7131	116.4234	Jarrah	Alive	620	0	No
HT198_WP	1/10/2024	-32.7132	116.4233	Jarrah	Alive	630	0	No
HT199_WP	1/10/2024	-32.7232	116.4255	Jarrah	Alive	500	0	No
HT200_WP	1/10/2024	-32.7232	116.4254	Jarrah	Alive	610	0	No
HT201_WP	1/10/2024	-32.7231	116.4253	Jarrah	Alive	800	0	No
HT202_WP	1/10/2024	-32.7231	116.4251	Jarrah	Alive	720	0	No
HT203_WP	1/10/2024	-32.7233	116.4250	Jarrah	Alive	510	0	No
HT204_WP	1/10/2024	-32.7233	116.4249	Jarrah	Alive	510	0	No
HT205_WP	1/10/2024	-32.7232	116.4248	Marri	Alive	520	0	No
HT206_WP	1/10/2024	-32.7232	116.4247	Jarrah	Alive	740	0	No
HT207_WP	1/10/2024	-32.7231	116.4247	Jarrah	Alive	500	0	No
HT208_WP	1/10/2024	-32.7230	116.4247	Jarrah	Alive	720	0	No
HT209_WP	1/10/2024	-32.7227	116.4246	Jarrah	Alive	500	0	No
HT210_WP	1/10/2024	-32.7227	116.4248	Jarrah	Alive	500	0	No
HT211_WP	1/10/2024	-32.7228	116.4251	Jarrah	Alive	560	0	No
HT212_WP	1/10/2024	-32.7227	116.4252	Jarrah	Alive	610	0	No
HT213_WP	1/10/2024	-32.7228	116.4252	Jarrah	Alive	620	0	No
HT214_WP	1/10/2024	-32.7229	116.4252	Jarrah	Alive	750	0	No
HT215_WP	1/10/2024	-32.7228	116.4255	Jarrah	Alive	800	0	No
HT216_WP	1/10/2024	-32.7227	116.4256	Jarrah	Alive	740	0	No
HT1_SWF	28/09/2024	-32.7612	116.4145	Jarrah	No	690	0	No
HT2_SWF	28/09/2024	-32.7613	116.4144	Jarrah	No	750	1	No
HT3_SWF	28/09/2024	-32.7614	116.4144	Jarrah	No	660	0	No
HT4_SWF	29/09/2024	-32.7612	116.4142	Jarrah	No	560	0	No
HT5_SWF	28/09/2024	-32.7612	116.4142	Jarrah	No	630	0	No
HT6_SWF	28/09/2024	-32.7611	116.4144	Jarrah	No	760	0	No
HT7_SWF	28/09/2024	-32.7611	116.4144	Jarrah	No	790	1	No
HT8_SWF	28/09/2024	-32.7610	116.4143	Marri	No	720	0	No
HT9_SWF	28/09/2024	-32.7611	116.4142	Jarrah	No	590	0	No
HT10_SWF	28/09/2024	-32.7611	116.4142	Jarrah	No	620	0	No
HT11_SWF	28/09/2024	-32.7607	116.4148	Jarrah	No	970	1	No
HT12_SWF	28/09/2024	-32.7065	116.4081	Jarrah	No	520	0	No
HT13_SWF	28/09/2024	-32.7064	116.4080	Jarrah	No	790	4	No
HT14_SWF	28/09/2024	-32.7065	116.4077	Jarrah	No	750	0	No
HT15_SWF	28/09/2024	-32.7066	116.4079	Jarrah	No	520	0	No
HT16_SWF	28/09/2024	-32.7066	116.4078	Jarrah	No	780	0	No
HT17_SWF	28/09/2024	-32.7066	116.4078	Jarrah	No	660	0	No

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HT18_SWF	28/09/2024	-32.7067	116.4078	Jarrah	No	540	0	No
HT19_SWF	28/09/2024	-32.7066	116.4078	Jarrah	No	610	0	No
HT20_SWF	28/09/2024	-32.7068	116.4079	Jarrah	No	500	0	No
HT21_SWF	28/09/2024	-32.7069	116.4077	Jarrah	No	740	0	No
HT22_SWF	28/09/2024	-32.7070	116.4077	Jarrah	No	630	0	No
HT23_SWF	28/09/2024	-32.7071	116.4079	Marri	No	520	0	No
HT24_SWF	28/09/2024	-32.7070	116.4080	Marri	No	550	0	No
HT25_SWF	28/09/2024	-32.7072	116.4081	Jarrah	No	860	1	No
HT26_SWF	28/09/2024	-32.7071	116.4081	Jarrah	No	620	1	No
HT27_SWF	28/09/2024	-32.7032	116.4344	Jarrah	No	570	0	No
HT28_SWF	28/09/2024	-32.7032	116.4345	Jarrah	No	530	0	No
HT29_SWF	28/09/2024	-32.7032	116.4345	Marri	No	540	0	No
HT30_SWF	28/09/2024	-32.7032	116.4347	Jarrah	No	520	0	No
HT31_SWF	28/09/2024	-32.7032	116.4346	Jarrah	No	570	0	No
HT32_SWF	28/09/2024	-32.7031	116.4345	Marri	No	570	0	No
HT33_SWF	28/09/2024	-32.7030	116.4343	Jarrah	No	550	1	No
HT34_SWF	28/09/2024	-32.7029	116.4344	Jarrah	No	520	0	No
HT35_SWF	28/09/2024	-32.7030	116.4347	Jarrah	Yes	510	1	No
HT36_SWF	28/09/2024	-32.7030	116.4348	Jarrah	No	520	0	No
HT37_SWF	28/09/2024	-32.7031	116.4348	Jarrah	No	510	0	No
HT38_SWF	28/09/2024	-32.7032	116.4348	Jarrah	No	600	0	No
HT39_SWF	28/09/2024	-32.7032	116.4350	Jarrah	No	620	0	No
HT40_SWF	28/09/2024	-32.7033	116.4351	Jarrah	No	500	0	No
HT41_SWF	28/09/2024	-32.7032	116.4352	Jarrah	No	590	1	No
HT42_SWF	28/09/2024	-32.7030	116.4353	Jarrah	No	520	0	No
HT43_SWF	28/09/2024	-32.7047	116.4454	Jarrah	No	840	1	No
HT44_SWF	28/09/2024	-32.7048	116.4455	Jarrah	No	560	0	No
HT45_SWF	28/09/2024	-32.7048	116.4452	Jarrah	No	700	0	No
HT46_SWF	28/09/2024	-32.7047	116.4453	Jarrah	No	520	0	No
HT47_SWF	28/09/2024	-32.7049	116.4455	Powderbark	No	550	0	No
HT48_SWF	28/09/2024	-32.7050	116.4453	Jarrah	Yes	540	0	No
HT49_SWF	28/09/2024	-32.7050	116.4454	Jarrah	No	710	0	No
HT50_SWF	28/09/2024	-32.7053	116.4454	Powderbark	No	490	0	No
HT51_SWF	28/09/2024	-32.7053	116.4454	Jarrah	No	750	2	No
HT52_SWF	28/09/2024	-32.7054	116.4453	Wandoo	No	1100	0	No
HT53_SWF	28/09/2024	-32.7053	116.4452	Jarrah	No	550	0	No
HT54_SWF	28/09/2024	-32.7052	116.4451	Jarrah	No	530	0	No
HT55_SWF	28/09/2024	-32.7052	116.4450	Marri	No	520	0	No
HT56_SWF	28/09/2024	-32.7051	116.4450	Jarrah	No	810	0	No
HT57_SWF	28/09/2024	-32.7088	116.4247	Jarrah	No	610	0	No
HT58_SWF	28/09/2024	-32.7088	116.4251	Jarrah	No	690	0	No
HT59_SWF	28/09/2024	-32.7090	116.4251	Jarrah	No	550	0	No

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Tree ID	Date	Latitude	Longitude	Tree Species	Life status	DBH (mm)	Hollows	Evidence Of Use
HT60_SWF	28/09/2024	-32.7090	116.4250	Jarrah	No	560	0	No
HT61_SWF	28/09/2024	-32.7091	116.4248	Jarrah	No	790	0	No
HT62_SWF	28/09/2024	-32.7091	116.4249	Jarrah	No	760	0	No
HT63_SWF	28/09/2024	-32.7091	116.4250	Jarrah	No	590	0	No
HT64_SWF	28/09/2024	-32.7090	116.4252	Jarrah	No	920	1	No
HT65_SWF	28/09/2024	-32.7091	116.4253	Jarrah	No	570	0	No
HT66_SWF	28/09/2024	-32.7090	116.4254	Jarrah	No	840	0	No
HT67_SWF	28/09/2024	-32.7090	116.4254	Jarrah	No	560	0	No
HT68_SWF	28/09/2024	-32.7088	116.4254	Jarrah	No	520	0	No
HT69_SWF	28/09/2024	-32.7088	116.4256	Marri	Yes	730	1	No
HT70_SWF	28/09/2024	-32.7090	116.4255	Jarrah	No	560	0	No
HT71_SWF	28/09/2024	-32.7090	116.4257	Jarrah	No	550	0	No
HT72_SWF	29/09/2024	-32.7794	116.4484	Jarrah	No	610	0	No
HT73_SWF	29/09/2024	-32.7795	116.4485	Wandoo	No	520	0	No
HT74_SWF	29/09/2024	-32.7795	116.4486	Wandoo	No	450	0	No
HT75_SWF	29/09/2024	-32.7790	116.4487	Wandoo	No	440	0	No
HT76_SWF	29/09/2024	-32.7790	116.4487	Wandoo	No	380	0	No
HT77_SWF	29/09/2024	-32.7789	116.4487	Wandoo	No	420	0	No
HT78_SWF	29/09/2024	-32.7791	116.4484	Marri	No	340	0	No
HT79_SWF	29/09/2024	-32.7791	116.4484	Wandoo	No	320	0	No
HT80_SWF	29/09/2024	-32.7775	116.4404	Jarrah	No	520	0	No
HT81_SWF	29/09/2024	-32.7775	116.4404	Jarrah	No	510	0	No
HT82_SWF	29/09/2024	-32.7777	116.4405	Jarrah	Yes	590	1	No
HT83_SWF	29/09/2024	-32.7777	116.4408	Jarrah	Yes	540	1	No
HT84_SWF	29/09/2024	-32.7776	116.4408	Jarrah	No	860	2	No
HT85_SWF	29/09/2024	-32.7776	116.4411	Wandoo	No	440	0	No
HT86_SWF	29/09/2024	-32.7777	116.4412	Wandoo	No	320	0	No
HT87_SWF	29/09/2024	-32.7776	116.4413	Wandoo	No	460	0	No
HT88_SWF	29/09/2024	-32.7730	116.4404	Jarrah	No	530	0	No
HT89_SWF	29/09/2024	-32.7729	116.4404	Jarrah	No	850	2	No
HT90_SWF	29/09/2024	-32.7729	116.4405	Jarrah	No	770	1	No
HT91_SWF	29/09/2024	-32.7730	116.4407	Jarrah	No	560	0	No
HT92_SWF	29/09/2024	-32.7731	116.4407	Jarrah	No	510	0	No
HT93_SWF	29/09/2024	-32.7732	116.4409	Jarrah	Yes	730	3	No
HT94_SWF	29/09/2024	-32.7731	116.4410	Jarrah	No	560	0	No
HT95_SWF	29/09/2024	-32.7729	116.4413	Jarrah	No	710	0	No
HT96_SWF	29/09/2024	-32.7672	116.4477	Jarrah	No	1090	4	No
HT97_SWF	29/09/2024	-32.7671	116.4474	Wandoo	No	580	0	No
HT98_SWF	29/09/2024	-32.7673	116.4475	Jarrah	No	630	0	No
HT99_SWF	29/09/2024	-32.7673	116.4475	Wandoo	No	400	0	No
HT100_SWF	29/09/2024	-32.7672	116.4472	Wandoo	No	450	0	No
HT101_SWF	29/09/2024	-32.7672	116.4470	Jarrah	No	980	1	No

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HT102_SWF	29/09/2024	-32.7670	116.4470	Jarrah	No	670	2	No
HT103_SWF	29/09/2024	-32.7674	116.4469	Jarrah	No	890	0	No
HT104_SWF	29/09/2024	-32.7616	116.4348	Jarrah	No	560	0	No
HT105_SWF	29/09/2024	-32.7616	116.4347	Jarrah	No	920	0	No
HT106_SWF	29/09/2024	-32.7616	116.4347	Jarrah	No	560	1	No
HT107_SWF	29/09/2024	-32.7616	116.4348	Jarrah	No	520	0	No
HT108_SWF	29/09/2024	-32.7619	116.4347	Jarrah	No	620	0	No
HT109_SWF	29/09/2024	-32.7620	116.4346	Jarrah	No	960	1	No
HT110_SWF	29/09/2024	-32.7624	116.4346	Marri	No	730	0	No
HT111_SWF	29/09/2024	-32.7622	116.4349	Jarrah	No	510	0	No
HT112_SWF	29/09/2024	-32.7620	116.4349	Jarrah	No	610	0	No
HT113_SWF	29/09/2024	-32.7620	116.4350	Jarrah	No	870	2	No
HT114_SWF	29/09/2024	-32.7559	116.4413	Jarrah	No	640	0	No
HT115_SWF	29/09/2024	-32.7560	116.4414	Jarrah	No	760	0	No
HT116_SWF	29/09/2024	-32.7553	116.4413	Jarrah	No	660	0	No
HT117_SWF	29/09/2024	-32.7411	116.4373	Wandoo	No	380	0	No
HT118_SWF	29/09/2024	-32.7411	116.4375	Wandoo	No	300	0	No
HT119_SWF	29/09/2024	-32.7411	116.4375	Wandoo	No	360	0	No
HT120_SWF	29/09/2024	-32.7412	116.4375	Wandoo	No	310	0	No
HT121_SWF	29/09/2024	-32.7411	116.4376	Wandoo	No	990	3	No
HT122_SWF	29/09/2024	-32.7409	116.4377	Jarrah	No	540	0	No
HT123_SWF	29/09/2024	-32.7409	116.4377	Jarrah	No	690	3	No
HT124_SWF	29/09/2024	-32.7408	116.4378	Wandoo	No	340	0	No
HT125_SWF	29/09/2024	-32.7410	116.4378	Jarrah	Yes	510	0	No
HT126_SWF	29/09/2024	-32.7410	116.4380	Jarrah	No	590	0	No
HT127_SWF	29/09/2024	-32.7409	116.4380	Jarrah	No	740	0	No
HT128_SWF	29/09/2024	-32.7409	116.4381	Wandoo	No	340	0	No
HT129_SWF	29/09/2024	-32.7408	116.4380	Jarrah	No	520	0	No
HT130_SWF	29/09/2024	-32.7411	116.4381	Wandoo	No	730	1	No
HT131_SWF	29/09/2024	-32.7410	116.4383	Jarrah	No	680	0	No
HT132_SWF	29/09/2024	-32.7408	116.4383	Jarrah	Yes	610	0	No
HT133_SWF	29/09/2024	-32.7412	116.4376	Wandoo	No	450	0	No
HT134_SWF	29/09/2024	-32.7418	116.4319	Wandoo	No	420	0	No
HT135_SWF	29/09/2024	-32.7419	116.4318	Jarrah	Yes	680	3	No
HT136_SWF	29/09/2024	-32.7420	116.4319	Jarrah	Yes	800	1	No
HT137_SWF	29/09/2024	-32.7420	116.4318	Jarrah	No	580	2	No
HT138_SWF	29/09/2024	-32.7421	116.4318	Jarrah	No	790	0	No
HT139_SWF	29/09/2024	-32.7417	116.4315	Wandoo	No	430	0	No
HT140_SWF	29/09/2024	-32.7417	116.4313	Jarrah	Yes	640	2	No
HT141_SWF	29/09/2024	-32.7417	116.4312	Wandoo	No	780	1	No
HT142_SWF	29/09/2024	-32.7419	116.4309	Wandoo	No	360	0	No
HT143_SWF	29/09/2024	-32.7421	116.4311	Jarrah	No	610	0	No

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HT144_SWF	29/09/2024	-32.7421	116.4312	Jarrah	No	520	0	No
HT145_SWF	29/09/2024	-32.7421	116.4312	Jarrah	No	760	0	No
HT146_SWF	29/09/2024	-32.7421	116.4313	Jarrah	No	760	0	No
HT147_SWF	29/09/2024	-32.7420	116.4314	Jarrah	No	710	3	No
HT148_SWF	30/09/2024	-32.7370	116.4236	Jarrah	No	730	0	No
HT149_SWF	30/09/2024	-32.7369	116.4236	Jarrah	No	510	1	No
HT150_SWF	30/09/2024	-32.7369	116.4236	Wandoo	No	420	0	No
HT151_SWF	30/09/2024	-32.7367	116.4237	Wandoo	No	430	0	No
HT152_SWF	30/09/2024	-32.7366	116.4238	Wandoo	No	380	0	No
HT153_SWF	30/09/2024	-32.7365	116.4239	Jarrah	No	720	3	No
HT154_SWF	30/09/2024	-32.7365	116.4237	Wandoo	No	420	0	No
HT155_SWF	30/09/2024	-32.7364	116.4237	Wandoo	No	320	0	No
HT156_SWF	30/09/2024	-32.7362	116.4236	Wandoo	No	330	0	No
HT157_SWF	30/09/2024	-32.7362	116.4240	Wandoo	No	490	0	No
HT158_SWF	30/09/2024	-32.7366	116.4386	Jarrah	No	700	0	No
HT159_SWF	30/09/2024	-32.7365	116.4385	Jarrah	No	730	0	No
HT160_SWF	30/09/2024	-32.7365	116.4386	Jarrah	No	840	0	No
HT161_SWF	30/09/2024	-32.7364	116.4386	Marri	No	570	0	No
HT162_SWF	30/09/2024	-32.7364	116.4384	Jarrah	No	540	0	No
HT163_SWF	30/09/2024	-32.7363	116.4384	Jarrah	No	580	2	No
HT164_SWF	30/09/2024	-32.7363	116.4384	Jarrah	No	580	1	No
HT165_SWF	30/09/2024	-32.7364	116.4387	Jarrah	No	520	0	No
HT166_SWF	30/09/2024	-32.7364	116.4388	Marri	No	550	0	No
HT167_SWF	30/09/2024	-32.7363	116.4390	Jarrah	No	690	2	No
HT168_SWF	30/09/2024	-32.7364	116.4392	Jarrah	No	950	0	No
HT169_SWF	30/09/2024	-32.7365	116.4392	Jarrah	No	790	0	No
HT170_SWF	30/09/2024	-32.7366	116.4390	Jarrah	No	670	3	No
HT171_SWF	30/09/2024	-32.7366	116.4388	Jarrah	Yes	870	0	No
HT172_SWF	30/09/2024	-32.7367	116.4393	Jarrah	No	750	2	No
HT173_SWF	30/09/2024	-32.7366	116.4394	Jarrah	No	860	1	No
HT174_SWF	30/09/2024	-32.7363	116.4394	Jarrah	No	520	0	No
HT175_SWF	30/09/2024	-32.7332	116.4298	Jarrah	No	690	2	No
HT176_SWF	30/09/2024	-32.7331	116.4298	Jarrah	No	840	1	No
HT177_SWF	30/09/2024	-32.7333	116.4296	Jarrah	No	570	0	No
HT178_SWF	30/09/2024	-32.7335	116.4296	Jarrah	No	630	0	No
HT179_SWF	30/09/2024	-32.7335	116.4297	Jarrah	No	570	0	No
HT180_SWF	30/09/2024	-32.7334	116.4291	Marri	No	580	0	No
HT181_SWF	30/09/2024	-32.7335	116.4291	Jarrah	Yes	520	0	No
HT182_SWF	30/09/2024	-32.7333	116.4289	Jarrah	No	590	3	No
HT183_SWF	30/09/2024	-32.7331	116.4290	Jarrah	No	600	0	No
HT184_SWF	30/09/2024	-32.7332	116.4292	Jarrah	No	530	3	No
HT185_SWF	30/09/2024	-32.7328	116.4292	Jarrah	No	520	0	No

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HT186_SWF	30/09/2024	-32.7326	116.4291	Jarrah	No	510	0	No
HT187_SWF	30/09/2024	-32.7262	116.4312	Powderbark	No	480	0	No
HT188_SWF	30/09/2024	-32.7261	116.4313	Powderbark	No	300	0	No
HT189_SWF	30/09/2024	-32.7261	116.4313	Powderbark	No	300	0	No
HT190_SWF	30/09/2024	-32.7261	116.4314	Marri	No	390	0	No
HT191_SWF	30/09/2024	-32.7261	116.4315	Powderbark	No	330	0	No
HT192_SWF	30/09/2024	-32.7261	116.4315	Powderbark	No	440	0	No
HT193_SWF	30/09/2024	-32.7261	116.4315	Powderbark	No	360	0	No
HT194_SWF	30/09/2024	-32.7261	116.4315	Wandoo	No	860	3	No
HT195_SWF	30/09/2024	-32.7260	116.4316	Powderbark	No	470	0	No
HT196_SWF	30/09/2024	-32.7260	116.4316	Wandoo	No	380	0	No
HT197_SWF	30/09/2024	-32.7261	116.4317	Powderbark	No	310	0	No
HT198_SWF	30/09/2024	-32.7262	116.4317	Powderbark	No	410	0	No
HT199_SWF	30/09/2024	-32.7263	116.4316	Powderbark	No	400	0	No
HT200_SWF	30/09/2024	-32.7263	116.4316	Wandoo	No	780	2	No
HT201_SWF	30/09/2024	-32.7263	116.4317	Powderbark	No	320	0	No
HT202_SWF	30/09/2024	-32.7262	116.4319	Powderbark	No	320	0	No
HT203_SWF	30/09/2024	-32.7259	116.4320	Wandoo	No	440	0	No
HT204_SWF	30/09/2024	-32.7259	116.4310	Powderbark	No	400	0	No
HT205_SWF	30/09/2024	-32.7140	116.4438	Marri	No	560	0	No
HT206_SWF	30/09/2024	-32.7138	116.4438	Jarrah	No	550	0	No
HT207_SWF	30/09/2024	-32.7140	116.4435	Jarrah	No	530	0	No
HT208_SWF	30/09/2024	-32.7142	116.4437	Jarrah	No	660	0	No
HT209_SWF	30/09/2024	-32.7139	116.4432	Jarrah	No	1120	3	No
HT210_SWF	30/09/2024	-32.7139	116.4432	Jarrah	No	1100	1	No
HT211_SWF	30/09/2024	-32.7138	116.4429	Marri	No	850	1	No
HT212_SWF	30/09/2024	-32.7139	116.4429	Jarrah	No	500	0	No
HT213_SWF	30/09/2024	-32.7141	116.4428	Jarrah	No	820	0	No
HT214_SWF	30/09/2024	-32.7141	116.4428	Jarrah	No	620	0	No
HT215_SWF	30/09/2024	-32.7141	116.4430	Jarrah	No	1030	2	No
HT216_SWF	30/09/2024	-32.7141	116.4430	Jarrah	No	1020	1	No
HT217_SWF	30/09/2024	-32.7106	116.4494	Jarrah	No	510	0	No
HT218_SWF	30/09/2024	-32.7105	116.4495	Jarrah	No	670	0	No
HT219_SWF	30/09/2024	-32.7105	116.4493	Jarrah	No	580	0	No
HT220_SWF	30/09/2024	-32.7103	116.4493	Jarrah	No	530	0	No
HT221_SWF	30/09/2024	-32.7102	116.4495	Jarrah	No	670	0	No
HT222_SWF	30/09/2024	-32.7102	116.4495	Jarrah	No	530	1	No
HT223_SWF	30/09/2024	-32.7103	116.4496	Jarrah	No	730	0	No
HT224_SWF	30/09/2024	-32.7103	116.4498	Jarrah	No	690	0	No
HT225_SWF	30/09/2024	-32.7105	116.4498	Jarrah	No	720	0	No
HT226_SWF	30/09/2024	-32.7106	116.4499	Jarrah	No	560	0	No
HT227_SWF	30/09/2024	-32.7106	116.4499	Jarrah	No	770	0	No

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HT228_SWF	30/09/2024	-32.7106	116.4502	Jarrah	No	530	0	No
HT229_SWF	30/09/2024	-32.7106	116.4503	Jarrah	No	540	0	No
HT230_SWF	30/09/2024	-32.7105	116.4501	Jarrah	No	780	1	No
HT231_SWF	30/09/2024	-32.7104	116.4501	Jarrah	No	730	0	No
HT232_SWF	30/09/2024	-32.7102	116.4499	Jarrah	No	630	0	No
HT233_SWF	30/09/2024	-32.7168	116.4322	Wandoo	No	320	0	No
HT234_SWF	30/09/2024	-32.7168	116.4322	Wandoo	No	380	0	No
HT235_SWF	30/09/2024	-32.7169	116.4322	Wandoo	No	370	0	No
HT236_SWF	30/09/2024	-32.7165	116.4322	Wandoo	No	390	0	No
HT237_SWF	30/09/2024	-32.7165	116.4325	Wandoo	No	410	0	No
HT238_SWF	30/09/2024	-32.7167	116.4324	Wandoo	No	310	0	No
HT239_SWF	30/09/2024	-32.7168	116.4326	Wandoo	No	440	0	No
HT240_SWF	30/09/2024	-32.7168	116.4326	Wandoo	No	510	1	No
HT241_SWF	30/09/2024	-32.7168	116.4329	Marri	No	520	0	No
HT242_SWF	30/09/2024	-32.7167	116.4331	Wandoo	No	890	2	No
HT243_SWF	30/09/2024	-32.7166	116.4328	Wandoo	No	350	0	No
HT244_SWF	1/10/2024	-32.7430	116.4564	Jarrah	No	620	1	No
HT245_SWF	1/10/2024	-32.7430	116.4563	Jarrah	No	520	0	No
HT246_SWF	1/10/2024	-32.7429	116.4563	Jarrah	No	670	1	No
HT247_SWF	1/10/2024	-32.7428	116.4563	Jarrah	No	640	0	No
HT248_SWF	1/10/2024	-32.7427	116.4563	Jarrah	No	840	0	No
HT249_SWF	1/10/2024	-32.7427	116.4563	Jarrah	No	510	0	No
HT250_SWF	1/10/2024	-32.7426	116.4562	Jarrah	No	770	0	No
HT251_SWF	1/10/2024	-32.7426	116.4560	Jarrah	No	570	0	No
HT252_SWF	1/10/2024	-32.7427	116.4559	Jarrah	No	680	0	No
HT253_SWF	1/10/2024	-32.7427	116.4558	Jarrah	No	650	0	No
HT254_SWF	1/10/2024	-32.7428	116.4558	Jarrah	No	630	0	No
HT255_SWF	1/10/2024	-32.7429	116.4555	Jarrah	No	930	3	No
HT256_SWF	1/10/2024	-32.7430	116.4557	Jarrah	Yes	520	0	No
HT257_SWF	1/10/2024	-32.7429	116.4558	Jarrah	Yes	560	2	No
HT258_SWF	1/10/2024	-32.7429	116.4558	Wandoo	No	320	0	No
HT259_SWF	1/10/2024	-32.7360	116.4565	Jarrah	No	590	0	No
HT260_SWF	1/10/2024	-32.7361	116.4565	Jarrah	No	1120	3	No
HT261_SWF	1/10/2024	-32.7361	116.4564	Jarrah	No	830	0	No
HT262_SWF	1/10/2024	-32.7360	116.4561	Jarrah	No	610	0	No
HT263_SWF	1/10/2024	-32.7361	116.4558	Jarrah	No	570	0	No
HT264_SWF	1/10/2024	-32.7361	116.4557	Jarrah	No	540	0	No
HT265_SWF	1/10/2024	-32.7361	116.4556	Jarrah	No	560	0	No
HT266_SWF	1/10/2024	-32.7362	116.4556	Jarrah	No	520	0	No
HT267_SWF	1/10/2024	-32.7363	116.4555	Jarrah	No	550	0	No
HT268_SWF	1/10/2024	-32.7363	116.4557	Jarrah	No	590	0	No
HT269_SWF	1/10/2024	-32.7362	116.4559	Jarrah	No	540	0	No

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Tree ID	Date	Latitude	Longitude	Tree Species	Life status	DBH (mm)	Hollows	Evidence Of Use
HT270_SWF	1/10/2024	-32.7359	116.4556	Jarrah	No	1200	2	No
HT271_SWF	1/10/2024	-32.7277	116.4490	Jarrah	No	790	3	No
HT272_SWF	1/10/2024	-32.7275	116.4490	Jarrah	No	520	0	No
HT273_SWF	1/10/2024	-32.7275	116.4491	Jarrah	No	630	1	No
HT274_SWF	1/10/2024	-32.7275	116.4490	Jarrah	No	640	1	No
HT275_SWF	1/10/2024	-32.7274	116.4489	Jarrah	No	520	0	No
HT276_SWF	1/10/2024	-32.7275	116.4488	Jarrah	No	560	1	No
HT277_SWF	1/10/2024	-32.7273	116.4486	Jarrah	No	580	1	No
HT278_SWF	1/10/2024	-32.7274	116.4486	Marri	No	580	0	No
HT279_SWF	1/10/2024	-32.7273	116.4485	Jarrah	No	520	1	No
HT280_SWF	1/10/2024	-32.7274	116.4485	Jarrah	No	600	0	No
HT281_SWF	1/10/2024	-32.7275	116.4484	Jarrah	No	500	0	No
HT282_SWF	1/10/2024	-32.7275	116.4484	Jarrah	No	810	0	No
HT283_SWF	1/10/2024	-32.7276	116.4484	Jarrah	No	560	0	No
HT284_SWF	1/10/2024	-32.7277	116.4484	Jarrah	No	570	0	No
HT285_SWF	1/10/2024	-32.7277	116.4485	Jarrah	No	510	0	No
HT286_SWF	1/10/2024	-32.7277	116.4481	Jarrah	No	680	0	No
HT287_SWF	1/10/2024	-32.7346	116.4481	Jarrah	No	580	1	No
HT288_SWF	1/10/2024	-32.7347	116.4481	Jarrah	No	740	0	No
HT289_SWF	1/10/2024	-32.7348	116.4482	Jarrah	No	650	0	No
HT290_SWF	1/10/2024	-32.7348	116.4482	Jarrah	No	690	1	No
HT291_SWF	1/10/2024	-32.7347	116.4483	Jarrah	No	810	0	No
HT292_SWF	1/10/2024	-32.7347	116.4482	Marri	No	510	0	No
HT293_SWF	1/10/2024	-32.7347	116.4482	Jarrah	No	560	0	No
HT294_SWF	1/10/2024	-32.7346	116.4482	Jarrah	No	630	0	No
HT295_SWF	1/10/2024	-32.7346	116.4483	Jarrah	No	590	0	No
HT296_SWF	1/10/2024	-32.7346	116.4484	Jarrah	No	530	0	No
HT297_SWF	1/10/2024	-32.7345	116.4486	Powderbark	No	550	1	No
HT298_SWF	1/10/2024	-32.7346	116.4486	Jarrah	Yes	510	0	No
HT299_SWF	1/10/2024	-32.7346	116.4489	Marri	No	530	0	No
HT300_SWF	1/10/2024	-32.7347	116.4490	Jarrah	No	610	0	No
HT301_SWF	1/10/2024	-32.7346	116.4490	Jarrah	Yes	510	0	No
HT302_SWF	1/10/2024	-32.7348	116.4490	Marri	No	500	0	No
HT303_SWF	1/10/2024	-32.7348	116.4489	Jarrah	Yes	600	0	No
HT304_SWF	1/10/2024	-32.7349	116.4488	Powderbark	No	340	0	No
HT305_SWF	1/10/2024	-32.7349	116.4487	Powderbark	No	360	0	No
HT306_SWF	1/10/2024	-32.7348	116.4486	Powderbark	No	510	0	No
HT307_SWF	1/10/2024	-32.7273	116.4408	Wandoo	No	330	0	No
HT308_SWF	1/10/2024	-32.7270	116.4410	Jarrah	No	690	1	No
HT309_SWF	1/10/2024	-32.7269	116.4410	Wandoo	No	340	0	No
HT310_SWF	1/10/2024	-32.7268	116.4410	Wandoo	No	370	0	No
HT311_SWF	1/10/2024	-32.7268	116.4409	Wandoo	No	310	0	No

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HT312_SWF	1/10/2024	-32.7268	116.4409	Salmon Gum	No	520	0	No
HT313_SWF	1/10/2024	-32.7268	116.4409	Wandoo	No	390	0	No
HT314_SWF	1/10/2024	-32.7268	116.4408	Wandoo	No	330	0	No
HT315_SWF	1/10/2024	-32.7269	116.4408	Powderbark	No	330	0	No
HT316_SWF	1/10/2024	-32.7270	116.4407	Powderbark	No	330	0	No
HT317_SWF	1/10/2024	-32.7271	116.4406	Wandoo	No	340	0	No
HT318_SWF	1/10/2024	-32.7267	116.4406	Marri	No	350	0	No
HT319_SWF	1/10/2024	-32.7264	116.4406	Marri	No	310	0	No
HT320_SWF	1/10/2024	-32.7264	116.4408	Wandoo	No	330	0	No
HT321_SWF	1/10/2024	-32.7266	116.4411	Wandoo	No	430	0	No
HT322_SWF	1/10/2024	-32.7178	116.4587	Eucalyptus sp.	Yes	650	1	No
HT323_SWF	1/10/2024	-32.7180	116.4587	Wandoo	No	690	1	No
HT324_SWF	1/10/2024	-32.7180	116.4588	Wandoo	No	480	0	No
HT325_SWF	1/10/2024	-32.7182	116.4584	Wandoo	No	390	0	No
HT326_SWF	1/10/2024	-32.7182	116.4583	Wandoo	No	570	0	No
HT327_SWF	1/10/2024	-32.7181	116.4579	Wandoo	No	300	0	No
HT328_SWF	1/10/2024	-32.7182	116.4578	Jarrah	No	520	0	No
HT329_SWF	1/10/2024	-32.7182	116.4577	Jarrah	Yes	550	0	No
HT330_SWF	1/10/2024	-32.7179	116.4579	Wandoo	No	390	0	No
HT331_SWF	1/10/2024	-32.7179	116.4580	Wandoo	No	390	0	No
HT332_SWF	1/10/2024	-32.7179	116.4581	Wandoo	No	320	0	No
HT333_SWF	1/10/2024	-32.7180	116.4583	Wandoo	No	410	0	No
HT334_SWF	1/10/2024	-32.7081	116.4599	Wandoo	No	350	0	No
HT335_SWF	1/10/2024	-32.7080	116.4598	Wandoo	No	380	0	No
HT336_SWF	1/10/2024	-32.7079	116.4591	Wandoo	No	410	0	No
HT337_SWF	1/10/2024	-32.7445	116.4478	Jarrah	No	500	0	No
HT338_SWF	1/10/2024	-32.7444	116.4478	Jarrah	No	510	0	No
HT339_SWF	1/10/2024	-32.7446	116.4475	Jarrah	No	590	0	No
HT340_SWF	1/10/2024	-32.7447	116.4475	Jarrah	No	720	0	No
HT341_SWF	1/10/2024	-32.7447	116.4473	Jarrah	No	590	0	No
HT342_SWF	1/10/2024	-32.7447	116.4474	Marri	No	580	0	No
HT343_SWF	1/10/2024	-32.7448	116.4472	Jarrah	No	890	3	No
HT344_SWF	1/10/2024	-32.7449	116.4470	Jarrah	No	810	0	No
HT345_SWF	1/10/2024	-32.7446	116.4472	Jarrah	No	670	0	No
HT346_SWF	1/10/2024	-32.7445	116.4471	Jarrah	No	550	0	No
HT347_SWF	1/10/2024	-32.7445	116.4472	Jarrah	No	550	0	No
HT348_SWF	1/10/2024	-32.7445	116.4471	Jarrah	No	940	0	No
HT349_SWF	1/10/2024	-32.7446	116.4470	Jarrah	No	580	0	No
HT350_SWF	1/10/2024	-32.7448	116.4474	Jarrah	No	680	0	No
HT351_SWF	1/10/2024	-32.7449	116.4476	Marri	No	520	0	No
HT352_SWF	1/10/2024	-32.7447	116.4477	Jarrah	No	660	0	No
HT353_SWF	1/10/2024	-32.7656	116.4563	Eucalyptus sp.	Yes	530	1	No

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HT354_SWF	1/10/2024	-32.7654	116.4562	Eucalyptus sp.	No	690	0	No
HT355_SWF	1/10/2024	-32.7653	116.4558	Wandoo	No	370	0	No
HT356_SWF	1/10/2024	-32.7654	116.4558	Eucalyptus sp.	No	620	0	No
HT357_SWF	1/10/2024	-32.7655	116.4557	Wandoo	No	300	0	No
HT1_KF	28/09/2024	-32.7612	116.4142	Jarrah	Alive	670	0	No
HT2_KF	28/09/2024	-32.7611	116.4142	Jarrah	Alive	610	0	No
HT3_KF	28/09/2024	-32.7611	116.4142	Jarrah	Alive	520	0	No
HT4_KF	28/09/2024	-32.7610	116.4143	Jarrah	Alive	620	0	No
HT5_KF	28/09/2024	-32.7606	116.4140	Jarrah	Alive	690	0	No
HT6_KF	28/09/2024	-32.7608	116.4140	Jarrah	Alive	630	0	No
HT7_KF	28/09/2024	-32.7608	116.4140	Jarrah	Alive	570	0	No
HT8_KF	28/09/2024	-32.7610	116.4140	Jarrah	Alive	710	2	No
HT9_KF	28/09/2024	-32.7610	116.4139	Jarrah	Alive	720	0	No
HT10_KF	28/09/2024	-32.7611	116.4138	Jarrah	Alive	710	0	No
HT11_KF	28/09/2024	-32.7611	116.4137	Jarrah	Alive	550	0	No
HT12_KF	28/09/2024	-32.7611	116.4137	Jarrah	Alive	550	0	No
HT13_KF	28/09/2024	-32.7614	116.4139	Jarrah	Alive	860	2	No
HT14_KF	28/09/2024	-32.7065	116.4084	Jarrah	Alive	850	0	No
HT15_KF	28/09/2024	-32.7068	116.4084	Jarrah	Alive	1140	1	No
HT16_KF	28/09/2024	-32.7068	116.4082	Jarrah	Alive	640	1	No
HT17_KF	28/09/2024	-32.7068	116.4081	Jarrah	Alive	680	0	No
HT18_KF	28/09/2024	-32.7071	116.4077	Jarrah	Alive	690	0	No
HT19_KF	28/09/2024	-32.7072	116.4080	Jarrah	Alive	680	1	No
HT20_KF	28/09/2024	-32.7072	116.4082	Jarrah	Alive	510	0	No
HT21_KF	28/09/2024	-32.7071	116.4085	Jarrah	Alive	1120	1	No
HT22_KF	28/09/2024	-32.7070	116.4086	Jarrah	Alive	780	1	No
HT23_KF	28/09/2024	-32.7068	116.4086	Jarrah	Alive	560	0	No
HT24_KF	28/09/2024	-32.7035	116.4343	Jarrah	Alive	560	0	No
HT25_KF	28/09/2024	-32.7035	116.4343	Jarrah	Alive	540	0	No
HT26_KF	28/09/2024	-32.7035	116.4344	Jarrah	Alive	640	0	No
HT27_KF	28/09/2024	-32.7036	116.4344	Jarrah	Alive	520	1	No
HT28_KF	28/09/2024	-32.7037	116.4344	Jarrah	Alive	530	0	No
HT29_KF	28/09/2024	-32.7037	116.4346	Jarrah	Alive	740	1	No
HT30_KF	28/09/2024	-32.7036	116.4347	Jarrah	Alive	530	1	No
HT31_KF	28/09/2024	-32.7035	116.4349	Jarrah	Alive	510	0	No
HT32_KF	28/09/2024	-32.7035	116.4351	Jarrah	Alive	510	0	No
HT33_KF	28/09/2024	-32.7035	116.4351	Jarrah	Alive	500	2	No
HT34_KF	28/09/2024	-32.7036	116.4353	Jarrah	Alive	640	1	No
HT35_KF	28/09/2024	-32.7037	116.4353	Eucalyptus sp.	Alive	610	0	No
HT36_KF	28/09/2024	-32.7047	116.4459	Jarrah	Alive	550	0	No
HT37_KF	28/09/2024	-32.7048	116.4460	Jarrah	Alive	700	1	No
HT38_KF	28/09/2024	-32.7050	116.4459	Jarrah	Alive	810	0	No

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HT39_KF	28/09/2024	-32.7054	116.4460	Jarrah	Alive	700	1	No
HT40_KF	28/09/2024	-32.7056	116.4458	Jarrah	Alive	810	1	No
HT41_KF	28/09/2024	-32.7054	116.4457	Jarrah	Alive	710	1	No
HT42_KF	28/09/2024	-32.7053	116.4457	Eucalyptus sp.	Dead	620	1	No
HT43_KF	28/09/2024	-32.7052	116.4457	Jarrah	Alive	520	0	No
HT44_KF	28/09/2024	-32.7052	116.4457	Jarrah	Alive	630	0	No
HT45_KF	28/09/2024	-32.7051	116.4457	Wandoo	Alive	350	0	No
HT46_KF	28/09/2024	-32.7051	116.4458	Eucalyptus sp.	Dead	510	1	No
HT47_KF	28/09/2024	-32.7049	116.4457	Jarrah	Alive	510	0	No
HT48_KF	28/09/2024	-32.7048	116.4457	Wandoo	Alive	570	0	No
HT49_KF	28/09/2024	-32.7047	116.4457	Eucalyptus sp.	Dead	1190	0	No
HT50_KF	28/09/2024	-32.7086	116.4248	Jarrah	Alive	710	0	No
HT51_KF	28/09/2024	-32.7086	116.4249	Eucalyptus sp.	Dead	1320	1	No
HT52_KF	28/09/2024	-32.7086	116.4250	Jarrah	Alive	660	0	No
HT53_KF	28/09/2024	-32.7085	116.4252	Eucalyptus sp.	Alive	670	0	No
HT54_KF	28/09/2024	-32.7084	116.4257	Eucalyptus sp.	Dead	700	1	No
HT55_KF	28/09/2024	-32.7083	116.4258	Jarrah	Alive	530	0	No
HT56_KF	28/09/2024	-32.7082	116.4256	Jarrah	Alive	560	0	No
HT57_KF	28/09/2024	-32.7083	116.4252	Jarrah	Alive	1120	0	No
HT58_KF	28/09/2024	-32.7084	116.4249	Eucalyptus sp.	Dead	720	0	No
HT59_KF	28/09/2024	-32.7084	116.4249	Jarrah	Alive	740	0	No
HT60_KF	28/09/2024	-32.7083	116.4248	Marri	Alive	750	1	No
HT61_KF	29/09/2024	-32.7795	116.4479	Wandoo	Alive	310	0	No
HT62_KF	29/09/2024	-32.7791	116.4481	Marri	Alive	510	0	No
HT63_KF	29/09/2024	-32.7790	116.4478	Jarrah	Alive	710	0	No
HT64_KF	29/09/2024	-32.7788	116.4478	Jarrah	Alive	530	0	No
HT65_KF	29/09/2024	-32.7788	116.4480	Marri	Alive	940	0	No
HT66_KF	29/09/2024	-32.7787	116.4479	Marri	Alive	560	0	No
HT67_KF	29/09/2024	-32.7770	116.4407	Wandoo	Alive	310	0	No
HT68_KF	29/09/2024	-32.7770	116.4407	Wandoo	Alive	490	0	No
HT69_KF	29/09/2024	-32.7729	116.4404	Jarrah	Alive	1000	0	No
HT70_KF	29/09/2024	-32.7724	116.4406	Marri	Alive	660	1	No
HT71_KF	29/09/2024	-32.7725	116.4407	Eucalyptus sp.	Dead	540	1	No
HT72_KF	29/09/2024	-32.7725	116.4408	Jarrah	Alive	510	0	No
HT73_KF	29/09/2024	-32.7724	116.4409	Jarrah	Alive	710	3	No
HT74_KF	29/09/2024	-32.7726	116.4410	Jarrah	Alive	530	0	No
HT75_KF	29/09/2024	-32.7725	116.4412	Jarrah	Alive	510	0	No
HT76_KF	29/09/2024	-32.7677	116.4477	Jarrah	Alive	820	1	No
HT77_KF	29/09/2024	-32.7676	116.4476	Jarrah	Alive	510	0	No
HT78_KF	29/09/2024	-32.7678	116.4477	Wandoo	Alive	320	0	No
HT79_KF	29/09/2024	-32.7679	116.4477	Wandoo	Alive	390	0	No
HT80_KF	29/09/2024	-32.7679	116.4473	Jarrah	Alive	700	0	No

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HT81_KF	29/09/2024	-32.7678	116.4474	Wandoo	Alive	320	0	No
HT82_KF	29/09/2024	-32.7676	116.4474	Wandoo	Alive	490	0	No
HT83_KF	29/09/2024	-32.7675	116.4472	Jarrah	Alive	520	0	No
HT84_KF	29/09/2024	-32.7675	116.4472	Jarrah	Alive	780	0	No
HT85_KF	29/09/2024	-32.7678	116.4471	Eucalyptus sp.	Alive	900	1	No
HT86_KF	29/09/2024	-32.7678	116.4471	Jarrah	Alive	610	0	No
HT87_KF	29/09/2024	-32.7676	116.4468	Jarrah	Alive	570	0	No
HT88_KF	29/09/2024	-32.7674	116.4469	Jarrah	Alive	670	0	No
HT89_KF	29/09/2024	-32.7615	116.4345	Jarrah	Alive	610	0	No
HT90_KF	29/09/2024	-32.7617	116.4344	Jarrah	Alive	570	0	No
HT91_KF	29/09/2024	-32.7618	116.4343	Jarrah	Alive	730	1	No
HT92_KF	29/09/2024	-32.7619	116.4341	Jarrah	Alive	610	0	No
HT93_KF	29/09/2024	-32.7623	116.4340	Jarrah	Alive	500	1	No
HT94_KF	29/09/2024	-32.7624	116.4342	Jarrah	Alive	590	0	No
HT95_KF	29/09/2024	-32.7623	116.4341	Wandoo	Alive	310	0	No
HT96_KF	29/09/2024	-32.7623	116.4342	Jarrah	Alive	510	0	No
HT97_KF	29/09/2024	-32.7624	116.4343	Jarrah	Alive	620	1	No
HT98_KF	29/09/2024	-32.7624	116.4345	Marri	Alive	610	0	No
HT99_KF	29/09/2024	-32.7551	116.4288	Eucalyptus sp.	Dead	500	1	No
HT100_KF	29/09/2024	-32.7550	116.4288	Wandoo	Alive	330	0	No
HT101_KF	29/09/2024	-32.7548	116.4288	Wandoo	Alive	310	0	No
HT102_KF	29/09/2024	-32.7549	116.4291	Wandoo	Alive	330	0	No
HT103_KF	29/09/2024	-32.7545	116.4290	Jarrah	Alive	810	0	No
HT104_KF	29/09/2024	-32.7544	116.4292	Wandoo	Alive	410	0	No
HT105_KF	29/09/2024	-32.7503	116.4224	Jarrah	Alive	510	0	No
HT106_KF	29/09/2024	-32.7505	116.4224	Jarrah	Alive	720	0	No
HT107_KF	29/09/2024	-32.7505	116.4226	Jarrah	Alive	710	0	No
HT108_KF	29/09/2024	-32.7506	116.4228	Jarrah	Alive	600	1	No
HT109_KF	29/09/2024	-32.7503	116.4231	Jarrah	Alive	670	1	No
HT110_KF	29/09/2024	-32.7503	116.4230	Jarrah	Alive	640	1	No
HT111_KF	29/09/2024	-32.7502	116.4229	Wandoo	Alive	450	0	No
HT112_KF	29/09/2024	-32.7502	116.4228	Jarrah	Alive	650	0	No
HT113_KF	29/09/2024	-32.7501	116.4229	Jarrah	Alive	510	1	No
HT114_KF	29/09/2024	-32.7499	116.4231	Jarrah	Alive	600	0	No
HT115_KF	29/09/2024	-32.7499	116.4232	Jarrah	Alive	520	0	No
HT116_KF	29/09/2024	-32.7498	116.4231	Jarrah	Alive	620	2	No
HT117_KF	29/09/2024	-32.7498	116.4230	Jarrah	Alive	650	0	No
HT118_KF	29/09/2024	-32.7499	116.4229	Jarrah	Alive	570	0	No
HT119_KF	29/09/2024	-32.7497	116.4226	Jarrah	Alive	590	0	No
HT120_KF	29/09/2024	-32.7500	116.4226	Jarrah	Alive	640	0	No
HT121_KF	29/09/2024	-32.7505	116.4111	Jarrah	Alive	610	0	No
HT122_KF	29/09/2024	-32.7505	116.4109	Jarrah	Alive	590	0	No

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HT123_KF	29/09/2024	-32.7505	116.4107	Jarrah	Alive	590	0	No
HT124_KF	29/09/2024	-32.7503	116.4107	Jarrah	Alive	620	0	No
HT125_KF	29/09/2024	-32.7501	116.4108	Eucalyptus sp.	Dead	770	0	No
HT126_KF	29/09/2024	-32.7500	116.4107	Jarrah	Alive	1170	0	No
HT127_KF	29/09/2024	-32.7498	116.4107	Jarrah	Alive	640	0	No
HT128_KF	29/09/2024	-32.7500	116.4110	Jarrah	Alive	740	0	No
HT129_KF	29/09/2024	-32.7498	116.4112	Jarrah	Alive	910	1	No
HT130_KF	29/09/2024	-32.7497	116.4111	Jarrah	Alive	680	0	No
HT131_KF	29/09/2024	-32.7397	116.4148	Jarrah	Alive	510	0	No
HT132_KF	29/09/2024	-32.7397	116.4147	Jarrah	Alive	520	0	No
HT133_KF	29/09/2024	-32.7396	116.4148	Jarrah	Alive	640	0	No
HT134_KF	29/09/2024	-32.7394	116.4147	Jarrah	Alive	619	0	No
HT135_KF	29/09/2024	-32.7393	116.4149	Jarrah	Alive	630	0	No
HT136_KF	29/09/2024	-32.7391	116.4146	Eucalyptus sp.	Alive	660	1	No
HT137_KF	29/09/2024	-32.7389	116.4148	Jarrah	Alive	520	0	No
HT138_KF	29/09/2024	-32.7389	116.4147	Jarrah	Alive	590	0	No
HT139_KF	29/09/2024	-32.7391	116.4146	Jarrah	Alive	500	0	No
HT140_KF	29/09/2024	-32.7393	116.4143	Jarrah	Alive	560	0	No
HT141_KF	29/09/2024	-32.7393	116.4142	Eucalyptus sp.	Dead	500	0	No
HT142_KF	29/09/2024	-32.7393	116.4146	Marri	Alive	629	1	No
HT143_KF	29/09/2024	-32.7238	116.4083	Wandoo	Alive	830	0	No
HT144_KF	29/09/2024	-32.7238	116.4082	Eucalyptus sp.	Alive	910	0	No
HT145_KF	29/09/2024	-32.7238	116.4078	Jarrah	Alive	700	0	No
HT146_KF	29/09/2024	-32.7238	116.4078	Marri	Alive	570	0	No
HT147_KF	29/09/2024	-32.7237	116.4075	Marri	Alive	550	0	No
HT148_KF	29/09/2024	-32.7236	116.4077	Jarrah	Alive	590	0	No
HT149_KF	29/09/2024	-32.7236	116.4083	Wandoo	Alive	350	0	No
HT150_KF	29/09/2024	-32.7241	116.4076	Wandoo	Alive	300	0	No
HT151_KF	29/09/2024	-32.7239	116.4078	Eucalyptus sp.	Dead	710	0	No
HT152_KF	30/09/2024	-32.7289	116.4180	Jarrah	Alive	750	2	No
HT153_KF	30/09/2024	-32.7285	116.4181	Jarrah	Alive	810	1	No
HT154_KF	30/09/2024	-32.7281	116.4180	Jarrah	Alive	560	1	No
HT155_KF	30/09/2024	-32.7281	116.4179	Jarrah	Alive	530	0	No
HT156_KF	30/09/2024	-32.7282	116.4178	Jarrah	Alive	500	0	No
HT157_KF	30/09/2024	-32.7283	116.4176	Jarrah	Alive	590	0	No
HT158_KF	30/09/2024	-32.7282	116.4175	Eucalyptus sp.	Dead	670	0	No
HT159_KF	30/09/2024	-32.7284	116.4172	Jarrah	Alive	520	1	No
HT160_KF	30/09/2024	-32.7281	116.4171	Eucalyptus sp.	Dead	750	1	No
HT161_KF	30/09/2024	-32.7350	116.4136	Wandoo	Alive	460	0	No
HT162_KF	30/09/2024	-32.7349	116.4137	Wandoo	Alive	320	0	No
HT163_KF	30/09/2024	-32.7348	116.4137	Wandoo	Alive	670	0	No
HT164_KF	30/09/2024	-32.7349	116.4137	Wandoo	Alive	530	0	No

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HT165_KF	30/09/2024	-32.7346	116.4139	Wandoo	Alive	430	0	No
HT166_KF	30/09/2024	-32.7345	116.4139	Wandoo	Alive	380	0	No
HT167_KF	30/09/2024	-32.7344	116.4139	Wandoo	Alive	320	0	No
HT168_KF	30/09/2024	-32.7344	116.4137	Wandoo	Alive	400	0	No
HT169_KF	30/09/2024	-32.7344	116.4136	Marri	Alive	630	0	No
HT170_KF	30/09/2024	-32.7344	116.4136	Wandoo	Alive	320	0	No
HT171_KF	30/09/2024	-32.7344	116.4133	Wandoo	Alive	520	0	No
HT172_KF	30/09/2024	-32.7344	116.4132	Marri	Alive	740	0	No
HT173_KF	30/09/2024	-32.7444	116.4218	Jarraah	Alive	570	0	No
HT174_KF	30/09/2024	-32.7446	116.4218	Jarraah	Alive	560	0	No
HT175_KF	30/09/2024	-32.7448	116.4217	Jarraah	Alive	550	0	No
HT176_KF	30/09/2024	-32.7450	116.4217	Jarraah	Alive	600	0	No
HT177_KF	30/09/2024	-32.7452	116.4218	Marri	Alive	660	0	No
HT178_KF	30/09/2024	-32.7451	116.4219	Jarraah	Alive	510	0	No
HT179_KF	30/09/2024	-32.7446	116.4219	Jarraah	Alive	760	0	No
HT180_KF	30/09/2024	-32.7446	116.4219	Jarraah	Alive	510	0	No
HT181_KF	30/09/2024	-32.7445	116.4220	Jarraah	Alive	700	0	No
HT182_KF	30/09/2024	-32.7444	116.4220	Jarraah	Alive	550	0	No
HT183_KF	30/09/2024	-32.7444	116.4221	Jarraah	Alive	620	0	No
HT184_KF	30/09/2024	-32.7443	116.4221	Jarraah	Alive	610	0	No
HT185_KF	30/09/2024	-32.7443	116.4222	Jarraah	Alive	510	0	No
HT186_KF	30/09/2024	-32.7444	116.4222	Jarraah	Alive	620	0	No
HT187_KF	30/09/2024	-32.7446	116.4223	Marri	Alive	750	0	No
HT188_KF	30/09/2024	-32.7448	116.4222	Jarraah	Alive	560	0	No
HT189_KF	30/09/2024	-32.7449	116.4222	Marri	Alive	570	0	No
HT190_KF	30/09/2024	-32.7451	116.4222	Eucalyptus sp.	Dead	530	0	No
HT191_KF	30/09/2024	-32.7451	116.4223	Jarraah	Alive	530	0	No
HT192_KF	30/09/2024	-32.7451	116.4224	Jarraah	Alive	620	0	No
HT193_KF	30/09/2024	-32.7616	116.4229	Jarraah	Alive	510	0	No
HT194_KF	30/09/2024	-32.7616	116.4229	Jarraah	Alive	510	0	No
HT195_KF	30/09/2024	-32.7618	116.4229	Jarraah	Alive	520	0	No
HT196_KF	30/09/2024	-32.7619	116.4230	Jarraah	Alive	510	0	No
HT197_KF	30/09/2024	-32.7619	116.4229	Jarraah	Alive	510	0	No
HT198_KF	30/09/2024	-32.7619	116.4227	Jarraah	Alive	530	0	No
HT199_KF	30/09/2024	-32.7620	116.4231	Jarraah	Alive	530	0	No
HT200_KF	30/09/2024	-32.7621	116.4232	Jarraah	Alive	500	0	No
HT201_KF	30/09/2024	-32.7622	116.4233	Marri	Alive	560	0	No
HT202_KF	30/09/2024	-32.7622	116.4229	Eucalyptus sp.	Alive	720	0	No
HT203_KF	30/09/2024	-32.7624	116.4228	Jarraah	Alive	520	0	No
HT204_KF	30/09/2024	-32.7620	116.4226	Jarraah	Alive	540	0	No
HT205_KF	30/09/2024	-32.7620	116.4226	Jarraah	Alive	580	0	No
HT206_KF	30/09/2024	-32.7678	116.4326	Marri	Alive	589	0	No

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HT207_KF	30/09/2024	-32.7678	116.4322	Marri	Alive	830	0	No
HT208_KF	30/09/2024	-32.7675	116.4323	Jarrah	Alive	630	0	No
HT209_KF	30/09/2024	-32.7675	116.4323	Jarrah	Alive	500	0	No
HT210_KF	30/09/2024	-32.7674	116.4323	Jarrah	Alive	520	0	No
HT211_KF	30/09/2024	-32.7673	116.4324	Jarrah	Alive	790	0	No
HT212_KF	30/09/2024	-32.7672	116.4323	Jarrah	Alive	660	0	No
HT213_KF	30/09/2024	-32.7671	116.4324	Jarrah	Alive	630	0	No
HT214_KF	30/09/2024	-32.7671	116.4325	Jarrah	Alive	550	0	No
HT215_KF	30/09/2024	-32.7670	116.4326	Jarrah	Alive	550	0	No
HT216_KF	30/09/2024	-32.7671	116.4326	Jarrah	Alive	500	0	No
HT217_KF	30/09/2024	-32.7672	116.4327	Jarrah	Alive	500	0	No
HT218_KF	30/09/2024	-32.7672	116.4322	Jarrah	Alive	520	0	No
HT219_KF	30/09/2024	-32.7672	116.4321	Jarrah	Alive	510	0	No
HT220_KF	30/09/2024	-32.7672	116.4318	Jarrah	Alive	630	0	No
HT221_KF	30/09/2024	-32.7672	116.4319	Jarrah	Alive	530	0	No
HT222_KF	30/09/2024	-32.7792	116.4326	Jarrah	Alive	660	0	No
HT223_KF	30/09/2024	-32.7791	116.4325	Jarrah	Alive	500	0	No
HT224_KF	30/09/2024	-32.7789	116.4327	Marri	Alive	500	0	No
HT225_KF	30/09/2024	-32.7789	116.4326	Jarrah	Alive	500	0	No
HT226_KF	30/09/2024	-32.7788	116.4324	Marri	Alive	680	0	No
HT227_KF	30/09/2024	-32.7788	116.4323	Jarrah	Alive	740	0	No
HT228_KF	30/09/2024	-32.7790	116.4322	Jarrah	Alive	560	0	No
HT229_KF	30/09/2024	-32.7790	116.4322	Jarrah	Alive	520	0	No
HT230_KF	30/09/2024	-32.7789	116.4321	Jarrah	Alive	540	0	No
HT231_KF	30/09/2024	-32.7790	116.4321	Marri	Alive	630	0	No
HT232_KF	30/09/2024	-32.7721	116.4122	Eucalyptus sp.	Dead	510	1	No
HT233_KF	30/09/2024	-32.7732	116.4290	Wandoo	Alive	360	0	No
HT234_KF	30/09/2024	-32.7732	116.4293	Jarrah	Alive	510	0	No
HT235_KF	30/09/2024	-32.7732	116.4294	Eucalyptus sp.	Alive	630	1	No
HT236_KF	30/09/2024	-32.7727	116.4295	Wandoo	Alive	480	0	No
HT237_KF	30/09/2024	-32.7725	116.4293	Jarrah	Alive	790	0	No
HT238_KF	30/09/2024	-32.7726	116.4292	Wandoo	Alive	300	0	No
HT239_KF	30/09/2024	-32.7729	116.4289	Wandoo	Alive	420	0	No
HT240_KF	30/09/2024	-32.7691	116.4212	Jarrah	Alive	500	0	No
HT241_KF	30/09/2024	-32.7694	116.4218	Wandoo	Alive	500	0	No
HT242_KF	30/09/2024	-32.7694	116.4218	Wandoo	Alive	300	0	No
HT243_KF	30/09/2024	-32.7693	116.4220	Jarrah	Alive	500	0	No
HT244_KF	30/09/2024	-32.7694	116.4222	Jarrah	Alive	500	0	No
HT245_KF	30/09/2024	-32.7692	116.4219	Wandoo	Alive	400	0	No
HT246_KF	30/09/2024	-32.7562	116.4547	Jarrah	Alive	510	0	No
HT247_KF	30/09/2024	-32.7562	116.4545	Jarrah	Alive	520	0	No
HT248_KF	30/09/2024	-32.7564	116.4546	Jarrah	Alive	660	2	No

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HT249_KF	30/09/2024	-32.7564	116.4547	Jarrah	Alive	760	0	No
HT250_KF	30/09/2024	-32.7566	116.4549	Jarrah	Alive	910	0	No
HT251_KF	30/09/2024	-32.7569	116.4548	Jarrah	Alive	710	0	No
HT252_KF	30/09/2024	-32.7570	116.4546	Jarrah	Alive	1230	2	No
HT253_KF	30/09/2024	-32.7511	116.4565	Jarrah	Alive	700	0	No
HT254_KF	30/09/2024	-32.7512	116.4563	Jarrah	Alive	610	0	No
HT255_KF	30/09/2024	-32.7511	116.4561	Jarrah	Alive	640	0	No
HT256_KF	30/09/2024	-32.7511	116.4561	Marri	Alive	650	0	No
HT257_KF	30/09/2024	-32.7512	116.4559	Jarrah	Alive	580	0	No
HT258_KF	30/09/2024	-32.7512	116.4559	Jarrah	Alive	730	0	No
HT259_KF	30/09/2024	-32.7511	116.4555	Jarrah	Alive	670	0	No
HT260_KF	30/09/2024	-32.7508	116.4560	Jarrah	Alive	670	2	No
HT261_KF	1/10/2024	-32.7432	116.4563	Jarrah	Alive	600	0	No
HT262_KF	1/10/2024	-32.7432	116.4563	Jarrah	Alive	540	0	No
HT263_KF	1/10/2024	-32.7433	116.4565	Jarrah	Alive	680	0	No
HT264_KF	1/10/2024	-32.7434	116.4564	Jarrah	Alive	590	0	No
HT265_KF	1/10/2024	-32.7435	116.4563	Jarrah	Alive	600	0	No
HT266_KF	1/10/2024	-32.7435	116.4562	Jarrah	Alive	590	0	No
HT267_KF	1/10/2024	-32.7435	116.4558	Jarrah	Alive	580	0	No
HT268_KF	1/10/2024	-32.7434	116.4557	Jarrah	Alive	540	0	No
HT269_KF	1/10/2024	-32.7434	116.4557	Jarrah	Alive	580	0	No
HT270_KF	1/10/2024	-32.7356	116.4559	Eucalyptus sp.	Dead	9000	1	No
HT271_KF	1/10/2024	-32.7357	116.4557	Jarrah	Alive	720	0	No
HT272_KF	1/10/2024	-32.7356	116.4557	Jarrah	Alive	610	0	No
HT273_KF	1/10/2024	-32.7281	116.4490	Jarrah	Alive	660	1	No
HT274_KF	1/10/2024	-32.7280	116.4489	Jarrah	Alive	510	0	No
HT275_KF	1/10/2024	-32.7280	116.4487	Marri	Alive	769	0	No
HT276_KF	1/10/2024	-32.7280	116.4487	Jarrah	Alive	510	0	No
HT277_KF	1/10/2024	-32.7280	116.4487	Jarrah	Alive	500	0	No
HT278_KF	1/10/2024	-32.7280	116.4486	Jarrah	Alive	550	0	No
HT279_KF	1/10/2024	-32.7279	116.4486	Jarrah	Alive	840	0	No
HT280_KF	1/10/2024	-32.7280	116.4486	Eucalyptus sp.	Dead	800	1	No
HT281_KF	1/10/2024	-32.7280	116.4485	Jarrah	Alive	670	1	No
HT282_KF	1/10/2024	-32.7281	116.4485	Jarrah	Alive	500	0	No
HT283_KF	1/10/2024	-32.7281	116.4485	Jarrah	Alive	560	0	No
HT284_KF	1/10/2024	-32.7281	116.4485	Jarrah	Alive	510	0	No
HT285_KF	1/10/2024	-32.7281	116.4483	Jarrah	Alive	670	0	No
HT286_KF	1/10/2024	-32.7281	116.4482	Marri	Alive	670	0	No
HT287_KF	1/10/2024	-32.7277	116.4484	Jarrah	Alive	610	0	No
HT288_KF	1/10/2024	-32.7349	116.4480	Jarrah	Alive	780	0	No
HT289_KF	1/10/2024	-32.7350	116.4480	Marri	Alive	600	0	No
HT290_KF	1/10/2024	-32.7351	116.4480	Jarrah	Alive	830	1	No

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HT291_KF	1/10/2024	-32.7352	116.4482	Jarrah	Alive	580	0	No
HT292_KF	1/10/2024	-32.7352	116.4483	Wandoo	Alive	390	0	No
HT293_KF	1/10/2024	-32.7351	116.4484	Wandoo	Alive	380	0	No
HT294_KF	1/10/2024	-32.7351	116.4484	Eucalyptus sp.	Alive	0	0	No
HT295_KF	1/10/2024	-32.7351	116.4484	Wandoo	Alive	310	0	No
HT296_KF	1/10/2024	-32.7351	116.4485	Wandoo	Alive	430	0	No
HT297_KF	1/10/2024	-32.7349	116.4486	Jarrah	Alive	540	0	No
HT298_KF	1/10/2024	-32.7350	116.4488	Wandoo	Alive	310	0	No
HT299_KF	1/10/2024	-32.7352	116.4489	Powderbark	Alive	810	0	No
HT300_KF	1/10/2024	-32.7353	116.4489	Wandoo	Alive	460	0	No
HT301_KF	1/10/2024	-32.7353	116.4485	Wandoo	Alive	310	0	No
HT302_KF	1/10/2024	-32.7353	116.4485	Wandoo	Alive	330	0	No
HT303_KF	1/10/2024	-32.7352	116.4483	Wandoo	Alive	340	0	No
HT304_KF	1/10/2024	-32.7352	116.4482	Wandoo	Alive	330	0	No
HT305_KF	1/10/2024	-32.7352	116.4482	Powderbark	Alive	390	0	No
HT306_KF	1/10/2024	-32.7272	116.4409	Jarrah	Alive	660	0	No
HT307_KF	1/10/2024	-32.7271	116.4411	Wandoo	Alive	600	0	No
HT308_KF	1/10/2024	-32.7271	116.4412	Wandoo	Alive	400	0	No
HT309_KF	1/10/2024	-32.7271	116.4413	Eucalyptus sp.	Dead	749	0	No
HT310_KF	1/10/2024	-32.7271	116.4413	Wandoo	Alive	370	0	No
HT311_KF	1/10/2024	-32.7270	116.4412	Wandoo	Alive	300	0	No
HT312_KF	1/10/2024	-32.7270	116.4411	Eucalyptus sp.	Dead	549	0	No
HT313_KF	1/10/2024	-32.7270	116.4412	Wandoo	Alive	320	0	No
HT314_KF	1/10/2024	-32.7269	116.4412	Wandoo	Alive	310	0	No
HT315_KF	1/10/2024	-32.7269	116.4412	Wandoo	Alive	470	0	No
HT316_KF	1/10/2024	-32.7269	116.4411	Wandoo	Alive	380	0	No
HT317_KF	1/10/2024	-32.7268	116.4412	Wandoo	Alive	380	0	No
HT318_KF	1/10/2024	-32.7268	116.4412	Wandoo	Alive	310	0	No
HT319_KF	1/10/2024	-32.7266	116.4411	Wandoo	Alive	300	0	No
HT320_KF	1/10/2024	-32.7265	116.4413	Wandoo	Alive	300	0	No
HT321_KF	1/10/2024	-32.7268	116.4411	Wandoo	Alive	310	0	No
HT322_KF	1/10/2024	-32.7176	116.4586	Wandoo	Alive	730	0	No
HT323_KF	1/10/2024	-32.7174	116.4586	Wandoo	Alive	380	0	No
HT324_KF	1/10/2024	-32.7175	116.4583	Wandoo	Alive	430	0	No
HT325_KF	1/10/2024	-32.7175	116.4581	Wandoo	Alive	500	0	No
HT326_KF	1/10/2024	-32.7175	116.4581	Wandoo	Alive	620	0	No
HT327_KF	1/10/2024	-32.7176	116.4581	Wandoo	Alive	520	0	No
HT328_KF	1/10/2024	-32.7176	116.4582	Wandoo	Alive	530	0	No
HT329_KF	1/10/2024	-32.7178	116.4582	Wandoo	Alive	680	0	No
HT330_KF	1/10/2024	-32.7178	116.4583	Wandoo	Alive	500	0	No
HT331_KF	1/10/2024	-32.7079	116.4599	Wandoo	Alive	460	0	No
HT332_KF	1/10/2024	-32.7080	116.4598	Wandoo	Alive	330	0	No

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Tree ID	Date	Latitude	Longitude	Tree Species	Life status	DBH (mm)	Hollows	Evidence Of Use
HT333_KF	1/10/2024	-32.7078	116.4596	Jarrah	Alive	520	0	No
HT334_KF	1/10/2024	-32.7078	116.4596	Wandoo	Alive	400	0	No
HT335_KF	1/10/2024	-32.7079	116.4595	Wandoo	Alive	400	0	No
HT336_KF	1/10/2024	-32.7079	116.4594	Eucalyptus sp.	Alive	690	1	No
HT337_KF	1/10/2024	-32.7079	116.4594	Wandoo	Alive	480	0	No
HT338_KF	1/10/2024	-32.7078	116.4591	Wandoo	Alive	589	0	No
HT339_KF	1/10/2024	-32.7078	116.4589	Wandoo	Alive	310	0	No
HT340_KF	1/10/2024	-32.7078	116.4588	Eucalyptus sp.	Alive	650	1	No
HT341_KF	1/10/2024	-32.7076	116.4588	Wandoo	Alive	6890	0	No
HT342_KF	1/10/2024	-32.7076	116.4593	Eucalyptus sp.	Dead	670	0	No
HT343_KF	1/10/2024	-32.7076	116.4593	Wandoo	Alive	300	0	No
HT344_KF	1/10/2024	-32.7077	116.4594	Wandoo	Alive	480	0	No
HT345_KF	1/10/2024	-32.7077	116.4595	Wandoo	Alive	400	0	No
HT346_KF	1/10/2024	-32.7078	116.4596	Wandoo	Alive	460	0	No
HT347_KF	1/10/2024	-32.7077	116.4597	Eucalyptus sp.	Alive	530	0	No
HT348_KF	1/10/2024	-32.7077	116.4598	Wandoo	Alive	640	0	No
HT349_KF	1/10/2024	-32.7076	116.4599	Wandoo	Alive	380	0	No
HT350_KF	1/10/2024	-32.7075	116.4597	Wandoo	Alive	320	0	No
HT351_KF	1/10/2024	-32.7450	116.4478	Marri	Alive	550	0	No
HT352_KF	1/10/2024	-32.7450	116.4478	Marri	Alive	640	0	No
HT353_KF	1/10/2024	-32.7451	116.4476	Jarrah	Alive	580	0	No
HT354_KF	1/10/2024	-32.7452	116.4476	Jarrah	Alive	860	1	No
HT355_KF	1/10/2024	-32.7452	116.4476	Jarrah	Alive	1110	0	No
HT356_KF	1/10/2024	-32.7450	116.4474	Jarrah	Alive	880	0	No
HT357_KF	1/10/2024	-32.7450	116.4474	Jarrah	Alive	990	1	No
HT358_KF	1/10/2024	-32.7451	116.4474	Jarrah	Alive	900	1	No
HT359_KF	1/10/2024	-32.7451	116.4473	Jarrah	Alive	940	0	No
HT360_KF	1/10/2024	-32.7450	116.4472	Jarrah	Alive	890	0	No
HT361_KF	1/10/2024	-32.7450	116.4472	Eucalyptus sp.	Dead	580	0	No
HT362_KF	1/10/2024	-32.7450	116.4472	Eucalyptus sp.	Dead	6790	0	No
HT363_KF	1/10/2024	-32.7452	116.4472	Jarrah	Alive	620	0	No
HT364_KF	1/10/2024	-32.7453	116.4471	Jarrah	Alive	1170	0	No
HT365_KF	1/10/2024	-32.7453	116.4470	Jarrah	Alive	950	0	No
HT366_KF	1/10/2024	-32.7453	116.4469	Wandoo	Alive	570	0	No
HT367_KF	1/10/2024	-32.7450	116.4470	Jarrah	Alive	650	0	No
HT368_KF	1/10/2024	-32.7656	116.4559	Wandoo	Alive	330	0	No
HT369_KF	1/10/2024	-32.7656	116.4557	Wandoo	Alive	300	0	No
HT370_KF	1/10/2024	-32.7661	116.4557	Eucalyptus sp.	Alive	750	0	No
HT1_DL	29/09/2024	-32.7550	116.4294	Jarrah	Dead	560	1	No
HT2_DL	29/09/2024	-32.7549	116.4297	Wandoo	Alive	440	0	No
HT3_DL	29/09/2024	-32.7546	116.4297	Wandoo	Alive	410	0	No
HT4_DL	29/09/2024	-32.7546	116.4297	Wandoo	Alive	350	0	No

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HT5_DL	29/09/2024	-32.7544	116.4297	Jarrah	Alive	500	0	No
HT6_DL	29/09/2024	-32.7544	116.4295	Jarrah	Dead	550	0	No
HT7_DL	29/09/2024	-32.7543	116.4295	Jarrah	Alive	570	1	No
HT8_DL	29/09/2024	-32.7544	116.4293	Wandoo	Alive	330	0	No
HT9_DL	29/09/2024	-32.7544	116.4293	Wandoo	Alive	440	0	No
HT10_DL	29/09/2024	-32.7549	116.4294	Wandoo	Alive	330	0	No
HT11_DL	29/09/2024	-32.7502	116.4224	Jarrah	Alive	500	0	No
HT12_DL	29/09/2024	-32.7502	116.4225	Jarrah	Alive	530	0	No
HT13_DL	29/09/2024	-32.7502	116.4226	Jarrah	Alive	550	0	No
HT14_DL	29/09/2024	-32.7500	116.4224	Jarrah	Alive	590	0	No
HT15_DL	29/09/2024	-32.7499	116.4223	Jarrah	Alive	560	0	No
HT16_DL	29/09/2024	-32.7500	116.4224	Jarrah	Alive	700	1	No
HT17_DL	29/09/2024	-32.7499	116.4225	Jarrah	Alive	600	1	No
HT18_DL	29/09/2024	-32.7499	116.4224	Jarrah	Alive	900	1	No
HT19_DL	29/09/2024	-32.7499	116.4224	Jarrah	Alive	100	1	No
HT20_DL	29/09/2024	-32.7497	116.4224	Jarrah	Alive	530	0	No
HT21_DL	29/09/2024	-32.7505	116.4115	Jarrah	Alive	70	0	No
HT22_DL	29/09/2024	-32.7503	116.4115	Jarrah	Alive	500	0	No
HT23_DL	29/09/2024	-32.7502	116.4115	Jarrah	Alive	950	1	No
HT24_DL	29/09/2024	-32.7503	116.4115	Jarrah	Alive	950	1	No
HT25_DL	29/09/2024	-32.7501	116.4114	Jarrah	Alive	500	0	No
HT26_DL	29/09/2024	-32.7500	116.4112	Jarrah	Alive	520	0	No
HT27_DL	29/09/2024	-32.7500	116.4112	Jarrah	Alive	680	0	No
HT28_DL	29/09/2024	-32.7499	116.4114	Jarrah	Alive	160	1	No
HT29_DL	29/09/2024	-32.7496	116.4114	Jarrah	Alive	700	0	No
HT30_DL	29/09/2024	-32.7395	116.4138	Jarrah	Alive	100	0	No
HT31_DL	29/09/2024	-32.7394	116.4140	Jarrah	Alive	500	1	No
HT32_DL	29/09/2024	-32.7393	116.4139	Jarrah	Alive	600	0	No
HT33_DL	29/09/2024	-32.7393	116.4142	Jarrah	Dead	600	1	No
HT34_DL	29/09/2024	-32.7393	116.4144	Jarrah	Alive	600	0	No
HT35_DL	29/09/2024	-32.7391	116.4142	Jarrah	Alive	700	0	No
HT36_DL	29/09/2024	-32.7390	116.4141	Marri	Dead	510	1	No
HT37_DL	29/09/2024	-32.7389	116.4140	Wandoo	Alive	540	0	No
HT38_DL	29/09/2024	-32.7390	116.4140	Jarrah	Alive	500	1	No
HT39_DL	29/09/2024	-32.7244	116.4083	Wandoo	Alive	300	0	No
HT40_DL	29/09/2024	-32.7243	116.4082	Jarrah	Alive	500	0	No
HT41_DL	29/09/2024	-32.7242	116.4081	Wandoo	Alive	700	1	No
HT42_DL	29/09/2024	-32.7242	116.4080	Wandoo	Alive	450	0	No
HT43_DL	29/09/2024	-32.7244	116.4078	Jarrah	Alive	500	0	No
HT44_DL	29/09/2024	-32.7244	116.4079	Jarrah	Alive	550	0	No
HT45_DL	30/09/2024	-32.7289	116.4172	Jarrah	Alive	540	0	No
HT46_DL	30/09/2024	-32.7289	116.4173	Jarrah	Alive	500	0	No

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HT47_DL	30/09/2024	-32.7288	116.4173	Jarrah	Alive	650	0	No
HT48_DL	30/09/2024	-32.7287	116.4172	Jarrah	Alive	600	0	No
HT49_DL	30/09/2024	-32.7287	116.4172	Jarrah	Alive	500	0	No
HT50_DL	30/09/2024	-32.7287	116.4175	Jarrah	Alive	600	0	No
HT51_DL	30/09/2024	-32.7287	116.4175	Jarrah	Alive	500	0	No
HT52_DL	30/09/2024	-32.7288	116.4176	Jarrah	Alive	500	0	No
HT53_DL	30/09/2024	-32.7288	116.4176	Jarrah	Alive	600	0	No
HT54_DL	30/09/2024	-32.7286	116.4176	Jarrah	Dead	800	1	No
HT55_DL	30/09/2024	-32.7286	116.4174	Jarrah	Alive	700	0	No
HT56_DL	30/09/2024	-32.7286	116.4175	Jarrah	Alive	550	0	No
HT57_DL	30/09/2024	-32.7285	116.4172	Jarrah	Alive	700	0	No
HT58_DL	30/09/2024	-32.7286	116.4172	Jarrah	Alive	560	0	No
HT59_DL	30/09/2024	-32.7286	116.4172	Jarrah	Alive	500	0	No
HT60_DL	30/09/2024	-32.7285	116.4171	Jarrah	Alive	600	0	No
HT61_DL	30/09/2024	-32.7284	116.4172	Jarrah	Alive	700	1	No
HT62_DL	30/09/2024	-32.7349	116.4128	Marri	Alive	1100	1	No
HT63_DL	30/09/2024	-32.7344	116.4132	Marri	Alive	1100	0	No
HT64_DL	30/09/2024	-32.7344	116.4133	Wandoo	Alive	600	0	No
HT65_DL	30/09/2024	-32.7346	116.4132	Wandoo	Alive	500	0	No
HT66_DL	30/09/2024	-32.7346	116.4132	Wandoo	Alive	400	0	No
HT67_DL	30/09/2024	-32.7347	116.4134	Jarrah	Dead	600	1	No
HT68_DL	30/09/2024	-32.7347	116.4134	Wandoo	Alive	400	0	No
HT69_DL	30/09/2024	-32.7445	116.4215	Jarrah	Alive	950	1	No
HT70_DL	30/09/2024	-32.7446	116.4215	Jarrah	Alive	700	0	No
HT71_DL	30/09/2024	-32.7447	116.4215	Jarrah	Alive	500	0	No
HT72_DL	30/09/2024	-32.7448	116.4215	Jarrah	Alive	800	0	No
HT73_DL	30/09/2024	-32.7448	116.4216	Jarrah	Alive	680	0	No
HT74_DL	30/09/2024	-32.7448	116.4217	Jarrah	Alive	800	0	No
HT75_DL	30/09/2024	-32.7449	116.4217	Jarrah	Alive	600	0	No
HT76_DL	30/09/2024	-32.7449	116.4217	Jarrah	Alive	700	0	No
HT77_DL	30/09/2024	-32.7450	116.4217	Jarrah	Alive	800	0	No
HT78_DL	30/09/2024	-32.7451	116.4217	Marri	Alive	950	0	No
HT79_DL	30/09/2024	-32.7449	116.4213	Marri	Alive	500	0	No
HT80_DL	30/09/2024	-32.7449	116.4214	Marri	Alive	500	0	No
HT81_DL	30/09/2024	-32.7448	116.4215	Jarrah	Alive	850	0	No
HT82_DL	30/09/2024	-32.7447	116.4213	Jarrah	Alive	500	0	No
HT83_DL	30/09/2024	-32.7445	116.4214	Jarrah	Alive	1250	0	No
HT84_DL	30/09/2024	-32.7444	116.4217	Jarrah	Alive	600	0	No
HT85_DL	30/09/2024	-32.7616	116.4223	Jarrah	Alive	800	0	No
HT86_DL	30/09/2024	-32.7618	116.4225	Marri	Alive	900	0	No
HT87_DL	30/09/2024	-32.7618	116.4225	Jarrah	Alive	500	0	No
HT88_DL	30/09/2024	-32.7619	116.4224	Jarrah	Alive	600	0	No

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HT89_DL	30/09/2024	-32.7619	116.4224	Jarrah	Alive	630	0	No
HT90_DL	30/09/2024	-32.7619	116.4225	Jarrah	Alive	650	1	No
HT91_DL	30/09/2024	-32.7620	116.4223	Jarrah	Alive	860	1	No
HT92_DL	30/09/2024	-32.7622	116.4224	Jarrah	Alive	830	1	No
HT93_DL	30/09/2024	-32.7622	116.4223	Jarrah	Alive	1000	1	No
HT94_DL	30/09/2024	-32.7623	116.4227	Jarrah	Alive	640	0	No
HT95_DL	30/09/2024	-32.7678	116.4322	Jarrah	Alive	900	0	No
HT96_DL	30/09/2024	-32.7677	116.4320	Jarrah	Alive	680	0	No
HT97_DL	30/09/2024	-32.7677	116.4318	Jarrah	Alive	730	1	No
HT98_DL	30/09/2024	-32.7675	116.4318	Jarrah	Alive	680	0	No
HT99_DL	30/09/2024	-32.7676	116.4319	Jarrah	Dead	680	1	No
HT100_DL	30/09/2024	-32.7675	116.4320	Jarrah	Alive	700	0	No
HT101_DL	30/09/2024	-32.7675	116.4320	Jarrah	Alive	800	0	No
HT102_DL	30/09/2024	-32.7674	116.4320	Jarrah	Alive	800	0	No
HT103_DL	30/09/2024	-32.7673	116.4321	Jarrah	Alive	500	0	No
HT104_DL	30/09/2024	-32.7673	116.4321	Jarrah	Alive	700	0	No
HT105_DL	30/09/2024	-32.7672	116.4321	Jarrah	Alive	600	0	No
HT106_DL	30/09/2024	-32.7669	116.4319	Jarrah	Alive	700	0	No
HT107_DL	30/09/2024	-32.7794	116.4319	Jarrah	Alive	530	0	No
HT108_DL	30/09/2024	-32.7794	116.4319	Jarrah	Alive	740	0	No
HT109_DL	30/09/2024	-32.7792	116.4320	Jarrah	Alive	600	0	No
HT110_DL	30/09/2024	-32.7791	116.4320	Jarrah	Alive	600	0	No
HT111_DL	30/09/2024	-32.7792	116.4321	Jarrah	Alive	800	0	No
HT112_DL	30/09/2024	-32.7791	116.4320	Jarrah	Alive	600	0	No
HT113_DL	30/09/2024	-32.7791	116.4321	Jarrah	Alive	760	0	No
HT114_DL	30/09/2024	-32.7791	116.4321	Jarrah	Alive	800	0	No
HT115_DL	30/09/2024	-32.7792	116.4322	Jarrah	Alive	800	0	No
HT116_DL	30/09/2024	-32.7790	116.4318	Jarrah	Alive	700	0	No
HT117_DL	30/09/2024	-32.7789	116.4319	Jarrah	Alive	760	0	No
HT118_DL	30/09/2024	-32.7789	116.4319	Jarrah	Alive	550	0	No
HT119_DL	30/09/2024	-32.7787	116.4318	Jarrah	Alive	700	0	No
HT120_DL	30/09/2024	-32.7787	116.4320	Jarrah	Alive	640	0	No
HT121_DL	30/09/2024	-32.7714	116.4117	Wandoo	Alive	530	0	No
HT122_DL	30/09/2024	-32.7720	116.4119	Eucalyptus sp.	Alive	600	1	No
HT123_DL	30/09/2024	-32.7731	116.4286	Jarrah	Alive	700	0	No
HT124_DL	30/09/2024	-32.7731	116.4287	Jarrah	Alive	560	0	No
HT125_DL	30/09/2024	-32.7731	116.4286	Jarrah	Alive	550	0	No
HT126_DL	30/09/2024	-32.7730	116.4287	Wandoo	Alive	350	0	No
HT127_DL	30/09/2024	-32.7729	116.4289	Wandoo	Alive	390	0	No
HT128_DL	30/09/2024	-32.7729	116.4290	Jarrah	Alive	540	0	No
HT129_DL	30/09/2024	-32.7726	116.4288	Wandoo	Alive	350	0	No
HT130_DL	30/09/2024	-32.7725	116.4288	Jarrah	Alive	650	0	No

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HT131_DL	30/09/2024	-32.7724	116.4289	Jarrah	Alive	640	0	No
HT132_DL	30/09/2024	-32.7723	116.4289	Jarrah	Alive	550	0	No
HT133_DL	30/09/2024	-32.7724	116.4290	Jarrah	Alive	660	1	No
HT134_DL	30/09/2024	-32.7724	116.4290	Jarrah	Alive	710	0	No
HT135_DL	30/09/2024	-32.7724	116.4290	Jarrah	Alive	710	0	No
HT136_DL	30/09/2024	-32.7688	116.4212	Jarrah	Alive	560	0	No
HT137_DL	30/09/2024	-32.7689	116.4213	Jarrah	Dead	660	1	No
HT138_DL	30/09/2024	-32.7689	116.4214	Marri	Alive	600	0	No
HT139_DL	30/09/2024	-32.7689	116.4212	Jarrah	Alive	740	1	No
HT140_DL	30/09/2024	-32.7688	116.4215	Marri	Alive	500	1	No
HT141_DL	30/09/2024	-32.7688	116.4219	Wandoo	Alive	620	0	No
HT142_DL	30/09/2024	-32.7688	116.4220	Jarrah	Alive	580	0	No
HT143_DL	30/09/2024	-32.7688	116.4221	Jarrah	Alive	600	0	No
HT144_DL	30/09/2024	-32.7690	116.4218	Wandoo	Alive	300	0	No
HT145_DL	30/09/2024	-32.7563	116.4550	Jarrah	Alive	500	0	No
HT146_DL	30/09/2024	-32.7564	116.4551	Jarrah	Alive	700	0	No
HT147_DL	30/09/2024	-32.7562	116.4553	Jarrah	Alive	520	0	No
HT148_DL	30/09/2024	-32.7566	116.4551	Jarrah	Alive	550	0	No
HT149_DL	30/09/2024	-32.7568	116.4553	Jarrah	Alive	800	1	No
HT150_DL	30/09/2024	-32.7568	116.4552	Jarrah	Alive	700	0	No
HT151_DL	30/09/2024	-32.7569	116.4553	Jarrah	Alive	680	0	No
HT152_DL	30/09/2024	-32.7570	116.4553	Jarrah	Alive	550	0	No
HT153_DL	30/09/2024	-32.7569	116.4548	Jarrah	Alive	700	0	No
HT154_DL	30/09/2024	-32.7513	116.4564	Jarrah	Alive	790	0	No
HT155_DL	30/09/2024	-32.7514	116.4563	Jarrah	Alive	700	0	No
HT156_DL	30/09/2024	-32.7515	116.4563	Jarrah	Alive	600	0	No
HT157_DL	30/09/2024	-32.7514	116.4562	Jarrah	Alive	660	1	No
HT158_DL	30/09/2024	-32.7514	116.4562	Jarrah	Alive	540	0	No
HT159_DL	30/09/2024	-32.7514	116.4562	Jarrah	Alive	500	0	No
HT160_DL	30/09/2024	-32.7515	116.4559	Jarrah	Alive	620	0	No
HT161_DL	30/09/2024	-32.7516	116.4558	Marri	Alive	730	1	No
HT162_DL	30/09/2024	-32.7516	116.4555	Jarrah	Alive	650	0	No
HT163_DL	1/10/2024	-32.7123	116.4172	Jarrah	Alive	670	0	No
HT164_DL	1/10/2024	-32.7125	116.4171	Jarrah	Alive	600	0	No
HT165_DL	1/10/2024	-32.7126	116.4169	Jarrah	Alive	570	0	No
HT166_DL	1/10/2024	-32.7126	116.4168	Jarrah	Alive	540	0	No
HT167_DL	1/10/2024	-32.7125	116.4167	Jarrah	Alive	590	0	No
HT168_DL	1/10/2024	-32.7124	116.4168	Jarrah	Alive	680	0	No
HT169_DL	1/10/2024	-32.7123	116.4168	Jarrah	Alive	690	0	No
HT170_DL	1/10/2024	-32.7123	116.4167	Jarrah	Alive	560	0	No
HT171_DL	1/10/2024	-32.7123	116.4166	Jarrah	Alive	630	0	No
HT172_DL	1/10/2024	-32.7124	116.4167	Jarrah	Alive	730	1	No

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Tree ID	Date	Latitude	Longitude	Tree Species	Life status	DBH (mm)	Hollows	Evidence Of Use
HT173_DL	1/10/2024	-32.7126	116.4166	Jarrah	Alive	1000	1	No
HT174_DL	1/10/2024	-32.7127	116.4165	Jarrah	Dead	880	1	No
HT175_DL	1/10/2024	-32.7126	116.4165	Jarrah	Alive	810	0	No
HT176_DL	1/10/2024	-32.7126	116.4163	Jarrah	Alive	670	0	No
HT177_DL	1/10/2024	-32.7125	116.4163	Jarrah	Alive	600	0	No
HT178_DL	1/10/2024	-32.7126	116.4161	Jarrah	Alive	800	1	No
HT179_DL	1/10/2024	-32.7123	116.4162	Jarrah	Alive	730	0	No
HT180_DL	1/10/2024	-32.7123	116.4162	Jarrah	Alive	700	0	No
HT181_DL	1/10/2024	-32.7124	116.4164	Jarrah	Alive	550	0	No
HT182_DL	1/10/2024	-32.7124	116.4164	Jarrah	Alive	500	0	No
HT183_DL	1/10/2024	-32.7133	116.4226	Jarrah	Alive	680	1	No
HT184_DL	1/10/2024	-32.7133	116.4227	Jarrah	Alive	520	1	No
HT185_DL	1/10/2024	-32.7134	116.4227	Jarrah	Alive	560	0	No
HT186_DL	1/10/2024	-32.7134	116.4227	Jarrah	Alive	500	0	No
HT187_DL	1/10/2024	-32.7134	116.4227	Jarrah	Alive	680	0	No
HT188_DL	1/10/2024	-32.7134	116.4228	Jarrah	Alive	530	0	No
HT189_DL	1/10/2024	-32.7135	116.4228	Jarrah	Alive	530	0	No
HT190_DL	1/10/2024	-32.7136	116.4229	Jarrah	Alive	530	0	No
HT191_DL	1/10/2024	-32.7136	116.4229	Jarrah	Alive	650	0	No
HT192_DL	1/10/2024	-32.7135	116.4230	Jarrah	Alive	640	0	No
HT193_DL	1/10/2024	-32.7134	116.4230	Jarrah	Alive	800	1	No
HT194_DL	1/10/2024	-32.7134	116.4230	Jarrah	Alive	630	0	No
HT195_DL	1/10/2024	-32.7133	116.4230	Jarrah	Alive	710	0	No
HT196_DL	1/10/2024	-32.7133	116.4231	Jarrah	Alive	910	1	No
HT197_DL	1/10/2024	-32.7134	116.4232	Jarrah	Alive	500	0	No
HT198_DL	1/10/2024	-32.7134	116.4233	Jarrah	Alive	550	0	No
HT199_DL	1/10/2024	-32.7136	116.4234	Jarrah	Alive	530	0	No
HT200_DL	1/10/2024	-32.7134	116.4235	Jarrah	Dead	780	1	No
HT201_DL	1/10/2024	-32.7133	116.4234	Jarrah	Dead	730	1	No
HT202_DL	1/10/2024	-32.7235	116.4256	Jarrah	Alive	500	0	No
HT203_DL	1/10/2024	-32.7236	116.4256	Jarrah	Alive	640	0	No
HT204_DL	1/10/2024	-32.7235	116.4254	Jarrah	Alive	1000	1	No
HT205_DL	1/10/2024	-32.7235	116.4252	Jarrah	Alive	500	0	No
HT206_DL	1/10/2024	-32.7235	116.4251	Jarrah	Alive	500	0	No
HT207_DL	1/10/2024	-32.7235	116.4248	Marri	Alive	930	1	No
HT208_DL	1/10/2024	-32.7235	116.4246	Jarrah	Alive	560	1	No
HT209_DL	1/10/2024	-32.7234	116.4248	Jarrah	Alive	670	0	No
HT210_DL	1/10/2024	-32.7233	116.4252	Jarrah	Alive	590	0	No
HT211_DL	1/10/2024	-32.7234	116.4255	Jarrah	Alive	500	1	No
HT212_DL	1/10/2024	-32.7232	116.4256	Jarrah	Alive	500	0	No

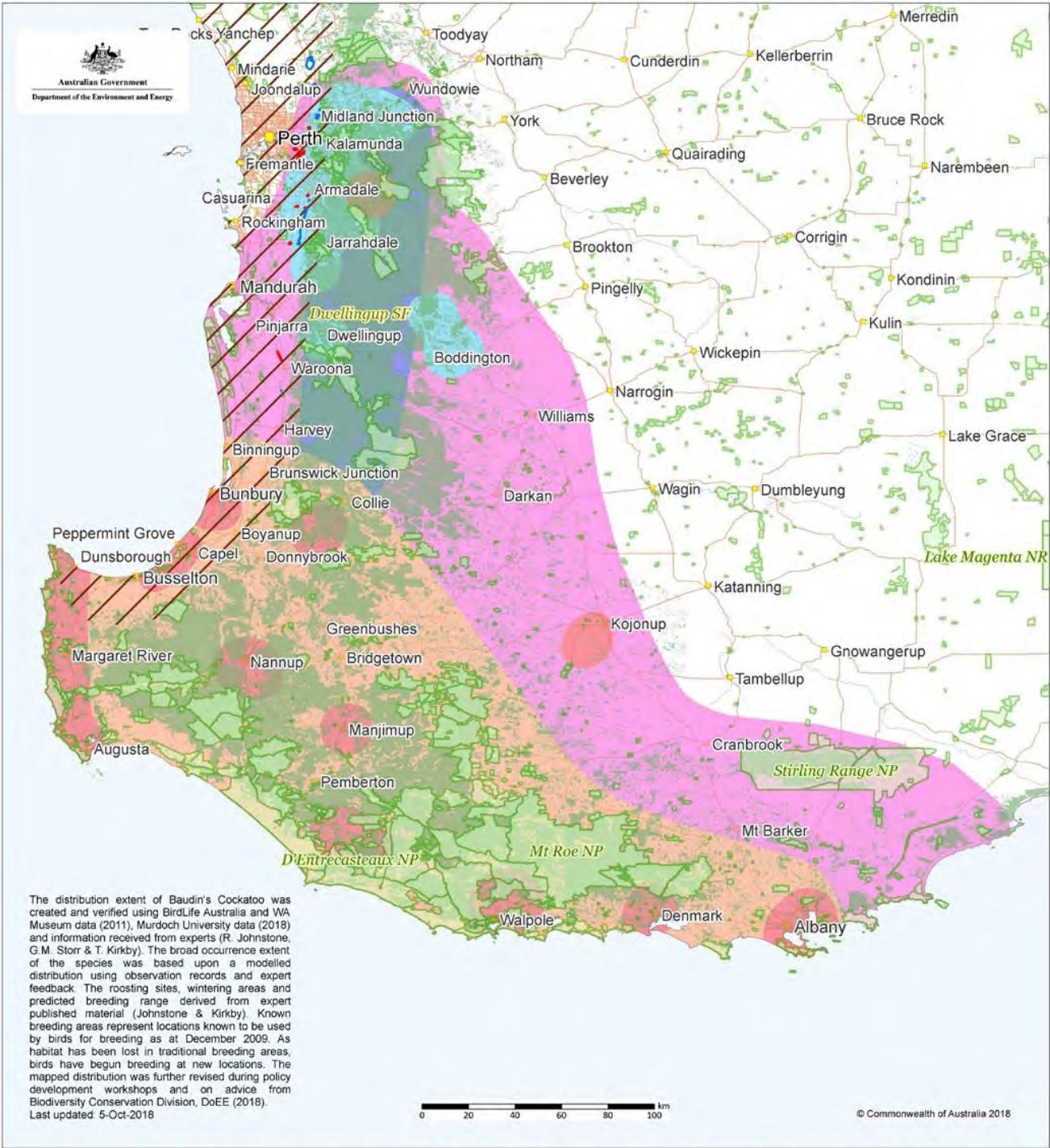
Appendix 20 Black cockatoo foraging quality scoring tool template, retrieved from DAWE (2022)

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

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Starting score	Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black Cockatoo
Total score			
Appraisal	To support your habitat score, you should provide an overall appraisal of the habitat on the impact site and within 20km of the impact area to clearly explain and justify the score. It should include discussion on the foraging habitat's proximity to other resources (e.g. exact distance to proximate resources), frequency of use of proximate sites, the degree of evidence and description of vegetation type and condition.		

Map 2 Modelled distribution for Baudin's Cockatoo (*Zanda baudinii*)



INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool and the Species Profiles & Threats Database at

Produced by:
Environmental Resources Information Network 2018

Contextual data source:
National Vegetation Information System (NVIS 5.1) 2018
Interim Biogeographic Regionalisation for Australia (IBRA) version 7 2012
Collaborative Australian Protected Area Database (CAPAD) 2016
Geoscience Australia GEODATA TOPO 250K Topographic Data Series 3 2006

Projection: Geographic
Datum: GDA94

Conservation Areas
Jarrah, Karri and Manri

Species

Known Breeding Areas
Predicted Breeding Range
Known Foraging Areas
Main Wintering Area
Species Likely to Occur

Ecological Communities

Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain
Banksia Woodlands of the Swan Coastal Plain

Cities & Towns

Roads (sealed)

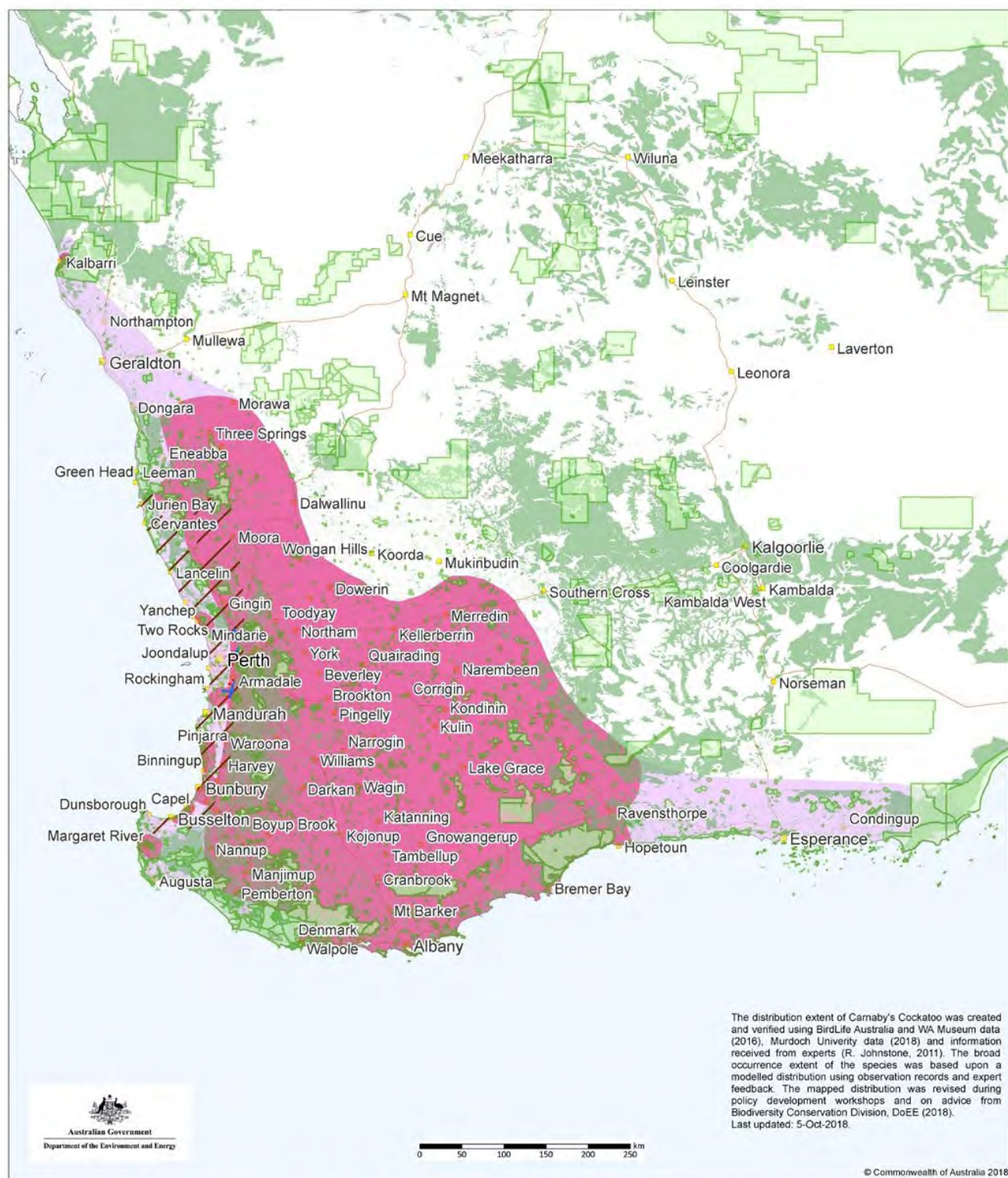
Roads (unsealed)

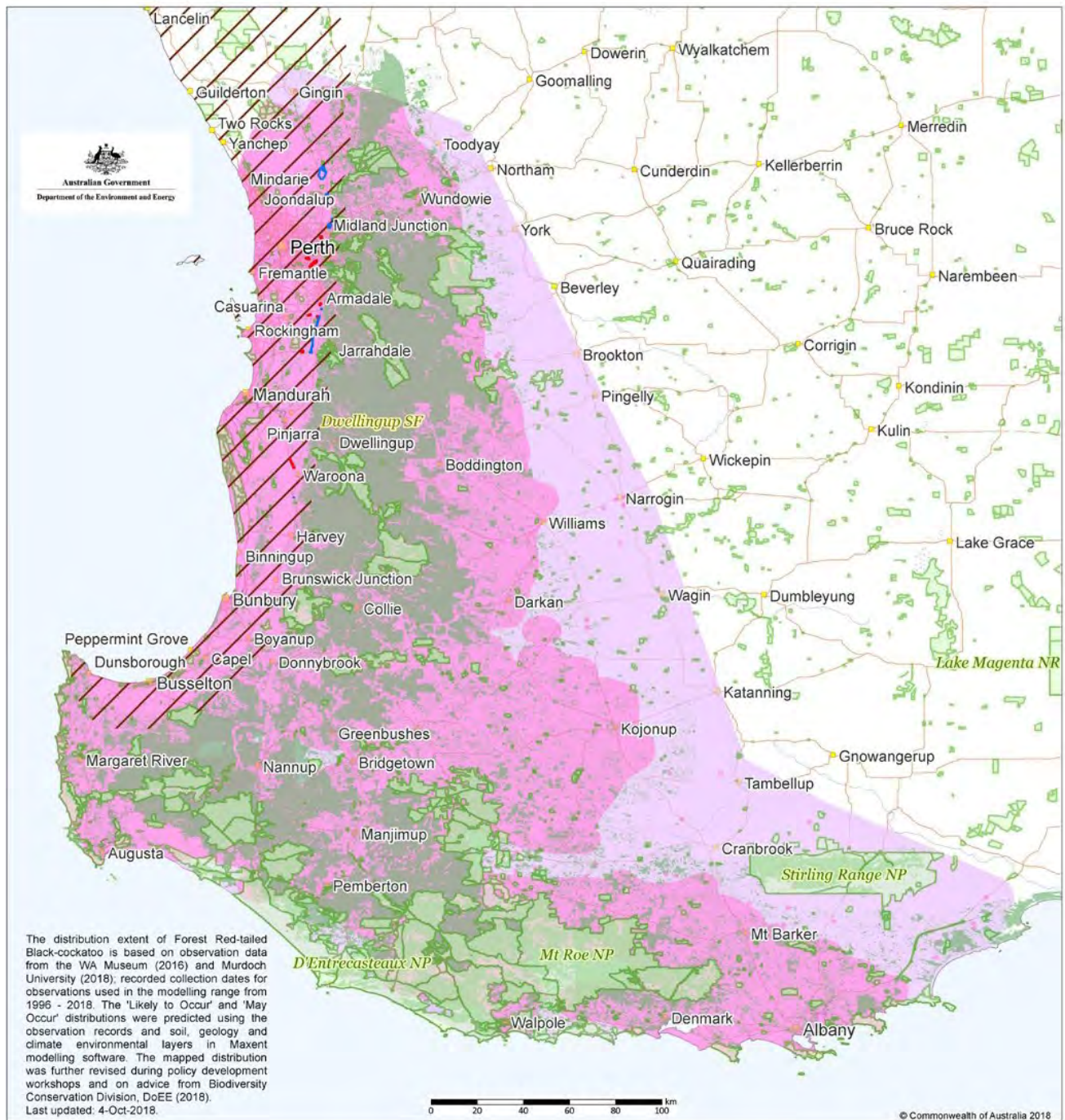
State Border

Major Rivers

Lakes/Reservoirs

Non-perennial Lakes

Map 3 Modelled distribution for Carnaby's Cockatoo (*Zanda latirostris*)

Map 4 Modelled distribution for Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*)

Name and field name	Sites located	Spot description	Body condition	Photos
Albus (CHU_001)	NHS-1-1 NHS-1-3	2 distinct spots on right forelimb, larger spot above. If dividing the head (forelimbs), thorax (chest/torso) and rump the 'head' has 5 spots, thorax has 6 spots and rump has 9.	3	  

Rubeus (CHU_002)	HS-1-4	Right forelimb has a pair of 2 spots one over the other. Left forelimb has a low spot followed by some tiny speckles higher, then 2 more spots up the forelimb.	3	
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Hermione (CHU_003)	HS-1-24 HS-1-10 HS-1-11 HS-1-12 HS-1-17 HS-1-18 HS-1-23 HS-1-9 NS-1-29 HS-1-4	Y shaped spot pattern on right lateral from front forelimb to rear limb. Rump above tail looks like a 5 dice face. Left side has two lines of spots.	3	  
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Neville (CHU_004)	NHS-1-1 NHS-1-2 NHS-1-3 NHS-1-4 NHS-1-5 NHS-1-6 NHS-1-7 NHS-1-8 NHS-1-10 NHS-1-11 NHS-1-12 NHS-1-15 NHS-1-18 NHS-1-26 NM-1-8	Y-like pattern on left shoulder starting with a bold elongated spot. Dice-like pattern of five spots on neck (2-1-2 spots in 3 rows). 2 rows of 3 spots on rump.	3	
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Severus (CHU_005)	NM-2-7 NM-2-8 NM-2-15 NM-2-16 NM-2-20 NM-2-36	House shape with dot in middle on right flank. Face like diamond on left flank. Notch in left ear. Six spots on rump (2 rows of 3 spots).	3	  
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Bill (CHU_006)	NHS-1-2 NHS-1-5 NHS-1-6 NHS-1-10 NHS-1-11 NHS-1-16 NHS-1-17 NHS-1-21 NHS-1-23 NHS-1-25 NHS-1-29 NHS-1-30	Three spots in a triangle above right forelimb, square shape on mid left flank, three spots in a v-shape on the left side of the neck right behind head, tattered ears and looks very scruffy.	3	  
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Aberforth (CHU_007)	NHS-1-6	Triangle configuration on left side of spine, with two spots almost touching, two spots on lower left hind limb, four spots on upper left hind limb forming a kite shape.	3	
Minerva (CHU_008)	HS-1-33 NHS-1-7 NHS-1-15 NHS-1-22 NS-1-1 NS-1-4 NS-1-29	9 spots in rows of 2-3-2-2 dots on right side, three spots angled down towards the right hind limb, five spots on left hind limb, three dots on left forelimb.	3	  

Luna (CHU_009)	NHS-1-15 NM-1-1 NM-1-2 NM-1-7 NM-1-8 NM-1-13 NM-1-15	Crescent with spot in centre on left rear flank with double spot above and to the left. Triangle on right upper shoulder. Relatively bare at base of left hind leg - few faint spots.	3	
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Cha Cha (CHU_010)	NHS-1-3 NHS-1-8 NHS-1-16 NHS-1-23 NHS-1-29 NHS-1-30 NHS-1-34 NHS-1-35 NS-1-1	3 spots in a line with one above the tail. 5-sided dice face on left hindlimb. 4-spot kite on the right hindlimb, 5-sided dice face on right flank.	3	
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Firenze (CHU_011)	NHS-1-24 NHS-1-29 NHS-1-30 NHS-1-35 NHS-1-36 NM-1-2 NM-1-3 NM-1-4 NM-1-7 NM-1-8 NM-1-9 NM-1-10 NM-1-13 NM-1-14 NM-1-21	Kite formation of spots on the right shoulder and three spots in a horizontal line on right hip, diamond formation of four spots located on the left flank - the bottom spot of the formation is two spots combined.	3	
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Jim (CHU_012)	HM-1-1 HM-1-5 HM-1-10	Arrow formation of spots on back starting from rump pointing towards the head. 6-sided dice face on left flank.	3	
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Tim (CHU_013)	HM-1-2 HM-1-9 HM-1-10 HM-1-11 HM-1-12	Ring of spots group closely together above left shoulder. Four spots on right flank: two small spots above two large spots.	3	 The image block contains three black and white photographs of a spotted animal, likely a leopard or similar big cat. The top photograph shows the animal's rear, with a ring of spots visible above the left shoulder. The middle and bottom photographs show the animal's side, with a red circle highlighting a group of spots on the right flank. The animal is lying down on a rocky or dirt surface.
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Slim (CHU_014)	HM-1-3 HM-1-9 HM-1-11 HM-1-19	Ring of spots on the right side of the neck, six spots on right flank next to right hind limb. Two horizontal lines of spots on left side spanning the whole left side.	3	
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Sirius (CHU_015)	NHS-1-13 NS-1-1 NS-1-13	3 spots on the back of the neck, reversed 'N' shape of 6 spots on left flank, 3 spots on the left hindlimb almost touching.	3	 
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Malfoy (CHU_016)	NHS-1-20 NHS-1-22 NHS-1-26 NHS-1-27 NHS-1-28	Dice-like 5 spots on top right hindlimb, three vertical spots on right forelimb, very close cluster of 4 spots on left flank.	3	  
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Hedwig (CHU_017)	NHS-1-21	Lots of small spots shaped like a H on right hind limb.	3	
Dobby (CHU_018)	NM-1-3 NM-1-7 NM-1-8 NM-1-9 NM-1-10 NM-1-13 NM-1-14 NM-1-15 NM-1-17 NM-1-21 NM-1-27 NM-1-28 NM-1-33 NM-1-36	Missing half his tail. Fur missing on right shoulder but does grow back throughout October. 4 spot diamond above right hip. 4 spot diamond on rump.	3	 

				
Tonks (CHU_019)	NM-1-5 NM-1-9 NM-1-10 NM-1-12 NM-1-15 NM-1-17 NM-1-18 NM-1-21 NM-1-22 NM-1-23	Circle of spots on right flank with a single spot in the centre. Two spots close together on rump and two spots close together mid back. Three spots in a horizontal line on right hindlimb.	3	

	NM-1-24 NM-1-27 NM-1-29 NM-1-30 NM-1-35 NS-1-25 NS-1-31 NS-1-33				
Ginny (CHU_20)	NM-1-25 NM-1-31 NM-1-32	Square on neck behind right ear. Hexagon of 6 spots on right flank. Diagonal line of 3 bold spots on left flank. Arrow shape pointing slightly diagonally to the right.	3		

				
Lupin (CHU_21)	NHS-1-21 NM-1-12 NM-1-13	Y pattern on right shoulder. Arc of spots over rump with small spot at base of tail. Diamond shape on left flank.	3	

					 The table contains two grayscale images of a spotted animal, likely a leopard or cheetah, in a dark environment. The top image shows a close-up of the animal's head and neck, with a red bounding box highlighting a specific area on its face. The bottom image shows the animal's full body, with a red bounding box highlighting its hindquarters and tail. The bounding boxes are drawn in red and are slightly irregular, suggesting they were manually drawn.
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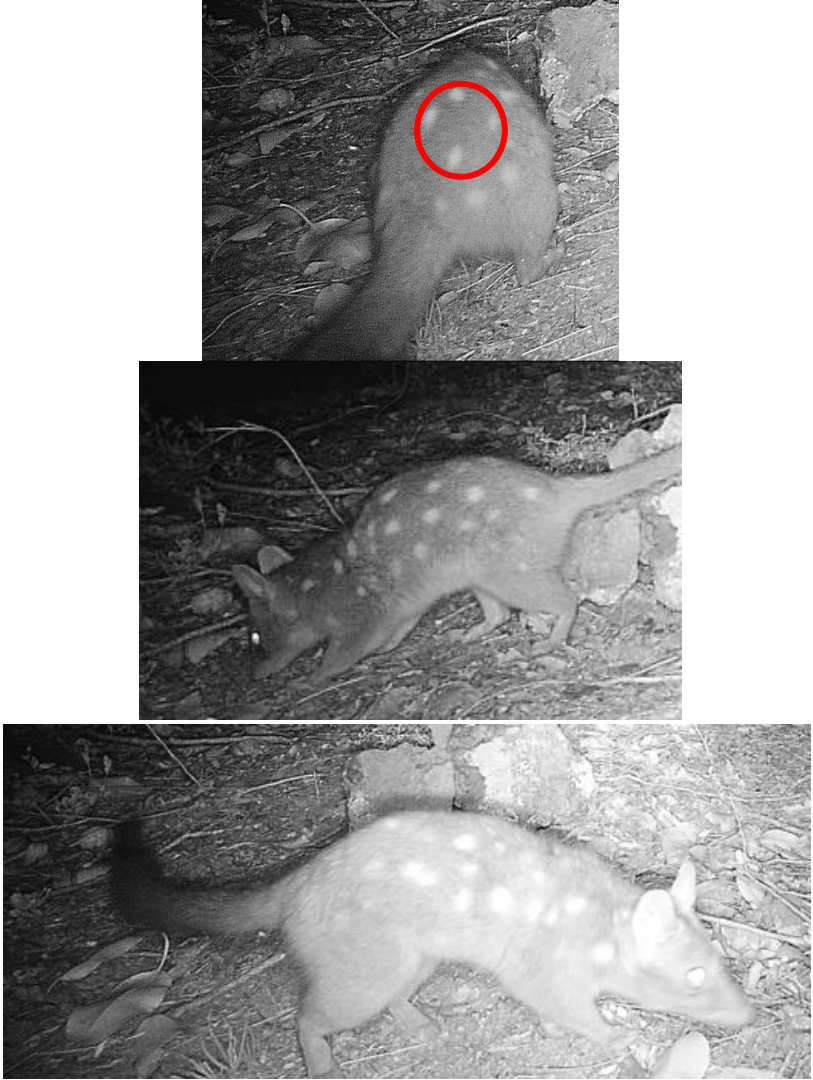
Arthur (CHU_022)	NHS-1-3 NHS-1-27 NM-2-3 NM-2-4	3 horizontal lines of small spots from left shoulder/forearm to mid left flank. Arch of 4 spots on mid right flank and 6 spots on right hip.	3	
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Fluffy (CHU_23)	NM-2-3 NM-2-15 NM-2-16 NS-1-3 NS-1-4 NS-1-33 MS-1-28	Left side has three big spots running linear towards the back of the body. Two very large spots on right side of the neck. Pentagon with a single dot in the centre on right hip and flat diamond shape of 4 spots on right flank. Triangle of dots right above tail.	3	 2024-11-24 23:06:38 AM N 4/5 10°C 09124747  
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Fleur (CHU_24)	NS-1-1 NS-1-6 NS-1-15 NS-1-25 NS-1-26 NS-1-27	Large V shape of spots on right shoulder with a 4-spot diamond shape on right flank at the tip of the V shape. Flat hexagon of spots on left rump, a pentagon on mid left flank. 5-sided dice face above tail.	3	  
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Tom R (CHU_25)	NS-1-4 NS-1-15	Two lines of three dots and T-shape of 5 dots on back. Two diamond shapes, one on right hip and right flank.	3	 The top photograph shows the dorsal view of a spotted animal, likely a leopard or cheetah, with red markings on its back. The markings include a vertical line of three dots and a T-shape of five dots. The bottom photograph shows the lateral view of the same animal, with red markings on its side, including a diamond shape on the right hip and another diamond shape on the right flank.
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Sgt Johnson (CHU_26)	NS-1-4 NS-1-15 MS-1-28	Ring of spots on right shoulder, triangle on right flank next to hip. Triangle and arch of 3 spots on left hip. Pentagon on rump towards the right side.	3	  
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Buckbeak (CHU_027)	HM-1-18 HM-1-19 HM-1-25 HM-1-31 HM-1-34	6 spots on left flank (2 rows of three spots). Kite shape on rump above tail. Upside-down T shape on right flank.	3	 The image contains three black and white photographs of a spotted animal, likely a civet or mongoose, showing its distinctive markings. The top photo shows the rear of the animal with a red circle highlighting a specific spot. The middle photo shows the animal in profile, highlighting the spots on its flank. The bottom photo shows the animal from a side-front angle, highlighting the spots on its back and flank.
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Scabbers (CHU_028)	HM-1-22	Arch of three large spots on right flank.	3	
Ronald (CHU_029)	NHS-1-21	Arch of three spots on left hip. Two spots on rump above tail.	3	 

Newt (CHU_030)	NS-2-2 NS-2-4 NS-2-5 NS-2-6 NS-2-7 NS-2-8	Two spots above tail in a line. 6 spots on left flank (2 rows of 3 spots). Arch of three spots on the right hip with a small spot underneath. Small square on the right flank.	3	
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Slughorn (CHU_031)	NM-1-8	Bold line of 3 spots on back, from tail leading up to the head. Arch of 3 spots on right hip. 5 spots on upper left flank (2 rows of 2 and 3).	3	
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Harry (CHU_032)	HM-1-36 HS-1-35	Ring of spots on left shoulder, arrow-shape of 5 spots on left rump. 8 spots (2 rows of 4) on right flank. Five-sided dice face on rump above tail.	3	A black and white photograph showing the dorsal view of a spotted animal, likely a civet, lying on the ground. The animal's back is covered in numerous light-colored spots of varying sizes. The tail is visible on the right side of the frame. A black and white photograph of a spotted animal in profile, facing left. Two areas on its back are circled in blue: one on the shoulder and one on the rump. The animal is standing on dry, uneven ground. A black and white photograph showing the side profile of a spotted animal. The animal is facing right, and its body is covered in a pattern of light spots. The background consists of dry vegetation and soil.
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Sprout (CHU_033)	HM-1-33	Ring of spots with a large spot in the centre on rump. 6 spots on left flank (3 rows of 2). Square of 4 spots on right hip.	3	
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Appendix 23 Daily maximum and minimum temperatures and rainfall for Wandering (no. 010917) during the surveys (BoM 2024)

Date (2024)	Maximum temperature (°C)	Minimum temperature (°C)	Rainfall (mm)
24 Sep	18.6	7.7	0
25 Sep	19.2	-0.6	0
26 Sep	27.2	1.8	0
27 Sep	16.3	5.6	2.2
28 Sep	17	0.8	2.6
29 Sep	18.8	0.4	0
30 Sep	23.1	2.4	0
1 Oct	29	1.4	0
2 Oct	15.7	10.9	9.2
3 Oct	16.3	9.1	11
4 Oct	20.2	10.8	1
5 Oct	21.6	8.5	0.2
6 Oct	23.5	8.8	0.6
7 Oct	27.7	5.4	0
8 Oct	24.4	6.6	0
9 Oct	20.7	12.1	0
10 Oct	24.7	4.3	0
11 Oct	29.8	7.7	0
12 Oct	26.1	11.5	0
13 Oct	26.8	6	0
14 Oct	23.6	10.4	0
15 Oct	20.4	10.2	1.8
16 Oct	23.1	4.4	1
17 Oct	22.3	8.5	0
18 Oct	23.3	10.8	0
19 Oct	26.1	7.4	0
20 Oct	23.1	5.6	0
21 Oct	19.1	4.4	2
22 Oct	21.1	2.9	0
23 Oct	24.3	1	0
24 Oct	30.3	4.1	0
25 Oct	27.8	5.2	0
26 Oct	23.7	10.1	0
27 Oct	26.4	7.4	0
28 Oct	30.8	6.1	0

Date (2024)	Maximum temperature (°C)	Minimum temperature (°C)	Rainfall (mm)
29 Oct	34.5	5.1	0
30 Oct	30.7	11	0
31 Oct	31.2	9.2	0
1 Nov	34.2	7.0	0
2 Nov	23.7	14.5	0
3 Nov	25.4	8.8	0
4 Nov	27.4	4.3	0
5 Nov	22.7	6.4	0
6 Nov	21.8	11.1	0.4
7 Nov	24	0.9	0
8 Nov	20.2	11.3	3.8
9 Nov	22.5	11.6	0
10 Nov	25	4.9	0
11 Nov	28.5	8.6	0
12 Nov	26.8	5.3	0
13 Nov	32	8.6	0
14 Nov	34.8	10.5	0
15 Nov	24.6	14.7	0
16 Nov	23.2	2.4	0
17 Nov	25.5	3.9	0
18 Nov	32.3	9.9	0
19 Nov	29.5	17.7	0.2
20 Nov	27.8	18.3	6.2
21 Nov	23.8	16.3	0
22 Nov	25.3	6.6	-
23 Nov	30	8.6	0
24 Nov	35.5	9.8	0
25 Nov	24	14.9	0
26 Nov	23.3	2.6	0
27 Nov	25.9	5.6	0
28 Nov	29.2	11.1	0
29 Nov	30.6	11.5	0
30 Nov	34.1	10.5	0
1 Dec	24.6	12	0
2 Dec	22.2	12.4	0

