Mt Marion Mining Tenements Terrestrial Fauna Surveys

Basic Fauna and Targeted Malleefowl, Chuditch, and ABAB Surveys

Mineral Resources Limited

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SLR Project No.: 675.VX5937.00001

Client Reference No.: ENV-TS-RP-0481

2 April 2024

Revision: 02

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	1 March 2024	SG, PD, DL	ML	
02	2 April 2024	SG	LG	

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Mineral Resources Limited (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

Executive Summary

Mineral Resources Limited commissioned SLR Consulting Australia to undertake a basic fauna and targeted Malleefowl (*Leipoa ocellata*), Chuditch (*Dasyurus geofroii*), and Arid Bronze Azure Butterfly (ABAB) (*Ogyris petrina*) to inform approvals for the proposed Mt Marion Mineral Resources Tenements Terrestrial Fauna Survey. The Survey Area covers approximately 7,376 hectares and is located approximately 31 km south of Kalgoorlie, in the Goldfields bioregion of Western Australia.

The objective of the survey was to identify key fauna values within the Survey Area as part of the environmental impact assessment process. This report presents the findings of the survey.

The fauna survey used a variety of detection methods including baited camera traps for chuditch, LiDAR for detection of Mallefowl mounds, transects for the host ants used by the ABAB, active searches, and opportunistic observations. Fauna habitat mapping was based on a combination of field observations, fauna habitat assessment data, and aerial imagery.

Six fauna habitats were mapped within the Survey Area. The Drainage Line and Shrubland/Heathland habitats represent the highest value to Malleefowl (*Leipoa ocellata*) and Carnaby's Cockatoos (*Zanda latirostris*). The Eucalypt Woodland habitat represents the highest value to ABAB and Inland Hairstreak Butterfly (*Jalmenus aridus*) as this is the preferred habitat of their respective host ants and plants. Eucalypt Woodland is also valuable supporting habitat for the Malleefowl, particularly when near Shrubland/Heathland habitat.

One significant taxon was recorded during the fauna survey, the Malleefowl (*Leipoa ocellata*) – Vulnerable (BC Act); Vulnerable (EPBC Act). *Camponotus* sp. nr. *terebrans*, the host ant for the ABAB, was also recorded during the fauna survey.

Five Introduced species were recorded during the survey: Cat (*Felis catus*), European Cattle (*Bos taurus*), Horse (*Equus ferrus*), House Mouse (*Mus musculus*), Rabbit (*Oryctolagus cuniculus*)

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Acronyms and Abbreviations

°C	Degree Celsius
ABAB	Arid Bronze Azure Butterfly
BAM Act	*Biosecurity and Agriculture Management Act 2007*
BC Act	*Biodiversity Conservation Act 2016*
BoM	Bureau of Meteorology
CR	Critically Endangered
DAWE	Department of Agriculture Water and Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEE	Department of the Environment and Energy
Desktop Study Area	The area that was studied during the desktop assessment encompassing the Survey Area and 100 km buffer.
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DoE	Department of the Environment
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning, Lands and Heritage
DRF	Declared Rare Flora
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection Biodiversity and Conservation Act 1999*
ESA	Environmentally Sensitive Area
GIS	Geographic Information System
GPS	Global Positioning System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
ILUA	Indigenous land Use Agreement
km	Kilometres
Lat	Latitude
LiDAR	Light Detection And Ranging

Long	Longitude
m	Metres
MA	Marine
MI	Migratory
mm	Millimetres
NNTT	National Native Title Tribunal
MNES	Matters of National Environmental Significance
OS	Other Specially Protected Fauna
P	Priority
Project	The Mt Marion MinRes Mining Tenements Fauna Survey (SLR, 2024)
PMST	Protected Matters Search Tool
MinRes	Mineral Resources Limited
SLR	SLR Consulting Australia
Survey Area	The 7,376 ha area 31 km south from Kalgoorlie-Boulder surveyed for MinRes by SLR
T	Threatened
VU	Vulnerable
WA	Western Australia
WAM	Western Australian Museum

1.0 Introduction

1.1 The Project

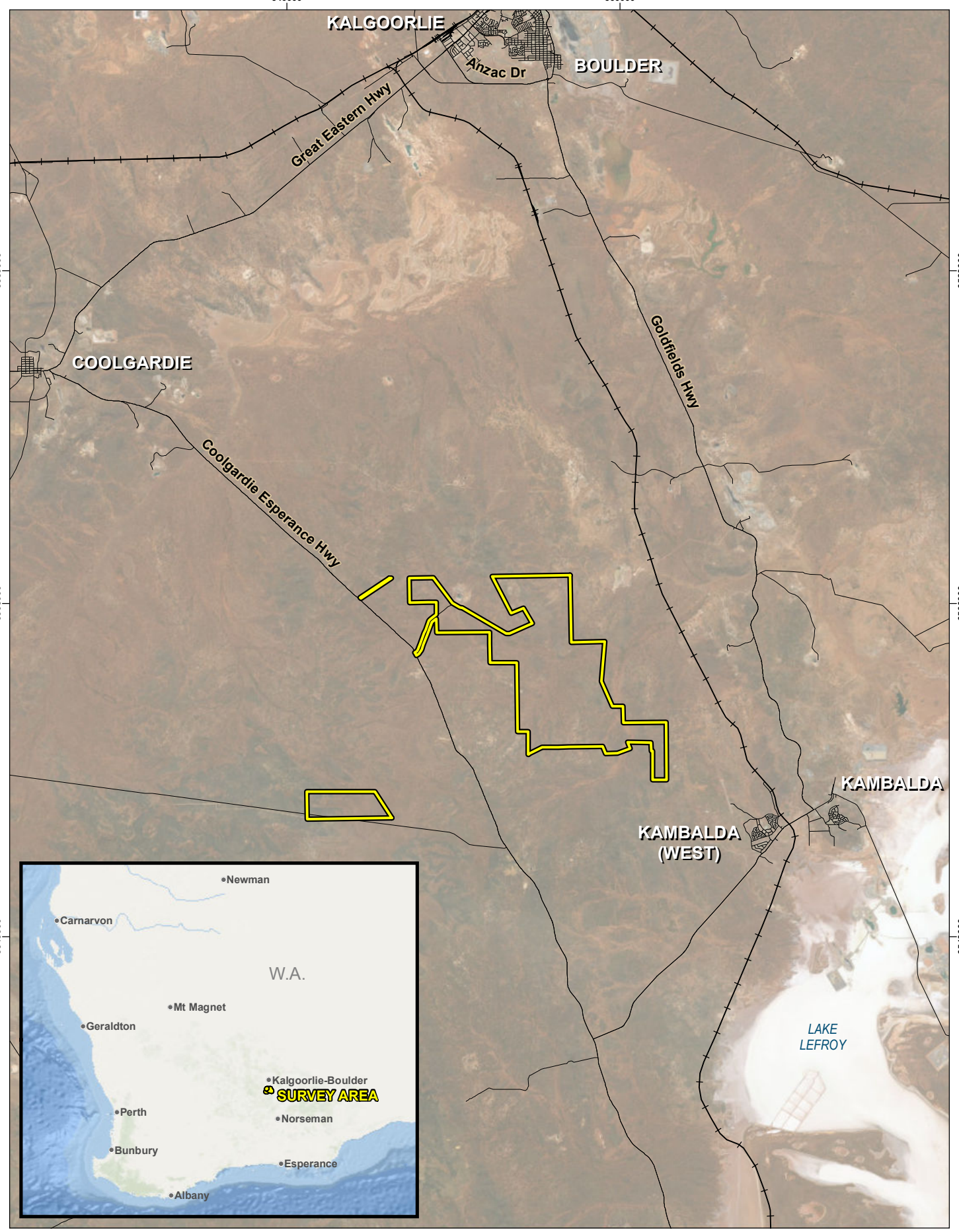
Mineral Resources Limited (MinRes) commissioned SLR Consulting Australia (SLR) to undertake a basic and targeted fauna survey for the proposed Mt Marion Lithium Project expansion. The Survey Area covers approximately 7,376 hectares and is located approximately 31 km south of the Kalgoorlie townsite, in the Goldfields bioregion of Western Australia (**Map 1**). The survey was undertaken concurrently with a basic and targeted fauna survey of an area adjacent to the north of the Survey Area, the outcomes of which are documented in a separate report (SLR Consulting, 2024).

1.2 Objective and Scope

The objective of the survey was to identify key fauna values within the Survey Area as part of the environmental impact assessment process for the Project.

The following scope of work was completed:

- A desktop assessment including relevant database searches and literature review that compiled and summarised existing records of fauna in the vicinity of the Survey Area.
- A basic fauna survey.
- Targeted significant terrestrial vertebrate fauna using a variety of detection methods including baited camera traps, advanced LIDAR techniques, active searches, and opportunistic observations.
- A technical biological report.
- A geospatial data package prepared in accordance with IBSA and MinRes data standard requirements.



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Survey Area
MAP 1

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2.0 Background

2.1 Statutory and Regulatory Framework

Western Australian fauna is protected by the following legislative measures:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). (Commonwealth of Australia, 1999).
- *Biodiversity Conservation Act 2016* (WA) (BC Act) (Government of Western Australia, 2016).
- *Environmental Protection Act 1986* (WA) (EP Act) (Government of Western Australia, 1986).

In addition to these legislative measures, the following non-legislative lists are considered on a case-by-case basis:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora, and ecological communities.
- Recognition of locally significant populations by DBCA.

The EIA process is supported by guidance documents published by the Environmental Protection Authority (EPA), DBCA and the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

Western Australia

- *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020).
- *Environmental Factor Guideline – Terrestrial Fauna* (EPA, 2016)
- *Arid bronze azure butterfly (ABAB) survey in Western Australia additional information* (DBCA, 2020a).
- *Guideline for the survey of arid bronze azure butterfly (ABAB) in Western Australia* (DBCA, 2020b).

Commonwealth

- *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (DoE, 2013).
- *Survey guidelines for Australia's threatened birds* (DEWHA, 2010a).
- *Survey guidelines for Australia's threatened frogs* (DEWHA, 2010b).
- *Survey guidelines for Australia's threatened mammals* (DSEWPaC, 2011a).
- *Survey guidelines for Australia's threatened reptiles* (DSEWPaC, 2011b).

2.2 Existing Environment

2.2.1 Climate

The closest long-term Bureau of Meteorology weather station with a complete dataset is Kalgoorlie-Boulder Airport Weather Station (Station 012038), located approximately 31 km north of the Survey Area.

Climate statistics were calculated using data from the most current climate normal, which is defined as a 30-year interval where possible. A climate normal is a period long enough to include year-to-year variations while avoiding the influence of longer-term changes in climate (BoM, 2007).

The long-term (1939 to 2023) mean minimum temperature for Kalgoorlie-Boulder Airport Weather Station ranges from 5.1˚C (July) to 18.3˚C (January) and the long-term mean maximum temperature ranges from 16.9˚C (July) to 33.6.˚C (January) (**Figure 1**) (BoM, 2024).

The Kalgoorlie-Boulder Airport Weather Station recorded 220.8 mm of rainfall in the 12 months prior to the survey (August 2022 to July 2023), which is 44.2 mm below the long-term (1939 to 2023) average of 265 mm (BoM, 2024). In the three months prior to the survey (May 2023 to July 2023), 57.6 mm of rainfall was recorded, which is 9.1 mm above the long-term average of 48.5 mm for the same period (BoM, 2024).

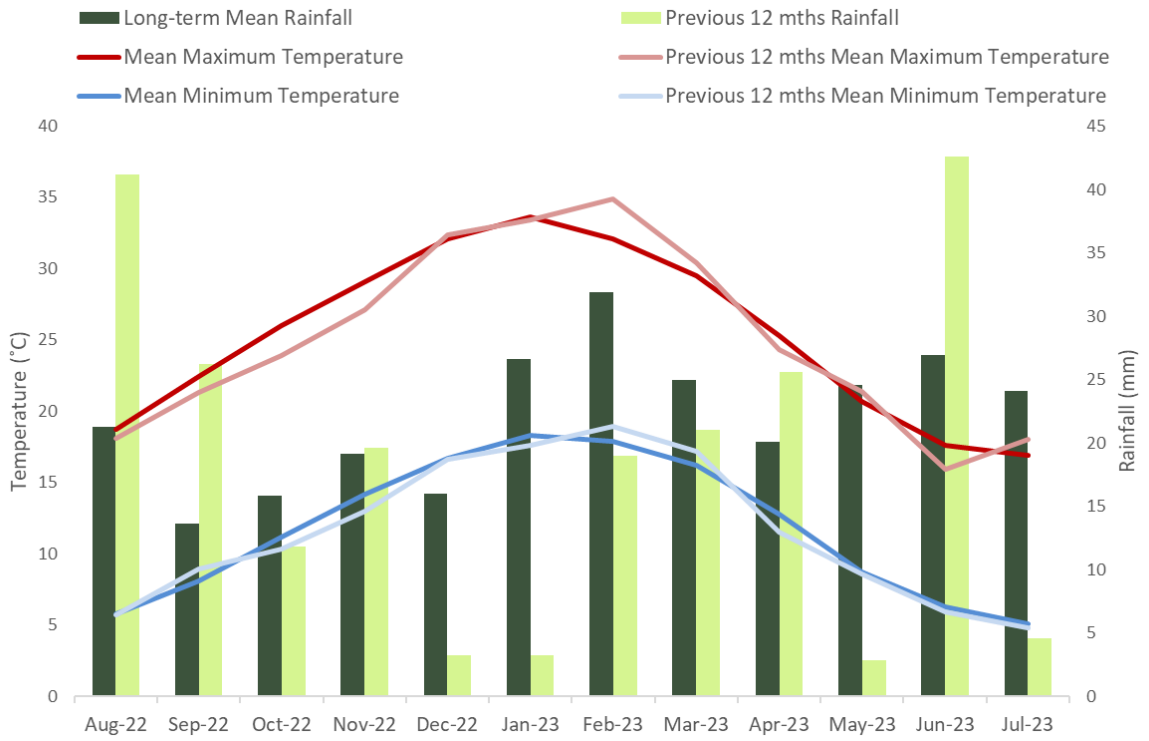


Figure 1: Climate summary of the Survey Area

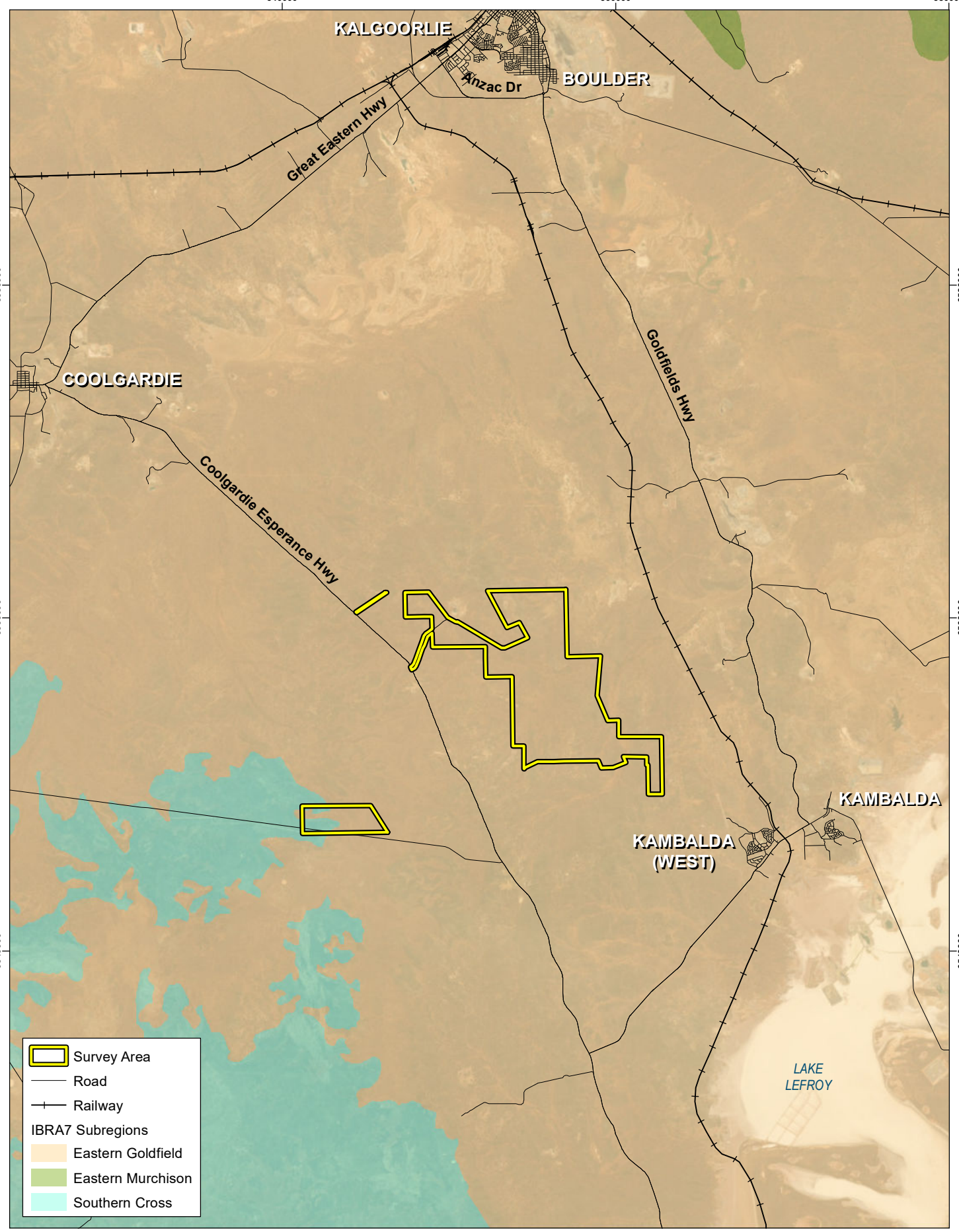
2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework

(DEE, 2016). The Survey Area occurs within the Goldfields bioregion and the Eastern Goldfield (COO3) and Southern Cross (COO2) subregions (**Map 2**).

The Eastern Goldfield (COO3) subregion lies on the 'Eastern Goldfields Terrains' of the Yilgarn Craton. The relief is subdued and comprises gently undulating plains interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The vegetation is mallees, acacia thickets and shrub heaths on sandplains. Diverse *Eucalypt* woodlands occur around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland occur on basic graninulites of the Fraser Range. The area is rich in endemic acacias. The climate is arid to semi-arid with 200-300 mm of rainfall, sometimes in summer but usually in winter. The subregional area is 5,102,428 ha (Cowan, 2001).

The Southern Cross (COO2) subregion lies on the ‘Southern Cross Terrains’ of the Yilgarn Craton and has a subdued relief comprising of gently undulating uplands and broad valleys with bands of low greenstone hills. The vegetation comprises of *Eucalypt* woodlands which are rich in endemic eucalypts and occur around salt lakes on the low greenstone hills. Dwarf shrublands of samphire are supported by the surface of salt lakes. Upper levels of the landscape have eroded yielding yellow sandplains, gravelly sand plains and laterite breakaways, populated by mallees and scrub-heaths which are rich in endemic *Acacias* and Myrtaceae species. The climate is arid to semi-arid with a warm mediterranean climate and a mainly winter rainfall of 250-300 mm. The subregional area is 7,041,232 ha (Cowan, Graham and McKenzie, 2001).



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IBRA Subregions
MAP 2

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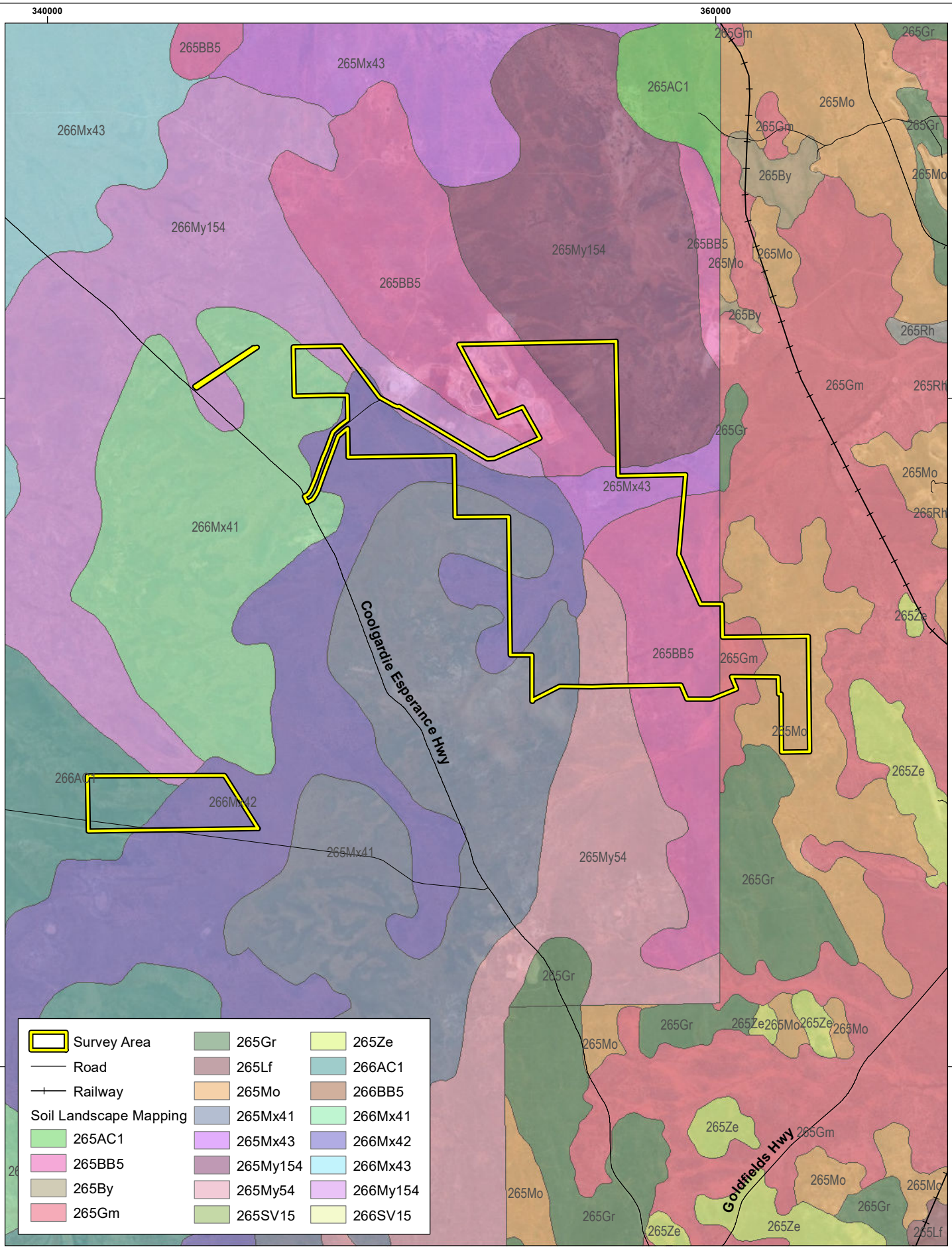
2.2.3 Soil Landscape Mapping

Soil landscape mapping of Western Australia consists of a compilation of various surveys at different scales varying between 1:20,000 and 1:3,000,000 (DPIRD, 2022). Soil landscape mapping for the Survey Area has been described below to the highest level of detail available.

The Survey Area occurs across 11 land systems (**Table 1**; **Map 3**). Land system level is the highest level of detail available for soil landscape mapping in the Survey Area.

Table 1: Soil landscape systems within the Survey Area

Land system		Description	Area and percentage within Survey Area
Name	Code		
BB5 atlas system	265BB5	Rocky ranges and hills of greenstones-basic igneous rocks	2256 ha, 30.5%
Gumland System	265Gm	Extensive pedeplains supporting eucalypt woodlands with halophytic and non-halophytic shrub understoreys.	175 ha, 2.3%
Mx41 atlas system	265Mx41	Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments	658 ha, 8.9%
Mx43 atlas system	265Mx43	Gently undulating valley plains and pediments; some outcrop of basic rock	456 ha, 6.2%
My154 atlas system	265My154	Undulating country on acid volcanic rocks and sedimentary materials	512 ha, 6.9%
My54 atlas system	265My54	Broad very gently undulating plains with scattered rock outcrops occurring as mesas	439 ha, 6%
Moriarty System	265Mo	Low greenstone rises and stony plains supporting chenopod shrublands with patchy eucalypt overstoreys.	366 ha, 5%
AC1 atlas system	266AC1	Gently sloping to gently undulating plateau areas, or uplands, on granites, gneisses, and allied rocks, with long gentle slopes and, in places, abrupt erosional scarps	352 ha, 4.8%
Mx41 atlas system	266Mx41	Flat to undulating pediments marginal to unit AC1; granitic rock outcrop; some low escarpments	182 ha, 2.5%
Mx42 atlas system	266Mx48	Broad flat to undulating valleys with isolated granitic rock outcrops and some low escarpments; some seasonal lakes and clay pans	1704 ha, 23.1%
My154 atlas system	266My154	Undulating country on acid volcanic rocks and sedimentary materials	277 ha, 3.8%



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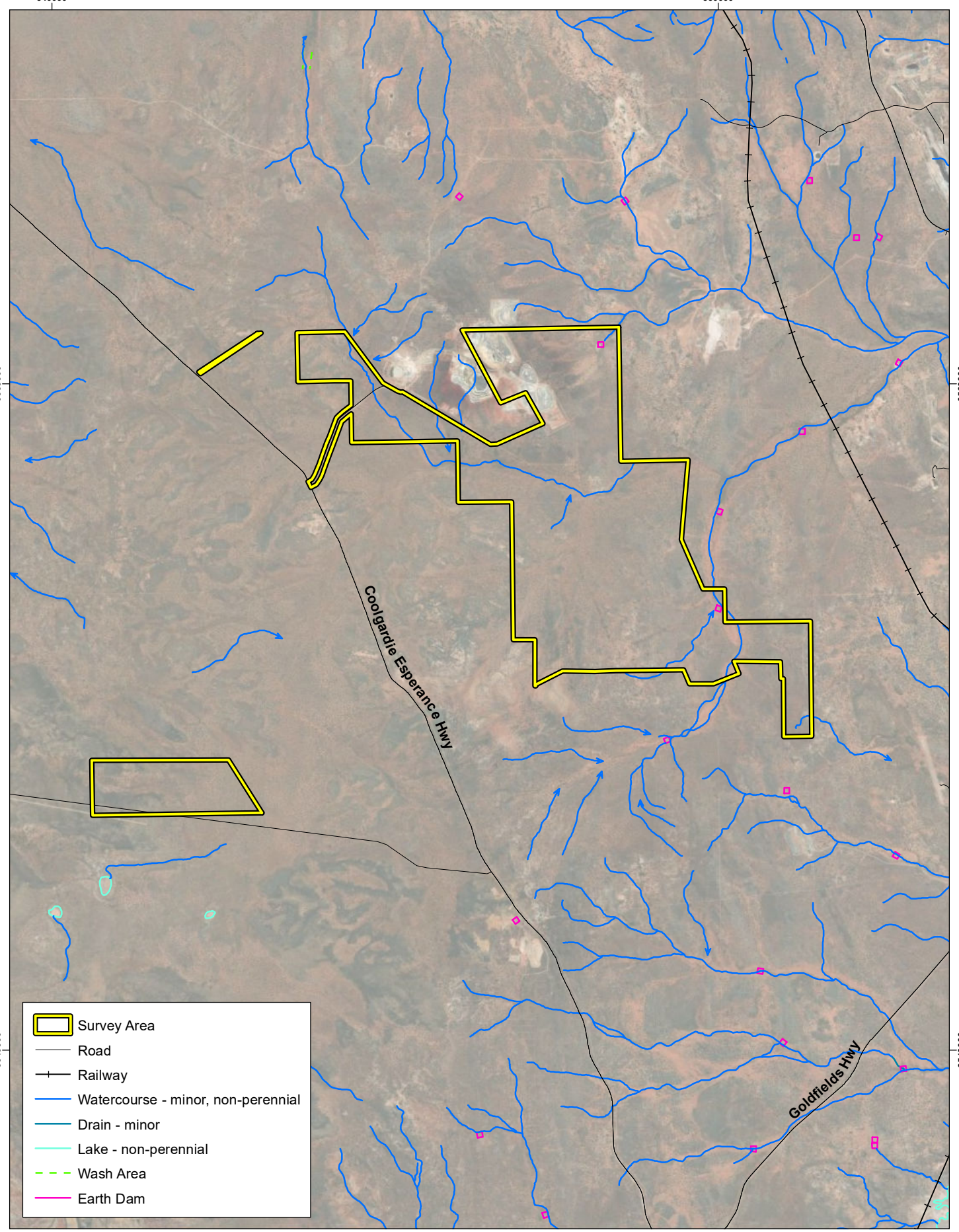
Soil Landscape Mapping
MAP 3

2.2.4 Hydrography

Hydrographic features that either intersect or occur in the vicinity of the Survey Area are described in **Table 2** and shown in **Map 4** (DWER, 2018).

Table 2: Hydrographical features in the vicinity of the Survey Area

Hydrographical feature	Description
Non-perennial watercourses	Multiple non-perennial watercourses in and around the Survey Area.
Salt lakes	Two ephemeral salt lakes are in the vicinity of the Survey Area, one 1.9 km south, and one 16 km north.
Lake Lefroy	Salt lake 15 km southeast of the Survey Area.



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Hydrography
MAP 4

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2.2.5 Vegetation

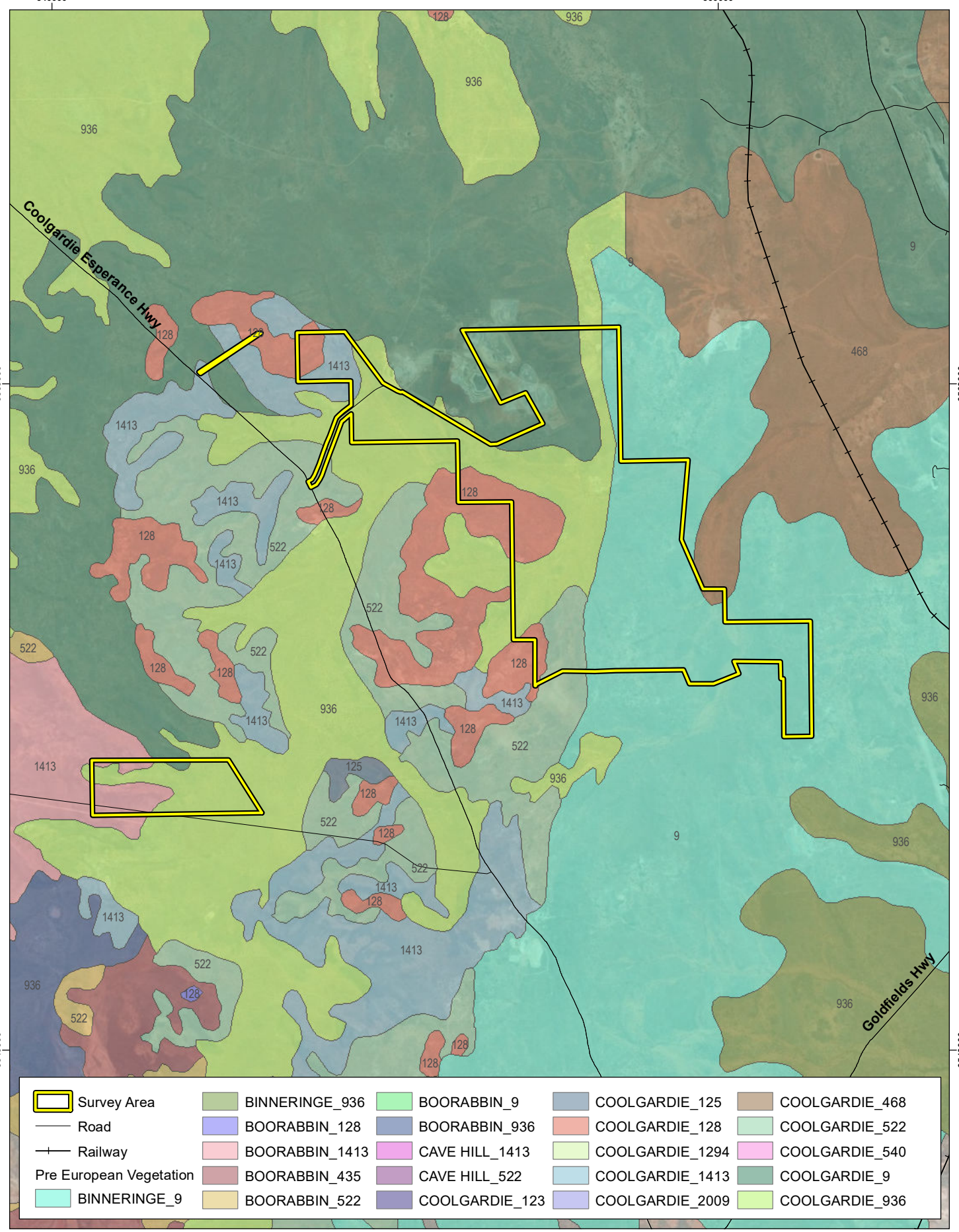
2.2.5.1 Pre-European Vegetation

The major source of data for pre-European vegetation mapping in Western Australia is the published and unpublished mapping of J. S. Beard at 1:250,000 scale. These vegetation types were later refined by Shepherd, Beeston, and Hopkins (2002), resulting in 819 Vegetation Association-level units, and a subsequent reclassification resulted in the creation of over 2,175 finer-scale System Associations (Beard *et al.*, 2013). Eight System Associations are mapped within the Survey Area (Error! Reference source not found.; **Map 5**).

Representation of Vegetation Associations at a state, regional, and local level is shown in **Table 4** (Government of Western Australia, 2019).

Table 3: Vegetation System Associations within the Survey Area

System Association	Description	Area (ha) and percentage within Survey Area
Coolgardie_9	Woodland other: Wheatbelt; york gum, salmon gum etc. *Eucalyptus loxophleba*, *E. salmonophloia*. Goldfields; gimlet, redwood etc. *E. salubris*, *E. oleosa*. Riverine; rivergum *E. camaldulensis*. Tropical; messmate, woolybush.	1,012 (13.7%)
Coolgardie_128	Rock	69 (0.9%)
Coolgardie_1413	Thicket: Wattle, *Casuarina* and teatree A*cacia-Allocasuarina-Melaleuca* alliance.	178 (2.4%)
Coolgardie_522	Woodland other: Wheatbelt; York gum (*Eucalyptus loxophleba*), salmon gum (*E. salmonophloia*) etc. Goldfields; gimlet (*E. salubris*), redwood (*E. oleosa*) etc. Riverine; rivergum (*E. camaldulensis*). Tropical; messmate, woolybush.	284 (3.9%)
Coolgardie_936	Woodland other: Wheatbelt; york gum, salmon gum etc. *Eucalyptus loxophleba*, *E. salmonophloia*. Goldfields; gimlet, redwood etc. *E. salubris*, *E. oleosa*. Riverine; rivergum *E. camaldulensis*. Tropical; messmate, woolybush.	2,341 (31.7%)
Coolgardie_468	Woodland other: Wheatbelt; york gum, salmon gum etc. *Eucalyptus loxophleba*, *E. salmonophloia*. Goldfields; gimlet, redwood etc. *E. salubris*, *E. oleosa*. Riverine; rivergum *E. camaldulensis*. Tropical; messmate, woolybush.	31 (0.4%)
Boorabbin_1413	Thicket: Wattle, *Casuarina* and teatree A*cacia-Allocasuarina-Melaleuca* alliance.	244 (3.3%)
Binneringe_9	Woodland other: Wheatbelt; york gum, salmon gum etc. *Eucalyptus loxophleba*, *E. salmonophloia*. Goldfields; gimlet, redwood etc. *E. salubris*, *E. oleosa*. Riverine; rivergum *E. camaldulensis*. Tropical; messmate, woolybush.	2,687 (36.4%)



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Pre-European Vegetation Associations
MAP 5

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Table 4: Representation of Vegetation Associations within the Survey Area at a state, regional, and local level

Vegetation Association	Extent				
	Pre-European (ha)	Current (ha)	Remaining (%)	Managed in DBCA lands (%)*	Within Survey Area (%)*
Representation across Western Australia					
9	240,509.33	235,161.94	97.78	8.07	1.5
936	698,752.00	676,689.18	96.84	4.14	0.3
128	329,836.19	288,813.54	87.56	23.92	0.02
1413	1,679,916.32	1,286,855.48	76.60	17.25	0.03
468	592,022.32	583,902.76	97.78	23.15	0.005
522	709, 714.81	709, 228.05	99.93	5.55	0.04
Representation across the Coolgardie Bioregion					
9	240,441.99	235,100.97	97.78	8.07	1.5
936	586,792.23	584,336.14	99.58	3.10	0.4
128	184,549.90	183,891.19	99.64	18.85	0.03
1413	1,061,212.28	1,042,553.77	98.24	18.50	0.04
468	583,357.71	575,360.61	98.63	22.72	0.005
522	688, 406.97	687, 920.22	99.93	5.72	0.04
Representation across the Eastern Goldfields (COO03) Subregion					
9	235,047.15	229,757.07	97.75	8.26	1.6
936	310,897.74	308,459.61	99.22	4.38	0.7
128	26,871.74	26,853.58	99.93	6.53	0.2
1413	107,974.55	107,727.82	99.77	7.54	0.3
468	482,361.84	474,364.74	98.34	22.42	0.006
522	208, 175.17	207, 714.22	99.78	2.02	0.1
Representation across the Southern Cross (COO02) Subregion					
9	5,394.84	5,343.90	99.06	0.06	69.2
1413	953,237.73	934,825.95	98.07	19.76	0.04
Representation across the Shire of Coolgardie					
9	166,572.37	163,720.39	98.29	9.81	2.2
936	359,112.73	356,674.60	99.32	4.02	0.6
128	96,232.93	96,215.07	99.98	13.56	0.07
1413	334,488.08	334,256.37	99.93	8.16	0.1
468	149,487.25	148,635.89	99.43	44.52	0.02
522	313, 283.77	312, 787.98	99.86	11.54	0.09

*as a portion of the current extent

2.2.6 Conservation Areas

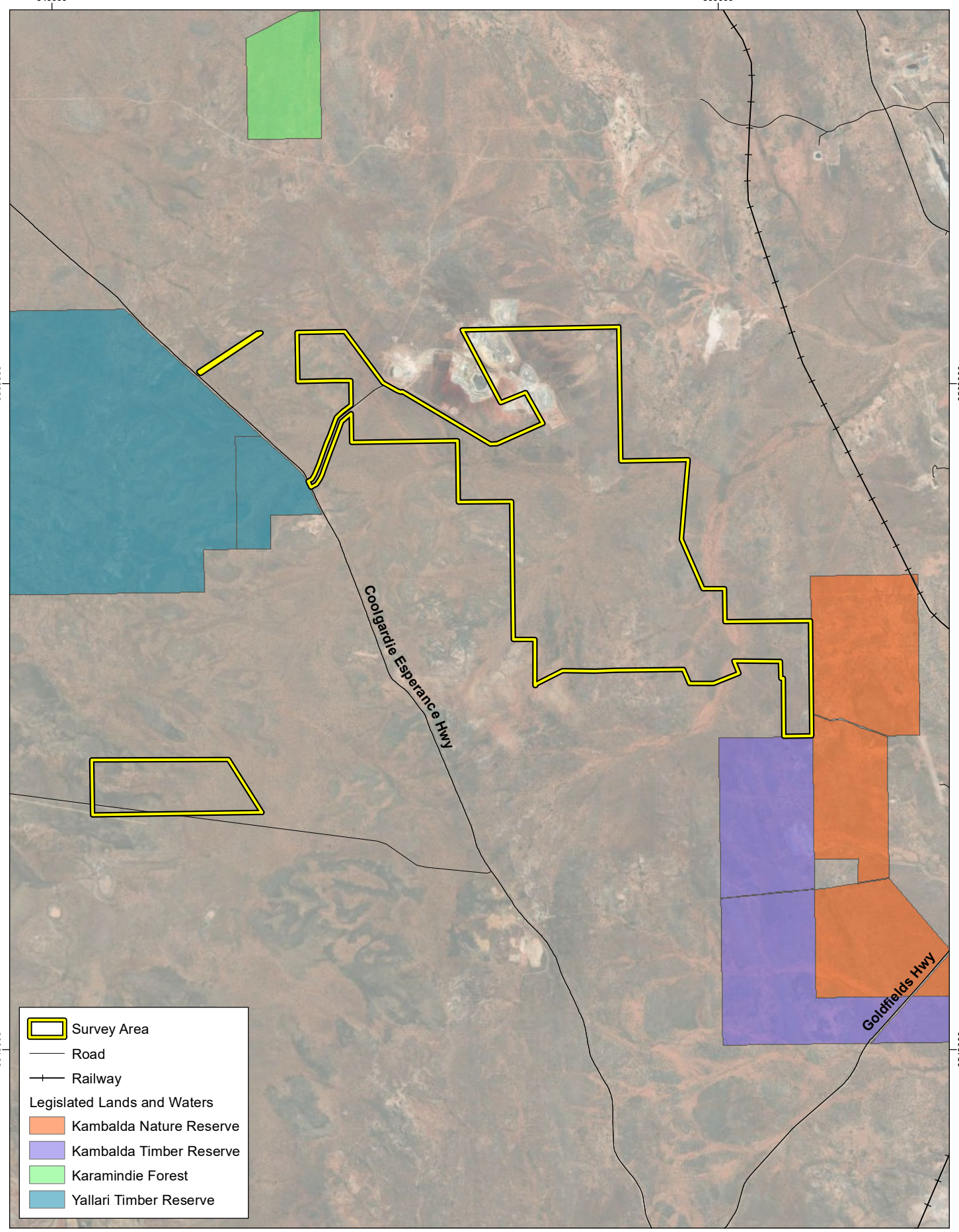
Conservation areas consist of areas protected for the purpose of conservation, including but not limited to National Parks, Nature Reserves, Conservation Parks, and Regional Parks. The Survey Area does not occur within a conservation area (DBCA, 2023a, 2023b). Nearby conservation areas within 20 km of the Survey Area are listed below and shown in **Map 6**:

- Yallari Timber Reserve, located adjacent to the western border of the northeast polygon of the Survey Area and is vested under the Conservation Commission of WA.
- Scahill Timber Reserve, located approximately 4 km west of the southwest polygon of the Survey Area and is vested under the Conservation Commission of WA.
- Karamindie Forest, located approximately 5.8 km north of the northeast polygon of the Survey Area and is vested under the Conservation Commission of WA.
- Kangaroo Hills Timber Reserve, located approximately 22 km northwest of the northeast polygon of the Survey Area and is vested under the Conservation Commission of WA.
- Kambalda Nature Reserve, located adjacent to the southeastern border of the northeast polygon of the Survey Area and is vested under the Conservation Commission of WA.
- Kambalda Timber reserve, located adjacent to the southern border of the northeast polygon of the Survey Area and is vested under the Conservation Commission of WA.

2.2.7 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs), or significant wetlands. The Survey Area does not occur within a mapped ESA (DWER, 2023). The nearest ESAs are listed below.

- Unnamed ESA (site of Declared Rare Flora (DRF)), 48 km west-northwest of the north-eastern polygon of the Survey Area
- Unnamed ESA (site of DRF) within the Victoria Rocks Nature Reserve, 39 km west-southwest of the south-west polygon of the Survey Area.
- Unnamed ESA (site of DRF) within the Victoria Rocks Nature Reserve, 40 km west-southwest of the south-west polygon of the Survey Area.



N 0 1.25 2.5 5 km

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Reviewed By	: EW

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Conservation Areas
MAP 6

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2.2.8 Land Use

Woolibar Pastoral station (N050022 and N050023) encompasses the northeast polygon of the Survey Area. Exploration and mining leases identified within the Survey Area:

- Reed Industrial Minerals PTY LTD (E 1501599)
- Reed Industrial Minerals PTY LTD (E 1500321)
- Reed Industrial Minerals PTY LTD (M 1501000)
- St Ives Gold Mining Company PTY LTD (E 1500972)
- St Ives Gold Mining Company PTY LTD (E 1500841)
- St Ives Gold Mining Company PTY LTD (E 1500984)
- St Ives Gold Mining Company PTY LTD (E 1500973)
- St Ives Gold Mining Company PTY LTD (M 1500841)

2.2.9 Indigenous Land Rights

The Survey Area falls within the Goldfields Land and Sea Council Aboriginal Group jurisdiction area (NNTT, 2017) and has one native title determination over the area (Landgate, 2023a), Marlinyu Ghoorlie People (NNTT no. WC2017/007).

There are no Indigenous Land Use Agreements (ILUAs) over the Survey Area (Landgate, 2023b).

3.0 Methods

The surveys documented in this report were undertaken in accordance with relevant EPA and DAWE guidelines (see **Section 2.1**).

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds (the Desktop Study Area) was compiled prior to the field survey (see **Section 2.2**). The literature review also considered a selection of relevant reports detailing assessments undertaken in the region that were either publicly available or provided by the client. These reports are listed below and summarised in **Appendix A**.

- Mt Marion Lithium Project Malleefowl Survey, July 2022 (Bamford Consulting Ecologists, 2022a), overlaps the Survey Area.
- Mt Marion Fauna Assessment: Hamptons lease Area 53, L15/353, M15/999 and East E15/1599 (Bamford Consulting Ecologists, 2022b), overlaps the Survey Area.
- Mt Marion Lithium Project Malleefowl Survey, January 2020 (Bamford Consulting Ecologists, 2020), overlaps the Survey Area.
- Fauna Assessment of Proposed Woolibar Borefields (Bamford Consulting Ecologists, 2018), overlaps the Survey Area.
- Fauna Assessment of Proposed Borefields Pipeline Corridor (Bamford Consulting Ecologists, 2017b), overlaps the Survey Area.
- Fauna Assessment of M15/717 Lease Area; Mt Marion Lithium Project (Bamford Consulting Ecologists, 2017a), overlaps the Survey Area.
- Mt Marion Project Fauna Assessment v4 (Bamford Consulting Ecologists, 2016), overlaps the Survey Area.
- Terrestrial Fauna Habitat Assessment; Mount Marion Lithium Project (Rapallo, 2010), overlaps the Survey Area.
- Fauna Assessment of the Mt Marion Mining Lease Area (Bamford Consulting Ecologists, 2012), overlaps the Survey Area.

3.1.2 Database Searches

Database searches were undertaken to compile a list of fauna known to occur in the Desktop Study Area and identify significant fauna with potential to occur within the Survey Area (**Table 5**).

Table 5: Database search details

Database name	Date received	Search target	Buffer around the Survey Area
Threatened and Priority Fauna database search (DBCA, 2023c)	28 June 2023	Threatened and Priority Fauna	100 km
Protected Matters Search Tool (PMST) (DCCEEW, 2023)	July 2023	Threatened Fauna	50 km
NatureMap Database Search (DBCA, 2023d)	28 June 2023	Vertebrate Fauna	100 km

3.1.3 Likelihood of Occurrence

Significant fauna taxa identified during the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area before and after the field survey. The assessment used the likelihood of occurrence criteria presented in **Table 6**.

Taxa listed as Marine only under the EPBC Act were not considered to be significant taxa because the Marine listing does not constitute MNES under the EPBC Act. Additionally, erroneous records (i.e. records that occur well outside a taxon's known distribution) were excluded from consideration. Only significant taxa that were targeted as part of this survey, were recorded within the Survey Area, or were assessed as having a high or medium likelihood of occurrence are discussed in detail.

Table 6: Likelihood of occurrence criteria

Rank	Criteria
Recorded	The taxon was recorded within the Survey Area during the current survey.
Previously Recorded	The taxon has been previously recorded within the Survey Area according to database search or literature review results.
High (Likely to occur)	There are existing records of the taxon near the Survey Area, suitable habitat is present within the Survey Area, and the taxon has been recorded within the Desktop Study Area in the last 15 years.
Medium (May occur)	There are existing records of the taxon within the Desktop Study Area, however, the taxon does meet the criterion for high likelihood, or suitable habitat within the Survey Area is marginal or limited in extent, or the taxon has not been recorded within the Desktop Study Area in the last 15 years.
Low (Unlikely to occur)	Suitable habitat is not present within the Survey Area, or the taxon is very infrequently recorded in the locality despite reasonable previous search effort, or the taxon is believed to be extinct or locally extinct.

3.2 Field Surveys

3.2.1 Survey Timing

The field surveys were undertaken across two field trips as shown in **Table 7**.

Table 7: Survey timing

Survey trip	Tasks completed	Dates	Person field days
1	Basic fauna, targeted Chuditch, targeted Malleefowl, and targeted *Camponotus* sp. nr. *terebrans* survey.	26 July – 03 August 2023	54
2	Basic fauna, targeted Chuditch, targeted Malleefowl, and targeted *Camponotus* sp. nr. *terebrans* survey.	09 – 14 August 2023	42

3.2.2 Field Personnel and Licences

Details of field personnel, including their level of experience, role for each field trip are detailed in **Table 8**.

Fauna fieldwork was completed under Fauna Taking (Biological Assessment) License – Regulation 27 (BA27000901) (**Appendix B**). Animal ethics approval was obtained under scientific use licence number U336 / 2023 - 2025 and permit number WAEC 24-02-12.

Table 8: Field personnel

Personnel	Experience	Role	Trips
Dr. Michael Lohr – Principal Zoologist	11 years	Project Director, field logistics, team lead	1 & 2
Dr. Rod Eastwood – Associate Ecologist	50 years	Specialist ABAB and associated ant species consultant	1 & 2
Evan Webb – Associate Zoologist	7 years	Field logistics, team lead	1 & 2
Poppy Walker – Senior Ecologist	5 years	Field hand	1 & 2
Simon Girando – Senior Ecologist	5 years	Project Manager, field lead, logistics coordinator	1 & 2
Datta Li – Graduate Zoologist	2 years	Field hand	1 & 2

3.2.3 Weather Conditions

Weather conditions during the fauna surveys are presented in **Table 9** and **Table 10**. Daily temperature and rainfall data is from the Kalgoorlie-Boulder Airport Weather Station (Station 012038) (BoM, 2024). Weather conditions can impact potential detection of fauna taxa during a survey.

Table 9: Trip 1 weather conditions

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
26/07/2023	10.4	17.4	0.8
27/07/2023	6.8	14.9	0.4
28/07/2023	2.6	16.6	0.0
29/07/2023	5.0	20.1	0.0
30/07/2023	11.1	19.1	0.0
31/07/2023	3.9	20.8	0.0
01/08/2023	8.7	25.4	0.0
02/08/2023	15.1	25.9	0.0
03/08/2023	9.7	13.7	18.0

Table 10: Trip 2 weather conditions

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
09/08/2023	8.8	18.5	0.0
10/08/2023	5.1	24.0	0.0
11/08/2023	11.4	18.2	0.0
12/08/2023	10.0	12.9	3.4
13/08/2023	9.8	15.9	6.0
14/08/2023	7.7	18.1	5.8

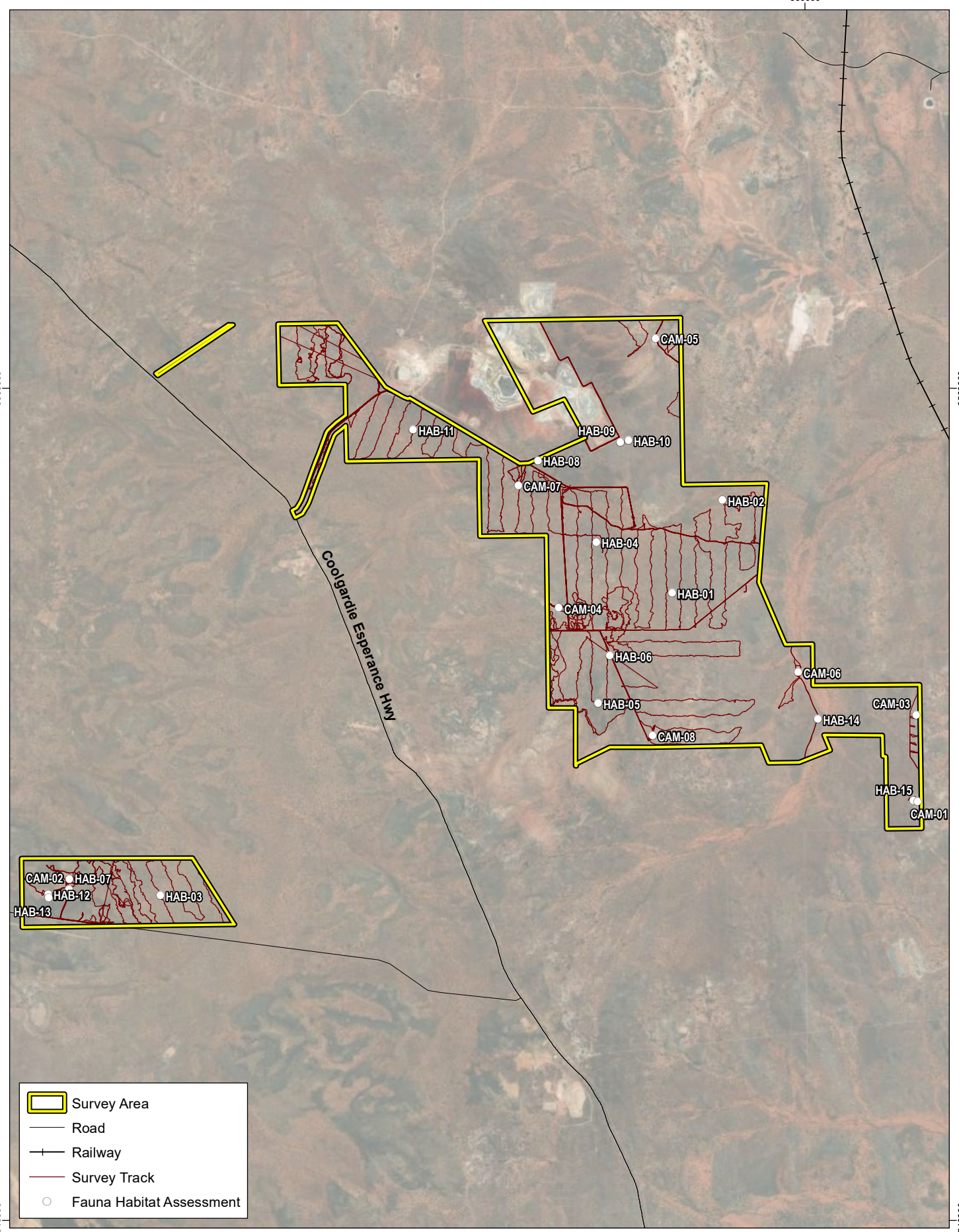
3.2.4 Habitat Assessments

Habitat assessments were undertaken in representative areas of fauna habitat within the Survey Area to record habitat values. Where possible, at least one habitat assessment was recorded within each habitat type. Habitat assessment locations are shown in **Map 7**.

The following information was collected at each habitat assessment locations using a GPS-enabled handheld device:

- Site photo.
- Landform.
- Soil type and colour.
- Rock types, surface stone cover, and size classes.
- Key habitat and microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, and water sources.
- Habitat quality, fire history, and evidence of disturbance.
- General description of vegetation structure.

Fauna habitat mapping was based on a combination of field observations, habitat assessment data and aerial imagery. Polygons were digitised using GIS software.



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Survey Effort
MAP 7

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3.2.5 Camera Traps

Twenty-two motion sensitive camera traps were set up during the field survey. Camera traps were deployed in lines of five cameras spaced approximately 50 m apart in areas of suitable habitat for Chuditch hunting and denning, or ad-hoc in areas of high fauna activity (e.g. water holes, caves, etc.). Cameras were baited with universal bait (rolled oats, peanut butter, and sardines). **Table 11** shows the total camera trap survey effort, and camera trap locations are shown in **Map 7**.

Table 11: Camera trap survey effort

Habitat	Site number	Lat/long (WGS84)	Number of camera traps	Total camera trap nights
Rocky Hill	5937-CAM-01	-31.1751606, 121.588234	1	14
Cleared (with pool of water)	5937-CAM-02	-31.191920, 121.345223	1	14
Rocky Hill	5937-CAM-03	-31.156722, 121.559246	5	70
Rocky outcrop	5937-CAM-04	-31.132402, 121.49274	5	70
Man-made Dam	5937-CAM-05	-31.074263, 121.49489	2	28
Drainage Line	5937-CAM-06	-31.147018, 121.529668	2	28
Drainage Line	5937-CAM-07	-31.105381, 121.459833	5	70
Eucalypt Woodland	5937-CAM-08	-31.160305, 121.49274	1	14
Total			**22**	**308**

3.2.6 Opportunistic Observations

Opportunistic observations of fauna were recorded throughout the Survey Area, including primary evidence (direct sightings, calls, and remains) and secondary evidence (tracks, scats, and diggings).

3.2.7 Bird Surveys

Bird surveys were undertaken at each trap site in a 2-ha quadrat. Where practicable, this was undertaken during typical peak periods of activity when birds are calling and moving about, which is typically within three to four hours of sunrise, particularly during warmer periods.

3.2.8 Malleefowl Mound Survey

LiDAR data was collected during an Aerial Survey completed by Outline and processed by Anditi to create an accurate Digital Elevation Model (DEM) that includes potential mound-like features. The data was then further analysed using Anditi Malleefowl mound analysis algorithms, which identifies ground features that best approximate a typical Malleefowl

mound shape. Based on the algorithm match and manual checks, potential Malleefowl mounds were classed from 1 to 4:

1 Very closely matches a typical Malleefowl mound shape and is highly likely to be a Malleefowl mound.

2 Similar to a Malleefowl mound shape and could be a Malleefowl mound.

3 A mound shape that approximates the size parameters of a Malleefowl mound and could be an old Malleefowl mound.

4 A mound shape that approximates the size parameters of a Malleefowl mound but is not very similar to a typical Malleefowl mound and could be a broken or old Malleefowl mound.

Following analysis, potential Malleefowl mounds classed as 1 to 2 were ground-truthed during the field survey to confirm their status as mounds classed as 3 to 4 were deemed highly unlikely to be Malleefowl mounds. If the presence of an active or inactive Malleefowl mound was confirmed the following parameters were recorded:

- Whether the mound is new or previously known.
- Evidence of Malleefowl activity.
- Mound dimensions.
- Mound photo.

3.2.9 ABAB Ant Transect Survey

The ABAB has an obligate association with the sugar ant *Camponotus* sp. nr. *terebrans*, in which the butterfly larvae spend almost their entire lives within the ant's nest during their development. Therefore, surveying for the ABAB begins by confirming the presence of the any species and assessing whether there are colonies large enough to support the ABAB, generally considered to be greater than 40 ha (Eastwood, 2024, pers. comm.).

Camponotus sp. nr. *terebrans* typically nests at the base of smooth barked eucalypts. Areas likely to contain smooth barked eucalypts were identified within the Survey Area using aerial imagery and publicly available vegetation mapping. Based on these areas, it was determined that a total of 859 sample trees (i.e. sample points) along transect lines spaced 293 m apart were required to survey for *C*. sp. Nr *terebrans* nests using the following formula from the *Guideline for the survey of arid bronze azure butterfly (ABAB) in Western Australia* (DBCA, 2020b):

$$\text{No. sample tree} = 10 \times \sqrt{(\text{site area in ha})}$$

$$\text{Spacing} = \sqrt{[(\text{site area in ha} \times 10{,}000) / \text{No. sample trees}]}$$

A total of 93 km of transects were traversed on foot. At each sample point, the nearest tree was checked for evidence of a *C.* sp. nr. *terebrans* nest. Evidence includes a sandy apron, fresh debris, and one or more irregularly shaped nest entrance holes. Any trees opportunistically observed with the nest evidence while traversing transect lines were also checked. If evidence of a nest was observed, then the surface layer of soil around the next was removed and, if present, two adult ants were collected and preserved in ethanol-filled vials.

The formal identification of these specimens did not occur after the conclusion of the field survey; therefore, delineation of the colony boundary was not undertaken.

3.2.10 Identification and Taxonomy

Terrestrial vertebrate fauna taxa that were opportunistically observed were identified in the field. Where there was doubt on a species name (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon.

Terrestrial vertebrate fauna taxa that were recorded via motion sensing cameras were identified after the field survey had concluded. Where there was doubt on a species name (through lack of photography detail or lack of identifying features visible in photos), the taxon was identified to the nearest taxonomic level possible.

Taxonomy and nomenclature in this report follows the *Checklist of the Terrestrial Vertebrate Fauna of Western Australia* (WAM, 2023) where relevant.

Terrestrial invertebrates captured as part of this survey were collected in the field and stored in ethanol vials. Ants were identified by taxonomist Brian Heterick at the WAM. *Pogonoscopus* Leafhoppers were identified by Melissa Moir.

3.3 Limitations

Limitations and constraints of the fauna survey are detailed below in **Table 12**.

Table 12: Limitations and constraints associated with the survey

Variable	Degree of limitation	Potential constraints on survey outcomes
Availability of data and information	No limitation	Sufficient data and information, including regional and local contextual information, was available to complete the scope of the survey.
Competency and experience of the survey team	No limitation	The survey was undertaken by a team with extensive experience undertaking similar scopes within the bioregion. • Principle Zoologist, Dr Michael Lohr – 11 years' experience • Specialist Ecologist, Dr Rod Eastwood – 50 years' experience • Associate Zoologist, Evan Webb – 7 years' experience • Senior Ecologist, Poppy Walker – 5 years' experience • Senior Ecologist, Simon Girando – 5 years' experience • Graduate Zoologist, Datta Li – 2 years' experience
The proportion of fauna identified, recorded, or collected	No limitation	Of the 56 fauna taxa recorded, two taxa (3.6%), could not be identified to species level because camera photos did not always carry enough detail to determine identifying features of specific species. The unidentified fauna taxa did not include potential significant fauna taxa.
Scope of the survey	No limitation	The scope of the survey was limited to terrestrial fauna. No further exclusions were made within these groups.
Adequacy of the survey intensity and proportion of survey achieved	No limitation	All habitat types within the Survey Area were identified and adequate intensity was allocated to identify all major taxonomic groups that might occur in each. Increased survey intensity may yield additional fauna taxa; however, sufficient time and effort was allocated to the survey given the size and complexity of the Survey Area and the expected level of survey intensity.
Access problems	No limitation	The Survey Area was sufficiently accessed by vehicle and on foot.
Timing, weather, and season	No limitation	The recommended primary survey periods for the Southwest broad climatic regions are: • Amphibians – May – August & November - December • Birds – September - December • Mammals – September - December • Reptiles – October – December & February - March The fauna surveys (July – August) were undertaken outside the recommended primary survey periods for most species but as this was not a detailed survey, it will not affect the adequacy of the survey. Targeted surveys for Malleefowl, Chuditch, and *Camponotus* sp. nr. *terebrans* – the host ants

Variable	Degree of limitation	Potential constraints on survey outcomes
		supporting the ABAB – are not constrained by seasonality and can be conducted effectively at any time of year.
Disturbance that may have affected the results of survey	No limitation	Areas of disturbance associated with mining activity, roads, and infrastructure were present within the Survey Area but were not a limitation on the results of the survey.
Problems with data and analysis, including sampling biases	No limitation	Survey effort for significant fauna taxa was concentrated in preferred habitats. This may introduce a bias where the use of non-preferred habitat is underrepresented, however, this is not considered a limitation on the survey outcomes.

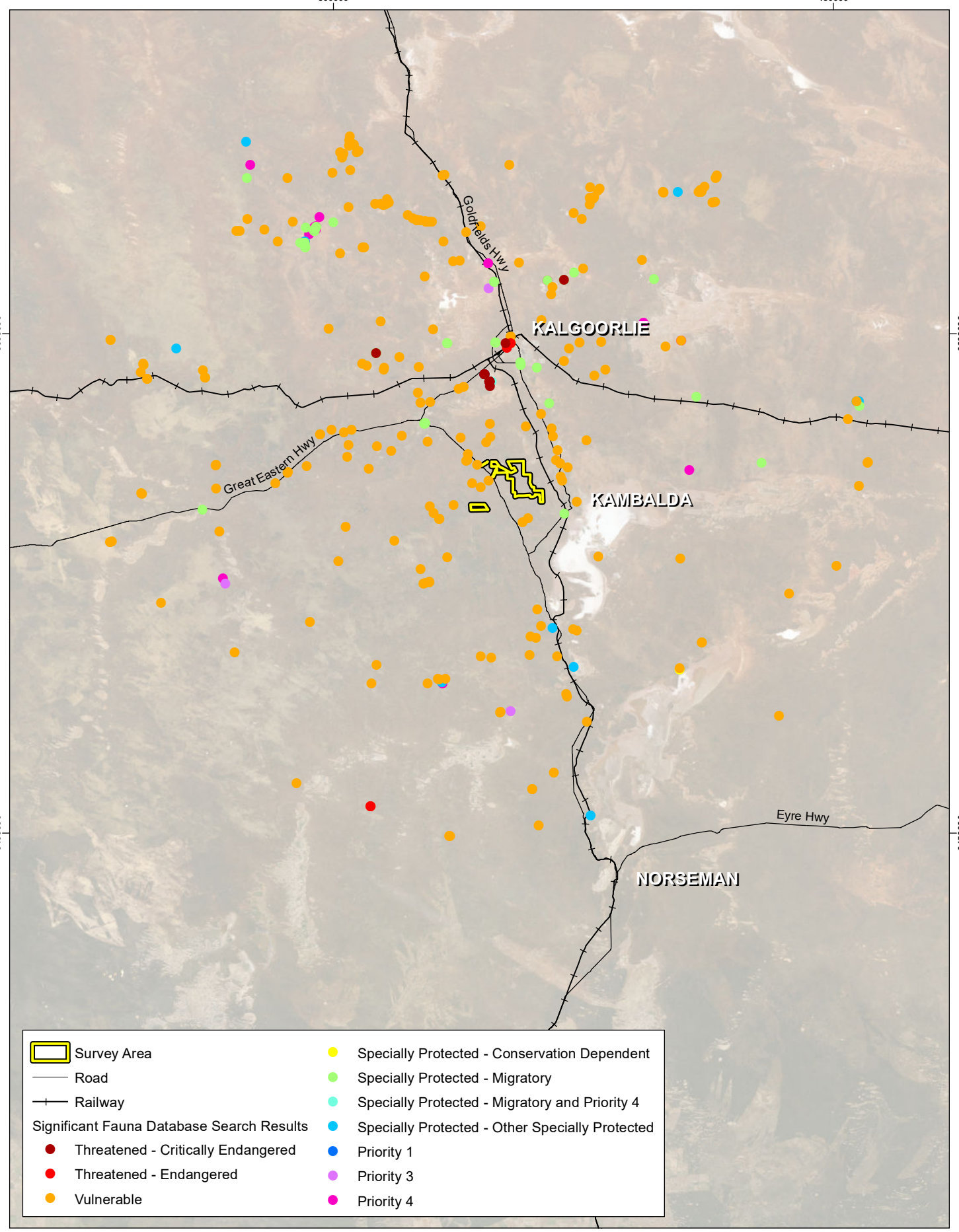
4.0 Results

4.1 Desktop Assessment

The database searches and literature review identified 216 terrestrial vertebrate fauna taxa occurring within the Desktop Study Area, comprising:

- Four amphibians, of which none are significant.
- 126 birds, of which 23 are significant.
- 23 mammals, of which five are significant.
- 61 reptiles, of which one is significant.
- Two invertebrates, both of which are significant.

Key findings of the literature review are summarised in **Appendix A**, a complete list of fauna taxa recorded within the Desktop Study Area is presented in **Appendix C**, and database search results are displayed in **Map 8**.



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Scale	: 1:1,500,000 @ A4
Project Number	: 675.VX5937.00001
Date Drawn	: 5/03/2024
Drawn By	: Environmaps
Reviewed By	: EW

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Significant Fauna Database Search Results
MAP 8

4.2 Fauna Habitat

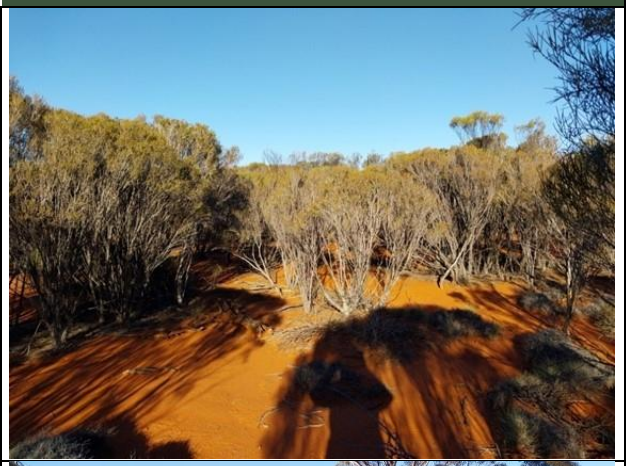
Six fauna habitats (excluding cleared areas, man-made dams, and rehab areas) were identified and mapped within the Survey Area. Fauna habitats are presented in **Map 9**, described below in Error! Not a valid bookmark self-reference., and site sheets for each habitat assessment are provided in **Appendix D**. Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding.

Table 13: Fauna habitats recorded within the Survey Area

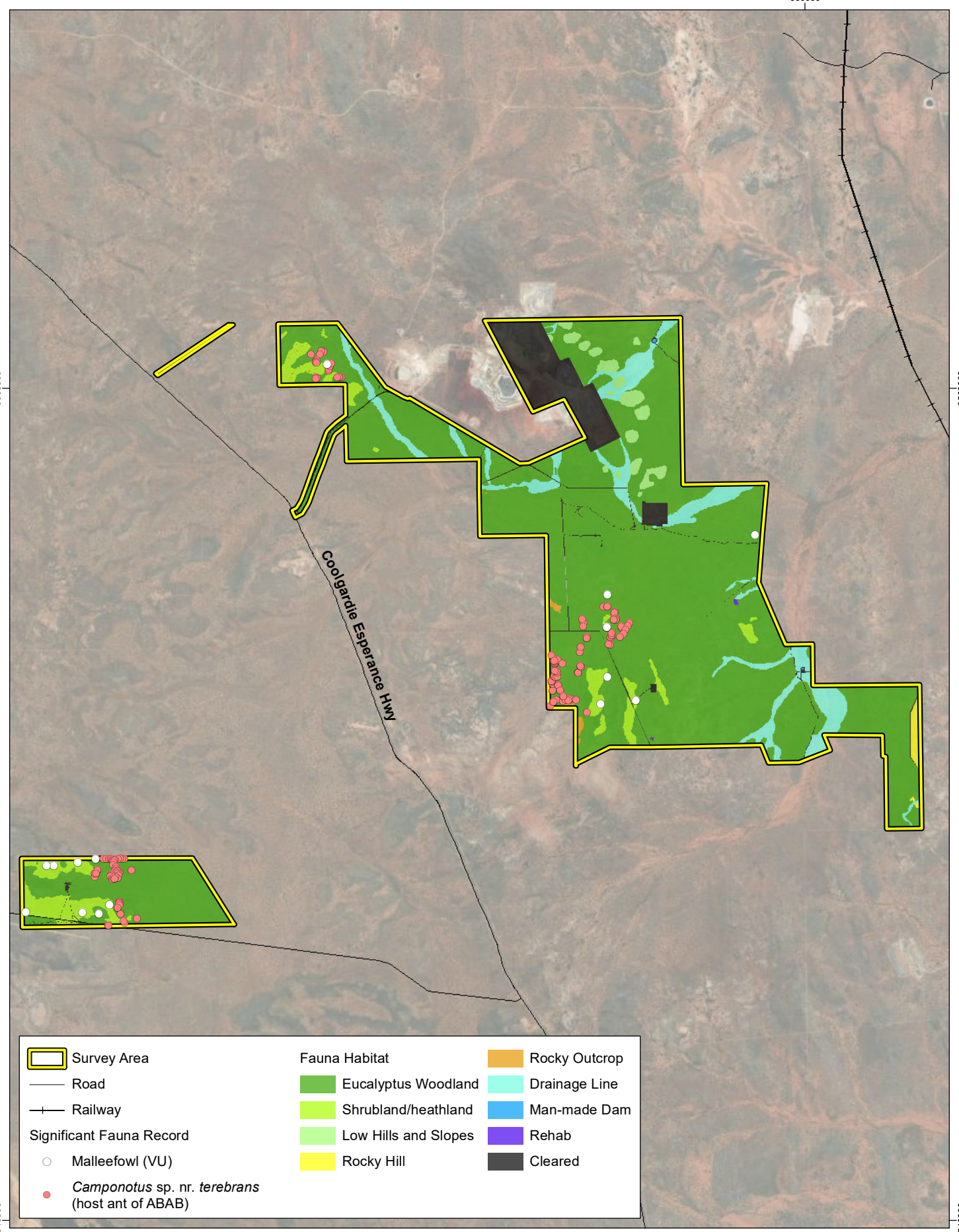
Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Drainage Line	543.28 ha, 7.37%	Areas of drainage consisting of narrow individual channels or, in some cases, lacking surface channelling altogether. Overstorey vegetation made up primarily of mixed open *Eucalyptus* spp., with dense *Acacia* and *Melaleuca* midstory. Ground cover is typically *Solanum* spp. sprawling *Acacia* spp. and *Atriplex* spp. on substrates ranging from sand to sandy clay, with an assortment of river stones. Most drainage lines lack permanent or semi-permanent pooling of water. Large, hollow-bearing eucalypts were occasionally observed within this habitat. Key microhabitats include woody debris, leaf litter, peeling bark, hollow trees, and logs which provide refuge, shelter, and foraging opportunities for a wide variety of fauna taxa. This habitat was mostly in good condition across the Survey Area with small disturbances of roads seen infrequently crossing the lines. This habitat constitutes a potential water source for Malleefowl and Carnaby's Cockatoo.	

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Eucalypt Woodland	5,794.63 ha, 78.57%	Undulating plains of sandy clay loams with subtle granite, greenstone, or quartz extrusions. Vegetation consists of mixed *Eucalyptus* trees over *Acacia* and *Melaleuca* midstory and low *Acacia, Atriplex*, understorey with occasional *Triodia* hummock grassland. Microhabitats include tree hollows, rocky outcrops, leaf litter, burrows, and hummocks. This habitat varied widely in its condition, ranging from Very Good to Disturbed. Disturbances of rubbish, historic mining, historic roads, erosion, and historic farming were seen in isolated patches throughout the Survey Area. This habitat type constitutes preferred habitat for the ABAB as it contains trees suitable for the host ant *Camponotus* sp. nr. *terebrans*. Eucalypt Woodland in close proximity with Shrubland/Heathland also constitutes important foraging habitat for Malleefowl.	
Low Hills and Slope	119.21 ha, 1.62%	Granite and greenstone hills and slopes with occasional outcropping and thin soils over shallow bedrock. Vegetation consists of open woodlands of mixed eucalypts over sparse *Acacia* and *Melaleuca* midstory and minimal understorey of seasonal herbs and daisies. Microhabitats include tree hollows, burrows, leaf litter, and occasional rocky outcrops. Habitat condition was mostly good throughout, with some localised clearing and rubbish dumps.	

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Rocky Hill	39.51 ha, 0.54%	Granite and greenstone hills with moderate to high levels of outcropping and thin soils over shallow bedrock. Vegetation consists of sparse mixed eucalypts over dense *Acacia, Melaleuca,* and *Senna* midstory. Ground cover was mostly small *Acacia*, *Solanum*, and *Atriplex* species with occasional herbs and daisies. Microhabitats include rocky outcrops, crevices, exfoliating rock, and leaf litter. Small breakaways containing shallow overhangs were occasionally observed. Habitat condition was mostly good throughout with occasional clearing and road networks.	
Rocky Outcrop	23.61 ha, 0.32%	Areas of bare rock, often granite, greenstone, or quartz, with little to no vegetation surrounding. Ephemeral pools often form after heavy rains. Microhabitats include exfoliating rock, crevices, caves, leaf litter, and woody debris. Important shelter and denning habitat for a variety of reptile and mammal species.	

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Shrubland/Heathland	362.54 ha, 4.92%	Sandplains of deep alluvial soils with minimal outcropping. Vegetation lacks any form of overstorey and is predominantly tall dense *Acacia* and *Myrtaceae* shrubland with minimal understory of herbs and forbs. Microhabitats include leaf litter, woody debris, and peeling bark. Habitat was mostly good throughout with minimal areas of clearing and rehabilitation. This habitat constitutes important refuge and nesting habitat for Malleefowl.	
Rehab	1.68 ha, 6.64%	Areas that were previously cleared which have since been scarified and replanted/reseeded. They provide some level of habitat for fauna species but are still in very poor condition.	

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Man-made Dam	0.86 ha, 0.01%	Areas that were cleared and bunded to hold water for domestic livestock. They provide water sources for longer periods of the year than most natural water-holding areas and become important water sources for animals in the local area.	
Cleared	490.04 ha, 6.64%	Cleared land for existing mining activity and associated tracks/roads. Low/negligible fauna habitat value.	



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Project Number	: 675.VX5937.00001
Date Drawn	: 12/03/2024
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Fauna Habitat and Significant Fauna Records
MAP 9

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C:\GIS\Jobs\360\675.VX5937.00001 - Mt Marion Fauna Surveys, Mineral Resouces\Figures_MMM\675-VX5937-00001_MMM_M09 Fauna Habitat and Significant Fauna Records_240312.mxd

4.3 Fauna Records

The fauna survey recorded a total of 56 fauna taxa from 34 families. The fauna diversity within each habitat type is summarised in **Table 14 Table 14**and a full inventory of fauna taxa recorded during the field survey is provided in **Appendix E**.

Table 14: Fauna diversity by habitat type

Fauna habitat	Insects	Birds	Mammals	Reptiles	Total
Drainage Line	0	5	2	3	10
Eucalypt Woodland	3	22	6	4	35
Low Hills and Slope	0	0	0	0	0
Rocky Hill	0	5	2	0	7
Rocky Outcrop	0	4	4	2	10
Shrubland/Heathland	0	5	1	0	6
Rehab	0	0	0	0	0
Man-made Dam	0	0	0	0	0
Cleared	0	9	3	0	12

Birds

A total of 36 native bird species from 22 families were recorded within the Survey Area. The most abundant bird taxa were the Purple-crowned Lorikeet (*Parvipsitta porphyrocephala*) and the Yellow-plumed Honeyeater (*Ptilotula ornata*). The most diverse bird families were Meliphagidae (five taxa), Artamidae (three taxa), and Psittaculidae (three taxa).

One significant bird was recorded (Malleefowl) and no introduced birds were recorded.

Mammals

A total of nine mammals from seven families were recorded within the Survey Area, comprising of four native mammal taxa and five non-native mammal taxa. The most abundant mammal taxa were the Dunnart sp. (*Sminthopsis sp.*) and the Mitchell's Hopping Mouse (*Notomys mitchellii*). One genus contained multiple records which could not be identified to species level (*Sminthopsis* sp.) as they were recorded via remote sensing cameras and sufficient detail to determine species was unavailable. The most diverse mammal families were Muridae (two taxa) and Dasyuridae (two taxa).

Reptiles

A total of nine native reptiles from five families were recorded within the Survey Area. The most abundant reptile taxa were the Bynoe's Gecko (*Heteronotia binoei*) and the Western Netted Dragon (*Ctenophorus reticulatus*). The most diverse reptile family was Scincidae (five taxa).

No significant reptiles or introduced reptiles were recorded.

Insects

A total of two insect taxa from two families were recorded within the Survey Area. The Sugar Ant (*Camponotus* sp. nr. *terebrans*) and the Leafhopper (*Pogonoscopus lenis*).

4.4 Significant Fauna

4.4.1 Recorded Within the Survey Area

One significant fauna taxon was recorded within the Survey Area:

- Malleefowl (*Leipoa ocellata*), listed as Vulnerable under the BC Act and EPBC Act, was recorded five times during the field survey. One record by sighting, three records by tracks, and one record by digging. Eleven mounds were also recorded during the survey. Further results of Malleefowl mounds are presented in **Section 4.5** below.

Significant fauna record locations are presented in **Map 9**.

4.4.2 Potentially Occurring Within the Survey Area

Two significant fauna taxa were assessed as having a high likelihood of occurring within the Survey Area:

- Arid Bronze Azure Butterfly (*Ogyris petrina*), listed as Critically Endangered under the BC Act and EPBC Act (ABAB has been elevated to the species level, but is currently listed as *Ogyris subterrestris petrina* (Beaver *et al.*, 2023))
- Inland Hairstreak Butterfly (*Jalmenus aridus*), listed as P1 by DBCA.

One significant fauna taxon was assessed as having a medium likelihood of occurring within the Survey Area:

- Carnaby's Cockatoo (*Zanda latirostris*), listed as Endangered under the BC Act and EPBC Act.

One targeted species as assesses as having a low likelihood of occurrence within the Survey Area:

- Chuditch (*Dasyurus geofroii*), listed as Vulnerable under the BC Act and EPBC Act

A further 27 significant fauna taxa were assessed as having a low likelihood of occurring within the Survey Area.

The complete results of the significant fauna likelihood of occurrence assessment including justification for the assessment outcome for each taxon is provided in **Appendix F**.

4.5 Malleefowl Mound Survey

The Malleefowl mound analysis algorithm identified 12 potential mounds classed as 1 or 2 (see Section 3.2.8 for class definitions). Following ground-truthing, no mounds were active at the time of survey, seven were maintained and potentially in use, three were unmaintained and potentially abandoned, one was an old mound no longer in use, and one was not a Malleefowl mound (**Table 15**).

The Mallefowl mound analysis algorithm identified 12 potential mounds classed as 1 or 2 (see Section 3.2.8 for class definitions). Following ground-truthing, no mounds were confirmed to be active (likely to contain eggs) at the time of survey, seven mounds were inactive but Malleefowl activity was present, three were dormant, one was long unused, and one was not a Malleefowl mound. Of the mounds that were active or inactive but Malleefowl activity was present, two were found in Eucalypt Woodland, five were found in Shrubland/Heathland, and none were found in Rocky Hill habitat. Malleefowl mounds are presented in **Table 15** and **Map 9.** Malleefowl mound numbers start from 40 because they follow on from mounds recorded during a concurrent survey (SLR Consulting, 2024).

Table 15: Malleefowl mounds recorded during the survey effort

Mound no.	Lat/Long WGS84	Status	Profile	Photo
40	-31.11714, 121.51922	Inactive (long unused)	Mound low and flat without peak or crater	
41	-31.15270, 121.48863	Inactive (Malleefowl activity present)	Mound fully dug out	
42	-31.15340, 121.47976	Inactive (Malleefowl activity present)	Mound with Litter	
43	-31.18538, 121.35203	Inactive (dormant)	Typical crater with raised rims	

Mound no.	Lat/Long WGS84	Status	Profile	Photo
44	-31.18605, 121.34761	Inactive (Malleefowl activity present)	Typical crater with raised rims	
45	-31.18671, 121.33970	Inactive (long unused)	Mound mounded up (no crater)	
46	-31.18673, 121.34143	Inactive (long unused)	Mound mounded up (no crater)	
47	-31.19673, 121.33424	Inactive (dormant)	Typical crater with raised rims	

Mound no.	Lat/Long WGS84	Status	Profile	Photo
48	-31.19700, 121.34851	Inactive (dormant)	Mound with litter	
49	-31.19734, 121.35273	Inactive (dormant)	Typical crater with raised rims	

4.6 ABAB Ant Transect Survey

Twenty ant nests (general location in survey area) of the Survey Area were confirmed to be *Camponotus* sp. nr *terebrans*. The formal identification of these specimens occurred after the conclusion of the field survey. Nest locations are presented in **Table 16** and **Map 9**.

A total of 93 km of transect line was walked during the survey. Ants from 40 nests were collected, and subsequently identified by Brian Heterick at the Western Australian Museum. A total of 20 samples collected throughout the Survey Area were positively identified as *Camponotus* sp. nr *terebrans*, the host ant for ABAB.

Table 16: *Camponotus* sp. nr. *terebrans* nests recorded within the Survey Area

Collection No.	Lat	Long	Date	Field Comments
M.M – ABAB – 002	-31.188503	121.352149	02-08-2023	*C*. sp. nr. *terebrans*
M.M – ABAB – 004	-31.138768	121.476527	01-08-2023	*C*. sp. nr. *terebrans*
M.M – ABAB – 010	-31.187799	121.352407	Missing	*C*. sp. nr. *terebrans*
M.M – ABAB – 016	-31.146579	121.474212	01-08-2023	*C*. sp. nr. *terebrans*
M.M – ABAB – 017	-31.195563	121.3580002	12-08-2023	

Collection No.	Lat	Long	Date	Field Comments
M.M – ABAB – 051	-31.139294	121.4814936	01-08-2023	Very active nest, ants were abundant
M.M – ABAB – 056	-31.077314	121.4079145	02-08-2023	
M.M – ABAB – 063	-31.076728	121.4081284	02-08-2023	
M.M – ABAB – 066	-31.077719	121.4053072	02-08-2023	Could only find 1 ant
M.M – ABAB – 067	-31.077346	121.4078807	02-08-2023	
M.M – ABAB – 068	-31.077908	121.4047542	02-08-2023	
M.M – ABAB – 069	-31.081742	121.4153104	02-08-2023	
M.M – ABAB – 082	-31.081751	121.4152785	02-08-2023	
M.M – ABAB – 097	-31.132258	121.4818289	01-08-2023	Hole irregular and at base of tree. 2nd nest with same ants at base of mallee 10m away. Marked separately.
M.M – ABAB – 120	-31.138903	121.4849657	14-08-2023	*Camponotus* sp. nr. *terebrans*
M.M – ABAB – 122	-31.136429	121.4757131	14-08-2023	Sp. nr. *terebrans*
M.M – ABAB – 137	-31.147575	121.468626	14-08-2023	
M.M – ABAB – 138	-31.135771	121.4757685	14-08-2023	Likely Sp. nr. *terebrans*
M.M – ABAB – 160	-31.132258	121.4818289	01-08-2023	Hole irregular and at base of tree. 2nd nest with same ants at base of mallee 10m away. Marked separately.
M.M – ABAB – 164	-31.134882	121.4754467	14-08-2023	Likely Sp. Nr. *terebrans*

5.0 Discussion

5.1 Fauna Habitat

The six broad fauna habitats identified within the Survey Area are typical of the Coolgardie and Eastern Goldfield bioregions and consistent with habitats identified by previous studies in the region (**Appendix A**). At least one habitat assessment was conducted within each habitat type. Multiple assessments were conducted within the fauna habitats with the highest value to both significant fauna and overall fauna assemblages, the Rocky Hill and Drainage Line habitats. Nearly all identified fauna habitats extend outside the Survey Area to form larger ecosystems, however there are three pockets of Shrubland/Heathland habitat contained entirely within the Survey Area which lack connectivity to similar habitat.

The Drainage Line habitat is of highest value to significant fauna due to dense fringing shrubland, and higher foraging potential. Numerous shallow ephemeral pools provide valuable water sources for significant species such as Malleefowl and Carnaby's Cockatoo. The Drainage Line habitats are valuable for their role as an ecological linkage. The habitat provides continuous corridors of vegetation cover that allow fauna to traverse large distances.

The Rocky Outcrop habitat is of high value to a number of fauna species due to the caves and rock crevices found throughout the habitat. Numerous shallow ephemeral pools provide valuable water sources for Malleefowl, black cockatoos, mammal, and reptile species. The Rocky Outcrop habitats are valuable for their role as denning and refuge habitat. These habitats may also occasionally flood, providing a temporary water source for fauna species.

The Shrubland/Heathland habitat is of high value to Malleefowl and other large fauna species as a refuge from predators due to the density of vegetation making it difficult to see long distances and inability to traverse at high speed. Malleefowl mounds were almost exclusively restricted to this habitat.

The Eucalypt Woodland habitat is common and widespread throughout the Survey Area and provides moderate value habitat to all fauna within the Survey Area and surrounds. However, the smooth barked eucalypts that are within this habitat are the preferred trees for the Sugar Ant *Camponotus* sp. nr. *terebrans* – the host ant for the Arid Bronze Azure Butterfly (ABAB) (*Ogyris petrina*). These ants were recorded within the Survey Area during the survey which makes the areas of Eucalypt Woodland where the ant species occurs to be of high value to the ABAB.

Habitat condition varied throughout the Survey Area. Large portions of the Survey Area had been recently cleared, and weeds and degradation caused by cattle were observed throughout all habitats. Large areas within all habitats had been cleared for mining activity, drill pads, and associated access tracks.

5.2 Significant Fauna

5.2.1 Recorded Within the Survey Area

5.2.1.1 Malleefowl (*Leipoa ocellata*) – VU (BC Act); VU (EPBC Act)

The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or acacia. A sandy substrate and abundance of leaf litter are required for breeding (DEE, 2018). Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where habitats tend to be thicker and there is an

abundance of food plants. The species nests in large mounds of dirt and leaf litter, up to five metres wide and one metre tall (Menkhorst *et al.*, 2017).

This species was recorded five times within the Survey Area by sightings and tracks. Eleven mounds were also recorded during the survey, with three showing signs of recent activity such as fresh scraping. The Shrubland/Heathland habitat present within the Survey Area provides suitable nesting habitat and foraging grounds for Malleefowl. Other habitats adjacent to Shrubland/Heathland may be used on a limited basis for foraging. Denser vegetation in Drainage Line habitat provides shelter from introduced predators when moving between patches of Shrubland/Heathland habitat and facilitates landscape-level population connectivity.

5.2.2 High Likelihood of Occurrence

5.2.2.1 Arid Bronze Azure Butterfly (*Ogyris petrina*) – CR (BC Act); CR (EPBC Act)

Following the extirpation of the only known population in the early 1990s, the Arid Bronze Azure Butterfly (ABAB) was rediscovered at Barbalin Nature Reserve in 2006. The ABAB has an obligate association with the Sugar Ant (*Camponotus* sp. nr. *terebrans*). ABAB larvae have adapted to emit a chemical that fools sugar ants into thinking that larvae are queen ants. The duped ants escort the larvae to their ant nurseries where the butterfly larvae are either fed by the ants or, feed on the baby ants. As well has hosting the larvae of the butterfly, the ants also host leafhoppers (*Pogonoscopus lenis)* within their nests (Department of Energy, 2022).Unlike other species in this genus, the ABAB larvae do not eat vegetation and are entirely dependent upon the host ant as a food source. The ABAB larva requires large ant colonies that are typically found at the base of many species of smooth-barked eucalypts including *Eucalyptus salubris* and *E. salmonophloia* (DBCA, 2020b).

Twenty Sugar Ant (*C.* sp. nr. *terebrans*) nests were identified from samples taken in the northeast polygon (**Map 9**) which were not identified in the field. As a result, total delineation of this colony did not occur during the field survey, however, the proximity of these nests to each other suggests that they are part of the same colony. The Eucalypt Woodland habitat in which the ants were found extends outside the Survey Area, forming a large habitat for the host ant species to potentially occur. The true extent of the ant colony is to be determined by the ongoing surveys.

5.2.2.2 Inland Hairstreak Butterfly (*Jalmenus aridus*) – P1 (DBCA)

The Inland Hairstreak Butterfly (*Jalmenus aridus*) is one of ten currently-recognised species in the genus *Jalmenus*, endemic to Australia. *Jalmenus* species feed openly on the foliage of their respective host plants, and all are attended by specific ant species. *Jalmenus aridus* is attended by *Froggattella kirbii* (Sands and New, 2002). *Jalmenus aridus* is in a mutualistic relationship with the ant whereby the ant colony protect the butterflies from predators and parasitoids and the butterfly caterpillars reward the ants with sweet secretions from special organs on their cuticle.

The butterfly adults are cryptic, and their flight period is relatively short (only two to three weeks at a given site). Timing of their emergence is linked to rainfall patterns, plant phenology and other ecological conditions with most likely flight times from mid-October to mid-November.

Their mutualist ant, *Froggattella kirbii* is found from the Perth Hills to the East coast of Australia. Their host plant *Senna artemisioides* is found over most of central and eastern

WA and *Acacia tetragonophylla* is found almost everywhere in WA except the very far north and far south.

The ant and host plant A. tetragonophylla were recorded within the Survey Area. The presence of the butterfly has not been confirmed, however surveys for the butterfly are ongoing.

Within 100 km of the Survey Area, five historical (1985-1997) records of Inland Hairstreak Butterfly were identified with the closest record at 26 km north of the Survey Area. Surveys completed within the surrounding areas of Kalgoorlie in 2021 and 2022 identified 10 active breeding sites within 100 km of Kalgoorlie (Eastwood *et al.*, 2023). A breeding site on a mining tenement near Kalgoorlie falling within 100 km of the Survey Area had survey records of 114 adults in 2021 and 120 adults recorded in 2022 (Eastwood *et al.*, 2023). The taxon has a high likelihood of presence within the Survey Area due to the presence of suitable habitat of *Acacia tetragonophylla* for both the host ants *Froggattella kirbii* and the food source of the *Jalmenus aridus* larvae. *Jalmenus aridus* is likely to occur in five fauna habitats within the Survey Area, including:

- Drainage Line
- Eucalypt Woodland
- Low Hills and slopes
- Rocky Hill
- Shrubland/Heathland

5.2.3 Medium Likelihood of occurrence

5.2.3.1 Carnaby's Cockatoo (*Zanda latirostris*) – EN (BC Act); EN (EPBC Act)

Carnaby's Cockatoos nest in the hollows of a wide range of eucalypt trees, with a preference for smooth barked trees such as Salmon Gum (*E. salmonophloia*) and Wandoo (*E. wandoo*) but also rough barked eucalypts and *Corymbia* trees such as Red Morrell (*E. longicornis*), York Gum (*E. loxophleba*), Marri (*Corymbia calophylla*) and Tuart (*E. gomphocephala*) (Johnstone and Storr, 1998). Carnaby's Cockatoos feed on seeds, nuts, and flowers of a variety of native and exotic plants, including *Banksia* spp., Pine trees (*Pinus sp*.), Marri, Jarrah (*E. marginata*), *Grevillea* spp., *Allocasuarina* spp., and *Hakea* spp. (Shah, 2006).

This taxon was not identified within the Survey Area during the survey effort, however, the closest record to the Survey Area was 34 km north in 2018. Habitat present within the Survey Area, such as the Eucalypt Woodlands, could be used by the taxon for nesting and foraging. While this species does not frequently inhabit this region, it is an uncommon vagrant that may utilise habitats within the Survey Area.

5.2.4 Low Likelihood of Occurrence

5.2.4.1 Chuditch (*Dasyurus geoffroii*) VU (BC Act); VU (EPBC Act)

The Chuditch inhabits areas dominated by sclerophyll forest or drier woodland, heath and mallee shrubland (Van Dyck and Strahan, 2008). The species is generally highly mobile and uses bush remnants as corridors (Woinarski, Burbidge and Harrison, 2012). The Chuditch is a largely nocturnal animal, feeding on a carnivorous diet of mammals, birds, lizards, and frogs. Although they have been recorded foraging during the day at particular times such as

during the breeding season or when cold and wet weather restricts their nocturnal movements (Van Dyck and Strahan, 2008). Most diurnal nesting sites in sclerophyll forest consist of hollow logs or earth burrows, although bandicoot nests and hollow tree bases may be used (Van Dyck and Strahan, 2008). The Chuditch was abundant prior to European settlement, and it is now largely restricted to the south-west of Western Australia, with small numbers in the Midwest, Wheatbelt and South Coast Regions (Department of Biodiversity Conservation and Attractions, 2017).

A single historic DBCA records 10.3 km east of the Survey Area, recorded in 1974 (DBCA, 2023c), shows that this taxon may have historically been present within the Survey Area, but has since become locally extinct. The Drainage Lines, Rocky Outcrop, and Shrubland/Heathland habitats within the Survey Area would provide valuable hunting, dispersal, and denning habitat for this taxon. Chuditch can have home ranges of up to 15 square kilometres, the possibility of a small and scattered population to exist within the region is highly unlikely but cannot be ruled out without broader intensive survey effort.

A further 26 significant fauna were identified as having a low likelihood of occurrence within the Survey Area and were not identified during the survey. These taxa will not be discussed as they were not targeted as part of this survey.

6.0 Conclusion

Six fauna habitats were mapped within the Survey Area:

- Drainage Line
- Eucalypt Woodland
- Low Hills and Slopes
- Rocky Hill
- Rocky Outcrop
- Shrubland/Heathland

These habitats are typical of the Coolgardie and Eastern Goldfield bioregions and are widespread outside the Survey Area. The Drainage Line, Rocky Outcrop, and Shrubland/Heathland habitats were considered to have microhabitats of value to significant fauna.

One significant fauna species was recorded during the survey effort:

- Malleefowl (*Leipoa ocellata*), listed as VU under the BC Act and EPBC Act.

Two species were considered to have a high likelihood of occurrence:

- Arid Bronze Azure Butterfly (*Ogyris petrina*), listed as CR under the BC Act and EPBC Act
- Inland Hairstreak Butterly (*Jalmenis Aridus*), listed as P1 by DBCA.

Five Introduced species were recorded during the survey effort:

- Cat (*Felis catus*)
- European Cattle (*Bos taurus*)
- Horse (*Equus ferrus*)
- House Mouse (*Mus musculus*)
- Rabbit (*Oryctolagus cuniculus*)

Additional surveys targeting the ABAB within colonies of the host ant *Camponotus* sp. nr. *terebrans* have been recommended and are ongoing.

7.0 References

Baker, A.M. and Gynther, I.C. (2023) *Strahan's Mammals of Australia*. 4th edn. Wahroonga, Australia: Reed New Holland Publishers.

Bamford Consulting Ecologists (2012) *Fauna Assessment of the Mt Marion Mining Lease Area*. Perth.

Bamford Consulting Ecologists (2016) *Mt Marion Project Fauna Assessment v4*. Perth.

Bamford Consulting Ecologists (2017a) *Fauna Assessment of M15/717 Lease Area; Mt Marion Lithium Project*. Perth.

Bamford Consulting Ecologists (2017b) *Mineral Resources Limited Fauna Assessment of Proposed Borefields Pipeline Corridor (including lease area L15/321)*. Perth.

Bamford Consulting Ecologists (2018) *Mineral Resources Limited Fauna Assessment of Proposed Woolibar Borefields Stage 2 Pipeline Corridor; Mt Marion Lithium Project*. Perth.

Bamford Consulting Ecologists (2020) *Mount Marion Lithium project Malleefowl Survey, January 2020*. Perth.

Bamford Consulting Ecologists (2022a) *Mount Marion Lithium Project Malleefowl Survey, July 2022*. Perth.

Bamford Consulting Ecologists (2022b) *Mt Marion Fauna Assessment: Hamptons Lease Area 53, L15/353, M15/999 and East E15/1599*. Perth.

Beard, J.S. *et al.* (2013) 'The vegetation of Western Australia at the 1:3,000,000 scale. Explanatory memoir. Second edition', *Conservation Science W. Aust.*, 9(1), pp. 1–152.

Beaver, E.P. *et al.* (2023) 'Systematic revision of the Ogyris idmo (Hewitson, 1862) species group (Lepidoptera: Lycaenidae): implications for the conservation management of Australia's most threatened butterflies', *Invertebrate Systematics*, 37(10), pp. 677–701. Available at: https://doi.org/10.1071/IS23032.

BoM (2007) *About Climate Statistics*. Available at: http://www.bom.gov.au.

BoM (2024) *Climate Data Online*. Available at: http://www.bom.gov.au.

Commonwealth of Australia (1999) *Environment Protection and Biodiversity Conservation Act 1999*. Australia. Available at: www.legislation.gov.au.

Cowan, M. (2001) *Coolgardie 3 (COO3 – Eastern Goldfields subregion)*. Available at: https://www.dpaw.wa.gov.au/images/documents/about/science/projects/waaudit/coolgardie03_p156-169.pdf.

Cowan, M., Graham, G. and McKenzie, N. (2001) *Coolgardie 2 (COO2 - Southern Cross subregion)*. Available at: https://www.dpaw.wa.gov.au/images/documents/about/science/projects/waaudit/coolgardie02_p143-155.pdf.

DBCA (2020a) *Arid bronze azure butterfly (ABAB) survey in Western Australia additional information*.

DBCA (2020b) *Guideline for the survey of arid bronze azure butterfly (ABAB) in Western Australia*.

DBCA (2023a) *DBCA - Lands of Interest (DBCA-012)*. Available at: https://catalogue.data.wa.gov.au.

DBCA (2023b) *DBCA - Legislated Lands and Waters (DBCA-011)*. Available at: https://catalogue.data.wa.gov.au.

DBCA (2023c) *DBCA Threatened and Priority Fauna Database request (Custom Search)*.

DBCA (2023d) *NatureMap Database Search*. Perth, Australia.

DCCEEW (2023) *Protected Matters Search Tool*. Available at: https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool.

DEE (2016) *Interim Biogeographic Regionalisation for Australia, Version 7*. Canberra, Australia. Available at: www.environment.gov.au.

DEE (2018) *Leipoa ocellata - Malleefowl*. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=934.

Department of Biodiversity Conservation and Attractions (2017) *Fauna Profile - Chuditch Dasyurus geoffroii*. Available at: https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/animal_profiles/chuditch_fauna_profile.pdf.

Department of Energy, M.I.R. and S. (2022) *Critically endangered butterfly species a consideration in native vegetation clearing*.

DEWHA (2010a) *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.dcceew.gov.au.

DEWHA (2010b) *Survey guidelines for Australia's threatened frogs: Guidelines for detecting frogs listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*. Available at: https://www.dcceew.gov.au.

DoE (2013) *Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.environment.gov.au.

DPIRD (2022) *Soil Landscape Mapping - Best Available (DPIRD-027)*. Perth, Australia. Available at: https://catalogue.data.wa.gov.au.

DSEWPaC (2011a) *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.dcceew.gov.au.

DSEWPaC (2011b) *Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australia. Available at: https://www.dcceew.gov.au/.

DWER (2018) *Hydrography, Linear (Hierarchy) (DWER-031)*. Perth, Australia: Landgate. Available at: https://catalogue.data.wa.gov.au.

DWER (2023) *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*. Perth, Australia. Available at: https://catalogue.data.wa.gov.au/.

Van Dyck, S. and Strahan, R. (2008) *The mammals of Australia*. 3rd edn. Sydney, Australia: New Holland Publishers.

Eastwood, R. *et al.* (2023) 'Current distribution, preferred habitat, behaviour, and biology of the Inland Hairstreak, Jalmenus aridus Graham and Moulds, 1988 (Lepidoptera: Lycaenidae) in the Eastern Goldfields region of Western Australia', *Records of the Western Australian Museum*, 38(1), p. 68. Available at: https://doi.org/10.18195/issn.0312-3162.38.2023.068-075.

EPA (2016) *Environmental Factor Guideline - Terrestrial Fauna*. Perth. Available at: https://www.epa.wa.gov.au.

EPA (2020) *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*. Perth, Australia. Available at: https://www.epa.wa.gov.au/policies-guidance/technical-guidance-terrestrial-vertebrate-fauna-surveys-environmental-impact.

Government of Western Australia (1986) *Environmental Protection Act 1986*. Available at: www.legislation.wa.gov.au.

Government of Western Australia (2016) *Biodiversity Conservation Act 2016*. Available at: www.legislation.wa.gov.au.

Government of Western Australia (2019) *2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019.* Available at: https://catalogue.data.wa.gov.au.

Johnstone, R.E. and Storr, G.M. (1998) *Handbook of Western Australian birds*. Edited by D. Louise. Perth, Australia: Western Australian Museum.

Landgate (2023a) *Native Title (Determinations) (LGATE066)*. Available at: https://catalogue.data.wa.gov.au.

Landgate (2023b) *Native Title (ILUA) (LGATE-067)*. Available at: https://catalogue.data.wa.gov.au.

Menkhorst, P. *et al.* (2017) *The Australian bird guide*. Australia: CSIRO Publishing.

Menkhorst, P. and Knight, F. (2010) *A Field Guide to the Mammals of Australia*. Third Edit. Melbourne, Australia: Oxford University Press.

Morcombe, M. (2003) *Field Guide to Australian Birds*. Archerfield: Steve Parish Publishing Pty Ltd.

NNTT (2017) *Representative Aboriginal and Torres Strait Islander Body Boundaries (NNTT-001)*. Available at: https://catalogue.data.wa.gov.au.

Pizzey, G. and Knight, F. (2001) *Field Guide to Birds of Australia*. Pymble, Australia: HarperCollins Australia.

Rapallo (2010) *Terrestrial Fauna Habitat Assessment; Mount Marion Lithium Project*. Perth.

Sands, D.P.A. and New, T.R. (2002) *The Action Plan for Butterflies*. Canberra: Environment Australia.

Shah, B. (2006) *Conservation of Carnaby's Black Cockatoo on the Swan Coastal Carnaby's plain, Western Australia*. Perth, Australia.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J. (2002) *Native vegetation in Western Australia: Extent, type and status. Resource Management Technical Report 249*. Perth, Australia. Available at: https://library.dpird.wa.gov.au.

SLR Consulting (2024) *Mt Marion Hamptons Tenements Terrestrial Fauna Survey - Basic Fauna and Targeted Malleefowl, Chuditch, and ABAB Surveys*.

Threatened Species Scientific Committee (2013) *Threatened Species Scientific Committee - Idiosoma nigrum (shield-back spider)*.

WAM (2023) *Checklist of the Terrestrial Vertebrate Fauna of Western Australia*. Available at: https://museum.wa.gov.au.

Wilson, S. and Swan, G. (2017) *A complete guide to reptiles of Australia*. 5th edn, *Reptiles of Australia*. 5th edn. Australia: New Holland Publishers.

Woinarski, J., Burbidge, A. and Harrison, P. (2012) *The action plan for Australian mammals 2012*. CSIRO Publishing.

Appendix A Literature Review Summary

Mt Marion Mining Tenements Terrestrial Fauna Surveys

Basic Fauna and Targeted Malleefowl, Chuditch, and ABAB Surveys

Mineral Resources Limited

SLR Project No.: 675.VX5937.00001

2 April 2024

Report	Survey location	Survey timing	Survey type	Significant fauna recorded	Fauna habitats recorded
Mt Marion Lithium Project Malleefowl Survey, July 2022 (Bamford Consulting Ecologists, 2022a)	Overlaps Survey Area	July 2022	Targeted Malleefowl survey	Nil	N/A
Mt Marion Fauna Assessment: Hamptons lease Area 53, L15/353, M15/999 and East E15/1599 (Bamford Consulting Ecologists, 2022b)	Overlaps Survey Area	September 2021	Basic and targeted terrestrial vertebrate survey	Malleefowl (*Leipoa ocellata*) (VU)	Mixed eucalypt woodland over sclerophyll shrubland Acacia shrubland on slopes Open to closed eucalypt woodland or mallee Mixed eucalypt woodland over *Melaleuca sheathiana* Dense mallee and eucalypt woodland associated with minor drainage lines Acacia shrubland on brown loam flats Dense Acacia shrubland on exposed granite
Mt Marion Lithium Project Malleefowl Survey, January 2020(Bamford Consulting Ecologists, 2020)	Overlaps Survey Area	January 2020	Targeted Malleefowl survey	Nil	*Acacia spp*. shrubland
Fauna Assessment of the Proposed Woolibar Borefields Stage 2 Pipeline Corridor (Bamford Consulting Ecologists, 2018)	Overlaps Survey Area	July 2018	Basic fauna survey	Nil	Eucalypt woodland on sandy-loam and clay-loams Eucalypt woodland over Melaleuca shrubland on gravelly clay-loam Tall dense Acacia shrubland
Fauna Assessment of Proposed Borefields Pipeline Corridor (Bamford Consulting Ecologists, 2017b)	Overlaps Survey Area	September 2017	Basic fauna survey	Nil	Eucalypt woodland on sandy-loam and clay-loams Eucalypt woodland over Melaleuca shrubland on gravelly clay-loam

Report	Survey location	Survey timing	Survey type	Significant fauna recorded	Fauna habitats recorded
					Salmon Gum open woodland over open mixed shrubland
Fauna Assessment of M15/717 Lease Area; Mt Marion Lithium Project (Bamford Consulting Ecologists, 2017a)	Overlaps Survey Area	August 2017	Basic and targeted terrestrial vertebrate survey	Malleefowl (*Leipoa ocellata*) (VU)	Broad drainage lines Low rises Tall Acacia shrublands
Mt Marion Project Fauna Assessment v4 (Bamford Consulting Ecologists, 2016)	Overlaps Survey Area	October 2016	Basic and targeted terrestrial vertebrate survey	Malleefowl (*Leipoa ocellata*) (VU)	Mixed Eucalypt woodland on greenstone hills Dense Acacia shrubland Eucalypt woodland over mixed shrubs Mixed eucalypt woodland over *Melaleuca sheathiana* Dense mallee and eucalypt woodland associated with major drainage lines Dense Acacia and Allocasuarina shrubland on sandy clay flats Mixed eucalypt woodland over sclerophyll shrubland *Casuarina pauper* shrubland
Terrestrial Fauna Habitat Assessment; Mount Marion Lithium Project (Rapallo, 2010)	Overlaps Survey Area	March 2010	Basic fauna survey	Nil	Greenstone non-halophytic eucalypt woodlands Rocky hillslope shrubland Granite hill mixed shrubland Stony close *Allocasuarina* shrubland Stony close Jam shrubland Eucalyptus woodland over low shrubs on undulating slopes Plain *Eucalyptus longicornis* woodland with Melaleuca Plain *Melaleuca pauperiflora* woodland Plain *Eucalyptus eremophila* woodland

Report	Survey location	Survey timing	Survey type	Significant fauna recorded	Fauna habitats recorded
					Plain *Eucalyptus eremophila* / chenopod woodland Plain mallee mixed shrubland *Eucalyptus celastroides* over low shrubs
Fauna Assessment of the Mt Marion Mining Lease Area (Bamford Consulting Ecologists, 2012)	0.6 km northeast of the Survey Area	February 2012	Basic fauna survey	Nil	Greenstone hills and rocky ridges Stoney plains Drainage lines Loam plains Loam flats

Appendix B Licences and Permits

Mt Marion Mining Tenements Terrestrial Fauna Surveys

Basic Fauna and Targeted Malleefowl, Chuditch, and ABAB Surveys

Mineral Resources Limited

SLR Project No.: 675.VX5937.00001

2 April 2024

Department of
Primary Industries and Regional Development

GOVERNMENT OF WESTERN AUSTRALIA

Dr Mike Lohr
Principal Zoologist
360 Environmental

Dear Dr Lohr

WILDLIFE ANIMAL ETHICS COMMITTEE – ASSESSMENT DECISION

New Project Application #: NPA168
Project Title: Goldfields vertebrate fauna survey
Project Chief Investigator: Mike Lohr

Thank you for your application to use animals for scientific purposes which was reviewed and assessed by the Wildlife Animal Ethics Committee (WAEC) on 8 June 2023, and for your responses to their queries. The WAEC has **Approved** this application for one (1) year from **8 June 2023 to 7 June 2024.** Work on this project using animals for scientific purposes may commence from the date above. Work on this project beyond the 7 June 2024 will require a new application that provides more detail about the site(s) where the project will be undertaken and a more accurate listing of species most likely to be captured or observed in the study area. Estimates of the numbers of the species captured or observed will also be required.

The project's **WAEC Permit number** is: **WAEC 23-07-42**

The **Level of Impact** is determined as: **2. Minor conscious intervention.**

The approval of this project requires you to adhere to the conditions outlined in this letter and to comply with the *Animal Welfare Act* (2002) and the *Australian code for the care and use of animals for scientific purposes* (8th edition, 2013).

Specific Conditions of Approval that apply to this project:

1. Cooling then freezing is not to be used as a euthanasia technique in this project.

Conditions of Approval applicable to all projects:

1. Responsibilities of Chief Investigators

Investigators and teachers have personal responsibility for all matters related to the welfare of the animals they use and must act in accordance with all requirements of the Australian code of practice for the care and use of animals for scientific purposes. This responsibility begins when an animal is allocated to the project and ends with its fate and the completion of the project.

Chief Investigators are required to:

- Provide the WAEC Executive Officer with a copy of any current licences and permits required for the project e.g., from Department of Biodiversity, Conservation and Attractions (DBCA).
- Ensure all personnel associated with the project are competent to perform the tasks assigned to them.
- Provide prompt notification to the WAEC Executive Officer (wildlifeaec@dpird.wa.gov.au) immediately (within 24 hours) should any unforeseen or adverse event occur. In the event of the death of an animal, the cause needs to be determined as quickly as possible and a post-mortem examination by a qualified person undertaken where possible. In remote areas, any animals that die as a result of the project's activities should be refrigerated and retained until a post-mortem can be undertaken. Use photographs to record injuries, moribund animals and the adverse event scene wherever possible.
- Accommodate and facilitate requests from the WAEC to monitor the care and use of animals by inspecting animals, animal housing and the conduct of procedures, and / or reviewing records, photography and reports.
- Ensure accurate records of the care and use of animals are maintained.
- Provide information on your Annual Animal Use in the preceding year to the Scientific Licencing Unit when requested (usually in January – March).
- Where personnel from other Institutions are involved in the project, or when premises of another Institution are being utilised, that Institution must be advised of the project and must provide approval or formally delegate approval of the proposal.

2. Permits:

- Permits are valid for the dates shown above providing a satisfactory Annual Animal Use Report is submitted and approved by February of each year.
- Permits and application documents are treated in confidence. Information contained within your permit and application documents will only be provided to the Scientific Licensing Unit and other appropriate personnel as required. Any other requests for information will be referred to the Chief Investigator and their institution.
- Permits may be closed by a Chief Investigator with the submission of a Closed Permit form, or by a WAEC directive.
- Up to three major amendments to the project may be sought during this period.
- Investigators may be added to a permit following the submission of a signed amendment form. This will not be counted as one of the three amendments allowed per application.
- All forms are available on the DPIRD WAEC website or from the Executive Officer at: wildlifeaec@dpird.wa.gov.au.
- Please quote your ethics permit number in all correspondence.

3. Licences and Authorities:

- It is a requirement that your institution's licence to use animals for scientific purposes (Scientific Use Licence, SUL) obtained from the WA Department of Primary Industries and Regional Development (DPIRD) is available for public scrutiny. Therefore, you must ensure that a copy (an electronic copy is adequate) of the licence is:
- Displayed wherever animals are used for scientific purposes, e.g., in your laboratory, or
- Carried by Investigators when undertaking field work, e.g., in the car or boat.
- An approved animal ethics project and Permit does not constitute an Authorisation to take or disturb threatened species, or a Fauna Licence under the *Biodiversity Conservation Act* (2016) and Regulations (2018).

I wish you every success with your project.

Yours sincerely

Keith Morris
Chair, Wildlife Animal Ethics Committee
20 July 2023

Department of **Biodiversity, Conservation and Attractions**

GOVERNMENT OF WESTERN AUSTRALIA

FAUNA TAKING (BIOLOGICAL ASSESSMENT) LICENCE

Regulation 27, Biodiversity Conservation Regulations 2018

Licence Number: BA27000901

Licence Holder: Simon Girando
SLR Consulting
10 Bermondsey Street
West Leederville WA 6007

Date of Issue: 15/08/2023

Date Valid From: 15/08/2023
Date of Expiry: 14/08/2024

LICENSED ACTIVITIES

Subject to the terms and conditions on this licence, the licence holder may –

1. Disturb fauna through the deployment (installation and retrieval) of baited remote sensing cameras in suitable habitat for Mineral Resources Limited Mt Marion Lithium Project in the Goldfields Region. To inform future management plans for MinRes in their application for their Lithium Project and reduce the risk of impacting any significant fauna species in these areas.

LOCATIONS

1. Localities south of Coolgardie, north of Kambalda, and west of Kalgoorlie-Boulder in the Goldfields region also part of the Kambalda Nature Reserve.

AUTHORISED PERSONS

The following persons or persons of the specified class may assist in carrying out the licensed activities:

1. Michael Lohr
2. Evan Webb
3. Christina Walker
4. Li Yanlin
5. Rodney Eastwood
6. Lukas Geidans
7. Lachlan Crossley
8. Lewis Berry

CONDITIONS

1. Fauna must not be taken on CALM land, (as defined in the Conservation and Land Management Regulations 2002), unless authorised by a written notice of a lawful authority issued under regulations 4 and 8 of the Conservation and Land Management Regulations 2002.

2. If persons, other than the licence holder, are authorised to carry out/assist in carrying out the activities under the licence, the licence holder must ensure those persons have read and understand the licence terms and conditions.
3. The written authorisation of the person in possession or occupation of the land accessed and upon which fauna is taken, as required under regulation 101(2) and referred to in "Additional information" below, must:
   a) state location details (including lot or location number, street/road, suburb and local government authority);
   b) state land owner or occupier name, and contact phone number;
   c) specify the time period that the authorisation is valid for;
   d) be signed and dated; and
   e) be attached to this licence at all times.
4. This licence, and any written authorisation or lawful authority which authorises the take of fauna on specified locations must be carried at all times while conducting licensed activities and be produced on demand by a wildlife officer.
5. If a species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* is inadvertently captured, that species is to be released immediately at the point of capture. If the fauna is injured or deceased, the licence holder shall contact the DBCA Wildlife Licensing Section (wildlifelicensing@dbca.wa.gov.au) for advice on treatment or disposal. Details of any capture of threatened fauna must be included in the "Return of Fauna Taken."
6. The licence holder must not:
   a) release any fauna in any area where it does not naturally occur;
   b) transfer fauna to any other person or authority (other than the Western Australian Museum) unless approved in writing by the CEO; or
   c) dispose of the remains of fauna in any manner likely to interfere the natural or present day distribution of the species.
7. The licence holder must not take and remove more than ten specimens of any one protected species of fauna from any location less than 20km apart. Where exceptional circumstances make it necessary to take a larger number of specimens from a particular location in order to obtain adequate statistical data, the collector must proceed with circumspection and justify their actions to the Director General in advance.
8. All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this licence must be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range must be offered to the Western Australian Museum.
9. All specimens and material retained under the authority of this licence must be offered to the Western Australian Museum for loan, for inclusion in its collection, or on request be made available to other persons involved in relevant scientific studies.
10. The licence holder must create, compile and maintain records and information as required in a DBCA approved "Return of Fauna Taken" of all fauna taking activities as they occur.
11. A DBCA approved "Return of Fauna Taken" must be completed in full (including nil taking details) and submitted to DBCA Wildlife Licensing Section (wildlifelicensing@dbca.wa.gov.au) prior to the end of each annual period of the licence (from the valid from date) (refer to "Additional Information" section

D Stefoni
LICENSING OFFICER
WILDLIFE PROTECTION BRANCH

Delegate of CEO

ADDITIONAL INFORMATION

1. It is an offence to take any species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* unless the person is authorised under Section 40. The penalty ranges between $300 000 and $500 000; Section 150 Biodiversity Conservation Act 2016.
2. Regulation 82 empowers the CEO to add, substitute or delete a term or condition of a licence or to correct errors. Such power may be exercised on application of a licence holder or by the CEO's own initiative. If an amendment to a licence term or condition is required, please contact the CEO or the Licensing Section on wildlifelicensing@dbca.wa.gov.au in the first instance. The licence holder, if adversely affected by a condition imposed in this licence, may apply to the State Administrative Tribunal for review of the decision of the CEO to impose that condition on a licence: regulation 89(2) Biodiversity Conservation Regulations 2018.
3. A person must not contravene a condition of a licence. The penalty for an offence involving the contravention of a condition of a licence is a fine of $10 000: regulation 84 of the Biodiversity Conservation Regulations 2018.
4. It is an offence for persons authorised by this licence to enter land that is not in their possession or under their control without first having the *prior* written authorisation of the current owner or occupier of the land to:

   a) enter the land; and

   b) carry out the activity authorised by this licence.

   The penalty for this offence is a fine of $5 000: regulation 101(2) of the Biodiversity Conservation Regulations 2018.
5. The licence holder must be able to produce for inspection upon request any information or records required by regulation 85(2) of the Biodiversity Conservation Regulations 2018 Penalty $10 000. It is an offence to knowingly include false or misleading information or make statements in records: regulation 85(3) of the Biodiversity Conservation Regulations 2018 Penalty $10 000. It is an offence to include any information or make any statement in a return that the licence holder knows to be false or misleading in a material particular: regulation 86 (2) of the Biodiversity Conservation Regulations 2018 Penalty $10 000.
6. The approved DBCA "Return of Fauna Taken" data file can be downloaded from the DBCA webpage (https://www.dpaw.wa.gov.au/plants-and-animals/licences-and-authorities).
7. The issuing of a licence under the Biodiversity Conservation Regulations 2018 does not constitute an animal ethics approval or a licence to use animals for scientific purposes as required under the *Animal Welfare Act 2002,* Animal Welfare (Scientific Purposes) Regulations 2003. It is the responsibility of a licence applicant / licence holder to ensure that they comply with the requirements of all applicable legislation. Enquiries relating to the Animal Welfare Act licences and animal ethics approvals are to be directed to the Department of Primary Industries and Regional Development (https://www.agric.wa.gov.au/animalwelfare).

8. Threatened fauna can only be taken under a *Biodiversity Conservation Act 2016* Section 40 authorisation, Occurrences of threatened species must be reported to the CEO. For more information please see https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals.

9. Any interaction involving Nationally Listed Threatened Fauna that may be invasive and/or harmful to the fauna may require approval from the Commonwealth Department of the Environment and Energy http://www.environment.gov.au/about-us/business-us/permits-assessments-licences. Interaction with such species is controlled by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Environment Protection and Biodiversity Conservation Regulations 2000 as well as the *Biodiversity Conservation Act 2016* and Biodiversity Conservation Regulations 2018.

DEPARTMENT OF PARKS AND WILDLIFE

Department of
Parks and Wildlife

Enquiries: 17 DICK PERRY AVE, KENSINGTON, WESTERN AUSTRALIA
Telephone: 08 9219 9000
Facsimile: 08 9219 8242

Correspondence: **Locked Bag 30**
Bentley Delivery Centre WA 6983

CE006886

RECEIPT NO. **AMOUNT** $0.00

CONSERVATION AND LAND MANAGEMENT REGULATIONS 2002
REGULATION 4

WRITTEN NOTICE OF LAWFUL AUTHORITY

FOR THE PURPOSE(S) DESCRIBED

TO AUTHORIZE A PERSON TO DO AN ACT THAT WOULD, BUT FOR SUCH A NOTICE, BE UNLAWFUL UNDER THE CONSERVATION AND LAND MANAGEMENT REGULATIONS.

DIRECTOR GENERAL

CONDITIONS

1 This authority is a written notice for the purposes of regulation 4(1) of the Conservation and Land Management Regulations 2002 (the Regulations) and it authorises the person named as the authority holder to carry out certain acts as described under "Purpose" (below), that would otherwise be unlawful under the Regulations cited in this authority.

2 Where applicable, licenses issued under regulation 89 or section 15(1) and/or section 23C of the Wildlife Conservation Act 1950 for the taking of flora and/or fauna are required in addition to this authority.

3 This authority does not comprise a lawful authority to enter CALM Act land the subject of division 1 of part 3 of the Regulations unless the land and/or waters is described below. "CALM land" is defined in regulation 2 to mean land, or land and waters, to which the Regulations apply, including caves and parts of caves on, or under that land. The Regulations apply to the land and waters as described in regulation 3.

4 Licensee/authority holder must contact the applicable region/district at least one (1) week prior to activity commencement for site specific instructions. (Contact details provided in the covering letter and/or attached conditions to this licence/authority).

5 No bioprospecting involving the removal of sample aquatic and terrestrial organisms (both flora and fauna) for chemical extraction and bioactivity screening is permitted to be conducted without specific written approval by the Director General.

6 Where applicable, a licence issued under the Biodiversity Conservation Regulations 2018 is required in addition to this authority.

PURPOSE

DISTURB FAUNA (REGULATION 8) THROUGH THE DEPLOYMENT (INSTALLATION AND RETRIEVAL) OF BAITED REMOTE SENSING CAMERAS IN SUITABLE HABITAT FOR MINERAL RESOURCES LIMITED MT MARION LITHIUM PROJECT IN THE GOLDFIELDS REGION. TO INFORM FUTURE MANAGEMENT PLANS FOR MINRES IN THEIR APPLICATION FOR THEIR LITHIUM PROJECT AND REDUCE THE RISK OF IMPACTING ANY SIGNIFICANT FAUNA SPECIES IN THESE AREAS WITHIN KAMBALDA NATURE RESERVE.

AUTHORISED PERSONS

MICHAEL LOHR
EVAN WEBB
CHRISTINA WALKER
LI YANLIN
RODNEY EASTWOOD
LUKAS GEIDANS
LACHLAN CROSSLEY
LEWIS BERRY

DEPARTMENT OF PARKS AND WILDLIFE

Department of
Parks and Wildlife

Enquiries: 17 DICK PERRY AVE, KENSINGTON, WESTERN AUSTRALIA
Telephone: 08 9219 9000
Facsimile: 08 9219 8242

Correspondence: **Locked Bag 30**
Bentley Delivery Centre WA 6983

DATE OF ISSUE 15/08/2023
VALID FROM 15/08/2023
DATE OF EXPIRY 14/08/2024

LICENSING OFFICER

LICENSEE: S GIRANDO (SIMON)
ADDRESS SLR CONSULTING
10 BERMONDSEY STREET
WEST LEEDERVILLE WA 6007

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Appendix C Fauna Desktop Assessment Results

Mt Marion Mining Tenements Terrestrial Fauna Surveys

Basic Fauna and Targeted Malleefowl, Chuditch, and ABAB Surveys

Mineral Resources Limited

SLR Project No.: 675.VX5937.00001

2 April 2024

Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation, Commonwealth - Listed under Environmental Protection and Biodiversity Conservation Act 1999.

CR - Critically Endangered, EN - Endangered, VU - Vulnerable, MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.

Source: NM - NatureMap, PMST - EPBC Protected Matters Search Tool, DBCA - DBCA Threatened and Priority Fauna database search

Class	Family	Scientific Name	Common Name	DBCA	Commonwealth	NM	PMST	DBCA
Insecta	Lycaenidae	*Jalmenus aridus*	Inland Hairstreak	P1	-			5
Insecta	Lycaenidae	*Ogyris subterrestris petrina*	Arid Bronze Azure Butterfly	CR	CR		1	17
Amphibia	Limnodynastidae	*Neobatrachus kunapalari*	Kunapalari Frog	-	-	1		
Amphibia	Limnodynastidae	*Neobatrachus pelobatoides*	Humming Frog	-	-	1		
Amphibia	Limnodynastidae	*Neobatrachus sutor*	Shoemaker Frog	-	-	1		
Amphibia	Myobatrachidae	*Pseudophryne occidentalis*	Western Toadlet	-	-	1		
Aves	Acanthizidae	*Acanthiza apicalis*	Inland Thornbill, Broad-tailed Thornbill	-	-	1		
Aves	Acanthizidae	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	-	-			
Aves	Acanthizidae	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	-	-	1		
Aves	Acanthizidae	*Aphelocephala leucopsis*	Southern Whiteface	-	VU		1	
Aves	Acanthizidae	*Calamanthus cautus*	Shy Groundwren, Shy Heathwren	-	-			
Aves	Acanthizidae	*Gerygone fusca*	Western Gerygone	-	-			
Aves	Acanthizidae	*Pyrrholaemus brunneus*	Redthroat	-	-	1		
Aves	Acanthizidae	*Smicrornis brevirostris*	Weebill	-	-	1		
Aves	Accipitridae	*Accipiter fasciatus*	Brown Goshawk	-	MA			
Aves	Accipitridae	*Aquila audax*	Wedge-tailed Eagle	-	-			
Aves	Accipitridae	*Circus assimilis*	Spotted Harrier	-	-			
Aves	Accipitridae	*Elanus axillaris*	Black-shouldered Kite	-	-			
Aves	Accipitridae	*Haliastur sphenurus*	Whistling Kite	-	MA			
Aves	Aegothelidae	*Aegotheles cristatus*	Australian Owlet-nightjar	-	-			
Aves	Alcedinidae	*Todiramphus pyrrhopygius*	Red-backed Kingfisher	-	-			
Aves	Alcedinidae	*Todiramphus sanctus*	Sacred Kingfisher	-	MA			
Aves	Anatidae	*Anas gracilis*	Grey Teal	-	-			
Aves	Anatidae	*Anas superciliosa*	Pacific Black Duck	-	-			
Aves	Anatidae	*Chenonetta jubata*	Australian Wood Duck, Wood Duck, Maned Duck	-	-			
Aves	Anatidae	*Cygnus atratus*	Black Swan	-	-			
Aves	Anatidae	*Malacorhynchus membranaceus*	Pink-eared Duck	-	-			
Aves	Anatidae	*Oxyura australis*	Blue-billed Duck	P4	-			8
Aves	Anatidae	*Tadorna tadornoides*	Australian Shelduck, Mountain Duck	-	-			
Aves	Apodidae	*Apus pacificus*	Pacific Swift, Fork-tailed Swift	MI	MI, MA			2
Aves	Ardeidae	*Egretta novaehollandiae*	White-faced Heron	-	-			
Aves	Artamidae	*Artamus cinereus*	Black-faced Woodswallow	-	-			
Aves	Artamidae	*Artamus cyanopterus*	Dusky Woodswallow	-	-			
Aves	Artamidae	*Artamus personatus*	Masked Woodswallow	-	-			
Aves	Artamidae	*Cracticus nigrogularis*	Pied Butcherbird	-	-			
Aves	Artamidae	*Cracticus torquatus*	Grey Butcherbird	-	-	1		

Class	Family	Scientific Name	Common Name	DBCA	Commonwealth	NM	PMST	DBCA
Aves	Artamidae	*Gymnorhina tibicen*	Australian Magpie	-	-			
Aves	Artamidae	*Strepera versicolor*	Grey Currawong	-	-	1		
Aves	Cacatuidae	*Eolophus roseicapilla*	Galah	-	-	1		
Aves	Cacatuidae	*Zanda latirostris*	Carnaby's Cockatoo	EN	EN			6
Aves	Campephagidae	*Coracina maxima*	Ground Cuckooshrike	-	-			
Aves	Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike	-	MA			
Aves	Campephagidae	*Lalage tricolor*	White-winged Triller	-	-			
Aves	Caprimulgidae	*Eurostopodus argus*	Spotted Nightjar	-	MA			
Aves	Casuariidae	*Dromaius novaehollandiae*	Emu	-	-			
Aves	Charadriidae	*Charadrius ruficapillus*	Red-capped Plover	-	MA			
Aves	Charadriidae	*Charadrius veredus*	Oriental Plover	MI	MI, MA			4
Aves	Charadriidae	*Elseyornis melanops*	Black-fronted Dotterel	-	-			
Aves	Charadriidae	*Thinornis cucullatus*	Hooded Dotterel	P4	MA			4
Aves	Cinclosomatidae	*Cinclosoma clarum*	Western Chestnut Quail-thrush, Copperback Quail-thrush	-	-			
Aves	Cinclosomatidae	*Cinclosoma marginatum*	Western Quail-thrush	-	-			
Aves	Climacteridae	*Climacteris rufus*	Rufous Treecreeper	-	-			
Aves	Columbidae	*Geopelia cuneata*	Diamond Dove	-	-			
Aves	Columbidae	*Ocyphaps lophotes*	Crested Pigeon	-	-			
Aves	Columbidae	*Phaps chalcoptera*	Common Bronzewing	-	-	1		
Aves	Corvidae	*Corvus bennetti*	Little Crow	-	-			
Aves	Corvidae	*Corvus coronoides*	Australian Raven	-	-	1		
Aves	Cuculidae	*Chalcites basalis*	Horsfield's Bronze Cuckoo	-	MA			
Aves	Cuculidae	*Chalcites osculans*	Black-eared Cuckoo	-	MA			
Aves	Cuculidae	*Heteroscenes pallidus*	Pallid Cuckoo	-	MA			
Aves	Dicaeidae	*Dicaeum hirundinaceum*	Mistletoebird	-	-			
Aves	Estrildidae	*Taeniopygia castanotis*	Australian Zebra Finch	-	-			
Aves	Falconidae	*Falco berigora*	Brown Falcon	-	-			
Aves	Falconidae	*Falco hypoleucos*	Grey Falcon	VU	VU		1	1
Aves	Falconidae	*Falco peregrinus*	Peregrine Falcon	OS	-			12
Aves	Hirundinidae	*Cheramoeca leucosterna*	White-backed Swallow	-	-			
Aves	Hirundinidae	*Hirundo neoxena*	Welcome Swallow	-	MA			
Aves	Hirundinidae	*Petrochelidon ariel*	Fairy Martin	-	-			
Aves	Hirundinidae	*Petrochelidon nigricans*	Tree Martin	-	MA			
Aves	Maluridae	*Amytornis textilis textilis*	Western Grasswren	P4	(A. modestus VU)			1
Aves	Maluridae	*Malurus assimilis*	Purple-backed Fairywren	(M. assimilis bernieri VU)	-			
Aves	Maluridae	*Malurus leucopterus*	White-winged Fairywren	(M. leucopterus edouardi, M.s leucopterus leucopterus VU	(M. leucopterus edouardi, M. leucopterus leucopterus VU)			
Aves	Maluridae	*Malurus pulcherrimus*	Blue-breasted Fairywren	-	-			
Aves	Maluridae	*Malurus splendens*	Splendid Fairywren	-	-	1		

Class	Family	Scientific Name	Common Name	DBCA	Commonwealth	NM	PMST	DBCA
Aves	Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU		1	224
Aves	Meliphagidae	*Acanthagenys rufogularis*	Spiny-cheeked Honeyeater	-	-	1		
Aves	Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	-	-	1		
Aves	Meliphagidae	*Epthianura albifrons*	White-fronted Chat	-	-			
Aves	Meliphagidae	*Epthianura tricolor*	Crimson Chat	-	-			
Aves	Meliphagidae	*Gavicalis virescens*	Singing Honeyeater	-	-	1		
Aves	Meliphagidae	*Lichmera indistincta*	Brown Honeyeater	-	-	1		
Aves	Meliphagidae	*Manorina flavigula*	Yellow-throated Miner	-	-	1		
Aves	Meliphagidae	*Melithreptus brevirostris*	Brown-headed Honeyeater	-	-			
Aves	Meliphagidae	*Nesoptilotis leucotis*	White-eared Honeyeater	-	-	1		
Aves	Meliphagidae	*Ptilotula ornata*	Yellow-plumed Honeyeater	-	-			
Aves	Meliphagidae	*Ptilotula penicillata*	White-plumed Honeyeater	-	-			
Aves	Meliphagidae	*Purnella albifrons*	White-fronted Honeyeater	-	-	1		
Aves	Meropidae	*Merops ornatus*	Rainbow Bee-eater	-	MA			
Aves	Monarchidae	*Grallina cyanoleuca*	Magpie-lark	-	MA			
Aves	Motacillidae	*Anthus australis australis*		-	(A. australis MA)			
Aves	Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	-	-			
Aves	Oreoicidae	*Oreoica gutturalis*	Crested Bellbird	-	-	1		
Aves	Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush	-	-	1		
Aves	Pachycephalidae	*Pachycephala inornata*	Gilbert's Whistler	-	-	1		
Aves	Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler	-				
Aves	Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler	-	-	1		
Aves	Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote	-	-			
Aves	Pardalotidae	*Pardalotus striatus*	Striated Pardalote	-	-	1		
Aves	Petroicidae	*Drymodes brunneopygia*	Southern Scrub Robin	-	-	1		
Aves	Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin	-	-			
Aves	Petroicidae	*Microeca fascinans*	Jacky Winter	-	-			
Aves	Petroicidae	*Petroica goodenovii*	Red-capped Robin	-	-			
Aves	Podargidae	*Podargus strigoides*	Tawny Frogmouth	-	-			
Aves	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian Grebe, Black-throated Grebe	-	-			
Aves	Pomatostomidae	*Pomatostomus superciliosus*	White-browed Babbler	-	-	1		
Aves	Pomatostomidae	*Pomatostomus temporalis*	Grey-crowned Babbler	-	-			
Aves	Psittaculidae	*Barnardius zonarius*	Australian Ringneck	-	-	1		
Aves	Psittaculidae	*Melopsittacus undulatus*	Budgerigar	-	-			
Aves	Psittaculidae	*Parvipsitta porphyrocephala*	Purple-crowned Lorikeet	-	-	1		
Aves	Psittaculidae	*Pezoporus occidentalis*	Night Parrot	CR	EN		1	
Aves	Psittaculidae	*Platycercus icterotis xanthogenys*		P4	-			3
Aves	Psittaculidae	*Polytelis alexandrae*	Princess Parrot	P4	VU		1	
Aves	Psittaculidae	*Polytelis anthopeplus*	Regent Parrot	-	-			
Aves	Psittaculidae	*Psephotellus varius*	Mulga Parrot	-	-			
Aves	Rallidae	*Porzana fluminea*	Australian Spotted Crake, Australian Crake	-	-			
Aves	Recurvirostridae	*Cladorhynchus leucocephalus*	Banded Stilt	-	-			
Aves	Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	-	MA			

Class	Family	Scientific Name	Common Name	DBCA	Commonwealth	NM	PMST	DBCA
Aves	Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	-	-			
Aves	Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	-	-			
Aves	Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	MI	MI, MA			9
Aves	Scolopacidae	*Arenaria interpres*	Ruddy Turnstone	MI	MI, MA			2
Aves	Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	MI	MI, MA			9
Aves	Scolopacidae	*Calidris alba*	Sanderling	MI	MI, MA			1
Aves	Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	CR	CR, MI, MA		1	2
Aves	Scolopacidae	*Calidris ruficollis*	Red-necked Stint	MI	MI, MA			3
Aves	Scolopacidae	*Tringa brevipes*	Grey-tailed Tattler	MI, P4	MI, MA			1
Aves	Scolopacidae	*Tringa glareola*	Wood Sandpiper	MI	MI, MA			7
Aves	Scolopacidae	*Tringa nebularia*	Common Greenshank	MI	MI, MA			10
Aves	Strigidae	*Ninox boobook boobook*	Southern Boobook	-	MA			
Aves	Threskiornithidae	*Plegadis falcinellus*	Glossy Ibis	MI	MI, MA			2
Aves	Turnicidae	*Turnix velox*	Little Buttonquail	-	-			
Aves	Zosteropidae	*Zosterops lateralis*	Grey-breasted White-eye, Silvereye	-	MA			
Mammalia	Bovidae	*Bos primigenius taurus*	European Cattle	-	-			
Mammalia	Bovidae	*Capra aegagrus hircus*	Goat	-	-			
Mammalia	Canidae	*Canis familiaris*	Dingo / Dog	-	-			
Mammalia	Canidae	*Vulpes vulpes*	Red Fox	-	-			
Mammalia	Dasyuridae	*Dasyurus geoffroii fortis*	Western Quoll, Chuditch	VU	VU		1	1
Mammalia	Dasyuridae	*Phascogale calura*	Red-tailed Phascogale	CD	VU			1
Mammalia	Dasyuridae	*Sminthopsis dolichura*	Little Long-tailed Dunnart	-	-			
Mammalia	Felidae	*Felis catus*	Cat	-	-			
Mammalia	Leporidae	*Oryctolagus cuniculus*	Rabbit	-	-			
Mammalia	Macropodidae	*Macropus fuliginosus melanops*	Western Grey Kangaroo	-	-			
Mammalia	Macropodidae	*Osphranter rufus*	Red Kangaroo, Marlu	-	-			
Mammalia	Molossidae	*Austronomus australis*	White-striped Free-tailed Bat	-	-			
Mammalia	Muridae	*Mus musculus*	House Mouse	-	-			
Mammalia	Muridae	*Notomys mitchellii*	Mitchell's Hopping-mouse	-	-			
Mammalia	Myrmecobiidae	*Myrmecobius fasciatus fasciatus*	Numbat, Walpurti	EN	EN			1
Mammalia	Tachyglossidae	*Tachyglossus aculeatus acanthion*	Short-beaked Echidna	-	-			
Mammalia	Thylacomyidae	*Macrotis lagotis*	Bilby, Dalgyte	VU	VU			3
Mammalia	Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat	-	-			
Mammalia	Vespertilionidae	*Chalinolobus morio*	Chocolate Wattled Bat	-	-			
Mammalia	Vespertilionidae	*Nyctophilus major tor*	Central Long-eared Bat	P3	-			1
Mammalia	Vespertilionidae	*Scotorepens balstoni*	Inland Broad-nosed Bat	-	-			
Mammalia	Vespertilionidae	*Vespadelus baverstocki*	Inland Forest Bat	-	-			
Mammalia	Vespertilionidae	*Vespadelus regulus*	Southern Forest Bat	-	-			
Reptilia	Agamidae	*Ctenophorus cristatus*	Bicycle Dragon	-	-	1		
Reptilia	Agamidae	*Ctenophorus fordi*	Western Mallee Dragon	-	-	1		
Reptilia	Agamidae	*Ctenophorus maculatus*	Spotted Sand Dragon	-				
Reptilia	Agamidae	*Ctenophorus reticulatus*	Western Netted Dragon	-	-	1		

Class	Family	Scientific Name	Common Name	DBCA	Commonwealth	NM	PMST	DBCA
Reptilia	Agamidae	*Ctenophorus salinarum*	Salt Pan Dragon	-	-	1		
Reptilia	Agamidae	*Moloch horridus*	Thorny Devil	-	-	1		
Reptilia	Agamidae	*Pogona minor minor*	Western Bearded Dragon	-	-	1		
Reptilia	Agamidae	*Tympanocryptis pseudopsephos*	Goldfields Pebble-mimic Dragons	-	-	1		
Reptilia	Carphodactylidae	*Underwoodisaurus milii*	Southern Barking Gecko	-	-	1		
Reptilia	Diplodactylidae	*Crenadactylus ocellatus*	South-western Clawless Gecko	-	-	1		
Reptilia	Diplodactylidae	*Diplodactylus granariensis granariensis*		-	-	1		
Reptilia	Diplodactylidae	*Diplodactylus pulcher*		-	-	1		
Reptilia	Diplodactylidae	*Hesperoedura reticulata*		-	-	1		
Reptilia	Diplodactylidae	*Lucasium maini*		-	-	1		
Reptilia	Diplodactylidae	*Rhynchoedura ornata*	Western Beaked Gecko	-	-	1		
Reptilia	Diplodactylidae	*Strophurus assimilis*	Goldfields Spiny-tailed Gecko	-	-	1		
Reptilia	Diplodactylidae	*Strophurus elderi*	Jewelled Gecko	-	-	1		
Reptilia	Elapidae	*Brachyurophis semifasciatus*		-	-	1		
Reptilia	Elapidae	*Demansia psammophis (doesn't occur in WA try reticulata)*	Yellow-faced whipsnake	-	-	1		
Reptilia	Elapidae	*Furina ornata*	Moon Snake	-	-	1		
Reptilia	Elapidae	*Pseudechis australis*	Mulga Snake	-	-	1		
Reptilia	Elapidae	*Pseudonaja affinis*	Dugite	(P. affinis exilis P4; P. affinis tanneri P4)				
Reptilia	Elapidae	*Pseudonaja mengdeni*	Western Brown Snake	-	-	1		
Reptilia	Elapidae	*Pseudonaja modesta*	Ringed Brown Snake	-	-	1		
Reptilia	Elapidae	*Simoselaps bertholdi*	Jan's Banded Snake	-	-	1		
Reptilia	Elapidae	*Suta fasciata*	Rosen's Snake	-	-	1		
Reptilia	Elapidae	*Suta gouldii*	Gould's Hooded Snake	-	-	1		
Reptilia	Elapidae	*Suta monachus*	Inland Hooded Snake	-	-	1		
Reptilia	Elapidae	*Suta nigriceps*		-	-	1		
Reptilia	Gekkonidae	*Christinus marmoratus*	Marbled Gecko	-	-			
Reptilia	Gekkonidae	*Gehyra purpurascens*		-	-	1		
Reptilia	Gekkonidae	*Gehyra variegata*	Variegated Gehyra	-	-	1		
Reptilia	Gekkonidae	*Heteronotia binoei*	Bynoe's Gecko	-	-	1		
Reptilia	Pygopodidae	*Delma australis*		-	-	1		
Reptilia	Pygopodidae	*Delma fraseri*	Fraser's Delma	-	-	1		
Reptilia	Pygopodidae	*Pygopus lepidopodus*	Common Scaly Foot	-	-	1		
Reptilia	Pythonidae	*Morelia spilota imbricata*		-	-	1		
Reptilia	Scincidae	*Cryptoblepharus buchananii*		-	-	1		
Reptilia	Scincidae	*Ctenotus atlas*		-	-	1		
Reptilia	Scincidae	*Ctenotus schomburgkii*	Barred Wedge-snouted Ctenotus	-	-			
Reptilia	Scincidae	*Ctenotus uber uber*	Western Spotted Ctenotus	-	-	1		
Reptilia	Scincidae	*Cyclodomorphus melanops elongatus*	Spinifex Slender Blue-tongue	-	-	1		
Reptilia	Scincidae	*Egernia depressa*	Southern Pygmy Spiny-tailed Skink	-	-	1		

Class	Family	Scientific Name	Common Name	DBCA	Commonwealth	NM	PMST	DBCA
Reptilia	Scincidae	*Egernia formosa*	Goldfields Crevice-skink	-	-			
Reptilia	Scincidae	*Egernia stokesii badia*	Western Spiny-tailed Skink	VU	EN			1
Reptilia	Scincidae	*Eremiascincus richardsonii*	Broad-banded Sand Swimmer	-	-	1		
Reptilia	Scincidae	*Hemiergis initialis initialis*		-	-	1		
Reptilia	Scincidae	*Hemiergis peronii peronii*		-	-	1		
Reptilia	Scincidae	*Lerista kingi*		-	-	1		
Reptilia	Scincidae	*Lerista timida*	Timid Slider	-	-	1		
Reptilia	Scincidae	*Liopholis inornata*		-	-	1		
Reptilia	Scincidae	*Liopholis multiscutata*	Bull Skink	-	-	1		
Reptilia	Scincidae	*Menetia greyii*	Common Dwarf Skink	-	-	1		
Reptilia	Scincidae	*Morethia butleri*		-	-	1		
Reptilia	Scincidae	*Tiliqua occipitalis*	Western Bluetongue	-	-			
Reptilia	Scincidae	*Tiliqua rugosa*	Bobtail	(T. rugosa konowi VU)				
Reptilia	Typhlopidae	*Anilios australis*		-	-	1		
Reptilia	Typhlopidae	*Anilios bicolor*		-	-	1		
Reptilia	Typhlopidae	*Anilios bituberculatus*		-	-	1		
Reptilia	Varanidae	*Varanus gouldii*	Bungarra Or Sand Goanna	-	-	1		
Reptilia	Varanidae	*Varanus tristis*	Racehorse Goanna	-	-	1		

Appendix D Fauna Habitat Assessment Sheets

Mt Marion Mining Tenements Terrestrial Fauna Surveys

Basic Fauna and Targeted Malleefowl, Chuditch, and ABAB Surveys

Mineral Resources Limited

SLR Project No.: 675.VX5937.00001

2 April 2024

5937-CAM-01

Project:	5937				
Date	27-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	934573	**Northing**	6542025
Landform and Soil			**Rock**		
Landform	Outcrop/breakaway		**Rock type/s**	Granite	
Aspect	Negligible		**Surface stone cover**	50 - 75%	
Soil type	Sandy loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Rocks (20 - 60 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Grey				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Unknown		**Microhabitats**	Burrows, Caves, Leaf litter, Logs > 10 cm	
Disturbance	None observed				
Introduced fauna	Cattle		**Ground Cover**		
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		*Eucalyptus spp.*	
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)		*Atriplex sp., Melaleuca sp., Solanum sp.*	

Fulcrum photo ID	16dfd066-0715-4692-91f2-fbdf7adf116b

5937-CAM-02

Project:	5937				
Date	27-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	914174	**Northing**	6540985
Landform and Soil			**Rock**		
Landform	Cleared		**Rock type/s**	Laterite	
Aspect	Negligible		**Surface stone cover**	75 - 100%	
Soil type	Clay loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Red				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**		
Disturbance	Clearing, Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		*Myrtaceaea spp.*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)		*Mixed sedges*	

Fulcrum photo ID	25cc3934-7e61-4f67-9a97-a5a30d6caacc,bf7ebebd-70de-4608-bbb1-

5937-CAM-03

Project:	5937				
Date	27-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	934754	**Northing**	6544068

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Granite, Quartz, Sandstone
Aspect	East	**Surface stone cover**	75 - 100%
Soil type	Rock	**Surface stone size classes present**	Pebbles (<0.6 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)
Soil colour			
Condition		**Habitat Features**	
Quality	Very good	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Burrows, Leaf litter, Logs > 10 cm
Disturbance	None observed		
Introduced fauna	None observed	**Ground Cover**	

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Eucalyptus spp.*
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	*Proteaceae spp.*
Ground stratum	Absent		

Fulcrum photo ID	24271a12-3c61-46fa-9f7e-6d3fe6de9552

5937-CAM-04

Project:	5937				
Date	27-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	926307	**Northing**	6547117

Landform and Soil		**Rock**	
Landform	Rocky Outcrop	**Rock type/s**	Granite
Aspect	Negligible	**Surface stone cover**	50 - 75%
Soil type	Rock	**Surface stone size classes present**	Pebbles (<0.6 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)
Soil colour	Brown		
Condition		**Habitat Features**	
Quality	High quality	**Water Source**	Present
Fire History	Unknown	**Microhabitats**	Exfoliating rock, Rock crevices
Disturbance	None observed		
Introduced fauna	Cattle	**Ground Cover**	<10%

Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	*Melaleuca sp., Hakea sp., Brachychiton sp.*
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*Sedges, rushes, forbs, herbs.*

Fulcrum photo ID	332138c6-bdd7-4b79-b6dd-aa2199023bea

5937-CAM-05

Project:	5937				
Date	27-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	928984	**Northing**	6553474
Landform and Soil			**Rock**		
Landform	Man-made Dam		**Rock type/s**	Limestone	
Aspect	Negligible		**Surface stone cover**	50 - 75%	
Soil type	Clay loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Grey, White				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Present	
Fire History	Unknown		**Microhabitats**	Leaf litter	
Disturbance	Man-made Dam				
Introduced fauna	Cattle, yabbies		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)		*Eucalyptus spp.*	
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)		*Melaleuca spp., Atriplex spp., Acacia sp.*	
Ground stratum	Low (>0.5 m)	Sparse rushland and/or sedgeland (0.25-20%)			

Fulcrum photo ID	b7f7fa0d-d25c-4638-bd06-5cd303c9da17

5937-CAM-06

Project:	5937				
Date	27-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	931975	**Northing**	6545261
Landform and Soil			**Rock**		
Landform	Man-made Dam		**Rock type/s**	Unknown	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Clay		**Surface stone size classes present**		
Soil colour	Red				
Condition			**Habitat Features**		
Quality	Disturbed		**Water Source**	Present	
Fire History	Unknown		**Microhabitats**	Hollows - trees, Leaf litter, Woody debris	
Disturbance	Clearing, Erosion, Vehicle tracks, Weeds				
Introduced fauna	Cattle, Rabbit		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)		*Eucalyptus spp.*	
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)		*Atriplex sp., Melaleuca sp., Acacia sp.*	
Ground stratum	Low (>0.5 m)	Isolated forbs (<0.25%)		*Cucumis myriocarpus.*	

Fulcrum photo ID	91cb7cca-7ac3-4cde-b219-b742f326c01c

5937-CAM-07

Project:	5937				
Date	09-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	-796818	**Northing**	6478586
Landform and Soil			**Rock**		
Landform	Man-made Dam		**Rock type/s**	None	
Aspect	Southwest		**Surface stone cover**		
Soil type	Clay		**Surface stone size classes present**		
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		*Eucalyptus spp.*	
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)		*Acacia spp.*	
Ground stratum	Mid (0.5-1 m)	Sparse rushland and/or sedgeland (0.25-20%)			

Fulcrum photo ID	3e06e526-ef2d-481e-90ed-776f7c52b914

5937-CAM-08

Project:	5937				
Date	28-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	928391	**Northing**	6543930
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Unknown	
Aspect	West		**Surface stone cover**	0 - 5%	
Soil type	Clay loam		**Surface stone size classes present**		
Soil colour	Red				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Burrows, Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		*Eucalyptus spp.*	
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		*Solanum acuminata, Hakea sp., Senna sp.*	
Ground stratum	Mid (0.5-1 m)	Sparse forbland (0.25-20%)		*Melaleuca spp., Acacia sp., Atriplex sp.*	

Fulcrum photo ID	fcf9169b-b935-4aad-9ca5-19a498026bc7

5937-HAB-01

Project:	5937				
Date	01-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	929045	**Northing**	6547327
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	None	
Aspect	Negligible		**Surface stone cover**		
Soil type	Sand		**Surface stone size classes present**		
Soil colour	Red				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Burrows, Hollows - logs, Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus spp.*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Acacia spp., Eremophila spp.*		
Ground stratum	Low (>0.5 m)	Isolated rushes and/or sedges (<0.25%)	*Mixed sedges.*		

Fulcrum photo ID	250400fb-2956-49d1-a561-9a2e37e418e4

5937-HAB-02

Project:	5937				
Date	02-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	930382	**Northing**	6549496
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	None	
Aspect	Negligible		**Surface stone cover**	0 - 5%	
Soil type	Sandy clay		**Surface stone size classes present**		
Soil colour	Red				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	Rabbit		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus spp.*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Acacia spp.*		
Ground stratum	Absent				

Fulcrum photo ID	c68cdc52-0e04-4ca7-80a7-8df7d0d34be4

5937-HAB-03

Project:	5937				
Date	02-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	916362	**Northing**	6540722

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	Granite, Ironstone, Quartz
Aspect	Negligible	**Surface stone cover**	0 - 5%
Soil type	Sandy loam	**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)
Soil colour	Orange, Red		
Condition		**Habitat Features**	
Quality	Very good	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Burrows, Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Ground Cover**	26-50%

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus spp.*
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Eremophila spp., Solanum acuminatum, Acacia spp., Hakea sp.*
Ground stratum	Absent		

Fulcrum photo ID	26cc1e74-c767-4ad7-8999-1e1e49c3601f

5937-HAB-04

Project:	5937				
Date	27-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	927291	**Northing**	6548651

Landform and Soil		**Rock**	
Landform	Undulating plain	**Rock type/s**	Dolerite, Granite, Ironstone
Aspect	Negligible	**Surface stone cover**	0 - 5%
Soil type	Clay loam	**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)
Soil colour	Red		
Condition		**Habitat Features**	
Quality	Very good	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Hollows - trees, Leaf litter, Woody debris
Disturbance	Vehicle tracks		
Introduced fauna	None observed	**Ground Cover**	<10%

Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	*Eucalyptus spp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*Melaleuca pauperiflora, Melaleuca spp.*
Ground stratum	Absent		

Fulcrum photo ID	06a2b170-0b3c-40ca-b522-433f23232edf

5937-HAB-05

Project:	5937				
Date	01-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	927125	**Northing**	6544773

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	Unknown
Aspect	Negligible	**Surface stone cover**	0 - 5%
Soil type	Sandy loam	**Surface stone size classes present**	
Soil colour	Orange, Red		
Condition		**Habitat Features**	
Quality	High quality	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Burrows, Hummocks, Leaf litter, Peeling bark, Woody debris
Disturbance	None observed		
Introduced fauna	None observed	**Ground Cover**	<10%

Vegetation			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Closed shrubland and/or heathland (>80%)	*Melaleuca sp., Melaleuca Pauperiflora, acacia acuminata.*
Ground stratum	Mid (0.5-1 m)	Sparse hummock grassland (0.25-20%)	*Triodia rigidissima.*

Fulcrum photo ID	5ab17f8a-260f-4acd-a1c4-0601437ffd5a

5937-HAB-06

Project:	5937				
Date	01-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	927472	**Northing**	6545906

Landform and Soil		**Rock**	
Landform	Plain	**Rock type/s**	Unknown
Aspect	Negligible	**Surface stone cover**	0 - 5%
Soil type	Sandy loam	**Surface stone size classes present**	
Soil colour	Orange		
Condition		**Habitat Features**	
Quality	Very good	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Burrows, Leaf litter, Woody debris
Disturbance	Vehicle tracks		
Introduced fauna	None observed	**Ground Cover**	11-25%

Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	*Eucalyptus spp.*
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	*Acacia acuminata, Melaleuca paupiflora, Solanum spp., Hakea sp.*
Ground stratum	Mid (0.5-1 m)	Sparse forbland (0.25-20%)	*Mixed forbs.*

Fulcrum photo ID	1de5fb40-9e1a-4990-aa71-8c48f3b7eb89

5937-HAB-07

Project:	5937				
Date	28-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	914192	**Northing**	6541229
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Ironstone	
Aspect	South		**Surface stone cover**	5 - 25%	
Soil type	Sandy clay		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Orange				
Condition			**Habitat Features**		
Quality	Good		**Water Source**	Present	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Clearing, Vehicle tracks				
Introduced fauna	Cattle		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus spp.*		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	*Myrtaceae spp.*		
Ground stratum	Absent				

Fulcrum photo ID	f8a60bb3-b3c6-4556-80a6-48c429f43f12,ba71074f-471e-452f-b71d-

5937-HAB-08

Project:	5937				
Date	14-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	926002	**Northing**	6550690
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	Ironstone, Quartz	
Aspect	Negligible		**Surface stone cover**	25 - 50%	
Soil type	Clay		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Rocks (6 - 20 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown, Red				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - logs, Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	Cattle		**Ground Cover**	51-75%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus spp.*		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Melaleuca spp.*		
Ground stratum	Low (>0.5 m)	Chenopod sedgeland (0.25-20%)			

Fulcrum photo ID	e61b5ecc-a432-4ac2-8071-78108b9017c5

5937-HAB-09

Project:	5937				
Date	14-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	15	**Easting**	928006	**Northing**	6551014
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Calcrete, Ironstone	
Aspect	Southeast		**Surface stone cover**	5 - 25%	
Soil type	Clay		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm)	
Soil colour	Brown, Orange				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Peeling bark, Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	Cattle		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	*Eucalyptus spp., Melaleuca pauperiflora.*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Acacia spp., Atriplex.*		
Ground stratum	Absent				

Fulcrum photo ID	ad87bbb0-3023-4369-98ff-2162624f675f,371d7c99-c007-4b33-9573-

5937-HAB-10

Project:	5937				
Date	14-08-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	928198	**Northing**	6551060
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Ironstone	
Aspect	South		**Surface stone cover**	75 - 100%	
Soil type	Clay		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Brown				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus spp.*		
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Acacia spp.*		
Ground stratum	Low (>0.5 m)	Sparse forbland (0.25-20%)	*Mixed forbs.*		

Fulcrum photo ID	ca4f0470-ec50-4c7e-af0e-d93461510dc0,e75630c4-c99c-4964-be93-

5937-HAB-11

Project:	5937				
Date	31-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	923042	**Northing**	6551589
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	Ironstone, Quartz	
Aspect	Negligible		**Surface stone cover**	5 - 25%	
Soil type	Clay loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm)	
Soil colour	Brown, Red				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	Rabbit		**Ground Cover**		
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)	*Eucalyptus spp.*		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	*Acacia spp.*		
Ground stratum	Absent				

Fulcrum photo ID	efd5b2bd-54b7-4737-ae4f-813ac5bd7a2c,f5d0e50d-1494-4321-9884-

5937-HAB-12

Project:	5937				
Date	28-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	-807172	**Northing**	6467351
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	Limestone, Quartz	
Aspect	East		**Surface stone cover**	0 - 5%	
Soil type	Sandy clay		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Orange				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		**Ground Cover**	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Mallee woodland (20-50%)	*Eucalyptus spp.*		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Myrtaceae spp.*		
Ground stratum	Absent				

Fulcrum photo ID	38f34a76-f1c9-46de-a348-4bc9d44eac13

5937-HAB-13

Project:	5937				
Date	28-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	913672	**Northing**	6540814
Landform and Soil			**Rock**		
Landform	Undulating plain		**Rock type/s**	None	
Aspect	Negligible		**Surface stone cover**		
Soil type	Sand		**Surface stone size classes present**		
Soil colour	Yellow				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	nearby	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Leaf litter, Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		**Ground Cover**	76-100%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Tall (>2 m)	Closed shrubland and/or heathland (>80%)		*Allocasuarina sp.*	
Ground stratum	Tall (1-2 m)	Sparse forbland (0.25-20%)		*Mixed herbs.*	

Fulcrum photo ID	89938981-cdbb-41be-aa67-d36f9835f255,0342b13f-54eb-4586-

5937-HAB-14

Project:	5937				
Date	27-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	932377	**Northing**	6544109
Landform and Soil			**Rock**		
Landform	Plain		**Rock type/s**	Dolerite, Granite, Ironstone	
Aspect	Negligible		**Surface stone cover**	5 - 25%	
Soil type	Clay loam		**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm)	
Soil colour	Brown, Red				
Condition			**Habitat Features**		
Quality	Very good		**Water Source**	Absent	
Fire History	Little or no fire evidence (>5 years)		**Microhabitats**	Hollows - trees, Leaf litter, Logs > 10 cm, Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	Cattle		**Ground Cover**	11-25%	
Vegetation					
Upper stratum	Low (<10 m)	Woodland (20-50%)		*Eucalyptus spp.*	
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)		*Acacia spp., Atriplex sp., Senna sp.*	
Ground stratum	Absent				

Fulcrum photo ID	1586f2d8-4225-4e79-a10a-492f63137a89

5937-HAB-15

Project:	5937				
Date	27-07-2023		**Sample Type**	Terrestrial vertebrate fauna	
Zone	51	**Easting**	934676	**Northing**	6541998

Landform and Soil		**Rock**	
Landform	Drainage line	**Rock type/s**	Granite, Ironstone, Quartz
Aspect	Negligible	**Surface stone cover**	0 - 5%
Soil type	Clay loam	**Surface stone size classes present**	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)
Soil colour	Red		
Condition		**Habitat Features**	
Quality	Very good	**Water Source**	Absent
Fire History	Little or no fire evidence (>5 years)	**Microhabitats**	Hollows - trees, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris
Disturbance	None observed		
Introduced fauna	Cattle	**Ground Cover**	<10%

Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	*Eucalyptus spp.*
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	*Acacia spp., Melaleuca pauperiflora, Hakea sp., Senna sp., Atriplex sp.*
Ground stratum	Absent		

Fulcrum photo ID	d27c77e2-517a-44bf-ab3e-57dcb34bc480

Appendix E Fauna Recorded During the Survey

Mt Marion Mining Tenements Terrestrial Fauna Surveys

Basic Fauna and Targeted Malleefowl, Chuditch, and ABAB Surveys

Mineral Resources Limited

SLR Project No.: 675.VX5937.00001

2 April 2024

Conservation Status: State - Listed under Biodiversity Conservation Act 2016, Federal - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, MI/IA - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.

Family	Scientific Name	Common Name	Conservation Status		Method							
			State	Commonwealth	Call	Remains	Sighting	Tracks	Scat	Digging	Collected	Baited Camera Trap
Birds												
Acanthizidae	*Acanthiza sp.*	Thornbill sp.	-	-			4					
Acanthizidae	*Smicrornis brevirostris*	Weebill	-	-	13							
Accipitridae	*Haliastur sphenurus*	Whistling Kite	-	-	2							
Anatidae	*Anas superciliosa*	Pacific Black Duck	-	-			2					
Artamidae	*Artamus cyanopterus*	Dusky Woodswallow	-	-			6					
Artamidae	*Cracticus torquatus*	Grey Butcherbird	-	-								1
Artamidae	*Strepera versicolor*	Grey Currawong	-	-	2		4					2
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckooshrike	-	-			1					
Casuariidae	*Dromaius novaehollandiae*	Emu	-	-			1	5	1			
Cinclosomatidae	*Cinclosoma clarum*	Western Chestnut Quail-thrush, Copperback Quail-thrush	-	-								1
Climacteridae	*Climacteris rufus*	Rufous Treecreeper	-	-	4		1					8
Corvidae	*Corvus coronoides*	Australian Raven	-	-								4
Corvidae	*Corvus orru*	Torresian Crow	-	-								1
Cuculidae	*Chalcites osculans*	Black-eared Cuckoo	-	-	1							
Cuculidae	*Chalcites lucidus*	Shining Bronze Cuckoo	-	-	1							
Falconidae	*Falco berigora*	Brown Falcon	-	-			1					
Maluridae	*Malurus splendens*	Splendid Fairywren	-	-			2					
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	-	-	2							
Meliphagidae	*Gavicalis virescens*	Singing Honeyeater	-	-			1					
Meliphagidae	*Manorina flavigula*	Yellow-throated Miner	-	-			1					
Meliphagidae	*Melithreptus brevirostris*	Brown-headed Honeyeater	-	-			1					
Meliphagidae	*Ptilotula ornata*	Yellow-plumed Honeyeater	-	-			20					
Megapodiidae	*Leipoa ocellata*	Malleefowl	VU	VU			1	3		1		
Oreoicidae	*Oreoica gutturalis*	Crested Bellbird	-	-	3							1
Pachycephalidae	*Colluricincla harmonica*	Grey Shrikethrush	-	-	1							3
Pachycephalidae	*Pachycephala fuliginosa*	Western Whistler	-	-	2							
Pachycephalidae	*Pachycephala inornata*	Gilbert's Whistler	-	-			1					
Pardalotidae	*Pardalotus striatus*	Striated Pardalote	-	-	2							
Petroicidae	*Drymodes brunneopygia*	Southern Scrub Robin	-	-			1					
Petroicidae	*Eopsaltria griseogularis*	Western Yellow Robin	-	-			1					
Podargidae	*Podargus strigoides*	Tawny Frogmouth	-	-			2					
Pomatostomidae	*Pomatostomus superciliosus*	White-browed Babbler	-	-	1		11					
Psittaculidae	*Barnardius zonarius*	Australian Ringneck	-	-	3		3					
Psittaculidae	*Parvipsitta porphyrocephala*	Purple-crowned Lorikeet	-	-	8		12					
Psittaculidae	*Psephotellus varius*	Mulga Parrot	-	-			2					

Family	Scientific Name	Common Name	Conservation Status		Method							
			State	Commonwealth	Call	Remains	Sighting	Tracks	Scat	Digging	Collected	Baited Camera Trap
Rhipiduridae	*Rhipidura leucophrys*	Willie Wagtail	-	-	1		5					1
Mammals												
Bovidae	*Bos primigenius taurus*	European Cattle	-	-				2				
Dasyuridae	*Sminthopsis granulipes*	White-tailed Dunnart	-	-								3
Dasyuridae	*Sminthopsis sp.*	Dunnart sp.	-	-								61
Equidae	*Equus ferus caballus*	Horse	-	-					1			
Felidae	*Felis catus*	Cat	-	-				1	3			
Leporidae	*Oryctolagus cuniculus*	Rabbit	-	-		1			3			
Macropodidae	*Macropus fuliginosus*	Western Grey Kangaroo	-	-			1					
Muridae	*Mus musculus*	House Mouse	-	-								1
Muridae	*Notomys mitchellii*	Mitchell's Hopping-mouse	-	-								27
Reptiles												
Agamidae	*Ctenophorus reticulatus*	Western Netted Dragon	-	-								2
Carphodactylidae	*Underwoodisaurus milii*	Southern Barking Gecko	-	-			1					
Gekkonidae	*Heteronotia binoei*	Bynoe's Gecko	-	-			2			1		
Scincidae	*Egernia formosa*	Goldfields Crevice-skink	-	-			1					
Scincidae	*Hemiergis initialis*	Southwest Earless Skink	-	-						1		
Scincidae	*Lerista kingi*	King's Slider	-	-			1			1		
Scincidae	*Lerista timida*	Timid Slider	-	-						1		
Scincidae	*Morethia butleri*	Woodland Morethia Skink	-	-			1					
Varanidae	*Varanus gouldii*	Bungarra, Sand Goanna	-	-		1						
Insects												
Cicadellidae	*Pogonoscopus lenis*	Leafhopper	-	-							5	
Formacidae	*Camponotus sp. nr. terebrans*	Sugar Ant	-	-							30	

Appendix F Significant Fauna Likelihood of Occurrence

Mt Marion Mining Tenements Terrestrial Fauna Surveys

Basic Fauna and Targeted Malleefowl, Chuditch, and ABAB Surveys

Mineral Resources Limited

SLR Project No.: 675.VX5937.00001

2 April 2024

Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation, Commonwealth - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Birds						
Acanthizidae	*Aphelocephala leucopsis* Southern Whiteface	-	VU	This taxon prefers dry, sparse open forest/woodland and inland scrubland (Pizzey and Knight, 2001).	No nearby records identified from the database searches or literature. Species only returned from PMST which measures distribution, not individual records (DCCEEW, 2023).	**Low** No nearby records
Anatidae	*Oxyura australis* Blue-billed Duck	P4	-	This taxon prefers densely vegetated freshwater lakes, swamps, dams (Morcombe, 2003).	The DBCA database identified eight records within 100 km of the Survey Area, including 85.6 km northwest in 2015 and 85.7 km northwest in 2014 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Apodidae	*Apus pacificus* Pacific Swift, Fork-tailed Swift	MI	MI, MA	This taxon occupies low to very high airspace over varied habitat (Morcombe, 2003).	The DBCA database identified one record within 100 km of the Survey Area, 80.9 km east in 2002 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Cacatuidae	*Zanda latirostris* Carnaby's Cockatoo	EN	EN	This taxon is commonly found in forests, woodlands, heathlands, and farms. Common food sources include banksias, hakeas, and pine plantations (Morcombe, 2003).	The DBCA database identified six records within 100 km of the Survey Area, including 34.1 km north in 2018 and 35.2 km north in 2017 (DBCA, 2023c).	**Medium** Suitable habitat is present within the Survey Area; low number of nearby records
Charadriidae	*Charadrius veredus* Oriental Plover	MI	MI, MA	This taxon is commonly found in grasslands and thinly vegetated plains (Menkhorst *et al.*, 2017).	The DBCA database identified four records within 100 km of the Survey Area, including 84.2 km north west in 2013 and two records 85.5 km north west in 2012 (DBCA, 2023c).	**Low** Minimal nearby records in recent years

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Charadriidae	*Thinornis cucullatus* Hooded Dotterel	P4	MA	This taxon prefers beaches and margins of inland salt lakes (Menkhorst *et al.*, 2017).	The DBCA database identified four records within 100 km of the Survey Area, including 54.6 km north in 1980 and 54,9 km north in 2009 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Falconidae	*Falco hypoleucos* Grey Falcon	VU	VU	This taxon prefers open plains with treed watercourses in arid inland (Menkhorst *et al.*, 2017).	The DBCA database identified one record within 100 km of the Survey Area, 81.4 km south in 1979 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Falconidae	*Falco peregrinus* Peregrine Falcon	OS	-	This taxon is found in most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species (Menkhorst *et al.*, 2017). May use the Survey Area for hunting.	The DBCA database identified 12 records within 100 km of the Survey Area, including 38.0 km south in 1998, and 50.5 km south in 1994 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Maluridae	*Amytornis textilis textilis* Western Grasswren	P4	(*A. modestus* VU)	Located in the Shark Bay region, this taxon prefers acacia shrubland with dense shrub clumps and lower recumbent shrubs (<1 m high) in which foliage extends to ground (Menkhorst *et al.*, 2017).	The DBCA database identified one record within 100 km of the Survey Area, 59.6 km northeast in 1908 (DBCA, 2023c).	**Low** Outside current distribution of taxon
Megapodiidae	*Leipoa ocellata* Malleefowl	VU	VU	This taxon is commonly found in long unburned mallee and woodland with abundant litter and low scrub (Morcombe, 2003).	The DBCA database identified 224 records within 100 km of the Survey Area, including 1.5 km east in 2006 and 1.6 km east in 2011 (DBCA, 2023c).	**Recorded** Multiple records made during the field survey
Psittaculidae	*Pezoporus occidentalis*	CR	EN	This taxon is not commonly found, but is believed to occupy long unburnt spinifex and	No nearby records identified from the database searches or literature. Species only returned	**Low**

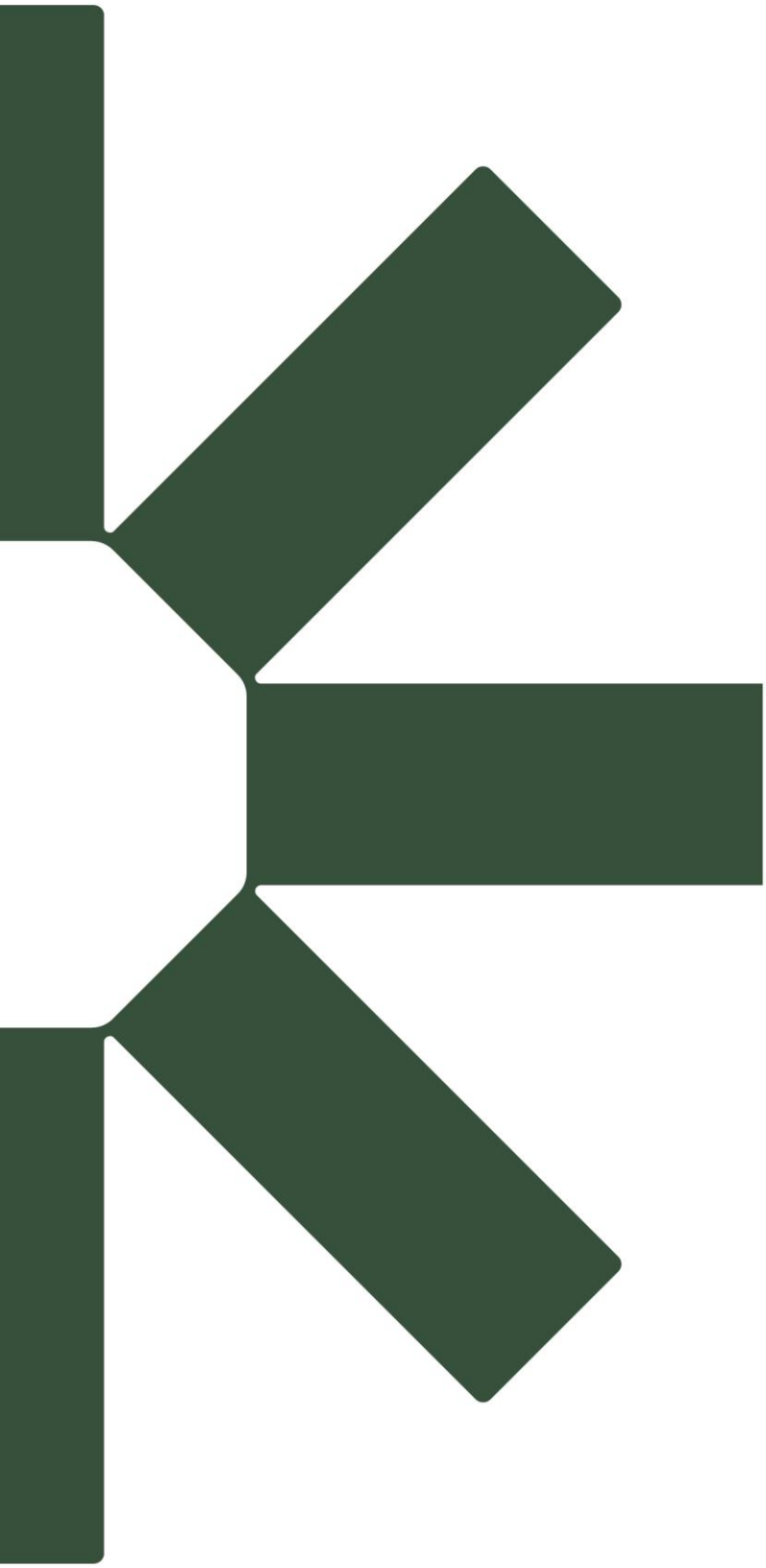
Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
	Night Parrot			samphire shrublands bordering salt lakes.(Morcombe, 2017) Was once widely distributed throughout arid and semi-arid Australia, but has since been declared extinct. Recent discoveries of this species have been found in Queensland and WA since 2013 (Threatened Species Scientific Committee, 2013).	from PMST which measures distribution, not individual records (DCCEEW, 2023).	No nearby records
Psittaculidae	*Platycercus icterotis xanthogenys* Western Rosella	P4	-	This taxon prefers salmon gum and wandoo woodlands or farmlands; less common in heavy wet Karri and Jarrah; scarce on sandy west coastal plain (Menkhorst *et al.*, 2017).	The DBCA database identified three records within 100 km of the Survey Area, including 44.5 km east in 2008 and 52.8 km south west in 1989 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Psittaculidae	*Polytelis alexandrae* Princess Parrot	P4	VU	This taxon prefers areas of spinifex with eucalypt trees, acacia shrubland, desert oaks, or hakeas around salt lakes (Pizzey and Knight, 2001).	No nearby records identified from the database searches or literature. Species only returned from PMST which measures distribution, not individual records (DCCEEW, 2023).	**Low** No nearby records
Scolopacidae	*Actitis hypoleucos* Common Sandpiper	MI	MI, MA	This taxon prefers coastal and interior wetlands, narrow muddy edges of billabongs, river pools, mangroves, rocky beaches, estuaries, near-coastal salt lakes, lagoons, claypans, sewage pond (Morcombe, 2003) (Johnstone and Storr, 1998).	The DBCA database identified nine records within 100 km of the Survey Area, including 21.2 km northwest in 2013 and 21.4 km northwest in 2014 (DBCA, 2023c).	**Low** No suitable habitat within the Survey Area
Scolopacidae	*Arenaria interpres*	MI	MI, MA		The DBCA database identified two records within 100 km of the	**Low**

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
	Ruddy Turnstone			This taxon prefers coastal, tidal flats, beaches, rocky shorelines (Menkhorst *et al.*, 2017).	Survey Area, both 86.5 km north in 2016 (DBCA, 2023c).	No suitable habitat within the Survey Area
Scolopacidae	*Calidris acuminata* Sharp-tailed Sandpiper	MI	MI, MA	This taxon is commonly found in fresh and salt wetlands, muddy edges of lagoons, swamps, lakes, dams, soaks, sewage farms, temporary floodwaters (Morcombe, 2003).	The DBCA database identified nine records within 100 km of the Survey Area, including 7.6 km east in 2012 and 18.9 km north in 1980 (DBCA, 2023c).	**Low** No suitable habitat within the Survey Area
Scolopacidae	*Calidris alba* Sanderling	MI	MI, MA	This taxon is commonly found in beaches and sandy tidal flats (Menkhorst *et al.*, 2017).	The DBCA database identified one record within 100 km of the Survey Area, 28.3 km north of the Survey Area in 2016 (DBCA, 2023c).	**Low** No suitable habitat within the Survey Area
Scolopacidae	*Calidris ferruginea* Curlew Sandpiper	CR	CR, MI, MA	This taxon prefers inter-tidal mudflats of estuaries, lagoons, mangrove channels, dams, floodwaters, flooded saltbush surrounds of inland lakes (Morcombe, 2003).	The DBCA database identified two records within 100 km of the Survey Area, 46.2 km north west in 2006 and 55.8 km north in 1999 (DBCA, 2023c).	**Low** No suitable habitat within the Survey Area
Scolopacidae	*Calidris ruficollis* Red-necked Stint	MI	MI, MA	This taxon is commonly found in tidal mudflats, saltmarshes, sandy or shelly beaches, saline and freshwater wetlands, salt fields, sewage ponds (Pizzey and Knight, 2001).	The DBCA database identified three records within 100 km of the Survey Area, including 46.2 km north west in 2006 and 54.4 km east in 2012 (DBCA, 2023c).	**Low** No suitable habitat within the Survey Area
Scolopacidae	*Tringa brevipes* Grey-tailed Tattler	MI, P4	MI, MA	This taxon is commonly found in coastal areas, tidal flats, and rocky shorelines (Menkhorst *et al.*, 2017).	The DBCA database identified one record within 100 km of the Survey Area, including 24.1 km north in 2017 (DBCA, 2023c).	**Low** No suitable habitat within the Survey Area
Scolopacidae	*Tringa glareola*	MI	MI, MA			**Low**

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
	Wood Sandpiper			This taxon prefers freshwater wetlands with emergent sedges and taller fringing vegetation (Menkhorst *et al.*, 2017).	The DBCA database identified seven records within 100 km of the Survey Area, including 28.8 km north in 2005 and 29.6 km north in 2005.	No suitable habitat within the Survey Area
Scolopacidae	*Tringa nebularia* Common Greenshank	MI	MI, MA	This taxon is commonly found near permanent and temporary wetlands, billabongs, swamps, lakes, floodplains, sewage farms and salt works ponds, flooded irrigated crops, mudflats, mangrove swamps, muddy shallows of lagoons (Morcombe, 2003).	The DBCA database identified 10 records within 100 km of the Survey Area, including 21.2 km northeast in 2013 and 37.5 km north in 2001 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Threskiornithidae	*Plegadis falcinellus* Glossy Ibis	MI	MI, MA	This taxon prefers shallow, fresh water, and estuarine waters, dry grasslands (Menkhorst *et al.*, 2017).	The DBCA database identified two records within 100 km if the Survey Area, including 35.6 km north in 1981 and 85.4 km north in 1981 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Mammals						
Dasyuridae	*Dasyurus geoffroii fortis* Western Quoll, Chuditch	VU	VU	This taxon prefers sclerophyll forest or drier woodland, heath, and mallee shrubland. Often dens in deep rock crevices and hollows of fallen trees (Van Dyck and Strahan, 2008).	The DBCA database identified one record within 100 km of the Survey Area, 10.3 km east in 1974 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Dasyuridae	*Phascogale calura* Red-tailed Phascogale	CD	VU	This taxon is commonly found in Allocasuarina woodlands with hollow-containing eucalypts e.g. *Eucalyptus wandoo*) and *Gastrolobium* spp.; prefers vegetation not burnt for at least 20 years (Van Dyck and Strahan, 2008).	The DBCA database identified one record within 100 km of the Survey Area, 65.5 km southeast in 2005 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Myrmecobiidae	*Myrmecobius fasciatus fasciatus*	EN	EN	This taxon is not commonly found, but has been found in	The DBCA database identified one record within 100 km of the	**Low**

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
	Numbat, Walpurti			Jarrah forests, and Wandoo woodlands; requires hollow logs and branches for shelter and termites for food (Van Dyck and Strahan, 2008). Was once commonly found throughout much of the southern half of Australia but has since been reduced to two isolated populations in southwest WA (Baker and Gynther, 2023).	Survey Area, 35.5 km north (DBCA, 2023c).	Minimal nearby records in recent years
Thylacomyidae	*Macrotis lagotis* Bilby, Dalgyte	VU	VU	This taxon is found in areas of mitchell grass and stony downs country of cracking clays, desert sandplains and dune fields sometimes containing laterite, hummock grassland and massive red earths with Acacia shrubland (Van Dyck and Strahan, 2008). Was once widely distributed throughout arid and semi-arid mainland Australia, but has since been reduced to areas of the Pilbara, Kimberley, and Northern Territory, and small isolated pockets of Queensland (Baker and Gynther, 2023).	The DBCA database identified three records within 100 km of the Survey Area, including two records 35.5 km north and 60.0 km north (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Vespertilionidae	*Nyctophilus major tor* Central Long-eared Bat	P3	-	This taxon is commonly found in dry woodland and shrubland in arid and semi-arid regions (Menkhorst and Knight, 2010).	The DBCA database identified one record within 100 km of the Survey Area, 77.1 km east in 2011 (DBCA, 2023c).	**Low** Minimal nearby records in recent years
Reptiles						
Scincidae	*Egernia stokesii badia* Western Spiny-tailed Skink	VU	EN	This taxon commonly occupies rock crevices and hollow timber in southwest interior of WA and on Dirk Hartog Island, Shark Bay (Wilson and Swan, 2017).	The DBCA database identified one record within 100 km of the Survey Area, 42.6 km north (DBCA, 2023c).	**Low** Minimal nearby records in recent years

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Invertebrates						
Lycaenidae	*Jalmenus aridus* Inland Hairstreak Butterfly	P1	-	This taxon is known only from a few localities west of Kalgoorlie-Boulder and is found in open woodland with mature *Senna artemisioides* ssp. *flifolia* as well as mixed flowering shrubs with open areas of well drained exposed ground adjoining the hostplants. The ant *Froggattella kirbii* must be present (Eastwood *et al.*, 2023).	The DBCA database identified five records within 100 km of the Survey Area, all records are 26.2 km north of the Survey Area from 1985 to 1997.3 SLR internal records returned 16 individuals within 50 km of the Survey Area in 2021.	**High** Suitable habitat is present within the Survey Area; high number of nearby and recent records
Lycaenidae	*Ogyris petrina* Arid Bronze Azure Butterfly	CR	CR	The Arid Bronze Azure butterfly is currently known from a single locality adjacent to Barbalin Nature Reserve in the northern wheatbelt. In order to reproduce, the butterfly has an obligate association with a single form of one species of ant, the pale-coloured or 'Goldfields' form of *Camponotus* sp. nr. *Terebrans* (DBCA, 2020a).	The DBCA database identified 17 records within 100 km of the Survey Area, including 22.5 km north in 1991 and 11 records 24.1 km north between 1981 and 1991 (DBCA, 2023c)	**High** Host ant colonies are present across large portions of the Survey Area and nearby records are in close proximity



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