



Biologic
ENVIRONMENTAL
SURVEY

Andover Study Area Detailed Vertebrate Fauna Survey

Report to Azure Minerals Limited

25 March 2026

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Executive Summary

Azure Minerals Limited (Azure) is currently undertaking exploration activities at the Andover Project (the Project), located approximately 35 kilometres (km) southeast of Karratha and 5 km south of Roebourne, Western Australia. Biologic Environmental Survey Pty Ltd (Biologic) previously undertook four basic and targeted vertebrate fauna surveys for the Project, over an area of approximately 1,810 hectares (ha) within tenements E47/ 2481 and E47/ 4700. Initial results from this survey indicated several factors for environmental assessment under Part IV of the WA *Environmental Protection Act 1986* (EP Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), including significant species listed under both acts. To further investigate these factors and provide contextual biological information to inform future environmental approvals for the Project, Azure commissioned Biologic to undertake a detailed vertebrate fauna assessment of the 12,278 ha Andover Lithium Study Area (herein the Study Area). This report documents findings of this assessment, which consisted of a desktop assessment and four-season detailed vertebrate fauna field survey (herein the current survey).

A detailed desktop assessment was conducted prior to the field survey to identify vertebrate fauna species which have previously been recorded or have the potential to occur in the Study Area. A total of 410 species were identified, comprising 50 mammals (including 41 native and nine non-native), 239 birds, 112 reptiles and nine amphibians. Sixty-three of these species were identified as significant, of which four have previously been recorded in the Study Area:

- Ghost bat (*Macroderma gigas*) – Vulnerable (EPBC Act and BC Act);
- Northern quoll (*Dasyurus hallucatus*) - Endangered (EPBC Act and BC Act);
- Pilbara olive python (*Liasis olivaceus*) - Endangered (EPBC Act and BC Act); and
- Western pebble-mound mouse (*Pseudomys chapmani*) - Priority 4 (DBCAs).

The four phases of the survey were conducted between 19–29 February 2024, 14–24 October 2024, 4–14 March 2025 and 14–23 August 2025. Sampling methods included systematic trapping (pitfall, Elliott, funnel and cage traps) (176 nights), avifauna censuses (66.6 hours), opportunistic sightings, nocturnal searches (36.75 hours), targeted searches (39.13 hours), acoustic bird recordings (114 hours), ultrasonic bat recordings (173 hours) and habitat assessments (143 locations).

Eleven (11) broad fauna habitats were recorded within the Study Area, comprising:

- Low Hills and Slopes (40.91%, 5,022.9 ha);
- Stony Plain (15.59%, 1,914.73 ha);
- Clay Plain (14.28%, 1,752.9 ha);

- Drainage Area/ Floodplain (12.3%, 1,510.24 ha);
- Minor Drainage Line (5.3%, 650.63 ha);
- Major Drainage Line (4.87%, 598.54 ha);
- Rock Piles (2.38%, 291.71 ha);
- Sand Plain (2.14%, 262.51 ha);
- Claypan (1.14%, 140.57 ha);
- Rocky Outcrop (0.17%, 21.29 ha); and
- Gorge/ Gully (0.04%, 5.52 ha).

The remaining 0.87% (107.06 ha) of the study area comprised Cleared/ Disturbed areas.

Six water features () were assessed in the Study Area during the survey. Three water features () recorded during previous surveys underwent check-up assessments. The majority of these water features () were assessed during the wet and dry season surveys. Surface water was present only during March 2025, suggesting these pools are ephemeral and dependent on seasonal rainfall.

The field surveys recorded a total of 178 vertebrate fauna species, comprising 30 mammal species (26 native and four introduced), 85 bird species, 61 reptile species and 2 amphibian species from the Study Area. This comprises approximately 44% of the total number of species identified in the desktop assessment (n=410). During the current survey, five significant species were recorded within the Study Area:

- Ghost bat (*Macroderma gigas*) – Vulnerable (EPBC Act and BC Act);
- Grey falcon (*Falco hypoleucos*) – Vulnerable (EPBC Act and BC Act);
- Lined soil-crevice skink (*Notoscincus butleri*) – Priority 4 (DBCA);
- Northern quoll (*Dasyurus hallucatus*) - Endangered (EPBC Act and BC Act); and
- Western pebble-mound mouse (*Pseudomys chapmani*) - Priority 4 (DBCA).

In addition to those significant species recorded within the Study Area during the current or previous surveys, fork-tailed swift (*Apus pacificus*) (Migratory – EPBC and BC Act) and northern short-tailed mouse (*Leggadina lakedownensis*) (Priority 4 - DBCA) were deemed Likely to occur and eastern osprey (*Pandion cristatus*) (Migratory – EPBC and BC Act) and peregrine falcon (*Falco peregrinus*) (Specially Protected - BC Act) Possible to occur. The remaining 53 significant species identified in the desktop assessment were deemed Unlikely or Highly Unlikely to occur within the Study Area, primarily due to lack of suitable habitat.

Nine habitats within the Study Area were found to provide critical or important habitat for significant species. Low Hills and Slopes provide important breeding, foraging and

dispersal habitat for the western pebble-mound mouse. Stony Plain provides important breeding, foraging and dispersal habitat for the western pebble-mound mouse and lined soil-crevice skink. Major Drainage provides critical breeding, foraging and dispersal habitat for the Pilbara olive python, critical foraging and dispersal habitat for the northern quoll and critical breeding and foraging habitat for the grey falcon. Sand Plain, Clay Plain and Clay Pan habitats are important for breeding, foraging and dispersal of the northern short-tailed mouse. Rock Piles, Rocky Outcrop and Gorge/ Gully provide critical breeding, foraging and dispersal habitat for northern quoll and Pilbara olive python. Two [REDACTED] within the Study Area ([REDACTED]) and two within 100 m of the Study Area ([REDACTED]) are classified as Category 2 roosts (permanent diurnal roosts) and represent critical habitat for ghost bats. Stony Plain, Drainage Area/ Floodplain, Sand Plain, Minor and Major Drainage Line habitats within 12 km of these roosts are considered to provide supporting foraging and dispersal habitat for the species.

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1 Introduction

1.1 Background

Azure Minerals Limited (Azure) is currently undertaking exploration activities at the Andover Lithium Project (the Project), located approximately 35 kilometres (km) southeast of Karratha and 5 km south of Roebourne, Western Australia (Figure 1-1).

Biologic Environmental Survey Pty Ltd (Biologic) previously undertook a basic vertebrate fauna survey for the project, covering 1,570 hectares (ha) within tenement E47/ 2481 in 2022. This was followed by three vertebrate fauna surveys in 2023, comprising basic and targeted work over an area of approximately 4,733ha within tenements E47/1068, E47/ 1096, E47/ 2481 and E47/4700. Results from these surveys indicated the presence, likely presence or suitable habitat of several conservation significant species that would require consideration during environmental assessment under Part IV of the WA *Environmental Protection Act 1986* (EP Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as species listed under both acts.

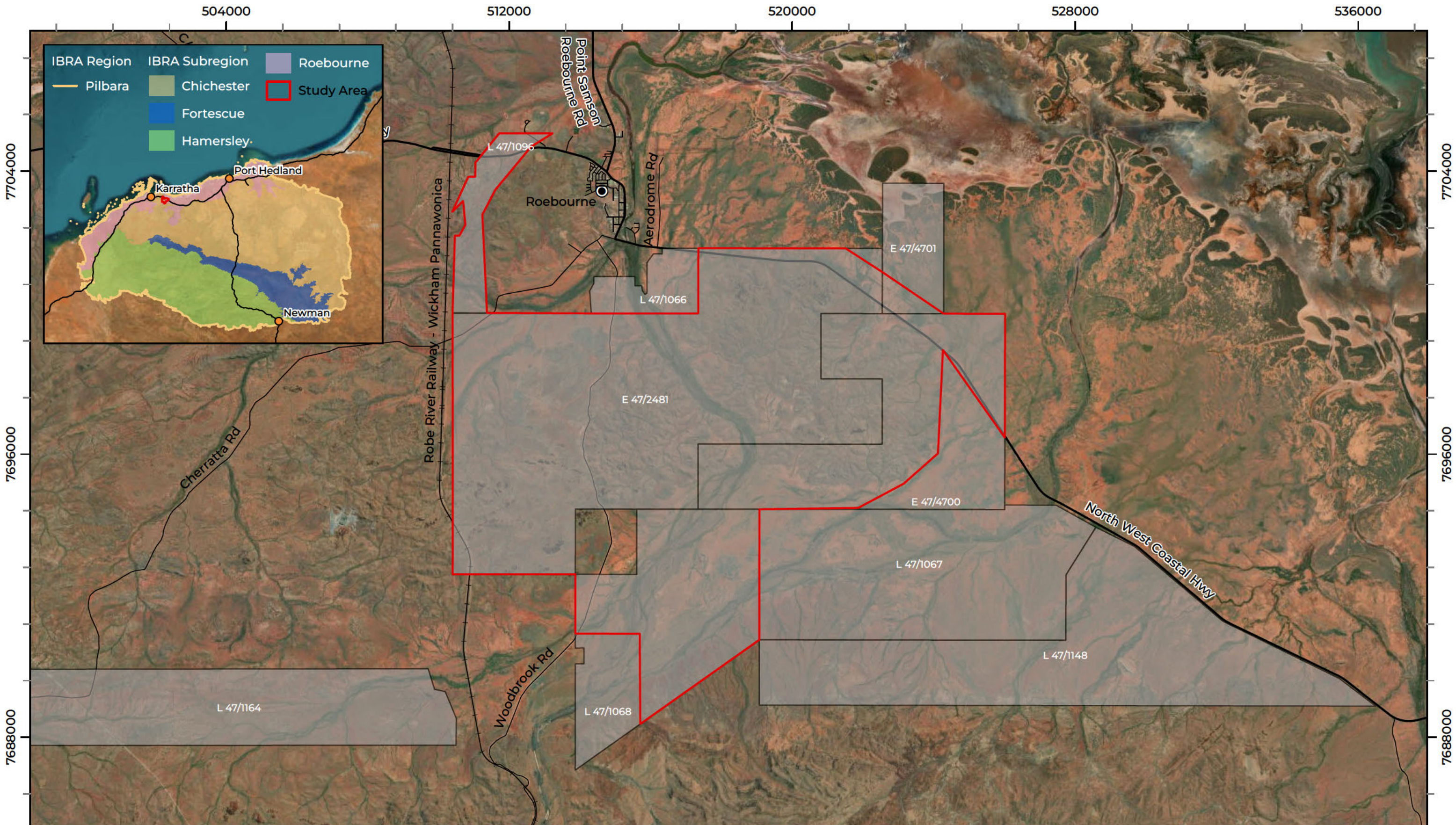
To provide contextual biological information to inform future environmental approvals for the Project, Azure commissioned Biologic to undertake a detailed terrestrial vertebrate fauna assessment in accordance with state and federal guidance documents. The Study Area for this assessment covers an area of approximately 12,278 ha and comprises the Lithium Exploration Area (tenements E47/ 2481, E47/ 4700, E47/ 4701 and E47/ 1068) and Groundwater North Area (L47/ 1096).

1.2 Scope and Objectives

The objective of the survey was to identify the occurrence of terrestrial vertebrate fauna species and their supporting habitats in the Study Area and identify any significant values that may require consideration during the Andover Project's design and/or approval process. Specifically, the key objectives of the assessment were to:

- Conduct a comprehensive desktop assessment (database searches and literature review) to identify terrestrial vertebrate fauna species known or potentially occurring within the Study Area;
- Define and delineate broad fauna habitats occurring within the Study Area, and describe their significance to vertebrate fauna (particularly significant species);
- Conduct a four-season detailed survey to identify terrestrial vertebrate fauna species and assemblages occurring within the Study Area;
- Assess the likelihood and distribution of significant vertebrate fauna species occurring within the Study Area and map areas of suitable habitat; and

- Provide a comprehensive survey report and associated spatial data.



LEGEND

Study Area	Local Road
AN Pending and Approved Tenements	State Road
	Rail

Biologic

Scale 1:100,000

0 2 4 Km

Coordinate System: GDA2020 MGA Zone 50 Transverse Mercator Created: 03/10/2025

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Figure 1.1: Study Area
and regional context

1.3 Compliance

1.3.1 Survey Guidance

This assessment was carried out with consideration of the following guidelines and recommendations published by the relevant state and federal regulatory bodies:

- Department of Biodiversity, Conservation and Attractions [DBCA] (2017) Guidelines for surveys to detect the presence of bilbies, and assess the importance of habitat in Western Australia;
- Department of Environment, Water, Heritage and the Arts [DEWHA] (2010a) Survey guidelines for Australia's threatened bats;
- DEWHA (2010b) Survey guidelines for Australia's threatened birds;
- Department of the Environment (2016) EPBC Act referral guideline for the endangered northern quoll (*Dasyurus hallucatus*);
- Department of Parks and Wildlife (2017) Interim guidelines for the preliminary surveys of night parrot (*Pezoporus occidentalis*) in Western Australia;
- Department of Biodiversity, Conservation and Attractions (DBCA, 2024e) Guidelines for determining the likely presence and habitat usage of night parrot (*Pezoporus occidentalis*) in Western Australia;
- DoE (2013) Significant impact guidelines 1.1: Matters of National Environmental Significance (MNES);
- Department of Sustainability, Environment, Water, Population and Communities [DSEWPac] (2011a) Survey guidelines for Australia's threatened mammals;
- DSEWPac (2011b) Survey guidelines for Australia's threatened reptiles;
- Environmental Protection Authority (2020) Technical guidance: terrestrial vertebrate fauna surveys for environmental impact assessment; and
- Environmental Protection Authority Statement of principles, factors and objectives.

1.3.2 Licensing and Ethics

All sampling was completed while holding the relevant licences:

- DBCA Regulation 27 "Fauna Taking (Biological Assessment) License" issued to Chris Knuckey - BA27000999 and BA27001371
- BC Act Section 40 DBCA "Authorisation to Take or Disturb Threatened Species" issued to Chris Knuckey - authorisation numbers TFA 2324-0199 and TFA 2526-0080.
- Department of Primary Industries and Regional Development (DPIRD) License to use animals for scientific purposes held by Biologic - License No. U244/ 2025-2027 and U244/ 2022-2024.
- Murdoch University Animal Ethics Committee approval - RW3354/ 21.

1.4 Background to the Protection of Flora and Fauna

Within Western Australia, native flora and fauna are protected under the *Biodiversity Conservation Act 2016* (BC Act) and at a national level under the EPBC Act (Table 1-1). Any action that has the potential to impact on native fauna or flora needs to be approved by relevant state and/or federal departments as dictated by the state EP Act and federal EPBC Act.

Some species of flora and fauna that are determined to be at risk of extinction or decline are afforded extra protection under these Acts. For the purposes of this report, these species are deemed to be significant species. Additionally, the EPBC Act identifies Threatened Ecological Communities (TECs) as ecological communities at risk of extinction. The BC Act provides for the statutory listing of TECs by the WA Minister for Environment (the Minister). A summary of the applicable legislation and status codes for ecological communities is provided in Table 1-1, with additional information on status codes provided in Appendix A.

For some species and ecological communities, there is insufficient information to determine their status. These species are generally considered by the EPA and DBCA as being of significance for environmental assessments and are listed on a 'Priority List' (Priorities 1, 2 and 3 for poorly known species and Priority 4 for rare and near threatened species) that is regularly reviewed and maintained by the DBCA (Table 1-1). Possible TECs that do not meet the criteria for statutory listing by the Minister for Environment are added to DBCA's 'Priority Ecological Communities' (PECs) lists under Priorities 1, 2, 3, 4 (Near Threatened) or 5 (Conservation Dependent).

Table 1-1: Significance assessment guidelines

Agreement, Act or List	Status Codes
Federal	
<i>Environment Protection and Biodiversity Conservation Act 1999</i> The Department of Climate Change, Energy, the Environment and Water DCCEEW lists Threatened flora, which are determined by the Threatened Species Scientific Committee (TSSC) per criteria set out in the Act. The Act lists flora and fauna that are considered to be of significance in the categories listed under 'Status Codes'.	Species • Extinct (EX) • Extinct in the Wild (EW) • Critically Endangered (CR) • Endangered (EN) • Vulnerable (VU) • Conservation Dependent (CD) • Migratory (MI)
TECs are those that are at risk of extinction.	TECs • Critically Endangered (CR) • Endangered (EN) • Vulnerable (VU)
State	
<i>Biodiversity Conservation Act 2016</i> At a state level, native flora, fauna and TECs are protected under the BC Act. Species in need of conservation are given a ranking ranging from Critically Endangered to Vulnerable.	Species • Extinct (EX) • Extinct in the Wild (EW) • Critically Endangered (CR) • Endangered (EN) • Vulnerable (VU) • Migratory (MI) • Conservation Dependent Fauna (CD) • Other Specially Protected Species (OS)
TECs are given a ranking ranging from Vulnerable to Presumed Totally Destroyed.	TECs • Presumed Totally Destroyed (PD) • Critically Endangered (CR) • Endangered (EN) • Vulnerable (VU)
DBCA Priority List DBCA produces a list of Priority species and ecological communities that have not been assigned statutory protection under the BC Act. This system gives a ranking from Priority 1 to Priority 4 for flora and fauna, and Priority 1 to Priority 5 for ecological communities.	• Priority 1 (P1) • Priority 2 (P2) • Priority 3 (P3) • Priority 4 (P4) • Priority 5 (PECs)(P5)

2 Existing Environment

2.1 Biogeography

The Study Area is located within the Pilbara biogeographic region, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA) (Thackway & Cresswell, 1995) (Figure 1-1). Approximately 55.86% (6,859.4 ha) of the Study Area occurs within the Roebourne subregion, with the remaining 44.14% (5,419.20 ha) occurring within the Chichester subregion (Figure 1-1).

The Roebourne subregion comprises quaternary alluvial and older colluvial coastal and sub-coastal plains supporting a grass savanna with dwarf shrub steppe of *Acacia*, with ephemeral drainage lines sustaining *Eucalyptus* woodlands emerging onto marine alluvial flats and river deltas featuring linear basalt ranges on the coastal plains (McKenzie *et al.*, 2003). The Chichester subregion is characterised by undulating Archaean granite and basalt plains supporting a shrub steppe characterised by *Acacia pyrifolia* over *Triodia pungens* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on significant areas of basaltic ranges (McKenzie *et al.*, 2003).

2.2 Climate

The Pilbara bioregion has a semi-desert to tropical climate, with rainfall occurring sporadically throughout the year, although mostly during summer (Thackway & Cresswell, 1995). Summer rainfall is usually the result of tropical low pressure systems and cyclonic activity in the region (Leighton, 2004). Winter rainfall is generally lighter and often associated with cold fronts moving north easterly across the state (Leighton, 2004). The average annual rainfall ranges from 200–350 mm, although there are significant fluctuations between years (BoM, 2023; McKenzie *et al.*, 2009).

Long-term climatic data is not available for the Study Area itself; however, data is available from the Bureau of Meteorology (BOM) weather station at Roebourne (004035), with climate data available for records between 1887–2015 (BoM, 2025). Mean maximum temperatures for the area range from 26.8°C (July) to 39.0°C (December), and mean minimum temperatures range from 13.6°C (July) to 26.2°C (January and February). Average annual rainfall is 314.6 mm, with peak rainfall occurring primarily in February and June (BoM, 2025).

While long-term climatic data has been taken from this station (004035); it should be noted that station ceased recording in 2015. BOM station Roebourne Aero (004090), began recording climate data in 2001 and is currently the closest recording station to the Study Area. Roebourne Aero station data has been used for observations in the immediate lead up to and during the survey itself.

2.3 Geology

The Roebourne and Chichester subregions have a long geological history, broadly comprising Archaean and Proterozoic metamorphic and sedimentary rocks with much younger (Tertiary) sedimentary deposits. Included in these terranes are granitoid rocks, basic and ultrabasic volcanic rocks, and acidic volcanic rocks (Tille, 2006). At a finer scale (1:80,000), the Study Area intersects nine bedrock geological units (Table 2-1; Figure 2-1). The dominant geological unit occurring within the Study Area is the Andover Intrusion, occupying approximately 63.42% of the Study Area (Table 2-1; Figure 2-1).

Table 2-1: Geology units within the Study Area

Unit Name	Geological Unit	Description	Extent in Study Area	
			Ha	%
Andover Intrusion	A-OPan-xo-a	Gabbro, leucogabbro, serpentinized peridotite and dunite, pyroxenite, and minor anorthosite; metamorphosed	7,787.46	63.42
Black Hill Well Monzogranite	A-OPbl-gm	Weakly foliated monzogranite; leucocratic veins; metamorphosed	1,739.00	14.16
Roebourne Group	A-RO-xb-u	Basalt and komatiite; minor chert; metamorphosed	1,176.80	9.58
Mount Gregory Monzodiorite	A-OPmg-gh	Monzodiorite; massive, medium- to coarse-grained; metamorphosed	788.82	6.42
Maitland River Supersuite	A-MR-g	Tonalite, granodiorite and monzogranite; K-feldspar phenocrysts in most intrusions; variably foliated; metamorphosed	461.46	3.76
Nickol River Formation	A-_nk-s	Quartzose sandstone, conglomerate, breccia, carbonate rocks, chert, and banded iron-formation; local felsic volcanic and intrusive rocks; metamorphosed	269.02	2.19
Regal Formation	A-_re-b	Massive and pillowed basalt, with local komatiitic peridotite; minor chert; metamorphosed	48.06	0.39
West Pilbara Superterrane mylonitic unit	A-myy-PWP	Mylonitic granitic, felsic and mafic volcanic, ultramafic, and sedimentary rocks	7.48	0.06
Mount Roe Basalt	A-FOr-b	Basaltic volcanic rock; local volcanoclastic and siliciclastic rocks	0.48	0.00
Total			12,278.60	100

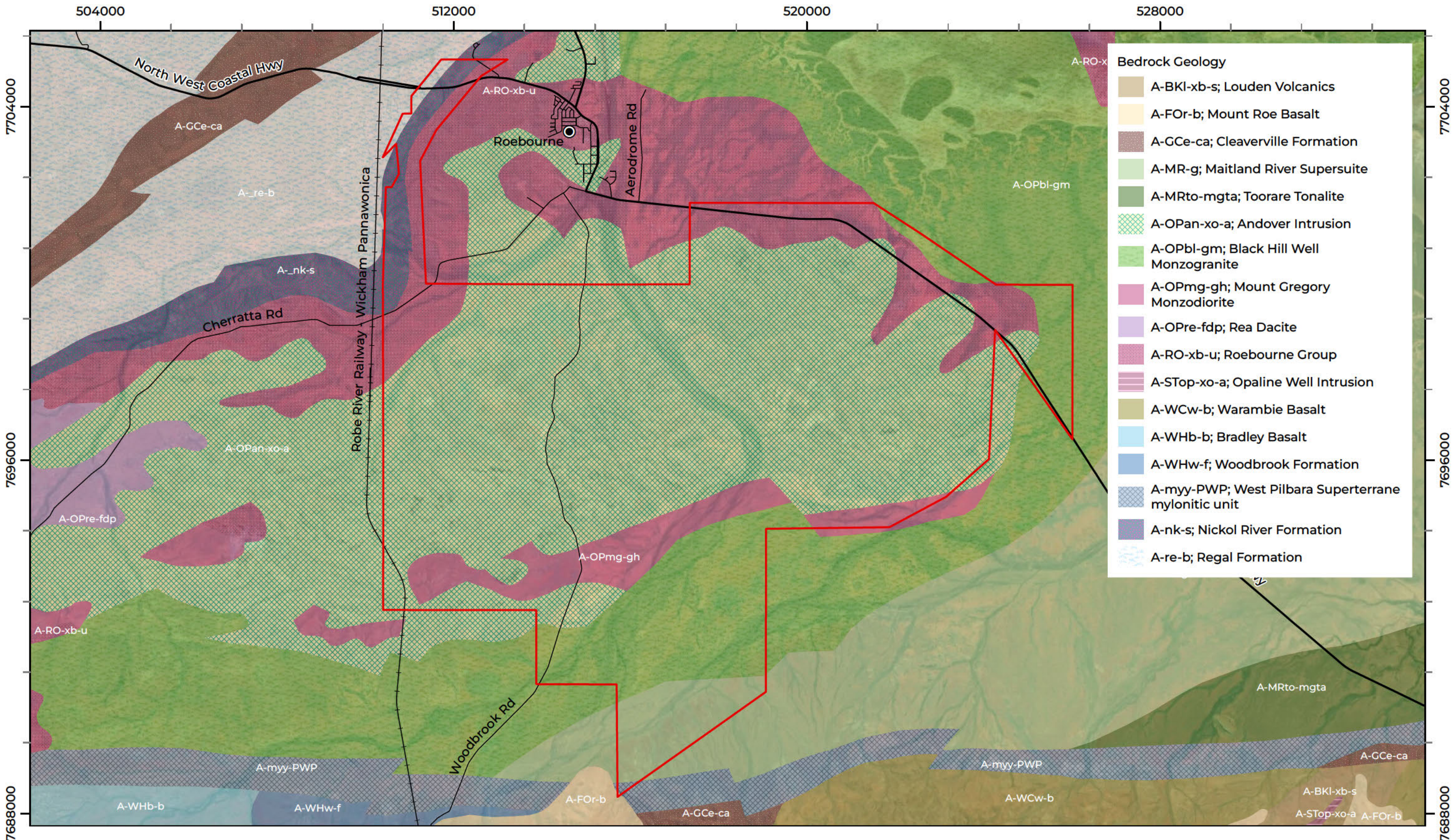
2.4 Soils

Soils of the alluvial plains along the Pilbara coast are for the most part sandy; however, where material is derived from basaltic rocks, mainly in the west around Roebourne and toward

Onslow, the soil may consist of “cracking clay”, a dark earth which cracks deeply in the dry season (Beard, 1990). The Atlas of Australian Soils, compiled by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) (2009), described and mapped the soils of Australia. The Study Area occurs across three soil units (Table 2-2; Figure 2-2).

Table 2-2: Soil units within the Study Area

Code	Description	Extent in Study Area	
		Ha	%
Cf1	Steep ranges on basic lavas along with dolomites.	6,396.35	52.09
MM17	Alluvial plains with occasional stony residuals of basic and ultrabasic rocks: chief soils are deep cracking clays (Ug5.38) but extensive areas of (Dr2.33) and (Uf6.71) soils occur. (Uc5.32) and (Uc1.22) soils occur as narrow bands along stream channels.	5,789.46	47.15
Fa19	Steep stony hills and ranges on metamorphosed basic and ultrabasic rocks.	92.79	0.76
Total		12,278.60	100



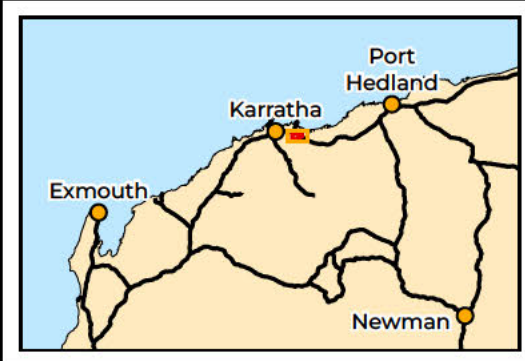
- LEGEND**
- Study Area
 - Local Road
 - State Road
 - + Rail

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Scale 1:80,000

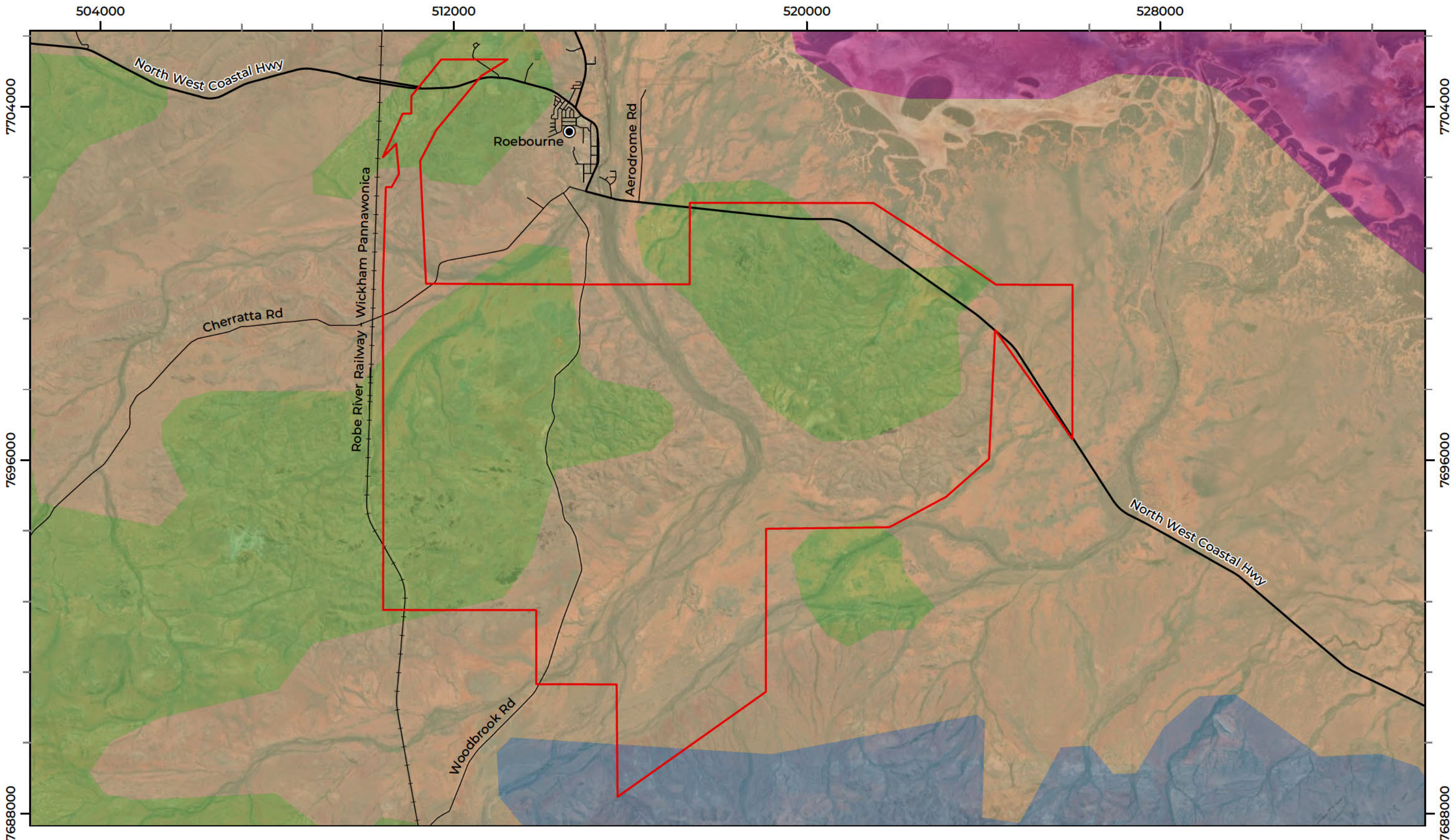
0 1 2 3 Km

Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 03/10/2025



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Figure 2.1: Broad geology
of the Study Area



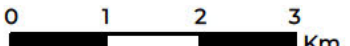
LEGEND

Study Area	Soil Unit
Local Road	Fa19
State Road	Gf1
Rail	MM17
	SV8

**Biologic**

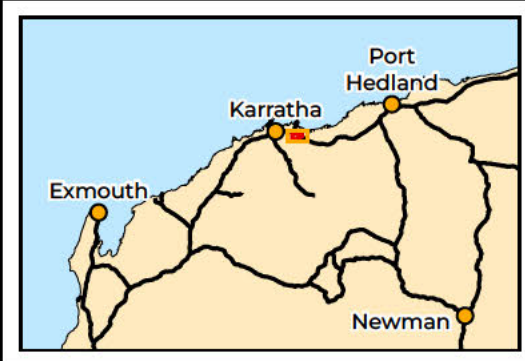


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Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 03/10/2025



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**Figure 2.2: Soils of the
Study Area**

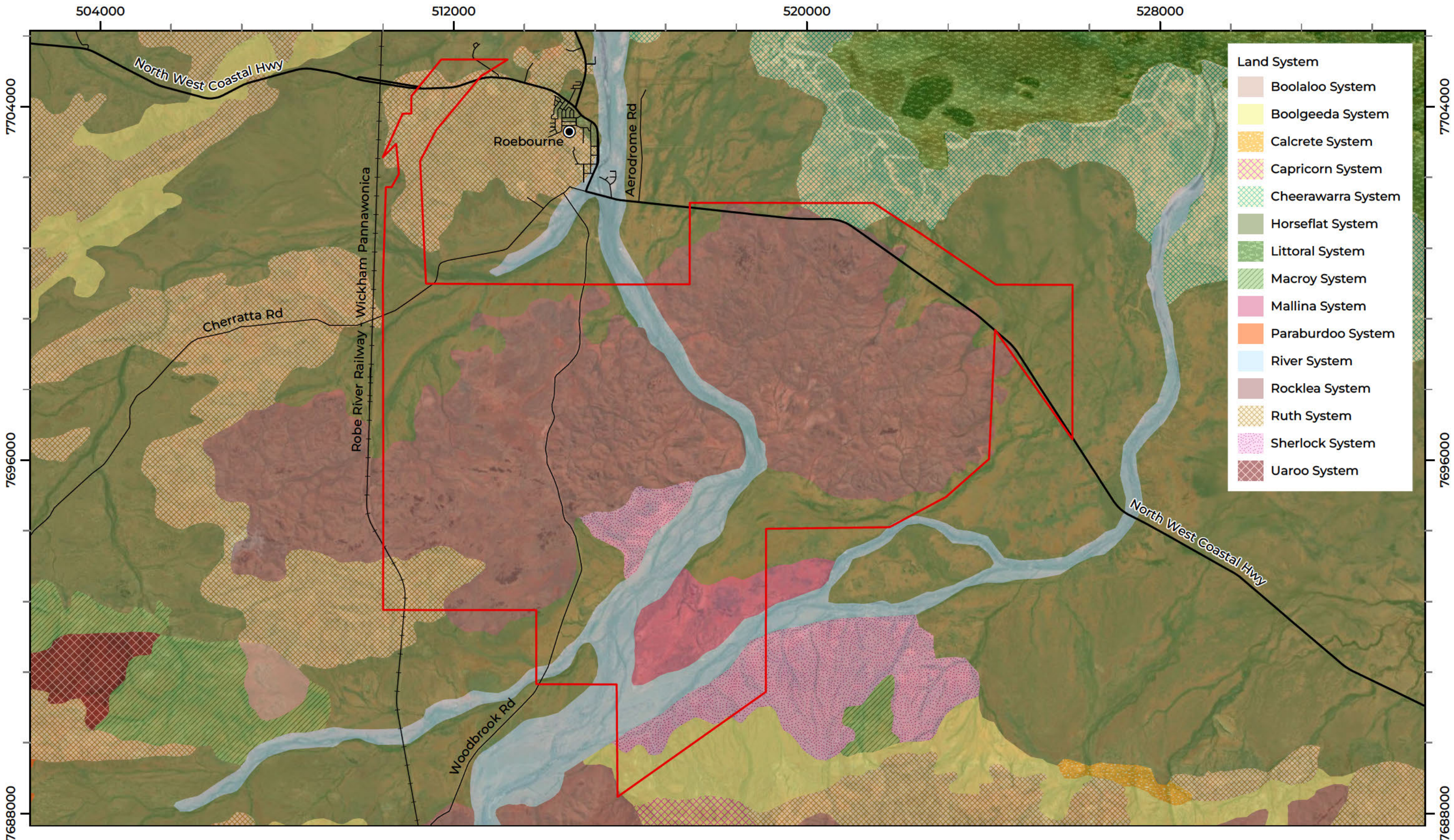
2.5 Land Systems

Van Vreeswyk *et al.* (2004) classified and mapped the land systems of the Pilbara bioregion according to similarities in landform, soil, vegetation, geology and geomorphology. An assessment of land systems provides an indication of the diversity and distribution of fauna habitats present within the Study Area.

The Study Area intercepts eight land systems (Table 2-3; Figure 2-3). The dominant land system is the Rocklea system, which covers approximately 54.9% of the Study Area, followed by the Horseflat system (22.53%), River system (8.74%) and Ruth system (4.95%). Of the eight land systems occurring within the Study Area, the Rocklea land system contains habitats most likely to be utilised by significant species, including the rocky ridges and boulder piles which provide critical denning, refuge and foraging habitats for northern quoll and Pilbara olive python. Additionally, hill slopes, rocky plains and minor drainage systems within this land system also provides a range of habitats which can provide supporting foraging and dispersal habitat for several other significant species.

Table 2-3: Land systems of the Study Area

Land system	Land type	Description	Extent in Study Area	
			Ha	%
Rocklea System	Hills and ranges with spinifex grasslands	Basalt hills, plateaux, lower slopes and minor Stony Plains supporting hard spinifex (and occasionally soft spinifex) grasslands.	6,740.50	54.90
Horseflat System	Alluvial plains with tussock grasslands	Gilgaied clay plains supporting Roebourne Plains grass grasslands and minor grassy snakewood shrublands.	2,766.93	22.53
River System	Flood plains and river channels with acacia shrublands	Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex.	1,073.52	8.74
Ruth System	Hills and ridges with spinifex grasslands	Hills and ridges of volcanic and other rocks supporting shrubby hard spinifex and occasionally soft spinifex grasslands.	520.33	4.24
Sherlock System	Alluvial plains with acacia shrubland	Stony alluvial plains supporting snakewood shrublands with patchy tussock grasses and spinifex grasslands	514.46	4.19
Mallina System	Alluvial plains with spinifex grasslands	Sandy surfaced alluvial plains supporting soft spinifex grasslands and minor hard spinifex and tussock grasslands.	463.01	3.77
Boolgeeda System	Stony slopes and plains with spinifex grasslands	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.	127.15	1.04
Cheerawarra System	Sandy and saline plains with spinifex grasslands	Sandy coastal plains and saline clay plains supporting soft and hard spinifex grasslands and minor tussock grasslands.	72.70	0.59
Total			12,278.60	100



- LEGEND**
- Study Area
 - Local Road
 - State Road
 - Rail



Biologic



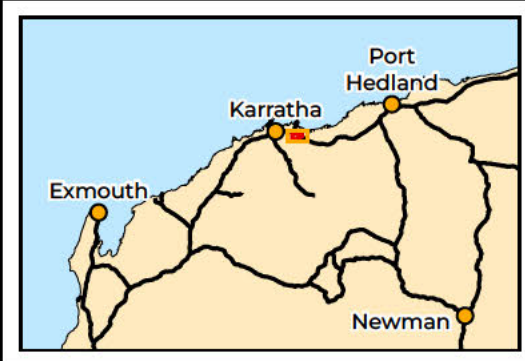
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Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator

Created: 03/10/2025



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**Figure 2.3: Land systems
of the Study Area**

2.6 Surface Hydrology

Uplands of the Study Area include Millstream and Chichester ranges with water from these ranges draining via the Harding Dam and Harding River northward toward Roebourne and the coast (Figure 2-4). The Harding River passes through the middle of the Study Area, with two large tributaries to the east and west, and a number of small ephemeral creek lines, which only flow after major rainfall events, occurring across the Study Area.

2.7 Pre-European Vegetation

Beard (1975) broadly (1:1,000,000) mapped the major structural vegetation types of Western Australia. Shepherd *et al.* (2002) reinterpreted and updated the vegetation association mapping to reflect the National Vegetation Information System (NVIS) standards (ESCAVI, 2003). This update also accounts for extensive clearing since Beard (1975) mapping. The Fortescue Botanical District is essentially a tree- and shrub-steppe with *Eucalyptus* trees, *Acacia* shrubs, *Triodia pungens* and *Triodia wiseana* (Beard, 1990). Some mulga (*Acacia aneura* and close relatives) occurs in valleys and there are short-grass plains on alluvia (Beard, 1990). The Study Area comprises six vegetation associations with the dominant association being 157 which is described as “Hummock grasslands, grass steppe; hard spinifex, *Triodia wiseana*” (Shepherd *et al.*, 2002) (Figure 2-5; Table 2-4).

Table 2-4: Pre-European vegetation of the Study Area

Vegetation system	Structural Description	Flora Description	Extent in Study Area	
			Ha	%
Abydos Plain - Chichester 157	Grass-steppe	Hummock grasslands, grass steppe; hard spinifex, <i>Triodia wiseana</i>	5,308.98	43.24
Abydos Plain 629	Short bunch-grass savanna / Grass-steppe	Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; hard spinifex, <i>Triodia wiseana</i>	3,572.45	29.09
Abydos Plain 589	Short bunch-grass savanna / Grass-steppe	Mosaic: Short bunch grassland - savanna/ grass plain (Pilbara) / Hummock grassland, grass steppe; soft spinifex	2,311.81	18.83
Abydos Plain 619	Woodland other	Medium woodland; river gum (<i>Eucalyptus camaldulensis</i>)	900.04	7.33
Abydos Plain - Chichester 152	Grass-steppe	Hummock grasslands, <i>Triodia spp.</i>	183.66	1.50
Abydos Plain 589	Short bunch-grass savanna / Grass-steppe	Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex	1.65	0.01
Total			12,278.60	100

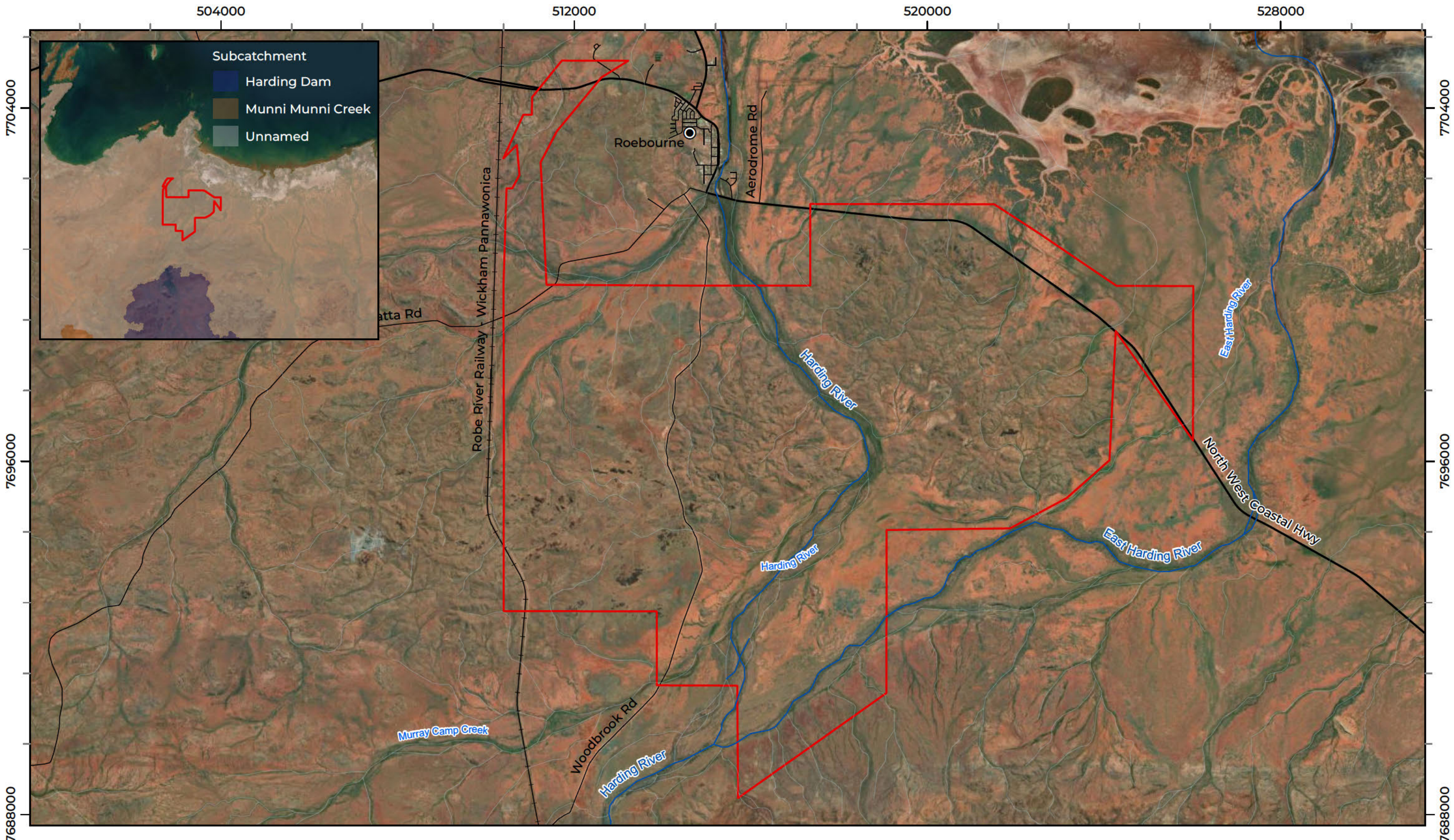
2.8 Threatened and Priority Ecological Communities

The Study Area occurs in the buffers of two state listed PECs, the Horseflat Land System of the Roebourne Plains PEC (Priority 3) and the Chenopod Vegetation Associations of the Roebourne Plains PEC (Priority 1) (Figure 2-6). Neither PECs occurring within the Study Area are of relevance to vertebrate fauna.

The Horseflat Land System of the Roebourne Plains are characterised as extensive, weakly gilgaied clay plains dominated by tussock grasslands on mostly alluvial non-gilgaied, red clay loams or heavy clay loams (DBCA, 2021). Perennial tussock grasses of the PEC include *Eragrostis xerophila* (Roebourne Plains grass) and other *Eragrostis* spp., *Eriachne* spp. and *Dichanthium* spp. (DBCA, 2021). The PEC is distributed across 11,561.95 ha (including an overlap of 552.17 ha with the Chenopod Vegetation Associations of the Roebourne Plains). of the Study Area; and extends more broadly from Cape Preston to Balla, surrounding the towns of Karratha and Roebourne (DBCA, 2021).

The Chenopod Vegetation Associations of the Roebourne Plain are dominated by *Eragrostis xerophila* and chenopods (*Sclerolaena*, *Atriplex* species) growing in saline clay soils with

moderate surface strew of pebbles and cobbles (DBCA, 2022). The Roebourne Chenopod Association is distributed across 1,473.68 ha of the Study Area. More broadly the PEC appears to be uncommon and only been located to date at Roebourne Airport and west of Karratha; however, it is likely some other small occurrences occur between Cape Preston and Mundabullangana (DBCA, 2021).



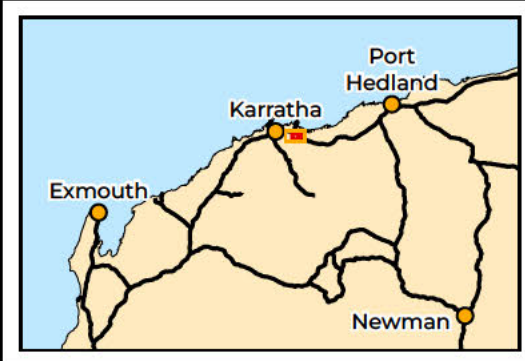
- LEGEND**
- | | |
|------------|--------------------------|
| Study Area | Surface Hydrology |
| Local Road | Minor |
| State Road | Major |
| Rail | |

 **Biologic**

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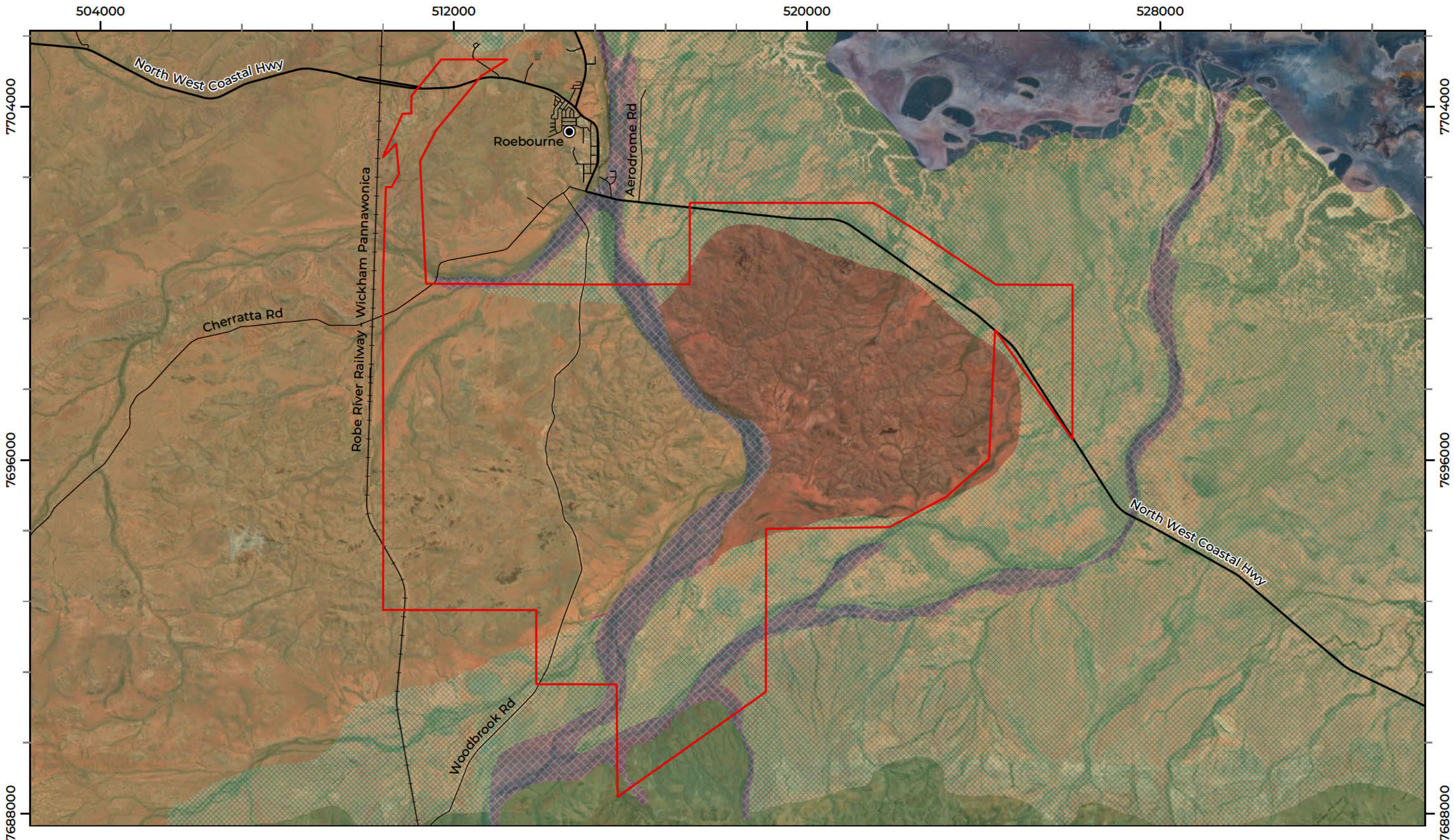
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Coordinate System: GDA 1994 MGA Zone 50 Transverse Mercator Created: 03/10/2025



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Figure 2.4: Surface hydrology of the Study Area



LEGEND

Study Area

Local Road

State Road

Rail

Vegetation Association

Abydos Plain - Chichester

Abydos Plain - Chichester 157

Abydos Plain - Chichester 589

Abydos Plain 127



Biologic

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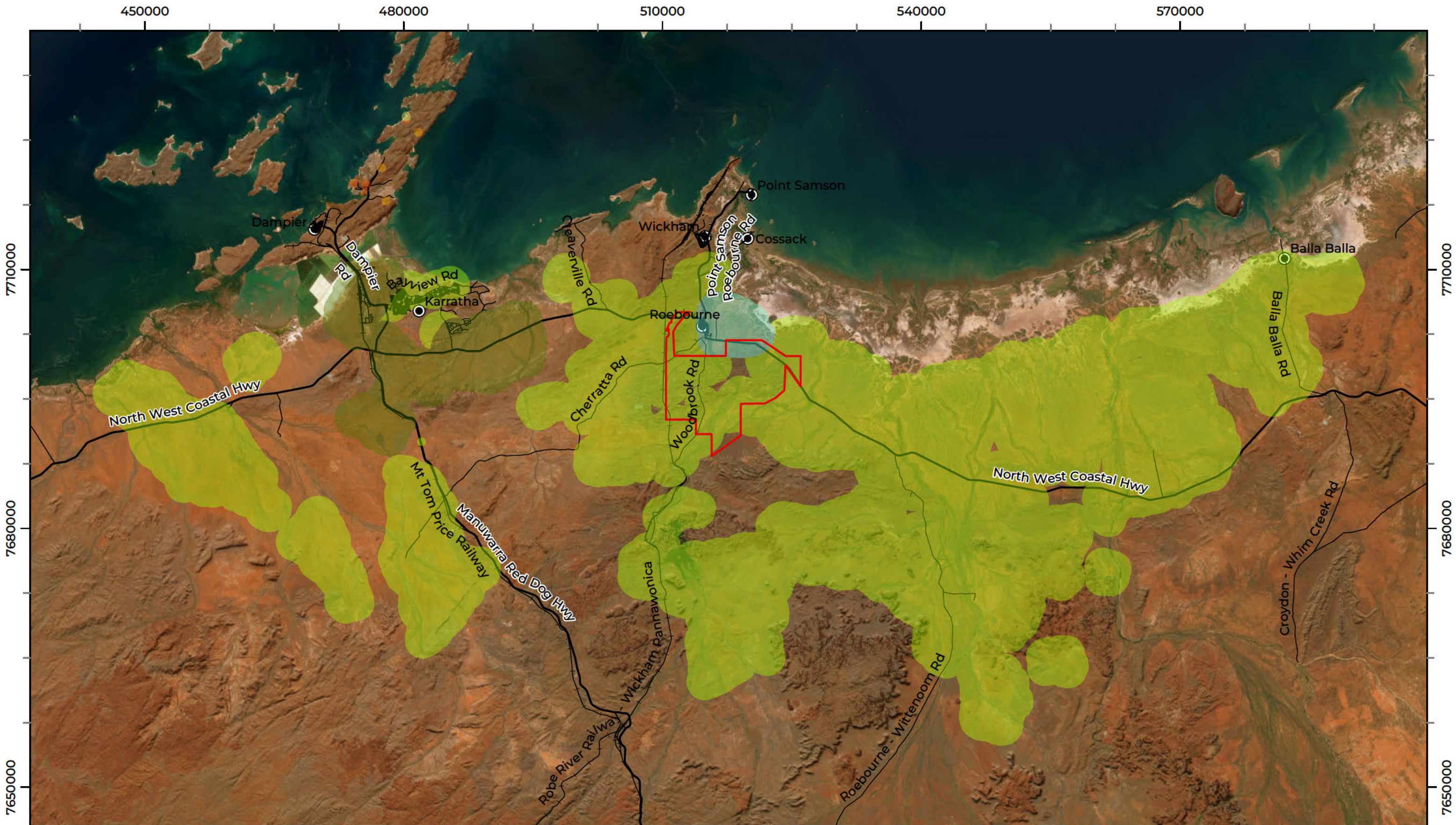
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Coordinate System: GDA 1994 MGA Zone 50
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Figure 2.5: Pre-European
vegetation associations
of the Study Area



LEGEND

Study Area

Local Road

State Road

Rail

Community - Category

Burrup Peninsula rock pile communities

Burrup Peninsula rock pool communities

Coastal dune native tussock grassland

Horseflat Land System

Roebourne Plains gilgai grasslands

Roebourne chenopod association

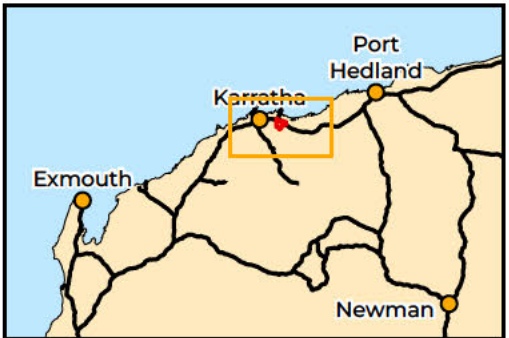


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Coordinate System: GDA 1994 MGA Zone 50 Transverse Mercator Created: 03/10/2025



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Figure 2.6: Threatened and Priority Ecological Community database search results

3 Desktop Assessment

A desktop assessment, comprising database searches and a literature review, was completed for the Study Area. The purpose of the desktop assessment was to identify vertebrate fauna and fauna habitats potentially occurring in the Study Area, with a focus on significant species. A summary of the methods and results of the desktop assessment are provided below.

3.1 Methods

3.1.1 Database Searches

Four fauna databases were searched, two to obtain information on all species previously recorded (Dandjoo and Birdata), one to identify species of significance previously recorded (Threatened and Priority Fauna Database) and one to identify significant species whose distribution overlaps with the Study Area (Protected Matters Search Tool) (Table 3-1).

Table 3-1: Details of database searches conducted

Database	Data access/ receipt date	Search area
Dandjoo (DBCA, 2025a)	21 January 2025	Central point of the Study Area (-20.8126, 117.1378) with a 50 km buffer
Birdata (BirdLife Australia, 2025)		
DBCA (2025b)Threatened and Priority Fauna Database		
DCCEEW (2025) Protected Matters Search Tool		50 km buffer around Study Area boundary

3.1.2 Literature Review

A review of available literature relevant to the Study Area was undertaken, utilising unpublished reports commissioned and provided by Azure, publicly available reports and the Index of Biodiversity Surveys for Assessment (IBSA) portal. A total of 25 vertebrate fauna reports were reviewed within approximately 70 km of the Study Area (Table 3-2). These reports include four studies previously undertaken by Biologic, which overlap the current Study Area.

Table 3-2: Literature sources used for the review

Report	Survey Type	Distance from Study Area
Biologic (2022). Andover Nickel-Copper Project Basic Terrestrial Vertebrate Fauna Survey	Basic	Within Study Area
Biologic (2024b). Andover Lithium Study Area Basic and Targeted Vertebrate Fauna Survey	Basic and Targeted	Within Study Area
Biologic (2024a). Andover Groundwater Study Area Basic and Targeted Vertebrate Fauna Survey	Basic and Targeted	Within Study Area
Biologic (2024c). Andover Nickel Study Area Basic and Targeted Vertebrate Fauna Survey	Basic and Targeted	Within Study Area
Ecoscape (2025). Andover Project Basic Terrestrial Vertebrate Fauna Survey	Basic	Adjacent to Study Area
Keith Lindbeck and Associates (2012). Roebourne Quarry Expansion Level 1 Fauna Survey	Basic	2.6 km W
Eco Logical (2012) Roebourne environmental scoping level 1 flora and fauna survey	Basic	5.7 km N
Phoenix (2010) Terrestrial vertebrate fauna survey for Anketell Point Rail Alignment and Port Projects	Detailed	6 km N
Biota (2009) West Pilbara Iron Ore Project Rail Corridor fauna survey	Detailed	6.9 km NNW to 90 km WSW
Biota (2008b) Rio Tinto Iron Ore Rail Duplication fauna survey: Cape Lambert Variation	Detailed	7.5 km N
GHD (2008) Report for 320 Mt Marshalling Yards, Maintenance Workshop and Quarry flora and fauna assessment	Basic	8 km N
Biota (2008a) Cape Lambert Port B Development seasonal fauna survey	Detailed	19 km N
GHD (2011). Report for Karratha Land Release - Amendment 21 Flora and Fauna Assessment	Basic	24 km W
360 Environmental (2021) Karratha and Boodarie Biological Surveys	Basic	28.8 km W
GHD (2019) Report for Horizon Power Line Upgrade Project	Basic and Targeted	29 km WNW
Eco Logical (2022) Karratha Rail Bridge Biological Survey	Basic	35 km W
Astron (2018) Burrup Peninsula Interconnector Pipeline flora and fauna survey	Basic	41 km NW
Animal Plant Mineral (2019) Perdaman Urea Project pre and post wet season biological surveys	Detailed	41 km NW
GHD (2021). Woodside Power Pty Ltd Solar PV Power Plant Fauna Survey	Basic	43.3 km W

Report	Survey Type	Distance from Study Area
AECOM (2021). Flora, Vegetation and Fauna Assessment Dampier Desalination Plant	Basic	44 km NW
Astron (2013). Millstream Transmission Corridor Level 1 Vegetation, Flora and Fauna Survey	Basic	47 km SW
Richardson (2007) Flora and fauna of Legendre Island	Detailed	53 km NNW
Phoenix (2018) Supplementary flora and vegetation survey and terrestrial fauna survey for the Balla Balla Infrastructure Project	Targeted	54 km E
Phoenix (2014) Terrestrial fauna surveys for the Balla Balla Railway Project	Basic and Targeted	54 km E
Phoenix (2023). Detailed terrestrial fauna and migratory shorebird surveys for the Eramurra Solar Salt Project	Detailed	68.5 km W

3.2 Results

The literature review and database searches identified 410 species of vertebrate fauna, which have previously been recorded and/or have the potential to occur within the Study Area. This comprised 50 mammals (including 41 native and nine non-native), 239 birds, 112 reptiles and nine amphibians (Table 3-3; Appendix B). Due to the size of the desktop assessment search area, and likelihood of encompassing habitats which may not occur within the Study Area, results of the desktop review are likely to include species which may not occur within the Study Area (e.g. marine bird species). Additionally, many species tend to be patchily distributed even where appropriate habitats are present, and many species of birds can occur as regular migrants, occasional visitors or vagrants. For the purposes of this desktop assessment, extinct species, pelagic bird species (i.e. petrels and albatross) and/or species that cannot physically occur within the Study Area (i.e. aquatic marine species) have been excluded from the database search results and are not discussed further.

Of the 410 species of vertebrate fauna identified by the desktop assessment, 63 are significant species, comprising seven mammals, 51 birds and five reptiles (Table 3-3; Figure 3-1). Of the 63 significant species identified as potentially occurring, 22 species are listed as Threatened, Conservation Dependent or Specially Protected under the EPBC Act and/or BC Act (including 12 species also listed as Migratory), 42 species are listed as Migratory under the EPBC Act and/or BC Act and seven species are listed as Priority by the DBCA (Table 3-3; Figure 3-1). Of these species, four have previously been recorded in the Study Area:

- Ghost bat (*Macroderma gigas*) – Vulnerable (EPBC Act and BC Act);
- Northern quoll (*Dasyurus hallucatus*) - Endangered (EPBC Act and BC Act);
- Pilbara olive python (*Liasis olivaceus*) - Endangered (EPBC Act and BC Act); and

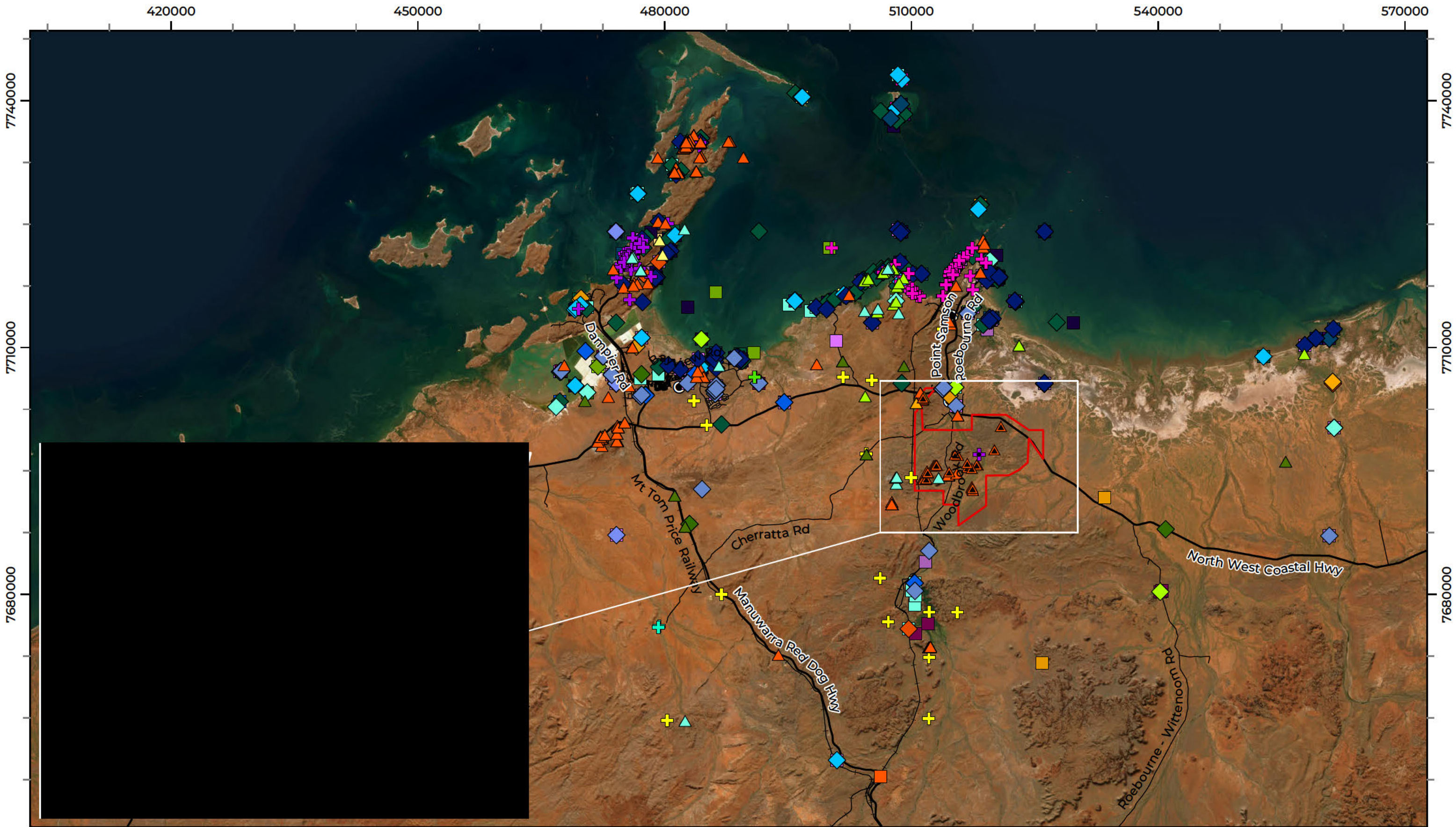
- Western pebble-mound mouse (*Pseudomys chapmani*) - Priority 4 (DBCA).

Table 3-3: Significant species identified in the desktop assessment

Scientific name	Common name	EPBC Act	BC Act	DBCA	Recorded Within Study Area
Mammals					
<i>Dasyurus hallucatus</i>	Northern quoll	EN	EN		•
<i>Macroderma gigas</i>	Ghost bat	VU	VU		•
<i>Ozimops cobourgianus</i>	Northern coastal free-tailed bat			P1	
<i>Leggadina lakedownensis</i>	Short-tailed mouse			P4	
<i>Pseudomys chapmani</i>	Western pebble-mound mouse			P4	•
<i>Rhinonictis aurantia</i> 'Pilbara form'	Pilbara leaf-nosed bat	VU	VU		
<i>Macrotis lagotis</i>	Bilby	VU	VU		
Birds					
<i>Erythrotriorchis radiatus</i>	Red goshawk	EN	VU		
<i>Pandion haliaetus cristatus</i>	Eastern osprey	MI	MI		
<i>Apus pacificus</i>	Fork-tailed swift	MI	MI		
<i>Charadrius leschenaultii</i>	Greater sand plover	VU/ MI	VU		
<i>Charadrius mongolus</i>	Lesser sand plover	EN/ MI	EN		
<i>Charadrius veredus</i>	Oriental plover	MI	MI		
<i>Pluvialis fulva</i>	Pacific golden plover	MI	MI		
<i>Pluvialis squatarola</i>	Grey plover	MI	MI		
<i>Falco hypoleucos</i>	Grey falcon	VU	VU		
<i>Falco peregrinus</i>	Peregrine falcon		OS		
<i>Glareola maldivarum</i>	Oriental pratincole	MI	MI		
<i>Hirundo rustica</i>	Barn swallow	MI	MI		
<i>Chlidonias leucopterus</i>	White-winged black tern	MI	MI		
<i>Gelochelidon nilotica</i>	Gull-billed tern	MI	MI		
<i>Onychoprion anaethetus</i>	Bridled tern	MI	MI		
<i>Thalasseus bergii</i>	Crested tern	MI	MI		

Scientific name	Common name	EPBC Act	BC Act	DBCA	Recorded Within Study Area
<i>Hydroprogne caspia</i>	Caspian tern	MI	MI		
<i>Sterna dougallii</i>	Roseate tern	MI	MI		
<i>Sterna hirundo</i>	Common tern	MI	MI		
<i>Sternula nereis</i>	Fairy tern	MI	MI		
<i>Sternula albifrons</i>	Little tern	VU	VU		
<i>Motacilla cinerea</i>	Grey wagtail	MI	MI		
<i>Pezoporus occidentalis</i>	Night parrot	CR	CR		
<i>Rostratula australis</i>	Australian painted snipe	EN	EN		
<i>Actitis hypoleucos</i>	Common sandpiper	VU/ MI	MI		
<i>Arenaria interpres</i>	Ruddy turnstone	VU/ MI	MI		
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	MI	MI		
<i>Calidris alba</i>	Sanderling	VU/ MI	EN		
<i>Calidris canutus</i>	Red knot	CR/ MI	CR		
<i>Calidris ferruginea</i>	Curlew sandpiper	MI	MI		
<i>Calidris melanotos</i>	Pectoral sandpiper	MI	MI		
<i>Calidris ruficollis</i>	Red-necked stint	MI	MI		
<i>Calidris subminuta</i>	Long-toed stint	VU/ MI	CR		
<i>Calidris tenuirostris</i>	Great knot	MI	MI		
<i>Gallinago stenura</i>	Pin-tailed Snipe	MI	MI		
<i>Calidris falcinellus</i>	Broad-billed sandpiper	VU/ MI	MI		
<i>Limnodromus semipalmatus</i>	Asian dowitcher	MI	MI		
<i>Limosa lapponica</i>	Bar-tailed godwit	EN	CR		
<i>Limosa lapponica menzbieri</i>	Yakutian bar-tailed godwit	EN/ MI	MI		
<i>Limosa limosa</i>	Black-tailed godwit	CR/ MI	CR		
<i>Numenius madagascariensis</i>	Eastern curlew	MI	MI		

Scientific name	Common name	EPBC Act	BC Act	DBCA	Recorded Within Study Area
<i>Numenius minutus</i>	Little curlew	MI	MI		
<i>Numenius phaeopus</i>	Whimbrel	MI	MI	P4	
<i>Phalaropus lobatus</i>	Red-necked phalarope	MI	MI		
<i>Tringa brevipes</i>	Grey-tailed tattler	MI	MI		
<i>Tringa glareola</i>	Wood sandpiper	MI	MI		
<i>Tringa nebularia</i>	Common greenshank	EN/ MI	MI		
<i>Tringa stagnatilis</i>	Marsh sandpiper	MI	MI		
<i>Tringa totanus</i>	Common redshank	MI	MI		
<i>Xenus cinereus</i>	Terek sandpiper	VU/ MI	MI		
<i>Plegadis falcinellus</i>	Glossy ibis	MI	MI		
Reptiles					
<i>Liasis olivaceus barroni</i>	Pilbara olive python	VU	VU		•
<i>Ctenotus angusticeps</i>	Northwestern coastal ctenotus			P3	
<i>Lerista neviniae</i>	Nevin's slider	EN	EN		
<i>Lerista quadrivincula</i>	Four-lined slider			P1	
<i>Notoscincus butleri</i>	Lined soil-crevice skink			P4	



LEGEND

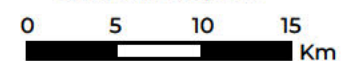
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-  Local Road
-  State Road
-  Rail



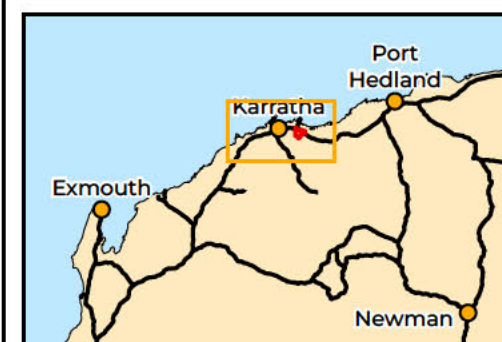
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Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 31/10/2025



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Figure 3.1: Significant
vertebrate fauna species
identified in the
desktop assessment

4 Field Survey Methods

4.1 Survey Timing and Personnel

Four detailed field surveys were undertaken from 19–29 February 2024, 14–24 October 2024, 4–14 March 2025 and 14–23 August 2025 by zoologists with extensive experience undertaking vertebrate fauna surveys in the Pilbara region (Table 4-1).

Table 4-1: Survey personnel and experience

Personnel	Qualification	Experience	Trip 1	Trip 2	Trip 3	Trip 4
Aidan Williams Senior Zoologist • field survey	BSc Conservation Biology and Botany	10 years' Environmental Impact Assessment (EIA) (consulting) 10 years' field survey 8 years' vertebrate zoology/ ecology	•	•	•	
Aleesha Turner Zoologist • field survey	BSc Zoology (Hons)	5 years' EIA (consulting) 7 years' field survey 7 years' vertebrate zoology/ ecology	•	•		
April Slater Zoologist • field survey • report writing	BSc Conservation Biology and Marine Science	4 years' EIA (consulting) 5 years' field survey 3 years' vertebrate zoology/ ecology	•	•	•	•
Eryn Quek Graduate Zoologist • field survey	BSc Zoology	1 year EIA (consulting) 2 years' field survey 4 years' vertebrate zoology/ ecology		•		
Jari Cornelis Senior Zoologist • field survey	MSc Philosophy BSc Zoology and Ecology	7 years' EIA (consulting) 8 years' field survey 8 years' vertebrate zoology/ ecology	•	•		
Katelyn Gibson Senior Zoologist • field survey	BASc Wildlife Science	7 years' EIA (consulting) 8 years' field survey 8 years' vertebrate zoology/ ecology				•
Robert Audcent Graduate Zoologist • field survey	BSc Wildlife Conservation & Biology	2 years' EIA (consulting) 5 years' field survey 5 years' vertebrate zoology/ ecology	•	•		

Personnel	Qualification	Experience	Trip 1	Trip 2	Trip 3	Trip 4
Sam Ronan Zoologist • field survey	BSc Environmental Biology	5 years' EIA (consulting) 7 years' field survey 5 years' vertebrate zoology/ ecology	•			
Sammy Alatas Environmental Technician • field survey	-	3 years EIA (consulting) 4 years' field survey 2 years' zoology/ ecology		•		
Thomas Rasmussen Principal Zoologist • field survey	-	19 years' EIA (consulting) 19 years' field survey 19 years' vertebrate zoology/ ecology		•		

4.2 Climate and Weather

Weather recorded leading up to and during the surveys (November 2023 to August 2025) was obtained from Roebourne Aero weather station (Station 004090), approximately 15 km north of the Study Area (BoM, 2024).

During the three months prior to the February 2024 survey, 0.6 millimetres (mm) of rainfall was recorded, which is significantly lower than the long-term average (LTA 75.3 mm) for the same period (Figure 4-1) (BoM, 2024). The three months prior to the October 2024 survey recorded 48.8 mm of rainfall which is considerably higher than the LTA of 14 mm for the same period (Figure 4-1) (BoM, 2024). Overall, total rainfall was 102.8 mm less than the LTA (264.6 mm) for the 12 month period from November 2023 to October 2024 (Figure 4-1) (BoM, 2024). Observed minimum and maximum temperatures were comparable to the LTA temperatures for the same period, with a slightly higher temperature trend overall (Figure 4-1) (BoM, 2024).

A significant rainfall event occurred in January 2025, resulting in a higher than average (LTA 130 mm) total of 229 mm of rainfall during the three months prior to the March 2025 survey (BoM, 2025). During the three months prior to the August 2025 survey, significantly less rainfall (11.4 mm) than the long term average of 78.9 mm was recorded. Rainfall for the 12 month period from September 2024 to August 2025 was 299.4 mm, above the LTA of 264.6 mm.

Observed minimum and maximum temperatures from November 2023 to August 2025 were comparable to the LTA temperatures for the same period, with a slightly higher temperature trend overall (Figure 4-1) (BoM, 2025).

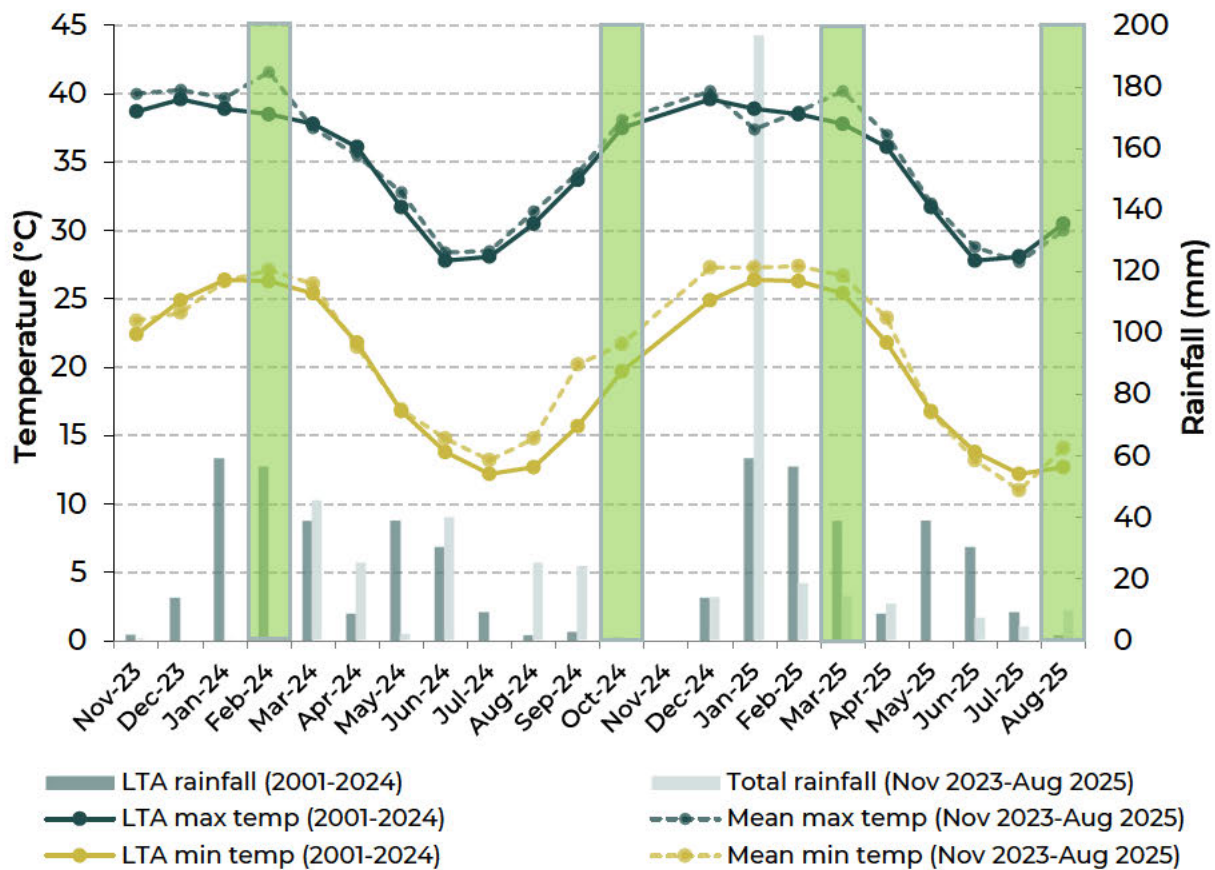


Figure 4-1: Long-term and current climatic data for Roebourne Aero (station 004090) with approximate survey timing shown in the light green shaded boxes

4.3 Sampling Methods

4.3.1 Habitat Assessments and Mapping

Fauna habitat assessments were undertaken in the field to characterise and define habitats and their significance to vertebrate fauna. Habitat assessments were undertaken at 143 locations across the Study Area during the surveys (Figure 4-3).

Habitat assessments were conducted using methodology and terminology modified from the *Australian Soil and Land Survey Field Handbook* (National Committee on Soil and Terrain, 2009). The characteristics recorded during the habitat assessments were:

- site information: location and photo;
- habitat: broad habitat type, landform, aspect, slope, soil type and availability, rocky outcropping presence and type;
- ground cover: rock size, vegetation litter and woody debris;
- vegetation: broad vegetation type, structure and dominant species;
- microhabitat: rocky cracks/ crevices, burrowing suitability, hollow presence and abundance, water presence; and

- condition: time since fire, disturbance and overall habitat condition.

Fauna habitat mapping was completed for the Andover Nickel, Lithium, and Ground Water Projects (Biologic, 2022, 2024a, 2024b, 2024c), which includes part of the Study Area. Fauna habitat mapping was completed for previously unmapped sections of the Study Area using habitat assessments completed during field surveys, high-resolution aerial imagery, and vegetation, topographical, geological and soil mapping. Habitats were delineated and mapped at a scale of approximately 1:10,000 and aligned with the existing mapping where possible.

4.3.2 Water Feature Assessments

Six water features ([REDACTED]) were assessed in the Study Area during the survey. Three water features ([REDACTED]) recorded during previous surveys underwent check-up assessments. The assessments aimed to define and characterise the features and identify the likelihood of significant species utilising them. The characteristics recorded during water feature assessments were:

- dimensions: length, width, depth;
- water presence: above the surface, in the intermediate zone;
- location and photograph;
- vegetation: obligate phreatophytes, emergent macrophytes; and
- presence of fauna.

4.3.3 Systematic Trapping Sites

Thirteen (13) systematic trapping sites were installed throughout the survey. Site location was selected to sample the most widespread and significant habitats, whilst ensuring adequate coverage of the Study Area. Each site was open for a total of 14 nights spread across two phases of sampling. A summary of trap site locations and sampling is presented in Table 4-2. Traps were checked daily within three hours of sunrise. To comply with ethics licensing conditions, traps were closed during the day and re-opened in the afternoon if temperatures were forecast to exceed 35 °C. During phase three, Elliott and cage traps were not utilised due to high nocturnal temperatures. This is further discussed in Section 5.5.3. Each site consisted of the following (Figure 4-2):

- Pit traps – ten pit traps were installed at all sites. This included five 20 litre buckets and five PVC pipes (16 centimetres (cm) diameter and 50 cm deep). Traps were installed approximately 10–20 metres (m) apart along a single transect with a 10 m long by 0.3 m high aluminium drift fence bisecting each pit trap. Traps were placed in microhabitats deemed most likely to catch fauna (areas with dense ground cover, litter, rocks etc.) and

most representative of the broad fauna habitat occurring at the site. Styrofoam trays were placed within all pits to provide refuge for any captured fauna from exposure to environmental conditions (i.e. temperature, wind and rainfall) and predators;

- Funnel traps – 20 funnel traps were placed in each site, with one placed at either end of the drift fence bisecting each pit trap;
- Elliott traps – 20 medium (Type B) Elliott style box traps were placed at each site. Traps were placed along two parallel transects adjacent to pit traps and positioned approximately 10–20 m apart in areas protected by shade;
- Cage traps – two cage traps (20 x 20 x 56 cm) were located at each site, with one placed at each end of the trap site transect;
- Camera traps – two camera traps were placed at each site with inaccessible bait tubes to survey for larger and/or cryptic species, including significant species which may not typically be recorded by other sampling methods; and
- Ultrasonic recorder – one ultrasonic recorder was placed at each site to survey for bat species which may not be typically recorded by other sampling methods at a systematic trapping site.

Figure 4-2 Layout of traps at a systematic sampling site

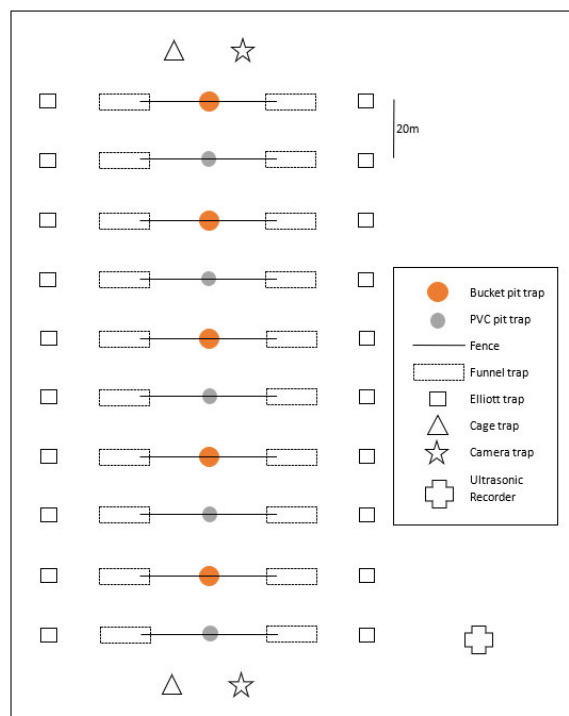


Table 4-2 Summary of systematic sampling site locations and timing

Site ID	Habitat	Phase 1 (Feb 2024)	Phase 2 (Oct 2024)	Phase 3 (Mar 2025)	Phase 4 (Aug 2025)
[REDACTED]	Major Drainage Line	•	•		
	Low Hills and Slopes	•	•		
	Clay Plain	•	•		
	Rock Piles	•	•		
	Major Drainage Line	•			•
	Stony Plain	•	•		
	Claypan	•	•		
	Major Drainage Line		•		
	Rock Piles		•	•	
	Stony Plain		•	•	
	Clay Plain			•	•
	Sand Plain			•	•
	Minor Drainage Line			•	•

¹ Closed during the March 2025 survey after two nights of trapping, due to unacceptable levels of ant activity

² Open for 13 nights during the survey period, this is discussed further in Section 5.5.3

Four habitat types (Claypan, Minor Drainage, Low Hills and Slopes, and Sand Plain) had only one systematic sampling site. This was due to the size of the area and likelihood of recording similar species assemblages to that in surrounding habitat types. No systematic trapping was undertaken within Rocky Outcrop or Gorge/ Gully habitats. This was due to the small and isolated occurrence of these habitat types, which limited suitability for trapping (trap site installation was unlikely to provide a sufficient representation of the habitat). Systematic trapping was not undertaken in Drainage Area/ Floodplain habitat, but four trap sites ([REDACTED]) were located within a broader landform of Drainage Area/ Floodplain.

4.3.4 Avifauna Sampling

An avifauna census was undertaken daily at each systematic trapping site between 0600 hrs and 1030 hrs. The census was undertaken for approximately 20 minutes within an area of 2 ha and confined to the habitat type represented by the trapping site. Birds were recorded from either direct observation, call or secondary evidence such as feathers or tracks. The order of site visitation each morning and personnel present was rotated, to reduce bias due to timing of arrival or observer (Lindenmayer *et al.*, 2009). Table 4-3 shows avifauna census effort at each systematic sampling site. Additionally, eight person hours of avifauna censuses were undertaken at targeted locations within the Study Area. A total of 66.59 hours of avifauna sampling was undertaken during the survey.

Table 4-3 Avifauna censuses undertaken at systematic sampling sites

Site ID	Habitat	Person Hours
	Major Drainage Line	4.66
	Low Hills and Slopes	4.66
	Clay Plain	4.66
	Rock Piles	4.66
	Major Drainage Line	4.66
	Stony Plain	4.66
	Claypan	4.66
	Major Drainage Line	3
	Rock Piles	4.66
	Stony Plain	4.66
	Clay Plain	4.66
	Sand Plain	4.66
	Minor Drainage Line	4.33
	Sand Plain	1
	Minor Drainage Line	1
	Major Drainage Line	1.5
	Major Drainage Line	1.5
	Minor Drainage Line	3
Total		66.59

4.3.5 Nocturnal Searches

Nocturnal Searches consisted of dusk counts for ghost bats and head torch surveys for nocturnal species.

Dusk counts targeting ghost bat were undertaken for one to four person hours post sunset at abandoned mine shafts within or adjacent to the Study Area (Table 4-4).

Nocturnal surveys involving searches using head torches were undertaken between the hours of 0700 hrs and 2130 hrs to detect presence of nocturnal fauna species, in particular northern quoll and Pilbara olive python. Surveys were conducted at one systematic site [REDACTED] and five opportunistic sites (Table 4-4). A total of 37.75 person hours of nocturnal searching (including ghost bat counts) was completed at 12 locations across the Study Area.

Table 4-4 Nocturnal searches undertaken in the Study Area

Phase	Site	Search Type	Date	Person Hours	Habitat
One		Nocturnal search	27/02/2024	1.5	Minor Drainage Line
		Dusk ghost bat count	25/02/2024	2	Stony Plain
		Dusk ghost bat count	26/02/2024	2	Stony Plain
		Dusk ghost bat count	25/02/2024	1	Mine Shaft
		Dusk ghost bat count	26/02/2024	1	Mine Shaft
Two		Nocturnal search	22/10/2024	3	Rock Piles
		Dusk ghost bat count	20/10/2024	1.5	Mine Shaft
		Dusk ghost bat count	22/10/2024	1.5	Mine Shaft
		Dusk ghost bat count	20/10/2024	1	Mine Shaft
		Dusk ghost bat count	20/10/2024	2	Mine Shaft
		Dusk ghost bat count	22/10/2024	1.5	Mine Shaft
		Dusk ghost bat count	22/10/2024	1.5	Mine Shaft
		Nocturnal search	21/10/2024	2.5	Rock Piles
Three		Nocturnal search	12/03/2025	3	Minor Drainage Line
		Dusk ghost bat count	12/03/2025	1	Mine Shaft
	Dusk ghost bat count	12/03/2025	1.5	Mine Shaft	
	Nocturnal search	10/03/2025	1.5	Rock Piles	
	Nocturnal search	12/03/2025	1	Minor Drainage Line	
	Nocturnal search	10/03/2025	1	Major Drainage Line	
	Nocturnal search	10/03/2025	1.25	Minor Drainage Line	
Four	Dusk ghost bat count	22/08/2025	4	Mine Shaft	
	Nocturnal search	22/08/2025	1.5	Minor Drainage Line	
Total				37.75	

4.3.6 Targeted Searches

Where habitat or habitat features (e.g. water features) were recorded within the Study Area which provided suitable denning, roosting and/or foraging habitat for significant species, traverses were undertaken to identify the presence of target species (via direct observation and/or secondary evidence). Searches focussed on northern quoll, Pilbara olive python and bilby (i.e. plot searches, see Section 4.3.9). Active foraging in microhabitats likely to support vertebrate fauna was undertaken during targeted searches. This included raking through leaf litter and dead spinifex, overturning rocks, logs and anthropogenic debris, and investigating burrows and rock piles. A total of 38.13 person hours of targeted searching was completed at 20 locations across the Study Area (Table 4-5).

Table 4-5: Targeted searches undertaken in the Study Area

Phase	Site	Date	Person Hours	Habitat
One		23/02/2024	3	Rock Piles
		23/02/2024	2	Gorge/ Gully
		24/02/2024	0.5	Clay Plain
		25/02/2024	0.5	Clay Plain
		24/02/2024	3	Minor Drainage Line
Two		19/10/2024	0.33	Clay Plain
		17/10/2024	0.5	Sand Plain
		16/10/2024	1	Clay Plain
		17/10/2024	0.3	Stony Plain
		20/10/2024	2	Minor Drainage Line
Three		7/03/2025	2.5	Rock Piles
		9/03/2025	2.5	Rock Piles
		10/03/2025	0.4	Sand Plain
		10/03/2025	2	Major Drainage Line
		10/03/2025	0.25	Sand Plain
		10/03/2025	2	Minor Drainage Line
		11/03/2025	0.25	Sand Plain
		13/03/2025	1.5	Major Drainage Line
Four		17/08/2025	4	Gorge/ Gully
		21/08/2025	1	Gorge/ Gully
		17/08/2025	5	Rock Piles
		20/08/2025	3	Minor Drainage Line
		19/08/2025	0.6	Sand Plain
		Total		38.13

4.3.7 Targeted Sampling – Northern Quoll Camera Trap Transects

Ten camera trap transects targeting northern quoll were deployed throughout the Study Area in critical breeding/ shelter habitat (e.g. Rock Piles and Gorge/ Gully) and supporting foraging and dispersal habitats (Table 4-6; Figure 4-3). Targeted sampling and survey effort followed recommendations of DoE (2016), and comprised ten camera traps deployed approximately 50–100 m apart. Each transect was deployed for a minimum of four consecutive nights for a total of 396 trap nights (Table 4-6).

Where possible, cameras were oriented to enable differentiation of individuals via spot patterning (following Hohnen *et al.*, 2012) and baited with universal bait mixture (comprising oats, peanut butter and sardines) contained within a non-reward receptacle (perforated and capped PVC pipe).

Since one individual may be detected at a location on multiple occasions, it was important to determine whether each capture event was a new or a previously recorded individual. In certain circumstances, individual animals can be distinguished based on the timing of photos, general size and shape, spot patterning (Hohnen *et al.*, 2012) and other physical characteristics of individuals (i.e. scars), allowing an indication of the number of individuals at a site. Spot patterning was used as the primary method for distinguishing individuals between each northern quoll capture event. Both the raw number of capture events and the number of individuals were recorded for each site. A capture event was defined for this study as an obviously different northern quoll captured on camera and/or a capture of an individual separated by a 10-minute interval between another northern quoll capture.

Each image was cropped to eliminate the background and focus the northern quoll from nose to tail. The image contrast was then adjusted to highlight spot patterns. Wild-ID (Dartmouth University, 2011- Hanover, New Hampshire) was used to compare all edited captures of northern quoll against one another. The program assigned each pair of images with a similarity rating (score) based on spot patterns between 0 and 1, whereby 0 equates to no similarity, and 1 suggests a perfect match. Biologic personnel then manually accepted or rejected the similarity between each pair of images. An output from Wild-ID was then generated, grouping images based on matches whereby each group represented an individual northern quoll.

Table 4-6: Camera trap transects sampled for northern quoll within the Study Area

Phase	Site	Habitat	Deployment	Retrieval	Total Trap Nights
One		Rock Piles	23/02/2024	27/02/2024	40
		Gorge/ Gully	23/02/2024	27/02/2024	40
		Major Drainage Line	23/02/2024	27/02/2024	40
Two		Drainage Area/ Floodplain	18/10/2024	22/10/2024	40
		Low Hills and Slopes	18/10/2024	22/10/2024	36
Three		Rock Piles	7/03/2025	13/03/2025	40
		Rock Piles	9/03/2025	13/03/2025	40
		Major Drainage Line	9/03/2025	13/03/2025	40
Four		Gorge/ Gully	17/08/2025	21/08/2025	40
		Rock Piles	17/08/2025	21/08/2025	40
Total					396

[†]Total trap nights = 36 due to equipment malfunction

4.3.8 Targeted Sampling – Ghost Bat and Pilbara Leaf-nosed Bat Ultrasonic Recorders

Overnight recordings of bat echolocation calls targeting ghost bat and Pilbara leaf-nosed bat were undertaken with SongMeter ultrasonic bat recorders at 31 locations within the Study Area during the detailed survey (Table 4-7; Figure 4-3). Sampling at each location focussed primarily on habitats and habitat features (i.e. water features) most likely to support the species (i.e. foraging and dispersal corridors/ areas provided by Major Drainage Line, Gorge/ Gully, Minor Drainage Line, Stony Plain, Low Hills and Slopes habitats). Ultrasonic recorders were also deployed at abandoned mine shafts (non-asbestos) within and adjacent to the Study Area where ghost bats were thought to be roosting. Recorders were deployed for a minimum of three consecutive nights at each location, resulting in a total of 173 recording nights (Table 4-7; Figure 4-3). All recordings were analysed by Robert Bullen of Bat Call WA for the presence of ghost bat and Pilbara leaf-nosed bat and a list of all bat species recorded was compiled.

Table 4-7: Ultrasonic recorder deployments for ghost bat and Pilbara leaf-nosed bat within and adjacent to the Study Area

Phase	Site	Habitat	Deployment	Retrieval	Sampling Nights
One		Major Drainage Line	20/02/2024	23/02/2024	4
		Low Hills and Slopes	20/02/2024	23/02/2024	4
		Clay Plain	20/02/2024	23/02/2024	4
		Rock Piles	22/02/2024	25/02/2024	4
		Major Drainage Line	21/02/2024	24/02/2024	4
		Stony Plain	22/02/2024	25/02/2024	4
		Claypan	22/02/2024	25/02/2024	4
		Rock Piles	23/02/2024	26/02/2024	3
		Major Drainage Line	23/02/2024	26/02/2024	3
		Mine Shaft	22/02/2024	25/02/2024	3
		Mine Shaft	22/02/2024	25/02/2024	3
		Mine Shaft	23/02/2024	26/02/2024	3
		Minor Drainage Line	24/02/2024	27/02/2024	3
		Drainage Area/ Floodplain	25/02/2024	28/02/2024	3
		Sand Plain	25/02/2024	28/02/2024	3
		Minor Drainage Line	25/02/2024	28/02/2024	3
		Mine Shaft	25/02/2024	29/02/2024	4
		Mine Shaft	26/02/2024	29/02/2024	3
		Mine Shaft	26/02/2024	29/02/2024	3
Two		Major Drainage Line	16/10/2024	19/10/2024	3
		Low Hills and Slopes	15/10/2024	18/10/2024	3
		Clay Plain	16/10/2024	19/10/2024	3
		Rock Piles	21/10/2024	24/10/2024	3
		Stony Plain	14/10/2024	17/10/2024	3
		Claypan	16/10/2024	19/10/2024	3
		Mine Shaft	21/10/2024	24/10/2024	3
		Mine Shaft	18/10/2024	21/10/2024	3
		Mine Shaft	18/10/2024	21/10/2024	3
		Minor Drainage Line	18/10/2024	21/10/2024	3
		Minor Drainage Line	17/10/2024	21/10/2024	4
		Major Drainage Line	14/10/2024	17/10/2024	3
		Rock Piles	15/10/2024	18/10/2024	3
		Stony Plain	15/10/2024	18/10/2024	3
		Minor Drainage Line	17/10/2024	20/10/2024	3

Phase	Site	Habitat	Deployment	Retrieval	Sampling Nights
Three		Major Drainage Line	6/03/2025	8/03/2025	2
		Mine Shaft	8/03/2025	11/03/2025	3
		Sand Plain	6/03/2025	9/03/2025	3
		Rock Piles	7/03/2025	10/03/2025	3
		Stony Plain	8/03/2025	11/03/2025	3
		Mine Shaft	8/03/2025	11/03/2025	3
		Stony Plain	5/03/2025	8/03/2025	3
		Clay Plain	5/03/2025	8/03/2025	3
		Minor Drainage Line	5/03/2025	9/03/2025	3
		Minor Drainage Line	11/03/2025	14/03/2025	3
		Mine Shaft	10/03/2025	13/03/2025	3
		Major Drainage Line	9/03/2025	12/03/2025	3
		Minor Drainage Line	10/03/2025	13/03/2025	3
Four		Minor Drainage Line	15/08/2025	18/08/2025	3
		Clay Plain	14/08/2025	17/08/2025	3
		Major Drainage Line	15/08/2025	18/08/2025	3
		Sand Plain	16/08/2025	19/08/2025	3
		Mine Shaft	18/08/2025	22/08/2025	4
		Mine Shaft	18/08/2025	22/08/2025	4
		Mine Shaft	18/08/2025	22/08/2025	4
Total					173

4.3.9 Targeted Sampling – Bilby Plot Searches

Sampling for bilby within the Study Area comprised 2-ha survey plots (plot searches) within areas of potential suitable habitat, in accordance with survey guidelines for the species (DBCA, 2017). Each plot was subject to targeted searches for secondary evidence of the species' occurrence, including burrows, diggings, tracks and scats, as described by Southgate *et al.* (2019). Thirteen 2-ha plot searches, totalling 6.65 person hours, were conducted in potential suitable habitat (Sand Plain and Clay Plain habitats) within the Study Area (Table 4-8; Figure 4-3).

Table 4-8: Two hectare plots sampled for bilby within the Study Area

Phase	Site	Habitat	Date	Person hours
Two		Clay Plain	19/10/2024	0.3
		Sand Plain	17/10/2024	0.5
		Clay Plain	16/10/2024	1
		Stony Plain	17/10/2024	0.3
		Sand Plain	17/10/2024	1
		Sand Plain	17/10/2024	1
		Sand Plain	18/10/2024	0.5
		Sand Plain	18/10/2024	0.3
Three		Sand Plain	10/03/2025	0.25
		Sand Plain	10/03/2025	0.4
		Sand Plain	10/03/2025	0.25
		Sand Plain	11/03/2025	0.25
Four		Sand Plain	19/08/2025	0.6
Total				6.65

4.3.10 Targeted Sampling – Night Parrot Acoustic Recorders

Nineteen acoustic recorders were deployed at 18 sites throughout the Study Area (Table 4-9; Figure 4-3). As recommended by DBCA (2024e), to target night parrot, acoustic recorders should be deployed in roosting/ breeding habitat comprising stands of structurally complex, long unburnt spinifex (*Triodia*), in relatively open areas with few trees. Although presence of suitable roosting habitat throughout the Study Area was limited, some areas of potentially suitable habitat were identified and targeted for sampling. Song Meters were deployed for six consecutive nights at each sampling site, for a total of 114 recording nights. Acoustic recordings were analysed for night parrot calls by ornithology specialist Louis Masarei from Malu Fauna (Appendix C).

Table 4-9: Acoustic recorders sampled for night parrot within the Study Area

Phase	Site	Habitat	Deployment	Retrieval	Sampling Nights
One		Sand Plain	21/02/2024	27/02/2024	6
		Sand Plain	21/02/2024	27/02/2024	6
		Sand Plain	21/02/2024	27/02/2024	6
		Sand Plain	21/02/2024	27/02/2024	6
		Sand Plain	21/02/2024	27/02/2024	6
Two		Stony Plain	15/10/2024	21/10/2024	6
		Stony Plain	15/10/2024	21/10/2024	6
		Sand Plain	15/10/2024	21/10/2024	6
		Stony Plain	15/10/2024	21/10/2024	6
		Sand Plain	17/10/2024	23/10/2024	6
Three		Sand Plain	7/03/2025	13/03/2025	6
		Sand Plain	7/03/2025	13/03/2025	6
		Minor Drainage Line	5/03/2025	11/03/2025	6
		Drainage Area/ Floodplain	7/03/2025	13/03/2025	6
		Clay Plain	7/03/2025	13/03/2025	6
		Stony Plain	8/03/2025	14/03/2025	6
		Stony Plain	8/03/2025	14/03/2025	6
Four		Drainage Area/ Floodplain	16/08/2025	22/08/2025	6
		Drainage Area/ Floodplain	16/08/2025	22/08/2025	6
Total		114			

4.3.11 Opportunistic Fauna Records

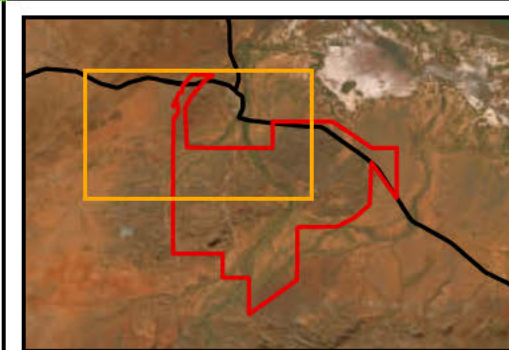
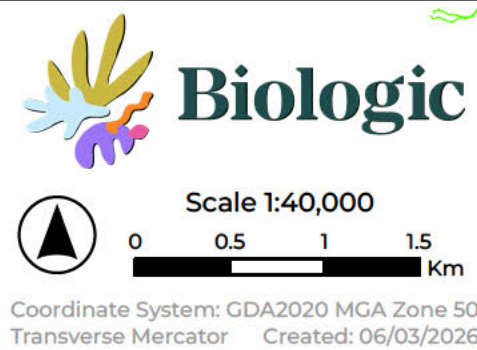
Opportunistic records of all vertebrate species encountered during the survey were documented. Records included those from primary (i.e. direct observation or calls) or secondary evidence (i.e. tracks, feathers, nests, scats and/or diggings).

4.3.12 Taxonomy and Nomenclature

The latest checklist of mammal, reptile and amphibian names published by the WAM (2024) was used as a guide to the current taxonomy and nomenclature of these groups, with the exception of taxonomic changes published subsequent to the checklist. For birds, the current checklist of Australian birds maintained by the Australian Faunal Directory (ABRS, 2021) was used in conjunction with the (WAM, 2024) species list.

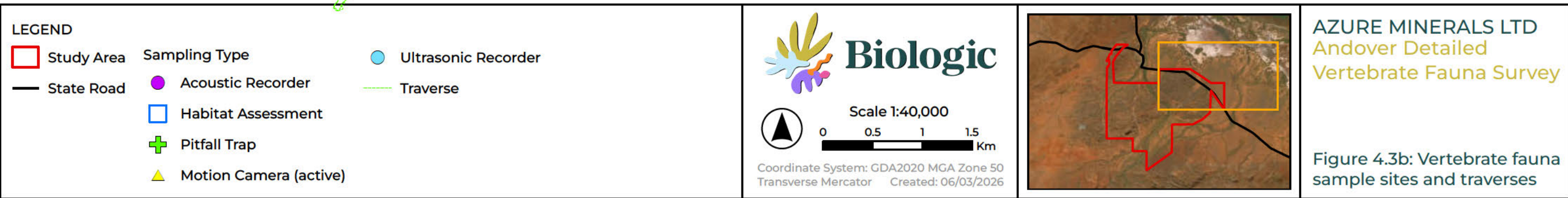
LEGEND

	Study Area	Sampling Type			Motion Camera (active)
	Local Road		Acoustic Recorder		Ultrasonic Recorder
	State Road		Habitat Assessment		Traverse
	Rail		Nocturnal Search		
			Pitfall Trap		



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Vertebrate Fauna Survey

Figure 4.3a: Vertebrate fauna
sample sites and traverses



LEGEND

 Study Area	Sampling Type	 Motion Camera (active)
 Local Road	 Acoustic Recorder	 Ultrasonic Recorder
 Rail	 Habitat Assessment	 Traverse
	 Nocturnal Search	
	 Pitfall Trap	



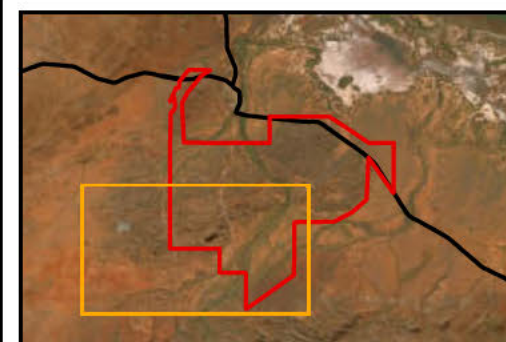
Biologic



Scale 1:40,000

0 0.5 1 1.5 Km

Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 06/03/2026



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Andover Detailed
Vertebrate Fauna Survey

Figure 4.3c: Vertebrate fauna
sample sites and traverses

LEGEND



Study Area

State Road



Acoustic Recorder



Habitat Assessment



Nocturnal Search



Pitfall Trap



Motion Camera (active)



Ultrasonic Recorder



Traverse



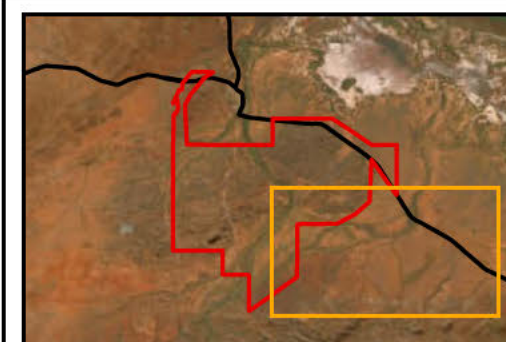
Biologic



Scale 1:40,000

0 0.5 1 1.5 Km

Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 06/03/2026



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Vertebrate Fauna Survey

Figure 4.3d: Vertebrate fauna
sample sites and traverses

4.4 Animal Welfare and Ethics

All sampling was undertaken in accordance with the *Australian Code for the Care and Use of Animals for Scientific Purposes* (NHMRC, 2013), the *Western Australian Animal Welfare Act 2002*, relevant survey-specific licence conditions, internal Biologic fauna trapping Standard Operating Procedures (SOPs) and ethics documents, and the following DBCA SOPs:

- DBCA (2024g) Aluminium Box Traps for Capture of Terrestrial Vertebrates;
- DBCA (2024h) Cage Traps for Live Capture of Terrestrial Vertebrates;
- DBCA (2024i) Dry Pitfall Traps for the Capture of Terrestrial Vertebrates;
- DBCA (2024f) Funnel Traps for the Capture of Terrestrial Vertebrates;
- DBCA (2024a) Hand Capture of Wildlife;
- DBCA (2018) Managing Disease Risk in Wildlife Management;
- DBCA (2024b) Hand Restraint of Wildlife;
- DBCA (2024c) Animal Handling and Restraint Using Soft Containment;
- DBCA (2023) First Aid for Animals; and
- DBCA (2024d) Transport and Temporary Holding of Wildlife.

4.5 Data Analysis

To estimate the adequacy and effectiveness of sampling during the survey, the cumulative number of species encountered from systematic sampling (i.e. trapping sites) was plotted against survey effort in terms of cumulative individuals or trap days/ nights to develop a species accumulation curve for the survey, following EPA (2020). The species accumulation curve assists in estimating total species richness and the proportion of species caught during the survey, with well-sampled species assemblages showing a distinct plateau following the initial rapid increase in the plotted data of species recorded, while under-sampled assemblages continue to show a continual or slowly decreasing rise in species diversity. When a curve approaches a plateau, it suggests that sampling effort has been sufficient to adequately collect the majority of species comprising the faunal assemblage at the locations sampled (Thompson & Withers, 2003). The value at which the curve asymptotes can also be used as an approximate measure of the total size of the species diversity at the sampled location (Thompson *et al.*, 2003).

Species accumulation curves were created for each faunal group (mammals, birds and reptiles) except for amphibians due to low capture rates. Accumulation curves and estimators were run using the R package iNEXT.4steps, which estimates diversity from presence-absence data ((Chao *et al.*, 2020).. For each group, the species-by-site matrix was

converted into a format that counts how many sites each species appeared in. Rarefaction and extrapolation methods were then used to estimate three standard measures of diversity:

- **species richness:** the number of species
- **shannon diversity:** which reflects both the number of species and how common they are
- **simpson diversity** which emphasises the most common species.

Species-accumulation curves were produced showing how the number of species increases with more sampling, and the 95% confidence intervals were calculated to show the uncertainty around each estimate.

Species accumulation curves and richness estimators for this survey were calculated using avifauna census data for birds and systematic trapping data for mammals and reptiles at systematic trapping sites only. It should be noted that additional species were recorded from other techniques (i.e. opportunistic and targeted sampling methods) which are not included in the analysis as the survey effort and data are not statistically valid (i.e. not standardised or comparable).

4.6 Assessment of Significance

4.6.1 Fauna Habitats

Mapped habitats of the Study Area were assigned significance based on whether they provided habitat critical to the survival of MNES species. Habitat critical to the survival of a species is defined by DoE (2013) as “areas that are necessary: for activities such as foraging, breeding, roosting, or dispersal, the long-term maintenance of the species, to maintain genetic diversity and long term evolutionary development, or for the reintroduction of populations or recovery of the species”. For each MNES species, suitable habitat within the Study Area was categorised as providing critical (i.e. critical foraging, breeding, roosting, or dispersal habitat, as per the definition above), or supporting (i.e. foraging, roosting or dispersal habitat where the species may occur, but it is not critical to the species survival at a local or regional scale) habitat. For non-MNES species, these habitats were classed as important. Due to differing habitat preferences of significant species (including habitat features and/or microhabitats), habitat significance was assessed on a species-by-species basis.

It should be noted that assessment of habitat significance applies only to habitat occurring within the Study Area and therefore may not be representative of significance applied to the same habitat in other areas outside the Study Area at a local or regional scale. For example, a habitat within the Study Area may be deemed unsuitable due to the absence of certain habitat features which are required for the species persistence, despite the same habitat occurring outside the Study Area being considered of greater significance. The significance of a habitat within the Study Area may also be influenced by other habitats occurring within the Study Area and more broadly, including areas adjacent to the Study Area, particularly if representative of primary habitat.

4.6.1.1 Northern Quoll

Habitat considered critical for the northern quoll includes “*habitat within the modelled distribution of the northern quoll, which provides shelter for breeding, refuge from fire or predation and potential poisoning from cane toads*” (DoE, 2016). Habitats providing this level of shelter can include; offshore islands, rocky habitats, major drainage lines or treed creek lines and structurally diverse woodlands with suitable refuge such as large diameter trees, termite mounds or hollow logs (DoE, 2016). Where dispersal and foraging habitats are associated with or are the connecting habitat between *populations important for the long-term survival* of the species, these habitats are also deemed critical habitat (DoE, 2016); where important populations are those which are;

- high density populations (characterised by numerous camera triggers of multiple individuals across multiple cameras and or traps on the site), which occur in refuge rich habitat critical to the survival of the species;
- occurring in habitat that is free of cane toads and unlikely to support cane toads upon arrival i.e. granite habitats in WA, populations surrounded by desert and without permanent water; or
- subject to ongoing conservation or research actions.

While survey efforts are typically focused on breeding/ denning and refuge habitat primarily, comparatively little study has focussed on foraging and dispersal habitats. As such there is yet an accepted definition of what constitutes “critical habitat” in relation to foraging and dispersal with respect to habitat features (type, structure or quality for example) other than those listed above by DoE (2016).

4.6.1.2 Ghost Bat

Bat Call (2021a) proposed four categories for ghost bat roost sites (Table 4-10), of which several are deemed to provide habitat critical to the survival of the species. Critical roosting habitat for the species includes cave or cave-like structures that offer conditions suitable

for the persistence of the species within the landscape. Category 1, Category 2 and some Category 3 roosts (those adjacent to Category 2 roosts) are determined to provide critical habitat, while Category 4 and isolated Category 3 roosts provide supporting habitat (Table 4-10) (Bat Call, 2021a).

There is currently limited confirmed data on what is determined to provide critical or supporting foraging habitat, however tracking surveys measuring the distances travelled nightly by bats, show that foraging is occurring within approximately 12 km of the diurnal roost (Bullen *et al.*, 2023). In the absence of confirmed foraging habitat data, a precautionary approach is applied; with suitable foraging habitat that is within 12 km of a diurnal roost being considered supporting foraging habitat for the ghost bat. More recently, studies of the species in the Pilbara (Bullen unpublished data) suggest that the bats prefer to forage on productive plain areas within mature woodland over patchy or clumped tussock or hummock grass (*Triodia* spp.) on sandy or stony ground. Isolated high points within the landscape such as trees along drainage corridors or on the edges of thickets or woodlands provide preferred vantage points while foraging (Bullen unpublished data).

Table 4-10: Roost categories for ghost bat

Category	Description	Typical features	Importance to ghost bat
Category 1	Maternity/ diurnal roost sites with year- round occupancy	Deep, dark caves with at least one roosting chamber behind a narrow entrance or in-cave constriction, a ceiling over 1.5 m in height, steady microclimate, and substantial evidence of previous occupation by ghost bat (e.g. extensive scat pile).	Critical habitat important for the ongoing presence of ghost bat in an area.
Category 2	Maternity/ diurnal roost sites with regular occupancy	These sites are similar to Category 1 sites but are usually less complex (e.g. may only contain a single chamber) and/or located in less productive areas which may only periodically attract ghost bats.	Critical habitat important for the ongoing presence of ghost bat in an area.

Category	Description	Typical features	Importance to ghost bat
Category 3	Diurnal roost sites with occasional occupancy	Simple caves where one to a few ghost bats roost occasionally, or rarely. Roosting locations are not necessarily dark.	Category 3 caves which are located adjacent to Category 1 or Category 2 caves are considered critical habitat important for the ongoing presence of ghost bat in the area. While isolated Category 3 caves are not considered critical habitat essential to the long-term viability of a population, such caves may play an important role in facilitating genetic exchange between neighboring colonies by enabling the long-distance movement of individuals.
Category 4	Nocturnal roost sites with opportunistic usage	Shallow caves and deep overhangs which may be visited during the night during foraging activity, but are unlikely to support diurnal roosting (e.g. roosting locations are exposed)	Not considered critical habitat for ghost bat.

Adapted from Bat Call (2021a)

4.6.1.3 Pilbara Leaf-nosed Bat

A recent review of the Pilbara leaf-nosed bat roost cave classifications by Bat Call (2021b) categorised caves into four categories:

- Permanent Diurnal (Category 1 and 2) roosts – Category 1 permanent roosts are maternity roosts where seasonal presence of young is proven. These often have large colonies present. Category 2 permanent roosts are occupied year-round but without the proven presence of young. Both categories are considered as critical habitat that is essential for the daily and long-term survival of the Pilbara leaf-nosed bat.
- Semi-permanent diurnal (Category 3) roosts – used diurnally during some part of the year but not occupied year-round. May be used during the breeding cycle and also may facilitate long distance dispersal in the region. They are considered as critical habitat that is essential for the long-term survival of the Pilbara leaf-nosed bat.

- Nocturnal refuge (Category 4) – These are occupied or entered at night for resting, feeding or other purposes, with perching not a requirement. These are not considered critical habitat but are important for persistence in a local area.

The species forages within and in the vicinity of roost caves and more broadly along waterbodies with suitable fringing vegetation supporting prey species (TSSC, 2016b). Foraging sites surrounding known or suspected roosts can be critical to the survival of the species. TSSC (2016b) categorised foraging habitat into five categories: gorges with pools (Priority 1), gullies (Priority 2), rocky outcrops (Priority 3), major watercourses (Priority 4) and open grassland and woodland (Priority 5) (TSSC, 2016b). The species is predicted to travel up to 20 km from roost caves during nightly foraging (Cramer *et al.*, 2016a); however, seasonal variation is known to occur, with foraging occurring up to 20 km in the dry season and up to 50 km during the wet season, and the species has been recorded travelling up to 170 km (Bullen, 2013; Bullen & Reiffer, 2019, 2020).

4.6.1.4 Pilbara Olive Python

Known only from ranges within the Pilbara region Western Australia, northern most section of the Ashburton region (Pearson *et al.*, 2013) and south into the Gascoyne region (Mousavi-Derazmahalleh *et al.*, 2023), the Pilbara olive python prefers habitat features such as deep gorges and water holes (Pearson, 1993). With a limited range and restricted habitat this species is highly susceptible to change. Radio tracking of the species has found that within the distribution of the species, habitats such as caves and rock outcrops (such as gorges, ridgelines, breakaway) provide suitable refuge in winter months away from water sources (TSSC, 2008), while in warmer months the species preferred to move around widely. The species is often observed in close proximity to natural and anthropogenic water features, primarily within major drainage or rocky gorge, gully, and/or breakaway habitats (Mousavi-Derazmahalleh *et al.*, 2023). With an ambush style hunting technique, the species attacks prey on trails or by striking from submerged positions in water holes (Pearson, 2007). With relatively little knowledge of the biology or distribution of the species and no accepted definition of critical habitat for the species, the precautionary approach would advocate that critical habitat includes major drainage habitat and habitat offering rocky cracks and crevices for refuge and shelter within proximity to water features.

4.6.1.5 Night Parrot

The current guidelines for assessing the likely presence of night parrots in Western Australia suggest this species requires patches of low, dense vegetation in which to roost during the day (DBCA, 2024e). Contemporary roosting/ breeding records have been from habitats dominated by spinifex (*Triodia*), but night parrots have historically been observed

roosting at chenopod dominated sites. Long-term stable roost sites are found in areas of long unburnt structurally complex *Triodia* hummocks (particularly ring-forming species such as *T. longiceps*) with a variety of hummock sizes. Suitable foraging habitats are sites with a diverse assemblage of native grasses and herbs, near floodplains or low-lying areas. Both roosting and foraging habitats are typically on flat/ low sloping ground and in open areas with few trees or shrubs present. While there is currently no accepted single definition of what constitutes habitat deemed “critical” to the survival of the species, the precautionary principle is adopted whereby habitats that meet the descriptions above defining what is currently deemed suitable or preferred habitat could be considered to offer habitat that is critical to the survival of the species and therefore subjected to targeted survey for the species.

4.6.1.6 Greater Bilby

Extant populations of the greater bilby occur in a variety of habitats; however, it is most often associated with landforms comprising level to low slope topography and light to medium soils, such as sand plain and sand dune habitats (Cramer *et al.*, 2017; Southgate, 1990). It often occupies three main vegetation types within these habitats, open tussock grassland on uplands and hills, hummock grassland in plains and alluvial areas and occasionally mulga woodland/ shrubland growing on ridges and rises (Southgate, 1990). In general, the distribution of greater bilbies can be limited by the availability of suitable burrowing habitat, such as dunes where burrow excavation is easier (Moseby & O'Donnell, 2003), and are not found in predominantly rocky areas or mountains where they would be unable to dig suitable burrow systems or dig for food. Home range of the species ranges between 1–3 km², averaging 3.16 km² for males and 0.18 km² for females (Moseby & O'Donnell, 2003).

Greater bilby can forage broadly across habitats and can be highly mobile in response to resource availability, particularly in response to fire and post-fire regeneration (Southgate *et al.*, 2007). The species is known to utilise mosaic habitats comprising unburnt areas and areas at various stages of post-fire regeneration, often primarily utilising unburnt areas but venturing into burnt areas during foraging and dispersal movements (Southgate & Carthew, 2007; Southgate & Carthew, 2006; Southgate *et al.*, 2007).

There is currently no established definition of what constitutes habitat deemed “critical” to the survival of the bilby, therefore for the purposes of this survey, the precautionary principle is adopted whereby habitats that meet the descriptions above defining what is currently deemed suitable or preferred habitat along with suitable foraging and dispersal

habitat within the 3.2 km² home range, could be considered to offer habitat that is critical to the survival of the species and therefore subjected to targeted survey for the species.

4.6.2 Likelihood of Significant Species Occurrence

Significant species identified by the desktop assessment were assessed post-survey for their likelihood of occurring within the Study Area using a decision matrix which considers the presence and suitability of habitat within the Study Area, and the proximity of previous records (Table 4-11). Based on this decision matrix, each species was assigned to one of six categories of likelihood: Confirmed, Highly Likely, Likely, Possible, Unlikely, or Highly Unlikely.

The decision matrix is intended to be an indicative guide only, and the way in which it is interpreted may vary between species, depending on a given species' habitat preferences and ability to disperse, as well as the reliability and availability of contextual information. For example, considering species which have been previously recorded close to the Study Area, a species with a limited dispersal capability will have a reduced likelihood of occurring in the Study Area compared with a species with greater dispersal capability. It is also recognised that a lack of records in the vicinity of the Study Area may indicate limited sampling effort rather than species' absence, and that previous records may include historic or presumed erroneous information which may misrepresent a species' current distribution. Where the determination of a species' likelihood of occurrence within the Study Area deviates from the decision matrix, detailed justification for any variation will be presented.

Table 4-11: Species likelihood of occurrence decision matrix

		Habitat suitability of Study Area			
		Breeding habitat present	Foraging and dispersal habitat present	Marginally suitable habitat present	No suitable habitat present
Species Records ¹	Recorded in Study Area	Confirmed	Confirmed	Confirmed	Confirmed
	Recorded within 10 km of Study Area	Highly Likely	Likely	Possible	Possible
	Recorded within 10-50 km of Study Area	Likely	Possible	Possible	Unlikely
	Recorded within 50-100 km of Study Area	Possible	Possible	Unlikely	Unlikely
	Recorded >100 km of Study Area	Possible	Unlikely	Unlikely	Highly Unlikely
	Species considered locally/regionally extinct	Unlikely	Unlikely	Highly Unlikely	Highly Unlikely

¹ Only records within the previous 50 years are considered.

4.6.3 Significance of Species Occurrence

For the target species, an assessment was made on the significance of their occurrence based on the most relevant and prescriptive guidance documents relative to each species. For northern quoll the significance of occurrence was based on definitions of the DoE (2016), specifically whether the individuals present in the Study Area were representative of a “populations important for the long-term survival of the northern quoll”. These are populations that are:

- high density quoll populations, which occur in refuge-rich habitat critical to the survival of the species, including where cane toads are present;
- occurring in habitat that is free of cane toads and unlikely to support cane toads upon arrival i.e. granite habitats in WA, populations surrounded by desert and without permanent water; and/or
- subject to ongoing conservation or research actions i.e. populations being monitored by government agencies or universities or subject to reintroductions or translocation.

For bilby, ghost bat and Pilbara olive python (species listed as vulnerable under the EPBC Act, but with no specific criteria to assess significance of occurrence), the significance of occurrence was based on criteria defined by DoE (2013), specifically whether their occurrence in the Study Area represented an 'important population'. An 'important population' is a population that is necessary for a species' long-term survival and recovery - this may include populations identified as such in recovery plans, and/or that are DoE (2013):

- key source populations either for breeding or dispersal;
- populations that are necessary for maintaining genetic diversity; and/or
- populations that are near the limit of the species range.

For the Pilbara leaf-nosed bat, the entire Pilbara is suggested to represent an 'important population' (TSSC, 2016b). Thus the significance of occurrence was based on the presence of Priority 1 and 2 refuges (permanent diurnal roosts and non-permanent breeding roosts) (TSSC, 2016b).

For the night parrot, the significance of occurrence was based on definitions by the DoE (2013), specifically the presence of a 'population'. A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area, including, but are not limited to:

- a geographically distinct regional population, or collection of local populations; or
- a population, or collection of local populations, that occurs within a particular bioregion.

5 Results and Discussion

5.1 Fauna Habitat

A total of 11 broad fauna habitats were recorded and mapped within the Study Area, comprising, in decreasing order of extent (Table 5-1; Figure 5-1):

- Low Hills and Slopes (40.91%, 5022.9 ha);
- Stony Plain (15.59%, 1914.73 ha);
- Clay Plain (14.28%, 1752.9 ha);
- Drainage Area/ Floodplain (12.3%, 1510.24 ha);
- Minor Drainage Line (5.3%, 650.63 ha);
- Major Drainage Line (4.87%, 598.54 ha);
- Rock Piles (2.38%, 291.71 ha);
- Sand Plain (2.14%, 262.51 ha);
- Claypan (1.14%, 140.57 ha);
- Rocky Outcrop (0.17%, 21.29 ha); and
- Gorge/ Gully (0.04%, 5.52 ha).

The remaining 0.87% (107.06 ha) of the study area comprised Cleared/ Disturbed areas. The condition of habitats within the Study Area ranged from 'excellent' to 'poor'. The majority of disturbances recorded were tracks/ access roads and mining exploration. There was a herd of approximately 100 wild horses (*Equus ferus*) observed in the Study Area throughout the survey. Grazing and soil compaction from this herd was evident on the Clay Plain in the southeast of the Study Area and the southern section of the Harding River. Descriptions of the distinguishing characteristics and the occurrence within the Study Area for each of habitat type is presented in Table 5-1. Data from on-site habitat assessments is presented in Appendix D.

Rock Piles, Rocky Outcrop and Gorge/ Gully habitats provide critical breeding and denning habitat for northern quoll and Pilbara olive python. Rock Piles and Rocky Outcrop habitat covers 2.55% of the Study Area and is most concentrated in the southwest corner, where it is interspersed throughout Low Hills and Slopes. Isolated patches of Rock Piles and Rocky Outcrop occur in the east of the Study Area, and the northern groundwater area. One occurrence of Gorge/ Gully occurs in the Study Area.

Major Drainage Line offers critical habitat for breeding, foraging and dispersal for Pilbara olive python and grey falcon, whilst also providing critical foraging and dispersal habitat for northern quoll. Major and Minor Drainage Line provides supporting habitat for several

significant species for foraging and dispersal, including eastern osprey and fork-tailed swift, as well as providing important habitat for northern short-tailed mouse (*Leggadina lakedownensis*), peregrine falcon (*Falco peregrinus*) and lined soil-crevice skink (*Notoscincus butleri*) (marginal breeding habitat when adjacent to important habitat e.g. Stony Plain). Major Drainage Line habitat is represented by the Harding River, which flows through the centre of the Study Area, with two main tributaries to the west and east. Minor Drainage Line habitat is dispersed throughout the Study Area, flowing through Low Hills and Slopes, Stony Plain and Clay Plain. Drainage Area/ Floodplain habitat occurs in association with drainage lines throughout the Study Area and provides supporting habitat for several significant species (Table 5-1).

Low Hills and Slopes and Stony Plain are the dominant habitat type, covering 56.5% of the Study Area. These habitats provide important breeding, foraging and dispersal habitat for western pebble-mound mouse and foraging and dispersal habitat for peregrine falcon; as well as supporting foraging and dispersal habitat for MNES species such as northern quoll, fork-tailed swift, grey falcon. Stony Plain provides important breeding, foraging and dispersal habitat for the lined soil-crevice skink and northern short-tailed mouse.

Sand Plain, Clay Plain and Claypan habitats extend over 17.56% of the study area and provide important breeding, foraging and dispersal habitat for northern short-tailed mouse and supporting foraging habitat for fork-tailed swift. Clay Plain and Claypan habitats occur interspersed with Drainage Area/ Floodplain and Minor Drainage Line, in three distinct patches throughout the Study Area. Isolated patches of Sand Plain habitat border the Harding River and occur in the northeast corner of the Study Area.

Stony Plain, Drainage Area/ Floodplain, Sand Plain, Minor and Major Drainage Line habitats within 12 km of the known diurnal ghost bat roosts in and adjacent to the groundwater area, are considered to provide supporting foraging and dispersal habitat for the species.

All fauna habitats mapped within the Study Area that provide supporting habitat are broadly distributed and well represented within and in the vicinity of the Study Area and across the Pilbara bioregion and therefore support fauna assemblages which are generally common and widespread. While these habitats support significant species, they are not limited and thus not critical for the long-term survival of such species.

Table 5-1: Broad fauna habitats occurring within the Study Area

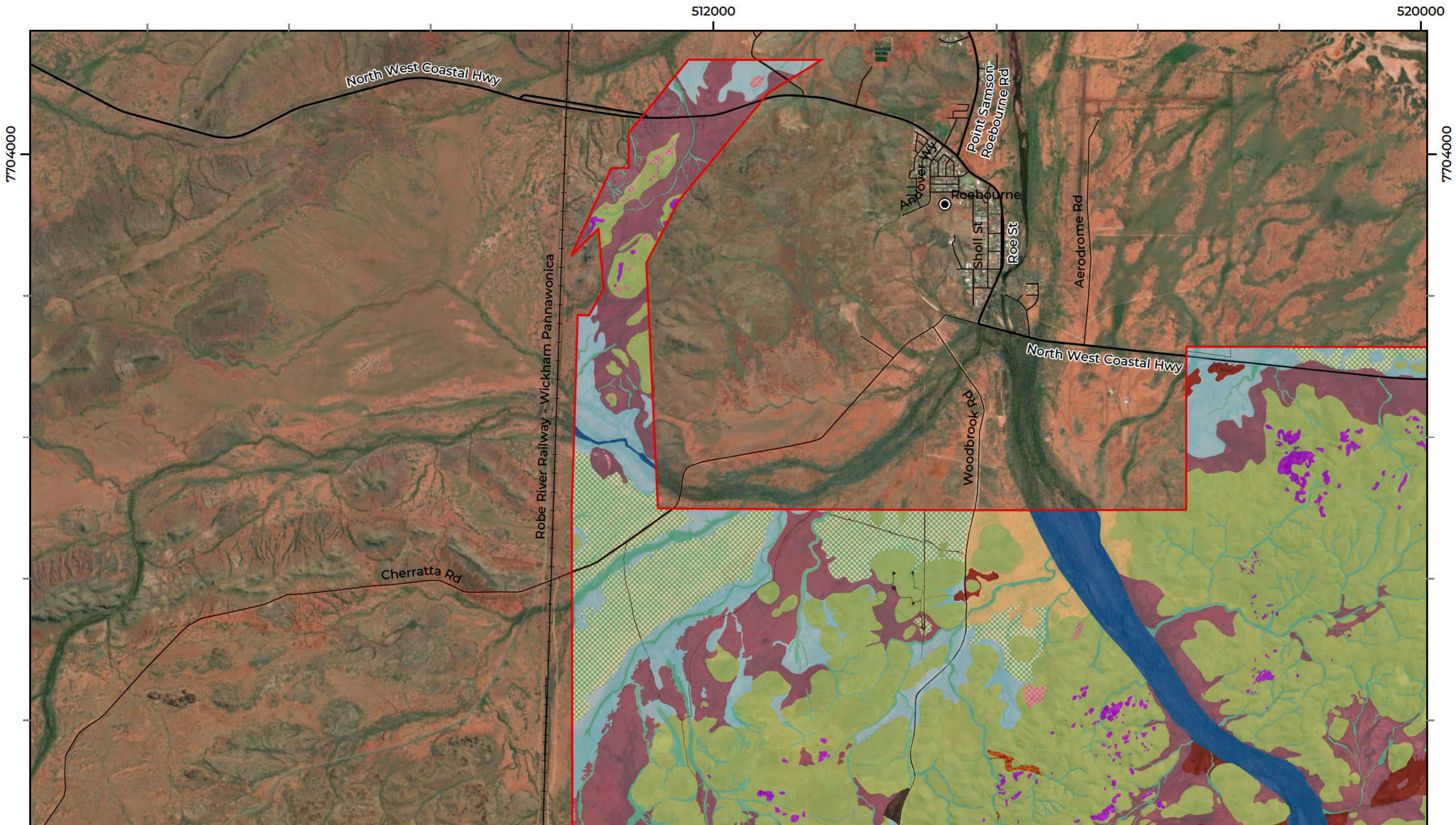
Habitat	Distinguishing habitat characteristics	Extent of the habitat	Suitability for Significant Species	Photo
Low Hills and Slopes 5022.9 ha 40.91%	Low Hills and Slopes habitat comprises hills and undulating Stony Plains of higher elevation, supporting hard spinifex with a mantle of gravel and larger rocks with occasional rocky outcropping. Vegetation is dominated by hard <i>Triodia</i> hummock grassland with scattered <i>Eucalyptus</i> trees and <i>Acacia</i> and/or <i>Grevillea</i> shrubs.	Within the Study Area, Low Hills and Slopes habitat is dispersed mostly throughout the central section of the Study Area, often occurring adjacent to Rock Piles and Minor Drainage Line habitat. This habitat type is characteristic of the Pilbara region. Its occurrence throughout the region is widespread and common.	Supporting habitat for: • northern quoll (foraging and dispersal) • fork-tailed swift (foraging and dispersal) Important habitat for: • western pebble-mound mouse (breeding, foraging and dispersal) • peregrine falcon (foraging)	
Stony Plain 1914.73 ha 15.59%	Stony Plain habitat comprises flat to low undulating areas and low hills with vegetation dominated by <i>Triodia</i> hummock grasses of various life stages with scattered eucalypts and patches of small to medium shrub species on gravelly clay loam substrates.	Stony Plain habitat is scattered throughout the Study Area, often occurring as the intervening area between Major and Minor Drainage Line, Drainage Area/ Floodplain, Clay Plain and Low Hills and Slopes habitats. Stony Plain is one of the most common and widespread habitat types within the Pilbara region. The vegetation and substrate which make up this habitat type are characteristic features of the region.	Supporting habitat for: • ghost bat (foraging and dispersal) if within 12 km of known diurnal roost • fork-tailed swift (foraging) • grey falcon (foraging) Important habitat for: • western pebble-mound mouse (breeding, foraging and dispersal) • lined soil-crevice skink (breeding, foraging and dispersal) • northern short-tailed mouse (breeding, foraging and dispersal) • peregrine falcon (foraging)	
Minor Drainage Line 650.63 ha 5.3%	Minor Drainage Lines occur in valleys and disperse to lower lying plains. Vegetation and substrates of this habitat is variable, often comprising scattered <i>Eucalyptus</i> over <i>Acacia</i> and/or <i>Grevillea</i> shrubs with an understory dominated by <i>Triodia</i> hummock grasses and/or mixed tussock grasses on alluvial substrates, often comprising sandy loams, clays and gravel. Soils were often soft and deep; conducive to burrowing. Some areas of this habitat type throughout the flat and low-lying parts of the Study Area are part of the floodplain and may become flooded during times of heavy rain.	Minor Drainage habitat occurs throughout the Study Area where water accumulates and flows from Gorge/ Gully, Rock Piles and Low Hills and Slopes toward the lower lying Stony Plains, Clay Plains and Sand Plains. This fauna habitat is common throughout the Pilbara bioregion. Across the region its structure and condition is variable, as a result of rainfall events and disturbance (i.e. fire and cattle grazing).	Supporting habitat for: • ghost bat (foraging and dispersal where proximal (12 km) to a critical roost) • Pilbara olive python (foraging and dispersal) • northern quoll (foraging and dispersal) • fork-tailed swift (foraging and dispersal) Important habitat for: • northern short-tailed mouse (foraging and dispersal) • peregrine falcon (foraging) • grey falcon (foraging)	

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Suitability for Significant Species	Photo
			lined soil-crevice skink (marginal breeding, foraging and dispersal)	
Major Drainage Line 598.54 ha 4.87%	Major Drainage Line habitat is prone to flooding and is more likely to retain water when inundated. The structure and condition of vegetation often varies seasonally, particularly following rainfall events. This habitat generally supports an upper story of relatively tall <i>Eucalyptus</i> or <i>Melaleuca</i> over open sandy or gravelly riverbeds.	The Major Drainage Line habitat is the Harding River and flows north-south through the centre of the Study Area. This fauna habitat is widespread throughout the Pilbara bioregion, though its structure and condition is variable as a result of rainfall events and susceptibility to degradation from introduced herbivore (e.g. cattle, horses) grazing.	Critical habitat for: - Pilbara olive python (breeding, foraging and dispersal) - northern quoll (foraging and dispersal) - grey falcon (breeding and foraging) Supporting habitat for: - ghost bat (foraging and dispersal where proximal (12 km) to a critical roost) - fork-tailed swift (foraging and dispersal) - peregrine falcon (foraging, marginal breeding/ nesting) - eastern osprey (marginal foraging and dispersal) - Pilbara leaf-nosed bat (foraging and dispersal) Important habitat for: - northern short-tailed mouse (foraging and dispersal) - lined soil-crevice skink (marginal breeding, foraging and dispersal)	
Sand Plain 262.51 ha 2.14%	Sand Plain occurs on low-lying or elevated areas with accumulated loose sandy substrate. Often supporting an open vegetation cover, dominated by scattered <i>Acacia</i> shrubs over <i>Triodia</i> hummock grasses of various life stages.	Sand Plain habitat is restricted to seven isolated patches in the Study Area, with no connectivity between patches. This habitat is bordered by Major Drainage Line, Clay Plain and Low Hills and Slopes habitats. Sand Plain is a common and widespread habitat throughout the Pilbara region.	Supporting habitat for: - ghost bat (foraging where proximal (12 km) to a critical roost) - fork-tailed swift (foraging) - greater bilby (foraging and dispersal) Important habitat for: - northern short-tailed mouse (breeding, foraging and dispersal)	

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Suitability for Significant Species	Photo
Rock Piles 291.71 ha 2.38%	Rock Piles habitat is composed of piles of large basalt boulders and crumbling rock faces; this habitat provides a multitude of deep cracks and crevices for shelter for a range of vertebrate fauna species. In some areas of this habitat scattered <i>Eucalyptus</i> and <i>Acacia</i> provided additional shelter or foraging opportunities.	Rock Piles habitat is located across the most elevated and steep terrain in the Study Area, with concentrations in the south-west and north-east sections. The habitat is commonly associated with Low Hills and Slopes. Individual Rock Piles habitats are separated by hill slopes, creek-lines and plains resulting in interrupted connectivity of habitat. This habitat type is limited in extent throughout the Pilbara but more common throughout the coastal area of Karratha, Dampier and Murujuga National Park (Burrup Peninsula).	Critical habitat for: • northern quoll (breeding, foraging and dispersal) • Pilbara olive python (breeding, foraging and dispersal) Supporting habitat for: • fork-tailed swift (foraging)	
Claypan 140.57 ha 1.14%	Claypan habitat is characterised by heavy clay-based soils of both cracking and non-cracking nature. The habitat occurs on lower lying plains that are often drainage depressions/ areas which are subjected to sheet flow following large rainfall events. This habitat is likely to be seasonally inundated. Claypan differs from Clay Plain in that it there is generally very little to no vegetation cover.	Claypan habitat is patchily distributed throughout the low lying sections of the Study Area. The habitat is surrounded by Major and Minor Drainage Line, Stony Plain and Sand Plain habitats. This fauna habitat is common throughout the coastal areas of Karratha and more broadly throughout the Pilbara bioregion. Across the region its structure and condition is variable as a result of rainfall events and disturbance (i.e. fire and cattle grazing).	Supporting habitat for: • fork-tailed swift (foraging and dispersal) Important habitat for: • northern short-tailed mouse (breeding, foraging and dispersal)	
Gorge/ Gully 5.52 ha 0.04%	Gorge/ Gully habitat is characterised by rugged, steep-sided valleys incised into the surrounding landscape. Gorges tend to be deeply incised, with vertical cliff faces, while gullies are more open (but not as open as Minor Drainage Lines). Rock pools are most often encountered in this habitat type. Vegetation can be dense and complex in areas of soil deposition or sparse and simple where erosion has occurred.	The Gorge/ Gully habitat is found in one patch west of the Harding River in the within Low Hills and Slopes habitat. The area would be best described as a gully. A reasonably common habitat in the Pilbara, usually associated with ranges. However, because this habitat type is narrow and linear, they only represent a small proportion of the total land area.	Critical habitat for: • northern quoll (breeding, foraging and dispersal) • Pilbara olive python (breeding, foraging and dispersal) Supporting habitat for: • ghost bat (foraging and dispersal where proximal (12 km) to a critical roost) • fork-tailed swift (foraging and dispersal) • Pilbara leaf-nosed bat (foraging and dispersal) Supporting habitat for: • peregrine falcon (foraging and dispersal)	

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Suitability for Significant Species	Photo
Rocky Outcrop 21.29 ha 0.17%	Rocky outcrop habitat is characterised by quartz outcropping on hillslopes, with vegetation typically comprising scattered chenopod shrubs or <i>Triodia</i> hummock grasses. The primary feature of the habitat was an abundance of deep rocky cracks and crevices.	A few isolated patches of Rocky Outcrop habitat were scattered throughout the Study Area, mostly concentrated in the groundwater north area. This fauna habitat is reasonably common throughout the Pilbara bioregion.	Critical habitat for: • northern quoll (breeding, foraging and dispersal) • Pilbara olive python (breeding, foraging and dispersal) Supporting habitat for: • fork-tailed swift (foraging) • Pilbara leaf-nosed bat (foraging and dispersal)	
Drainage Area/ Floodplain 1510.24 ha 12.3%	Drainage Area/ Floodplain habitat occurs on low lying plains, which are subject to flooding post rainfall events. Vegetation cover is typically sparse <i>Eucalyptus</i> over scattered <i>Acacia</i> with an understorey of hummock or tussock grasses on gravelly, sandy clay loam. Tussock grasses can become dominant after high rainfall events.	Relatively large patches of Drainage Area/ Floodplain occurred throughout the Study Area, concentrated along the northern and eastern borders, and in the southern-most section. Two patches occurred in the north and south of the Groundwater Study Area. This habitat was associated with Clay Plain and Claypan habitats and often contained Minor Drainage Line habitat. This fauna habitat is common throughout the Pilbara bioregion. Across the region its structure and condition are variable as a result of rainfall events and disturbance (i.e. fire and cattle grazing).	Supporting habitat for: • greater bilby (foraging and dispersal) • ghost bat (foraging and dispersal where proximal (12 km) to a critical roost) • Pilbara leaf-nosed bat (foraging and dispersal) • grey falcon (foraging and dispersal habitat where proximal to breeding habitat) • fork-tailed swift (foraging)	
Clay Plain 1752.9 ha 14.28%	Clay Plain habitat is characterised by heavy clay-based soils of both cracking and non-cracking nature. The habitat occurs on lower lying plains that have a very slight to no gradient. Vegetation present includes hummock and tussock grasses, with scattered <i>Acacia</i> shrubs.	A large Clay Plain is found in the southeastern section of the Study Area, east of the Harding River and bordered by Stony Plain. Another large patch occurs in the northeast section of the Study Area. Three smaller patches of Clay Plain occur in the northeast section of the Study Area and the southern section of the groundwater area. This habitat is common throughout the Pilbara bioregion, particularly coastal areas.	Supporting habitat for: • fork-tailed swift (foraging) • greater bilby (foraging and dispersal) Important habitat for: • northern short-tailed mouse (breeding, foraging and dispersal)	

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Suitability for Significant Species	Photo
Cleared/ Disturbed 107.06 ha 0.87%	Cleared/ Disturbed habitats are areas devoid of native vegetation or where vegetation structure and composition has been significantly disrupted. This includes roads, tracks, infrastructure and mining disturbance.	The Northwest Coastal Highway runs through the groundwater area and the northeast section of the Study Area. Various tracks and cleared areas associated with mining exploration are scattered throughout the Study Area. Mingullatharndo Community is located in the north-eastern section of the Study Area.	N/ A	-



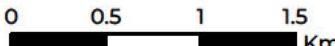
LEGEND

 Study Area	Fauna Habitat	 Gorge/Gully	 Rocky Outcrop
 Local Road	 Clay Plain	 Low Hills and Slopes	 Sand Plain
 State Road	 Claypan	 Major Drainage	 Stony Plain
 Rail	 Cleared	 Minor Drainage	
	 Drainage Area/Floodplain	 Rock Piles	

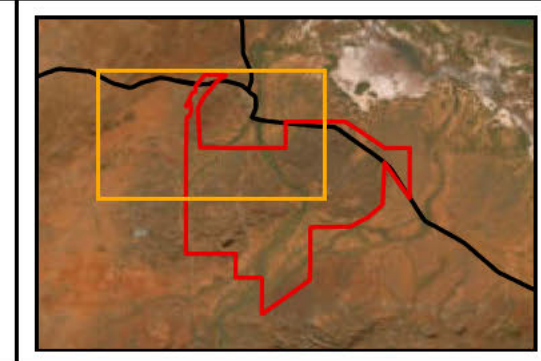


Biologic

Scale 1:40,000

Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 03/10/2025



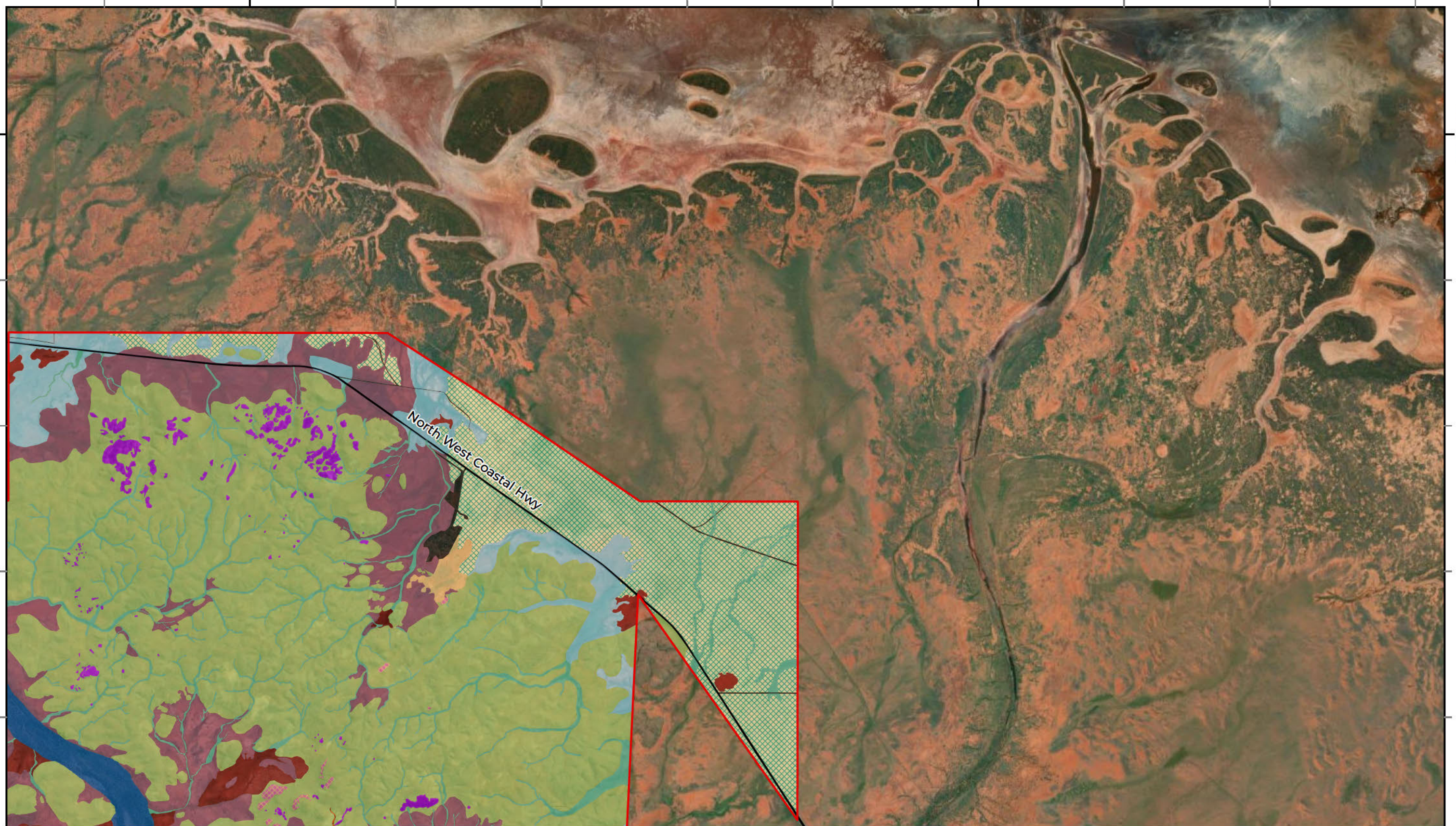
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Figure 5.1a: Broad fauna
habitats in the Study Area

520000

528000

7704000



LEGEND

Study Area

State Road

Fauna Habitat

Clay Plain

Claypan

Cleared

Drainage Area/Floodplain

Gorge/Gully

Low Hills and Slopes

Major Drainage

Minor Drainage

Rock Piles

Rocky Outcrop

Sand Plain

Stony Plain



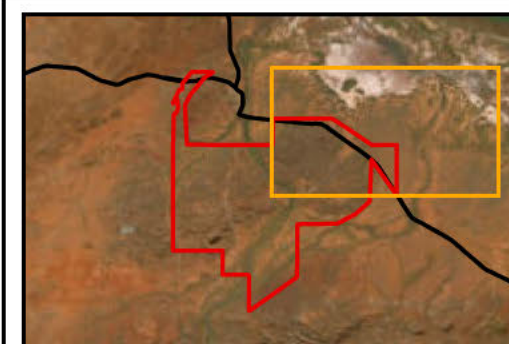
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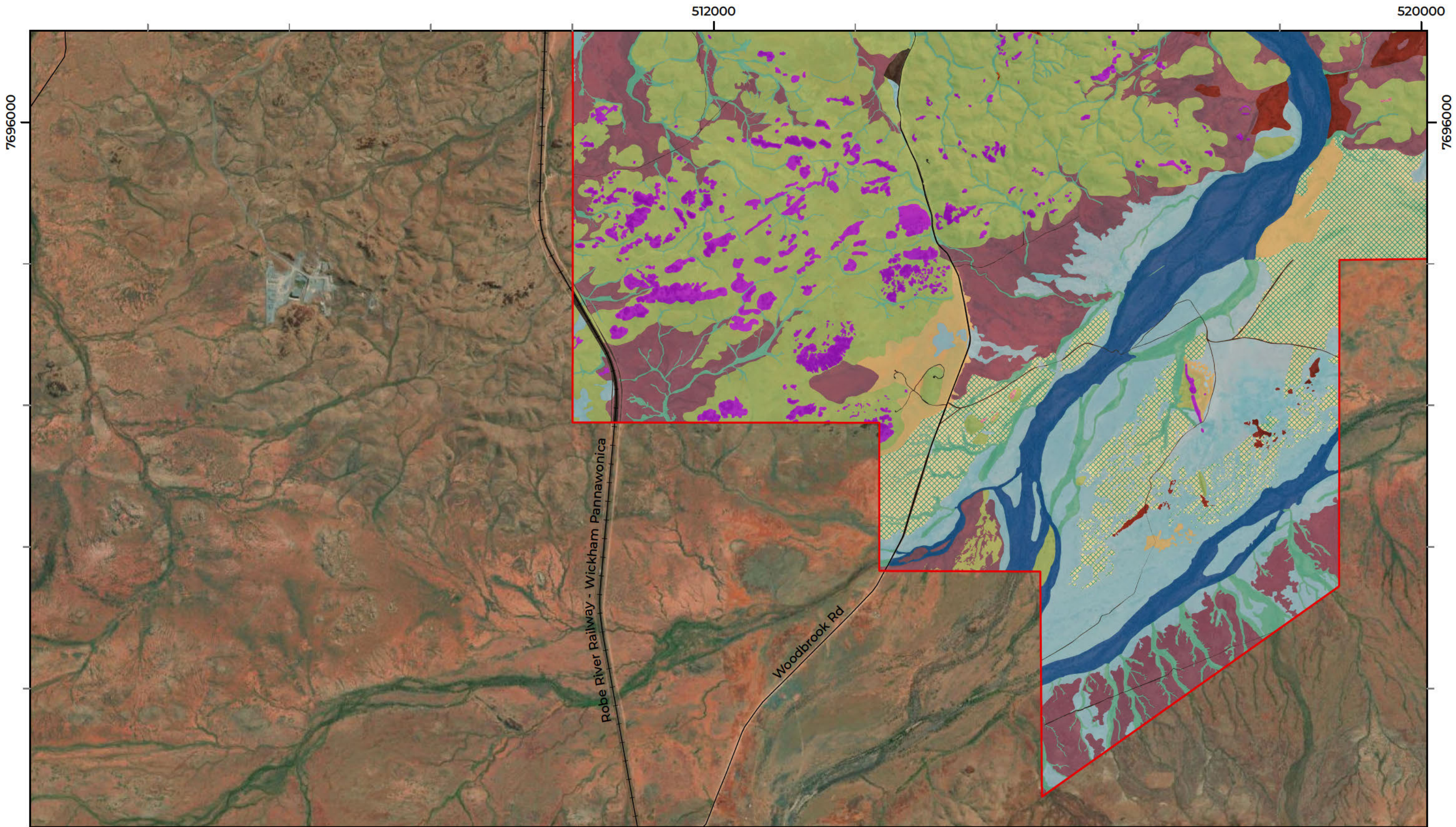
0 0.5 1 1.5 Km

Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 03/10/2025



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Figure 5.1b: Broad fauna
habitats in the Study Area



LEGEND

- Study Area
- Local Road
- +

 Rail

Fauna Habitat

- Clay Plain
- Claypan
- Cleared
- Drainage Area/Floodplain

Gorge/Gully

- Low Hills and Slopes
- Major Drainage
- Minor Drainage
- Rock Piles

Rocky Outcrop

- Sand Plain
- Stony Plain



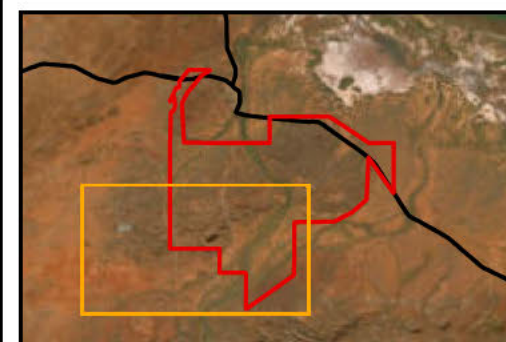
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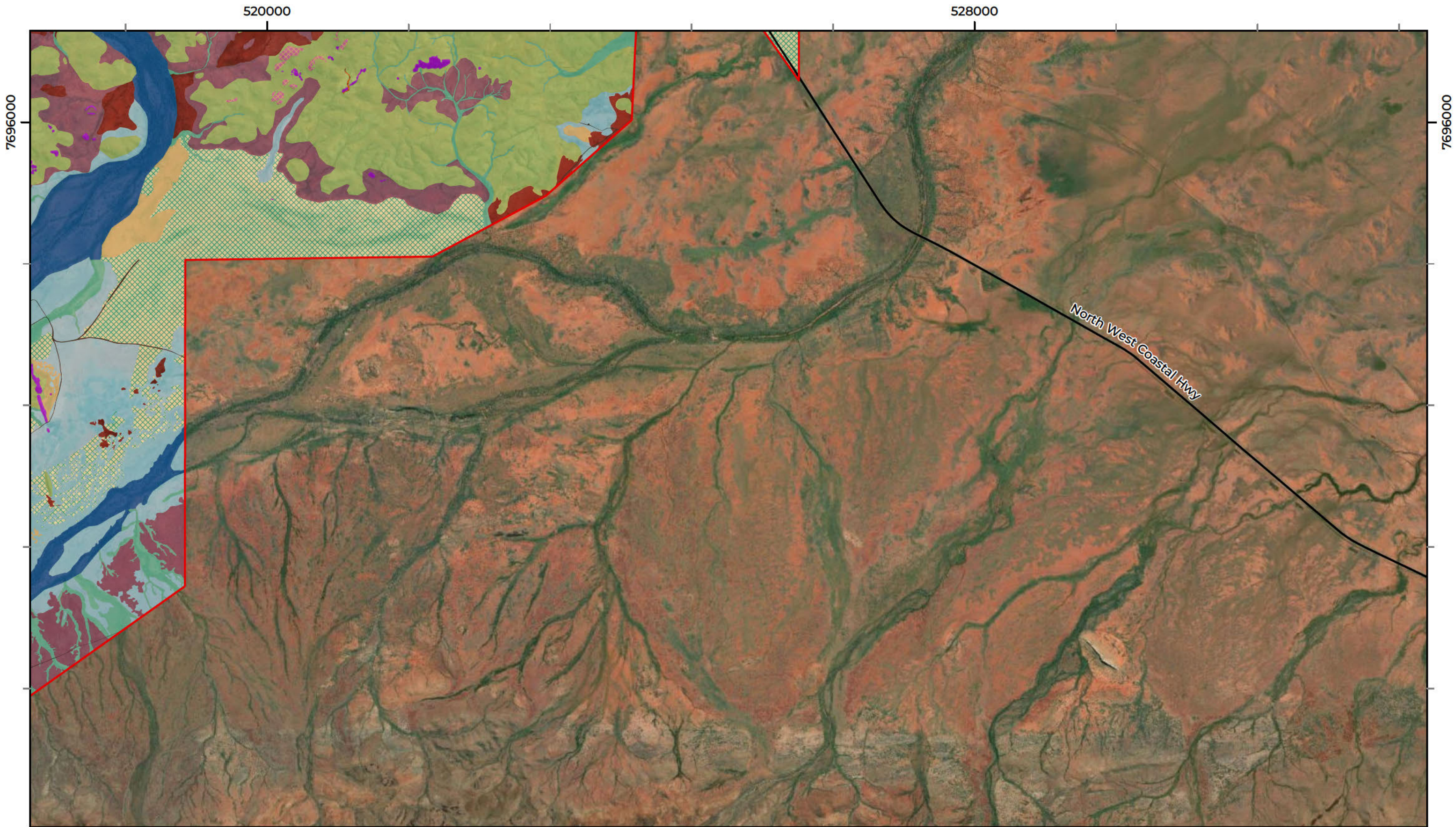
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Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 03/10/2025



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Figure 5.1c: Broad fauna
habitats in the Study Area



LEGEND

- Study Area
- State Road

Fauna Habitat

- Clay Plain
- Claypan
- Cleared
- Drainage Area/Floodplain

- Gorge/Gully
- Low Hills and Slopes
- Major Drainage
- Minor Drainage
- Rock Piles

- Rocky Outcrop
- Sand Plain
- Stony Plain



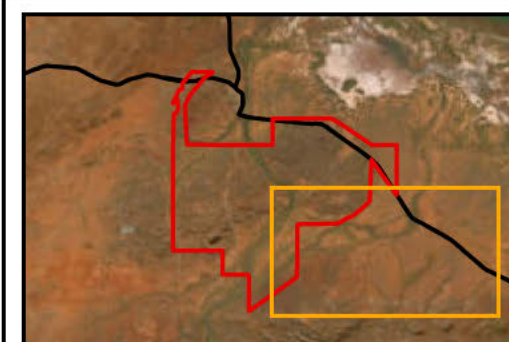
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0 0.5 1 1.5 Km

Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 03/10/2025



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Vertebrate Fauna Survey

Figure 5.1d: Broad fauna
habitats in the Study Area

5.2 Water Features

Water sources are a limiting factor for many ecosystems (James *et al.*, 1995) particularly within arid-zone ecosystems such as the Pilbara (Burbidge *et al.*, 2010; Doughty *et al.*, 2011) and often represent areas of comparatively high ecological productivity (Murray *et al.*, 2003). Mammals and birds have endothermic metabolisms and therefore require relatively continuous sources of food and moisture, while water for amphibians provides opportunities to forage (i.e. suitably wet periods) and breed (i.e. when water pools for long enough for them to complete the life cycle) (James *et al.*, 1995). These features are highlighted because they may provide important sources of food and water for significant species. For northern quolls, they often represent areas of high productivity, and therefore may contain a relatively high abundance of feeding resources (Braithwaite & Griffiths, 1994; Oakwood, 2000), when in suitable habitat – rocky habitats, and to a lesser degree, drainage lines. For Pilbara olive pythons these features can often act as primary foraging locations, particularly within rocky habitats and to a lesser degree within drainage habitats (Pearson, 1993).

Six water features () were assessed in the Study Area during the survey (Figure 5-2). A summary of information recorded at each water feature can be found in Appendix E. Three water features () recorded during previous surveys underwent check-up assessments. The majority of these water features were assessed during the wet and dry season surveys. Surface water was present only during March 2025, following the significant rainfall event in January 2025, suggesting these pools are ephemeral and dependent on seasonal rainfall. A culturally significant water pool () was initially recorded by Biologic in June 2023 and assessed during phase three of the current survey (March 2025). Surface water was present during both assessments, and a diverse assemblage of bird species present in March 2025. () Clay Plain habitat was recorded during phase one (February 2024). Whilst of a significant size (60 m in length), no surface water was recorded during the phase 1 survey. One artificial water source () was recorded in the Study Area. Presence of surface water and emergent macrophytes (*Typha domingensis*) at this water feature suggests that is semi-permanent.

Due to cultural heritage restrictions () was unable to be visited during three of the survey phases, so its permanence could not be confirmed. All other water sources were confirmed to be ephemeral.

5.3 Fauna Recorded

A total of 178 vertebrate fauna species, comprising 30 mammal species (26 native and four introduced), 85 bird species, 61 reptile species and 2 amphibian species were recorded from the Study Area during the current survey (Table 5-3, Appendix F). This comprises approximately 44% of the total number of species identified in the desktop assessment (n=410) as potentially occurring within the Study Area (see Section 3.2). In comparison with the results from previous detailed terrestrial vertebrate fauna surveys undertaken within 50 km of the Study Area, the total species diversity was considerably higher than most other surveys comprising two phases of trapping per site (Table 5-2) except for Phoenix (2010) who recorded a species diversity of 203, compared with 178 during the current survey.

Table 5-2 Summary of vertebrate fauna species recorded during the current survey and from previous detailed surveys within the vicinity of the Study Area.

Source	Distance from Study Area	Mammals (native)	Mammals (introduced)	Bird	Reptiles	Amphibians	Total
Literature Sources							
Phoenix (2010) Terrestrial Vertebrate Fauna Survey for Anketell Point Rail Alignment and Port Projects	6 km	21	5	111	63	3	203
Biota (2008b) Rio Tinto Iron Ore Rail Duplication Fauna Survey: Cape Lambert Variation	7.5 km	10	1	26	25	0	62
Biota (2008a) Cape Lambert Port B Development Seasonal Fauna Survey	19 km	14	3	62	38	2	119
APM (2019) Perdaman Urea Project Pre and Post-wet Season Biological Survey	41 km	12	3	62	27	1	105
Current Survey		26	4	85	61	1	178

Of the 178 species recorded during the current survey, one species was not identified in the desktop assessment as potentially occurring: the ground cuckoo shrike (*Coracina maxima*). The species is widespread, but uncommon across the arid to semi-arid interior zones of Australia (Menkhorst *et al.*, 2017). A group of five individuals were observed foraging in open eucalypt woodland adjacent to the Harding River. Whilst this record is outside the known species distribution, distinctive physical characteristics and foraging behaviour confirmed with certainty the species as ground cuckoo shrike.

A greater species diversity was recorded during the wet season surveys (160 species) than the dry season surveys (137 species), which is attributed to higher breeding, foraging and

dispersal activity of many species following rainfall events. The greatest species diversity (133 species) of a single survey phase was recorded during the phase three survey (March 2025) following the significant rainfall event in January 2025 (Section 4.2). A total of 119 species were recorded during both seasons, while 18 species were recorded only during dry season surveys and 41 species only during wet season surveys.

Table 5-3 Species abundance and diversity recorded at systematic trapping sites

Site		Mammals	Birds	Reptiles	Amphibians
	Abundance	31	88	49	0
	Diversity	8	20	15	0
	Abundance	36	27	55	0
	Diversity	8	14	11	0
	Abundance	30	84	66	0
	Diversity	6	11	12	0
	Abundance	32	31	30	0
	Diversity	12	9	6	0
	Abundance	40	396	57	0
	Diversity	7	29	19	0
	Abundance	23	102	74	0
	Diversity	8	20	15	0
	Abundance	25	244	62	0
	Diversity	7	15	16	0
	Abundance	8	104	35	0
	Diversity	6	20	10	0
	Abundance	44	462	78	0
	Diversity	11	13	12	0
	Abundance	7	995	94	0
	Diversity	7	15	16	0
	Abundance	18	2398	40	0
	Diversity	9	24	7	0
	Abundance	10	2684	134	17
	Diversity	7	28	15	1
	Abundance	18	1099	36	0
	Diversity	10	24	15	0

Green bold indicates greatest diversity or abundance for group across sampling sites

Red bold indicates lowest diversity or abundance for group across sampling sites

5.3.1 Fauna Assemblages

5.3.1.1 Mammals

A total of 30 mammal species from 11 families were recorded in the Study Area from 1,046 individual records. Twelve species were trapped (pitfalls, Elliot traps, cage traps and funnel traps), nine bat species were recorded from ultrasonic bat call recordings, ten species were recorded from camera traps, one species was recorded from targeted searches, and nine species were recorded opportunistically from direct observation or secondary evidence. Bats were the most abundant native mammal group, with 767 records, followed by dasyurids (n=101) and native rodents (n=63). Four introduced mammals were recorded in the Study Area, with wild horse (*Equus ferus*) the most abundant species (n=100). The most commonly occurring mammal across all sampling sites was the common sheath-tailed bat (*Taphozous georgianus*), which was recorded at 29 sampling sites.

Excluding bats, the most abundant mammal species at systematic trapping sites were:

- northern quoll (*Dasyurus hallucatus*) (n=26);
- stripe-faced dunnart (*Sminthopsis macroura*) (n=12); and
- desert mouse (*Pseudomys desertor*) (n=11)

Native mammal species diversity at the systematic trapping sites ranged from 12 species at [REDACTED] (Rock Piles) to six species at [REDACTED] (Clay Plain) and [REDACTED] (Major Drainage Line) (Table 5-3). It should be noted that [REDACTED] was open for only nine trapping nights. The greatest native mammal abundance was recorded at [REDACTED] (Rock Piles) (n=44) and the lowest at [REDACTED] (Stony Plain) (n=7).

5.3.1.2 Birds

A total of 85 bird species (40 families) were recorded in the Study Area from 49,674 individual records. Fifty species were recorded via acoustic recorder, 62 species from bird censuses, 13 species from camera traps, four species from nocturnal searches and 69 species were recorded opportunistically from direct or secondary evidence. The most abundant family group recorded was Psittaculidae (parrots) (n=46,057), followed by Estrildidae (finches) (n=803) and Artimidae (woodswallows and butcherbirds) (n=620).

The most commonly occurring bird species across the Study Area was Singing Honeyeater (*Gavicalis virescens*), which was recorded at 24 sampling sites. The most abundant bird species recorded in the Study Area (including systematic, targeted and opportunistic records) were:

- budgerigar (*Melopsittacus undulatus*) (n=46,048);
- zebra finch (*Taeniopygia guttata*) (n=714); and
- black-faced woodswallow (*Artamus personatus*) (n=492).

The same pattern of species abundance was observed at the systematic sampling sites, with budgerigar the most abundant bird, followed by zebra finch and black-faced woodswallow. Large flocks of over 20,000 budgerigars were observed during the phase three survey, following the rainfall event in January 2025. Total bird abundance at systematic sampling sites was highest at [REDACTED] (Sand Plain) (n=2,684) and [REDACTED] (Clay Plain) (n=2,398), and lowest at [REDACTED] (Low Hills and Slopes) (n=27) (Table 5-3). Species diversity ranged from 29 species at [REDACTED] (Major Drainage Line) to nine species at [REDACTED] (Rock Piles).

5.3.1.3 Reptiles

A total of 61 reptile species (nine families) were recorded in the Study Area from 884 individual records. Fifty three species were trapped (pitfalls, Elliot traps, and funnel traps), 11 species were recorded via camera trap, nine species from nocturnal searches and 21 species were recorded opportunistically from direct observation. Scincidae (skinks) were the most abundant group (n=348), followed by two gecko families (Gekkonidae n=213 and Diplodactylidae n=164). The most commonly occurring reptile species across the Study Area was Bynoe's Gecko (*Heteronotia binoei*), which was recorded at 13 sampling sites. The most abundant reptile species recorded in the Study Area were:

- Bynoe's gecko (*Heteronotia binoei*) (n=110);
- Northern Pilbara beak-faced gecko (*Diplodactylus galaxias*) (n=104); and
- Grand ctenotus (*Ctenotus grandis*) (n=63).

The same pattern of species abundance was observed at the systematic sampling sites, with Bynoe's gecko the most abundant reptile, followed by Northern Pilbara beak-faced gecko and grand ctenotus. Species diversity at the systematic sampling sites ranged from 19 species at [REDACTED] (Major Drainage Line) to six species at [REDACTED] (Rock Piles) (Table 5-3). The greatest reptile abundance was recorded at [REDACTED] (Sand Plain) (n=134) and lowest [REDACTED] (Rock Piles) (n=30).

5.3.1.4 Amphibians

A total of two amphibian species from one family (Pelodyadidae) were recorded in the Study Area from 34 individual records during wet seasons surveys only. Main's frog (*Cyclorana maini*) were recorded at one systematic trapping site [REDACTED] (Sand Plain)), with 17 individual records from pitfall traps during the phase three survey (Table 5-3). Little red tree frog (*Litoria rubella*) and Main's Frog were recorded during nocturnal searches.

5.4 Significant Species

Sixty-three potentially occurring significant species were identified during the desktop assessment, of which four have been previously recorded within the Study Area: Pilbara olive python, northern quoll, ghost bat and western pebble-mound mouse (Section 3.2). During the current survey, five significant species were recorded within the Study Area (Figure 5-2):

- northern quoll (*Dasyurus hallucatus*);
- ghost bat (*Macroderma gigas*);
- grey falcon (*Falco hypoleucos*);
- lined soil-crevice skink (*Notoscincus butleri*); and
- western pebble-mound mouse (*Pseudomys chapmani*).

Two species are considered Likely to occur within the Study Area (short-tailed mouse and fork-tailed swift), and two are considered Possible to occur (eastern osprey and peregrine falcon). The remaining 53 species are considered Unlikely or Highly Unlikely to occur within the Study Area, primarily due to the absence of any critical and/or supporting habitats likely to be used by the species (Table 5-4). The majority of these species are shorebirds, which are likely to use habitats in close proximity of the Study Area, such as the sewage ponds 0.6 km to the east or the coastal mangroves and tidal flats 11 km to the north.

LEGEND

-  Study Area
-  Local Road
-  State Road
-  Rail

 Water Feature

Species

-  Ghost Bat
-  Grey Falcon
-  Northern Quoll
-  Western Pebble-mound Mouse



Biologic



Scale 1:80,000

0 1 2 3 Km

Coordinate System: GDA2020 MGA Zone 50
Transverse Mercator Created: 03/11/2025



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Figure 5.2: Significant
vertebrate fauna species
recorded during
the survey

Table 5-4 Assessment of likelihood of occurrence in the Study Area of species identified in the desktop assessment

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments		
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan				Gorge/ Gully	
MAMMALS																		
DASYURIDAE																		
Northern quoll (<i>Dasyurus hallucatus</i>)	EN	EN		The species tends to inhabit rocky habitats which offer protection from predators and are generally more productive in terms of availability of resources (Braithwaite & Griffiths, 1994) (Oakwood, 2000). Other microhabitat features important to the species include rock cover, proximity to permanent water and time-since last fire (Woinarski <i>et al.</i> , 2008).	Within Study Area (2022) (DBCA, 2025b)	•		•	•	•					•	Confirmed	Resident	Individuals observed during current survey. Suitable breeding/ denning/ shelter habitat present in Rock Piles and Gorge/ Gully habitats. May occur in Major Drainage Line, Minor Drainage Line and Low Hills and Slopes habitats of the Study Area to forage and/or for dispersal, particularly when occurring near suitable denning/ shelter habitat occurring within wider region.
MEGADERMATIDAE																		
Ghost bat (<i>Macroderma gigas</i>)	VU	VU		Ghost bats roost in deep, complex caves beneath bluffs of low, rounded hills, granite rock piles and abandoned Mines (Armstrong & Anstee, 2000). These features often occur within habitats including Gorge/ Gully, hill crest/ hill slope and low hills (Armstrong & Anstee, 2000). Forages broadly across habitats, particularly woodland and open woodland habitats, including eucalypt and mulga woodlands (Biologic, 2020; Richards <i>et al.</i> , 2008; Tidemann <i>et al.</i> , 1985; TSSC, 2016a).	Within Study Area (2018) (DBCA, 2025a, 2025b)	•	•	•	•		•				•	Confirmed	Resident	Species confirmed during current survey to be roosting in abandoned mineshafts within Low Hills and Slopes, and Stony Plain and foraging in Minor Drainage Line habitat in the groundwater north Study Area. Major Drainage Line and Low Hills and Slopes may also provide suitable foraging habitat.
MOLOSSIDAE																		
North-western free-tailed bat (<i>Ozimops cobourgianus</i>)			P1	Associated with mangrove habitat and roost in the hollows of those trees, and known to seek food there and in eucalypt or melaleuca woodland or other coastal habitat (van Dyck & Strahan, 2008).	6.12 km W (2009) (DBCA, 2025b)											Unlikely	N/ A	Suitable habitat not present
MURIDAE																		
Northern short-tailed mouse (<i>Leggadina lakedownensis</i>)			P4	The species occupies a diverse range of habitats from the monsoon tropical coast to semiarid climates, including spinifex and tussock grasslands, samphire and sedgelands, <i>Acacia</i> shrublands, tropical eucalypt and Melaleuca woodlands and stony ranges; however, the species is usually found in seasonally inundated	3.81 NW (2007) (DBCA, 2025b)		•	•	•		•	•	•			Likely	Resident and foraging/ dispersal	Species likely to occur in Claypan, Clay Plain, Major Drainage Line, Minor Drainage Line, Stony Plain and Sand Plain habitats where sandy-clay soils are present.

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan				Gorge/Gully
				habitats on red or white sandy-clay soils (Moro & Kutt, 2008).													
Western pebble-mound mouse (<i>Pseudomys chapmani</i>)			P4	This species occurs on the gentler slopes of rocky ranges where the ground is covered with a stony mantle and vegetated by hard spinifex, often with a sparse overstorey of eucalypts and scattered shrubs (Anstee, 1996; Start <i>et al.</i> , 2000).	Within Study Area (2022) (DBCA, 2025b)	•	•							Confirmed	Resident	An individual was observed during the current survey in Stony Plain habitat. Species is also likely to occur in Low Hills and Slopes areas where suitable stony substrate is present.	
RHINONYCTERIDAE																	
Pilbara leaf-nosed bat (<i>Rhinonycteris aurantia</i> 'Pilbara form')	VU	VU		Species roosts within caves and abandoned mines with high humidity (95%) and temperature (32°C) (Armstrong, 2001). Species forages in caves and along waterbodies with fringing vegetation (TSSC, 2016b).	Within 50km of Study Area (DBCA, 2025b)									Unlikely	N/ A	No suitable roosting habitat present within the Study Area Occurrence in the Study Area is dependent upon proximity of roost cave sites, of which none are known to occur within the Study Area.	
THYLACOMYIDAE																	
Greater bilby (<i>Macrotis lagotis</i>)	VU	VU		Variety of habitats including spinifex hummock grassland and <i>Acacia</i> shrubland, on soft soils (Burrows <i>et al.</i> , 2012). In the Pilbara often associated with Major Drainage Line sandy terraces (How <i>et al.</i> , 1991). Includes residual landforms (e.g. laterite rises), loamy or sandy soils associated with paleo drainage lines and perched drainage lines, sandplains and dune fields, habitat types where shrubs containing root dwelling larvae are common, and recently burnt habitat (within the last 1-3 years) (DBCA, 2017).	>50 km from Study Area (DCCEEW, 2025)						•	•		Unlikely	N/ A	There are small patches of Sand Plain habitat (and bordering Clay Plain habitat) in the Study Area that could provide potential foraging habitat for dispersing individuals; however, these are isolated and unconnected to any other areas of suitable habitat. There are no records of the species within 50 km of the Study Area.	
BIRDS																	
ACCIPITRIDAE																	
Red goshawk (<i>Erythrotriorchis radiatus</i>)	VU	VU		Inhabits tall open forests and woodlands, often in association with drainage lines and fertile soils (Garnett <i>et al.</i> , 2011; Menkhorst <i>et al.</i> , 2017). Nests in trees taller than 20 m within 1 km of watercourse or wetland habitats (Garnett <i>et al.</i> , 2011). Forages in a broad range of habitats within a home range of up to 200 km² (Garnett <i>et al.</i> , 2011).	>50 km from Study Area (DCCEEW, 2025)				•					Unlikely	N/ A	Extremely rare visitor to the Pilbara. Tall eucalyptus associated with the Harding River may provide marginally suitable habitat.	
Eastern osprey (<i>Pandion haliaetus</i>)	MI	MI		Often occurs along coasts and inshore waters and tidal zones (Menkhorst <i>et al.</i> , 2017). Occasionally occurs further inland, particularly following cyclonic activity along the coast, where it's regularly associated with large permanent or	2.64 km WNW (1979)				•					Possible	N/ A	Suitable breeding habitat not present. Foraging and dispersal habitat may be present within Major Drainage Line habitat within the Study Area when large	

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan	Gorge/Gully		
				long-standing waterbodies, often occurring along rivers and lakes. Found mainly in sheltered seas around islands, tidal creeks, estuaries and saltwork ponds, also large river pools (Johnstone & Storr, 1998).	(DBCA, 2025b)											river pools are present following heavy rainfall.
APODIDAE																
Fork-tailed swift (pacific swift) (<i>Apus pacificus</i>)	MI	MI		Inhabits dry/ open habitats, inclusive of riparian woodlands and tea-tree swamps, low scrub, heathland or saltmarsh, as well as treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes (Johnstone & Storr, 1998). Aerial species, which forages high above the tree canopy and rarely lower (Johnstone & Storr, 1998).	26.86 km W (2011) (DBCA, 2025b)	•	•	•	•	•	•	•	•	Likely	Occasional visitor (foraging/ dispersal only)	Recorded foraging 500 m outside of the Study Area during the current survey. May occasionally occur within the airspace above the Study Area to forage, unlikely to land or nest within Study Area.
CHARADRIIDAE																
Greater sand plover (<i>Charadrius leschenaultii</i>)	VU/ MI	VU/ MI		Gregarious inhabitant of tidal flats in Australia, preferring sandy substrates. Roosts on beaches at high tide, usually in association with other small waders, but more tolerant of hot dry sand (Menkhorst et al., 2017). Estuarine mudflats and sandbanks, on sandy or rocky ocean beaches as well as open inland environments such as, semi-arid or arid grasslands, where the grass is short and sparse (Johnstone & Storr, 2004).	10.28 km NW (2012) (DBCA, 2025b)									Unlikely	N/ A	Suitable habitat is not present.
Lesser sand plover (<i>Charadrius mongolus</i>)	EN/ MI	EN/ MI		Tidal mudflats and sandflats, gently sloping sandy and shelly beaches, estuaries, reefs, saltmarsh, atolls, mangroves and airfields. On occasion inland on freshwater lakes, bore drains and swamps (Pizzey & Knight, 2007).	13.96 km N (1987) (DBCA, 2025b)									Unlikely	N/ A	Suitable habitat is not present.
Oriental plover (<i>Charadrius veredus</i>)	MI	MI		Variety of habitats, including coastal habitats, such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches as well as open inland environments such as, semi-arid or arid grasslands, where the grass is short and sparse (Johnstone & Storr, 2004).	38.15 km W (2012) (DBCA, 2025b)									Unlikely	N/ A	Suitable habitat is not present.
Pacific golden plover (<i>Pluvialis fulva</i>)	MI	MI		Found in estuaries, mudflats, saltmarshes, mangroves, rocky reefs and seaweed stranded on ocean shores (Pizzey & Knight, 2007). Roosts on near-coastal saltmarshes and short sparse grasses. A small proportion occurs inland on wetlands and sparse grasslands (Menkhorst et al., 2017).	15.09 km NNW (2010) (DBCA, 2025b)									Unlikely	N/ A	Suitable habitat is not present.

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan				Gorge/Gully
Grey plover (<i>Pluvialis squatarola</i>)	MI	MI		Inhabits intertidal mudflats, saltmarshes, sandflats and beaches, tidal reefs, estuaries and is rarely found inland. (Garnett <i>et al.</i> , 2011; Pizzey & Knight, 2007).	10.28 km NW (2011) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
FALCONIDAE																	
Grey falcon (<i>Falco hypoleucos</i>)	VU	VU		Timbered lowlands, particularly <i>Acacia</i> shrubland and along inland drainage systems. Also frequents spinifex and tussock grassland habitats to forage (Burbidge <i>et al.</i> , 2010; Olsen & Olsen, 1986). The species commonly nests in timbered areas, particularly tall trees along watercourses, or tall infrastructure (e.g. powerline towers) and forages in open or more sparsely vegetated habitats (Garnett <i>et al.</i> , 2011).	7.95km ESE (2011) (DBCA, 2025b)		•	•	•						Confirmed	Occasional visitor (potential nesting, foraging/ dispersal)	Individuals observed during current survey. Potentially forages along the Harding River system (Major Drainage Line habitat), within the Study Area. Tall eucalypts along Major Drainage Line and electricity pylons throughout the Stony Plain and Low Hills and Slopes offer potential nesting habitat.
Peregrine falcon (<i>Falco peregrinus</i>)			OS	Arid areas and is most often encountered along cliffs above rivers, ranges and wooded watercourses where it hunts birds (Johnstone & Storr, 1998). It typically nests on rocky ledges occurring on tall, vertical cliff faces between 25 m and 50 m high (Olsen <i>et al.</i> , 2004; Olsen & Olsen, 1989). In general it nests on cliffs, granite outcrops, quarries and in the wheatbelt, old Raven and Whistling Kite nests (Johnstone & Storr, 1998).	10.76 km NNE (2003) (DBCA, 2025b)				•						Possible	Occasional visitor (potential foraging/ dispersal)	Potentially forages along the Harding River system (Major Drainage Line habitat), within the Study Area on an occasional basis. Preferred nesting habitat (i.e. steep cliff faces) not present within the Study Area.
GLAREOLIDAE																	
Oriental pratincole (<i>Glareola maldivarum</i>)	MI	MI		Prefers open plains, floodplains or short grasslands, often with extensive bare areas. They often occur near terrestrial wetlands (such as billabongs, lakes or creeks), and artificial wetlands (such as reservoirs, saltworks and sewage farms) (Johnstone & Storr, 1998).	2.63 km WNW (1978) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
HIRUNDINIDAE																	
Barn swallow (<i>Hirundo rustica</i>)	MI	MI		Non-breeding summer visitor to the Pilbara and Kimberly. It favors areas near water (Johnstone <i>et al.</i> , 2013) (Menkhorst <i>et al.</i> , 2017).	42.90 km W (2016) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
LARIDAE																	
White-winged black tern	MI	MI		Mainly estuaries and sheltered seas in north, mainly freshwater swamps and lakes in the south; also samphire and short-grass flats, salt	19.03 km W (1980)										Unlikely	N/ A	Suitable habitat is not present.

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan				Gorge/Gully
(<i>Chlidonias leucopterus</i>)				lakes, saltwork and sewage ponds (Johnstone & Storr, 1998).	(DBCA, 2025b)												
Gull-billed tern (<i>Gelochelidon nilotica</i>)	MI	MI		Found in freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands (Johnstone & Storr, 1998). In the interior, they are often associated with inundated salt lakes and claypans and watercourses (Johnstone & Storr, 1998). Colonial breeds and nests on islets in partially filled salt lakes or saltmarshes in mid-western interior (Johnstone & Storr, 1998).	2.09 km E (2001) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Bridled tern (<i>Onychoprion anaethetus</i>)	MI	MI		Occupy tropical and sub-tropical seas. Breeds on islands including vegetated coral cays, rock stacks and rocky continental islands (DoEE, 2019).	13.96 km N (2011) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Crested tern (<i>Thalasseus bergii</i>)	MI	MI		Favours sheltered seas, also estuaries and saltwork ponds. Rarely crosses the coastline and inland records generally involve birds driven by a storm or cyclone (Johnstone & Storr, 1998).	13.63 km N (1999) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Caspian tern (<i>Hydroprogne caspia</i>)	MI	MI		Mainly sheltered seas, estuaries and tidal creeks; occasionally near-coastal salt lakes (including saltwork ponds) and brackish pools in lower courses of rivers; rarely fresh water (Johnstone & Storr, 1998).	2.09 km E (2001) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Roseate tern (<i>Sterna dougallii</i>)	MI	MI		Found in offshore waters, islands, coral reefs, sand cays, beaches and tidal inlets (Pizzey & Knight, 2007).	19.00 km WNW (undated) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Common tern (<i>Sterna hirundo</i>)	MI	MI		Migrant from north Asian breeding grounds. Coastal, foraging in near-shore waters from sheltered bays beyond surf zone (Menkhorst et al., 2017).	13.96 km N (2011) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Little tern (<i>Sternula albifrons</i>)	MI	MI		Widespread on coast of north and east Australia, forages over sheltered waters and roost on exposed sandbars, splits or beaches. From Oct – Mar most Little Terns seen in Australia are non-breeding migrants from Asian breeding grounds. Nests in colonies in open sandy settings, close to tideline; beach-nesting populations of at least south east Australia (Menkhorst et al., 2017).	10.28 km NW (2011) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan				Gorge/Gully
Fairy tern (<i>Sternula nereis</i>)	VU	VU		Found on sheltered coasts, and in fresh and saline wetlands. Nests on sandy beaches (Garnett <i>et al.</i> , 2011).	19.00 km WNW (undated) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
MOTACILLIDAE																	
Grey wagtail (<i>Motacilla cinerea</i>)	MI	MI		A rare vagrant to Western Australia where it has been recorded within various habitats with open waterbodies (Johnstone & Storr, 2004).	>50 km from Study Area (DCCEEW, 2025)										Highly Unlikely	N/ A	Suitable habitat is not present.
Yellow wagtail (<i>Motacilla flava</i>)	MI	MI		A seasonal visitor to the Pilbara region (Johnstone <i>et al.</i> , 2013). Occupies a range of damp or wet habitats with low vegetation although favors edges of fresh water, especially sewage ponds (Johnstone & Storr, 2004).	>50 km from Study Area (DCCEEW, 2025)										Highly Unlikely	N/ A	Suitable habitat is not present.
PSITTACIDAE																	
Night parrot (<i>Pezoporus occidentalis</i>)	EN	CR		Requires patches of low, dense vegetation (specifically long unburnt, ring-forming <i>Triodia</i> species) in which to roost during the day (DBCA, 2024e). Flat or gently sloping areas with few trees and structurally complex <i>Triodia</i> patches are favoured. Floodplains supporting a diverse assemblage of native grasses, herbs and chenopod shrubs are required for foraging.	>50 km from Study Area (DCCEEW, 2025)										Unlikely	N/ A	Favoured roosting habitat is not present within the Study Area. Structurally complex <i>Triodia</i> patches within the Study Area are not present. No chenopod shrublands or other suitable foraging habitat is not present in the Study Area.
ROSTRATULIDAE																	
Australian painted snipe (<i>Rostratula australis</i>)	EN	EN		Favours recently flooded areas in shallow lowland freshwater temporary or permanent wetlands. This includes swamps, marshes, reedbeds, overgrown rice fields, inundated grassland and saltmarsh, margins of pools, freshwater lakes, sewage pools, reservoirs and mudflats (BirdLife International, 2024).	32.06 km S (2011) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present
SCOLOPACIDAE																	
Ruddy turnstone (<i>Arenaria interpres</i>)	MI	MI		Species habitat includes tidal reefs and pools, pebbly, shelly and sandy shores with stranded seaweed, weed-covered rocks, mudflats and on occasion inland shallow waters, sewage ponds, open or ploughed grounds and commercial salt fields (Pizzey & Knight, 2007).	9.80 km NNE (2013) (DBCA, 2025b)										Unlikely	N/ A	Species recorded at sewage pond within 10 km of the Study Area. Lack of any suitable habitat present in the Study Area makes likelihood of occurrence unlikely.

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan				Gorge/ Gully
Sharp-tailed sandpiper (<i>Calidris acuminata</i>)	MI	MI		Coastal and inland areas saline and freshwater but prefers non-tidal fresh or brackish wetlands (Geering <i>et al.</i> , 2007). Favors flooded samphire flats and grasslands, mangrove creeks mudflats, beaches, river pools, saltwork ponds, sewage ponds and freshwater soaks (Johnstone <i>et al.</i> , 2013).	0.57 km E (2007) (DBCA, 2025b)										Unlikely	N/ A	Species recorded at sewage pond within 10 km of the Study Area. Lack of any suitable habitat present in the Study Area makes likelihood of occurrence unlikely.
Sanderling (<i>Calidris alba</i>)	MI	MI		Broad ocean beaches of firm sand, depositing strands and mounds of seaweed. Often near river mouths, tidal mudflats, inlets and coastal lagoons (Pizzey & Knight, 2007).	10.28 km NW (2011) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Red knot (<i>Calidris canutus</i>)	EN/ MI	EN/ MI		Found in mudflats and sandflats in estuaries, on sheltered coasts, near coastal salt lakes, and saltworks ponds (Johnstone & Storr, 1998).	10.28 km NW (2011) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Curlew sandpiper (<i>Calidris ferruginea</i>)	CR/ MI	CR/ MI		Inhabits intertidal mudflats in sheltered coastal areas (i.e. estuaries, bays, inlets and lagoons) (Geering <i>et al.</i> , 2007). This rare species generally roosts on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands (Geering <i>et al.</i> , 2007).	9.87 km NNE (2007) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Pectoral sandpiper (<i>Calidris melanotos</i>)	MI	MI		Coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (Johnstone & Storr, 2004; Johnstone <i>et al.</i> , 2013). It prefers wetlands with open fringing mudflats and low, emergent or fringing vegetation (Geering <i>et al.</i> , 2007).	Within 50 km (DCCEEW, 2025)										Unlikely	N/ A	Suitable habitat is not present.
Red-necked stint (<i>Calidris ruficollis</i>)	MI	MI		Lives in permanent or ephemeral wetlands of varying salinity, and regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In Western Australia they prefer freshwater to marine environments. The species usually forages in shallow water at the edge of wetlands and roost or loaf on tidal mudflats, near low saltmarsh, and around inland swamps (Johnstone & Storr, 1998).	8.69 km SSW (2014) (DBCA, 2025b)										Unlikely	N/ A	Species recorded at sewage pond within 10 km of the Study Area. Lack of any suitable habitat present in the Study Area makes likelihood of occurrence unlikely.

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments		
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan				Gorge/Gully	
Long-toed stint (<i>Calidris subminuta</i>)	MI	MI		Prefers shallow freshwater or brackish wetlands but are also fond of muddy shorelines, growths of short grasses, weeds, sedges, low or floating aquatic vegetation, reeds, rushes, and occasionally stunted samphire. Also frequents permanent wetlands and forages on wet mud or in shallow water, often among short grass, weeds, and other vegetation on islets or around the edges of wetlands. They roost or loaf in sparse vegetation at the edges of wetlands and on damp mud near shallow water. It also roosts in small depressions in the mud (Johnstone & Storr, 1998).	0.57 km E (2007) (DBCA, 2025b)										Unlikely	N/ A	Species recorded at sewage pond within 10 km of the Study Area. Lack of any suitable habitat present in the Study Area makes likelihood of occurrence unlikely.	
Great knot (<i>Calidris tenuirostris</i>)	CR/MI	CR/MI		Breeds in the subarctic on montane tundra. Non-breeding birds migrate to harbours, bays, inlets, estuaries and lagoons with large intertidal sand and mud flats (Garnett <i>et al.</i> , 2011).	10.28 km NW (2011) (DBCA, 2025b)											Unlikely	N/ A	Suitable habitat is not present.
Pin-tailed Snipe (<i>Gallinago stenura</i>)	MI	MI		Migrant to wetlands on the coastal plains of north-western Australia (Menkhorst <i>et al.</i> , 2017).	Within 50 km (DBCA, 2025b)											Unlikely	N/ A	Suitable habitat is not present.
Broad-billed sandpiper (<i>Calidris falcinellus</i>)	MI	MI		Migrant from Siberian bogs, staging on shores of Yellow Sea. Gregarious and mainly coastal in Australia (Menkhorst <i>et al.</i> , 2017). Tidal mudflats, reefs, saltmarsh, freshwater wetlands, sewerage ponds (Pizzey & Knight, 2007).	38.15 km W (2012) (DBCA, 2025b)											Unlikely	N/ A	Suitable habitat is not present.
Asian dowitcher (<i>Limnodromus semipalmatus</i>)	MI	MI		Breeds in isolated colonies in central and east Siberia, migrates to non-breeding grounds in south-east Asia, with stronghold in the north Sumatra coast in WA, especially Roebuck Bay (Menkhorst <i>et al.</i> , 2017).	< 50 km from Study Area (DCCEEW, 2025)											Highly Unlikely	N/ A	Suitable habitat is not present.
Bar-tailed godwit (<i>Limosa lapponica</i>)	EN	CR		Found on muddy coastlines, estuaries, inlets, mangrove-fringed lagoons and sheltered bays (Garnett <i>et al.</i> , 2011).	5.72 km N (1981) (DBCA, 2025b)											Unlikely	N/ A	Suitable habitat is not present.
Yakutian Bar-tailed godwit (<i>Limosa lapponica menzbieri</i>)	CR/MI	MI		Similar habitat preferences to <i>Limosa lapponica</i> (Menkhorst <i>et al.</i> , 2017).	Within 50 km (DCCEEW, 2025)											Unlikely	N/ A	Suitable habitat is not present.
Black-tailed godwit (<i>Limosa limosa</i>)	MI	MI		Found mainly in coastal habitats like estuaries, tidal mudflats, sandspits, shallow river margins, sewage ponds. Inland habitats include large shallow fresh or brackish waters (Pizzey & Knight,	5.72 km N (1978) (DBCA, 2025b)											Unlikely	N/ A	Suitable habitat is not present.

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan				Gorge/Gully
				2007). There are a few inland records, around shallow, freshwater and saline lakes, swamps, dams and bore-overflows. They also use lagoons in sewage farms and saltworks (Higgins & Davies, 1996).													
Eastern curlew (<i>Numenius madagascariensis</i>)	CR/MI	CR		Mainly tidal mudflats, also reef flats, sandy beaches and rarely near-coastal lakes including saltwork ponds (Johnstone & Storr, 1998).	5.72 km N (1981) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Little curlew (<i>Numenius minutus</i>)	MI	MI		Nests in east Siberian taiga clearings, late May to mid-July, on Migration, many stages on Coastal plains on west side of Yellow Sea. Occurs on north Australia and south New Guinea non breeding grounds from about mid-September to mid-April (Menkhorst <i>et al.</i> , 2017).	1.67 km ESE (2010) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Whimbrel (<i>Numenius phaeopus</i>)	MI	MI		Often found on the intertidal mudflats of sheltered coasts. Can also be found in lagoons, harbours, estuaries and river deltas, frequently those with mangroves, but also in open, unvegetated mudflats (DoEE, 2019).	5.72 km N (1981) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Red-necked phalarope (<i>Phalaropus lobatus</i>)				Found mainly in fresh to saline near-coastal wetlands with muddy margins (Menkhorst <i>et al.</i> , 2017).	Within 50 km (DCCEEW, 2025)										Unlikely	N/ A	Suitable habitat is not present.
Grey-tailed tattler (<i>Tringa brevipes</i>)	MI	MI	P4	Found mainly in tidal mudflats, estuaries; shores and reefs of islands and coastal swamps and commercial salt fields (Pizzey & Knight, 2007).	5.72 km N (1981) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Wood sandpiper (<i>Tringa glareola</i>)	MI	MI		Species occurs as a non-breeding summer migrant which occurs throughout the region. Occurs mainly in river pools, sewage ponds, flooded claypans, freshwater lagoons and bore overflows (Johnstone <i>et al.</i> , 2013). Freshwater wetlands and occasional brackish intertidal mudflats (Geering <i>et al.</i> , 2007).	0.57 km E (2007) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Common sandpiper (<i>Actitis hypoleucos</i>)	MI	MI		Estuaries and deltas of streams, as well as banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans (Johnstone & Storr, 1998).	5.72 km N (1977) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Common greenshank (<i>Tringa nebularia</i>)	MI	MI		Species occur as a non-breeding summer Migrant which occurs throughout the region.	2.24 km WNW										Unlikely	N/ A	Suitable habitat is not present.

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area									Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan	Gorge/Gully			
				Occurs mainly in Tidal mudflats, mangrove creeks, flooded samphire flats, beaches, river pools, and saltwork and sewage ponds (Johnstone <i>et al.</i> , 2013).	(2005) (DBCA, 2025b)												
Marsh sandpiper (<i>Tringa stagnatilis</i>)	MI	MI		Lives in permanent or ephemeral wetlands of varying salinity, and regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In Western Australia they prefer freshwater to marine environments. The species usually forages in shallow water at the edge of wetlands and roost or loaf on tidal mudflats, near low saltmarsh, and around inland swamps (Johnstone & Storr, 1998).	2.09 km E (2001) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Terek sandpiper (<i>Xenus cinereus</i>)	MI	MI		Mainly forages in open, soft wet intertidal mudflats, sheltered estuaries, embayments, harbours and lagoons, but also islets, mudbanks, sandbanks, spits, near mangroves and samphire. Generally, roosts in mangroves but also found on flat shores, muddy spits, islets, banks and occasionally sandy or pebbly beaches (DoEE, 2019).	10.28 km NW (2011) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
THRESKIORNITHIDAE																	
Glossy ibis (<i>Plegadis falcinellus</i>)	MI	MI		Freshwater wetlands, irrigated areas, margins of dams, floodplains, brackish and saline wetlands, tidal mudflats, pastures, lawns and public gardens (Johnstone <i>et al.</i> , 2013).	12.48 km S (2013) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
REPTILES																	
PYTHONIDAE																	
Pilbara olive python (<i>Liasis olivaceus barroni</i>)	VU	VU		Associated with drainage systems, including areas with localised drainage and watercourses (Pearson, 1993). In the inland Pilbara the species is most often encountered near permanent waterholes in rocky ranges or among riverine vegetation (Pearson, 1993).	Within Study Area (Biologic, 2024b)			•	•	•				•	Confirmed	Resident	Individual recorded in the survey area within Major Drainage Line habitat during a previous survey in2023. Rock Piles and Gorge/ Gully habitats and water features identified during the survey provide critical habitat for the species.
SCINCIDAE																	

Common Name (Scientific Name) WAM	Conservation Status			Preferred Broad Habitats	Nearest Previous Record to the Study Area	Potential Habitat Within the Study Area								Likelihood of Occurrence	Occurrence	Comments	
	EPBC Act	BC Act	DBCA			Low Hills and Slopes	Stony Plain	Minor Drainage Line	Major Drainage Line	Rock Piles	Sand Plain	Clay Plain	Claypan				Gorge/Gully
<i>Ctenotus angusticeps</i>	VU		P3	Observed on coastal mudflats vegetated with samphire, sometimes sheltering in crab holes on intertidal zone (Wilson & Swan, 2021).	19.62 km W (2012) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Nevin's slider (<i>Lerista neviniae</i>)	EN	EN		Coastal dunes vegetated with <i>Acacia</i> and low shrubs between Point Sampson and Cape Lambert (Wilson & Swan, 2021).	11.24 km N (2002) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Four-lined slider (Karratha) (<i>Lerista quadrivincula</i>)			P1	Arid coastal plain near Karratha. Only one specimen known (Wilson & Swan, 2021).	35.03 km SW (1980) (DBCA, 2025b)										Unlikely	N/ A	Suitable habitat is not present.
Lined soil-crevice skink (Dampier) (<i>Notoscincus butleri</i>)			P4	Recorded in areas dominated by spinifex and near water courses (Wilson & Swan, 2021). The species' preferred habitat is grasslands habitat on stony substrates fringing creek lines. Records are restricted to a coastal area within the Lower Fortescue Hedland region.	0.41 km W (2004) (DBCA, 2025b)		•	•	•		•				Confirmed	Resident	Individuals observed during the current survey throughout Major Drainage, Stony Plain, Claypan and Sand Plain habitats.

5.4.1 Species Confirmed as Occurring in the Study Area

5.4.1.1 Northern Quoll (*Dasyurus hallucatus*) – Endangered (EPBC Act and BC Act)

The Northern quoll was once widely distributed across northern Australia; however, it is now restricted to three isolated populations; the Pilbara, the Kimberley and Northern Territory, and Queensland (DoE, 2016). The northern quoll is both arboreal and terrestrial, inhabiting ironstone and sandstone ridges, scree slopes, granite boulders and outcrops, drainage lines, riverine habitats (Braithwaite & Griffiths, 1994; Oakwood, 2002), dissected rocky escarpments, open forest of lowland savannah and woodland (Oakwood, 2002, 2008). Rocky habitats tend to support higher densities, as they offer protection from predators and are generally more productive in terms of availability of resources (Braithwaite & Griffiths, 1994; Oakwood, 2000). Other microhabitat features important to the species include: rock cover; proximity to permanent water and time-since last fire (Woinarski *et al.*, 2008). Dens occur in a wide range of situations including rock overhangs, tree hollows, hollow logs, termite mounds, goanna burrows and human dwellings/ infrastructure, where individuals usually den alone (Oakwood, 2002; Woinarski *et al.*, 2008). At present, northern quolls are relatively common in the northern Pilbara region (generally within 150 km of the coast) but are much less common in southern and south-eastern parts of the region (Cramer *et al.*, 2016b). The Study Area is located within the species' current distribution as mapped by (DoE, 2016), and has been recorded 486 times within 43 km of the Study Area, including 50 records within the Study Area from previous surveys (Biologic, 2024b), (DBCA, 2025b) (Figure 3-1).

Northern quoll was recorded on 67 occasions during all phases of the current survey (Figure 5-2) from systematic trapping, nocturnal and diurnal targeted searching, opportunistic observations of secondary evidence (i.e. scat) (Table 5-5) and camera traps (Table 5-6).

During phase one, two individual northern quolls were trapped at systematic trapping site [REDACTED], and one northern quoll observed in Minor Drainage Line habitat during a nocturnal search (Table 5-5). Two individual northern quolls were trapped during phase two at systematic trapping site [REDACTED]. Northern quoll scat was recorded opportunistically during phase three and during a targeted search in phase four.

Table 5-5 Summary of northern quoll records during the current survey from direct observation or secondary evidence

Phase	Location	Date	Time	Observer	Notes
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual
1	Rock Piles	10 March 2025	1947 hrs	[REDACTED]	1 individual
1	Rock Piles	11 March 2025	1915 hrs	[REDACTED]	1 individual

A total of 20 individual quolls were recorded from 57 camera trap capture events across six sampling sites in Rock Piles and Gorge/ Gully habitat (Table 5-6). One individual was recorded during phase two and three, while all others were recorded only during one survey phase. The same individual was recorded at [REDACTED] on 10 March 2025 at 1947 hrs and at [REDACTED] on 11 March 2025 at 1915 hrs. [REDACTED] is located in Rock Piles habitat [REDACTED] in Rock Piles habitat [REDACTED]. Low Hills and Slopes and Minor Drainage Line provide connectivity between the two sites, evidencing use of these habitats for foraging or dispersal. Major Drainage Line may also provide supporting foraging and dispersal habitat. These supporting habitats cover a combined area of 6,271.11 ha (51.08%) of the Study Area and are of particular importance where providing connectivity between critical habitat (Figure 5-1). Rock Piles, Rocky Outcrop and Gorge/ Gully habitats cover a combined area of 318.52 ha (2.59%) of the Study Area and are considered critical habitat for breeding/ denning, foraging and dispersal (Figure 5-1). These habitats in the Study Area were assessed to be refuge-rich with high rock cover, rocky overhangs and rocky cracks/ crevices (Appendix D).

Table 5-6 Summary of northern quoll records from camera traps during the current survey

Drainage Line habitats cover 2,565.36 ha or 20.9% of the Study Area and provide supporting foraging and dispersal habitat for the species. Given the frequency of observation of this species over the current survey and presence of suitable habitat, it is likely that nesting sites are present within or proximal to the Study Area.

Table 5-7 Grey falcon records during the current survey

Date	Abundance	Observation method	Habitat notes
26/02/2024	2	Opportunistic	Flying over Stony Plain habitat in the groundwater area.
13/03/ 2025	1	Opportunistic	Perching on powerlines along Woodbrook Road.
12/03/ 2025	2	Opportunistic	Perching on an electricity pylon and then flying over Clay Plain and Minor Drainage Line habitats.
9/03/2025	2	Avifauna Census	Flying over VAND-431 Sand Plain.
7/03/2025	1	Opportunistic	Perching on powerlines along Woodbrook Road.

5.4.1.2 Pilbara Olive Python (*Liasis olivaceus barroni* – Endangered (EPBC Act and BC Act)

The Pilbara olive python is Western Australia's largest snake, averaging 2.5 m in length, with records up to 4.5 m (Bush & Maryan, 2011; Cogger, 2014). It is endemic to the Pilbara and northern parts of the Gascoyne bioregions, distributed from Burrup Peninsula, Ord Ranges and Meentheena, south to Nanutarra and Newman in the Pilbara, with an isolated population occurring at Mt Augustus in the Gascoyne region (Bush & Maryan, 2011; Storr *et al.*, 2002). The species is often associated with rocky habitats and drainage systems, including areas with localised drainage and watercourses (DSEWPaC, 2011b (Pearson, 1993). Pilbara olive pythons are primarily nocturnal and tend to shelter in small caves or under vegetation during the day, although they are occasionally active during the day during warmer summer months (Pearson, 1993). The breeding season takes place in the cooler months, which extends from June to August, and males will travel up to 3 km in search of a mate (DSEWPaC, 2011b). It is a well-adapted opportunistic ambush predator and common prey items include rock-wallabies, small euros, fruit bats, waterbirds, doves/ pigeons (Ellis, 2013; Ellis & Johnstone, 2016; Pearson, 2007; Pearson, 2003; TSSC, 2008).

There are 65 records of the species within 42 km of the Study Area (DBCA, 2025b) from 1990 to 2024. Whilst the majority of these records are located in the vicinity of the Burrup Peninsula and Dampier Archipelago approximately 35-42 km from the Study Area, one Pilbara olive python has previously been recorded in the Study Area (Biologic, 2024b). The individual was found in June 2023 at water feature [REDACTED] during a nocturnal search.

Major Drainage Line, Rock Piles, Rocky Outcrop and Gorge/ Gully habitats (covering a combined 916.52 ha or 7.46% of the Study Area) provide critical breeding, foraging and dispersal habitat for the species. Minor Drainage Line habitat (5.3%, 650.63 ha) within the Study Area may provide supporting foraging and dispersal habitat, particularly where aiding connectivity between areas of critical habitat. Permanent water features are also considered critical habitat for the species. Water feature [REDACTED] had surface water recorded in the dry season of 2023 and wet season of 2025, so may be a permanent pool. All other water features identified in the Study Area, including [REDACTED] where the individual was observed in 2023, are classified as ephemeral. Nocturnal and diurnal searches targeting Pilbara olive python were conducted during the current survey in critical and supporting habitats; however, no individuals were found.

Although the Pilbara olive python was not recorded during the current survey, the previous record confirms its occurrence within the Study Area. Considering this, and the extent of critical and supporting habitat within the Study Area, it is possible that a resident population occurs.

5.4.1.3 Ghost Bat (*Macroderma gigas*) – Vulnerable (EPBC Act and BC Act)

In the Pilbara region, ghost bats roosts in deep, complex caves beneath bluffs of low rounded hills, often composed of Marra Mamba Iron Formation or banded iron formation, granite rock piles and abandoned mines (Armstrong & Anstee, 2000). They roost either individually or in colonies (Churchill, 2008) and move between a number of caves, both seasonally and as dictated by weather changes (van Dyck & Strahan, 2008). The species will often forage more broadly across habitats, often showing a preference for plain (i.e. Drainage Area/ Floodplain, Stony Plain and Mulga Woodland habitats) habitats where prey species are likely to be most abundant (Bat Call, 2021a; Richards *et al.*, 2008; Tidemann *et al.*, 1985). Recent studies of ghost bat home range and foraging behaviour in the Pilbara region have identified Drainage Area/ Floodplain, Gorge/ Gully (particularly in close proximity to roosts), Major Drainage Line and Mulga Woodland as high suitability foraging habitats for the species, followed by Stony Plain as moderate suitability (Bat Call, 2021a; Biologic, 2020; unpublished data). This suitability, however, is variable depending on particular habitat characteristics, including the abundance of foraging structures (tree perches) and density of understory vegetation present (Bat Call, 2021a; Biologic, 2020; unpublished data). Foraging can occur up to 12 km from diurnal roosts (Bat Call, 2021a).

Ghost bat calls were recorded in 2023 within the Study Area, during a previous survey (Biologic, 2024a) at [REDACTED]. A ghost bat sighting was recorded in 2018 at the same site (DBCA, 2025b). During the 2018 survey, a ghost bat was trapped at [REDACTED]. In

2006 a ghost bat was trapped 36.78 km [REDACTED] of the Study Area [REDACTED].

During the current survey, ghost bat was recorded on 56 occasions [REDACTED] (Table 5-8). Ghost bat diurnal roosting was confirmed at three [REDACTED] and two adjacent to the Study Area ([REDACTED]).

One hundred and fifty (150) ghost bats were observed exiting [REDACTED] at midday during the phase one survey. The bats were observed flying [REDACTED] into the Study Area over Stony Plain habitat within the Study Area. An ultrasonic recorder was deployed [REDACTED] for four nights, with one to 26 ghost bat calls recorded each night (Table 5-8). During dusk counts in phase one and two, five and 16 individuals, respectively, were observed exiting [REDACTED].

Two [REDACTED] were observed in close proximity to [REDACTED] during phase one. The site ([REDACTED]) is approximately 100 m outside of the Study Area, [REDACTED]. An ultrasonic recorder was deployed at each [REDACTED] for three nights during the survey, with ghost bat calls recorded on all nights (Table 5-8). Call numbers ranged from seven to 56 calls. Dusk counts were undertaken on two nights during phase one, with 48 and 51 ghost bats recording exiting [REDACTED] on each night. A dusk count was undertaken on one night during phase two, with 27 individuals recorded exiting the larger [REDACTED]. Survey effort during phase three and four focussed on sites within the Study Area.

Ghost bat calls were recorded at [REDACTED] on 12 of the 13 recording nights from February 2024 to August 2025, with call numbers ranging from two to 17 calls (Table 5-8). During dusk counts, one ghost bat was recorded flying over Stony Plain habitat adjacent to [REDACTED] in phase two and four ghost bats were recorded exiting the [REDACTED] during phase three.

Ghost bat calls were recorded at [REDACTED] on eight of the 13 recording nights from February 2024 to August 2025, with call numbers ranging from one to ten calls (Table 5-1). It should be noted that ultrasonic data for the three recording nights during phase three was unable to be analysed due to data card corruption. During the survey however, three individuals were accidentally flushed from [REDACTED] at approximately 2pm, suggesting that diurnal roosting was occurring.

Ghost bat calls were recorded at [REDACTED] on 10 of the 13 recording nights from February 2024 to August 2025, with call numbers ranging from one to ten calls (Table 5-1). Due to data card corruption, ultrasonic data for the three recording nights during phase three was unable to be analysed at this site.

Ghost bat calls were recorded on four occasions at systematic trapping sites [REDACTED] (Major Drainage Line) and [REDACTED] (Minor Drainage Line) during phase 3. One call was recorded on each night (Table 5-8).

The [REDACTED] are classified as Category 2 (permanent diurnal roosts) and represent critical habitat for ghost bats (Bat Call, 2024). Due to the shallow structure of [REDACTED], it is classified as Category 3 (semi-permanent diurnal roost) and provides supporting habitat (Bat Call, 2024). The Stony Plain, Minor and Major Drainage Lines, Sand Plain, Gorge/ Gully and Drainage Area/ Floodplain habitats within 12km of these roost sites, provides supporting habitat for foraging and dispersal.

Table 5-8 Ghost bat records during the current survey

[illegible]

5.4.1.4 Lined Soil-crevice Skink (*Notoscincus butleri*) – Priority 4 (DBCA)

The lined soil-crevice skink is endemic to the Pilbara region. The species is scarcely recorded and little is known of the species' preferred habitats; however, most records have been associated with stony habitats with spinifex dominated vegetation, often on creek and river margins (Cogger, 2014).

Previous to the current survey, there were 23 records of the species within 26 km of the Study Area, between 1981 and 2015 (DBCA, 2025b). The closest of these records was 0.4 km west of the Study Area in 2004. During the current survey, the species was found to occur in the Study Area from 11 records at four systematic trapping sites (Table 5-9). The species was recorded in Claypan and Major Drainage habitats during wet and dry season surveys, and in Sand Plain and Stony Plain habitat during wet season surveys only.

Considering the location of previous records and findings from the current survey, preferred habitat in the Study Area for the species is Stony Plain, Major and Minor Drainage, Sand Plain and Claypan, covering a combined area of 2719.47 ha (26.9%) of the Study Area.

Table 5-9 Lined soil-crevice skink records during the current survey

Site	Habitat type	Observation method	Date	Abundance
██████	██████	██████	██████	1
██████	██████	██████	██████	1
██████	██████	██████	██████	1
██████	██████████████	██████	██████	1
██████	██████████████	██████	██████	1
██████	██████████████	██████	██████	1
██████	██████████████	██████	██████	1
██████	██████████████	██████	██████	1
██████	██████	██████	██████	1
██████	██████	██████	██████	1
██████	██████	██████	██████	1

5.4.1.1 Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4 (DBCA)

The western pebble-mound mouse has experienced a significant decline in their range through the Gascoyne and Murchison regions and is now considered endemic to the Pilbara (Start *et al.*, 2000). This species almost exclusively occurs on the gentler slopes of rocky ranges and low undulating hills where the ground is covered with a stony mantle and vegetated by hard spinifex, often with a sparse overstorey of eucalypts and scattered shrubs (Anstee & Armstrong, 2001).

The western pebble-mound mouse has been recorded on 24 occasions within 40 km of the Study Area (DBCA, 2025b), between 1979 and 2022. The species was recorded within the Study Area during a previous survey, from secondary evidence (Biologic, 2022). A pebble-mound mouse was recorded within the Study Area during the current survey. The individual was recorded in a pitfall trap at systematic trapping site [REDACTED] (Stony Plain). Stony Plain and Low Hills and Slopes habitat in the Study Area provide suitable substrates for burrow excavation and mound construction and are therefore considered important habitat for breeding, foraging and dispersal. These important habitats cover over half of the Study Area (56.5%, 6,937.63 ha). The species may also forage more broadly into habitats adjacent to Stony Plain or Low Hills and Slopes.

5.4.2 Species Likely to Occur in the Study Area

5.4.2.1 Fork-tailed Swift (*Apus pacificus*) – Migratory (EPBC Act and BC Act)

The fork-tailed swift is a wide ranging but sparsely distributed species that occurs in a wide range of dry and/or open habitats (Johnstone & Storr, 1998). The species does not breed in Australia, migrating from breeding grounds in the northern Hemisphere. During its occurrence in Australia, the species is almost exclusively aerial, feeding and possibly also roosting aerially (DCCEEW, 2023).

Previous to the current survey, the nearest record for fork-tailed swift was 27 km [REDACTED] the Study Area (DBCA, 2025b) (Figure 3-1). While not recorded in the Study Area during the current survey, a flock of approximately 25 individuals was observed flying in the airspace 500 m [REDACTED] of the Study Area boundary. Due to the proximity of this record and the availability of all habitat types in the Study Area for aerial dispersal and foraging, the species is considered Likely to occur.

5.4.2.2 Northern Short-tailed Mouse (*Leggadina lakedownensis*) – Priority 4 (DBCA)

The northern short-tailed mouse is endemic to northern Australia, where it occurs from Cape York in the east to the Pilbara, in Western Australia, although the distribution is discontinuous (Moro & Kutt, 2008). The species occupies a diverse range of environments from the monsoon tropical coast to semi-arid climates, including spinifex and tussock grasslands, samphire and sedgeland, *Acacia* shrub-lands, tropical *Eucalyptus* and Melaleuca woodlands and stony ranges (Moro & Kutt, 2008). Preferred habitats are structurally diverse ranging from hummock grasslands to open sedgy woodlands, with soil types uniformly red or white sandy clays, and generally prone to inundation or waterlogging (Kutt & Kemp, 2005). This species exhibits population fluctuations with a pattern of abundance and decline mediated by rain and the maximum period of grass growth, seeding and insect activity after the wet season (Moro & Morris, 2000).

While the northern short-tailed mouse was not recorded within the Study Area during the current survey, the species has been recorded on 15 occasions within 40 km of the Study Area (DBCA, 2025b) between 2000 and 2011, including five records within approximately 5km of the Study Area (Figure 3-1). Clay Plain, Clay Pan and Sand Plain habitats provide important breeding, foraging and dispersal habitat for the species. These habitats in the Study Area were found to have a diverse range of vegetation structures including hummock and tussock grasslands, with red sandy clay loam soils, prone to inundation after rainfall (Appendix D). Stony Plain, Minor and Major Drainage Lines provide foraging and dispersal habitats, with Stony Plain potentially providing supporting breeding habitat. These habitats together cover 5,319.88 ha or 43.43% of the Study Area. Based on the proximity of previous records and the widespread occurrence of suitable habitat within the Study Area, the species is considered Likely to occur. Its occurrence and abundance within the Study Area is likely to follow a boom-and-bust sequence based upon resource availability.

5.4.3 Species Possible to Occur in the Study Area

5.4.3.1 Peregrine Falcon (*Falco peregrinus*) – Specially Protected (BC Act)

The peregrine falcon is a medium-sized raptor found throughout Australia ((Menkhorst *et al.*, 2017)) It preys almost entirely on birds, and occasionally small reptiles, mammals (Olsen *et al.*, 2008) and insects (BirdLife Australia, 2012). The species inhabits most environments with suitable nesting sites such as cliffs, gorges, timbered watercourses, pylons, spires, and buildings (Pizzey & Knight, 2007). It typically nests on rocky ledges occurring on tall, vertical cliff faces between 25 m and 50 m high (Olsen & Olsen, 1989). Nesting may also occasionally occur in tall trees along drainage lines, including the use of abandoned nests of other large bird species (Olsen & Olsen, 1989).

Peregrine falcon was not recorded during the current survey; however the species has previously been recorded within 43 km of the Study Area on ten occasions between 1979 and 2012 (DBCA, 2025b). The nearest record was 10 km north-northwest of the Study Area in 2003 (Table 5-4, Figure 3-1).

Major Drainage Line habitat (4.87%, 598.54 ha within the Study Area) may provide foraging opportunity for the species, however usage of this habitat is likely to be determinant upon proximity to nesting sites. The Study Area does not contain preferred breeding habitats for the peregrine falcon (i.e. steep cliff faces or tall buildings), therefore utilisation of the Harding River system within the Study Area may occur on an occasional basis only. Foraging is likely to occur over a broader area and would not be confined to the Study Area. The species is considered Possible to occur while foraging or dispersing from nesting sites that may be located outside of the Study Area.

5.4.3.2 Eastern Osprey (*Pandion cristatus*) – Migratory (EBPC Act and BC Act)

The eastern osprey is a medium-sized raptor that primarily occurs along coasts and inshore waters and tidal zones (Menkhorst *et al.*, 2017). On occasion the species can occur further inland, where it's regularly associated with large permanent or long-standing waterbodies, often occurring along rivers and lakes. The species is commonly found in sheltered seas around islands, tidal creeks, estuaries and saltwork ponds, also large river pools (Johnstone & Storr, 1998). Breeding occurs predominantly on offshore islands (Johnstone & Storr, 1998).

The eastern osprey was not recorded during the current survey; however, the species has previously been recorded on 247 occasions within 43 km of the Study Area between 1977 and 2017 (DBCA, 2025b). The nearest record is 2.64 km [REDACTED] the Study Area (Figure 3-1). Although suitable breeding habitat is not present in the Study Area, Major Drainage Line (4.87%, 598.54 ha within the Study Area) may provide marginal foraging and dispersal habitat for the species following significant rainfall events when large river pools are present. The species is considered Possible to occur based on the proximity and regularity of previous records within the vicinity of the Study Area and the presence of potential foraging and dispersal habitat within the Study Area.

5.5 Field Survey Adequacy

5.5.1 Sampling Adequacy

The below table represents survey effort per habitat type for the Study Area (Table 5-10).

Table 5-10 Survey effort per habitat type

Sampling Method	Rationale for Effort	Habitat Types											
		Clay Plain	Claypan	Drainage Area/ Floodplain	Gorge/Gully	Low Hills and Slopes	Major Drainage Line	Mine Shaft	Minor Drainage Line	Rock Piles	Rocky Outcrop	Sandy Plain	Stony Plain
Habitat Assessments	Multiple assessments were undertaken in each habitat, with a focus on habitats that are critical to or support significant species (i.e. drainage lines) or which cover a high proportion of the study area (i.e. stony plain). Low Hills and Slopes cover a high proportion of the study area, however habitat characteristics were found to vary little within the habitat type, negating the need for a high number of assessments.	20	3	9	2	7	11	4	19	12	2	23	29
Systematic Trapping (nights)	Systematic trapping was undertaken in every habitat type with the exception of Drainage Area/ Floodplain, Gorge/ Gully, Mine Shaft and Rocky Outcrop. Further information can be found in Table 5.10.	28	14	-	-	14	30	-	13	28	-	14	28
Avifauna Sampling (person hours)	Avifauna sampling focussed on drainage line habitats where bird species are most likely to occur. Opportunistic avifauna sampling was undertaken in every habitat type throughout the entirety of the survey, whilst undertaking other sampling.	9.32	4.66	-	-	4.66	13.82	-	9.83	9.32	-	5.66	9.32
Nocturnal Searches (person hours)	Nocturnal searches were primarily undertaken in habitats where targeted species were most likely to be found (further information provided in Section 4.3.5).	-	-	-	-	-	1	17.5	8.25	7	-	-	4
Targeted Searches (person hours)	Targeted searches were primarily undertaken in habitats where targeted species were most likely to be found (further information provided in Section 4.3.6).	2.33	-	-	7	-	3.5	-	10	13	-	2	0.3
Bilby Plot Searches (person hours)	Bilby searches focussed on habitat where the species is most likely to occur. Survey effort was relatively low as little suitable habitat was located within the Study Area.	1.3	-	-	-	-	-	-	-	-	-	5.05	0.3

Sampling Method	Rationale for Effort	Habitat Types											
		Clay Plain	Claypan	Drainage Area/ Floodplain	Gorge/Gully	Low Hills and Slopes	Major Drainage Line	Mine Shaft	Minor Drainage Line	Rock Piles	Rocky Outcrop	Sandy Plain	Stony Plain
Motion Camera (deployment nights)	Motion cameras were deployed in every habitat throughout the Study Area, with the exception of Mine Shaft (not the recommended sampling method for the target species in this habitat) and Rocky Outcrop (similar habitat to Rock Piles and small occurrence in the Study Area). Camera deployment focussed on habitat types where Northern Quoll were likely to be located (Major Drainage Line and Rock Piles).	56	28	40	80	64	140	-	26	216	-	28	56
Ultrasonic recorder (deployment nights)	Ultrasonic sampling focussed on habitats (drainage lines and Mine Shafts) most likely to support target species (ghost bat and Pilbara leaf-nosed bat).	13	7	3	-	7	25	49	28	16	-	9	16
Acoustic recorder (deployment nights)	Ultrasonic sampling focussed on habitats (Sand Plain and Stony Plain) most likely to support target species (night parrot).	6	-	18	-	-	-	-	6	-	-	54	30

5.5.2 Species Accumulation Curves

The results below represent the survey accumulation curves for mammals, birds and reptiles separately. The results are based on systematic sampling results only and do not include opportunistic sightings or other non-standardised sampling methods.

5.5.2.1 Mammals

The species accumulation curve for mammals produced a steadily increasing curve, which flattened to a point plateau (Figure 5-3). Richness estimators indicated that between 99% of species had been recorded. This group had relatively few species, and those species were more evenly distributed. Sampling was sufficient for all diversity measures, with richness = 11 (7, 15), Shannon = 13 (10, 15), and Simpson = 15 (11, 18).

As richness estimates can only incorporate results recorded from standardised sampling methods for mammals, several species recorded from other methods within habitats trapped are not included. These include species such as red kangaroo (*Osphranter rufus*), euro (*Osphranter robustus*) and numerous bat species. Discussion of total mammal species recorded from all sampling methods is included in Section 5.3.1.1.

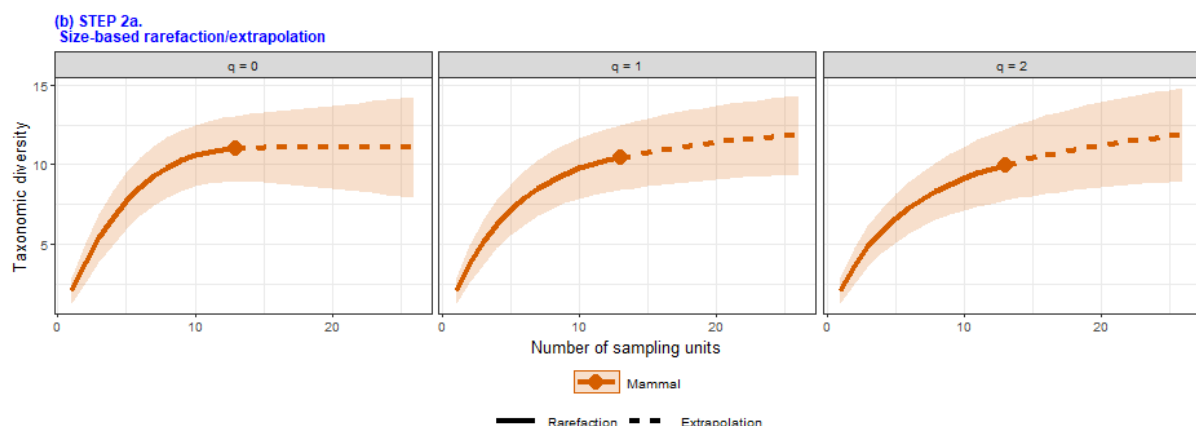


Figure 5-3 Species accumulation curve for mammals trapped at systematic trapping sites

5.5.2.2 Avifauna

Analysis of the avifauna data set from the systematic sampling sites produced a steadily increasing line which flattened towards a point plateau (Figure 5-4). Avifauna sampling did not capture all species present, especially the rare ones. Sample completeness was 79%, meaning about one-fifth of the community was likely missed. A total of 57 species were recorded, but statistical estimates suggest the true number is at least 72, indicating that some uncommon species were not detected. The species-accumulation curve for richness ($q = 0$) does not level off, which also suggests that more species remain to be found. Despite this, the more common species were well sampled, so estimates of Shannon and

Simpson diversity are reliable (Shannon = 52 (46, 58), Simpson $\approx$ 42 (38, 47). Overall, the bird community shows moderate unevenness, with some species more common than others.

These results indicate that additional survey effort may increase the species richness recorded, but that avifauna censuses were effective in recording the majority of the bird assemblage present at the systematic sampling sites. As richness estimates can only incorporate results recorded from standardised sampling methods for avifauna, several species recorded from other methods within systematic sampling habitats are not included. These include species such as grey shrike thrush (*Colluricincla harmonica*) and pictorella mannikin (*Heteromunia pectoralis*). Discussion of total bird species recorded from all sampling methods is included in Section 5.3.1.2.

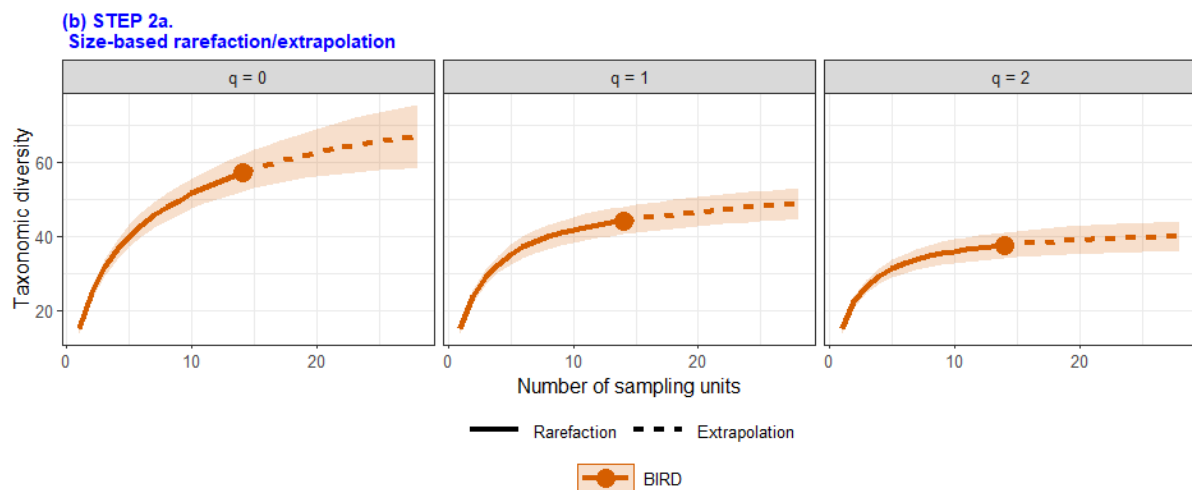


Figure 5-4 Species accumulation curve for birds recorded during avifauna census at systematic sampling sites

5.5.2.3 Reptiles

Analysis of the reptile data set from the systematic sampling sites produced a steadily increasing line which flattened towards a point plateau (Figure 5-5). Reptile sampling showed a similar pattern. Sample completeness for richness was 79%, and the accumulation curve again did not fully stabilise. We observed 49 species, but the estimated true richness is at least 62 (44, 80), indicating that rare species were under-sampled. As with birds, common species were well represented, so Shannon and Simpson diversity estimates are dependable (Shannon $\approx$ 47 (41, 53), Simpson $\approx$ 37 (32, 41). The reptile assemblage also shows moderate unevenness.

These results indicate that while additional survey effort may increase the species richness recorded, the systematic trapping effort was effective in recording the majority of the

reptile assemblage present at the sampling sites. As richness estimates can only include results recorded from standardised sampling methods for reptiles, several species recorded from other methods within systematic sampling habitats are not included. These include species such as *Cryptoblepharus ustulatus* and western brown snake (*Pseudonaja mengdeni*). Discussion of total reptile species recorded from all sampling methods is included in Section 5.3.1.3.

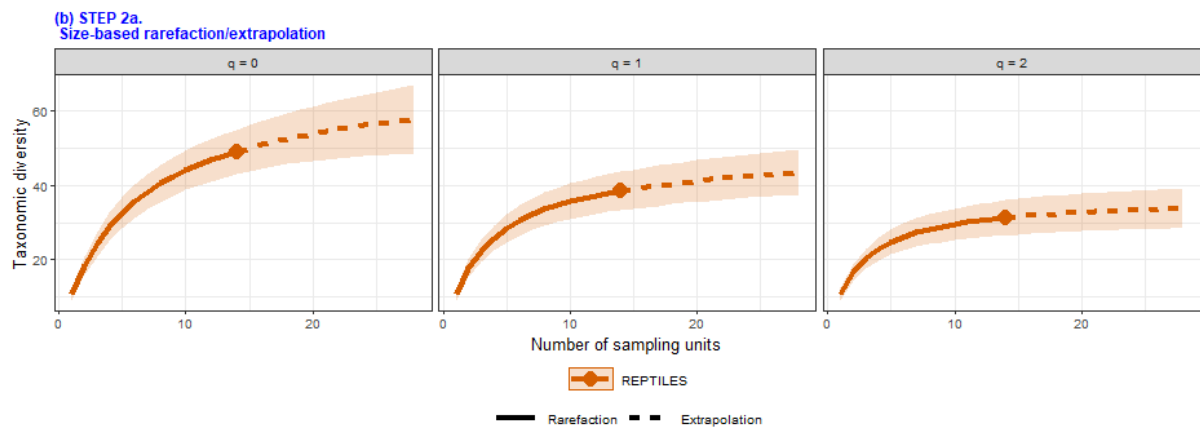


Figure 5-5 Species accumulation curve for reptiles trapped at systematic sampling sites

5.5.3 Limitations and Constraints

The EPA (2020) outlines several potential limitations and constraints which have the potential to affect the results of vertebrate fauna surveys. These aspects are assessed and discussed below in Table 5-11.

Table 5-11: Survey limitations and constraints

Potential limitation or constraint	Constraint	Applicability to this survey
Sources/ availability of data and information (recent or historic) and availability of contextual information	No	All contextual resources required to complete the assessment were available (previous surveys, database searches, environmental information, climate data). This included information from 12 biological surveys previously conducted in the vicinity of the Study Area.
Competency/ experience of the survey team	No	The field personnel involved in the survey are experienced in undertaking fauna surveys of similar nature, including with the significant species targeted during the survey (Section 4.1). Technical personnel with relevant expertise assisted with analysis of ultrasonic recordings (Bob Bullen BSc of Engineering and owner of Bat call WA) and acoustic recordings (Louis Marsel, Principal Zoologist and Ornithologist and owner of Malu Fauna).
Scope (faunal groups sampled and whether any constraints affect this)	Minor	The scope was a detailed vertebrate fauna survey, which was conducted within the EPA (2020) framework, where possible. Four habitat types had only one systematic sampling site. This was due to the size of the area and likelihood of recording similar species assemblages to that in surrounding habitat types. No systematic trapping was undertaken within Rocky Outcrop or Gorge/ Gully habitats. This was due to the small and isolated occurrence of these habitat types, which limited suitability for trapping (trap site installation was unlikely to provide a sufficient representation of the habitat). Systematic trapping was not undertaken in Drainage Area/ Floodplain habitat, but four trap sites [REDACTED] were located within a broader landform of Drainage Area/ Floodplain. These were not significant limitations. All fauna habitats were subject to further survey using targeted methods, and species accumulation curves for the different faunal groups showed that systematic sampling recorded the majority of species present.
Timing, weather, and season	No	Field surveys occurred over appropriate or optimal periods for sampling the vertebrate habitat and fauna. While high temperatures during phase 3 resulted in Elliott and cage traps not being deployed, and ant presence at VAND-400 and VAND-436 resulted in less than 14 trapping nights, species accumulation curves indicated an appropriate level of survey effort for recording the majority of mammal and reptile species.
Disturbances (e.g. fire or flood)	No	No disturbance occurred during or immediately prior to the surveys that was likely to impinge on the results of this assessment.
Proportion of fauna identified	No	All vertebrate fauna observed during the field surveys were identified to species or subspecies level. Species identification of fauna recorded via camera traps, and acoustic and ultrasonic recordings were able to be accurately identified with the assistance of technical personnel with relevant expertise. Species accumulation curves indicated that the majority of mammals, birds and reptiles were recorded during the survey.

Potential limitation or constraint	Constraint	Applicability to this survey
Adequacy of the survey intensity and proportion of the survey achieved	No	A multi-phase detailed survey was undertaken across the Study Area to assist with decisions on future survey effort and environmental approvals. The sampling methods and survey intensity was appropriate to achieve the scope of the survey.
Remoteness or access issues	No	The Study Area was accessible either by vehicle or on foot, thus the sampling techniques used in these areas during this survey were unconstrained by accessibility or remoteness.
Problems with data and analysis, including sampling bias	No	Three nights of ultrasonic recordings at VAND-076 and VAND-077 (six nights total) during phase three were unable to be analysed due to data card corruption. This data loss is not considered to be a limitation regarding targeted surveying for ghost bat. Ghost bat presence was confirmed during wet and dry season surveys at both of these sites via other sampling methods.

6 Conclusion

A total of 178 vertebrate fauna species, comprising 30 mammal species (26 native and four introduced), 85 bird species, 61 reptile species and two amphibian species were recorded from the Study Area during the current survey (Table 5 2). This comprises approximately 44% of the total number of species identified in the desktop assessment (n=410). Species diversity recorded during the survey was greater than that recorded in the majority of similar detailed surveys conducted within the vicinity of the Study Area. The species accumulation curves indicated that the systematic survey effort recorded at least 90% of mammal species, 85% of reptile species and 80% of bird species. While additional survey effort may increase species richness recorded, it would be unlikely to alter conclusions regarding the likelihood of occurrence of species of significance, or the level of significance attributed to fauna habitats identified in the Study Area.

Eleven (11) broad fauna habitats were recorded within the Study Area, nine of which provide critical or important habitat for species of significance. Low Hills and Slopes provide important breeding, foraging and dispersal habitat for the western pebble-mound mouse, and Stony Plain provides important breeding, foraging and dispersal habitat for the western pebble-mound mouse and lined soil-crevice skink. Major Drainage provides critical breeding, foraging and dispersal habitat for the Pilbara olive python, critical foraging and dispersal habitat for the northern quoll and critical breeding and foraging habitat for the grey falcon. Sand Plain, Clay Plain and Claypan habitats are important for breeding, foraging and dispersal of the northern short-tailed mouse. Rock Piles, Rocky Outcrop and Gorge/ Gully provide critical breeding, foraging and dispersal habitat for northern quoll and Pilbara olive python. Two [REDACTED] within the Study Area [REDACTED] and two within 100m of the Study Area ([REDACTED]) are classified as Category 2 (permanent diurnal roosts) and represent critical habitat for ghost bats. Stony Plain, Drainage Area/ Floodplain, Sand Plain, Minor and Major Drainage Line habitats within 12 km of these roosts are considered to provide supporting foraging and dispersal habitat for the species.

The desktop assessment identified 63 significant species, four of which had previously been recorded within the Study Area: Pilbara olive python, northern quoll, ghost bat and western pebble-mound mouse. Five significant species were recorded during the current survey:

- northern quoll (*Dasyurus hallucatus*) - Endangered (EPBC Act and BC Act)
- ghost bat (*Macroderma gigas*) – Vulnerable (EPBC Act and BC Act)
- grey falcon (*Falco hypoleucos*) – Vulnerable (EPBC Act and BC Act)

- western pebble-mound mouse (*Pseudomys chapmani*) - Priority 4 (DBCA)
- lined soil-crevice skink (*Notoscincus butleri*) – Priority 4 (DBCA)

Ghost bats were recorded roosting in the [REDACTED] section of the Study Area and foraging over Stony Plain and Major/ Minor Drainage Line habitats during each phase of the survey. Grey falcon (including pairs) were observed during the wet season surveys, perching on powerlines within the Study Area and dispersing over Stony Plain, Sand Plain, Clay Plain and Minor Drainage Line habitats. It is likely that nesting sites are present within or proximal to the Study Area. The lined soil-crevice skink was recorded via systematic trapping within Claypan, Major Drainage Line, Stony Plain and Sand Plain habitats during the wet and dry season surveys. One western pebble-mound mouse was recorded during the current survey, in Stony Plain habitat. Northern quoll was recorded during each phase of the survey, within Rock Piles, Gorge/ Gully and Minor Drainage Line habitats. A minimum of 20 individual quolls were identified within the Study Area, with one individual confirmed to be using Low Hills and Slopes and Minor Drainage Line habitat to disperse between Rock Piles over a period of two days. It is considered likely that northern quoll within the Study Area represent an important population. While Pilbara olive python was not recorded during the current survey, its presence has previously been confirmed within the Study Area.

Four species identified during the desktop assessment were concluded Likely (fork-tailed swift and northern short-tailed mouse) and Possible (eastern osprey and peregrine falcon) to occur in the Study Area. The remaining 53 species were determined Unlikely or Highly Unlikely to occur within the Study Area, primarily due to the absence of any critical or supporting habitats suitable for the species.

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Appendix A: Conservation codes

Environment Protection and Biodiversity Conservation Act 1999

Category	Definition
Threatened Ecological Communities (TEC)	
Critically Endangered	An ecological community is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered	An ecological community is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable	An ecological community is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered nor endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
Threatened Fauna Species	
Extinct (EX)	Taxa not definitely located in the wild during the past 50 years.
Extinct in the Wild (EW)	Taxa known to survive only in captivity.
Critically Endangered (CE)	Taxa facing an extremely high risk of extinction in the wild in the immediate future.
Endangered (EN)	Taxa facing a very high risk of extinction in the wild in the near future.
Vulnerable (VU)	Taxa facing a high risk of extinction in the wild in the medium-term future.
Migratory (MIG)	Consists of species listed under the following International Conventions: Japan-Australia Migratory Bird Agreement (JAMBA) China-Australia Migratory Bird Agreement (CAMBA) Convention on the Conservation of Migratory Species of Wild animals (Bonn Convention)

Biodiversity Conservation Act 2016

Category	Definition
Threatened Ecological Communities (TEC)	
Critically Endangered (CR)	An ecological community is eligible for listing in the category of critically endangered ecological community at a particular time if, at that time — (a) it is facing an extremely high risk of becoming eligible for listing as a collapsed ecological community in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines; and (b) listing in that category is otherwise in accordance with the ministerial guidelines.
Endangered (EN)	An ecological community is eligible for listing in the category of endangered ecological community at a particular time if, at that time — (a) it is not a critically endangered ecological community; and (b) it is facing a very high risk of becoming eligible for listing as a collapsed ecological community in the near future, as determined in accordance with criteria set out in the ministerial guidelines; and (c) listing in that category is otherwise in accordance with the ministerial guidelines.
Vulnerable (VU)	An ecological community is eligible for listing in the category of vulnerable ecological community at a particular time if, at that time — (a) it is not a critically endangered ecological community or an endangered ecological community; and (b) it is facing a high risk of becoming eligible for listing as a collapsed ecological community in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines; and (c) listing in that category is otherwise in accordance with the ministerial guidelines.

Category	Definition
Collapsed	An ecological community is eligible for listing as a collapsed ecological community at a particular time if, at that time — (a) there is no reasonable doubt that the last occurrence of the ecological community has collapsed; or (b) the ecological community has been so extensively modified throughout its range that no occurrence of it is likely to recover — (i) its species composition or structure; or (ii) its species composition and structure.
Threatened Fauna Species	
Critically Endangered (Cr)	Rare or likely to become extinct, as <i>critically endangered</i> fauna.
Endangered (En)	Rare or likely to become extinct, as <i>endangered</i> fauna.
Vulnerable (Vu)	Rare or likely to become extinct, as <i>vulnerable</i> fauna.
Extinct (Ex)	Being fauna that is presumed to be extinct.
Migratory (Mi)	Birds that are subject to international agreements relating to the protection of migratory birds.
Conservation Dependent (CD)	Special conservation need being species dependent on ongoing conservation intervention. (Conservation Dependant)
Other Specially Protected Species (OS)	In need of special protection, otherwise than for the reasons pertaining to Schedule 1 through to Schedule 6 Fauna. (Other specially protected species)

Department of Biodiversity, Conservation and Attractions Priority Definitions

Category	Definition
Priority Flora and Fauna Species	
Priority 1 (P1)	Poorly known Species Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2 (P2)	Poorly known Species Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3 (P3)	Poorly known Species Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Category	Definition
Priority 4 (P4)	Rare, Near Threatened and other species in need of monitoring (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Category	Definition
Priority Ecological Communities (PEC)	
Priority 1 (P1)	Poorly known ecological communities Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of ≤ 100ha). Occurrences are believed to be under threat either due to limited extent or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority 2 (P2)	Poorly known Ecological Communities Communities that are known from few occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of ≤ 200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Category	Definition
Priority 3 (P3)	Poorly known Ecological Communities (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or; (iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
Priority 4 (P4)	Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring. (i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These communities are usually represented on conservation lands. (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category. (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Category	Definition
Priority 5 (P5)	Conservation Dependent Ecological Communities Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Appendix B: Vertebrate fauna identified from the desktop assessment

Scientific Name	Common Name	Conservation status				Database searches				Literature review																								Current Survey		
		EPBC Act	BC Act	DBCA	IUCN	NatureMap	EPBC Protected Matters	DBCA Priority and Threatened	ALA	Birdlife	GHD (2008)	GHD (2019)	Richardson et al. (2007)	Eco Logical (2012)	Animal Plant Mineral (2019)	Phoenix (2010)	Biota (2008)	Aston (2018)	Biota (2009)	Phoenix (2018)	Phoenix (2014)	Biota (2008)	Keith Lindbeck and Associates	AECOM (2021)	GHD (2011)	Biologic (2022)	Biologic (2024)	Biologic (2024)	Biologic (2024)	Astron (2013)	Phoenix (2023)	Eco Logical (2022)	360 Environmental		GHD (2011)	Ecoscape (2025)
BOVIDAE																																				
Bos primigenius	*European cattle																X		X				X	X				X	X	X				X		
Capra aegagrus	*Goat																			X																
CAMELIDAE																																				
Camelus dromedarius	Camel																		X																	
CANIDAE																																				
Canis familiaris	*Dog					X					X			X	X		X		X			X	X	X		X	X	X	X	X			X	X	X	
Vulpes vulpes	*Red fox					X						X			X				X	X													X			
DASYURIDAE																																				
Dasykaluta rosamondae	Kaluta					X									X		X			X									X						X	
Dasyurus hallucatus	Northern quoll	EN	EN		EN	X	X	X									X	X	X					X	X	X	X		X					X	X	
Ningau timealeyi	Pilbara ningau					X									X	X	X		X	X															X	
Planigale ingrami	Long-tailed planigale					X														X																
Planigale kendricki	Orange-headed Pilbara planigale					X									X	X	X																		X	
Planigale maculata	Common planigale					X																														
Planigale tealei	Cracking-clay Pilbara planigale					X												X																	X	
Pseudantechinus woolleyae	Woolley's pseudantechinus					X					X												X	X	X		X							X	X	
Sminthopsis macroura	Stripe-faced dunnart					X									X	X	X			X									X				X		X	
Sminthopsis youngsoni	Lesser hairy-footed dunnart					X										X				X									X							
EMBALLONURIDAE																																				
Saccolaimus flaviventris	Yellow-bellied sheath-tailed bat					X									X				X	X					X				X						X	
Taphozous georgianus	Common sheath-tailed bat					X					X			X	X	X	X		X	X					X	X	X		X					X	X	
EQUIDAE																																				
Equus ferus	*Horse																									X	X								X	X
FELIDAE																																				
Felis catus	*Cat					X					X			X	X	X	X		X			X	X	X			X	X	X	X			X	X	X	
MACROPODIDAE																																				
Osphranter robustus	Euro					X					X	X		X	X	X	X		X	X		X	X	X	X			X	X	X	X		X	X	X	
Osphranter rufus	Red kangaroo					X					X				X	X	X			X			X									X			X	
Petrogale rothschildi	Rothschild's rock-wallaby					X					X								X				X	X		X		X							X	

Scientific Name	Common Name	Conservation status				Database searches					Literature review																									Current Survey	
		EPBC Act	BC Act	DBCA	IUCN	NatureMap	EPBC Protected Matters	DBCA Priority and Threatened	ALA	Birdlife	GHD (2008)	GHD (2019).	Richardson et al. (2007).	Eco Logical (2012).	Animal Plant Mineral (2019).	Phoenix (2010).	Biota (2008).	Aston (2018).	Biota (2009).	Phoenix (2018).	Phoenix (2014).	Biota (2008).	Keith Lindbeck and Associates	AECOM (2021).	GHD (2011).	Biologic (2022).	Biologic (2024).	Biologic (2024).	Biologic (2024).	Astron (2013).	Phoenix (2023).	Eco Logical (2022).	360 Environmental	GHD (2011).	Ecoscape (2025).		
MEGADERMATIDAE																																					
Macroderma gigas	Ghost bat	VU	VU		VU	X	X	X						X													X									X	
MOLOSSIDAE																																					
Austronomus australis	White-striped free-tailed bat					X					X			X	X								X		X												
Chaerephon jobensis	Greater northern free-tailed bat					X								X	X		X		X				X		X	X	X		X						X	X	
Ozimops cobourgianus	Northern coastal free-tailed bat			P1		X		X						X	X					X								X									
Ozimops lumsdenae	Northern free-tailed bat					X										X			X				X		X											X	
MURIDAE																																					
Leggadina lakedownensis	Short-tailed mouse			P4		X		X																													
Mus musculus	*House mouse					X									X		X			X					X											X	
Notomys alexis	Spinifex hopping-mouse					X									X	X	X		X																	X	
Pseudomys chapmani	Western pebble-mound mouse			P4		X		X							X		X		X					X										X	X	X	
Pseudomys delicatulus	Delicate mouse					X																															
Pseudomys desertor	Desert mouse					X								X	X	X	X		X	X																X	
Pseudomys hermannsburgensis	Sandy inland mouse					X									X		X			X																X	
Rattus rattus	*Black rat					X						X		X	X								X														
Rattus tunneyi	Pale field-rat					X						X																									
Zyzomys argurus	Common rock-rat					X											X		X						X	X	X	X									X
PHALANGERIDAE																																					
Trichosurus vulpecula	Common brushtail possum					X																							X								
PTEROPODIDAE																																					
Pteropus alecto	Black flying-fox					X																															
Pteropus scapulatus	Little red flying-fox					X											X									X											
RHINONYCTERIDAE																																					
Rhinonictis aurantia 'Pilbara form'	Pilbara leaf-nosed bat	VU	VU			X	X	X																					X								
TACHYGLOSSIDAE																																					
Tachyglossus aculeatus	Short-beaked echidna					X						X	X		X	X			X			X	X				X					X		X		X	
THYLACOMYIDAE																																					
Macrotis lagotis	Billby	VU	VU		VU		X																														
VESPERTILIONIDAE																																					
Chalinolobus gouldii	Gould's wattled bat					X								X	X		X		X						X	X	X		X						X	X	

Scientific Name	Common Name	Conservation status				Database searches					Literature review																						Current Survey			
		EPBC Act	BC Act	DBCA	IUCN	NatureMap	EPBC Protected Matters	DBCA Priority and Threatened	ALA	Birdlife	GHD (2008)	GHD (2019).	Richardson et al. (2007).	Eco Logical (2012).	Animal Plant Mineral (2019).	Phoenix (2010).	Biota (2008).	Aston (2018).	Biota (2009).	Phoenix (2018).	Phoenix (2014).	Biota (2008).	Keith Lindbeck and Associates (2021).	AECOM (2021).	GHD (2011).	Biologic (2022).	Biologic (2024).	Biologic (2024).	Biologic (2024).	Astron (2013).	Phoenix (2023).	Eco Logical (2022).		360 Environmental	GHD (2011).	Ecoscape (2025).
<i>Nyctophilus arnhemensis</i>	Arnhem long-eared bat					X									X																					
<i>Nyctophilus daedalus</i>	Pallid long-eared bat					X																														
<i>Nyctophilus geoffroyi</i>	Lesser long-eared bat					X									X						X					X		X								X
<i>Scotorepens balstoni</i>	Inland broad-nosed bat					X																														
<i>Scotorepens greyii</i>	Little broad-nosed bat					X								X	X		X			X						X	X	X		X					X	X
<i>Vespadelus finlaysoni</i>	Finlayson's cave bat					X						X		X	X		X			X	X					X	X	X		X					X	X
ACANTHIZIDAE																																				
<i>Gerygone fusca</i>	Western gerygone					X				X					X		X																			
<i>Gerygone levigaster</i>	Mangrove gerygone																												X							
<i>Gerygone magnirostris</i>	Large-billed gerygone												X																							
<i>Gerygone tenebrosa</i>	Dusky gerygone					X				X		X	X		X					X			X						X							
<i>Smicromis brevirostris</i>	Weebill					X				X		X		X	X		X	X		X	X			X		X				X	X				X	X
ACCIPITRIDAE																																				
<i>Accipiter cirrocephalus</i>	Collared sparrowhawk					X				X					X		X									X				X						
<i>Accipiter fasciatus</i>	Brown goshawk					X				X				X	X		X			X					X											X
<i>Aquila audax</i>	Wedge-tailed eagle					X				X	X	X		X	X	X	X			X			X			X			X	X				X		X
<i>Circus approximans</i>	Swamp harrier					X				X							X			X																
<i>Circus assimilis</i>	Spotted harrier					X				X	X	X	X		X	X	X	X		X			X	X					X							X
<i>Elanus axillaris</i>	Black-shouldered kite					X				X		X	X		X	X					X			X					X						X	X
<i>Erythrotriorchis radiatus</i>	Red goshawk	EN	VU		EN		X																													
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle					X				X	X	X	X		X	X				X		X	X						X					X		X
<i>Haliastur indus</i>	Brahminy kite					X				X	X	X	X		X	X	X	X			X		X	X					X					X		X
<i>Haliastur sphenurus</i>	Whistling kite					X				X		X	X	X	X	X		X				X	X	X		X		X	X	X				X	X	X
<i>Hamirostra melanosternon</i>	Black-breasted buzzard					X				X								X																		
<i>Hieraaetus morphnoides</i>	Little eagle					X				X	X							X		X									X					X		X
<i>Lophoictinia isura</i>	Square-tailed kite									X	X																									
<i>Milvus migrans</i>	Black kite					X				X		X		X	X		X			X			X											X		
<i>Pandion haliaetus cristatus</i>	Eastern osprey	MI	MI			X	X	X		X			X		X	X					X		X						X							
ACROCEPHALIDAE																																				

Scientific Name	Common Name	Conservation status				Database searches					Literature review																						Current Survey				
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<i>Acrocephalus australis</i>	Australian reed warbler					X				X																											
AEGOTHELIDAE																																					
<i>Aegotheles cristatus</i>	Australian owlet-nightjar					X				X		X				X				X				X		X	X	X						X		X	
ALAUDIDAE																																					
<i>Mirafra javanica</i>	Horsfield's bushlark					X				X					X	X		X		X	X			X						X				X		X	
ALCEDINIDAE																																					
<i>Dacelo leachii</i>	Blue-winged kookaburra					X				X						X		X		X						X	X							X		X	
<i>Todiramphus chloris</i>	Collared kingfisher					X				X						X					X		X														
<i>Todiramphus pyrrhopygius</i>	Red-backed kingfisher					X				X		X		X	X	X	X	X		X	X		X	X		X	X	X						X		X	
<i>Todiramphus sanctus</i>	Sacred kingfisher					X				X			X	X		X		X		X	X		X			X				X						X	
<i>Todiramphus sordidus</i>	Torresian kingfisher					X																															
ANATIDAE																																					
<i>Anas castanea</i>	Chestnut teal					X																															
<i>Anas gracilis</i>	Grey teal					X				X				X	X	X														X				X			
<i>Anas superciliosa</i>	Pacific black duck					X				X				X				X		X			X											X			
<i>Aythya australis</i>	Hardhead									X				X									X														
<i>Chenonetta jubata</i>	Australian wood duck					X				X																											
<i>Cygnus atratus</i>	Black swan					X				X				X						X															X		
<i>Dendrocygna arcuata</i>	Wandering whistling-duck									X																									X		
<i>Dendrocygna eytoni</i>	Plumed whistling-duck					X				X																											
<i>Malacorhynchus membranaceus</i>	Pink-eared duck									X																											
<i>Nettapus pulchellus</i>	Green pygmy-goose									X																											
<i>Stictonetta naevosa</i>	Freckled duck									X																											
<i>Tadorna tadornoides</i>	Australian shelduck					X										X																					
ANHINGIDAE																																					
<i>Anhinga novaehollandiae</i>	Australasian darter					X				X																											
APODIDAE																																					
<i>Apus pacificus</i>	Fork-tailed swift	MI	MI			X	X			X								X												X						X	
ARDEIDAE																																					
<i>Ardea alba modesta</i>	Eastern great egret					X				X			X	X							X									X							
<i>Ardea intermedia</i>	Intermediate egret					X				X																											

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<i>Ardea pacifica</i>	White-necked heron					X				X							X		X						X											
<i>Bubulcus ibis</i>	Cattle egret									X			X																							
<i>Butorides striata</i>	Striated heron					X				X					X														X							
<i>Egretta garzetta</i>	Little egret					X				X				X	X				X	X								X								
<i>Egretta novaehollandiae</i>	White-faced heron					X				X		X		X	X	X	X		X			X	X						X							X
<i>Egretta sacra</i>	Eastern reef egret					X				X		X			X							X						X								
<i>Ixobrychus flavicollis</i>	Black bittern									X												X														
<i>Nycticorax caledonicus</i>	Nankeen night heron					X				X									X						X			X								X
ARTAMIDAE																																				
<i>Artamus cinereus</i>	Black-faced woodswallow					X				X		X	X	X	X	X	X			X		X	X	X	X	X	X		X	X		X	X	X	X	
<i>Artamus leucorhynchus</i>	White-breasted woodswallow					X				X		X			X		X			X		X	X					X				X				
<i>Artamus minor</i>	Little woodswallow					X				X		X					X		X			X		X												X
<i>Artamus personatus</i>	Masked woodswallow					X				X	X								X			X				X		X							X	X
<i>Artamus superciliosus</i>	White-browed woodswallow									X																										
<i>Cracticus nigrogularis</i>	Pied butcherbird					X				X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X			X	X	X
<i>Gymnorhina tibicen</i>	Australian magpie					X				X					X		X		X					X	X	X	X		X					X		X
<i>Cracticus torquatus</i>	Grey butcherbird									X												X						X							X	
BURHINIDAE																																				
<i>Burhinus grallarius</i>	Bush stone-curlew					X				X		X	X													X										X
<i>Esacus magnirostris</i>	Beach stone-curlew					X				X			X																X							
CACATUIDAE																																				
<i>Eolophus roseicapilla</i>	Galah					X				X		X	X	X	X	X	X		X	X		X	X	X	X	X		X	X	X			X	X	X	
<i>Cacatua sanguinea</i>	Little corella					X				X	X	X	X	X	X		X		X	X		X	X		X	X		X			X		X	X	X	
<i>Nymphicus hollandicus</i>	Cockatiel					X				X		X		X		X		X		X			X		X	X	X		X				X	X	X	
CAMPEPHAGIDAE																																				
<i>Coracina novaehollandiae</i>	Black-faced cuckoo-shrike					X				X	X	X	X		X	X	X		X	X		X	X	X	X	X	X	X	X	X			X	X	X	
<i>Coracina papuensis</i>	White-bellied cuckoo-shrike													X																						
<i>Lalage tricolor</i>	White-winged triller					X				X		X	X		X	X		X		X	X		X	X						X				X	X	X
CAPRIMULGIDAE																																				
<i>Eurostopodus argus</i>	Spotted nightjar					X				X					X				X							X	X	X		X						X
CASUARIIDAE																																				

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<i>Dromaius novaehollandiae</i>	Emu					X				X						X	X		X																X	
CHARADRIIDAE																																				
<i>Charadrius leschenaultii</i>	Greater sand plover	MI / VU	VU			X	X	X		X					X					X									X							
<i>Charadrius mongolus</i>	Lesser sand plover	MI / EN	EN		EN	X	X	X		X			X		X													X								
<i>Charadrius ruficapillus</i>	Red-capped plover					X				X	X		X		X	X				X								X						X		
<i>Charadrius veredus</i>	Oriental plover	MI	MI			X	X	X		X																		X								
<i>Euseyonis melanops</i>	Black-fronted dotterel					X				X				X			X		X				X					X						X		X
<i>Erythronys cinctus</i>	Red-kneed dotterel									X																		X						X		
<i>Pluvialis fulva</i>	Pacific golden plover	MI	MI			X	X	X		X					X													X								
<i>Pluvialis squatarola</i>	Grey plover	MI / VU	MI			X	X	X		X																		X								
<i>Vanellus miles</i>	Masked lapwing									X																										
<i>Vanellus tricolor</i>	Banded lapwing					X				X							X											X								
CICONIIDAE																																				
<i>Ephippiorhynchus asiaticus</i>	Black-necked stork				NT	X				X																			X							
CLIMACTERIDAE																																				
<i>Climacteris melanurus</i>	Black-tailed treecreeper																												X							
COLUMBIDAE																																				
<i>Columba livia</i>	*Rock dove					X				X																										
<i>Geopelia cuneata</i>	Diamond dove					X				X	X	X			X	X	X	X		X				X		X	X		X	X	X			X	X	X
<i>Geopelia humeralis</i>	Bar-shouldered dove					X				X			X		X					X																
<i>Geopelia placida</i>	Peaceful dove					X				X		X			X		X	X		X		X	X		X	X		X					X		X	
<i>Geophaps plumifera</i>	Spinifex pigeon					X				X		X		X	X	X	X	X		X	X		X	X	X	X	X	X		X	X			X	X	X
<i>Ocyphaps lophotes</i>	Crested pigeon					X				X	X	X		X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X			X	X	X
<i>Phaps chalcoptera</i>	Common bronzewing					X				X							X		X				X				X							X		X
<i>Phaps histrionica</i>	Flock bronzewing					X				X							X																			
<i>Spilopelia chinensis</i>	*Spotted dove									X																										
CORVIDAE																																				
<i>Corvus bennetti</i>	Little crow					X				X							X																			
<i>Corvus orru</i>	Torresian crow					X				X		X	X		X	X	X	X		X	X		X	X	X	X	X	X	X	X				X	X	X
CUCULIDAE																																				
<i>Centropus phasianinus</i>	Pheasant coucal					X				X					X		X			X																
<i>Chalcites basal</i>	Horsfield's bronze-cuckoo					X				X					X		X			X		X	X	X	X	X		X	X				X		X	

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<i>Chalcites osculans</i>	Black-eared cuckoo					X				X					X												X										
<i>Cuculus optatus</i>	Oriental cuckoo							X																													
<i>Heteroscenes pallidus</i>	Pallid cuckoo					X				X	X				X	X						X	X	X	X	X	X							X		X	
DICAETIDAE																																					
<i>Dicaeum hirundinaceum</i>	Mistletoebird					X				X																										X	
ESTRILDIDAE																																					
<i>Emblema pictum</i>	Painted finch					X				X	X	X			X	X	X	X		X	X		X	X	X		X	X		X				X		X	
<i>Heteromunia pectoralis</i>	Pictorella mannikin									X																										X	
<i>Neochmia ruficauda</i>	Star finch					X				X					X						X															X	
<i>Taeniopygia guttata</i>	Zebra finch					X				X	X	X		X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X	
FALCONIDAE																																					
<i>Falco berigora</i>	Brown falcon					X				X		X			X	X		X		X	X			X		X	X	X		X	X			X		X	
<i>Falco cenchroides</i>	Nankeen kestrel					X				X	X	X	X	X	X	X	X		X	X		X	X	X		X		X	X	X			X	X	X	X	
<i>Falco hypoleucos</i>	Grey falcon	VU	VU		VU	X	X	X																					X							X	
<i>Falco longipennis</i>	Australian hobby					X				X		X				X				X				X												X	
<i>Falco peregrinus</i>	Peregrine falcon		OS			X				X							X												X								X
GLAREOLIDAE																																					
<i>Glareola maldivarum</i>	Oriental pratincole	MI	MI			X	X	X		X																				X							
<i>Stiltia isabella</i>	Australian pratincole									X								X																			
GRUIDAE																																					
<i>Antigone rubicunda</i>	Brolga					X				X																											
HAEMATOPODIDAE																																					
<i>Haematopus fuliginosus</i>	Sooty oystercatcher					X				X			X			X				X									X								
<i>Haematopus longirostris</i>	Australian pied oystercatcher					X				X			X			X				X									X								
HIRUNDINIDAE																																					
<i>Cheramoeca leucosterna</i>	White-backed swallow					X				X						X																					
<i>Hirundo neoxena</i>	Welcome swallow					X				X		X	X		X	X		X					X	X											X		
<i>Hirundo rustica</i>	Barn swallow	MI	MI				X	X																													
<i>Petrochelidon ariel</i>	Fairy martin					X				X				X	X	X		X		X			X			X								X	X	X	
<i>Petrochelidon nigricans</i>	Tree martin					X				X		X	X		X	X		X		X			X	X			X		X	X						X	
LARIDAE																																					
<i>Chlidonias leucopterus</i>	White-winged black tern	MI	MI					X		X																											
<i>Gelochelidon nilotica</i>	Gull-billed tern	MI	MI			X		X		X			X		X													X									

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Melithreptus gularis	Black-chinned honeyeater					X				X																										
Ptilotula keartlandi	Grey-headed honeyeater					X				X	X				X		X		X					X	X									X		X
Ptilotula penicillata	White-plumed honeyeater					X				X		X		X	X		X		X				X	X		X	X							X		X
Purnella albifrons	White-fronted honeyeater									X													X	X												
Sugomel niger	Black honeyeater					X				X					X																				X	
MEROPIDAE																																				
Merops ornatus	Rainbow bee-eater					X				X	X	X		X	X	X		X		X	X		X	X		X	X			X				X	X	X
MONARCHIDAE																																				
Grallina cyanoleuca	Magpie-lark					X				X		X		X	X	X	X	X		X	X		X	X		X	X	X		X	X			X	X	X
Myiagra alecto	Shining flycatcher					X																							X							
MOTACILLIDAE																																				
Anthus novaeseelandiae	Australian pipit					X				X		X	X	X	X		X			X		X	X		X	X			X					X	X	X
Motacilla cinerea	Grey wagtail	MI	MI				X																													
Motacilla tschutschensis	Eastern yellow wagtail						X																													
OREOICIDAE																																				
Oreoica gutturalis	Crested bellbird					X				X					X	X	X			X							X	X	X	X				X		X
OTIDIDAE																																				
Ardeotis australis	Australian bustard					X				X					X		X		X				X					X	X	X			X			X
PACHYCEPHALIDAE																																				
Colluricincla harmonica	Grey shrike-thrush					X				X		X					X		X				X	X	X		X	X	X						X	X
Pachycephala lanioides	White-breasted whistler					X				X			X		X		X																			
Pachycephala melanura	Mangrove golden whistler					X				X					X														X							
Pachycephala rufiventris	Rufous whistler					X				X			X				X		X									X		X						X
PARDALOTIDAE																																				
Pardalotus rubricatus	Red-browed pardalote					X				X				X	X		X		X							X				X					X	X
Pardalotus striatus	Striated pardalote					X				X				X			X		X																	X
PELECANIDAE																																				
Pelecanus conspicillatus	Australian pelican					X				X			X		X		X		X										X							
PETROICIDAE																																				
Peneothello pulverulenta	Mangrove robin					X				X		X			X														X							
Melanodryas cucullata	Hooded robin																X		X																	

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<i>Petroica goodenovii</i>	Red-capped robin					X				X					X		X																		X	
PHALACROCORACIDAE																																				
<i>Phalacrocorax carbo</i>	Great cormorant									X																			X							
<i>Microcarbo melanoleucos</i>	Little pied cormorant					X				X			X		X				X										X							
<i>Phalacrocorax sulcirostris</i>	Little black cormorant					X				X			X		X														X							
<i>Phalacrocorax varius</i>	Pied cormorant					X				X			X		X														X							
PHASIANIDAE																																				
<i>Coturnix pectoralis</i>	Stubble quail																X																		X	
<i>Synoicus ypsilophora</i>	Brown quail					X				X			X		X				X	X										X					X	
PODARGIDAE																																				
<i>Podargus strigoides</i>	Tawny frogmouth					X				X															X				X						X	
PODICIPEDIDAE																																				
<i>Podiceps cristatus</i>	Great crested grebe									X																										
<i>Poliocephalus poliocephalus</i>	Hoary-headed grebe									X												X							X							
<i>Tachybaptus novaehollandiae</i>	Australasian grebe					X				X							X					X											X			
POMATOSTOMIDAE																																				
<i>Pomatostomus superciliosus</i>	White-browed babbler					X																														
<i>Pomatostomus temporalis</i>	Grey-crowned babbler					X				X							X		X						X	X								X	X	
PSITTACIDAE																																				
<i>Aprosmictus erythropterus</i>	Red-winged parrot																X																			
<i>Barnardius zonarius</i>	Australian ringneck					X				X		X			X		X		X				X		X	X								X	X	
<i>Melopsittacus undulatus</i>	Budgerigar					X				X	X	X	X		X	X		X		X	X		X	X	X	X		X		X		X	X	X	X	
<i>Pezoporus occidentalis</i>	Night parrot	EN	CR		CR		X																													
<i>Psephotus varius</i>	Mulga parrot																								X			X								
PTILINORHYNCHIDAE																																				
<i>Chlamydera guttata</i>	Western bowerbird					X				X		X			X				X				X				X								X	
RALLIDAE																																				
<i>Fulica atra</i>	Eurasian coot									X							X																			
<i>Gallinula tenebrosa</i>	Dusky moorhen									X																										
<i>Hypotaenidia philippensis</i>	Buff-banded rail					X				X																							X			
<i>Porphyrio porphyrio</i>	Purple swamphen									X			X																						X	
<i>Zapornia pusilla</i>	Baillon's crane					X				X																										
<i>Zapornia tabuensis</i>	Spotless crane					X				X																										

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<i>Tribonyx ventralis</i>	Black-tailed native-hen					X				X																										
RECURVIROSTRIDAE																																				
<i>Cladorhynchus leucocephalus</i>	Banded stilt					X				X																			X							
<i>Himantopus himantopus</i>	Black-winged stilt					X				X				X	X					X		X							X				X			
<i>Recurvirostra novaehollandiae</i>	Red-necked avocet									X																		X								
RHIPIDURIDAE																																				
<i>Rhipidura albiscapa</i>	Grey fantail					X				X			X																							
<i>Rhipidura leucophrys</i>	Willie wagtail					X				X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X			X	X	X	
<i>Rhipidura phasiana</i>	Mangrove grey fantail					X				X			X		X					X								X								
ROSTRATULIDAE																																				
<i>Rostratula australis</i>	Australian painted snipe	EN	EN		EN		X	X		X																										
SCOLOPACIDAE																																				
<i>Actitis hypoleucos</i>	Common sandpiper	MI	MI			X	X	X		X					X							X							X							
<i>Arenaria interpres</i>	Ruddy turnstone	MI / VU	MI			X	X	X		X			X		X					X									X							
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	MI / VU	MI		VU	X	X	X		X																			X							
<i>Calidris alba</i>	Sanderling	MI	MI			X	X	X		X			X																X							
<i>Calidris canutus</i>	Red knot	MI / VU	EN		NT	X	X	X		X																			X							
<i>Calidris ferruginea</i>	Curlew sandpiper	MI / CR	CR		NT	X	X	X		X																			X							
<i>Calidris melanotos</i>	Pectoral sandpiper	MI	MI				X																													
<i>Calidris ruficollis</i>	Red-necked stint	MI	MI		NT	X	X	X		X				X	X					X									X							
<i>Calidris subminuta</i>	Long-toed stint	MI	MI			X	X	X		X																										
<i>Calidris tenuirostris</i>	Great knot	MI / VU	CR		EN	X	X	X		X																			X							
<i>Gallinago stenura</i>	Pin-tailed snipe	MI	MI			X																														
<i>Calidris falcinellus</i>	Broad-billed sandpiper	MI	MI			X	X	X		X																										
<i>Limnodromus semipalmatus</i>	Asian dowitcher	MI / VU	MI		NT		X																													
<i>Limosa lapponica</i>	Bar-tailed godwit	MI	MI		NT	X	X	X		X					X					X									X							
<i>Limosa lapponica menzbieri</i>	Yakutian bar-tailed godwit	EN	CR				X																													
<i>Limosa limosa</i>	Black-tailed godwit	MI / EN	MI		NT	X	X	X		X					X														X							

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<i>Numenius madagascariensis</i>	Eastern curlew	MI / CR	CR		EN	X	X	X		X					X						X									X						
<i>Numenius minutus</i>	Little curlew	MI	MI			X		X		X											X															
<i>Numenius phaeopus</i>	Whimbrel	MI	MI			X	X	X		X			X		X	X					X								X							
<i>Phalaropus lobatus</i>	Red-necked phalarope	MI	MI				X																													
<i>Tringa brevipes</i>	Grey-tailed tattler	MI	MI	P4	NT	X	X	X		X			X		X	X					X								X							
<i>Tringa glareola</i>	Wood sandpiper	MI	MI			X		X		X					X																					
<i>Tringa nebularia</i>	Common greenshank	MI / EN	MI			X	X	X		X			X	X	X	X					X								X							
<i>Tringa totanus</i>	Common redshank	MI	MI			X	X	X		X					X																					
<i>Tringa stagnatilis</i>	Marsh sandpiper	MI	MI				X																													
<i>Xenus cinereus</i>	Terek sandpiper	MI / VU	MI			X	X	X		X					X														X							
STRIGIDAE																																				
<i>Ninox connivens</i>	Barking owl									X																										
<i>Ninox boobook</i>	Boobook owl					X				X																	X			X					X	X
THRESKIORNITHIDAE																																				
<i>Platalea flavipes</i>	Yellow-billed spoonbill									X																										
<i>Platalea regia</i>	Royal spoonbill									X																										
<i>Plegadis falcinellus</i>	Glossy ibis	MI	MI					X		X																								X		
<i>Threskiornis moluccus</i>	Australian white ibis					X				X					X														X							
<i>Threskiornis spinicollis</i>	Straw-necked ibis					X				X							X					X	X											X		X
TURNICIDAE																																				
<i>Turnix velox</i>	Little button-quail					X				X		X			X		X						X						X					X	X	X
TYTONIDAE																																				
<i>Tyto javanica</i>	Eastern barn owl					X				X			X																							X
ZOSTEROPIDAE																																				
<i>Zosterops luteus</i>	Yellow white-eye					X				X			X		X					X			X		X		X		X							
AGAMIDAE																																				
<i>Ctenophorus caudicinctus</i>	Western ring-tailed dragon					X						X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X			X	X	X	X	
<i>Ctenophorus isolepis</i>	Central military dragon					X					X		X	X	X	X	X	X		X	X		X		X	X		X	X	X		X	X		X	
<i>Ctenophorus nuchalis</i>	Central netted dragon					X							X		X	X	X		X									X				X				
<i>Ctenophorus reticulatus</i>	Western netted dragon					X																														X
<i>Diporiphora vescus</i>	Northern pilbara tree dragon				VU	X									X					X																
<i>Gowidon longirostris</i>	Long-nosed dragon					X					X				X	X	X		X	X			X	X	X	X	X						X	X	X	

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<i>Lophognathus horneri</i>	Kimberley ta-ta dragon					X							X		X	X					X															
<i>Pogona minor</i>	Western bearded dragon					X								X	X	X	X			X									X					X		X
<i>Tympanocryptis cephalus</i>	Coastal pebble-mimic dragon				DD	X											X		X									X								X
CARPHODACTYLIDAE																																				
<i>Nephurus cinctus</i>	Northern banded knob-tailed gecko																X																			
DIPLODACTYLIDAE																																				
<i>Diplodactylus bilybara</i>	Western fat-tailed gecko					X																														X
<i>Diplodactylus conspicillatus</i>	Variable fat-tailed gecko					X																						X								X
<i>Diplodactylus galaxias</i>	Northern Pilbara beak-faced gecko					X						X			X	X	X		X																X	
<i>Diplodactylus mitchelli</i>						X											X											X								
<i>Lucasium wombeyi</i>						X											X																			
<i>Lucasium woodwardi</i>	Pilbara ground gecko					X									X																					X
<i>Oedura fimbria</i>	Western marbled velvet gecko					X						X			X	X	X		X	X								X								
<i>Rhynchoedura ornata</i>	Western beaked gecko					X									X		X		X																	X
<i>Strophurus ciliaris</i>						X											X		X																	
<i>Strophurus elderi</i>						X									X	X				X																X
<i>Strophurus jeanae</i>						X						X		X	X		X																			
<i>Strophurus wellingtonae</i>						X									X					X																
ELAPIDAE																																				
<i>Acanthophis wellsi</i>	Pilbara death adder					X									X		X																			
<i>Brachyuropsis approximans</i>						X											X			X								X								X
<i>Demansia reticulata</i>	Reticulated whipsnake					X									X		X											X								X
<i>Demansia rufescens</i>	Rufous whipsnake					X									X	X	X			X								X								X
<i>Furina ornata</i>	Moon snake					X										X	X			X																X
<i>Pseudechis australis</i>	Mulga snake					X								X	X														X					X		X
<i>Pseudonaja mengdeni</i>	Western brown snake					X								X	X					X								X						X		X
<i>Pseudonaja modesta</i>	Ringed brown snake					X											X																			
<i>Suta fasciata</i>	Rosen's snake					X																														

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<i>Suta gaikhorstorum</i>	Pilbara hooded snake														X																					
<i>Suta punctata</i>	Spotted snake					X									X		X											X								
<i>Vermicella snelli</i>						X														X																
GEKKONIDAE																																				
<i>Gehyra crypta</i>	Western cryptic gehyra					X																														
<i>Gehyra media</i>	Medium Pilbara spotted rock gehyra					X																			X										X	
<i>Gehyra micra</i>	Small Pilbara spotted rock gehyra					X																													X	
<i>Gehyra peninsularis</i>	Burrup Peninsula rock gehyra					X						X																								
<i>Gehyra pilbara</i>						X						X			X		X		X																	
<i>Gehyra punctata</i>						X						X	X		X	X		X		X	X			X			X						X		X	
<i>Gehyra variegata</i>	Variegated gehyra					X						X	X			X		X		X	X			X		X	X			X			X		X	
<i>Hemidactylus frenatus</i>	*Asian house gecko					X																														
<i>Heteronotia atra</i>	Black Pilbara gecko					X																														
<i>Heteronotia binoei</i>	Bynoe's gecko					X						X	X		X	X	X	X		X	X		X	X		X	X			X				X	X	
<i>Heteronotia spelea</i>	Pilbara cave gecko					X																														
HOMALOPSIDAE																																				
<i>Fordonia leucobalia</i>	White-bellied mangrove snake					X																														
PYGOPODIDAE																																				
<i>Delma borea</i>						X								X																						
<i>Delma butleri</i>						X									X																					
<i>Delma elegans</i>						X																														
<i>Delma nasuta</i>						X											X																			
<i>Delma pax</i>						X								X	X	X	X		X	X					X				X						X	
<i>Delma tincta</i>						X									X		X			X																
<i>Lialis burtonis</i>						X								X	X	X	X		X	X								X							X	
<i>Pygopus nigriceps</i>						X											X																	X		X
PYTHONIDAE																																				
<i>Antaresia childreni</i>	Children's python					X						X							X										X						X	
<i>Antaresia perthensis</i>	Pygmy python					X								X	X													X							X	
<i>Aspidites melanocephalus</i>	Black-headed python					X																														
<i>Liasis olivaceus barroni</i>	Pilbara olive python	VU	VU			X	X	X																	X											
SCINCIDAE																																				

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<i>Carlia munda</i>						X									X	X	X		X	X								X								X	
<i>Carlia triacantha</i>						X								X		X	X		X	X								X								X	
<i>Cryptoblepharus ustulatus</i>						X																															X
<i>Cryptoblepharus buechananii</i>																			X																		
<i>Cryptoblepharus plagioccephalus</i>						X					X			X	X		X								X											X	
<i>Ctenotus angusticeps</i>				P3		X		X																													
<i>Ctenotus duricola</i>	Eastern Pilbara lined ctenotus					X									X	X	X					X															
<i>Ctenotus grandis</i>						X									X		X		X	X					X				X							X	
<i>Ctenotus hanloni</i>						X										X	X											X									
<i>Ctenotus helenae</i>						X									X		X		X																	X	
<i>Ctenotus leonhardii</i>						X								X																							X
<i>Ctenotus pallasotus</i>	Western Pilbara lined ctenotus					X																															X
<i>Ctenotus pantherinus</i>	Leopard skink					X					X				X	X	X		X	X			X			X		X					X			X	
<i>Ctenotus robustus</i>						X											X											X									X
<i>Ctenotus rubicundus</i>						X								X	X		X								X												
<i>Ctenotus saxatilis</i>	Rock ctenotus					X					X	X	X	X	X	X	X		X	X			X	X	X	X	X						X	X		X	
<i>Ctenotus schomburgkii</i>						X									X		X					X						X								X	
<i>Ctenotus serventyi</i>						X						X			X	X	X			X																	
<i>Ctenotus uber</i>						X											X												X								
<i>Cyclodomorphus melanops</i>						X									X	X	X		X	X					X			X					X			X	
<i>Egernia cygnitos</i>	Western Pilbara spiny-tailed skink					X								X	X		X			X				X			X										
<i>Egernia formosa</i>																	X																				
<i>Egernia pilbarensis</i>	Pilbara skink					X									X													X									X
<i>Eremiascincus isolepis</i>						X						X		X	X		X											X								X	
<i>Eremiascincus pallidus</i>	Western narrow-banded skink					X									X					X																	
<i>Lerista bipes</i>						X						X		X	X	X	X		X	X								X								X	
<i>Lerista clara</i>						X					X				X		X						X					X					X				
<i>Lerista jacksoni</i>						X																															
<i>Lerista muelleri</i>						X						X			X		X		X									X								X	
<i>Lerista neviniae</i>		EN	EN		CR	X	X	X							X	X				X																	
<i>Lerista onslowiana</i>											X												X														
<i>Lerista quadrivincula</i>				PI	DD	X		X																													

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<i>Lerista verhmens</i>						X															X															X
<i>Menetia greyii</i>						X									X	X	X			X	X									X						X
<i>Menetia surda</i>						X						X		X			X						X													X
<i>Morethia ruficauda</i>						X						X	X		X		X			X	X		X					X						X		X
<i>Notoscincus butleri</i>				P4		X		X							X	X				X			X							X						X
<i>Notoscincus ornatus</i>						X											X			X																
<i>Proablepharus reginae</i>						X											X			X																X
<i>Tiliqua multifasciata</i>	Central blue-tongue					X									X		X			X	X									X						X
TYPHLOPIDAE																																				
<i>Anilius ammodytes</i>						X						X		X	X	X	X													X						X
<i>Anilius grypus</i>						X								X			X				X															X
<i>Anilius hamatus</i>						X											X																			
<i>Anilius pilbarensis</i>																	X																			
VARANIDAE																																				
<i>Varanus acanthurus</i>	Spiny-tailed goanna					X						X	X		X	X		X		X	X									X				X		X
<i>Varanus brevicauda</i>	Short-tailed pygmy goanna					X									X		X			X										X						X
<i>Varanus bushi</i>	Pilbara mulga goanna					X									X		X																			
<i>Varanus eremius</i>	Pygmy desert goanna					X									X		X			X	X									X						
<i>Varanus giganteus</i>	Perentie					X									X		X				X															X
<i>Varanus gouldii</i>	Sand goanna					X									X					X										X						X
<i>Varanus panoptes</i>						X						X	X		X	X	X			X			X										X			X
<i>Varanus pilbarensis</i>	Northern Pilbara rock goanna					X									X		X			X							X	X								X
<i>Varanus tristis</i>	Racehorse goanna					X											X			X																X
LIMNODYNASTIDAE																																				
<i>Notaden nichollsi</i>	Desert spadefoot					X									X						X									X						
MYOBATRACHIDAE																																				
<i>Pseudophryne guentheri</i>	Crawling toadlet					X																														
<i>Uperoleia russelli</i>	Northwest toadlet					X											X																			
<i>Uperoleia saxatilis</i>	Pilbara toadlet					X																														
PELODRYADIDAE																																				
<i>Cyclorana australis</i>	Giant frog					X																														
<i>Cyclorana maini</i>	Sheep frog					X								X	X		X				X									X					X	
<i>Cyclorana occidentalis</i>	Western water-holding frog					X									X																					
<i>Litoria caerulea</i>	Green tree frog					X																														

Scientific Name	Common Name	Conservation status				Database searches				Literature review																				Current Survey				
		EPBCAct	BCAct	DBCA	IUCN	NatureMap	EPBC Protected Matters	DBCA Priority and Threatened	ALA	Birdlife	GHD (2008)	GHD (2019).	Richardson et al. (2007).	Eco Logical (2012).	Animal Plant Mineral (2019).	Phoenix (2010).	Biota (2008).	Aston (2018).	Biota (2009).	Phoenix (2018).	Phoenix (2014).	Biota (2008).	Keith Lindbeck and Associates AECOM (2021).	GHD (2011).	Biologic (2022).	Biologic (2024).	Biologic (2024).	Biologic (2024).	Astron (2013).		Phoenix (2023).	Eco Logical (2022).	360 Environmental	GHD (2011).
Litoria rubella	Little red tree frog					X											X			X				X								X		X

Appendix C: Malu Fauna acoustic data memo

Malu Fauna


21-03-2024

Dear Hannah,

Analysis of 30 nights of acoustic recording across 5 sites at Azure Andover during February 2024 presented no detection of Night Parrot (*Pezoporus occidentalis*) calls.

Conditions were generally calm throughout the survey period. Significant periods of wind were detected across all sites and may have masked some concurrent calls within those specific frequencies. These interferences are considered minimal and the recording quality was considered adequate for detection of Night Parrot vocal signals.

There is a very low likelihood that long-term stable Night Parrot roosts exist within two hundred metres of each recording point. It is also highly unlikely that Night Parrots foraged within the same areas during the survey. These statements pertain only to the areas within two hundred metres of each recording point and not the entire survey area.

A total of 13 non-target species were recorded. These are shown for each site in Appendix 1.

Regards,

Louis Masarei


Appendix 1: Species detected during acoustic analyses.

Species					
Stubble Quail <i>Coturnix pectoralis</i>		○			
Australian Owllet-nightjar <i>Aegotheles cristatus</i>	○	○	○	○	○
Bush Stone-curlew <i>Burhinus grallarius</i>	○	○	○	○	○
Southern Boobook <i>Ninox boobook</i>		○	○		○
Blue-winged Kookaburra <i>Dacelo leachii</i>	○	○		○	○
Brown Falcon <i>Falco berigora</i>					○
Budgerigar <i>Melopsittacus undulatus</i>		○			
Singing Honeyeater <i>Gavicalis virescens</i>			○		
White-plumed Honeyeater <i>Ptilotula penicillata</i>			○		
Yellow-throated Miner <i>Manorina flavigula</i>		○			
Horsfield's Bushlark <i>Mirafra javanica</i>		○	○		
Spinifexbird <i>Poodytes carteri</i>		○			
Mistletoebird <i>Dicaeum hirundinaceum</i>		○			



14-11-2024

Dear 

Analysis of 35 nights of acoustic recording across 5 sites at Azure Andover during October 2024 presented no detection of Night Parrot (*Pezoporus occidentalis*) calls.

Conditions were generally calm throughout the survey period with periods of significant wind detected from the 15th of October through to the 17th of October. Machinery Noise was detected at . Both interferences may have masked some concurrent calls within those specific frequencies. These interferences are considered minimal and the recording quality was considered adequate for detection of Night Parrot vocal signals.

There is a very low likelihood that long-term stable Night Parrot roosts exist within two hundred metres of each recording point. It is also highly unlikely that Night Parrots foraged within the same areas during the survey. These statements pertain only to the areas within two hundred metres of each recording point and not the entire survey area.

A total of 35 non-target species were recorded. These are shown for each site in Appendix 1.

Regards,

Louis Masarei



Appendix 1: Species detected during acoustic analyses.

Common Name	Scientific Name					
Spotted Nightjar	<i>Eurostopodus argus</i>	o				
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	o	o	o	o	o
Horsfield's Bronze Cuckoo	<i>Chalcites basalis</i>		o	o		o
Pallid Cuckoo	<i>Heteroscenes pallidus</i>		o	o		o
Crested Pigeon	<i>Ocyphaps lophotes</i>				o	
Peaceful Dove	<i>Geopelia striata</i>					o
Whistling Kite	<i>Haliastur sphenurus</i>				o	o
Blue-winged Kookaburra	<i>Dacelo leachii</i>			o		o
Sacred Kingfisher	<i>Todiramphus sanctus</i>					o
Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>					o
Rainbow Bee-eater	<i>Merops ornatus</i>			o		
Cockatiel	<i>Nymphicus hollandicus</i>			o		o
Galah	<i>Eolophus roseicapilla</i>			o	o	o
Little Corella	<i>Cacatua sanguinea</i>			o		
Australian Ringneck	<i>Barnardius zonarius</i>				o	o
Budgerigar	<i>Melopsittacus undulatus</i>		o		o	
Purple-backed Fairywren	<i>Malurus assimilis</i>					o
White-winged Fairywren	<i>Malurus leucopterus</i>			o		
Singing Honeyeater	<i>Gavicalis virescens</i>	o	o	o	o	o
Grey-headed Honeyeater	<i>Ptilotula keartlandi</i>				o	
White-plumed Honeyeater	<i>Ptilotula penicillata</i>			o		o
Red-browed Pardalote	<i>Pardalotus rubricatus</i>					o
Striated Pardalote	<i>Pardalotus striatus</i>		o			
Black-faced Woodswallow	<i>Artamus cinereus</i>	o		o	o	o
Australian Magpie	<i>Cracticus tibicen</i>	o	o	o	o	
Pied Butcherbird	<i>Cracticus nigrogularis</i>				o	o
Black-faced Cuckooshrike	<i>Coracina novaehollandiae</i>		o		o	o
Crested Bellbird	<i>Oreoica gutturalis</i>	o		o	o	
Torresian Crow	<i>Corvus orru</i>					o
Horsfield's Bushlark	<i>Mirafrja javanica</i>	o				
Tree Martin	<i>Petrochelidon nigricans</i>			o		
Spinifexbird	<i>Poodytes carteri</i>	o	o	o	o	o
Rufous Songlark	<i>Cincloramphus mathewsi</i>					o
Painted Finch	<i>Emblema pictum</i>	o	o			
Zebra Finch	<i>Taeniopygia castanotis</i>				o	o



19-04-2025

Dear [REDACTED]

Analysis of 42 nights of acoustic recording across 7 sites at Azure Adover during March 2025 presented no detection of Night Parrot (*Pezoporus occidentalis*) calls.

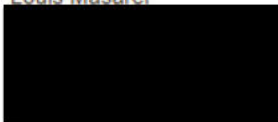
Conditions were generally calm throughout the survey period with small periods of wind and rain detected. Machinery Noise was detected at [REDACTED] and may have masked some concurrent calls within those specific frequencies. These interferences are considered minimal and the recording quality was considered adequate for detection of Night Parrot vocal signals.

There is a very low likelihood that long-term stable Night Parrot roosts exist within two hundred metres of each recording point. It is also highly unlikely that Night Parrots foraged within the same areas during the survey. These statements pertain only to the areas within two hundred metres of each recording point and not the entire survey area.

A total of 34 non-target species were recorded. These are shown for each site in Appendix 1. No vocal signals were detected within the frequency range used for detecting Night Parrots at [REDACTED] and as such, no non-target species were detected.

Regards,

Louis Masarei



Appendix 1: Species detected during acoustic analyses

Species Name							
Brown Quail <i>Synotris ypsilophorus</i>	o					o	
Horsfield's Bronze Cuckoo <i>Chalcites basalis</i>		o	o				
Common Brontewing <i>Phaps chalcoptera</i>	o						
Crested Pigeon <i>Ocyphaps lophotes</i>			o			o	
Diamond Dove <i>Geopelia cuneata</i>	o					o	
Peaceful Dove <i>Geopelia striata</i>				o			
Blue-winged Kookaburra <i>Dacelo leachii</i>	o						o
Red-backed Kingfisher <i>Todiramphus pyrrhopygius</i>		o	o				o
Rainbow Bee-eater <i>Merops ornatus</i>							o
Nankeen Kestrel <i>Falco cenchroides</i>	o		o	o		o	
Brown Falcon <i>Falco berigora</i>	o					o	o
Cockatiel <i>Nymphicus hollandicus</i>	o	o	o	o		o	o
Galah <i>Eolophus roseicapilla</i>	o		o	o			o
Little Corella <i>Cacatua sanguinea</i>	o	o				o	
Budgerigar <i>Melopsittacus undulatus</i>	o	o	o	o		o	o
Purple-backed Fairywren <i>Malurus assimilis</i>	o						
White-winged Fairywren <i>Malurus leucopterus</i>		o	o	o			
Singing Honeyeater <i>Savicalis virescens</i>	o	o	o	o		o	o
White-plumed Honeyeater <i>Psittacula penicillata</i>	o		o				o
Yellow-throated Miner <i>Manorina flavigula</i>	o		o	o			o
Masked Woodswallow <i>Artamus personatus</i>	o	o	o	o		o	o
Black-faced Woodswallow <i>Artamus cinereus</i>		o	o	o		o	
Australian Magpie <i>Cracticus tibicen</i>	o		o				o
Pied Butcherbird <i>Cracticus nigrogularis</i>		o	o	o			o
Black-faced Cuckooshrike <i>Coracina novaehollandiae</i>			o				o
Crested Bellbird <i>Oreolca gutturalis</i>		o	o				

Species Name							
Willie Wagtail <i>Rhipidura leucophrys</i>		o	o				o
Maggie-lark <i>Grallina cyanoleuca</i>							o
Torresian Crow <i>Corvus orru</i>	o	o		o			o
Horsfield's Bushlark <i>Mirafra javanica</i>		o	o	o		o	
Spinifexbird <i>Poodytes carteri</i>		o	o	o			
Rufous Songlark <i>Cincloramphus mathewsi</i>	o	o	o	o			o
Painted Finch <i>Emblema pictum</i>		o	o	o			o
Zebra Finch <i>Taeniopygia castanotis</i>	o	o	o	o		o	o



11-09-2025

Dear 

Analysis of 12 nights of acoustic recording across 2 sites at Azure Andover during August 2025 presented no detection of Night Parrot (*Pezoporus occidentalis*) calls.

Conditions were generally calm throughout the survey period with small periods of wind detected. Road noise was detected at both sites as well. Both interferences may have masked some concurrent calls within those specific frequencies. These interferences are considered minimal and the recording quality was considered adequate for detection of Night Parrot vocal signals.

There is a very low likelihood that long-term stable Night Parrot roosts exist within two hundred metres of each recording point. It is also highly unlikely that Night Parrots foraged within the same areas during the survey. These statements pertain only to the areas within two hundred metres of each recording point and not the entire survey area.

A total of 18 non-target species were recorded. These are shown for each site in Appendix 1.

Regards,

Louis Masarei



Appendix 1: Species detected during acoustic analyses

Species Name		
Australian Owlet-Nightjar <i>Aegotheles cristatus</i>	o	o
Rainbow Bee-eater <i>Merops ornatus</i>	o	o
Galah <i>Eolophus roseicapilla</i>	o	o
Little Corella <i>Cacatua sanguinea</i>		o
Crimson Chat <i>Epthianura tricolor</i>	o	o
Brown Honeyeater <i>Lichmera indistincta</i>	o	o
Singing Honeyeater <i>Gavicalis virescens</i>	o	o
Grey-headed Honeyeater <i>Ptilotula keartlandi</i>	o	o
Yellow-throated Miner <i>Manorina flavigula</i>		o
Striated Pardalote <i>Pardalotus striatus</i>		o
Black-faced Woodswallow <i>Artamus cinereus</i>	o	o
Pied Butcherbird <i>Cracticus nigrogularis</i>	o	o
Willie Wagtail <i>Rhipidura leucophrys</i>	o	o
Torresian Crow <i>Corvus orru</i>	o	
Horsfield's Bushlark <i>Mirafrja javanica</i>	o	
Spinifexbird <i>Poodytes carteri</i>	o	o
Painted Finch <i>Emblema pictum</i>	o	o
Zebra Finch <i>Taeniopygia castanotis</i>	o	

Appendix D: Habitat assessments recorded during the field survey

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			25/02/2024	Drainage Area/ Floodplain	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Negligible	Few Small Patches	Scattered Shrubs, Tussock Grassland	Few Large Patches	Nil	Moderate	Prone to Flooding	Old (6+ yr)	None Discernible	1		
			25/02/2024	Clay Plain	Claypan	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Gravel (1-4cm)	Many Small Patches	Scattered Shrubs, Tussock Grassland	Scarce	Nil	Moderate	Prone to Flooding	Old (6+ yr)	Cattle Grazing, Rubbish/ Litter	0.8		
			25/02/2024	Clay Plain	Claypan	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Gravel (1-4cm)	Many Small Patches	Scattered Shrubs, Tussock Grassland	Scarce	Nil	Moderate	Prone to Flooding	Old (6+ yr)	Rubbish/ Litter	0.8		
			25/02/2024	Clay Plain	Claypan	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Gravel (1-4cm)	Many Small Patches	Scattered Shrubs, Tussock Grassland	Scarce	Nil	Moderate	Prone to Flooding	Old (6+ yr)	Rubbish/ Litter	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			26/02/2024	Stony Plain	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Pebbles (5-10cm)	Many Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Many Small Patches	Nil	Moderate	None	Old (6+ yr)	Mining Exploration, Road/ Access Track	0.4		
			27/06/2022	Minor Drainage Line	Medium Drainage Line	Flat	Flat	Sandy Loam	Few Small Patches	Moderate Outcropping	Basalt	Large Rocks (21-60cm)	Many Small Patches	Acacia Shrubland, Scattered Eucalypts, Spinifex Hummock Grassland, Tussock Grassland	Few Small Patches	Moderate	Moderate	Prone to Flooding	Old (6+ yr)	None Discernible	1	Water feature	NO IMAGE AVAILABLE
			19/02/2024	Major Drainage Line	Major Drainage Line	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible		Gravel (1-4cm)	Few Large Patches	Eucalypt Woodland, Spinifex Hummock Grassland	Few Large Patches	Nil	High	Prone to Flooding	Old (6+ yr)	None Discernible	1		
			20/02/2024	Low Hills and Slopes	Undulating Low Hills	North/ East	Moderate	Clayey Sand	Few Small Patches	Minor Outcropping	BIF	Large Rocks (21-60cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Moderate	Low	None	Old (6+ yr)	Road/ Access Track	0.8		
			20/02/2024	Clay Plain	Claypan	Flat	Flat	Clayey Sand	Evenly Spread	Limited Outcropping	BIF	Pebbles (5-10cm)	Scarce	Spinifex Hummock Grassland	Scarce	Nil	Very High	None	Old (6+ yr)	Cattle Grazing	0.6	Small area of cracking clay	

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			21/02/2024	Rock Piles	Undulating Low Hills	North/ East	Moderate	Clayey Sand	Few Small Patches	Moderate Outcropping	BIF	Boulders (>61cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	High	Moderate	None	Old (6+ yr)	Road/ Access Track	0.8		
			21/02/2024	Major Drainage Line	Major Drainage Line	South/ West	Low	Clayey Sand	Evenly Spread	Limited Outcropping	Sandstone	Small Rocks (11-20cm)	Many Small Patches	Scattered Eucalypts, Tussock Grassland	Few Small Patches	Low	Very High	Prone to Flooding	Recent (0 to 2 yr)	Cattle Grazing	0.8		
			22/02/2024	Stony Plain	Stony Plain	Flat	Flat	Clayey Sand	Evenly Spread	Minor Outcropping	BIF	Small Rocks (11-20cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Nil	High	None	Moderate (3 to 5 yr)	Road/ Access Track	0.8		
			22/02/2024	Claypan	Drainage Area/ Floodplain	Flat	Flat	Clayey Sand	Evenly Spread	Negligible		Gravel (1-4cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Few Small Patches	Nil	Very High	Prone to Flooding	Old (6+ yr)	Road/ Access Track	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			23/02/2024	Rock Piles	Undulating Low Hills	North	Moderate	Clay Loam	Evenly Spread	Extensive Outcropping	Dolerite	Boulders (>61cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Few Small Patches	Very High	Nil	None	Old (6+ yr)	None Discernible	1		
			23/02/2024	Corge/ Gully	Gully	South/ West	Low	Clay Loam	Few Small Patches	Major Outcropping	BIF	Boulders (>61cm)	Many Small Patches	Scattered Eucalypts, Shrubland, Spinifex Hummock Grassland	Few Small Patches	Moderate	Moderate	Prone to Pooling	Moderate (3 to 5 yr)	None Discernible	1		
			23/02/2024	Major Drainage Line	Major Drainage Line	Flat	Low	Sandy Clay Loam	Many Small Patches	Limited Outcropping	River stones	Small Rocks (11-20cm)	Many Small Patches	Scattered Eucalypts, Tussock Grassland	Few Small Patches	Nil	Very High	Prone to Flooding	Old (6+ yr)	None Discernible	1		
			20/02/2024	Sandy Plain	Drainage Area/ Floodplain	Flat	Flat	Sand	Evenly Spread	Negligible		Negligible	Few Small Patches	Spinifex Hummock Grassland, Tussock Grassland	Few Small Patches	Low	High	Prone to Flooding	Old (6+ yr)	Cattle Grazing	0.8	Small patch of sand plain with <i>Triodia</i> between major drainage line and clay plain	

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			21/02/2024	Sandy Plain	Sand Plain	North/ East	Flat	Sandy Clay Loam	Evenly Spread	Negligible		Negligible	Scarce	Scattered Eucalypts, Scattered Shrubs, Spinifex Hummock Grassland, Tussock Grassland	Few Small Patches	Nil	Nil	None	Old (6+ yr)	Cattle Grazing, Road/ Access Track	1		
			21/02/2024	Sandy Plain	Sand Plain	North/ East	Flat	Sandy Clay Loam	Evenly Spread	Negligible		Negligible	Scarce	Scattered Eucalypts, Scattered Shrubs, Spinifex Hummock Grassland, Tussock Grassland	Few Small Patches	Nil	Nil	None	Old (6+ yr)	Cattle Grazing	0.8		
			21/02/2024	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible		Negligible	Scarce	Spinifex Hummock Grassland	Scarce	Nil	High	None	Moderate (3 to 5 yr)	Road/ Access Track	1		
			21/02/2024	Sandy Plain	Sand Plain	Flat	Flat	Clay Loam Sandy	Evenly Spread	Limited Outcropping	BIF	Pebbles (5-10cm)	Scarce	Shrubland, Spinifex Hummock Grassland	Few Small Patches	Nil	High	Scarce	Moderate (3 to 5 yr)	Small sand patch between base of slopes before claypan"			
			22/02/2024	Mine Shaft	Story Plain	North/ West	Low	Clay Loam	Scarce	Minor Outcropping	Quartz	Pebbles (5-10cm)	Few Small Patches	Scattered Eucalypts, Shrubland, Spinifex Hummock Grassland	Few Small Patches	Nil	Low	Prone to Pooling	Moderate (3 to 5 yr)	Rubbish/ Litter	0.6		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			22/02/2024	Mine Shaft	Hillslope	North/West	Moderate	Clay Loam	Scarce	Moderate Outcropping	Quartz	Small Rocks (11-20cm)	None Discernible	Scattered Shrubs, Spinifex Hummock Grassland	None Discernible	Low	Moderate	None	Moderate (3 to 5 yr)	Mining Exploration, Rubbish/Litter	0.6		
			23/02/2024	Mine Shaft	Stony Plain	Flat	Flat	Clay Loam	Few Small Patches	Minor Outcropping	BIF	Pebbles (5-10cm)	Scarce	Shrubland	None Discernible	Nil	Low	Prone to Pooling	Moderate (3 to 5 yr)	Mining Exploration, Road/Access Track, Rubbish/Litter	0.6		
			24/02/2024	Rocky Outcrop	Undulating Low Hills	South/East	Moderate	Clayey Sand	Scarce	Major Outcropping	BIF	Boulders (>61cm)	Scarce	Scattered Shrubs	Scarce	Very High	Nil	None	Old (6+ yr)	Mining Exploration, Road/Access Track, Rubbish/Litter, Weed Invasion	0.4	Old mine adit	
			24/02/2024	Stony Plain	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Pebbles (5-10cm)	Many Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Many Small Patches	Nil	Moderate	None	Old (6+ yr)	None Discernible	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			24/02/2024	Minor Drainage Line	Minor Drainage Line	South	Low	Sand	Scarce	Minor Outcropping	Granite	Small Rocks (11-20cm)	Few Small Patches	Scattered Eucalypts	Few Small Patches	Moderate	Low	Prone to Flooding	Old (6+ yr)	Road/ Access Track	0.8		
			24/02/2024	Minor Drainage Line	Major Drainage Line	Flat	Flat	Sandy Loam	Few Large Patches	Negligible		Negligible	Few Large Patches	Scattered Eucalypts, Tussock Grassland	Few Large Patches	Nil	High	Prone to Pooling	Old (6+ yr)	None Discernible	1		
			24/02/2024	Stony Plain	Undulating Low Hills	South	Moderate	Clay Loam	Evenly Spread	Moderate Outcropping	BIF	Large Rocks (21-60cm)	Scarce	Spinifex Hummock Grassland	Scarce	Very High	Nil	None	Old (6+ yr)	None Discernible	0.8		
			24/02/2024	Clay Plain	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Gravel (1-4cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Few Small Patches	Nil	High	Prone to Flooding	Old (6+ yr)	None Discernible	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			25/02/2024	Clay Plain	Story Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Pebbles (5-10cm)	Scarce	Scattered Shrubs, Tussock Grassland	Scarce	Nil	Moderate	None	Old (6+ yr)	Road/ Access Track	0.8		
			24/02/2024	Rock Piles	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Boulders (>61cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Few Small Patches	Nil	High	Prone to Flooding	Old (6+ yr)	Cattle Grazing, Road/ Access Track	0.8		
			25/02/2024	Drainage Area/ Floodplain	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Negligible	Few Small Patches	Shrubland, Tussock Grassland	Few Large Patches	Nil	Moderate	Prone to Flooding	Old (6+ yr)	Road/ Access Track	0.8		
			24/02/2024	Clay Plain	Drainage Area/ Floodplain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Negligible	Few Small Patches	Tussock Grassland	Few Small Patches	Nil	High	Prone to Flooding	Old (6+ yr)	None Discernible	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			25/02/2024	Clay Plain	Stony Plain	Flat	Flat	Clay Loam	Scarce	Negligible		Pebbles (5-10cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland, Tussock Grassland	Scarce	Nil	Moderate	None	Moderate (3 to 5 yr)	None Discernible	1	Deep soil cracks	
			25/02/2024	Drainage Area/ Floodplain	Sandy/ Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Minor Outcropping	BIF	Small Rocks (11-20cm)	Scarce	Scattered Eucalypts, Tussock Grassland	Few Large Patches	Moderate	Moderate	Prone to Pooling	Old (6+ yr)	Road/ Access Track, Rubbish/ Litter	0.8		
			24/02/2024	Minor Drainage Line	Medium Drainage Line	South/ East	Flat	Sandy Clay Loam	Few Small Patches	Minor Outcropping	River stones	Small Rocks (11-20cm)	Few Small Patches	Scattered Eucalypts, Scattered Shrubs, Tussock Grassland	Few Small Patches	Low	Moderate	Prone to Flooding	Old (6+ yr)	Road/ Access Track	0.8		
			23/02/2024	Stony Plain	Undulating Low Hills	South/ East	Low	Clay Loam	Scarce	Minor Outcropping	BIF	Pebbles (5-10cm)	None Discernible	Scattered Eucalypts, Shrubland, Spinifex Hummock Grassland	Scarce	Nil	Moderate	None	Moderate (3 to 5 yr)	Road/ Access Track	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			24/02/2024	Drainage Area/ Floodplain	Drainage Area/ Floodplain	Flat	Low	Sandy Clay Loam	Many Small Patches	Minor Outcropping	BIF	Pebbles (5-10cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Low	High	None	Old (6+ yr)	None Discernible	0.8		
			25/02/2024	Sandy Plain	Sand Plain	North	Low	Sand	Evenly Spread	Negligible		Negligible	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland, Tussock Grassland	None Discernible	Nil	Very High	None	Old (6+ yr)	Road/ Access Track	0.8		
			25/02/2024	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible		Gravel (1-4cm)	Scarce	Spinifex Hummock Grassland, Tussock Grassland	Scarce	Nil	High	Prone to Flooding	Old (6+ yr)	Cattle Grazing, Road/ Access Track	0.8		
			25/02/2024	Minor Drainage Line	Medium Drainage Line	North/ West	Low	Clay Loam	Few Large Patches	Limited Outcropping	Conglomerate	Small Rocks (11-20cm)	Few Large Patches	Scattered Shrubs	Many Large Patches	Low	Low	Prone to Pooling	Old (6+ yr)	Cattle Grazing	0.6	Old water trough present	

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			25/02/2024	Mine Shaft	Stony Plain	North/ West	Low	Clay Loam	Scarce	Minor Outcropping	Quartz	Pebbles (5-10cm)	Few Small Patches	Scattered Eucalypts, Shrubland, Spinifex Hummock Grassland	Few Small Patches	Nil	Low	None	Moderate (3 to 5 yr)	None Discernible	0.8	Outside Study Area	
			26/02/2024	Mine Shaft	Undulating Low Hills	North	Low	Clay Loam	Evenly Spread	Minor Outcropping	BIF	Small Rocks (11-20cm)	Many Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Many Small Patches	Low	Low	None	Old (6+ yr)	Mining Exploration, Rubbish/ Litter	0.6	Outside Study Area	
			24/02/2024	Low Hills and Slopes	Undulating Low Hills	South/ West	Moderate	Clay Loam	Evenly Spread	Moderate Outcropping	BIF	Large Rocks (21-60cm)	None Discernible	Scattered Shrubs, Spinifex Hummock Grassland	None Discernible	Moderate	Nil	None	Moderate (3 to 5 yr)	Road/ Access Track	0.8		
			24/02/2024	Stony Plain	Sandy/ Stony Plain	South	Low	Clay Loam	Evenly Spread	Negligible		Pebbles (5-10cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Low	Nil	None	Old (6+ yr)	Road/ Access Track	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			2/02/2024	Clay Plain	Sand Plain	Flat	Flat	Clay Loam Sandy	Evenly Spread	Negligible		Gravel (1-4cm)	Few Small Patches	Shrubland, Spinifex Hummock Grassland, Tussock Grassland	Few Small Patches	Nil	High	Scarce	Moderate (3 to 5 yr)	Rubbish/ Litter	0.6		
			14/10/2024	Major Drainage Line	Drainage Area/ Floodplain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Limited Outcropping	BIF	Gravel (1-4cm)	Many Large Patches	Eucalypt Woodland, Scattered Shrubs, Tussock Grassland	Many Large Patches	Nil	Very High	Prone to Flooding	Old (6+ yr)	Rubbish/ Litter	0.6		
			21/10/2024	Rock Piles	Undulating Low Hills	South/ East	Moderate	Clay Loam	Scarce	Extensive Outcropping	BIF	Boulders (>61cm)	Scarce	Shrubland, Spinifex Hummock Grassland	Few Small Patches	Very High	Low	None	Old (6+ yr)	None Discernible	1		
			15/10/2024	Stony Plain	Sandy/ Stony Plain	Flat	Flat	Sandy Clay Loam	Many Small Patches	Negligible	BIF	Pebbles (5-10cm)	Few Small Patches	Spinifex Hummock Grassland	Scarce	Nil	Low	None	Old (6+ yr)	None Discernible	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			15/10/2024	Stony Plain	Undulating Low Hills	South	Low	Clay Loam Sandy	None Discernible	Minor Outcropping	BIF	Small Rocks (11-20cm)	Few Large Patches	Eucalypt Woodland, Spinifex Hummock Grassland, Tussock Grassland	Many Small Patches	Nil	Moderate	None	Old (6+ yr)	Road/ Access Track	0.8		
			15/10/2024	Stony Plain	Sandy/ Stony Plain	Flat	Flat	Clay Loam Sandy	Scarce	Negligible		Pebbles (5-10cm)	Few Small Patches	Spinifex Hummock Grassland, Tussock Grassland	None Discernible	Low	Moderate	None	Old (6+ yr)	Road/ Access Track	0.8		
			15/10/2024	Sandy Plain	Gully	Flat	Flat	Sandy Clay Loam	Few Small Patches	Limited Outcropping	Calcrete	Gravel (1-4cm)	Scarce	Shrubland, Spinifex Hummock Grassland	Few Small Patches	Nil	High	None	Old (6+ yr)	None Discernible	1		
			15/10/2024	Stony Plain	Stony Plain	East	Low	Clay Loam	Scarce	Limited Outcropping	Calcrete	Pebbles (5-10cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Nil	Moderate	None	Moderate (3 to 5 yr)	None Discernible	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			16/10/2024	Clay Plain	Hardpan Plain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible		Negligible	Many Small Patches	Scattered Eucalypts, Scattered Shrubs, Spinifex Hummock Grassland	Few Small Patches	Nil	Moderate	Prone to Flooding	Old (6+ yr)	Road/ Access Track	0.8		
			17/10/2024	Stony Plain	Sandy/ Stony Plain	North/ East	Flat	Clay Loam	Few Large Patches	Negligible		Pebbles (5-10cm)	Few Small Patches	Scattered Eucalypts, Scattered Shrubs, Spinifex Hummock Grassland	Few Small Patches	Nil	Moderate	None	Moderate (3 to 5 yr)	Road/ Access Track	1		
			17/10/2024	Minor Drainage Line	Medium Drainage Line	Flat	Flat	Sandy Loam	Few Small Patches	Limited Outcropping	Basalt	Small Rocks (11-20cm)	Many Small Patches	Acacia Shrubland, Scattered Eucalypts, Spinifex Hummock Grassland, Tussock Grassland	Few Small Patches	Low	Moderate	Prone to Flooding	Old (6+ yr)	None Discernible	1		
			18/10/2024	Drainage Area/ Floodplain	Drainage Area/ Floodplain	Flat	Flat	Sandy Clay Loam	Evenly Spread	Negligible		Negligible	Many Small Patches	Shrubland, Spinifex Hummock Grassland	Many Small Patches	Nil	Moderate	Prone to Flooding	Old (6+ yr)	None Discernible	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			17/10/2024	Sandy Plain	Sandy/ Stony Plain	Flat	Flat	Sandy Loam	Evenly Spread	Negligible	BIF	Pebbles (5-10cm)	Few Small Patches	Spinifex Hummock Grassland	Few Large Patches	Nil	High	None	Old (6+ yr)	Road/ Access Track, Rubbish/ Litter, Weed Invasion	0.8		
			17/10/2024	Sandy Plain	Sandy/ Stony Plain	Flat	Flat	Clayey Sand	Evenly Spread	Negligible		Gravel (1-4cm)	Few Small Patches	Scattered Eucalypts, Spinifex Hummock Grassland	Scarce	Nil	Moderate	None	Old (6+ yr)	Road/ Access Track, Rubbish/ Litter, Weed Invasion	0.6		NO IMAGE AVAILABLE
			18/10/2024	Sandy Plain	Sand Plain	Flat	Flat	Sand	Evenly Spread	Negligible		Negligible	Scarce	Tussock Grassland	None Discernible	Nil	High	None	Old (6+ yr)	Horses, None Discernible	0.8	Small sand plain between clay plain and drainage	
			18/10/2024	Major Drainage Line	Major Drainage Line	North	Low	Clay Loam	Few Small Patches	Negligible		Pebbles (5-10cm)	Few Large Patches	Scattered Eucalypts	Few Large Patches	Low	Low	Prone to Pooling	Old (6+ yr)	Cattle Grazing, Weed Invasion	0.8		
			18/10/2024	Sandy Plain	Sandy/ Stony Plain	Flat	Flat	Sand	Many Large Patches	Limited Outcropping	Granite	Pebbles (5-10cm)	Scarce	Other - Snakewood, Spinifex Hummock Grassland	Few Small Patches	Low	Moderate	None	Old (6+ yr)	Horse	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			18/10/2024	Low Hills and Slopes	Undulating Low Hills	South/East	Low	Clay Loam	Scarce	Minor Outcropping	Basalt	Small Rocks (11-20cm)	None Discernible	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Low	Moderate	None	Moderate (3 to 5 yr)	None Discernible	0.8		
			20/10/2024	Stony Plain	Stony Plain	Flat	Flat	Clayey Sand	Many Large Patches	Negligible		Pebbles (5-10cm)	Scarce	Tussock Grassland	None Discernible	Nil	Moderate	None	Old (6+ yr)	Road/Access Track	0.8		
			20/10/2024	Rocky Outcrop	Hill slope	North/West	Moderate	Clay Loam	Scarce	Major Outcropping	Quartz	Boulders (>61cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Few Small Patches	Very High	Nil	None	Old (6+ yr)	None Discernible	1		
			20/10/2024	Drainage Area/Floodplain	Drainage Area/Floodplain	Flat	Flat	Sandy Clay Loam	Many Large Patches	Negligible		Gravel (1-4cm)	Few Small Patches	Scattered Acacia with spinifex	Many Small Patches	Nil	Low	Prone to Pooling	Old (6+ yr)	None Discernible	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			20/10/2024	Clay Plain	Stony Plain	Flat	Flat	Light Clay	Evenly Spread	Negligible		Gravel (1-4cm)	Scarce	Tussock Grassland	None Discernible	Moderate	Low	None	Old (6+ yr)	None Discernible	0.8		
			20/10/2024	Drainage Area/ Floodplain	Drainage Area/ Floodplain	Flat	Flat	Sandy Clay Loam	Many Large Patches	Negligible		Gravel (1-4cm)	None Discernible	Scattered Acacia over spinifex	Many Small Patches	Nil	Low	Prone to Flooding	Old (6+ yr)	Road/ Access Track, Rubbish/ Litter	0.8		
			20/10/2024	Stony Plain	Drainage Area/ Floodplain	Flat	Flat	Sandy Clay Loam	Many Large Patches	Negligible		Gravel (1-4cm)	Scarce	Tussock Grassland	Few Small Patches	Nil	Low	None	Old (6+ yr)	Mining Exploration, Road/ Access Track	0.6		
			20/10/2024	Rocky Piles	Stony Plain	South/ East	Steep	Sandy Clay Loam	Many Small Patches	Major Outcropping	Dolerite	Boulders (>61cm)	Many Small Patches	Scattered Acacia	Scarce	High	Nil	None	Old (6+ yr)	None Discernible	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			20/10/2024	Minor Drainage Line	Medium Drainage Line	Flat	Low	Sandy Clay Loam	Evenly Spread	Negligible		Small Rocks (11-20cm)	Few Large Patches	Eucalypt Woodland, Tussock Grassland	Few Large Patches	Nil	Low	Prone to Flooding	Old (6+ yr)	Horses	0.8		
			22/10/2024	Rock Piles	Boulders/ Rock Piles	South	Steep	Clay Loam Sandy	Scarce	Extensive Outcropping	Basalt	Boulders (>61cm)	Scarce	Minimal	Scarce	Very High	Nil	None	Old (6+yr)	Buffel grass on edges	1		
			24/02/2024	Minor Drainage Line	Medium Drainage Line	South	Low	Clay Loam	Scarce	Negligible		Pebbles (5-10cm)	Few Large Patches	Eucalypt Woodland, Melaleuca, Tussock Grassland	Few Large Patches	Nil	Low	Prone to Flooding	Old (6+yr)	Horses	0.8		
			5/03/2025	Clay Plain	Claypan	Flat	Flat	Clay Loam	Many Small Patches	Limited Outcropping	Quartz	Pebbles (5-10cm)	Scarce	Tussock Grassland	None Discernible	Nil	High	Prone to Flooding	Old (6+ yr)	Rubbish/ Litter, Weed Invasion	0.6		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			6/03/2025	Sandy Plain	Sand Plain	Flat	Flat	Sandy Loam	Few Large Patches	Negligible		Negligible	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland, Tussock Grassland	Scarce	Nil	Very High	None	Moderate (3 to 5 yr)	Weed Invasion	0.6		
			5/03/2025	Minor Drainage Line	Minor Drainage Line	Flat	Flat	Clay Loam	Scarce	Limited Outcropping	Granite	Pebbles (5-10cm)	Few Small Patches	Scattered Eucalypts, Spinifex Hummock Grassland, Tussock Grassland	None Discernible	Nil	Moderate	Scarce	Old (6+ yr)	None Discernible	1		
			7/03/2025	Rock Piles	Undulating Low Hills	North/East	Moderate	Clay Loam	Scarce	Major Outcropping	Ultramafics	Boulders (>61cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Very High	Low	None	Old (6+ yr)	None Discernible	1		
			7/03/2025	Sandy Plain	Sand Plain	Flat	Flat	Sandy Clay Loam	Many Small Patches	Negligible	Ultramafics	Negligible	Few Small Patches	Spinifex Hummock Grassland	None Discernible	Nil	Very High	None	Old (6+ yr)	Road/ Access Track	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			7/03/2025	Sandy Plain	Sand Plain	Flat	Flat	Sandy Clay Loam	Many Small Patches	Negligible		Negligible	Scarce	Spinifex Hummock Grassland, Tussock Grassland	None Discernible	Nil	Very High	None	Old (6+ yr)	Weed Invasion	0.6		
			8/03/2025	Minor Drainage Line	Drainage Area/ Floodplain	South/ West	Low	Clay Loam	Many Small Patches	Negligible		Gravel (1-4cm)	Many Large Patches	Spinifex Hummock Grassland	Many Small Patches	Low	Moderate	Prone to Pooling	Moderate (3 to 5 yr)	Road/ Access Track, Weed Invasion	0.6		
			9/03/2025	Rock Piles	Boulders/ Rockpiles	North/ West	Steep	Clay Loam	Few Small Patches	Extensive Outcropping	Basalt	Boulders (>61cm)	Scarce	Scattered Shrubs, Tussock Grassland	Few Small Patches	Very High	Nil	None	Old (6+ yr)	None Discernible	1		
			10/03/2025	Sandy Plain	Sandy/ Stony Plain	Flat	Flat	Sand	Many Large Patches	Negligible		Negligible	Many Small Patches	Spinifex Hummock Grassland	Few Small Patches	Nil	High	None	Old (6+ yr)	None Discernible	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			10/03/2025	Sandy Plain	Sand Plain	South/East	Low	Sandy Clay Loam	Few Large Patches	Negligible		Gravel (1-4cm)	Scarce	Spinifex Hummock Grassland	None Discernible	Nil	Very High	None	Moderate (3 to 5 yr)	Road/ Access Track	0.8		
			10/03/2025	Stony Plain	Drainage Area/ Floodplain	Flat	Flat	Clayey Sand	Many Large Patches	Negligible		Pebbles (5-10cm)	Many Small Patches	Spinifex Hummock Grassland	Few Small Patches	Low	Low	Prone to Pooling	Old (6+ yr)	None Discernible	0.8		
			10/03/2025	Major Drainage Line	Drainage Area/ Floodplain	South/ West	Low	Clayey Sand	Many Small Patches	Negligible		Small Rocks (11-20cm)	Many Large Patches	Eucalypt Woodland, Tussock Grassland	Many Large Patches	Low	Moderate	Prone to Flooding	Old (6+ yr)	None Discernible	0.8		
			10/03/2025	Sandy Plain	Sand Plain	Flat	Flat	Sandy Clay Loam	Many Large Patches	Limited Outcropping	Dolerite	Pebbles (5-10cm)	Scarce	Spinifex Hummock Grassland	Scarce	Nil	Very High	None	Moderate (3 to 5 yr)	Crazing pressure from horses	0.6		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			10/03/2025	Mine Shaft	Story Plain	North	Moderate	Sandy Clay Loam	Scarce	Minor Outcropping	Ultramafics	Large Rocks (21-60cm)	Few Small Patches	Spinifex Hummock Grassland	Few Small Patches	Moderate	Nil	None	Moderate (3 to 5 yr)	Mining Exploration	0.6		
			10/03/2025	Major Drainage Line	Drainage Area/ Floodplain	South/ East	Low	Clay Loam	Evenly Spread	Negligible		Negligible	Many Small Patches	Eucalypt Woodland	Many Small Patches	Nil	Low	Prone to Flooding	Old (6+ yr)	None Discernible	0.8		
			11/03/2025	Drainage Area/ Floodplain	Drainage Area/ Floodplain	South	Low	Medium Clay	Many Small Patches	Negligible		Negligible	Many Small Patches	Scattered Acacia, Tussock Grassland	Few Large Patches	Moderate	Moderate	Prone to Flooding	Moderate (3 to 5 yr)	Rubbish/ Litter	0.8		
			11/03/2025	Clay Plain	Drainage Area/ Floodplain	Flat	Flat	Clayey Sand	Many Large Patches	Negligible		Gravel (1-4cm)	Many Small Patches	Tussock Grassland	Many Small Patches	Low	Moderate	Prone to Pooling	Moderate (3 to 5 yr)	Rubbish/ Litter	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			11/03/2025	Clay Plain	Drainage Area/ Floodplain	Flat	Flat	Medium Heavy Clay	Many Small Patches	Negligible		Gravel (1-4cm)	Many Small Patches	Shrubland	Scarce	Low	Moderate	Prone to Flooding	Moderate (3 to 5 yr)	Road/ Access Track, Rubbish/ Litter	0.6		
			11/03/2025	Clay Plain	Drainage Area/ Floodplain	Flat	Flat	Medium Heavy Clay	Many Small Patches	Negligible		Negligible	Scarce	Tussock Grassland	Scarce	Moderate	Moderate	Prone to Pooling	Old (6+ yr)	Road/ Access Track	0.8		
			11/03/2025	Clay Plain	Drainage Area/ Floodplain	Flat	Flat	Sandy Clay Loam	Many Large Patches	Negligible		Gravel (1-4cm)	Scarce	Tussock Grassland	None Discernible	Nil	High	Prone to Pooling	Old (6+ yr)	None Discernible	0.8		
			11/03/2025	Clay Plain	Drainage Area/ Floodplain	Flat	Flat	Sandy Clay Loam	Many Large Patches	Negligible		Gravel (1-4cm)	Scarce	Tussock Grassland	Scarce	Low	Moderate	Scarce	Old (6+ yr)	Road/ Access Track	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			10/03/2025	Claypan	Sandy/ Stony Plain	Flat	Flat	Medium Clay	Evenly Spread	Negligible		Pebbles (5-10cm)	Scarce	Shrubland	Scarce	Low	Nil	Prone to Flooding	Old (6+ yr)	None Discernible	1		
			11/03/2025	Clay Plain	Stony Plain	Flat	Flat	Light Medium Clay	Many Small Patches	Negligible		Gravel (1-4cm)	Scarce	Tussock Grassland	Scarce	Moderate	Moderate	None	Old (6+ yr)	Horse grazing, Road/ Access Track	0.6		
			11/03/2025	Minor Drainage Line	Medium Drainage Line	Flat	Low	Light Clay	Many Small Patches	Major Outcropping	Dolerite	Large Rocks (21-60cm)	Few Small Patches	Spinifex Hummock Grassland	Scarce	Moderate	Low	Prone to Pooling	Old (6+ yr)	Cattle Grazing, Road/ Access Track, Rubbish/ Litter	0.4		
			13/03/2025	Clay Plain	Drainage Area/ Floodplain	Flat	Flat	Clayey Sand	Many Small Patches	Negligible		Pebbles (5-10cm)	Scarce	Tussock Grassland	Scarce	Moderate	Moderate	Prone to Pooling	Old (6+ yr)	Horse grazing, Road/ Access Track, Rubbish/ Litter	0.6		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			5/03/2025	Minor Drainage Line	Minor Drainage Line	South/West	Low	Clay Loam	Many Small Patches	Negligible		Pebbles (5-10cm)	Few Small Patches	Scattered Eucalypts, Scattered Shrubs, Spinifex Hummock Grassland	Few Large Patches	Low	Very High	Prone to Flooding	Old (6+ yr)	None Discernible	1		
			7/03/2025	Drainage Area/ Floodplain	Drainage Area/ Floodplain	Flat	Flat	Sandy Clay Loam	Many Large Patches	Negligible		Pebbles (5-10cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland, Tussock Grassland	Scarce	Nil	Very High	Prone to Pooling	Old (6+ yr)	Weed Invasion	0.8		
			7/03/2025	Clay Plain	Drainage Area/ Floodplain	Flat	Flat	Sandy Clay Loam	Many Large Patches	Negligible		Gravel (1-4cm)	Scarce	Tussock Grassland	None Discernible	Nil	High	Prone to Pooling	Old (6+ yr)	None Discernible	0.8		
			8/03/2025	Stony Plain	Sandy/ Stony Plain	Flat	Flat	Sandy Loam	Many Small Patches	Negligible		Gravel (1-4cm)	Scarce	Spinifex Hummock Grassland	Few Small Patches	Nil	Moderate	None	Old (6+ yr)	None Discernible	1		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			8/03/2025	Stony Plain	Stony Plain	Flat	Flat	Sandy Clay Loam	Many Small Patches	Limited Outcropping	BIF	Pebbles (5-10cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Nil	Moderate	None	Old (6+ yr)	None Discernible	1		
			9/03/2025	Major Drainage Line	Major Drainage Line	South/ West	Low	Sandy Loam	Many Large Patches	Limited Outcropping	Conglomerate	Pebbles (5-10cm)	Many Small Patches	Paperbark, Scattered Eucalypts, Scattered Shrubs, Tussock Grassland	Many Large Patches	Low	Moderate	Prone to Flooding	Old (6+ yr)	Horse grazing, Road/ Access Track, Weed Invasion	0.8		NO IMAGE AVAILABLE
			9/03/2025	Major Drainage Line	Major Drainage Line	North/ East	Flat	Sand	Evenly Spread	Negligible		Small Rocks (11-20cm)	Many Large Patches	Scattered Eucalypts, Scattered Shrubs, Tussock Grassland	Few Large Patches	Low	Very High	Prone to Flooding	Old (6+ yr)	Horse grazing	0.8		
			10/03/2025	Minor Drainage Line	Minor Drainage Line	South/ West	Low	Clayey Sand	Many Large Patches	Negligible		Gravel (1-4cm)	Many Small Patches	Scattered Shrubs, Spinifex Hummock Grassland, Tussock Grassland	Few Small Patches	Nil	High	Prone to Flooding	Old (6+ yr)	Rubbish/ Litter	0.8		
			10/03/2025	Stony Plain	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Pebbles (5-10cm)	Few Small Patches	Scattered Shrubs, Tussock Grassland	Few Large Patches	Nil	Moderate	Prone to Flooding	Old (6+ yr)	Road/ Access Track, Rubbish/ Litter	0.6		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			10/03/2025	Minor Drainage Line	Minor Drainage Line	South/West	Low	Sandy Loam	Few Large Patches	Negligible		Pebbles (5-10cm)	Few Small Patches	Scattered Eucalypts, Scattered Shrubs, Spinifex Hummock Grassland	Few Small Patches	Nil	High	Prone to Flooding	Old (6+ yr)	Rubbish/ Litter	0.8		
			10/03/2025	Stony Plain	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Gravel (1-4cm)	Scarce	Scattered Shrubs, Tussock Grassland	Scarce	Nil	Low	Prone to Flooding	Old (6+ yr)	Road/ Access Track, Rubbish/ Litter, Weed Invasion	0.6		
			10/03/2025	Stony Plain	Stony Plain	Flat	Flat	Sandy Clay Loam	Many Small Patches	Negligible		Small Rocks (11-20cm)	Scarce	Scattered Shrubs, Tussock Grassland	Scarce	Nil	High	Prone to Flooding	Old (6+ yr)	Rubbish/ Litter	0.8		
			10/03/2025	Stony Plain	Hillslope	North	Low	Clay Loam	Scarce	Limited Outcropping	Dolerite	Small Rocks (11-20cm)	None Discernible	Spinifex Hummock Grassland	None Discernible	Low	Nil	None	Moderate (3 to 5 yr)	Rubbish/ Litter	0.6		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			10/03/2025	Claypan	Claypan	Flat	Flat	Light Medium Clay	Evenly Spread	Negligible		Gravel (1-4cm)	Few Small Patches	Tussock Grassland	None Discernible	High	Low	Prone to Flooding	Old (6+ yr)	Road/ Access Track, Weed Invasion	0.6		
			10/03/2025	Low Hills and Slopes	Undulating Low Hills	South/ West	Moderate	Sandy Loam	Few Small Patches	Limited Outcropping	BIF	Pebbles (5-10cm)	None Discernible	Scattered Shrubs, Spinifex Hummock Grassland	None Discernible	Low	Low	None	Old (6+ yr)	None Discernible	0.8		
			10/03/2025	Low Hills and Slopes	Undulating Low Hills	South/ West	Moderate	Sandy Clay Loam	Many Small Patches	Minor Outcropping	BIF	Pebbles (5-10cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Low	Low	None	Old (6+ yr)	None Discernible	1		
			10/03/2025	Stony Plain	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Negligible		Gravel (1-4cm)	Scarce	Tussock Grassland	Scarce	Low	Low	Prone to Flooding	Moderate (3 to 5 yr)	Mining Exploration, Road/ Access Track	0.6		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			11/03/2025	Rock Piles	Boulders/Rockpiles	West	Low	Clay Loam	Few Small Patches	Moderate Outcropping	Dolerite	Boulders (>61cm)	Scarce	Spinifex Hummock Grassland	Few Small Patches	High	Nil	None	Old (6+ yr)	None Discernible	1		
			10/03/2025	Minor Drainage Line	Minor Drainage Line	South/West	Low	Sandy Clay Loam	Few Large Patches	Negligible		Gravel (1-4cm)	Many Small Patches	Scattered Eucalypts, Scattered Shrubs, Tussock Grassland	Few Small Patches	Nil	High	Prone to Flooding	Old (6+ yr)	Mining Exploration	0.8		NO IMAGE AVAILABLE
			11/03/2025	Stony Plain	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Limited Outcropping	Quartz	Pebbles (5-10cm)	None Discernible	Tussock Grassland	None Discernible	Nil	Moderate	None	Moderate (3 to 5 yr)	Grazing pressure from horses	0.6		
			11/03/2025	Minor Drainage Line	Minor Drainage Line	Flat	Flat	Clay Loam	Few Large Patches	Negligible		Negligible	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland, Tussock Grassland	Scarce	Nil	High	Prone to Flooding	Moderate (3 to 5 yr)	Grazing pressure from horses and buffel grass	0.6		
			11/03/2025	Stony Plain	Stony Plain	Flat	Flat	Clay Loam	Evenly Spread	Limited Outcropping	Dolerite	Pebbles (5-10cm)	None Discernible	Scattered Shrubs, Tussock Grassland	None Discernible	Nil	Moderate	None	Moderate (3 to 5 yr)	Grazing pressure from horses	0.6		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			11/03/2025	Minor Drainage Line	Minor Drainage Line	Flat	Flat	Clay Loam	Few Small Patches	Limited Outcropping	Dolerite	Pebbles (5-10cm)	Few Small Patches	Scattered Eucalypts, Shrubland, Spinifex Hummock Grassland, Tussock Grassland	Few Small Patches	Nil	High	Prone to Flooding	Moderate (3 to 5 yr)	Crazing pressure from horses and buffel grass	0.6		
			11/03/2025	Sandy Plain	Sand Plain	Flat	Flat	Clayey Sand	Many Large Patches	Limited Outcropping	Granite	Gravel (1-4cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Nil	Very High	None	Old (6+ yr)	None Discernible	1		
			11/03/2025	Rock Piles	Boulders/ Rockpiles	North/ East	Low	Clay Loam	Scarce	Major Outcropping	Granite	Boulders (>61cm)	Few Small Patches	Scattered Shrubs, Spinifex Hummock Grassland	Few Small Patches	Moderate	Low	None	Moderate (3 to 5 yr)	None Discernible	0.8		
			11/03/2025	Sandy Plain	Sand Plain	Flat	Flat	Sandy Clay Loam	Many Small Patches	Negligible	BIF	Negligible	Scarce	Spinifex Hummock Grassland	None Discernible	Nil	High	None	Old (6+ yr)	Road/ Access Track	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			11/03/2025	Sandy Plain	Sand Plain	Flat	Flat	Sandy Clay Loam	Many Large Patches	Negligible		Negligible	Scarce	Spinifex Hummock Grassland	None Discernible	Nil	Very High	None	Moderate (3 to 5 yr)	Road/ Access Track	0.6		
			11/03/2025	Stony Plain	Sandy/ Stony Plain	Flat	Flat	Clay Loam	Few Large Patches	Limited Outcropping	Dolerite	Pebbles (5-10cm)	None Discernible	Spinifex Hummock Grassland	Few Small Patches	Nil	Moderate	None	Moderate (3 to 5 yr)	None Discernible	0.8		
			11/03/2025	Minor Drainage Line	Minor Drainage Line	Flat	Flat	Sandy Clay Loam	Few Large Patches	Limited Outcropping	Dolerite	Pebbles (5-10cm)	Scarce	Shrubland, Spinifex Hummock Grassland, Tussock Grassland	None Discernible	Nil	High	Prone to Flooding	Old (6+ yr)	None Discernible	0.8		
			11/03/2025	Stony Plain	Stony Plain	Flat	Flat	Clay Loam	Few Large Patches	Limited Outcropping	Dolerite	Pebbles (5-10cm)	None Discernible	Spinifex Hummock Grassland	None Discernible	Nil	Moderate	None	Moderate (3 to 5 yr)	None Discernible	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			11/03/2025	Rock Piles	Boulders/ Rockpiles	North/ East	Moderate	Sandy Clay Loam	None Discernible	Extensive Outcropping	Basalt	Boulders (>61cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	Scarce	Very High	Nil	None	Old (6+ yr)	None Discernible	1		
			11/03/2025	Low Hills and Slopes	Undulating Low Hills	North/ East	Moderate	Clay Loam	Scarce	Moderate Outcropping	Granite	Boulders (>61cm)	None Discernible	Spinifex Hummock Grassland	Scarce	Moderate	Low	None	Moderate (3 to 5 yr)	None Discernible	1		
			13/03/2025	Major Drainage Line	Medium Drainage Line	Flat	Flat	Sandy Clay Loam	Many Large Patches	Limited Outcropping	Dolerite	Pebbles (5-10cm)	Few Large Patches	Eucalypt Woodland, Scattered Shrubs, Tussock Grassland	Evenly Spread	Nil	Very High	Prone to Flooding	Moderate (3 to 5 yr)	None Discernible	0.8		
			13/03/2025	Stony Plain	Sandy/ Stony Plain	South/ East	Low	Clay Loam	Many Small Patches	Limited Outcropping	Dolerite	Pebbles (5-10cm)	Scarce	Scattered Shrubs, Spinifex Hummock Grassland	None Discernible	Nil	High	None	Old (6+ yr)	None Discernible	0.8		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			17/08/2025	Rock Piles	Undulating Low Hills	South/ East	Steep	Sandy Clay Loam	Scarce	Moderate Outcropping	Ultramafics	Boulders (>61cm)	Few Small Patches	Scattered Shrubs	Few Small Patches	Very High	Nil	None	Old (6+ yr)	None Discernible	0g		
			17/08/2025	Sandy Plain	Undulating Low Hills	Flat	Flat	Clayey Sand	Many Large Patches	Negligible		Negligible	Many Small Patches	Scattered Eucalypts, Spinifex Hummock Grassland	Scarce	Nil	Low	Prone to Flooding	Moderate (3 to 5 yr)	None Discernible	0g		
			17/08/2025	Gorge/ Gully	Gully	West	Low	Sandy Loam	Evenly Spread	Major Outcropping	Ultramafic	Small Rocks (11-20cm)	Many Small Patches	Scattered Eucalypts, Spinifex Hummock Grassland	Many Small Patches	Moderate	Nil	Prone to Flooding	Old (6+ yr)	Other	0g		
			17/08/2025	Low Hills and Slopes	Undulating Low Hills	West	Moderate	Sandy Clay Loam	Many Small Patches	Minor Outcropping	Ultramafic	Small Rocks (11-20cm)	Few Small Patches	Spinifex Hummock Grassland	Scarce	Low	Nil	None	Old (6+ yr)	None Discernible	0g		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			18/08/2025	Stony Plain	Sandy/Stony Plain	Flat	Flat	Clayey Sand	Few Large Patches	Negligible		Pebbles (5-10cm)	Scarce	Spinifex Hummock Grassland	Scarce	Nil	Low	Scarce	Moderate (3 to 5 yr)	Road/ Access Track	g		
			18/08/2025	Stony Plain	Sandy/Stony Plain	Flat	Low	Clayey Sand	Evenly Spread	Negligible		Gravel (1-4cm)	Scarce	Spinifex Hummock Grassland	Scarce	Nil	Moderate	Scarce	Recent (0 to 2 yr)	Road/ Access Track	g		
			19/08/2025	Stony Plain	Undulating Low Hills	Flat	Flat	Sandy Clay Loam	Evenly Spread	Minor Outcropping	Dolerite	Pebbles (5-10cm)	Scarce	Spinifex Hummock Grassland	Scarce	Low	Nil	None	Moderate (3 to 5 yr)	Road/ Access Track	g		
			19/08/2025	Major Drainage Line	Drainage Area/ Floodplain	South	Low	Sandy Clay Loam	Many Large Patches	Negligible		Pebbles (5-10cm)	Many Large Patches	Eucalypt Woodland, Tussock Grassland	Many Large Patches	Nil	Moderate	Prone to Flooding	Old (6+ yr)	Weed Invasion	g		

Site	Latitude	Longitude	Date	Habitat type	Landform	Aspect	Slope	Soil type	Soil Avail	Outcrop	Rock type	Rock size	Veg litter	Veg type	Woody debris	Rocky cracks/ crevices	Burrowing suitability	Water presence	Last fire	Disturbances	Habitat condition	Comments	Photo
			19/08/2025	Sandy Plain	Undulating Low Hills	Flat	Flat	Clayey Sand	Evenly Spread	Negligible		Negligible	Few Small Patches	Spinifex Hummock Grassland	None Discernible	Nil	High	None	Old (6+ yr)	Road/ Access Track	g O		
			22/08/2025	Minor Drainage Line	Minor Drainage Line	North/ East	Low	Loamy Sand	Many Large Patches	Negligible		Pebbles (5-10cm)	Many Small Patches	Eucalypt Woodland, Spinifex Hummock Grassland	Many Small Patches	Low	High	Prone to Flooding	Old (6+ yr)	Weed Invasion	g O		

Appendix E: Water features recorded during the current survey

Site	Latitude	Longitude	Date	Length (m)	Width (m)	Water present above surface	Water depth (m)	Water in intermediate zone	Groundwater dependent vegetation present	Groundwater vegetation species	Emergent macrophytes present	Fauna present	Permanency	Photo
			24/02/2024	160	1	No	0	No	No	-	No	No	Ephemeral	
			18/10/2024	30	10	No	0	No	No	-	No	No	Ephemeral	
			12/03/2025	12	7	Yes	0.4	No	Yes	<i>Melaleuca ?argentea</i>	No	No	Permanency Unknown	
			12/03/2025	40	5	Yes	0.3	No	Yes	<i>Melaleuca ?argentea</i>	No	No	Permanency Unknown	

Site	Latitude	Longitude	Date	Length (m)	Width (m)	Water present above surface	Water depth (m)	Water in intermediate zone	Groundwater dependent vegetation present	Groundwater vegetation species	Emergent macrophytes present	Fauna present	Permanency	Photo
			10/03/2025	3	2	Yes	0.25	Yes	No	-	Yes	No	Artificial	
			10/03/2025	20	7	Yes	25	Yes	Yes	<i>Eucalyptus</i> <i>?camaldulensis,</i> <i>Eucalyptus</i> <i>?victrix</i>	No	Yes	Permanency Unknown	

Appendix F: Vertebrate fauna recorded during the current survey

Scientific Name	Species Common Name	Conservation Status				Total Number of Individuals Per Site																	Other sampling sites/ opportunistic records	Total
		EPBC Act	BC Act	DBCA	IUCN																			
Mammal																								
CANIDAE																								
Canis familiaris	*Dog								1										1		2			
DASYURIDAE																								
Dasykaluta rosamondae	Kaluta						2								1		4	1			8			
Dasyurus hallucatus	Northern quoll	EN	EN		EN				3					23					1		27			
Ningaui timealeyi	Pilbara ningau										2			1	1			1			5			
Planigale kendricki	Orange-headed Pilbara planigale								1					2							3			
Planigale tealei	Cracking-clay Pilbara planigale							1								1					2			
Pseudantechinus woolleyae	Woolley's pseudantechinus								1												1			
Sminthopsis macroura	Stripe-faced dunnart						1						1	1			9				12			
EMBALLONURIDAE																								
Saccolaimus flaviventris	Yellow-bellied sheath-tailed bat															1	1				2			
Taphozous georgianus	Common sheath-tailed bat					6	7	6	7	7	7	7		4		1	1	1			54			
EQUIDAE																								
Equus ferus	*Horse							8												92	100			
FELIDAE																								
Felis catus	*Cat								3		1			1						6	11			
MACROPODIDAE																								
Osphranter robustus	Euro								1											2	3			
Osphranter rufus	Red kangaroo																1				1			

<i>Petrogale rothschildi</i>	Rothschild's rock-wallaby					1			1										2	
MEGADERMATIDAE																				
<i>Macroderma gigas</i>	Ghost bat	VU	VU		VU							1					3	151	155	
MOLOSSIDAE																				
<i>Chaerephon jobensis</i>	Greater Northern free-tailed bat					6			1	1			1	1	1	1	1		13	
<i>Ozimops lumsdenae</i>	Northern free-tailed bat														1				1	
MURIDAE																				
<i>Mus musculus</i>	*House mouse								1	5		1							7	
<i>Notomys alexis</i>	Spinifex hopping-mouse																	1	1	
<i>Pseudomys chapmani</i>	Western pebble-mound mouse			P4							1								1	
<i>Pseudomys desertor</i>	Desert mouse					2	2				4						3		11	
<i>Pseudomys hermannsburgensis</i>	Sandy inland mouse					1	3				1	1	1				2		9	
<i>Zyzomys argurus</i>	Common rock-rat								5				6						11	
TACHYGLOSSIDAE																				
<i>Tachyglossus aculeatus</i>	Short-beaked echidna																	3	3	
VESPERTILIONIDAE																				
<i>Chalinolobus gouldii</i>	Gould's wattled bat					7	7	7		7	1	7	2	2	1	1	1	2	45	
<i>Nyctophilus geoffroyi</i>	Lesser long-eared bat									6				1	1				8	
<i>Scotorepens greyii</i>	Little broad-nosed bat					7	7	7		7		1	1	1	1	1		1	34	
<i>Vespadelus finlaysoni</i>	Finlayson's cave bat					1	7	1	7	7	6	7	2	2	1	2	1	3	1	48
Bird																				
ACANTHIZIDAE																				
<i>Smicrornis brevirostris</i>	Weebill									2									2	
ACCIPITRIDAE																				
<i>Accipiter fasciatus</i>	Brown goshawk																1	2	3	
<i>Aquila audax</i>	Wedge-tailed eagle						2										1	3	6	
<i>Circus assimilis</i>	Spotted harrier											1					3	3	12	
<i>Elanus axillaris</i>	Black-shouldered kite														1		1	4	6	
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle																	1	1	
<i>Haliastur indus</i>	Brahminy kite																	2	2	

<i>Haliastur sphenurus</i>	Whistling kite							1			1			1		2	1		3	9
<i>Hieraaetus morphnoides</i>	Little eagle										1								3	4
AEGOTHELIDAE																				
<i>Aegotheles cristatus</i>	Australian owlet-nightjar												1							1
ALAUDIDAE																				
<i>Mirafrja javanica</i>	Horsfield's bushlark					3	1	12		1						1	3		11	32
ALCEDINIDAE																				
<i>Dacelo leachii</i>	Blue-winged kookaburra						1										1		2	4
<i>Todiramphus pyrrhopygius</i>	Red-backed kingfisher									1									4	5
<i>Todiramphus sanctus</i>	Sacred kingfisher									4									4	8
ARDEIDAE																				
<i>Egretta novaehollandiae</i>	White-faced heron																		1	1
ARTAMIDAE																				
<i>Artamus cinereus</i>	Black-faced woodswallow					3			2	7	17	6	1		3			5	12	56
<i>Artamus minor</i>	Little woodswallow																		1	1
<i>Artamus personatus</i>	Masked woodswallow															59		160	63	282
<i>Cracticus nigrogularis</i>	Pied butcherbird								2	1	1		1	4	1	3		3	12	28
<i>Gymnorhina tibicen</i>	Australian magpie							3											6	9
BURHINIDAE																				
<i>Burhinus grallarius</i>	Bush stone-curlew																		5	5
CACATUIDAE																				
<i>Cacatua sanguinea</i>	Little corella						2		5	11				34			46	8		106
<i>Eolophus roseicapilla</i>	Galah					2	5	22		11		1	16		2	3	35	40	70	207
<i>Nymphicus hollandicus</i>	Cockatiel					2				32			2	21		79	70	20	12	238
CAMPEPHAGIDAE																				
<i>Coracina maxima</i>	Ground cuckoo-shrike																		5	5
<i>Coracina novaehollandiae</i>	Black-faced cuckoo-shrike					4	2		1	4	3		5		1	3		1	4	28
<i>Lalage tricolor</i>	White-winged triller					3					1				1	5			1	11
CAPRIMULGIDAE																				
<i>Eurostopodus argus</i>	Spotted nightjar									1									3	4

CHARADRIIDAE																				
<i>Elseya melanops</i>	Black-fronted dotterel																		1	1
COLUMBIDAE																				
<i>Geopelia cuneata</i>	Diamond dove					2		9		1			3	1	36	15	39	7	18	131
<i>Geopelia placida</i>	Peaceful dove									1			1							2
<i>Geophaps plumifera</i>	Spinifex pigeon							8				5			2				25	40
<i>Ocyphaps lophotes</i>	Crested pigeon					2	1	8		1	6	2	1		1	1	1	3	4	31
CORVIDAE																				
<i>Corvus orru</i>	Torresian crow							20		3		3	4	4		16	14	3	4	71
CUCULIDAE																				
<i>Chalcites basalis</i>	Horsfield's bronze-cuckoo					1					2	1	1				1	1	2	9
<i>Heteroscenes pallidus</i>	Pallid cuckoo									1	1	1							3	6
ESTRILDIDAE																				
<i>Emblema pictum</i>	Painted finch								6	6	22	7	24		4			1		70
<i>Heteromunia pectoralis</i>	Pictorella mannikin																		1	1
<i>Taeniopygia guttata</i>	Zebra finch					22				31			13	9	27	31	338	104	6	581
FALCONIDAE																				
<i>Falco berigora</i>	Brown falcon							1				1	1					1	7	11
<i>Falco cenchroides</i>	Nankeen kestrel							3		2		2	2	1		2	4	4	10	30
<i>Falco hypoleucos</i>	Grey falcon	VU	VU		VU												2		6	8
<i>Falco longipennis</i>	Australian hobby																2		1	3
<i>Falco peregrinus</i>	Peregrine falcon		OS																1	1
HIRUNDINIDAE																				
<i>Petrochelidon ariel</i>	Fairy martin									1				6			2		11	20
<i>Petrochelidon nigricans</i>	Tree martin					1				92	7								9	109
LOCUSTELLIDAE																				
<i>Cincloramphus cruralis</i>	Brown songlark										1					3			2	6
<i>Cincloramphus mathewsi</i>	Rufous songlark					1	2										1		5	9
<i>Poodytes carteri</i>	Spinifexbird					4	2				7	4		1	4		3	2	1	28
MALURIDAE																				

<i>Amytornis whitei</i>	Pilbara rufous grasswren																		2	2
<i>Malurus assimilis</i>	Purple-backed fairy-wren					2					1		1					21	5	30
<i>Malurus leucopterus</i>	White-winged fairy-wren															2	4		18	24
MELIPHAGIDAE																				
<i>Epthianura tricolor</i>	Crimson chat															2		6	8	16
<i>Gavicalis virescens</i>	Singing honeyeater						3		1	2	10	6	1	4	6	3	3	4		43
<i>Lichmera indistincta</i>	Brown honeyeater																		1	1
<i>Manorina flavigula</i>	Yellow-throated miner									60			4			1			5	70
<i>Ptilotula keartlandi</i>	Grey-headed honeyeater					1			1											2
<i>Ptilotula penicillata</i>	White-plumed honeyeater					7				75			14						6	102
MEROPIIDAE																				
<i>Merops ornatus</i>	Rainbow bee-eater					1		1	5	18									8	33
MONARCHIDAE																				
<i>Grallina cyanoleuca</i>	Magpie-lark									3	1						1		2	7
MOTACILLIDAE																				
<i>Anthus novaeseelandiae</i>	Australian pipit							4								1			4	9
OREOICIDAE																				
<i>Oreoica gutturalis</i>	Crested bellbird										1	2			1	3	2	2		11
OTIDIDAE																				
<i>Ardeotis australis</i>	Australian bustard																		3	3
PACHYCEPHALIDAE																				
<i>Pachycephala rufiventris</i>	Rufous whistler						1												1	2
PARDALOTIDAE																				
<i>Pardalotus rubricatus</i>	Red-browed pardalote					5													5	10
PHASIANIDAE																				
<i>Coturnix pectoralis</i>	Stubble quail																		4	4
<i>Synoicus ypsilophorus</i>	Brown quail																		5	5
PODARGIDAE																				
<i>Podargus strigoides</i>	Tawny frogmouth																		1	1
POMATOSTOMIDAE																				

<i>Pomatostomus temporalis</i>	Grey-crowned babbler						3				1							17	21	
PSITTACULIDAE																				
<i>Barnardius zonarius</i>	Australian ringneck									2								4	6	
<i>Melopsittacus undulatus</i>	Budgerigar					20				21	16	202	8	375	900	2158	2076	716	39171	45663
PTILONORHYNCHIDAE																				
<i>Chlamydera guttata</i>	Western bowerbird						1											2	3	
RALLIDAE																			1	
<i>Porphyrio melanotus</i>	Australasian swampphen																	1	1	
RHIPIDURIDAE																				
<i>Rhipidura leucophrys</i>	Willie wagtail						1				2					1	4	3	6	17
TURNICIDAE																				
<i>Turnix velox</i>	Little button-quail					2				1				1	6	3	5	1	4	23
TYTONIDAE																				
<i>Tyto javanica</i>	Eastern barn owl																		1	1
Reptile																				
AGAMIDAE																				
<i>Ctenophorus caudicinctus</i>	Western ring-tailed dragon						4				5			1				1	9	20
<i>Ctenophorus isolepis</i>	Central military dragon											4					22	1	6	33
<i>Ctenophorus reticulatus</i>	Western netted dragon																		2	2
<i>Gowidon longirostris</i>	Long-nosed dragon									3			1						5	9
<i>Pogona minor</i>	Western bearded dragon																3		1	4
<i>Tympanocryptis cephalus</i>	Coastal pebble-mimic dragon				DD			2								7				9
DIPLODACTYLIDAE																				
<i>Diplodactylus bilybara</i>	Western fat-tailed gecko					7	1			7	11	9			24		40	5		104
<i>Diplodactylus conspicillatus</i>	Variable fat-tailed gecko						1	1				1								3
<i>Diplodactylus galaxias</i>	Northern Pilbara beak-faced gecko					3		23							9					35
<i>Lucasium woodwardi</i>	Pilbara ground gecko					4				1	2				3		3			13
<i>Rhynchoedura ornata</i>	Western beaked gecko									1										1
<i>Strophurus elderi</i>														8						8
ELAPIDAE																				

<i>Brachyuophis approximans</i>						1				2			2						5
<i>Demansia reticulata</i>	Reticulated whipsnake						2			1									3
<i>Demansia rufescens</i>	Rufous whipsnake												1				1		2
<i>Furina ornata</i>	Moon snake									2									2
<i>Pseudechis australis</i>	Mulga snake							1			1						1		3
<i>Pseudonaja mengdeni</i>	Western brown snake																	2	2
GEKKONIDAE																			
<i>Gehyra media</i>	Medium Pilbara spotted rock gehyra									2		3			17				22
<i>Gehyra micra</i>	Small Pilbara spotted rock gehyra						2			4		9	1		5				22
<i>Gehyra punctata</i>										6					14				22
<i>Gehyra variegata</i>	Variegated gehyra					3		5		12	2		3				5	2	34
<i>Heteronotia binoei</i>	Bynoe's gecko					5	7	22		3	9	2	16	2	11	19	5	7	109
PYGOPODIDAE																			
<i>Delma pax</i>						1				1				1					3
<i>Lialis burtonis</i>																		1	1
<i>Pygopus nigriceps</i>							1												1
PYTHONIDAE																			
<i>Antaresia childreni</i>	Children's python																	1	1
<i>Antaresia perthensis</i>	Pygmy python											1		3		1		2	7
SCINCIDAE																			
<i>Carlia munda</i>													6					6	12
<i>Carlia triacantha</i>																		1	1
<i>Cryptoblepharus plagiocephalus</i>															1				1
<i>Cryptoblepharus ustulatus</i>																		2	2
<i>Ctenotus grandis</i>							19				6				34		4		63
<i>Ctenotus helenae</i>						6				6	1	18			4		4	1	40
<i>Ctenotus leonhardii</i>												1					5		6
<i>Ctenotus pallasotus</i>	Western Pilbara lined ctenotus						1				9	3			1				14
<i>Ctenotus pantherinus</i>	Leopard skink										11	12	1		7	1	27	2	61
<i>Ctenotus robustus</i>								6				2				2			10

<i>Ctenotus saxatilis</i>	Rock ctenotus					5	12		7		1	1		18	1			1	46
<i>Ctenotus schomburgkii</i>								2											2
<i>Cyclodomorphus melanops</i>																	2		2
<i>Egernia pilbarensis</i>	Pilbara skink						5							1	1			1	8
<i>Eremiascincus isolepis</i>									2				2						4
<i>Lerista bipes</i>						3		1									9		13
<i>Lerista muelleri</i>						1		1		7			1				2		12
<i>Lerista verhmens</i>											2								2
<i>Menetia greyii</i>								1		2							4		7
<i>Menetia surda</i>						2						1			1				4
<i>Morethia ruficauda</i>									8	2			1	7	2			1	21
<i>Notoscincus butleri</i>				P4		5					2	3					1		11
<i>Proablepharus reginae</i>															1				1
<i>Tiliqua multifasciata</i>	Central blue-tongue														1				1
TYPHLOPIDAE																			
<i>Anilius ammodytes</i>										1					1	1		3	6
<i>Anilius grypus</i>								1							1			1	3
VARANIDAE																			
<i>Varanus acanthurus</i>	Spiny-tailed goanna					2			3	1								1	7
<i>Varanus brevicauda</i>	Short-tailed pygmy goanna											1					1		2
<i>Varanus giganteus</i>	Perentie																	1	1
<i>Varanus gouldii</i>	Sand goanna											2	2					1	5
<i>Varanus panoptes</i>						1				1								1	3
<i>Varanus tristis</i>	Racehorse goanna									2									2
Amphibian																			
PELODRYADIDAE																			
<i>Cyclorana maini</i>	Sheep frog																17	1	18
<i>Litoria rubella</i>	Little red tree frog																	10	10