Report No. J022512

# Detailed terrestrial vertebrate fauna survey of the Round Hill Project

Prepared for: HanRoy Pty Ltd
Date: 24 January 2025

Rapallo Environmental is a Western Australian consultancy with a strong reputation for technical excellence, client-focus and innovation. We build long-term alliances through outstanding delivery on a range of services to the resource sector, government and associated industries.

Report No. J022512
Detailed terrestrial vertebrate fauna survey of the Round Hill Project
Prepared for HanRoy Pty Ltd
24 January 2025

| Revision | Date | Prepared | Reviewed | Approved |
|---|---|---|---|---|
| Draft V0 | 06/11/2024 | Jasmine Kasper | Marieke Weerheim | Marieke Weerheim |
| Draft V1 | 29/11/2024 | Jasmine Kasper | Kate George<br>Arnika Thorbjornsen | Kate George |
| Client review | 13/01/2024 | Jasmine Kasper | HanRoy | Marieke Weerheim |
| Final | 24/01/2025 | Jasmine Kasper | Kate George<br>Marieke Weerheim | Kate George |

Rapallo Group
Perth Office
10 Elmsfield Road, Midvale WA 6056
Phone: (08) 6279 0900
Fax: (08) 6279 0934

Kalgoorlie Office
10 Broadwood Street, West Kalgoorlie 6430
Phone: (08) 9460 4300
Fax: (08) 9226 2388
PO Box 1123 Kalgoorlie

ABN: 31 726 506 590
ACN: 009 257 836
www.rapallo.com.au

This document has been prepared based on assumptions as reported throughout and upon information and data supplied by others.

While Rapallo Pty. Ltd. has taken all reasonable care to ensure the facts and opinions expressed in this document are accurate, it does not accept any legal responsibility to any person for any loss or damage suffered by him resulting from his or her use of this report however caused and whether by breach of contract, negligence or otherwise.

# Table of Contents

**Executive Summary** ..... **1**

**1 Introduction** ..... **3**

1.1 Project overview ..... 3

1.2 Survey area ..... 3

1.3 Scope and objectives ..... 3

1.4 Survey timing ..... 4

**2 Regional context** ..... **6**

2.1 Climate and weather ..... 6

2.1.1 Climate averages for the survey area ..... 7

2.1.2 Weather during and prior to the surveys ..... 7

2.2 Fire ..... 8

2.3 Biogeography ..... 10

2.3.1 IBRA bioregions ..... 10

2.3.2 Land Systems ..... 10

2.3.3 Surface geology ..... 17

2.3.4 Regolith ..... 17

2.3.5 Soils ..... 20

2.3.6 Regional Surface Hydrology ..... 20

2.4 Regional vegetation ..... 21

2.4.1 Botanical district ..... 21

2.4.2 Pre-European vegetation system-associations ..... 21

2.5 Protected areas ..... 24

2.5.1 Reserves and Environmentally Sensitive Areas ..... 24

2.5.2 Threatened and Priority Ecological Communities ..... 25

**3 Desktop study** ..... **28**

3.1 Database search and literature review ..... 28

3.1.1 Sources of information ..... 28

3.2 Fauna desktop results ..... 29

3.2.1 Conservation significant fauna desktop results ..... 29

3.2.2 Introduced (feral) vertebrate fauna desktop results ..... 30

**4 Methods** ..... **32**

4.1 Personnel and licencing ..... 32

4.2 Field Survey ..... 32

4.2.1 Habitat Assessment ..... 36

4.2.2 Trap Sites ..... 36
4.2.3 Systematic bird census ..... 37
4.2.4 Opportunistic fauna records ..... 37
4.2.5 Camera traps ..... 37
4.2.6 SM4 recorders for bats and night parrot ..... 38
4.3 Species richness estimators ..... 38
**5 Results and discussion ..... 39**
5.1 Broad fauna habitats ..... 39
5.2 Habitat features ..... 40
5.3 Fauna assemblage ..... 59
5.3.1 Birds ..... 59
5.3.2 Mammals ..... 60
5.3.3 Reptiles ..... 61
5.3.4 Amphibians ..... 62
5.3.5 Species richness estimators ..... 62
5.4 Conservation significant species ..... 67
5.5 Survey adequacy and limitations ..... 94
5.5.1 Level of assessment and survey timing ..... 94
5.5.2 Survey completeness ..... 94
5.5.3 Survey limitations ..... 95
**6 Conclusion ..... 96**
**7 References ..... 98**
**8 Appendices ..... 108**

# Tables

Table 2.1 Land systems of the survey area ..... 10
Table 2.2 Surface geology units of the survey area ..... 17
Table 2.3 Regolith units of the survey area ..... 17
Table 2.4 Pre-European vegetation within the survey area ..... 22
Table 2.5 Reserves or Environmentally Sensitive Areas within 100 kilometres of the survey area ..... 25
Table 2.7 Threatened and Priority Ecological Communities within 50 kilometres of the survey area ..... 25
Table 3.1 Database search parameters ..... 28
Table 3.2 Regional literature sources ..... 29
Table 3.3 Desktop results introduced (feral) fauna ..... 31
Table 4.1 Personnel involved in the project ..... 32
Table 4.2 Summary of survey effort during the two-season survey at the Round Hill Project. ..... 36

Table 5.1 Fauna habitat condition descriptions as per Thompson, S.A. & Thompson, G.G. (2010) .....39
Table 5.2 Summary of broad fauna habitats sites recorded per mapped habitat. .....41
Table 5.3 Habitats that were opportunistically recorded within the wider exploration tenement (outside survey area), that were not observed within the survey area. .....53
Table 5.4 Summary of the number of vertebrate fauna species recorded from Round Hill over the dual season detailed fauna survey. .....59
Table 5.5 Conservation significant fauna identified in the desktop, likelihood scores, and discussion .....70
Table 5.6 Photographs relevant to the discussion of conservation significant fauna .....89
Table 5.7 Summary of survey assessment and timing .....94
Table 5.8 Limitations of the fauna survey .....95
Table 8.1 Fauna trap site location and details .....145
Table 8.2 Camera trap locations and details .....146
Table 8.3 SM4-U and SM4-A unit locations and details .....148
Table 8.4 Timed Bird Census locations and relevant data .....149

# Figures

Figure 1.1 Location and extent of the survey area .....5
Figure 2.1 Long term climate averages and observed monthly weather statistics for Newman Aero (BoM station ID 007176) .....6
Figure 2.2 NAFI Fire Scars of the Round Hill Survey area from 2000 to 2024 .....9
Figure 2.3 Land systems within the Round Hill survey area and greater tenement .....16
Figure 2.4 Surface geology of the Round Hill survey area and greater tenement .....18
Figure 2.5 Regolith units of the survey area and greater tenement .....19
Figure 2.6 Pre-European vegetation system-associations of the survey area .....23
Figure 4.1 Fauna survey effort in the Round Hill survey area: Trap sites .....33
Figure 4.2 Survey effort in the Round Hill survey area: All survey sites .....34
Figure 4.3 Fauna survey effort in the wider tenement (E47/1313) .....35
Figure 4.4 Standard fauna trap site design. .....37
Figure 5.1 Broad fauna habitats of the Round Hill survey area .....58
Figure 5.3 Species accumulation curve for trappable vertebrate fauna .....63
Figure 5.4 Species accumulation curve for systematic bird surveys .....65
Figure 5.5 Conservation significant fauna recorded to date within 50 kilometres of Round Hill .....68
Figure 5.6 Conservation significant fauna recorded during the survey .....69

# Appendices


Appendix I Conservation codes for Australian flora and fauna .....

Appendix II Matrix to assess likelihood of occurrence for vertebrate fauna species.....

Appendix III Desktop results: All vertebrate fauna species .....

Appendix IV Desktop results: Conservation significant vertebrate fauna .....

Appendix V Vertebrate fauna recorded during the survey.....

Appendix VI Conservation significant fauna recorded during detailed fauna survey .....

Appendix VII Introduced fauna recorded during survey.....

Appendix VIII Survey activity coordinates.....

Appendix IX Habitat Assessments.....

# Executive Summary

The Round Hill project is a HanRoy Pty Ltd (HanRoy) iron ore exploration project situated in exploration tenement E47/1313, located approximately 35 kilometres north-west of Newman in the Pilbara region of Western Australia. HanRoy requested Rapallo Environmental (Rapallo) to complete a two-phase detailed terrestrial vertebrate fauna survey over a 2097-hectare subset of the approximately 7863-hectare exploration tenement.

A team of six ecologists completed the two-season survey, with the first survey period occurring from 23 August to 7 September 2023, and the second survey period from 24 April to 6 May 2024, both inclusive of travel to site. This survey timing is in line with Environmental Protection Authority (EPA 2020) *Technical Guidance for Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* for surveys in the Eremaean climatic region of Western Australia. A total of eight trapping sites were established and removed within the survey area, in addition to camera traps, spotlighting (first season only), active fauna searches and audio recording equipment placed opportunistically for night parrots and bat species.

A desktop study was completed prior to the survey, which included searches of the threatened and priority fauna (TPFA) Department of Biodiversity Conversation and Attractions (DBCA) database, the threatened and priority ecological communities (TEC-PEC) DBCA database, the Protected Matters Search Tool and the Atlas of Living Australia (ALA) online database which also incorporates Birdata within its results. Five regional terrestrial fauna reports were also reviewed and included in the desktop study.

The desktop study identified 390 species of vertebrate fauna which had been recorded previously within 50 kilometres of the survey area. This comprised of 216 bird species, 44 mammals, 121 reptiles, five species of amphibians, four species of fish. Of the 44 mammal species, seven are considered to be feral or invasive species including dogs, cats, cattle, rabbits, foxes, house mice and dromedary camels.

In total 171 vertebrate species were recorded across both survey seasons, including 83 bird species, 26 mammal species, 60 reptile species, and two amphibians. The first survey season recorded 140 species while the second survey recorded 139 species. There was a notable increase in the number of bird species identified in the second survey season (76) compared to the first season (66) which can likely be attributed to the increased rainfall in the months prior to the second season compared to the first. Four introduced (feral) mammal species (cattle, dromedary camel, feral cat and house mouse) were recorded during the survey.

Species listed under the Western Australian *Biodiversity Conservation Act 2016* (BC Act), the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), and priority species administered by the Department of Biodiversity Conversation and Attractions (DBCA), are considered to be species of conservation significance.

A total of 39 conservation significant terrestrial vertebrate fauna species were identified in the desktop study, from both publicly available databases and nearby survey reports. This consisted of 26 bird species (14 of which are migratory), eight mammal species and five reptile species. From these 39 species, four species are confirmed to occur in the survey area as listed below:

- Gane's blind snake (*Pilbara) (Anilios ganei*) – Priority 1 under DBCA
- Long-tailed dunnart (*Antechinomys longicaudatus*) - Priority 4 under DBCA
- Pilbara olive python (*Liasis olivaceus barroni*) - Vulnerable under both the BC Act and the commonwealth EPBC Act

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

Two species from the desktop are considered to likely occur within the survey area based on habitats present and records proximal to the survey area:

- Ghost bat (*Macroderma gigas*) - Vulnerable under both the BC Act and the federal EPBC Act
- Grey falcon (*Falco hypoleucos*) - Vulnerable under both the BC Act and the federal EPBC Act

A further 13 species are considered to possibly occur within the survey area as listed below:

- Common sandpiper (*Actitis hypoleucos*) – Migratory under the BC Act and EPBC Act
- Glossy ibis (*Plegadis falcinellus*) – Migratory under the BC Act and EPBC Act
- Fork-tailed swift, also known as the Pacific swift (*Apus pacificus*) – Migratory under the BC Act and EPBC Act
- Pectoral sandpiper (*Calidris melanotos*) – Migratory under the BC Act and EPBC Act
- Peregrine falcon (*Falco peregrinus*) – Otherwise Specially protected under the BC Act
- Princess parrot (*Polytelis alexandrae*) – Priority 4 under DBCA and Vulnerable under the EPBC Act
- Sharp-tailed sandpiper (*Calidris acuminata*) – Migratory under the BC Act, as well as Vulnerable under the EPBC Act
- Southern whiteface (*Aphelocephala leucopsis*) – Vulnerable under the EPBC Act
- Wood sandpiper (*Tringa glareola*) – Migratory under the BC Act and EPBC Act
- Brush-tailed mulgara (*Dasycercus blythi*) – Priority 4 under DBCA
- Northern quoll (*Dasyurus hallucatus*) – Endangered under the BC Act and EPBC Act
- Pilbara leaf-nosed bat (*Rhinonicteris aurantia* (Pilbara form)) – Vulnerable under the BC Act and EPBC Act
- Unpatterned robust slider (*Lerista macropisthopus remota*) – Priority 2 under DBCA

The remaining 20 conservation significant terrestrial fauna species identified in the desktop study are considered to be unlikely (15 species) or highly unlikely (five species), based on a lack of suitable habitat in the survey area and/or a lack of nearby contemporary records.

Based on topography, landforms, broad vegetation, soil type and surface substrate, six broad fauna habitats were identified in the survey area. These are spinifex plains and rises, drainage, rocky hills, tussock grasslands, mulga woodlands, and disturbed habitats. No caves or waterbodies were identified within the survey area, although these habitat features, which may be of interest for conservation significant species, were opportunistically observed within the wider exploration tenements.

# 1 Introduction

## 1.1 Project overview

The Round Hill project is situated in exploration licence E47/1313, located approximately 35 kilometres north-west of Newman in the Pilbara region of Western Australia.

HanRoy Pty Ltd (HanRoy) commissioned Rapallo Environmental (Rapallo) to complete a two-phase detailed terrestrial vertebrate fauna survey of the Round Hill project, in accordance with Environmental Protection Authority (EPA 2020) Technical Guidance.

The first season was completed from 23 August to 7 September 2023, and the second season from 24 April to 6 May 2024. Both seasons were completed by a team of six ecologists. A total of eight trapping sites were utilised, in addition to camera traps, spotlighting (first season only), active fauna searches and audio recording equipment to target bird and bat species.

## 1.2 Survey area

The Round Hill survey area comprised two subsections of E47/1313, which includes a 197 hectare northern area and a 1900 hectare southern area, with a combined size of approximately 2097 hectares (Figure 1.1). The survey area is accessed via the Great Northern Highway and traversed by a network of unsealed roads and exploration tracks. Parts of the survey area are located further away from tracks were accessed on foot.

In addition to the defined survey area boundaries, the team was also requested to survey additional sites outside the defined study area but within E47/1313. The extent of E47/1313 is also shown in Figure 1.1.

## 1.3 Scope and objectives

The scope of the work was to complete a two-season detailed fauna survey and associated desktop study over a subset of the survey area defined in section 1.2 . The objective of the survey was to identify the occurrence of terrestrial vertebrate fauna species and their supporting habitats within the survey area, which may be used to inform environmental approvals.

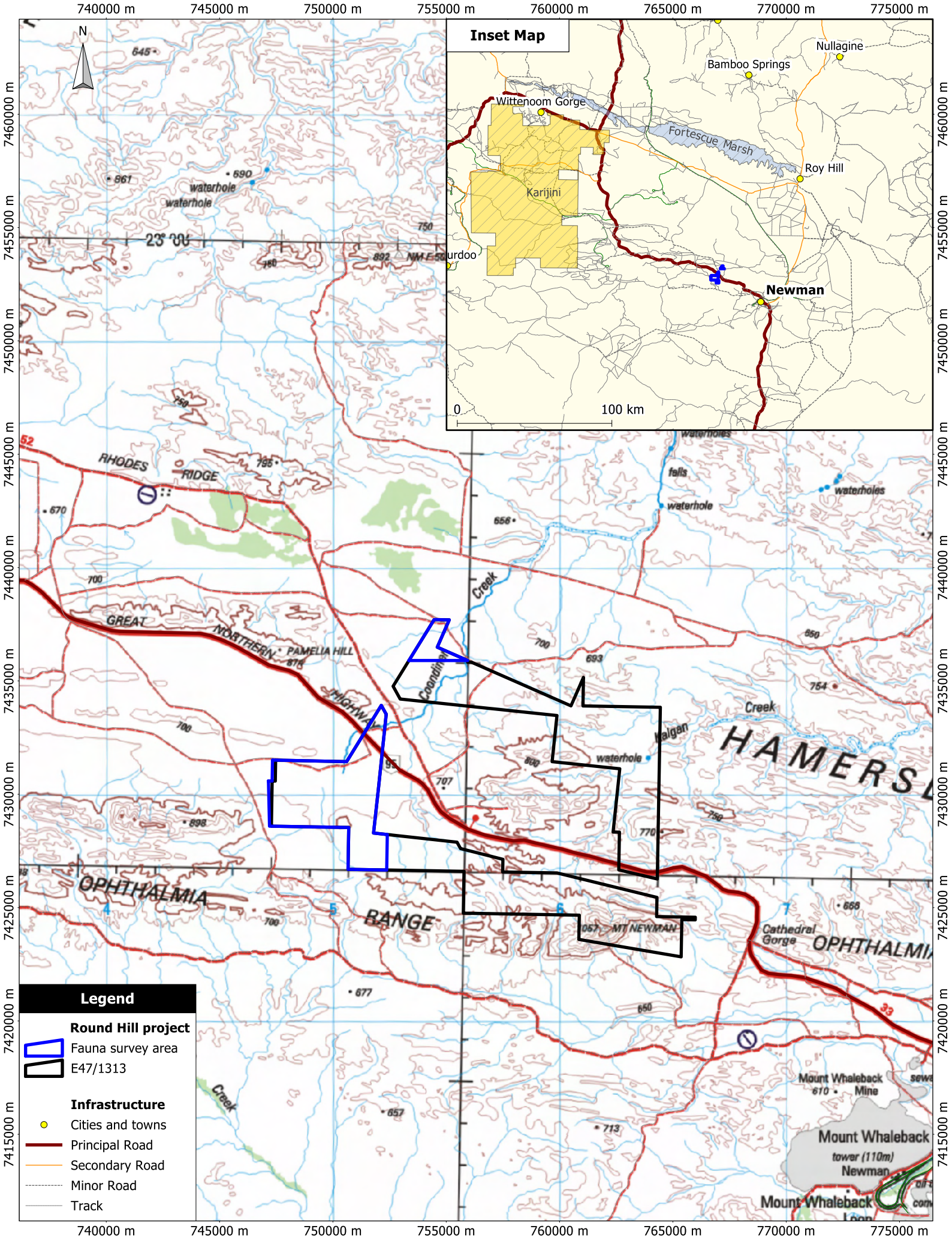
Specifically, the key objectives of the assessment were to:

- conduct a comprehensive desktop assessment (database searches and literature review) to identify vertebrate fauna species potentially occurring within the survey area;
- define and delineate broad fauna habitats occurring within the survey area, and describe their significance to vertebrate fauna, particularly species of conservation significance;
- conduct a two-season detailed survey to identify vertebrate fauna species and fauna assemblages occurring within the survey area to add to baseline data to inform environmental impact assessment and environmental approvals for the project and;
- assess the likelihood and distribution of vertebrate fauna of conservation significance occurring within the survey area.

## 1.4 Survey timing

The Round Hill survey area is situated in the Eremaean climatic region of Western Australia. According to the Environmental Protection Authority *Technical Guidance for Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA 2020), the peak activity period and time for primary surveys of reptiles is September to April, immediately after significant rainfall events for amphibians and birds, and no suggested time is provided for mammals and states these can be completed concurrently with reptile surveys for efficiency, and that population cycles for mammal species should be considered when planning mammal surveys.

Two survey seasons were completed as part of this detailed fauna survey. The first season occurred from 23 August to 7 September 2023, and the second season from 24 April to 6 May 2024. Climatic information for the two survey seasons is discussed in further detail in section 2.1.




Rapallo environmental

Hanroy / Hancock Prospecting
Round Hill
Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4
Scale: 1:200,000
Datum: MGA94 Zone 50

0 6 km

**Figure 1.1**

Location and extent of the survey area

# 2 Regional context

## 2.1 Climate and weather

The Round Hill project is situated in the Hamersley (PIL03) subregion of the Pilbara IBRA region. This area is part of the Eremaean Botanical Province (Beard 1990). The climate of the Hamersley subregion is described as semi-desert tropical with an average rainfall of 300 millimetres per year, usually occurring in summer cyclonic or thunderstorm events (Kendrick 2001). Cyclones develop off the north-west coast and often cross the coastline between Karratha and Port Hedland and move inland over the Fortescue Valley system towards Newman (Beard 1990).

The closest Bureau of meteorology (BoM) weather station to the survey area is situated in Newman at Newman Aero (BoM station 007176), approximately 35 kilometres southeast of the survey area. The weather station was opened in 1971 and is still open and operational at the time of writing in 2024. The long-term climate statistic for the survey area, as well as the observed conditions are displayed in Figure 2.1 and discussed further below in section 2.1.2 and 2.1.2.

Evaporation in the Central Pilbara Region is estimated to be between 2000 millimetres and 3500 millimetres per annum, which is approximately ten times greater than annual rainfall (Gardiner 2003). This disparity maintains a typically arid landscape, except for areas located in proximity to river systems and shallow groundwater resources.

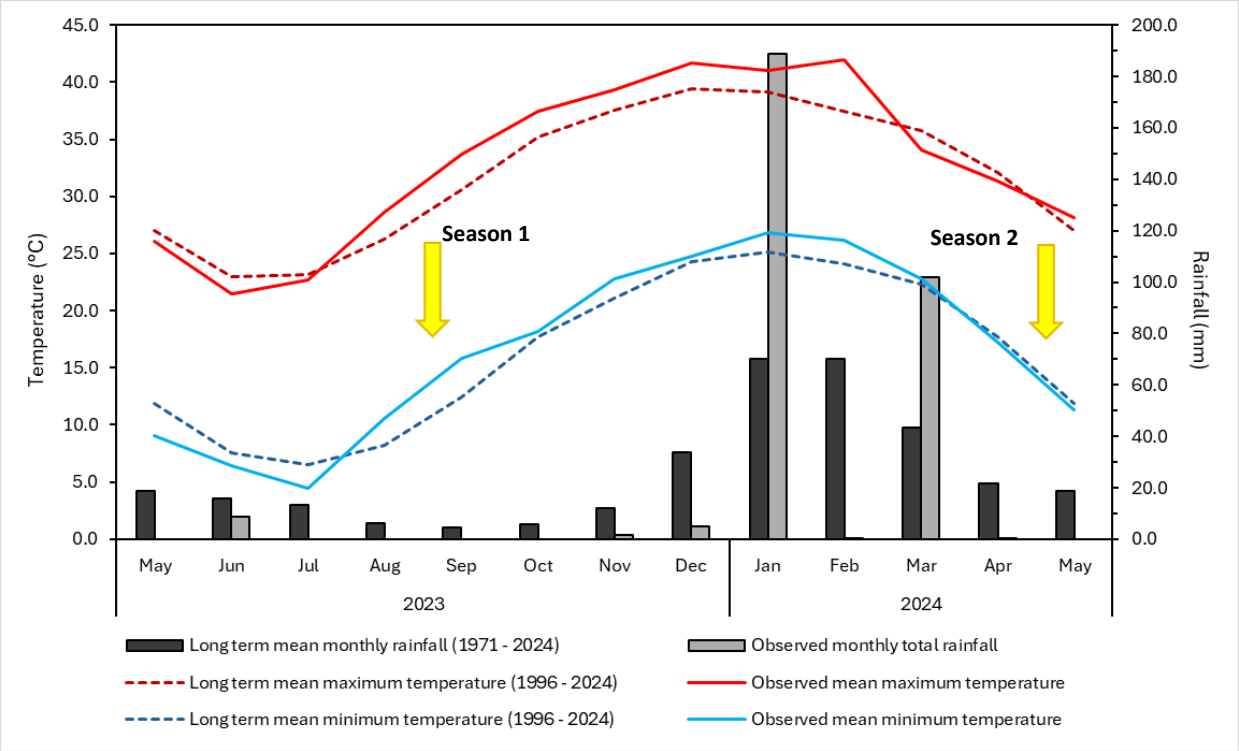



**Figure 2.1 Long term climate averages and observed monthly weather statistics for Newman Aero (BoM station ID 007176)**

### 2.1.1 Climate averages for the survey area

Rainfall data recorded at Newman Aero (station 007176) shows an average total rainfall of 317.7 millimetres per year between 1971 and 2024, with the most rainfall occurring between December and March, although monthly rainfall can vary greatly between years (BOM 2024).

Temperature data collected at Newman Aero (station 007176) between 1971 and 2024 shows that on average the hottest months of the year are October to April with the mean maximum temperatures ranging between 32.1°C (April) and 39.4°C (December). Highest daily temperatures during this period can reach between 40°C to 43°C. On average, the coldest months of the year are June to August, with the mean minimum temperatures ranging between 6.5°C (July) and 8.1°C (August), with daily temperatures getting as low as 2.9°C during this period.

### 2.1.2 Weather during and prior to the surveys

**Season 1 – 23 August to 7 September 2023**

The first survey season occurred at the end of the dry season. The total annual rainfall at Newman Aero during 2023 was 232.4 millimetres, which is lower than the long-term average of 317.7 millimetres. In the three months prior to the first survey season (May – July), rainfall was lower (8.8 millimetres) than the long-term average (47.6mm) for the same period (Figure 2.1), suggesting the survey area was much dryer than the long-term average conditions for the area.

Daily maximum temperatures were warm during the survey ranging between 25.8°C to 32.7°C, with minimum temperatures at night ranging from 6.5°C to 17.1°C. This is in line with the long term monthly mean maximum temperatures during August (26.3°C) and September (30.6°C), and long term monthly mean minimum temperatures during August (8.1°C) and September (12.4°C).

**Season 2 – 24 April to 6 May 2024**

The second survey season occurred towards the end of the wet season. The total rainfall for the first half of 2024 at Newman Aero (January to June) is 334.0 millimetres, which is above the long-term average for the whole year (317.7 millimetres). In the three months prior to the second survey season (January – March) rainfall was higher the long-term average for this period, but below the average in February (Figure 2.1), with total observed rainfall for this period reaching 291 millimetres compared to the long-term average for the same period of 183.8 millimetres. This suggests that the survey area was wetter than the long-term average.

Daily maximum temperatures were warm during the survey ranging between 28.3°C to 33.5°C, with minimum temperatures at night ranging from 10.5°C to 22.8°C. This is in line with the long term monthly mean maximum temperatures during April (32.1°C) and May (27.1°C), and long term monthly mean minimum temperatures during April (17.7°C) and May (11.8°C).

**Comparing Season 1 and Season 2**

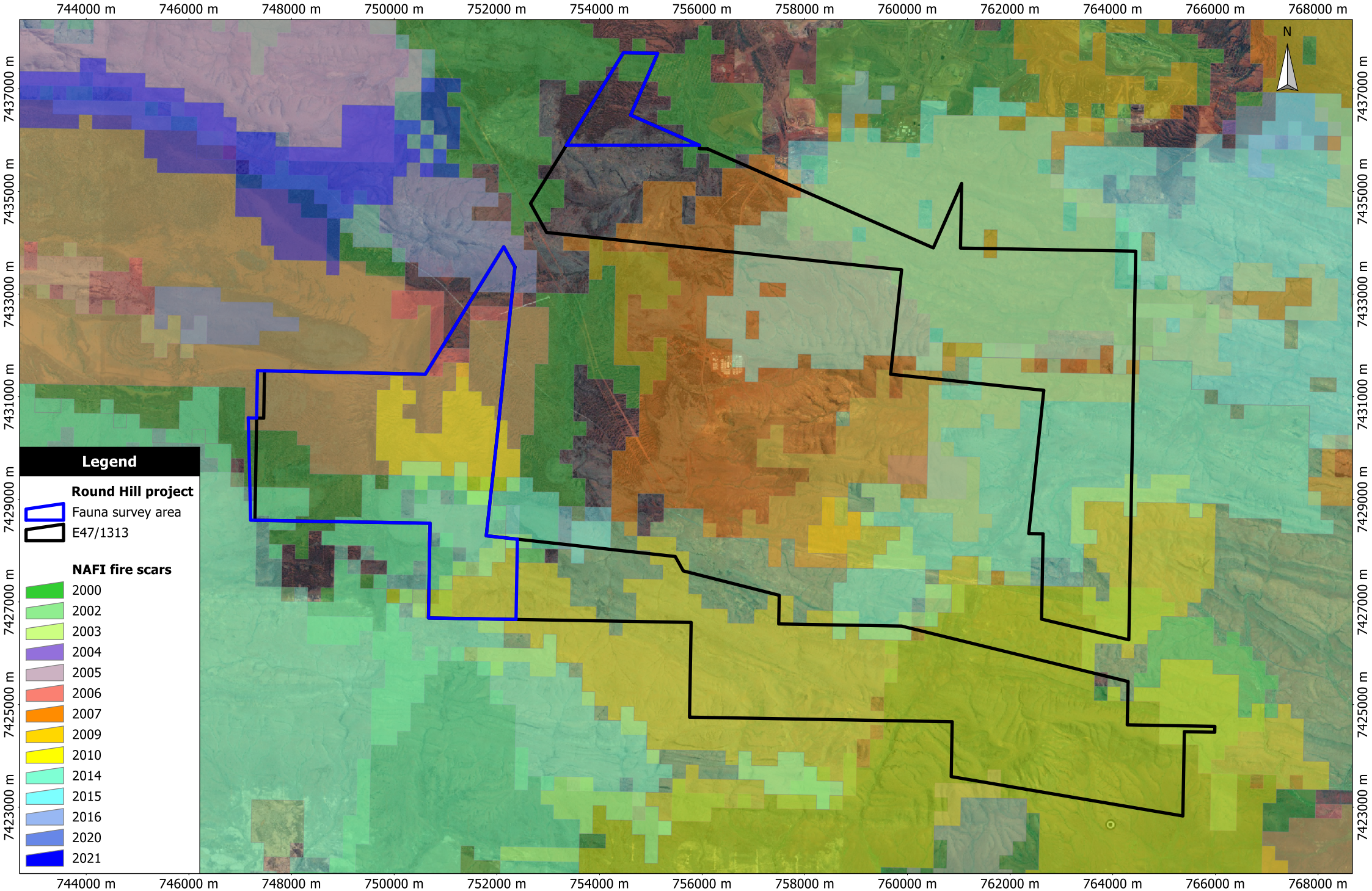
The amount of rainfall experienced in the three months prior to the second survey season was much greater than the amount of rainfall recorded prior to the first survey season. Day time temperatures were relatively similar between the two seasons, although the nighttime temperatures were typically lower during the first survey.

## 2.2 Fire

Fire has been part of the Australian environment for thousands of years and is integral to the health and persistence of various ecosystems across the country. Indigenous people had managed the land through frequent low intensity burning practices prior to European colonisation (Enright & Thomas 2008). Recent studies have now confirmed that due to both the loss of the traditional burning practices and the results of global warming, such as drought and high temperatures, Australia is now at higher risk of intense, destructive wildfires than it was prior to colonisation (Mariani et al. 2022).

Fire mapping for Australia is available from the North Australia and Rangelands Fire Information (NAFI) website, with fire scar data available from 2000 to present (NAFI 2024). The NAFI service displays maps of fire activity based on information from satellites, such as hotspots (locations of recent fires) and fire burn scars (maps of recently burnt country). Factors such as high smoke output and cloud cover can affect these results, and smaller or less intense fires may not be detected due to their size or lack of significant heat. It must be noted that NAFI data is broad-scale, mapping fire history in approximately 7-hectare blocks, and does not show fine-scale mosaics.

Based on the NAFI fire data (Figure 2.2) the Round Hill survey area has experienced three burns within the last 10 years in 2014, 2015 and in 2016. All these burns appear to have only affected the larger southern section of survey area, with no burns recorded by NAFI in the smaller northern survey area. Prior to this, the southern section of the survey area had also been burnt in 2002, 2006, 2009, 2010, while the northern survey area had some burning along the northern edge in 2000. It is possible that smaller or low-heat fires may have occurred in the survey area that were not detected by NAFI satellites.




Rapallo environmental

Hanroy / Hancock Prospecting
Round Hill Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4 Scale: 1:90,000
Datum: MGA94 Zone 50

0 4 km

**Figure 2.2**

NAFI fire scars of the Round Hill survey area from 2000 to 2024

## 2.3 Biogeography

### *2.3.1 IBRA bioregions*

The bioregions of Australia are described in the Interim Biogeographic Regionalisation for Australia (IBRA) (Thackway & Cresswell 1995). Bioregions are large, geographically distinct areas of land with common characteristics such as geology, landform patterns, climate, ecological features and plant and animal communities. The latest version, IBRA7, classifies Australia's landscapes into 89 large geographically distinct bioregions and 419 subregions (Department of the Environment and Energy (DotEE) 2012).

The survey area is situated within the Hamersley subregion (PIL03) of the Pilbara IBRA bioregion (PIL). It is located approximately 25 kilometres south-west of the Fortescue subregion (PIL02) and approximately 22 kilometres north of the Augustus subregion (GAS03) of the Gascoyne bioregion (GAS).

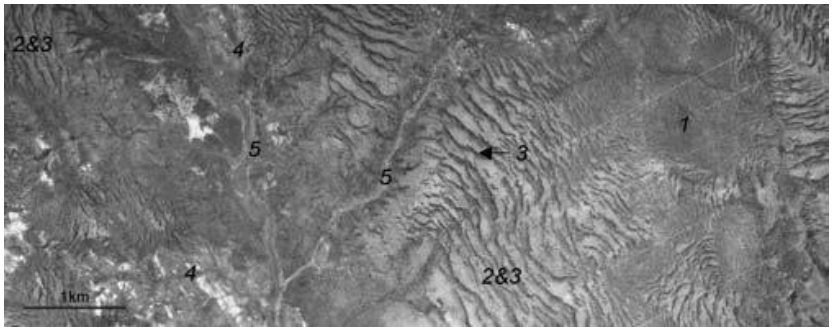
The Hamersley subregion is a mountainous area containing Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale and dolerite). The vegetation is characterised by low mulga woodlands over bunch grasses on fine textured soils in valley floors, with snappy gum (*Eucalyptus leucophloia*) over spinifex (*Tridoida brizoides*) on skeletal soils of the ranges. The area experiences thunderstorm and cyclonic rainfall during the summer months, with the occasional winter rainfall (Kendrick 2001).

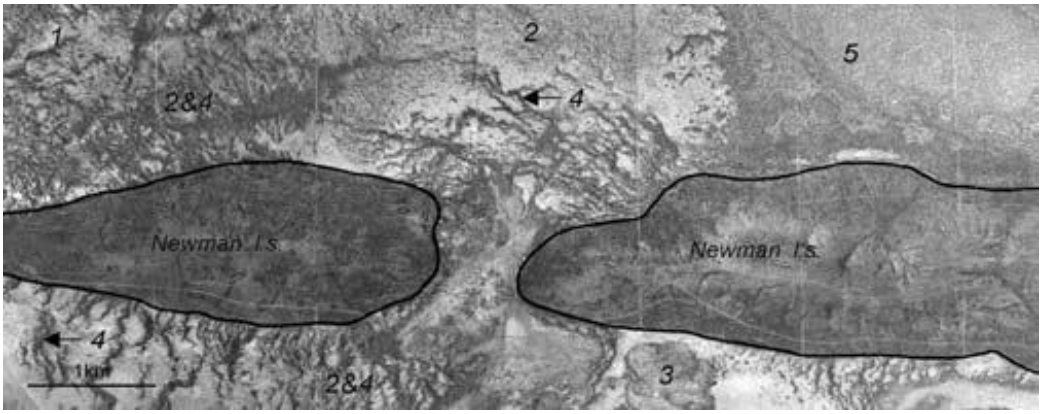
### *2.3.2 Land Systems*

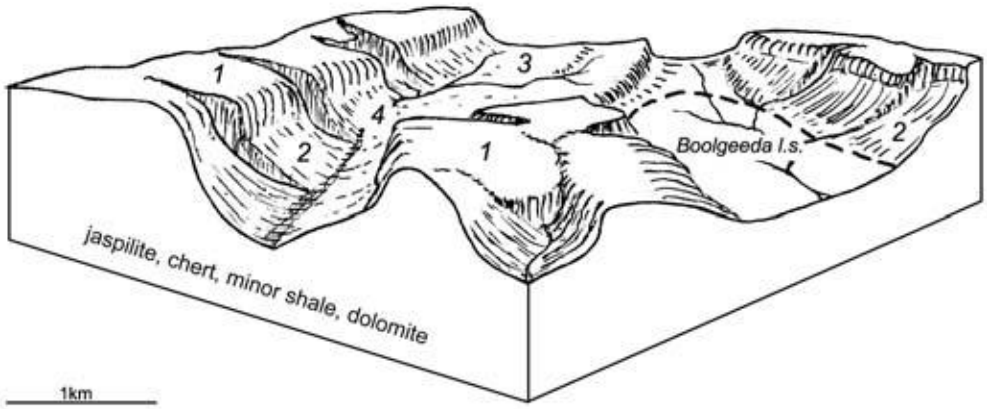
Land systems are classified according to similarities in landform, soil, vegetation, geology and geomorphology, following Van Vreeswyk et al. (2004). The survey area traverses five different land systems, as summarised in Table 2.1 and displayed in Figure 2.3. The Spearhole Land System is the dominant land system covering 48.8% of the survey area, followed by the Wannamunna Land System covering 25% of the survey area, and the Newman Land System covering 16.8% of the survey. The two least dominant land systems were the Rocklea and Boolgeeda Land Systems which were only present across 7.4% and 1.9% of the survey area respectively.

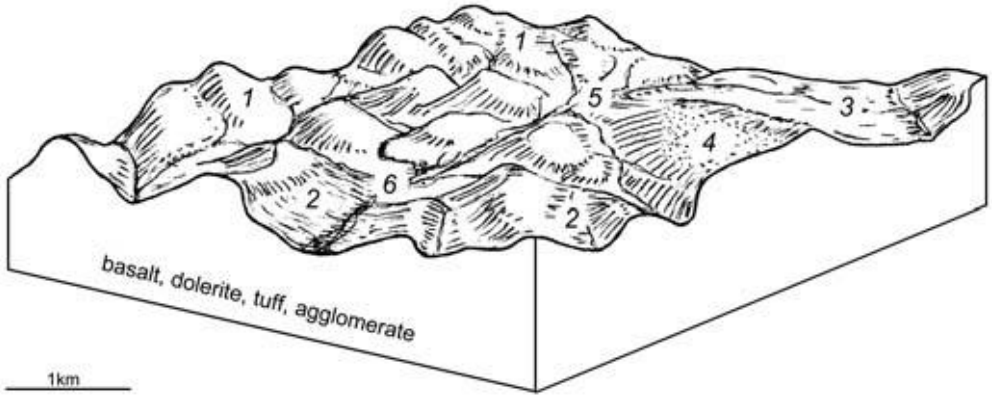
**Table 2.1 Land systems of the survey area**

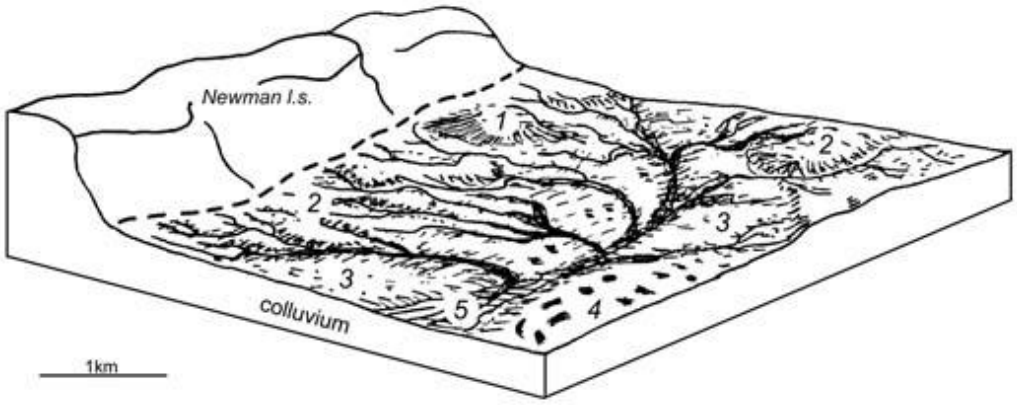
| Land system | Description based on Van Vreeswyk et al. (2004) |
|---|---|
| Spearhole Land System | Extent: 127,000 hectares within Western Australia, 1022 hectares in survey area.<br>Summary: Gently undulating hardpan plains supporting groved mulga shrublands and hard spinifex.<br>Geology: Partially cemented Quaternary alluvium and colluvium.<br>Geomorphology: Depositional surfaces; gently undulating non-saline plains with hardpan at shallow depth and groved vegetation, sparse patterns of tributary drainage with restricted areas of shallow valleys and finely dissected slopes. Relief up to 35 metres.<br>Land units as show in diagram below:<br>1. Low rises - Red loamy earths and red-brown hardpan shallow loams. Gently rounded crests with very gently inclined slopes, extending up to 1 kilometre and mostly up to 15 metres relief above general level of surrounding plains, surface mantles of abundant ironstone gravel. Vegetation characterised by very scattered to scattered tall shrublands with *Acacia aneura* (mulga), *A. pruinocarpa* (gidgee) and other acacias with sparse low shrubs *Eremophila* and *Ptilotus* spp. with or without *Triodia* spp. (hard spinifex) ground layer.<br>2. Gravelly hardpan plains - Red-brown hardpan shallow loams, red loamy earths and some red sandy earths. Level or gently undulating plains or intergrove areas up to 6 km or more in extent with surface mantles of abundant ironstone gravel subject to sheet flow. |

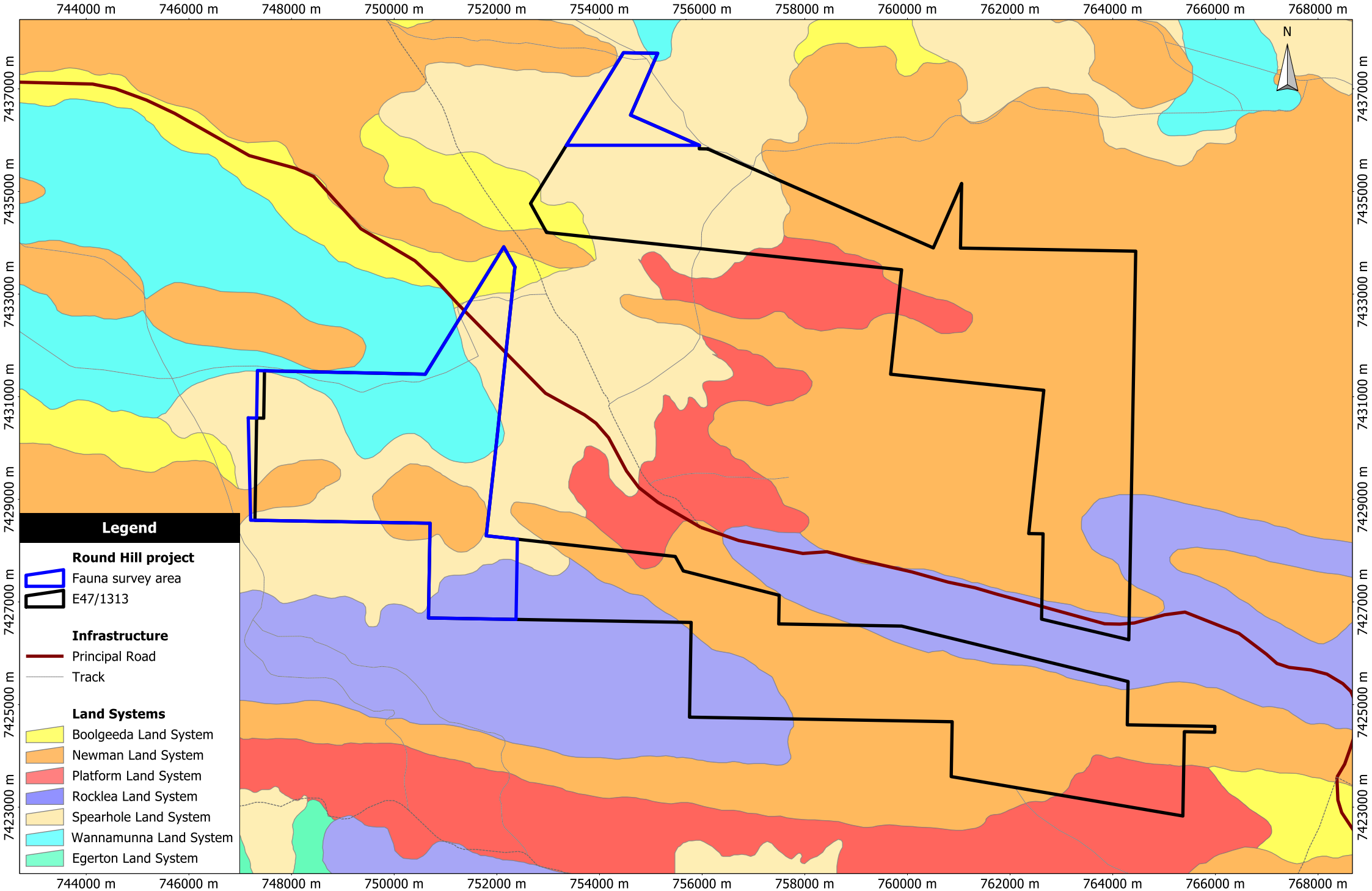
| Land system | Description based on Van Vreeswyk et al. (2004) |
|---|---|
| | Vegetation is characterised by very scattered to moderately close tall shrublands of *Acacia aneura*, *A. catenulate* with *Eremophila* and *Ptilotus* spp. low shrubs with or without a prominent ground layer of *Triodia* spp. (hard spinifex). Also, hummock grasslands of *Triodia* spp. (hard spinifex) with few shrubs.<br>3. Groves - Red loamy earths and red-brown hardpan loams. Groves or arcuate bands up to 1.5 kilometres long by 100 metres wide (though commonly much smaller) arranged on hardpan plains (land unit 2) with long axes at right angles to direction of sheet flow. Vegetation is characterised by close woodlands/tall shrublands with *Acacia aneura*, *A. catenulata* and other acacias with numerous low shrubs of *Eremophila, Ptilotus, Sida* spp. and occasionally perennial grasses.<br>4. Dissected slopes - Red shallow loams and red-brown hardpan shallow loams. Adjacent to hardpan plains (land unit 2) and extending up to 1 kilometre downslope to drainage lines or as stripped margins to other land systems, often intensely dissected up to 20 metres to give a series of spur slopes and interfluves with gently inclined slopes. Vegetation is characterised by hummock grasslands of *Triodia wiseana* (hard spinifex) with very scattered *Acacia* spp. shrubs and occasional trees such as *Eucalyptus socialis*, *Corymbia hamersleyana* (Hamersley bloodwood).<br>5. Drainage zones and channels - Red loamy earths or red sandy earths. Channels with riverbed soils. Drainage zones 10-40 metres wide in upper parts becoming wider downslope, channels incised 1-2 metres in hardpan or centrally positioned in shallow valleys incised up to 20 metres with flanking slopes of land unit 4. Vegetation is characterised by scattered to moderately close woodlands or tall shrublands with eucalypts and acacias, low shrubs and prominent ground storey of *Triodia* spp. (hard spinifex) or tussock grasses.<br>  |
| Wanna-munna Land System | Extent: 57,700 hectares within Western Australia, 524 hectares in survey area.<br>Summary: Hardpan plains and internal drainage tracts supporting mulga shrublands and woodlands (and occasionally eucalypt woodlands).<br>Geology: Quaternary alluvium and colluvium.<br>Geomorphology: Depositional surfaces; level hardpan wash plains subject to overland sheet flow, drainage foci as discrete arcuate groves and broad internal drainage flats both receiving run-on from adjacent hardpan surfaces; rare, channelled tracts but mostly no organised through drainage. Relief up to 5 metres.<br>Land units as show in diagram below:<br>1. Stony plains - Red loamy earths and red-brown hardpan shallow loams. Level or very gently inclined plains up to 500 metres in extent, usually on outer margins of system; surface mantles of abundant pebbles of ironstone. Vegetation is characterised by very scattered to scattered tall shrublands of *Acacia aneura* (mulga) with sparse low shrubs and *Triodia* sp. (hard spinifex) understorey.<br>2. Hardpan plains - Red-brown hardpan shallow loams and some red shallow loams. Level plains up to 5-6 kilometres in extent, subject to overland sheet flow; surface mantles of very few to few pebbles of ironstone. Vegetation is characterised by very scattered tall or low shrublands of *Acacia aneura, Eremophila* spp., *Ptilotus obovatus* (cotton bush), *Maireana villosa*. |

| Land system | Description based on Van Vreeswyk et al. (2004) |
|---|---|
| | 3. Calcrete platforms – Calcareous shallow loams. Level plains up to 300 metres in extent and raised 1-2 metres above adjacent hardpan plains (land unit 2); surface mantles of abundant calcrete pebbles and fragments. Vegetation is characterised by scattered shrublands with *Acacia aneura* and other acacias, *Senna* spp. and *Triodia wiseana* (hard spinifex).<br>4. Groves - Red deep loamy duplex soils, red loamy earths and self-mulching cracking clays. Arcuate drainage foci up to 1 kilometre long and 150 metre wide arranged on hardpan plains (land unit 2) with long axes at right angles to direction of sheet flow, receiving run-on from adjacent plains; often with gilgai microrelief. Vegetation is characterised by moderately close to closed woodlands of *Acacia aneura* with numerous undershrubs and tussock grasses such as *Chrysopogon fallax* (ribbon grass) and *Themeda triandra* (kangaroo grass).<br>5. Internal drainage plains - Deep red/brown noncracking clays, self-mulching cracking clays and red loamy earths. Level plains and drainage sumps up to 5 kilometres in extent, receiving run-on from adjacent hill land systems and hardpan plains (land unit 2), microrelief may be gilgaied or non-gilgaied. Vegetation is characterised by moderately close to closed woodlands of *Acacia aneura* and *Eucalyptus victrix* (coolibah) with sparse undershrubs such as *Muehlenbeckia florulenta* (lignum) and *Chenopodium auricomum* (swamp bluebush) and patchy tussock grasses. Also, grasslands of *Eriachne* sp. with isolated Eucalyptus victrix trees and shrubs such as *M. florulenta* or grassy scattered woodlands of *E. victrix*.<br>  |
| Newman Land System | Extent: 1,458,000 hectares within Western Australia, 353 hectares in survey area (16.8%).<br>Summary: Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.<br>Geology: Lower Proterozoic jaspilite, chert, siltstone, shale, dolomite and minor acid volcanics.<br>Geomorphology: Geomorphology: Erosional surfaces; plateaux and mountains - extensive high plateaux, mountains and strike ridges with vertical escarpments and steep scree slopes and more gently inclined lower slopes; moderately spaced dendritic and rectangular tributary drainage patterns of narrow valleys and gorges with narrow drainage floors and channels. Relief up to 450 metres.<br>Land units as show in diagram below:<br>1. Plateau, ridge, mountain and hills – Stony soils, red shallow loams and some red shallow sands. Mountain tracts, plateaux and strike ridges, relief up to 400 metres; level or rounded plateaux summits and mountain crests, ridges and indented escarpments with vertical upper cliff faces and moderately inclined to very steep upper scree slopes; surface mantles of abundant to very abundant pebbles, cobbles and stones of ironstone, jaspilite, chert and other rocks. Also outcrop of parent rock. Vegetation is characterised by hummock grasslands of *Triodia wiseana, T. brizoides, T. plurinervata* (hard spinifex) with very scattered to scattered shrubs and trees including *Acacia* and *Senna* spp., *Grevillea wickhamii* (Wickham's grevillea), *Eucalyptus leucophloia* (snappy gum) and other eucalypts. Occasionally hummock grass is *Triodia biflora* (soft spinifex). |

| Land system | Description based on Van Vreeswyk et al. (2004) |
|---|---|
| | 2. Lower slopes - Stony soils on upper margins with red loamy earths on lower margins. gently inclined concave slopes mostly less than 400 metres in extent with mantles of very abundant pebbles and cobbles of ironstone and other rocks. Vegetation as per land unit 1.<br>3. Stony plains – Stony soils, red shallow loams with some red loamy earths. Gently undulating lower plains and interfluves up to 500 metres in extent with mantles of abundant to very abundant pebbles of ironstone. Vegetation is characterised by hummock grasslands of *Triodia wiseana, Triodia spp.* (hard spinifex) with isolated to very scattered shrubs of *Acacia* and *Senna* spp. and occasional eucalypt trees. Occasionally hummock grasslands of *Triodia pungens* (soft spinifex).<br>4. Narrow drainage floors with channels – Red shallow loams, red loamy earths. Channels with riverbed soils. Almost level floors up to 400 metres wide but usually much less in valleys, mantles of abundant pebbles of ironstone and other rocks; channels up to 200 metres wide with cobble bedloads. Smaller floors support hummock grassland of *Triodia pungens* with very scattered shrubs. Larger floors and channels support tall shrublands/woodlands of *Acacia* spp. and *Eucalyptus victrix* (coolibah) with tussock grass or hummock grass understoreys.<br>  <br> |
| Rocklea Land System | Extent: 2,293,300 hectares within Western Australia, 156 hectares in survey area (7.4%).<br>Summary: Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands.<br>Geology: Archaean basalt, Lower Proterozoic basalt, dolerite, tuff and agglomerate, minor shale and jaspilite.<br>Geomorphology: Geomorphology: Erosional surfaces; hills, ridges and plateaux remnants on basalt with steep stony slopes, restricted lower slopes, stony interfluves and minor gilgai plains; moderately spaced tributary drainage patterns of small channels in shallow valleys in upper parts becoming broader floors and channels downslope. Relief up to 110 metres.<br>Land units as show in diagram below:<br>1. Hills, ridges, plateaux and upper slopes - Stony soils, red shallow loams and calcareous shallow loams. Rounded, very gently inclined or undulating crests and plateaux surfaces with moderately inclined to very steep, sometimes benched, upper slopes; surface mantles of very abundant cobbles and pebbles mostly of basalt, also much outcrop of basalt; relief up to 110 metres. Vegetation characterised by hummock grasslands of *Triodia wiseana, Triodia* spp. (hard spinifex) or, less frequently, of *T. pungens* (soft spinifex) with isolated to very scattered shrubs such as *Acacia inaequilatera* (kanji) and *Senna* spp.<br>2. Lower slopes - Red shallow loams and red shallow sandy duplex soils. Very gently inclined to gently inclined slopes extending up to 1 kilometre downslope from hills (land |

| Land system | Description based on Van Vreeswyk et al. (2004) |
|---|---|
| | unit 1), surface mantles of abundant to very abundant pebbles and cobbles mostly of basalt, also outcrop of basalt. Vegetation as per land unit 1.<br>3. Stony plains and interfluves – Calcareous shallow loams, red sandy earths and shallow red/brown noncracking clays. Gently undulating to undulating plains, interfluves and low rises to 1.5 kilometres in extent, surface mantles of abundant to very abundant pebbles and cobbles of basalt and occasionally shale and other rocks. Vegetation characterised by hummock grasslands of *Triodia wiseana* or, less frequently, *T. pungens* with isolated to very scattered shrubs such as *Acacia inaequilatera*. Occasionally grassy shrublands with *Acacia, Senna* and *Eremophila* spp.<br>4. Gilgai plains – Self-mulching cracking clays. Level plains up to 500 metres in extent with gilgai microrelief and variably abundant surface mantles of basalt pebbles and cobbles. Vegetation is characterised by tussock grasslands with *Astrebla pectinate* (barley Mitchell grass), *Eragrostis xerophila* (Roebourne Plains grass) and other perennial grasses.<br>5. Upper drainage lines – Red shallow sands and calcareous shallow loams. Channels with riverbed soils. Narrow headwater valleys with branching drainage tracts mostly <200 metres wide, unchanneled or with central channels up to 10 metres wide. Vegetation is characterised by hummock grasslands of *Triodia wiseana* or *T. pungens* with very scattered to scattered acacia shrubs and occasional *Corymbia hamersleyana* (Hamersley bloodwood) trees.<br>6. Drainage floors and channels - Red loamy earths with red shallow sandy duplex soils and red/brown non-cracking clays. Almost level floors rarely more than 400 metres wide, central tracts with braided channels and stony banks; major trunk channels up to 50 metres wide. Scattered to moderately close tall shrublands or woodlands of *Acacia* and *Eucalyptus* spp. with numerous undershrubs and hummock grass understoreys or tussock grass understoreys.<br>  <br> |
| Boolgeeda Land System | Extent: 774,800 hectares within Western Australia, 40 hectares in survey area (1.9%).<br>Summary: Stony plains with spinifex grasslands<br>Geology: Quaternary colluvium<br>Geomorphology: Predominantly depositional surfaces; very gently inclined stony slopes and plains below hill systems becoming almost level further downslope; closely spaced, dendritic and sub-parallel drainage lines. Relief up to about 20 metres.<br>Land units as show in diagram below:<br>1. Low hill and rises – Stony soils and red shallow loams. Isolated hills and low rises usually (<500m in extent), surface mantles of very abundant pebbles and cobbles of ironstone, basalt and other rocks. Vegetation consists of hummock grasslands with *Triodia wiseana* (hard spinifex) and other *Triodia* spp. with very scattered acacia shrubs.<br>2. Stony slope and upper plain – Red shallow loams or red loamy earths. Very gently inclined slopes and upper interfluves immediately downslope form adjacent hill |

| Land system | Description based on Van Vreeswyk et al. (2004) |
|---|---|
| | systems, dissected up to 5 metres by dendritic or sub parallel small creek lines, surface mantles of common to very abundant pebbles of chert, ironstone, quartz and other rocks. Vegetation is characterised by Hummock grasslands of *T. lanigera*, *T. wiseana* (hard spinifex) or scattered tall shrublands of *Acacia aneura* (mulga), *A. ancistrocarpa* (shiny leaf wattle), *A. atkinsiana* and other acacias, occasional eucalypt trees and prominent hard spinifex ground layer.<br>3. Stony lower plain – Red loamy earths. Almost level plains downslope from land unit 2, surface mantles vary from few to very abundant ironstone and other pebbles; subject to sheet and channelised flow from land units 1 and 2. Vegetation is characterised by Hummock grasslands *T. wiseana*, *T. lanigera* (hard spinifex) or *T. pungens* (soft spinifex). Also scattered to moderately close tall shrublands of *A. aneura* and other acacias with hard and soft spinifex ground layer.<br>4. Grove – Red loamy earths. Small (up to 20 metres long) arcuate drainage foci occurring infrequently on land units 2 and 3. Vegetation is characterised by moderately close woodlands or tall shrublands of *A. aneura* with sparse lowshrubs and tussock or hummock grasses.<br>5. Narrow drainage floor and channel – Red loamy earths and minor self-mulching cracking clays. Channels with riverbed soils. Dendritic and parallel flow zones and creek lines on slopes and plains (land units 2 and 3), only 5 – 10 metres wide in upper parts becoming wider on the lower plains, larger channels may be braided and incised up to 3 metres. Vegetation is characterised by Scattered to close tall shrublands or woodlands of *A. aneura, A. atkinsiana, Corymbia hamersleyana* (Hamersley bloodwood) with sparse low shrubs and hummock and tussock grasses. Occasionally hummock grasslands of *T. pungens*.<br>  |




Rapallo environmental

Hanroy / Hancock Prospecting
Round Hill Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4 Scale: 1:90,000
Datum: MGA94 Zone 50
0 4 km

**Figure 2.3**

Land systems within the Round Hill survey area and greater tenement

### 2.3.3 Surface geology

The surface geology of the Round Hill survey area is summarised in Table 2.2 and mapped in Figure 2.4.

**Table 2.2 Surface geology units of the survey area**

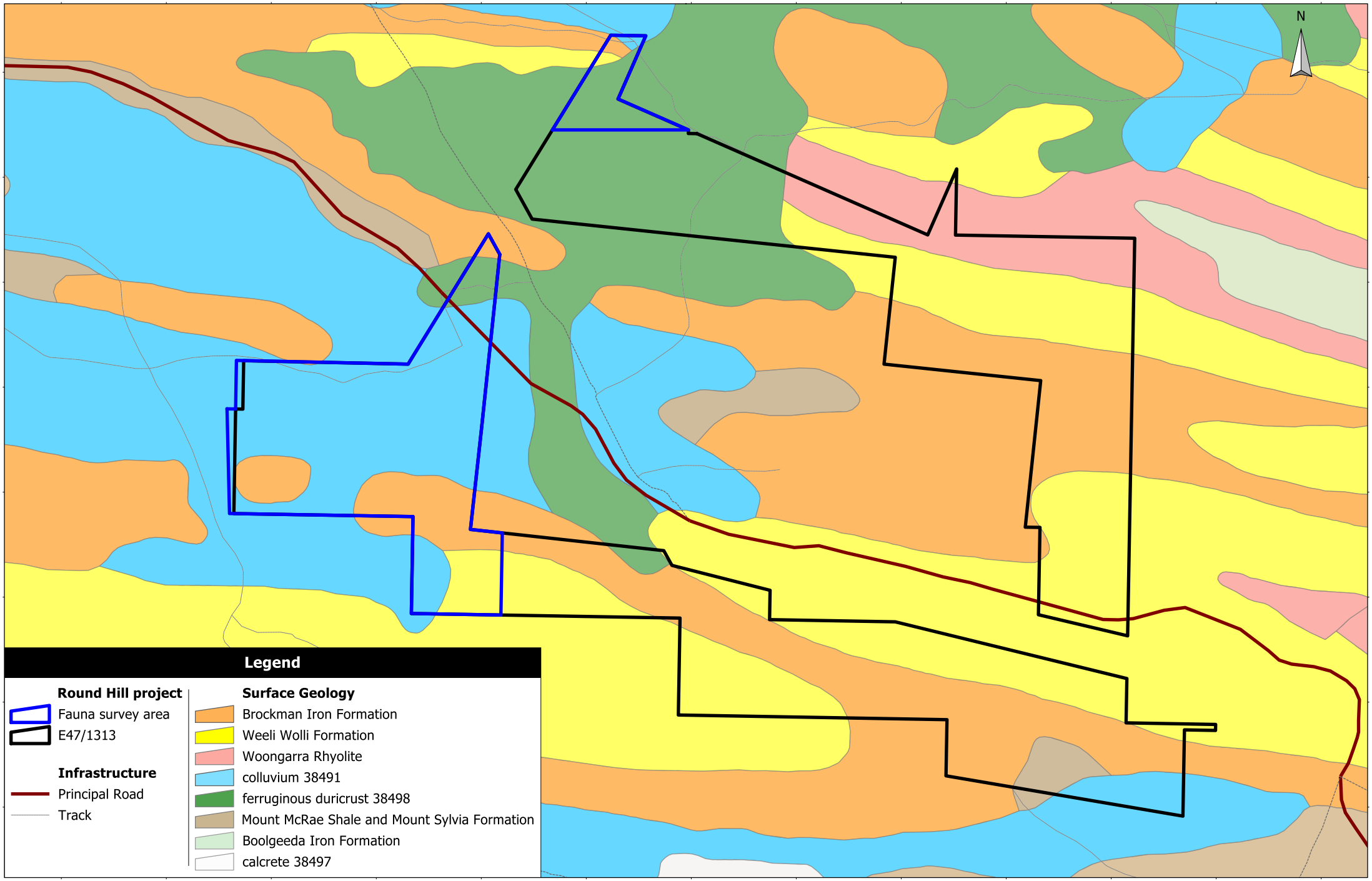
| Unit name | Code | Description | Extent in survey area |
|---|---|---|---|
| ferruginous duricrust 38498 | Czl | Lateritic duricrust: Pisolitic, nodular or vuggy ferruginous laterite; some lateritic soils; ferricrete; magnesite; ferruginous and siliceous duricrusts and reworked products, calcrete, kaolinised rock, gossan; residual ferruginous saprolite | 228 hectares (11%) |
| Brockman Iron Formation | Lchk | Banded iron-formation, chert, mudstone and siltstone | 385 hectares (18%) |
| Weeli Wolli Formation | Lchw | Banded iron-formation (commonly jaspilitic), mudstone, siltstone; common interlayered metadoleritic sills | 139 hectares (7%) |
| colluvium 38491 | Qrc | Colluvial sediment: Colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete, reworked laterite | 1345 hectares (64%) |

### 2.3.4 Regolith

The Round Hill survey area is situated in the Pilbara Physiographic Province (PIP) and traverses five regolith units, as summarised in Table 2.3 and mapped in Figure 2.5.

**Table 2.3 Regolith units of the survey area**

| Landform | Code | Description | Extent in survey area |
|---|---|---|---|
| Alluvial/fluvial | _Aa-PIP | Sand- or clay-rich alluvium on alluvial plain | 23 hectares (1%) |
| Alluvial/fluvial | _A-PIP | Clay, silt, sand, and gravel in channels and on floodplains | 1371 hectares (65%) |
| Colluvial | _C-PIP | Colluvium derived from different rock types; includes gravel, sand, silt and clay | 118 hectares (6%) |
| Exposed | _X-PIP | Exposed bedrock | 291 hectares (14%) |
| Residual or relict | _Rr-f-PIP | Ferruginous duricrust, massive to rubbly; includes iron-cemented reworked products | 294 hectares (14%) |




Rapallo environmental

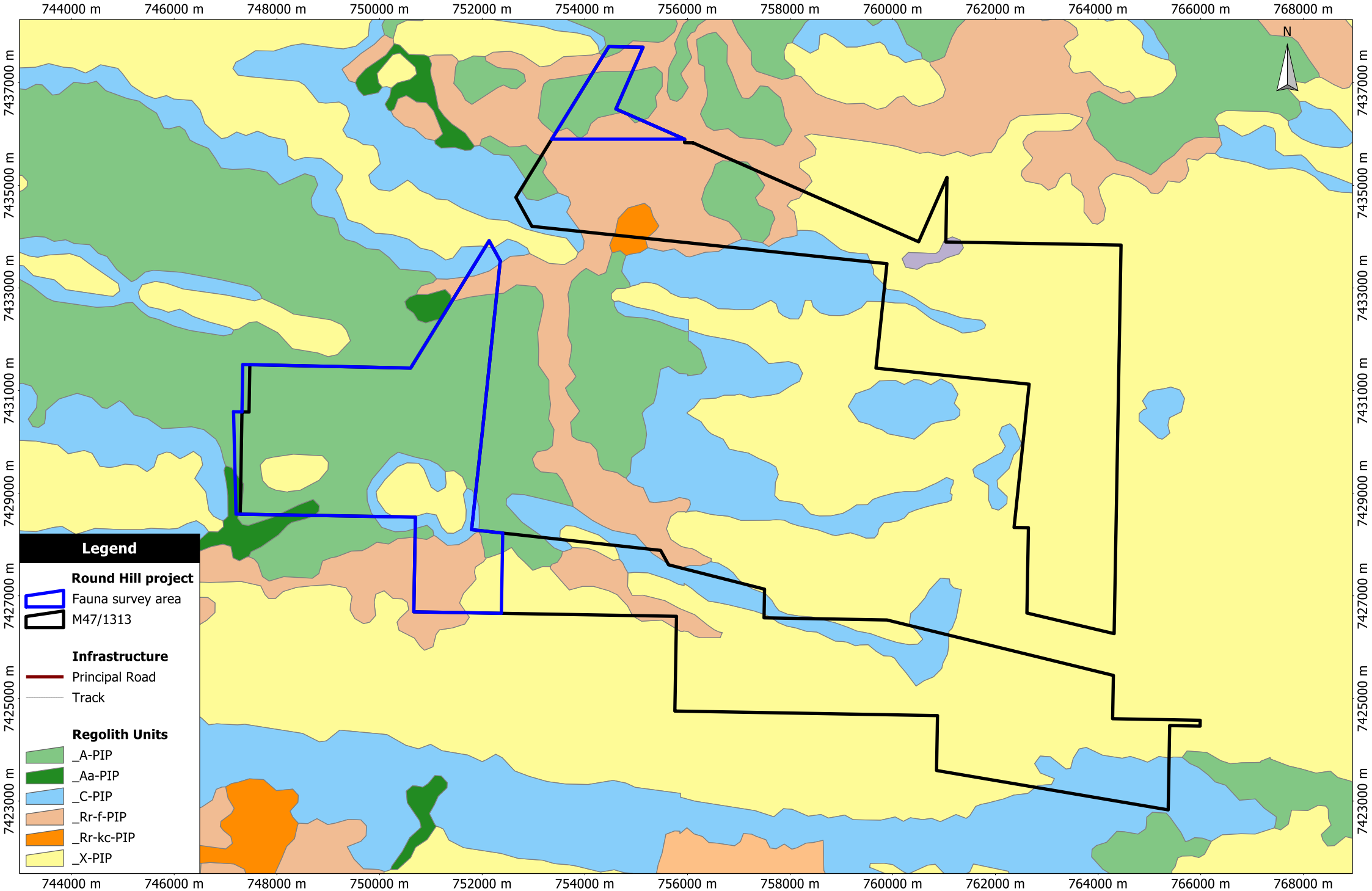
Hanroy / Hancock Prospecting
Round Hill Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4 Scale: 1:90,000
Datum: MGA94 Zone 50

0 4 km

**Figure 2.4**

Surface geology of the Round Hill survey area and greater tenement




Rapallo environmental

Hanroy / Hancock Prospecting
Round Hill Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4 Scale: 1:90,000
Datum: MGA94 Zone 50

0 4 km

**Figure 2.5**

Regolith units of the Round Hill survey area and greater tenement

### 2.3.5 Soils

The survey area is located within the Fortescue botanical district of the Eremaean botanical province, which is synonymous with the Pilbara region (Beard 1990). This region is mountainous, with soils ranging from shallow, stony sandy loams along slopes, to cracking clays, stripped hardpans and calcareous loams along active waterways (Beard 1990).

The landforms of the survey area are typical of the eastern Pilbara with rocky hills, small gorges, mostly seasonal watercourses and gravelly loam valleys. The soils are typified by hard red alkaline soils on plains, pediments and alluvial areas, while shallow, skeletal soils are common on ranges that rise to 1,250 metres (Beard 1990). The southern part of eastern Pilbara region is characterised by earthy loams underlain by red-brown hardpan (Beard 1975, 1990).

The survey area traverses two distinct soil assemblages. The northern area and the vast majority of the southern area are characterised as soil unit Fa14 (1946 hectares: 93%), while small sections of the south and south-west of the southern area are characterised as soil unit Fa13 (151 hectares: 7%). These soil units are defined as follows (CSIRO Australia 2018):

- Fa13 – Ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations; some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. This unit is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and there are extensive areas without soil cover: chief soils are shallow stony earthy loams (Um5.51) along with some brown sands (Uc5.11) on the steeper slopes. Associated are hard alkaline red soils and loamy red duplex (Dr2.33, Dr2.32) soils on the limited areas of dissected pediments, while deep earthy loams (Um5.52) and earthy clays (Uf6.71) soils occur on the valley plains.
- Fa14 – Steep hills and steeply dissected pediments on areas of banded jaspilite and chert along with shales, dolomite, and iron ore formations; some narrow winding valley plains: chief soils are shallow stony earthy loams (Um5.51) along with some brown sands (Uc5.11) on the steeper slopes. Hard alkaline red soils and loamy red duplex (Dr2.33, Dr2.32) soils which occur on the pediments are more extensive in this unit than in unit Fa13. Deep earthy loams (Um5.52) and earthy clays (Uf6.71) soils occur on the valley plains

### 2.3.6 Regional Surface Hydrology

The survey area occurs within the Upper Fortescue River Catchment within the Fortescue River Basin. Like many of the major rivers in the Pilbara region, the Fortescue River, is an ephemeral river and is the only major river in the region that flows above 0.01 $m^3/s$ for more than an average 50% of the year (Ruprecht & Ivanescu 2000).

The Fortescue River flows in a northerly direction and traverses through the Fortescue Marsh, a unique wetland area that is a Key Biodiversity Area of international significance (KBA site ID 25148) located within the Upper Fortescue River Catchment (Key Biodiversity Areas Partnership 2024, WA Parks Foundation 2024), and discharges into the Indian Ocean (Barnett & Commander 1986, Ruprecht & Ivanescu 2000). Stream flows across the Pilbara are variable over the course of the year and increase during periods of rainfall.

Coondiner Creek, a major non-perennial water course that branches from the Fortescue River, is present parallel to the northern survey area and terminates within the southern survey area. Smaller creek lines

and minor drainage areas were also present within the survey area, some of which are visible on satellite images, although all were dry during both survey periods. No permanent water pools were recorded within the survey area, although water pools were recorded within the wider Round Hill tenement.

## 2.4 Regional vegetation

### *2.4.1 Botanical district*

The Round Hill survey area is situated in the Fortescue botanical district of the Eremaean botanical province, which is synonymous with the Pilbara IBRA region. The Pilbara region receives a slightly higher than average rainfall than most of the Eremaean Province, due to the prevalence of cyclones off the coast, but this is not enough to modify the essentially desert appearance of the plant cover (Beard 1990).

The Fortescue botanical district consists predominantly of tree and shrub steppe communities with *Eucalyptus* trees, *Acacia* shrubs and spinifex grasses including *Triodia pungens* and *T. wiseana* (Beard, (1975). Mulga (species of the *Acacia aneura* complex) occurs in valleys and short-grass plains may be present on alluvial soils (Beard 1990).

### *2.4.2 Pre-European vegetation system-associations*

The Round Hill project is situated in the Hamersley (PIL3) IBRA subregion of the Pilbara. Vegetation of the Hamersley subregion is described as Mulga (*Acacia aneura* complex) low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (Kendrick 2001).

Digital maps (spatial data) of pre-European vegetation communities, based on state-wide mapping by J.S. Beard at 1:250,000 scale, are published by the Department of Primary Industries and Regional Development (DPIRD) (Beard 2018).

This mapping indicates that the vegetation system-associations of the survey area consist of Hamersley 18, Hamersley 82, and Hamersley 175 in a very small (260 $m^2$) section of the southern survey area, as summarised in Table 2.4 and displayed in Figure 2.6.

Vegetation that is not a Threatened or Priority Ecological Community may still be considered significant if it has a restricted distribution, or has experienced a degree of historical impact from threatening processes (EPA 2016). Vegetation types retaining less than 30% of their pre-European extent generally experience accelerated species loss at an ecosystem level (EPA 2000) and are regarded as being 'vulnerable', while vegetation types retaining less than 10% of their original extent are regarded as being 'endangered' (EPA 2000, 2016, Shepherd *et al.* 2002, DER 2014).

As presented in Table 2.4, the vegetation system-associations of the survey area have close to 100% of their original extent remaining, and would be considered 'least concern' (DER 2014).

**Table 2.4 Pre-European vegetation within the survey area**

| Beard Vegetation System and Association | Extent in survey area | | Total current extent in Australia [1] | Pre-European extent remaining [1] |
|---|---|---|---|---|
| | Hectares | Percentage | | |
| Hammersley_18 | 1627 | 78% | 576 542 hectares | 99.19 % |
| Hammersley_82 | 470 | 22% | 2 165 224 hectares | 99.43 % |
| Hammersley_175 | 0.026 | 0.001% | 92 751 hectares | 99.69 % |

*Footnotes: 1) Numbers from 2018 Statewide Vegetation Statistics (DBCA 2019)*

**Hamersley 18** – Low woodland, open low woodland, to sparse low woodland of *Acacia aneura* (complex), *Eremophila fraseri*, *Acacia pruinocarpa*, over *Acacia* sp. aff. ligulata, and *Eremophila forrestii*; over *Ptilotus drummondii*, *Eremophila lanceolata*, *Brachyscome* sp., *Calocephalus francisii*, and *Rhodanthe floribunda*.

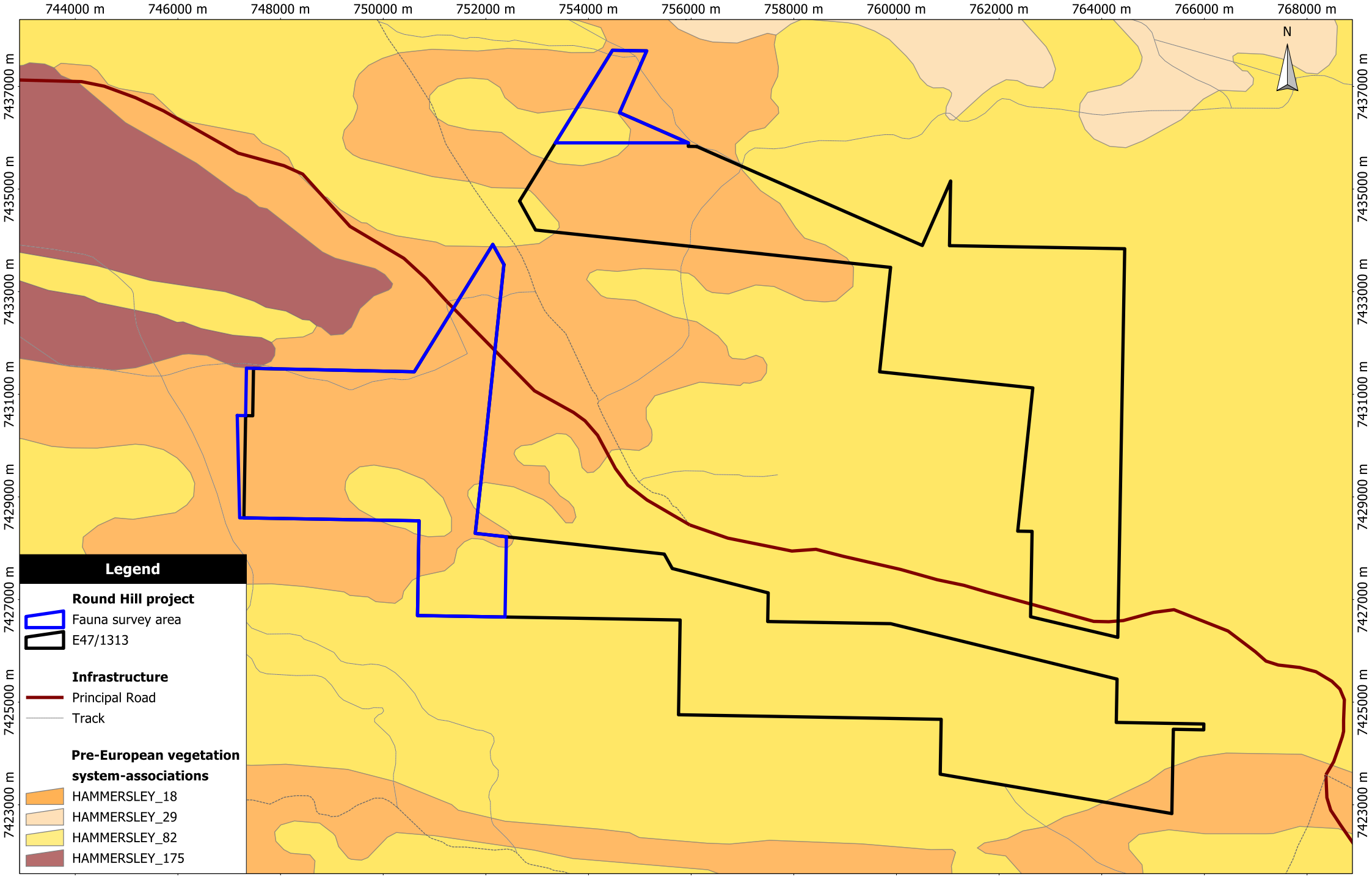
**Hamersley 82** – Hummock grassland and low tree steppe of *Triodia wiseana* and *Eucalyptus leucophloia* (snappy gum). The vegetation within this system-association forms a mosaic following landforms:

- Ranges: *Eucalyptus leucophloia* and *Eucalyptus gamophylla* trees and mallees; over *Senna artemisioides* subsp. x *sturtii*, *Dodonaea viscosa*, *Grevillea wickhamii*, *Hakea lorea*, *Senna pleurocarpa* var. *pleurocarpa* shrubs; over *Triodia wiseana*, *Ptilotus rotundifolius*, *Acacia lycopodiifolia*, *Gompholobium polyzygum*, *Calytrix exstipulata* hummock grassland, shrubs and forbs.

- Summits: *Eucalyptus kingsmillii*, *Eucalyptus gamophylla*, *Eucalyptus leucophloia*, *Eucalyptus* sp. trees and mallees; over *Senna artemisioides* subsp. x *sturtii*, *Dodonaea viscosa*, *Grevillea wickhamii*, *Hakea lorea*, *Senna pleurocarpa* var. *pleurocarpa* shrubs; over *Triodia wiseana*, *Ptilotus rotundifolius*, *Acacia lycopodiifolia*, *Atriplex* sp., *Gompholobium polyzygum* hummock grassland, shrubs and forbs.

- Gorge floors: *Eucalyptus camaldulensis*, *Eucalyptus microtheca*, *Eucalyptus dichromophloia*, *Acacia pruinocarpa*, *Melaleuca leucadendra* trees; over *Hibiscus goldsworthii*, *Arivela viscosa* shrubs and forbs; over *Swainsona stenodonta*, *Tephrosia* sp., *Jasminum lineare*, *Duperreya sericea forbs*, shrubs, and vines.

**Hamersley 175** – Grasslands, short bunch-grass savanna of *Astrebla pectinata*, *Aristida latifolia*, *Chrysopogon fallax*, *Eragrostis setifolia*, *Angianthus* sp. tussock grasses and forbs.




Rapallo environmental

Hanroy / Hancock Prospecting
Round Hill Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4 Scale: 1:90,000
Datum: MGA94 Zone 50

0 4 km

**Figure 2.6**

Pre-European vegetation system-associations

## 2.5 Protected areas

### *2.5.1 Reserves and Environmentally Sensitive Areas*

Environmentally sensitive areas (ESAs) and Schedule 1 (S1) areas are protected under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

Schedule One Areas require a permit for clearing resulting from low impact mineral or petroleum activities as declared in Regulation 6 in Government Gazette No. 115 Environmental Protection (Clearing of Native Vegetation) Regulations 2004 - Schedule 1.

ESAs are selected for their environmental values at state or national levels and are classes or areas of native vegetation where exemptions for clearing vegetation under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* do not apply. ESAs are declared in *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, Government Gazette No. 55.

Reserves are Crown land that has been set aside for a particular purpose in the public interest, in effect the dedication of land to that purpose, under section 41 of the *Land Administration Act 1997* (LAA). Every reserve has its description and designated purpose registered on a Crown Land Title (CLT), as depicted on maps held by Landgate. Reserves cover about 17.5% of the total area of the State of Western Australia. Under the previous legislation (the *Land Act 1933* – now superseded) three classes of reserves were recognised, being classes A, B and C. Under the current LAA, only Class A and Class B reserves remain, with all other reserves referred to as simply “reserves”. Under the LAA there is no provision to create new Class B reserves, and there is no longer reference to Class C reserve. Class A reserves hold the highest level of protection, and are areas of high conservation or high community value (Landgate 2020, Department of Planning Lands and Heritage 2023).

The following data sources were reviewed to identify the occurrence of ESAs, S1 areas, and reserves within or near 100 kilometres of the survey area:

- Tengraph Web (Department of Mines, Industry Regulation and Safety 2024)
- Spatial datasets for ESAs (DWER-046) (DWER 2023) and Schedule 1 areas (DWER-046) (DWER 2021) as available on Data WA catalogue (Government of Western Australia 2024).
- Clearing Permit System and Map Viewer (Department of Water and Environmental Regulation 2024)
- Birdata (Birdlife Australia 2024a) online databases for an Important Bird Areas
- (IBA)Protected Matters search tool (Department of Climate Change, Energy, the Environment and Water 2024a)

These resources identified a total of one national park (Karijini) and three other environmentally sensitive areas within 100 kilometres of the survey area, as summarised in Table 2.5.

The survey area does not occur within an ESA, nor are there any ESAs within 20 kilometres of the survey area (DWER 2023).

**Table 2.5 Reserves or Environmentally Sensitive Areas within 100 kilometres of the survey area**

| Name | Purpose | Responsible Agency | Distance to survey area |
|---|---|---|---|
| Wannama Art Site | Aboriginal heritage area with registered indigenous rock art | Department of Aboriginal Affairs | 31 kilometres northwest |
| Jigalong Aboriginal Reserve | Indigenous community | Martu Traditional Owners | 90 kilometres southeast |
| Fortescue Marshes | Nationally Important Wetland and a Priority 3 Priority Ecological Community (PEC), A class reserve,<br>Important Bird Area | Department of Biodiversity, Conservation and Attractions | 65 kilometres north |
| Karijini National Park | National Park (section 19) | Department of Biodiversity, Conservation and Attractions | 85 kilometres west |

### *2.5.2 Threatened and Priority Ecological Communities*

An ecological community is a naturally occurring assemblage of organisms, including flora, fauna and microorganisms, that occur and interact a unique habitat together. These communities can be influenced by several factors such as soil type, altitude, position in the landscape, climate and water availability.

Search results of the DBCA Threatened and Priority Ecological Communities (TEC-PEC) database yielded seven PECs were within 50 kilometres of the survey area. These are discussed in (Table 2.6) against descriptions from the Priority Ecological Communities List (DBCA 2023). Review of the PEC locations, landforms, and descriptions indicates that all these PEC are considered unlikely to occur in the survey area.

**Table 2.6 Threatened and Priority Ecological Communities within 50 kilometres of the survey area**

| Name | Status | Description | Comments |
|---|---|---|---|
| Ethel Gorge Aquifer Stygobiont Community | Critically Endangered | The community is known from the Ethel Gorge (Ophthalmia Basin) alluvium calcrete aquifer on the Fortescue River in the vicinity of the town of Newman.<br>It comprises a diverse assemblage of stygofauna species and is the known occurrence of this community. At least one species of *Chydaekata* is known only from this community. | Located approximately 32 kilometres southeast from the Round Hill survey area.<br>As the survey area is not located on the Fortescue River and does not contain large calcrete deposits like those present at Ethel Gorge, this PEC is considered unlikely to occur in the survey area. |
| Coolibah - Lignum Flats (sub-type 1) | Priority 3 | Woodland or forest of *Eucalyptus victrix* (coolibah) over thicket of *Duma florulenta* (lignum) on red clays in run-on zones. Associated species include *Eriachne benthamii*, *Themeda triandra*, *Aristida latifolia*, *Eulalia aurea* and *Acacia aneura*. | Located approximately 8-9 kilometres west at the closest point, to the Round Hill survey area.<br>*Eucalyptus victrix* woodlands were not recorded in the survey |

| Name | Status | Description | Comments |
|---|---|---|---|
| | | Three subtypes have been identified as part of this community.<br>Sub-type 1 is described as Coolibah and mulga (*Acacia aneura*) woodland over lignum and tussock grasses on clay plains (Coondewanna Flats and Wanna Munna Flats).<br>Threats: dewatering and grazing, clearing associated with infrastructure corridors, altered fire regimes leading to changes in floristics and structure, weed invasion. | area and the vegetation within the survey area does not resemble that of the survey area. The PEC is considered unlikely to occur in the survey area. |
| Vegetation of sand dunes of the Hamersley Range/Fortescue Valley (*previously 'Fortescue Valley Sand Dunes'*) | Priority 3 | Red linear iron-rich sand dunes lie on the Divide Land system at the junction of the Hamersley Range and Fortescue Valley, between Kalgan Creek and the low hills to the west.<br>A small number are vegetated with *Acacia dictyophleba* scattered tall shrubs over *Crotalaria cunninghamii*, *Trichodesma zeylanicum* var. *grandiflorum* open shrubland. They are regionally rare, small and fragile and highly susceptible to threatening processes. Previously 'Fortescue Valley Sand Dunes'.<br>Threats: weed invasion especially buffel grass, grazing by cattle, altered fire regimes, erosion and clearing for mining and infrastructure. | Several sites approximately 28 to 45 km northeast-northwest of the survey area.<br>Sand dunes were not recorded in the survey area and the vegetation within does not resemble that of the PEC description. The PEC is considered unlikely to occur in the survey area. |
| Riparian communities of springs and pools in the Pilbara | Priority 2 | The community includes flora with restricted distributions or populations that are highly disjunct or are major range extensions from northern and eastern Australia. These include *Imperata cylindrica*, *Cladium procerum, Schoenus falcatus* and *Fimbristylis sieberiana* (P3).<br>In the Pilbara these taxa are almost exclusively restricted to the riparian zones of permanent wetlands with high soil moisture maintained by groundwater flows. Occurrences are disjunct with sites typically associated with groundwater discharge in gorge and valley wetlands that are often coupled with significant shading.<br>Threats: hydrological change associated with mining, altered fire regimes, weed invasion (*Cenchrus ciliaris*, *Passiflora foetida*), grazing (camels), increased visitation. | Several sites approximately 20 kilometres northwest of the study area surrounding the priority 3 Kumina Land System.<br>The survey area does not contain permanent wetlands, and the vegetation described for the PEC has not been recorded within. This PEC is considered unlikely to occur in the survey area. |

| Name | Status | Description | Comments |
|---|---|---|---|
| Kumina Land System | Priority 3 | Ferricrete duricrust plains, uplands and plateaux remnants, relief up to 15 m. Duricrust plains and plateau remnants support hard spinifex grasslands.<br>Threats: mining | Several areas located approximately 16 kilometres northwest of the survey area.<br>The Kumina land system does not occur within the survey area. This PEC is considered unlikely to occur in the survey area. |
| Weeli Wolli Spring community | Priority 1 | Weeli Wolli Spring's riparian woodland and forest associations are unusual because of the composition of the understorey. The sedge and herb field communities that fringe many of the pools and associated water bodies along the main channels of Weeli Wolli Creek have not been recorded from any other wetland site in the Pilbara.<br>The spring and creek line are also noted for their relatively high diversity of stygofauna, and this is probably attributed to the large-scale calcrete and alluvial aquifer system associated with the creek. The valley of Weeli Wolli Spring also supports a very rich microbat assemblage including a threatened species.<br>Threats: dewatering and re-watering altering patterns of inundation, weed invasion, increased visitation. | Several sites approximately 26 to 33 kilometres northwest of the Round Hill survey area.<br>No permanent wetlands or large calcrete deposits have been recorded within the survey area. This PEC is considered unlikely to occur in the survey area. |
| West Angelas Cracking Clays | Priority 1 | Open tussock grasslands of *Astrebla pectinata*, *Astrebla elymoides*, *Aristida latifolia*, in combination with low scattered shrubs of *Sida fibulifera*, on basalt (Jerrinah formation) derived cracking-clay loam depressions and flowlines. Occurs throughout the central and eastern Hamersley Range from near Tom Price east to Newman.<br>Threats: clearing for mining, infrastructure and solar farms, possible weed invasion, fragmentation and altered fire regimes. | Several sites located approximately 30 – 40 kilometres southwest of the survey area.<br>Key defining flora taxa in the vegetation description of this PEC were not recorded during the flora survey. This PEC is considered unlikely to occur in the survey area. |

*Footnotes: 1) Source: Priority Ecological Communities List (DBCA 2023)*

# 3 Desktop study

## 3.1 Database search and literature review

The desktop study was completed in two stages. The first stage occurred prior to the field survey and comprised a review of available database information and literature relevant to the survey area to compile a list of potential conservation significant fauna taxa and ecological communities which may occur in the survey area.

The second stage occurred after the field survey and involved a likelihood of occurrence assessment for the conservation significant fauna identified in first desktop stage based on field survey data.

### *3.1.1 Sources of information*

The desktop study included searches of the DBCA databases for threatened and priority fauna (TPFA), threatened and priority ecological communities (TEC-PEC), the Protected Matters Search Tool (PM) and the Atlas of Living Australia (ALA), which also incorporates Birdata, online databases. Search radius for the ALA and PM databases were set to 50 kilometres surrounding the survey area shapefile. The search radius for DBCA database searches is selected by DBCA. These parameters are summarised in Table 3.1.

The desktop study also included a review of relevant publicly available survey reports using the Index of Biodiversity Surveys for Assessments (IBSA) portal (DWER 2019), these reports are listed in Table 3.2 and/or referenced in text.

Conservation significant fauna were checked against the most recent DBCA Threatened and Priority Fauna list (Department of Biodiversity Conservation and Attractions 2024a), the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* (Government of Western Australia 2018), and the EPBC Act List of Threatened Fauna (Department of Climate Change, Energy, the Environment and Water 2024b). Introduced fauna (feral animals) were checked against the Western Australian Organism List (WAOL) (Department of Primary Industries and Regional Development 2024).

Names for birds follow the Birdlife Australia (2023) Working List of Australian birds (v4.3). Names for mammals, reptiles, and amphibians follow the Western Australian Museum, *Checklist of the Terrestrial Vertebrate Fauna of Western Australia* (2024).

**Table 3.1 Database search parameters**

| Database name | Search area |
|---|---|
| DBCA Threatened and Priority Fauna database (TPFA) | 50 kilometre radius |
| DBCA Threatened and Priority Ecological Communities (TEC-PEC) database | 50 kilometre radius |
| Department of Climate Change, Energy, the Environment and Water (DCCEEW 2023) Protected Matters Search Tool | 50 kilometre radius |
| Atlas of Living Australia (ALA) database | 50 kilometre radius |

**Table 3.2 Regional literature sources**

| Report title | Year | Survey level | Distance to survey area |
|---|---|---|---|
| Jinidi Targeted Vertebrate Fauna Survey by Biologic | 2024 | Targeted | 30 km east |
| Nyidinghu Iron Ore Project Detailed Terrestrial Fauna Survey by 360 Environmental | 2023 | Detailed | 40 km north |
| Western Ridge Pipeline Vertebrate Fauna Survey by Biologic | 2022 | Basic and targeted | 25 km southeast |
| Hope Downs 2 Proposal – Fauna Survey by Astron Environmental | 2019 | Detailed | 30 km northwest |
| A Fauna Survey of The Proposed Hope Downs 4 Mining Area by Ninox Wildlife Consulting | 2009 | Detailed | 10 km east |

## 3.2 Fauna desktop results

The desktop study identified 390 species of vertebrate fauna which had been recorded previously within 50 kilometres of the survey area. These comprised 216 bird species, 44 mammals, 121 reptiles, 5 species of amphibians, 4 species of fish. The full desktop fauna list is presented in Appendix III.

### *3.2.1 Conservation significant fauna desktop results*

The desktop study identified 39 conservation significant fauna species recorded within 50 kilometres of the survey area, as presented in Appendix IV. Species are listed under the Western Australian *Biodiversity Conservation Act 2016* (BC Act), the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), and priority species administered by the Department of Biodiversity Conversation and Attractions (DBCA), are considered to be species of conservation significance.

Likelihood of occurrence in the survey area is discussed in Table 5.5, based on currently available information on distribution, habitat requirements, relevant ecological traits, and the distance of database records to the survey area. The risk matrix used to assess likelihood is presented in Appendix II and likelihood scores are presented in Table 5.5.

The desktop did not produce any conservation significant fauna species records from within the survey area, although it did identify two species records within the wider tenements:

- Western pebble-mound mouse (*Pseudomys chapmani*) listed Priority 4 under DBCA
- Common sandpiper (*Actitis hypoleucos*) listed as Migratory under the BC Act and EPBC Act

Three species of conservation significant species were confirmed to occur in the survey area during the detailed fauna survey, with a fourth species confirmed during a following targeted fauna survey (Rapallo Environmental, 2025):

- Long-tailed dunnart (*Antechinomys longicaudatus*) listed Priority 4 under DBCA – confirmed, recorded in the survey area in 2023 during the Rapallo detailed fauna survey.
- Pilbara olive python (*Liasis olivaceus barroni*) listed vulnerable under both the Biodiversity Conservation Act 2016 and the federal EPBC Act – confirmed, sloughed skin recorded in the survey area in 2023 during the Rapallo detailed fauna survey.

- Western pebble-mound mouse (*Pseudomys chapmani*) listed Priority 4 under DBCA – confirmed, recorded in the survey area in 2023 and 2024 during the Rapallo detailed fauna survey.
- Gane's blind snake (Pilbara) (*Anilios ganei*) listed Priority 1 under DBCA – confirmed, recorded in 2024 during Round Hill Targeted Fauna survey (2025) within the survey area and listed in proximity to the survey area the desktop by DBCA, ALA and 360 Environmental (2023).

Two conservation significant species, the ghost bat (*Macroderma gigas*) and the grey falcon (*Falco hypoleucos*) which are both classified as Vulnerable under the state BC Act and the federal EPBC Act, are considered to be likely to occur within the survey area for foraging purposes based on nearby records and habitats present within the survey area.

A further 13 conservation significant species are considered to possibly occur within the survey area as listed below:

- Common sandpiper (*Actitis hypoleucos*) – Migratory under the BC Act and EPBC Act
- Glossy ibis (*Plegadis falcinellus*) – Migratory under the BC Act and EPBC Act
- Fork-tailed swift, also known as the Pacific swift, (*Apus pacificus*) – Migratory under the BC Act and EPBC Act
- Pectoral sandpiper (*Calidris melanotos*) –- Migratory under the BC Act and EPBC Act
- Peregrine falcon (*Falco peregrinus*) – Otherwise Specially protected under the BC Act
- Princess parrot (*Polytelis alexandrae*) – Priority 4 under DBCA and Vulnerable under the EPBC Act
- Sharp-tailed sandpiper (*Calidris acuminatal*) - Migratory under the BC Act, as well as Vulnerable under the EPBC Act
- Southern whiteface (*Aphelocephala leucopsis*) – Vulnerable under the EPBC Act
- Wood sandpiper (*Tringa glareola*) - Migratory under the BC Act and EPBC Act
- Brush-tailed mulgara (*Dasycercus blythi*) – Priority 4 under DBCA
- Northern quoll (*Dasyurus hallucatus*) - Endangered under the BC Act and EPBC Act
- Pilbara leaf-nosed bat (*Rhinonicteris aurantia* (Pilbara form)) – Vulnerable under the BC Act and EPBC Act
- Unpatterned robust slider (*Lerista macropisthopus remota*) – Priority 2 under DBCA

The remaining 20 conservation significant terrestrial fauna species identified in the desktop study are considered to be unlikely (15 species) or highly unlikely (five species) as listed in Table 5.5.

### *3.2.2 Introduced (feral) vertebrate fauna desktop results*

The desktop study identified 7 species of introduced (feral) fauna which have been recorded previously within 50 kilometres of the survey area. These are listed in Appendix III and with more information below in Table 3.3.

From the desktop study five sources recorded a total of seven terrestrial introduced (feral) fauna, all of which are mammals. These include wild dogs, cats, cattle, rabbits, foxes, house mice and dromedary camels.

**Table 3.3 Desktop results introduced (feral) fauna**

| Scientific name | Common name | WAOL status |
|---|---|---|
| *Bos taurus* | European cattle | Permitted - s11 |
| *Camelus dromedarius* | Dromedary, camel | Permitted - s11 (Domestic) |
| | | Declared Pest - s22(2) (C3 Exempt) |
| *Canis familiaris sp.* | Wild dog / dingo | Declared Pest - s22(2) (C3 Exempt) |
| *Felis catus* | Cat | Permitted - s11 (Domestic) |
| | | Declared Pest - s22(2) (Feral) |
| *Mus musculus* | House mouse | Permitted - s11 (Exempt) |
| *Oryctolagus cuniculus* | Rabbit | Declared Pest - s22(2) (C3 Prohibited) |
| *Vulpes vulpes* | Red fox | Declared Pest - s22(2) (C1 Prohibited, C3 Prohibited) |

*Note that although *Canis familiaris sp.* is listed as a Declared Pest, in Western Australia – (Wild Dog/Dingo) under the Western Australian Organism List but this does not reflect all opinions in the literature.

# 4 Methods

## 4.1 Personnel and licencing

The personnel involved in the field survey, data processing, and the preparation of this report are listed in Table 4.1. The field survey was conducted under the following licences and permits:

- Fauna Taking (Biological Assessment) Licence BA27000806-B issued under Regulation 27 of the *Biodiversity Conservation Regulations 2018*,
- Authorisation number TFA 2223-0216 – Authorisation to take or disturb Threatened species under Section 40(3) of the *Biodiversity Conservation Act 2016*, as
- DPIRD scientific use license U311/ 2023
- WAEC Permit Number 22-04-53

As part of the license conditions, a list of fauna recorded in the survey will be forwarded to the DBCA.

**Table 4.1 Personnel involved in the project**

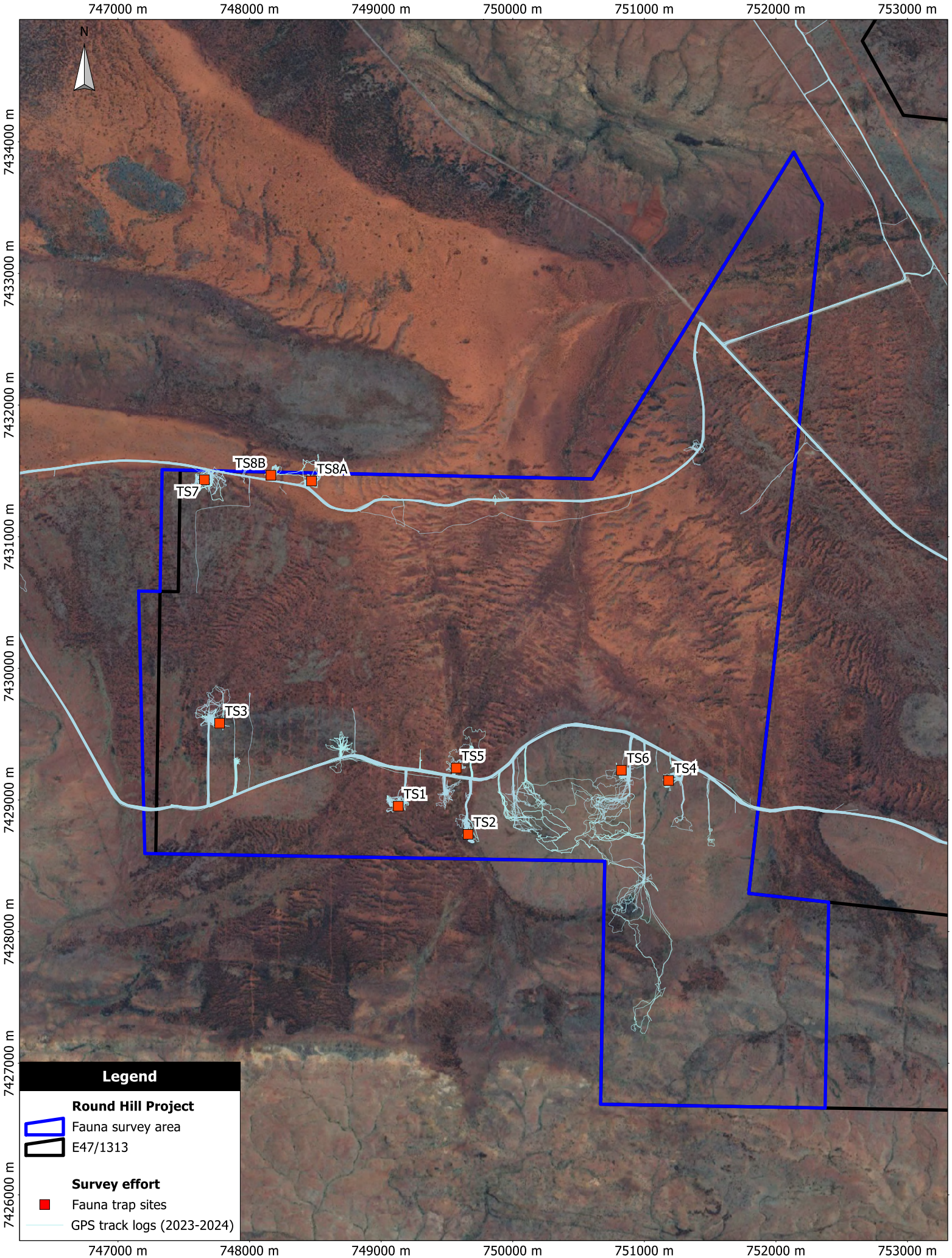
| Name | Position | Fieldwork* | | Data entry and analysis | Reporting |
|---|---|---|---|---|---|
| | | S1 | S2 | | |
| Kate George | Principal Environmental Scientist | ● | ● | ● | ● |
| Marieke Weerheim | Senior Environmental Scientist | | | | ● |
| Jasmine Kasper | Ecologist | ● | ● | ● | ● |
| Molly George | Ecologist | ● | ● | ● | |
| Arnika Thorbjornsen | Ecologist | | | ● | ● |
| Brendan Schembri | Senior Ecologist | ● | | | |
| Dion Hobcroft | Senior Ecologist | ● | ● | | |
| Henry Cook | Senior Ecologist | | ● | | |
| Jordan Mulder | Ecologist | ● | | | |
| Justin Wright | Ecologist | | ● | | |

*Footnotes: * Fieldwork S1 = Survey 1 (2023); Fieldwork S2 = Survey 2 (2024).*

## 4.2 Field Survey

A two-season detailed terrestrial vertebrate fauna survey was completed over the survey area defined in section 1.1 by a team of six Rapallo ecologists. The fauna survey aligned with Environmental Protection Authority (EPA 2020) *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment*.

The first field season occurred from 23 August to 7 September 2023, and the second season occurred from 24 April to 6 May 2024. Survey effort is summarised in Table 4.2 and mapped in Figure 4.1 to 4.3, while survey activities are detailed further in sections 4.2.1 to 4.2.6 below.



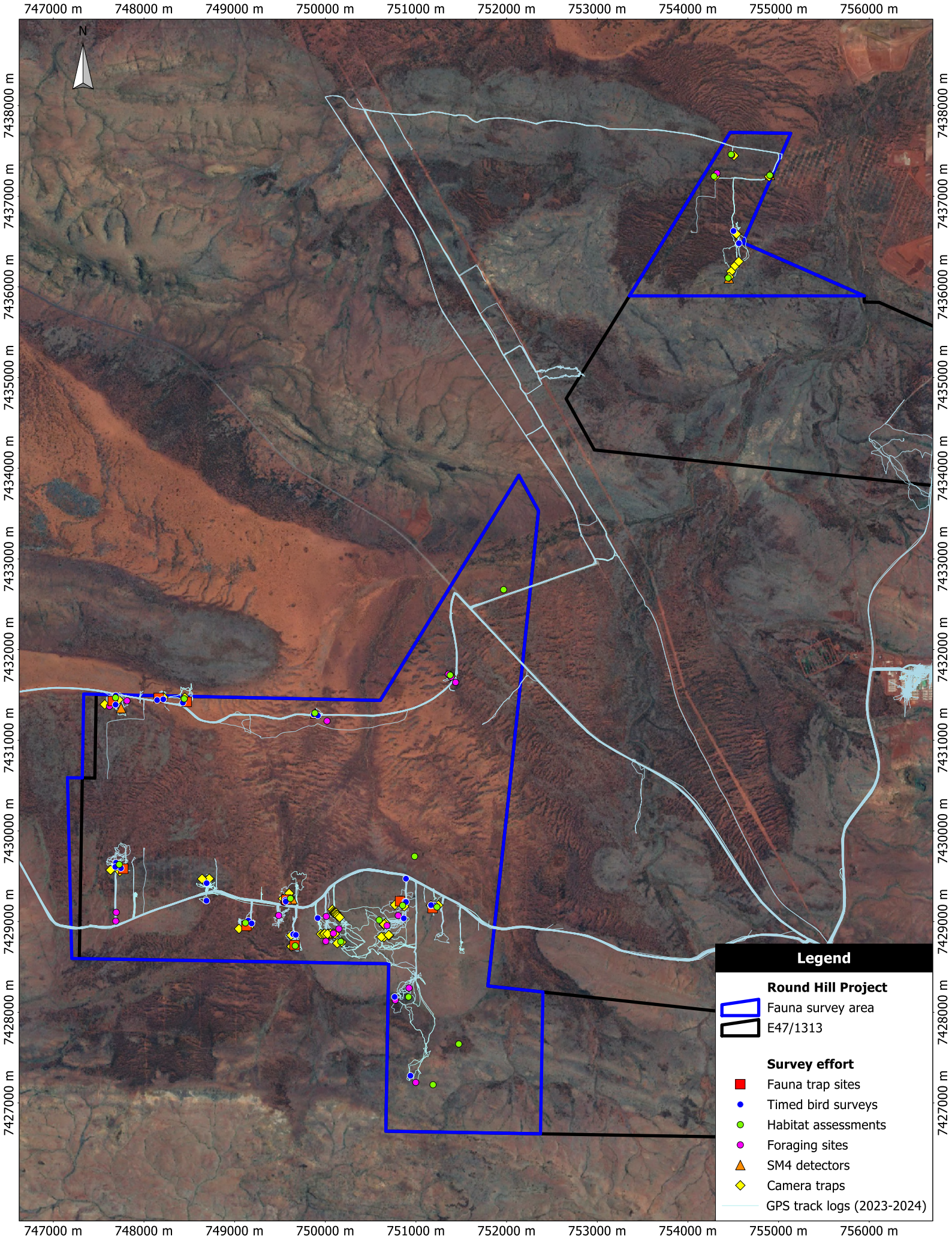

Rapallo environmental

Hanroy / Hancock Prospecting
Round Hill
Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4
Scale: 1:35,000
Datum: MGA94 Zone 50
0 1 km

**Figure 4.1**

Fauna survey effort in the Round Hill survey area: Trap sites




Rapallo environmental

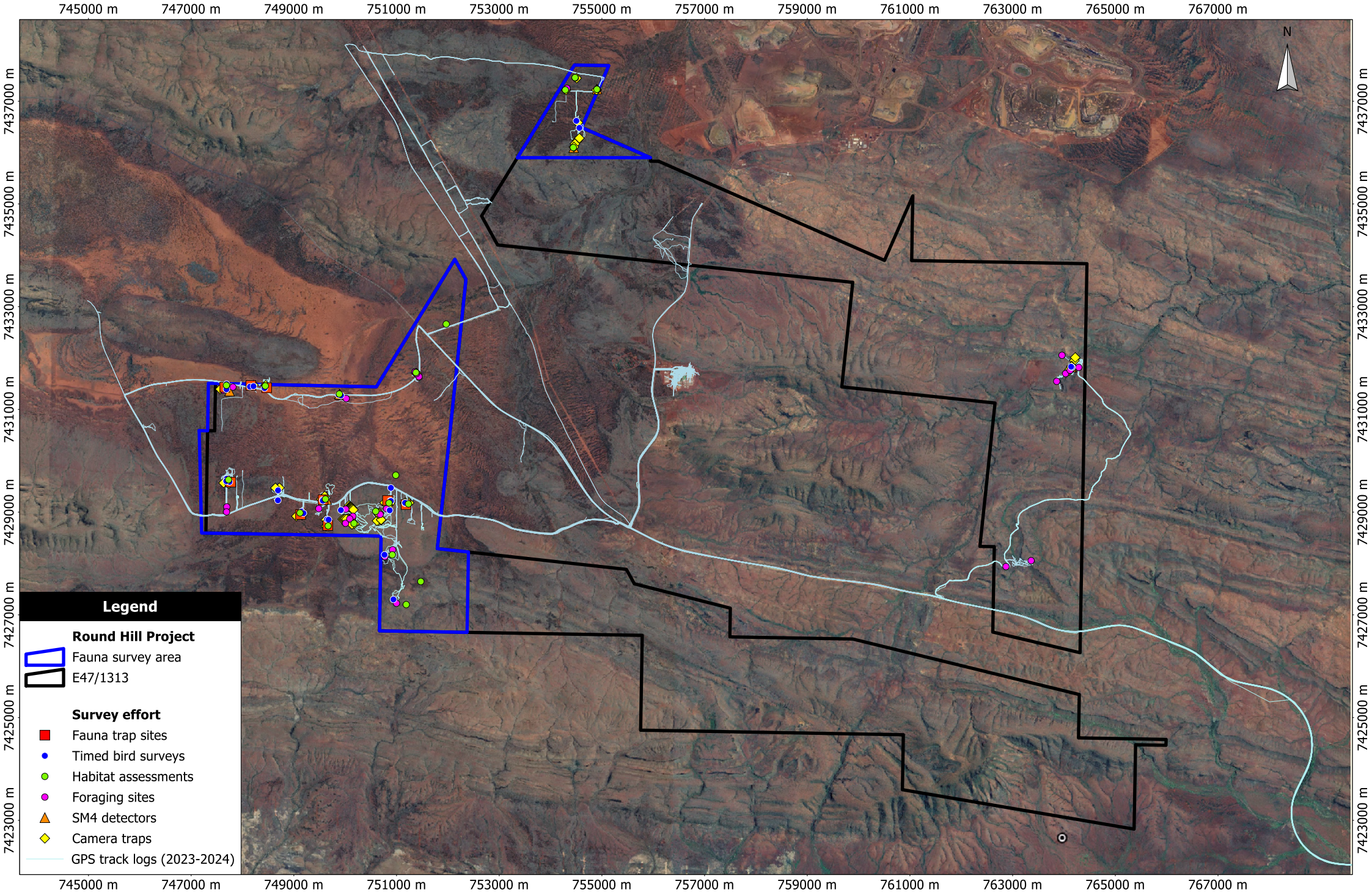
Hanroy / Hancock Prospecting
Round Hill
Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4
Scale: 1:50,000
Datum: MGA94 Zone 50

0 1.5 km

**Figure 4.2**

Fauna survey effort in the Round Hill survey area: All survey sites




Rapallo environmental

Hanroy / Hancock Prospecting
Round Hill Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4 Scale: 1:90,000
Datum: MGA94 Zone 50

0 4 km

**Figure 4.3**

Fauna survey effort in the wider tenement (E47/1313)

**Table 4.2 Summary of survey effort during the two-season survey at the Round Hill Project.**

| Name | Season 1 Effort | Season 2 Effort | Total |
|---|---|---|---|
| Pit fall trap nights | 665 | 665 | 1330 |
| Funnel trap nights | 686 | 686 | 1372 |
| Box (Elliott) trap nights | 1120 | 1120 | 2240 |
| Ultrasonic (bat) detector nights | 9 | 10 | 19 |
| Acoustic detector nights | 7 | 6 | 13 |
| Camera Trap nights (trap sites + opportunistic) | 251 | 129 | 380 |
| Systematic bird census (minutes) | 855 | 1520 | 2375 |
| Foraging/spotlighting (minutes) | 4305 | 545 | 4850 |

### *4.2.1 Habitat Assessment*

The broad fauna habitats of the survey area were assessed, with a specific focus on identifying habitats that may support conservation significant vertebrate fauna. Habitats were identified in the field, based on visual assessment of landforms, vegetation, soil and other relevant habitat features, in addition to aerial photographs. Fauna habitat descriptions were made at each trap site and at representative locations throughout the survey area, during the first season of the survey. These sites within the survey area are mapped in Figure 4.2, with opportunistic assessments in the wider tenement shown in Figure 4.3, and coordinates listed in Appendix VIII and Appendix IX.

Fauna habitat data recorded at these sites included:

- Site name, date, photographs, central GPS coordinate
- Landform, slope, and aspect
- Notes on soil and rock cover
- Leaf litter cover and depth, presence of coarse woody debris and dead trees
- Broad description of floristic composition and vegetation structure
- Assessment of habitat suitability for species of conservation significance

Fauna habitats were assessed for the likelihood that they may support fauna of conservation significance and is discussed in Table 5.2.

### *4.2.2 Trap Sites*

Each trap site was established with the aim of targeting fauna within each microhabitat type present in the survey area. Microhabitats are driven by changes in landform, vegetation structure, soil type and fire history. Each trap site was open for a period of seven nights, and as per DBCA standard operating procedures, all traps were cleared within the first three hours after sunrise and were cleared again each afternoon.

As represented in Figure 4.4, a standard trap site typically consisted of six buckets (20 litres) and six pipes (which together formed a total of 12 pitfall traps) that are evenly distributed between two parallel 50 metre drift fences, spaced approximately 50 metres apart. Twelve funnel traps were also distributed along the fence lines, with six per line. At least one camera trap was deployed at each trap site. This setup was surrounded by a grid of 20 aluminium box traps (known as Elliott traps).

In some cases, such as trap site 8, due to microhabitat size or shape, the two trap lines were separated by a greater distance, for example trap line TS8A and trap line TS8B were 300 metres apart.

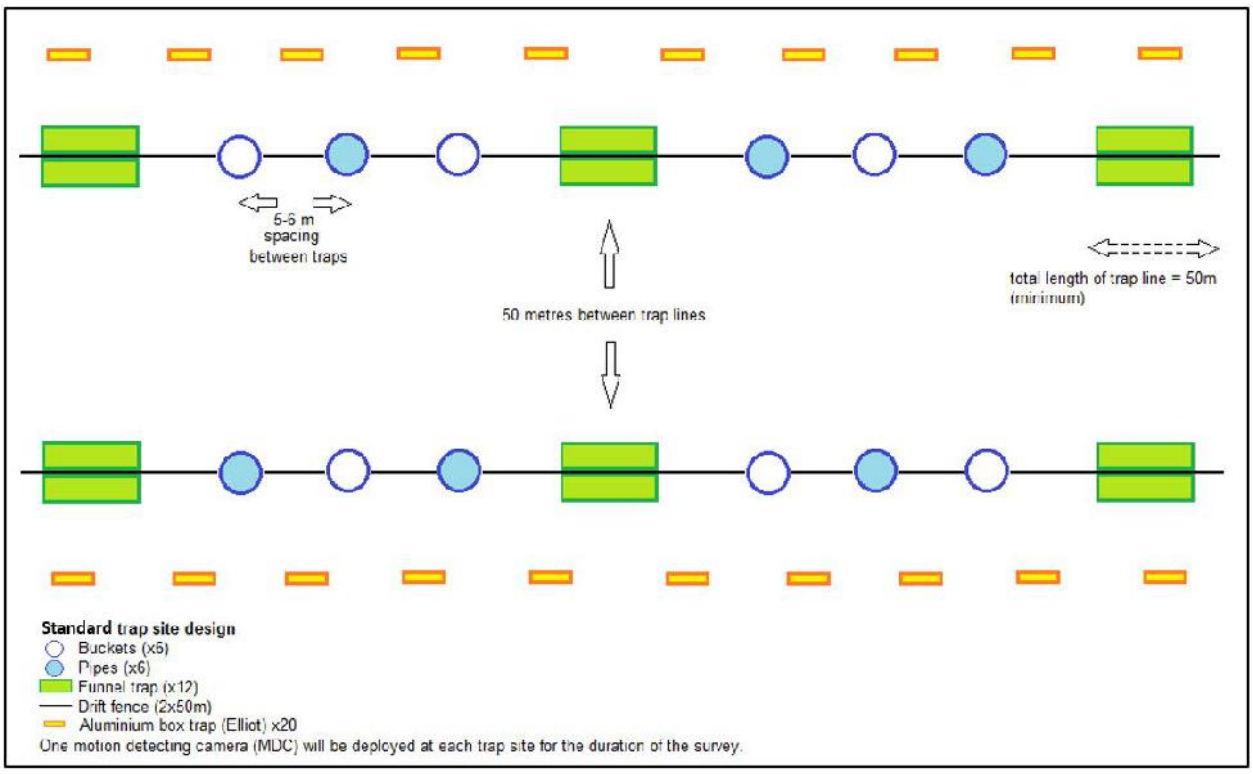



**Figure 4.4 Standard fauna trap site design.**

During the first survey season, eight trap sites were established based on satellite images and initial data from the first flora survey conducted by Rapallo shortly prior to the fauna survey. These same eight sites were also used in the second survey season. All trap site locations are displayed in Figure 4.1 with central coordinates provided in Appendix VIII.

### *4.2.3 Systematic bird census*

Birds were recorded both opportunistically and through systematic censuses at trap sites and other localities across the survey area. Bird census locations that are not at trapping sites are mapped in Figure 4.2 and Figure 4.3.

### *4.2.4 Opportunistic fauna records*

Opportunistic records of birds, mammals, and reptiles were taken across the survey area. Opportunistic records included direct sightings and calls, as well as secondary signs of presence such as tracks, scats, diggings, burrows, mounds, feathers, bones, and sloughed reptile skins.

All records were accompanied by a GPS waypoint and/or fauna habitat notes, in order to link species records to fauna habitats. Where records were of potential conservation significant species, photographs were taken, and GPS locations recorded.

### *4.2.5 Camera traps*

Camera traps, of the model Swift Enduro, were deployed at ten locations throughout the survey area over the two survey periods. Camera trap locations are mapped in Figure 4.2 and Figure 4.3, with

coordinates are listed in Appendix VIII. During the first season camera traps were deployed between the 30 August and 4 September 2023 and retrieved between 3 and on the 5 September 2023. During the second season camera traps were deployed between 30 April and 30 May 2024 and all retrieved on 4 and 5 May 2024. Fauna recorded on camera traps are included in the fauna list presented in Appendix V.

### *4.2.6 SM4 recorders for bats and night parrot*

Over the course of the two surveys, ultrasonic echolocation recorders were placed at a total of nine locations. Microbat calls were surveyed with Wildlife Acoustics SM4BAT-FS ultrasonic recorders, hereafter referred to as simply a SM4 ultrasonic recorder or SM4-U. During the first survey period, two recorders were moved between three locations for a period of 2 to 4 nights at a time. In the second survey period two recorders were deployed separately across three sites for a period of 2 to 5 nights each.

Night parrot calls were opportunistically surveyed using a Wildlife Acoustics SM4BAT-FS acoustic recorder, hereafter referred to as the SM4 acoustic recorder or SM4-A. Over both survey periods combined, a SM4-A recorded was deployed at three locations within the survey area within areas of mature spinifex habitat. During the first season, the SM4-A recorder was deployed at one location over a period of seven nights. During the second season, the SM4-A was deployed at two locations for over a period of three nights per site.

SM4-U and SM4-A locations are mapped in Figure 4.2 and Figure 4.3, with coordinates and deployment dates listed in Appendix VIII. After the field survey, recordings were analysed by Mr Bob Bullen of Bat Call WA. Bat calls were identified to full species level, where possible, with results returned as a list of species for each deployment location. Results are included in the fauna list presented in Appendix V.

## 4.3 Species richness estimators

Species accumulation curves for birds and trappable ground-dwelling fauna were generated via EstimateS software Version 9.1.0 (Copyright R. K. Colwell). Predicted species richness was calculated by taking the average of the estimators ACE, Chao 1, Jackknife 1 and Bootstrap (Colwell 2013).

Since models can only be generated from data collected through systematic methods, the species accumulation curve and predicted species richness were calculated from systematic trapping data and systematic bird surveys. Separate analyses were conducted for these two methods.

Predicted species richness of trappable ground-dwelling vertebrate fauna was calculated using the combined trapping data for mammals, amphibians and reptiles from all eight trap sites for the two-season fauna survey, with statistics calculated over abundance data (total number of captures per species at that site).

Predicted species richness of birds was calculated using data from systematic bird censuses only, with data entered as total abundance for each species per site. Analyses for both trappable ground-dwelling fauna and birds were run using the default settings with the following exceptions:

- Accumulations (runs) were randomised 10,000 times without replacement.
- Upper abundance limit for rare or infrequent species was set to three.

# 5 Results and discussion

## 5.1 Broad fauna habitats

Six broad fauna habitats were identified in the survey area: spinifex plains and rises, drainage, rocky hills, tussock grasslands, mulga woodlands, and disturbed habitats (Figure 5.1). These habitats were classified and identified based on topography, landforms, broad vegetation, soil type and surface substrate. These habitat classifications are also supported by data collected from a detailed flora and vegetation survey (Rapallo Environmental 2024a) that occurred during dates close to the detailed fauna surveys. The three most dominant fauna habitats within the survey area consists of spinifex plains and rises habitat at approximately 728.4 hectares, followed by mulga woodlands at approximately 605.1 hectares and tussock grasslands at approximately 528.6 hectares.

The broad fauna habitats recorded on the survey area were representative of the region, based on biogeography (section 2.3) and regional vegetation descriptions (section 2.4). Based on topographical mapping and aerial photography, the habitats appeared to extend outside of the survey area. Habitat condition for each habitat is described in Table 5.1.

Table 5.2 summarises the broad fauna habitats of the survey area and discusses the potential for conservation significant species to be present in these habitats and provides a likelihood rating based on the criteria listed in Appendix II. As requested by the client, Rapallo also opportunistically assessed habitats outside of the survey area in the broader exploration tenement. Any additional habitats that were recorded during this area presented in Table 5.3.

**Table 5.1 Fauna habitat condition descriptions, as per Thompson & Thompson (2010).**

| Habitat Condition | Description |
|---|---|
| High Quality Fauna Habitat | These areas closely approximate the vegetation mix and quality that would have been in the area prior to any human induced disturbance. The habitat has connectivity with other habitats and is likely to support the most natural vertebrate fauna assemblage. |
| Very Good Fauna Habitat | These areas show minimal signs of human induced disturbance (e.g. grazing, clearing, fragmentation, weeds) and retain almost all of the characteristics of the habitat had it not been disturbed. The habitat has connectivity with other habitats, and fauna assemblages in these areas are likely to be minimally affected by disturbance. |
| Good Fauna Habitat | These areas show signs of human induced disturbance (e.g. grazing, clearing, fragmentation, weeds) but generally retain many of the characteristics of the habitat had it not been disturbed. The habitat still retains some connectivity with other habitats but fauna assemblages in these areas are likely to be affected by disturbance. Fauna assemblages in these areas are likely to be similar to what might be expected in this habitat. |
| Disturbed Fauna Habitat | These areas show signs of human induced significant disturbance (e.g. mining, clearing, tracks and roads). Many of the trees, shrubs and undergrowth have died or have been cleared. These areas may be in the early succession and regeneration stages. Areas may show signs of significant grazing, contain an abundance of weeds or have been damaged by vehicles or machinery. Habitats are fragmented or have limited connectivity with other fauna habitats. Fauna assemblages in these areas are likely to differ significantly from what might be expected in the area had the disturbance not occurred. |
| Highly Degraded Fauna Habitat | These areas often have a significant human induced loss of vegetation, and / or many vehicle tracks and / or have been completely cleared, and / or areas have been heavily grazed or farmed. There is limited or no fauna habitat connectivity. Fauna assemblages in these areas are likely to differ significantly from what existed prior to the disturbance and are often depleted compared to what existed prior to the disturbance. |

## 5.2 Habitat 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). Continuous sources of food and moisture, and water provides opportunities for amphibians to forage and breed (James *et al.* 1995). To date there have not been any permanent or semi-permanent pools recorded from the survey area, although a potentially semi-permanent or ephemeral pool is located within the wider northern tenement. All creeks within the survey area have been dry during the survey periods.

Caves can be important features within a landscape, particularly in arid zone systems, often providing stable microclimates, shelter and protection for fauna species (Medellin et al. 2017). No caves were observed on the survey area, although some caves have been observed within the wider tenement.

**Table 5.2 Summary of broad fauna habitats sites recorded per mapped habitat.**

| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| ***Spinifex stony plains and rises***<br><br>**Broad condition:** Very Good<br><br>**Extent in survey area:** 728.4 hectares (34.8%)<br><br>**Habitat Assessment Sites:** SF camera RA20, GPS3 Wp 8515, R32, Parrot Box SF, RHQ35<br><br>**Trap Sites:** 3, 4, 7 | Spinifex stony plains and rises typically consists of low open woodland and/or open shrublands over a spinifex dominated hummock grass land with a soil surface cover of rock over sandy/loam soils. The topography of this habitat varies from flat plains to gently undulating rises bisected with minor drainage lines. Often there is a surface cover of stones, with loam – or loam like – soils underneath.<br><br>**Habitat complexity:** There are few sub-habitat types within this habitat, with sub-types based on the presence of woodland, mallees and/or shrubland densities. This habitat type may be bisected by minor drainage lines.<br><br>**Extent:** This is the dominant habitat present in the survey area and appears to extend outside of the survey area. This habitat type is common across the Pilbara region. | **Western pebble mound mouse**<br>**Signs of presence:** Pebble mounds.<br>**Evidence of food resources:** Yes, grasses with seeds and insects present.<br>**Could a population persist in this habitat:** Yes, multiple active and non-active mounds located.<br>**Habitat type:** Denning and foraging.<br><br>**Night parrot**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Seeding grasses and spinifex observed.<br>**Could a population persist in this habitat:** Unlikely, as habitat contains a higher density of trees and shrubs than what is preferred by this species (treeless plains) and lacks an easily accessible source of water. The night parrot is classified as unlikely to occur within the survey area (refer to Table 5.5).<br>**Habitat type:** Temporary roosting and foraging, noting that the night parrot is considered unlikely to occur in the survey area (refer to Table 5.5).<br><br>**Northern quoll**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small mammals (such as native mice) and small reptiles observed. |  <br>Photo: Near trap site 4<br>  <br>Photo: Trap site 7 |

| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| | | **Could a population persist in this habitat:** Unlikely to occur here long term due to minimal, or lack of, denning opportunities.<br>**Habitat type:** Foraging and dispersal.<br><br>**<u>Ghost bat:</u>**<br>**Signs of presence:** No obvious signs or calls detected at time of surveys.<br>**Evidence of food resources:** Multiple small bird, mammal and reptile species observed in this habitat type.<br>**Could a population persist in this habitat:** No, due to a lack of suitable caves present in this habitat, but it could be used for foraging.<br>**Habitat type:** Potential foraging and dispersal habitat.<br><br>**<u>Pilbara Leaf-nosed bat:</u>**<br>**Signs of presence:** No obvious signs or calls detected at time of surveys.<br>**Evidence of food resources:** Suitable invertebrates observed in this habitat type.<br>**Could a population persist in this habitat:** No, due to a lack of suitable caves present in this habitat, but it could be used for foraging.<br>**Habitat type:** Potential foraging habitat. |  <br>Photo: Trap site 3 |

| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| | | **<u>Grey falcon</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small reptiles and birds observed.<br>**Could a population persist in this habitat:** No, due to a typical lack of tall trees for nesting, although habitat could be used for foraging.<br>**Habitat type:** Potential foraging and dispersal habitat.<br><br>**<u>Brush-tailed mulgara</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small reptiles, small mammal and large invertebrates observed.<br>**Could a population persist in this habitat:** Potentially if feral predators such as cats were controlled.<br>**Habitat type:** Potential foraging and burrowing habitat. | |

| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| ***Mulga woodlands***<br><br>**Broad condition:** Very Good<br><br>**Extent in survey area**: 605.1 hectares (28.9%)<br><br>**Habitat Assessment Sites:** RHQ31, RHR03<br><br>**Trap Sites:** 1, 5 | The mulga woodland habitat is dominated by mulga, and/or allied *Acacia* species. Grasses are the present in typically low quantities at the ground layer of vegetation. These grasses may vary between hummock forming spinifex and tussock grasses. The topography of this habitat type is often flat to gently undulating, with clay-based soils and patches of sandy loam with patchily distributed surface pebbles.<br><br>**Habitat complexity:** This habitat type is simple, with sub habitats based on mulga densities and whether it presents as strongly banded or unbanded mulga.<br><br>**Extent:** This is the second most dominant habitat type of the survey area and appears to extend outside of this area. Mulga woodlands are a common habitat type across the Pilbara region. | **<u>Greater bilby</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys**.**<br>**Evidence of food resources:** Acacia roots are often home to various species of grubs and larvae which are eaten by bilby.<br>**Could a population persist in this habitat:** Potentially if feral predators such as cats were controlled, although the greater bilby is classified as unlikely to occur within the survey area (refer to Table 5.5).<br>**Habitat type:** Foraging and burrowing.<br><br>**<u>Northern quoll</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small mammals (such as native mice) and small reptiles observed.<br>**Could a population persist in this habitat:** Unlikely to occur here long term due to a typical lack of denning opportunities.<br>**Habitat type:** Foraging and dispersal.<br><br>**<u>Brush-tailed mulgara</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small reptiles, small mammal and large invertebrates observed.<br>**Could a population persist in this habitat:** Potentially if feral predators such as cats were controlled. |  <br>Photo: Trap site 1<br><br>  <br>Photo: Qy77 (survey 1) |

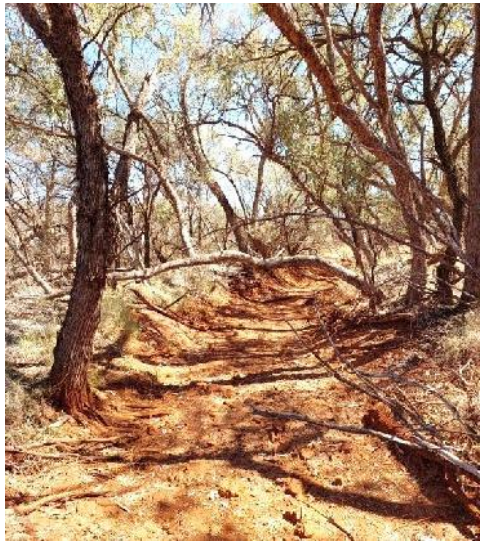
| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| | | **Habitat type:** Potential foraging and burrowing habitat.<br><br>**<u>Ghost bat:</u>**<br>**Signs of presence:** No obvious signs or calls detected at time of surveys.<br>**Evidence of food resources:** Multiple small bird, mammal and reptile species observed in this habitat type.<br>**Could a population persist in this habitat:** No, due to a lack of suitable caves present in this habitat, but it could be used for foraging.<br>**Habitat type:** Potential foraging habitat. |  <br>Photo: Qy62 (survey 1) |
| ***Tussock grassland***<br><br>**Broad condition:** Good<br><br>**Extent in survey area:** 548.6 hectares (25.2%)<br><br>**Habitat Assessment Sites**: GPS11 WP001<br><br>**Trap Sites:** 8 | This habitat is topographically flat and is visibly dominated by tussock grasses, with the occasional spinifex hummocks, if any. The upper layers of vegetation in this habitat predominantly consist of sparse mulga or small patches of occasional shrubs. The substrate is typically a hard clay-based soil, with few to no surface stones present.<br><br>**Habitat complexity:** Habitat is simple with few sub-types present.<br><br>**Extent:** This is the third most dominant habitat present in the survey area. This habitat type is only present in the southern survey area, although does | **<u>Grey falcon</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small reptiles and birds observed.<br>**Could a population persist in this habitat:** No, due to a typical lack of tall trees for nesting, although habitat could be used for foraging.<br>**Habitat type:** Potential foraging habitat.<br>**<u>Migratory birds</u>**<br>**Signs of presence:** No obvious signs detected at the time of surveys<br>**Could a population persist in this habitat:** This habitat may be used sporadically during times of high rainfall by some migratory bird species such as sandpipers and stints.<br>**Habitat type:** Potential foraging habitat |  <br>Photo: Trap site 8 |

| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| | appear to extend outside of the survey area borders. | **<u>Northern quoll</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small mammals (such as native mice) and small reptiles observed.<br>**Could a population persist in this habitat:** Unlikely to occur here long term due to a typical lack of denning opportunities.<br>**Habitat type:** Foraging and dispersal.<br><br>**<u>Pilbara Leaf-nosed bat:</u>**<br>**Signs of presence:** No obvious signs or calls detected at time of surveys.<br>**Evidence of food resources:** Suitable invertebrates observed in this habitat type.<br>**Could a population persist in this habitat:** No, due to a lack of suitable caves present in this habitat, but it could be used for foraging.<br>**Habitat type:** Potential foraging habitat. |  <br>Photo: GPS11-009 Opp Bird |

| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| ***Rocky hill***<br><br>***Broad condition:***<br>Very good to high quality habitat<br><br>**Extent in survey area:** 163.3 hectares (7.8%)<br><br>**Habitat Assessment Sites:** RA19, Jk HA 1<br><br>**Trap Sites:** 6 | This habitat is characterised by hill landforms, often dominated by spinifex, with sparse to open eucalyptus woodland and sparse shrubs. This habitat type also often contains minor rocky drainage gullies along the slope of the hill landforms, which contain mixed shrubs. Surface substrate typically consists of stones varying in size from gravel to boulder sized or larger rocks as seen in the representative photographs.<br><br>**Habitat complexity:** Few sub-habitats are present within this habitat type, which is bisected with minor drainage.<br><br>**Extent:** This habitat type is the second smallest habitat in the survey area, although it is common throughout the Pilbara region and extends outside of the survey area. | **<u>Western pebble-mound mouse</u>**<br>**Signs of presence:** Pebble mounds<br>**Evidence of food resources:** Yes, grasses with seeds and insects present.<br>**Could a population persist in this habitat:** Yes, multiple active and non-active mounds located.<br>**Habitat type:** Denning and foraging<br><br>**<u>Long-tailed dunnart</u>**<br>**Signs of presence:** Observed on camera trap<br>**Evidence of food resources:** Yes, invertebrates observed in this habitat type<br>**Could a population persist in this habitat:** Yes.<br>**Habitat type:** Denning and foraging<br><br>**<u>Gane's blind snake</u>**<br>**Signs of presence:** Individual observed during spotlighting activities as part of a following targeted fauna survey (Rapallo Environmental 2025)<br>**Evidence of food resources:** Yes, ants and sometimes termites present in this habitat type.<br>**Could a population persist in this habitat:** Yes, as indicated by mature individual observed.<br>**Habitat type:** Foraging and shelter<br><br>**<u>Pilbara olive python</u>**<br>**Signs of presence:** Sloughed skin (survey 1, 2023)<br>**Evidence of food resources:** Small mammals (such as native mice, rock rats and |  <br>Photo: Sax, Opportunistic (season 2)<br>  <br>Photo: QY50 (season 1) |

| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| | | pseudantechinus), small reptiles and birds observed. Scats of macropods also recorded.<br>**Could a population persist in this habitat:** Potentially at very low densities due to a lack of long-term water bodies in the survey area.<br>**Habitat type:** Predominantly foraging and dispersal habitat. Cracks, crevices and holes present in this habitat may provide shelter during the cooler months.<br><br>**<u>Northern quoll</u>**<br>**Signs of presence:** No obvious signs detected at the time of surveys<br>**Evidence of food resources:** Small mammals (such as native mice, rock rats and pseudantechinus), small reptiles and fruiting Ficus plants observed.<br>**Could a population persist in this habitat:** It is possible a small population could persist in this habitat type in the survey area if feral predators such as cats were adequately managed.<br>**Habitat type:** Predominantly foraging habitat with the potential for shelter within the minor gullies (although observed holes and crevices appeared to be shallow).<br><br>**<u>Ghost bat:</u>**<br>**Signs of presence:** No obvious signs or calls detected at time of surveys.<br>**Evidence of food resources:** Multiple small bird, mammal and reptile species observed in this habitat type. |  <br>Photo: Qy13 (season 1) |

| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| | | **Could a population persist in this habitat:** No, due to a lack of suitable caves present in this habitat, but it could be used for foraging.<br>**Habitat type:** Potential foraging habitat.<br><br>**<u>Grey falcon</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small reptiles and birds observed.<br>**Could a population persist in this habitat:** No, due to a typical lack of tall trees for nesting, although habitat could be used for foraging.<br>**Habitat type:** Potential foraging habitat.<br><br>**<u>Pilbara olive python</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small mammals (such as native mice), small reptiles and birds observed.<br>**Could a population persist in this habitat:** Potentially at very low densities due to a lack of long-term water bodies in the survey area.<br>**Habitat type:** Predominantly foraging and dispersal habitat.<br><br>**<u>Pilbara barking gecko</u>**<br>**Signs of presence:** No obvious signs detected at the time of surveys | |

| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| | | **Evidence of food resources:** Yes, invertebrates observed in this habitat type<br>**Could a population persist in this habitat:** Yes, habitat seems suitable based on information available on this species<br>**Habitat type:** Foraging | |
| ***Drainage***<br><br>**Broad condition:** Very Good<br><br>**Extent in survey area:** 66.37 hectares (3.2%)<br><br>**Habitat Assessment Sites:** Schembri HA 1, SM4-U + camera site, Hill Drainage<br><br>**Trap Sites:** 2 | Within the survey area, this habitat was often a combination of non-incised and incised drainage. Vegetation and substrates of this habitat are variable, but most often consisted of more clay-based soils and dense vegetation comprising of Acacias or Mulga, with an understory dominated by tussock grasses and/or mixed shrubs. The survey area did not contain major drainages, such as rivers, although these were observed opportunistically in the wider tenements.<br><br>**Habitat complexity:** Some sub habitats are present within this habitat type, such as incised creek lines as most commonly seen in the Northern survey area, or non-incised areas of drainage at the bottom of hills as seen south of Round Hill in the survey area. Some drainages may vary between the two as seen in the northern part of the Southern Survey area.<br><br>**Extent:** This is the smallest, least dominant fauna habitat present in the | **<u>Brush-tailed mulgara</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys<br>**Evidence of food resources:** Small reptiles, small mammal and large invertebrates observed.<br>**Could a population persist in this habitat:** Potentially if feral predators such as cats were controlled.<br>**Habitat type:** Potential foraging habitat when next to spinifex hummock grasslands.<br><br>**<u>Northern quoll</u>**<br>**Signs of presence:** No obvious signs detected at the time of surveys<br>**Evidence of food resources:** Small mammals (such as native mice) and small reptiles observed.<br>**Could a population persist in this habitat:** Unlikely to have quolls on a long-term basis in this habitat type as it has limited to no denning opportunities.<br>**Habitat type:** Potential foraging and dispersal habitat when in proximity to rocky hill habitat. |  <br>Photo: Schembri HA 1 (Survey 1) |

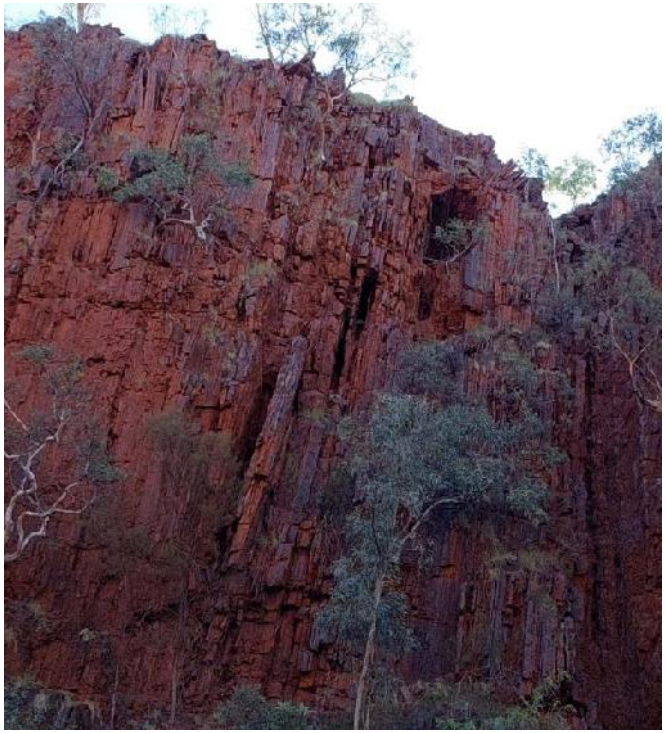
| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| | survey area. Drainages extend outside of the survey area. | **Ghost bat:**<br>**Signs of presence:** No obvious signs detected at time of surveys<br>**Evidence of food resources:** multiple small bird, small mammal and reptile species observed in this habitat type<br>**Could a population persist in this habitat:** No, due to a lack of suitable caves present in this habitat, but it could be used for foraging.<br>**Habitat type:** Potential foraging habitat<br><br>**Pilbara Leaf-nosed bat:**<br>**Signs of presence:** No obvious signs or calls detected at time of surveys.<br>**Evidence of food resources:** Suitable invertebrates observed in this habitat type.<br>**Could a population persist in this habitat:** No, due to a lack of suitable caves present in this habitat, but it could be used for foraging.<br>**Habitat type:** Potential foraging habitat.<br><br>**Gane's blind snake**<br>**Signs of presence:** No obvious signs of this species in this habitat type during the survey<br>**Evidence of food resources:** Yes, ants and termites present in this habitat type.<br>**Could a population persist in this habitat:** Yes, it could be possible for a population to potentially persist in this habitat type.<br>**Habitat type:** Foraging and shelter |  <br>Photo: Qy14, West Creek (Survey 1)<br>  <br>Photo: SM4-U + Camera site (Survey 1) |

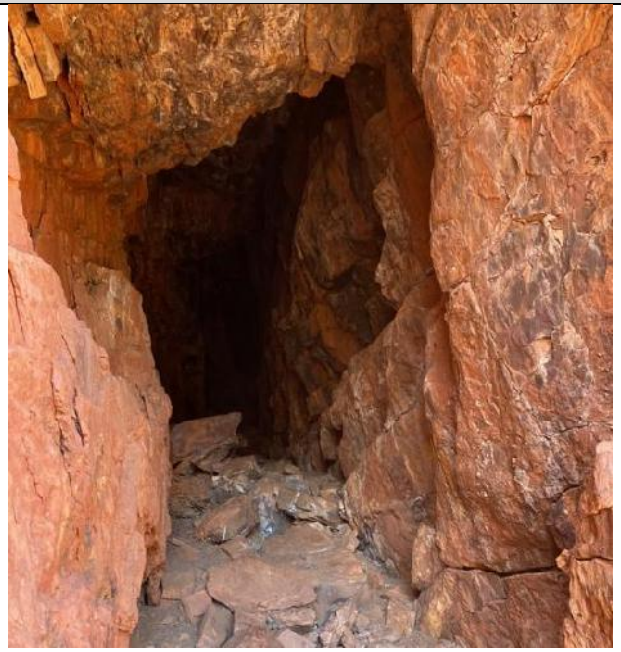
| Within Survey Area | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Suitability of habitat for conservation significant species** | **Representative Photograph** |
| | | **<u>Grey falcon</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys.<br>**Evidence of food resources:** Small reptiles and birds observed.<br>**Could a population persist in this habitat:** No, due to a typical lack of tall trees for nesting within the drainage habitat of the survey area, although habitat could be used for foraging.<br>**Habitat type:** Potential foraging habitat. | |
| ***Cleared / heavily disturbed***<br><br>**Broad condition:** Highly degraded<br><br>**Extent in survey area:** 3.3 hectares (0.2%)<br><br>**Habitat Assessment Sites**:<br>NIL<br>**Trap Sites:** N/A | This habitat is characterised by heavy clearing and infrastructure, such as bituminised roads.<br><br>**Habitat complexity:** This habitat is simple.<br><br>**Extent:** This habitat extends outside of the survey area. | Unlikely for conservation significant fauna to persist in this area. |  <br>Photo: Google Image streetview (2014) within heavily disturbed habitat in the survey area (-23.1977, 119.4579) |

**Table 5.3 Habitats that were opportunistically recorded within the wider exploration tenement (outside survey area), that were not observed within the survey area.**

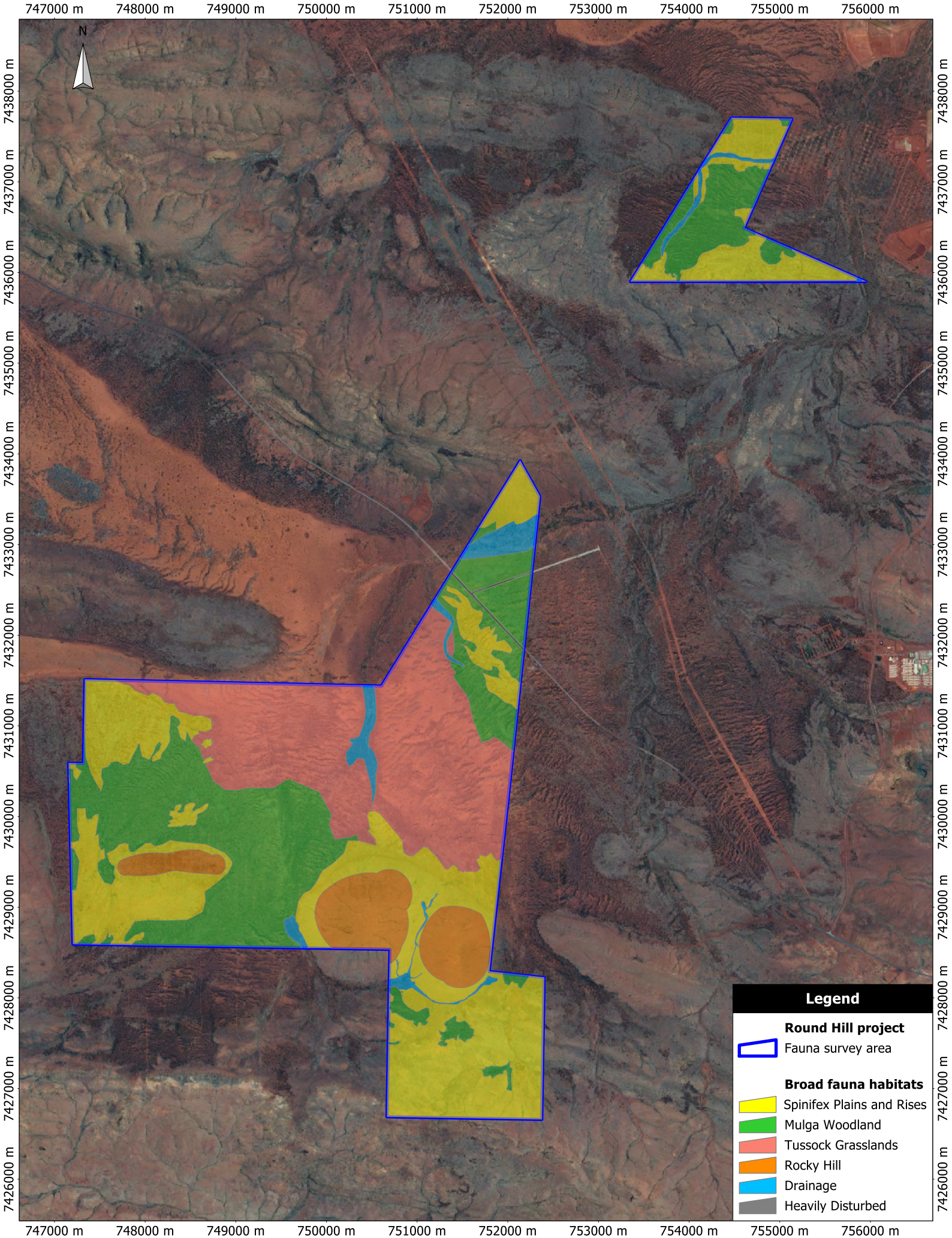
| Additional Habitats (outside survey area) | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Conservation significant species notes** | **Representative Photograph** |
| ***Major drainage gullies*** | This habitat type refers to areas where a major drainage channel occurs within the bottom of a rocky gully system. Water bodies may be ephemeral or semi-permanent in the deeper parts of the drainage channel. Water was present at one site during both Round Hill survey seasons. Large eucalyptus trees, likely *Eucalyptus victr*ix, are often present along the edges or within the path of the drainage channel.<br><br>Ficus have been observed growing within the rocky walls of these major drainage gullies, which also contain various sized holes, cracks, crevices and caves that can provide shelter for fauna.<br><br>**Habitat complexity:** There are few sub-habitat types within this habitat, and this habitat type will often border with rocky breakaways and outcrop habitats.<br><br>**Extent:** This habitat type was not observed within the primary survey area but is present within the wider exploration tenement and regionally. | **<u>Pilbara olive python</u>**<br>**Signs of presence:** No obvious signs observed at time of detailed fauna surveys<br>**Evidence of food resources:** Fish, frogs, small birds and rock wallabies have been observed in this habitat<br>**Could a population persist in this habitat:** Yes<br>**Habitat type:** Foraging and shelter<br><br>**<u>Northern quoll</u>**<br>**Signs of presence:** No obvious signs detected at time of detailed surveys<br>**Evidence of food resources:** Small reptiles and fruiting Ficus plants observed in habitat type.<br>**Could a population persist in this habitat:** Yes<br>**Habitat type:** Foraging and denning<br><br>**<u>Grey falcon</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys<br>**Evidence of food resources:** Small reptiles and birds observed.<br>**Could a population persist in this habitat:** Yes |  <br>Photo: Op cam45 (season 1)<br>  <br>Photo: Rubella – Kalgan Waterhole opportunistic (season 2) |

| Additional Habitats (outside survey area) | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Conservation significant species notes** | **Representative Photograph** |
| | | **Habitat type:** Nesting habitat (tall trees present with suitable sized nests left from other bird species) and potential foraging habitat |  Photo: Qy42 (season 1) |

| Additional Habitats (outside survey area) | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Conservation significant species notes** | **Representative Photograph** |
| ***Caves*** | Although not a broad habitat, cave habitats consist of natural chambers that occur typically in a hillside, cliff or rocky breakaway. These were opportunistically observed within the wider tenement. It is suggested that cave searches and assessments are completed prior to works being competed in the wider tenements due to there being known conservation significant bat species in present within 50 km of the tenements.<br><br>Caves in the wider tenement were not formally assessed for conservation significant bat roosting suitability during the detailed vertebrate survey as they were outside of the main survey area.<br><br>**Habitat complexity:** There are few to no sub-habitat types recorded for this type of habitat, although the caves themselves may vary in terms of size, depth, internal humidity and complexity.<br><br>**Extent:** This habitat type was not observed within the primary survey area but is present within the wider exploration tenement. | **Ghost bat**<br>**Signs of presence:** No obvious signs opportunistically observed, although ghost bats have been recorded within the region.<br>**Evidence of food resources:** Birds, small reptiles and small bats have observed in proximity this habitat type<br>**Could a population persist in this habitat:** If a suitable diurnal roost is present, yes.<br>**Habitat type:** Shelter<br><br>**Pilbara leaf-nosed bat**<br>**Signs of presence:** No obvious signs observed, although these bats have been recorded within the region.<br>**Evidence of food resources:** Invertebrates such as moths, beetles and other bugs have observed in proximity this habitat type<br>**Could a population persist in this habitat:** If a suitable diurnal roost is present, yes.<br>**Habitat type:** Shelter<br><br>**Pilbara olive python**<br>**Signs of presence:** No obvious signs observed at time of surveys<br>**Evidence of food resources:** Rock wallabies and signs of macropod activity have been observed in this habitat<br>**Could a population persist in this habitat:** Yes, dependant on distance to water<br>**Habitat type:** Shelter |  <br>Photo: Gorge Caves, Point mapping (season 2) |

| Additional Habitats (outside survey area) | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Conservation significant species notes** | **Representative Photograph** |
| | | **<u>Northern quoll</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys<br>**Evidence of food resources:** Small reptiles and fruiting Ficus plants observed in proximity to this habitat type.<br>**Could a population persist in this habitat:** Yes<br>**Habitat type:** Denning and shelter |  <br>Photo: HA9 (season 1) |

| Additional Habitats (outside survey area) | | | |
|---|---|---|---|
| **Broad fauna habitat** | **Description** | **Conservation significant species notes** | **Representative Photograph** |
| ***Rocky outcrops and breakaways*** | Although similar to the rocky hill habitat observed in the survey area, the rocky outcrops and breakaways habitat has steeper slopes and often consist of larger continuous solid rock structures, as well has larger boulder sized rocks, as seen in the representative images. This habitat type often contains caves of various sizes, as well as a high proportion of holes, cracks and crevices that can provide shelter to fauna.<br><br>**Habitat complexity:** Habitat type is simple with few sub-habitats present. Often borders gullies and drainage related habitat types.<br><br>**Extent:** This habitat type was not observed within the primary survey area but is present within the wider exploration tenement. | **<u>Pilbara olive python</u>**<br>**Signs of presence:** No obvious signs observed at time of surveys<br>**Evidence of food resources:** Rock wallabies and signs of macropod activity have been observed in this habitat<br>**Could a population persist in this habitat:** Yes, depending on distance to water<br>**Habitat type:** Shelter<br><br>**<u>Northern quoll</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys<br>**Evidence of food resources:** Small reptiles, small mammals (or signs of) and fruiting Ficus plants observed in this habitat type.<br>**Could a population persist in this habitat:** Yes<br>**Habitat type:** Denning and foraging<br><br>**<u>Long-tailed dunnart</u>**<br>**Signs of presence:** No obvious signs detected at time of surveys<br>**Evidence of food resources:** Yes, invertebrates observed in this habitat type<br>**Could a population persist in this habitat:** Potentially<br>**Habitat type:** Denning and foraging |  <br>Photo: JK HA Gun5 (season 1)<br>  <br>Photo: HA12 'The Gorge' (season 1) |




Rapallo environmental

Hanroy / Hancock Prospecting
Round Hill
Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4
Scale: 1:50,000
Datum: MGA94 Zone 50

0 1.5 km

**Figure 5.1**

Broad fauna habitats of the Round Hill survey area

## 5.3 Fauna assemblage

In total 171 vertebrate species were detected across both survey seasons, including 83 bird species, 26 mammal species, 60 reptile species, and two amphibians which are representative of fauna of the Eremaean bioregion.

The first survey season recorded a total of 140 species while the second survey detected 139 species. There is an increase in the number of bird species identified in the second survey season (76) compared to the first season (66) which can likely be attributed to the increased rainfall in the months prior to the second season compared to the first (Figure 2.1). Fauna results are presented in Appendix V, summarised in Table 5.4 below and discussed in the text below.

**Table 5.4 Summary of the number of vertebrate fauna species recorded from Round Hill over the dual season detailed fauna survey.**

| Class | Season 1 | Season 2 | Total Species |
|---|---|---|---|
| Birds | 66 | 76 | 83 |
| Mammals | 24 | 20 | 26 |
| Reptiles | 49 | 41 | 60 |
| Amphibians | 1 | 2 | 2 |
| **Totals** | **140** | **139** | **171** |

The site with the highest number of species was trap site 3 with 51 species, while trap sites 4 and 1 had the lowest number of species with 32 and 33 species recorded respectively. These species were recorded across various survey activities at the trap sites such as systematic trapping, camera traps, spot lighting, opportunistic sightings, and systematic bird censuses.

### *5.3.1 Birds*

Birds were the most frequently observed and most diverse fauna group, with 1004 records representing 82 bird species from 35 families. During the first survey season 66 species were recorded, while 75 species were recorded during the second season. A total of 58 species were common across both seasons. No conservation significant species were observed at the Round Hill survey area during either survey phase.

Overall, the systematic bird surveys detected 75 species, and 75 species were also recorded opportunistically. Eight species were only detected during the timed bird censuses, while eight other species were also only recorded opportunistically. The remaining species were recorded using both methods.

The most frequently occurring bird species during the surveys was the budgerigar (*Melopsittacus undulatus*), followed by Australian zebra finch (*Taeniopygia castanotis*), and the Torresian crow (*Corvus orru*). The most diverse bird families present were Accipitridae (small to large birds of prey with strongly hooked bills) and Meliphagidae (honeyeaters) with eight species each, followed by Artamidae (woodswallows & Cracticids) and Maluridae (Australasian wrens) with six species each, as well as Acanthizidae (Australian warblers) and Columbidae (doves & pigeons) with five species each recorded in the survey area. All remaining avian families identified during the surveys had between one to three species each.

Bird diversity was lower than predicted from the desktop study, which listed 217 bird species for the region (section 3.2). However, the survey area did not contain suitable habitats for each of these regional

species. For example, there was no available habitat present within the survey area for marine based species. Some species on the desktop list are also migratory or respond to climatic conditions, such as high rainfall. There was no high rainfall in the time immediately prior to either survey season occurring, although there is an increase in the number of species detected between the first and second survey which may be a result of the higher than average rainfall in early – mid March 2024 prior to the second survey in late April – early May 2024.

### *5.3.2 Mammals*

A total of 26 mammal species from 11 families were recorded across both surveys, with 24 species recorded in the first survey and 20 species recorded in the second survey. A total of 17 species recorded in both surveys, with seven species only observed during the first season and three only observed during the second survey. Camera traps and opportunistic records recorded the highest number of mammal species with 9 species each, followed trapping activities which detected seven mammal species.

Two conservation significant mammals were recorded over the course of the two surveys: the western pebble-mound mouse, (*Pseudomys chapmani*) (Priority 4 - DBCA), long-tailed dunnart (*Antechinomys longicaudata*) (Priority 4 - DBCA). The pebble mound mouse was recorded based on observations of their pebble mound structures which this species builds over their dens. These were most often encountered in rocky hill habitats and in areas of stony plains and rises habitats that were close to the rocky hill habitat during active searches or while otherwise traversing these habitats during other survey activities. The long-tailed dunnart was only detected once during the surveys via a camera trap at trap site 6 during the first survey phase.

All mammal species recorded during the survey were also present in the desktop results, although mammal diversity was lower than predicted from the desktop study, which lists 44 mammal species recorded previously within 50 kilometres of the survey area (Appendix III). This is partially due to the survey area not containing suitable habitat for a number of these species, such as deep humid caves for ghost bat for example, and distributions of fauna can be patchy within their known ranges.

Dasyuridae (carnivorous marsupials) were the most detected family of mammal in each survey and overall, with a total of 109 individuals recorded across six species, followed by Muridae (rodents) with 90 individuals recorded across five species. The two most recorded dasyurids were Woolley's pseudantechinus (*Pseudantechinus woolleyae*) and the kaluta (*Dasykaluta rosamondae*), with 65 and 26 individuals recorded respectively. Woolley's pseudantechinus was detected the most via camera traps, while kalutas were most often encountered through trapping activities at trap sites 3 and 7. The two most recorded rodent species were the common rock rat (*Zyzomys argurus*) with 44 individual records and the sandy inland mouse (*Pseudomys hermannsburgensis*) with 19 individuals recorded. The rock rat was only recorded through camera trapping within the rocky hill habitat, while the sandy inland mouse was typically found during trapping activities. A single introduced Muridae species, the house mouse (*Mus musculus*) was also recorded once, during trapping activities at trap site 5 in the second survey.

The most diverse mammal group were bats, with seven species from six genera and four family groups detected over both survey seasons. All seven species were detected during the first survey and five species were detected during the second survey. Two species, common sheath-tailed bat (*Taphozous georgianus*) and the lesser long-eared bat (*Nyctophilus geoffroyi geoffroyi*) were only detected in the first survey season. No conservation significant bats were detected during the survey periods.

Systematic captures of small mammals were dominated by dasyurids and native mice. The three most abundant mammal species during trapping were the kaluta with 20 individuals captured, followed by the

sandy inland mouse with 15 records, and the desert mouse (*Pseudomys desertor*) with 10 records. No conservation significant mammals were recorded through systematic trapping. Captures of these two mammal groups were similar between survey seasons with 15 dasyurids captured in season one and 23 in season two, and 18 Muridae trapped in the first survey while 13 were trapped in the second survey. During the first survey, two Ooldea dunnarts (*Sminthopsis ooldea*) were captured during trapping activities, once at trap site 4 and once at trap site 3. Although it is a species of least concern under the BC Act and EPBC Act, Ooldea dunnarts are considered to be uncommon at locations where it is known to occur (Van Dyck & Strahan 2008), and are typically rarely caught (Gibson & McKenzie 2009). They are primarily found in Mulga shrublands and woodlands with a tussock grass understory, and are also found, less commonly, in dunes and sandplains with extensive shrublands with *Triodia* hummock grasslands (Van Dyck & Strahan 2008).

Four introduced (feral) mammal species were recorded during the surveys. These were the European cow (*Bos primigenius taurus*), dromedary camel (*Camelus dromedarius*), feral cat (*Felis catus*) and house mouse (*Mus musculus*). All of these species were also identified in the desktop results, and so no further introduced species have been added. For species listings as per the Western Australian Organism List (Department of Primary Industries and Regional Development 2024), see Table 3.3 in section 3.2.2.

### *5.3.3 Reptiles*

A total of 60 reptile species from nine families were recorded during the Round Hill Survey. During the first survey period 49 reptile species were recorded, while the second survey period recorded 41 reptile species (Table 5.4). Thirty reptile species were common across both surveys, while 19 were only recorded in the first survey and 11 were only recorded in the second survey. The desktop study indicated a total of 121 reptile species within 50 kilometres of the survey area. However, the survey area does not contain suitable habitat for every one of these species.

The reptile assemblage consisted of 22 skink species, 12 gecko species (which includes six Diplodactylidae and six Gekkonidae), 10 varanid species, five pygopod species, five agamid species, five species of elapid snake, three species of python and one species of blind snake (Typhlopidae). The most recorded reptile species were the leopard skink (*Ctenotus pantherinus*) with 30 records, followed by the rock ctenotus (*Ctenotus saxatilis*) and spotted Pilbara rock gehyra (*Gehyra punctata*) with 27 records each. The three most recorded skink species were the leopard skink and rock ctenotus, as stated above, followed by the barred wedge-snout ctenotus (*Ctenotus schomburgkii*) with 24 records and the clay-soil ctenotus (*Ctenotus helenae*) with 13 records. The most common gecko species were the spotted Pilbara rock gehyra, as stated above, the western beaked gecko (*Rhynchoedura ornata*) with 14 records, as well as Bynoe's gecko (*Heteronotia binoei*) and the variegated gehyra (*Gehyra variegata*) with 12 records each. The highest number of reptile species were detected during trapping activities (35 species), followed by active foraging (34 species) and opportunistic sightings (26 species).

The highest reptile species richness was recorded at trap site 7 with 16 species, followed by trap site 3 with 14 reptile species. The lowest species richness was recorded at trap site 8 with six species. Trap site 8 was located within the tussock grassland habitat, which had minimal ground cover, sparsely spread shrubs and trees, with ground that is difficult to dig into. The combination of these features results in an area with reduced places for reptiles to hide from predators such as birds of prey and mammals such as kaluta, making it unfavourable for various species.

One conservation significant reptile species, the Pilbara olive python (*Liasis olivaceus barroni*) which is listed as vulnerable under both state and federal legislation was recorded during the surveys. A sloughed

skink was located at the base of Round Hill, as shown in Figure 5.5 and Table 5.6. The species identification from this skin was confirmed by two herpetologists.

### *5.3.4 Amphibians*

Amphibian diversity was low with a total of two species recorded in total. One species (desert tree frog *(Litoria rubella)*) was recorded during both survey seasons, while the shoemaker frog (*Neobatrachus sutor*) was recorded in season two only.

The desert tree frog was only recorded within the wider exploration tenement at a site that had a body of water present during both surveys. The shoemaker frog on the other hand was recorded within the survey area as juveniles in a large puddle that was present near track 2.

The desktop study identified five possible amphibian species that occur within 50 kilometres of the survey area. The desktop had an additional four species that were not recorded during this the detailed fauna survey, while the Rapallo survey also identified one species (shoemaker frog) that was not within the desktop. The amphibian diversity during the surveys was likely lower than the predicted diversity from the desktop due to a lack of rain fall immediately prior to the surveys. The last rainfall that was recorded at Newman Aero (BOM station 7176) prior to the first survey season was 8.8 millimetres in mid-June 2023, two months before the survey, while 0.2 millimetres of rain that fell on both the 10$^{th}$ and the 11$^{th}$ April 2024, 12 days prior to the second survey season, with a total of 102.0 millimetres of rainfall occurring between 3$^{rd}$ – 15$^{th}$ March 2024 prior to that.

All the amphibian species listed in the desktop survey for Round Hill require a body of water during their breeding cycle, such as a creek, pool, flooded ditch, inundated clay pans or other temporary pools. Only one temporary water source, a puddle of water in a potential old sump hole along track 2, was recorded within the survey area during the second survey season. It contained juvenile shoemaker frogs that were in the process of metamorphosis. This puddle proceeded to dry out over the course of the survey and was not present by the end of it. At least one larger water body is present within the wider tenements which may be more suitable for further amphibian species to those recorded during the surveys.

### *5.3.5 Species richness estimators*

To provide an indication of survey completeness, the software program EstimateS (Version 9.1.0) (Colwell 2013) was used to generate species accumulation curves and to calculate predicted species richness. Species accumulation curves represent a theoretical model of the relationship between survey effort and species accumulation: as the number of individuals recorded during the survey increases, the accumulation of fauna species decreases until the curve reaches an asymptote (Gotelli & Colwell 2011).

Since models can only be generated from data collected through systematic methods, the species accumulation curve and predicted species richness were calculated from systematic trapping data, and from systematic bird surveys. Separate analyses were conducted for these two methods.

#### 5.3.5.1 Species accumulation curve for trapping data

The species accumulation curve for trapping data is presented in Figure 5.2, plotting the number of fauna species recorded (y-axis) against the number of individual animals captured in traps (x-axis). Observed species richness is presented as a sample-based rarefaction curve, computing the mean number of fauna species (S(est)) over all possible combinations of 1, 2, and up to 270 individuals captured (Colwell *et al.* 2012). The analysis was conducted on species abundance data (total number of individuals recorded for

each species), with 10,000 accumulations (runs) that were randomised without replacement, and an upper abundance limit for rare or infrequent species set to 3. Predicted species richness was calculated by taking the average of the estimators ACE, Chao 1, Jackknife 1, and Bootstrap, as appropriate for abundance data (Colwell 2013).

Systematic trapping recorded 43 species. The average predicted species richness for trappable ground-dwelling fauna was 51 species, which indicates that 84% of the (estimated) trappable fauna had been captured during the survey. This is reflected in the species accumulation curve, which after 270 individuals captured has not started to approach an asymptote (Figure 5.2).

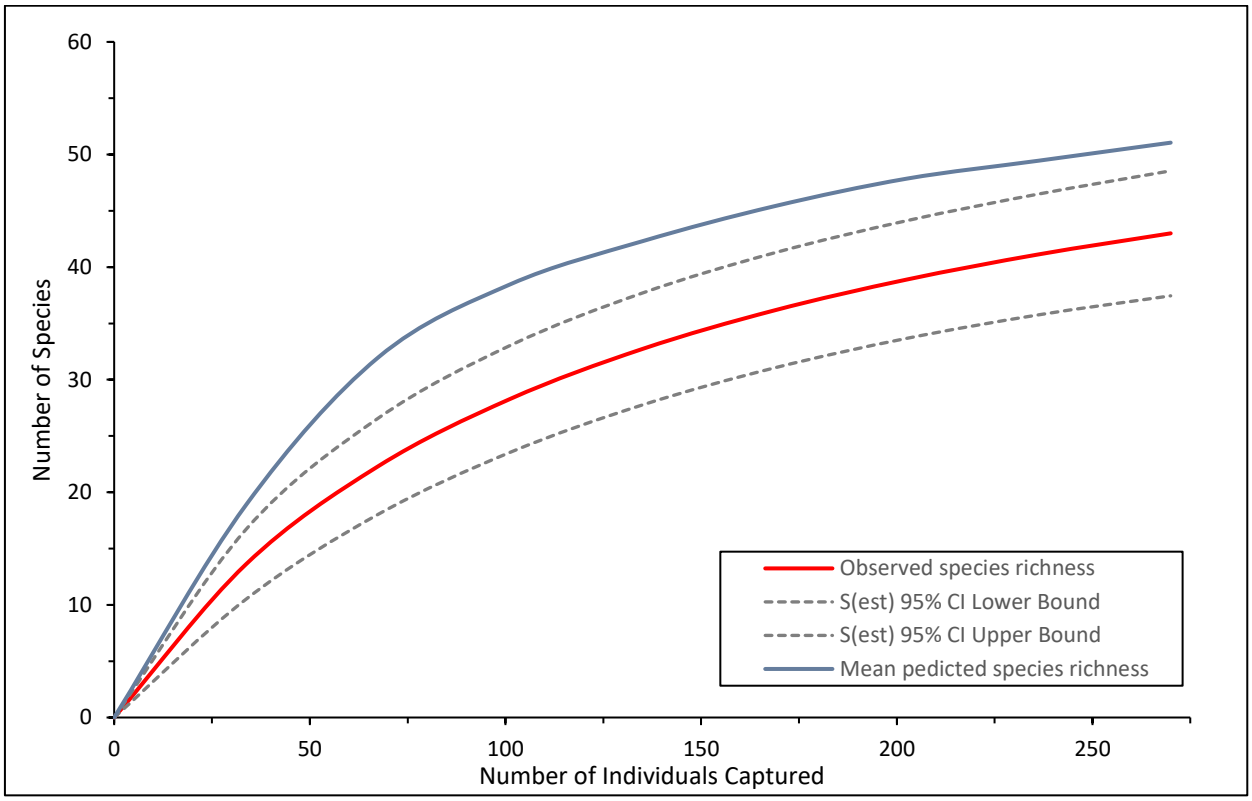



**Figure 5.2 Species accumulation curve for trappable vertebrate fauna**

The primary reason for the difference between predicted and recorded species richness was the Jackknife 1 estimator, which implies that the number of undetected species is approximately the same as the number of species represented only by singletons (rare species). The theory behind the Jackknife 1 estimator is to remove bias from data by removing sub-sets of data (such as singletons) and recalculating the estimated number of species within the sample, as the species richness estimate will change when these singletons are removed (Gotelli & Colwell 2011). If these rare species (singletons) are still being discovered by the end of the survey, there are likely to still be more species present in the survey area that have not yet been recorded (Vavrek 2011). During two-season fauna survey of Round Hill, nine out of the 43 trapped species were only trapped once, hence 21% of the species captured in traps were represented by singletons. This suggests that more species are likely present in the survey area than recorded during the recent field surveys.

Opportunistic, camera trap and active foraging records of trappable fauna yielded an additional 31 species of small to medium-sized ground dwelling vertebrate fauna that could have been captured in traps. Hence, the actual number of trappable fauna recorded during the survey was 74, which represents over 100% of the predicted total of 51 species.

The desktop study identified 44 mammals (seven of which are introduced), 121 reptiles, and 5 frog species within 50 kilometres of the survey area (Appendix III). Of these, 19 native mammals and six introduced mammals were not considered trappable as they were either too big for the traps deployed or were bat species. Hence, the total number of potential trappable fauna identified in the desktop is 151 species. This number exceeds the predicted species richness, which is not unexpected, as not all species occur everywhere within their range, and not all habitats that appear potentially suitable may meet the exact specifications that a particular species needs.

Based on current desktop results, differences between the two Rapallo survey seasons, as well as the shape of the species accumulation curve, it is expected that additional trapping surveys would not greatly improve the current known species richness of the Round Hill survey area. Without considerable effort, further trapping surveys are also unlikely to yield additional trappable conservation significant vertebrate fauna. Targeted surveys for would be better suited for conservation significant species that occur regionally, such as the Pilbara olive python (*Liasis olivaceus barroni*), ghost bat (*Macroderma gigas*) and northern quoll (*Dasyurus hallucatus*).

#### 5.3.5.2 Species accumulation curve for systematic bird survey data

The species accumulation curve for systematic bird census data is presented in (Figure 5.3), plotting the number of bird species recorded (y-axis) against the total number of detections for all species combined (x-axis). Observed species richness is presented as a sample-based rarefaction curve, computing the mean number bird species (S(est)) over all possible combinations of 1, 2, and up to 1921 detections (Colwell *et al.* 2012). Predicted species richness was calculated by taking the average of the estimators ACE, Chao 1, Jackknife 1, and Bootstrap, as appropriate for abundance data (Colwell 2013).

Systematic bird surveys recorded 75 bird species. The average predicted bird species richness was 82 species, which indicates that 91% of the (estimated) bird species present in the survey area had been detected through systematic surveys. This is reflected in the species accumulation curve, which after 1921 systematic detections has not yet reached an asymptote but it is close to doing so (Figure 5.3).

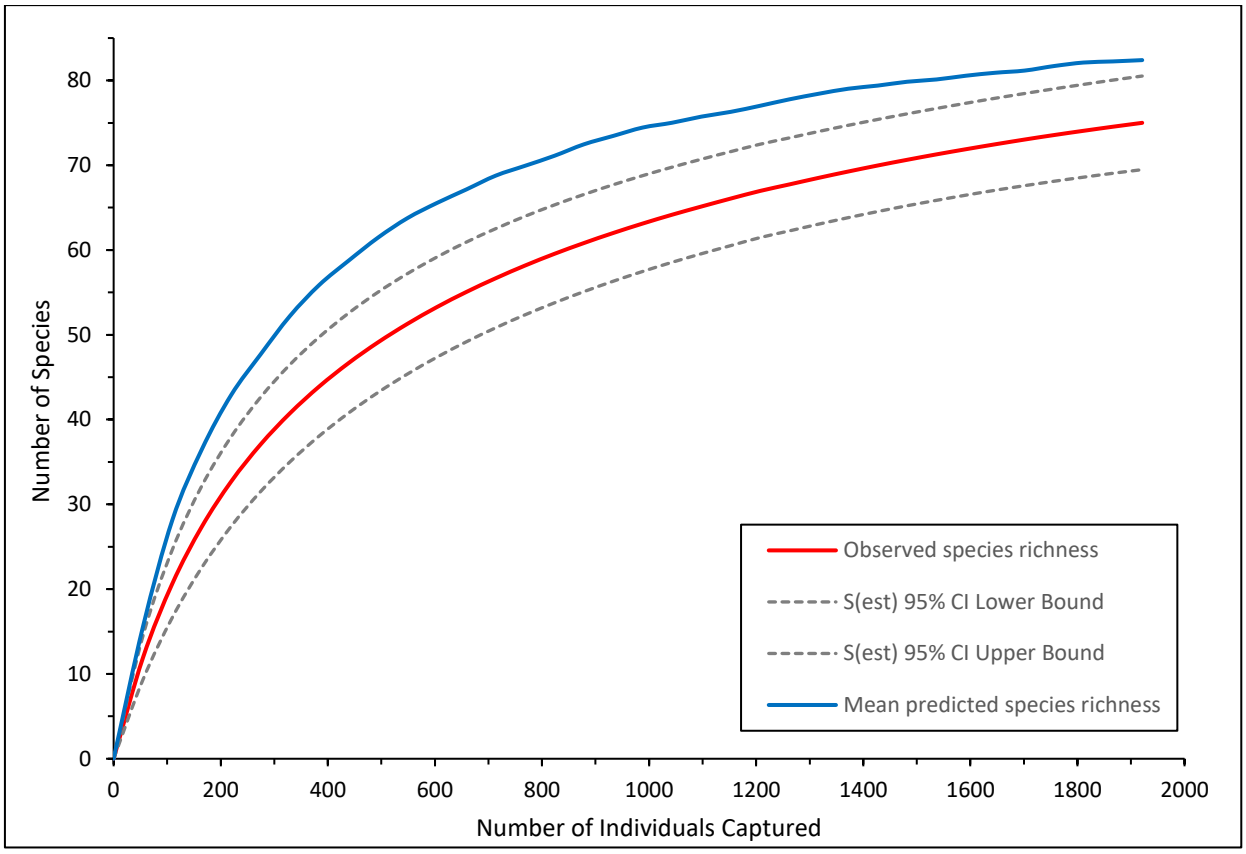



**Figure 5.3 Species accumulation curve for systematic bird surveys**

Similar to the trapping data, the Jack 1 estimator for the systematic bird data was higher than the other estimators, which is reflected by the fact that out of the total 75 species that were detected during the systematic bird surveys, seven were represented by singletons (9%).

Many opportunistic bird records were also collected to ensure adequate coverage of the avifauna present in the survey area. Opportunistic bird records yielded an additional eight species. Therefore, the actual number of bird species recorded during the survey was 83, which represents 100% of the predicted total.

Bird assemblages of a given area often show variability between seasons. A comparison with data from the first field survey yielded a total of 66 bird species, while the second season recorded a total of 76 species. Of these species, 46 were recorded during both survey seasons, 7 were only recorded in the first survey, and 17 were only recorded in the second season. This can be attributed to the higher rainfall prior to the second survey occurring, resulting in an increased number of bird species in the area.

The desktop study identified 216 bird species recorded within 50 kilometres of the survey area. However, the survey area contains unsuitable habitat for many of these species during the majority of the year due to a lack of permanent water, thus making it typically unsuitable for species such as ducks, waders and other water birds. Although, it should be noted that the sections of the survey area with more clay based soils may hold water for these species during the wet season, or during other periods of high rainfall, and so some of these species may visit the area opportunistically depending on conditions.

The total number of bird species detected during the field surveys and in the desktop study exceeds the predicted species richness of bird species. This is likely because the predicted species richness was calculated based on only timed bird census data from the Rapallo surveys, and does not include opportunistic observations.

Based on the desktop results, seasonal variability in bird assemblages, and the shape of the species accumulation curve, additional bird surveys would likely not further improve the known bird species richness of the Round Hill survey area, unless completed during periods of high rainfall or inundation. Targeted surveys may provide further information on conservation significant species, if conducted during peak activity or migration periods.

## 5.4 Conservation significant species

Four species of vertebrate fauna listed as conservation significant under either the Western Australian *Biodiversity Conservation Act 2016* (BC Act) or the federal *Environment Protection and Biodiversity Conservation Act 1950* (EPBC Act)[1] or listed as priority species by the Department of Biodiversity Conversation and Attractions (DBCA) have been recorded at the Round Hill Project to date. Three of which were identified, as below, during the detailed fauna survey:

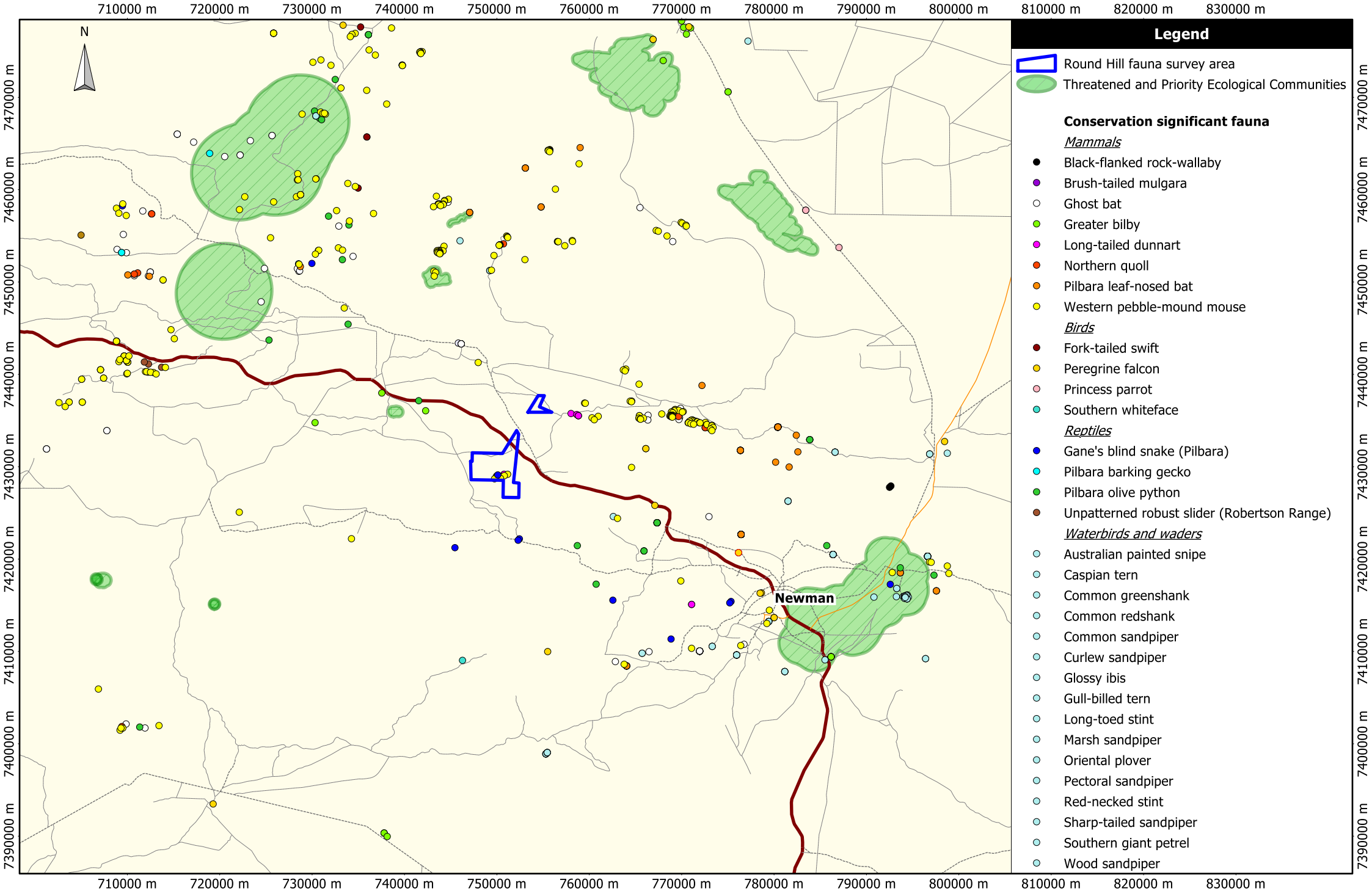
- Long-tailed dunnart (*Antechinomys longicaudatus*) listed Priority 4 under the DBCA
    - Confirmed - recorded in the survey area in 2023 during the Rapallo detailed fauna survey.
- Pilbara olive python (*Liasis olivaceus barroni*) listed vulnerable under both the BC Act and the federal EPBC Act
    - Confirmed - sloughed skin recorded in the survey area in 2023 during the Rapallo detailed fauna survey.
- Western pebble-mound mouse (*Pseudomys chapmani*) listed Priority 4 under the DBCA
    - Confirmed – recorded multiple pebble mounds, both active and inactive, in the survey area in 2023 and 2024 during the Rapallo detailed fauna survey.

The fourth species was confirmed within the survey area following the detailed fauna surveys, during a targeted fauna survey in 2024 (Rapallo Environmental, 2025) as listed below:

- Gane's blind snake (Pilbara) (*Anilios ganei*) listed Priority 1 under DBCA
    - Confirmed – recorded on the survey area during targeted fauna surveying in 2024 (Rapallo Environmental, 2025). Also recorded proximal to the survey area in the desktop study (Appendix IV).

Occurrences of conservation significant fauna within 50 kilometres of the survey area are mapped in Figure 5.4, while conservation significant fauna from within the survey area are mapped in Figure 5.5, with relevant habitat photographs presented in Table 5.6. Likelihood of occurrence of conservation significant species identified in the desktop, based on the habitats of the survey area, record age and distance to the survey area, is discussed in Table 5.5.

[1] Note that all species listed under the EPBC Act as Threatened (see Appendix VI) are considered Matters of National Environmental Significance (MNES).




Rapallo environmental

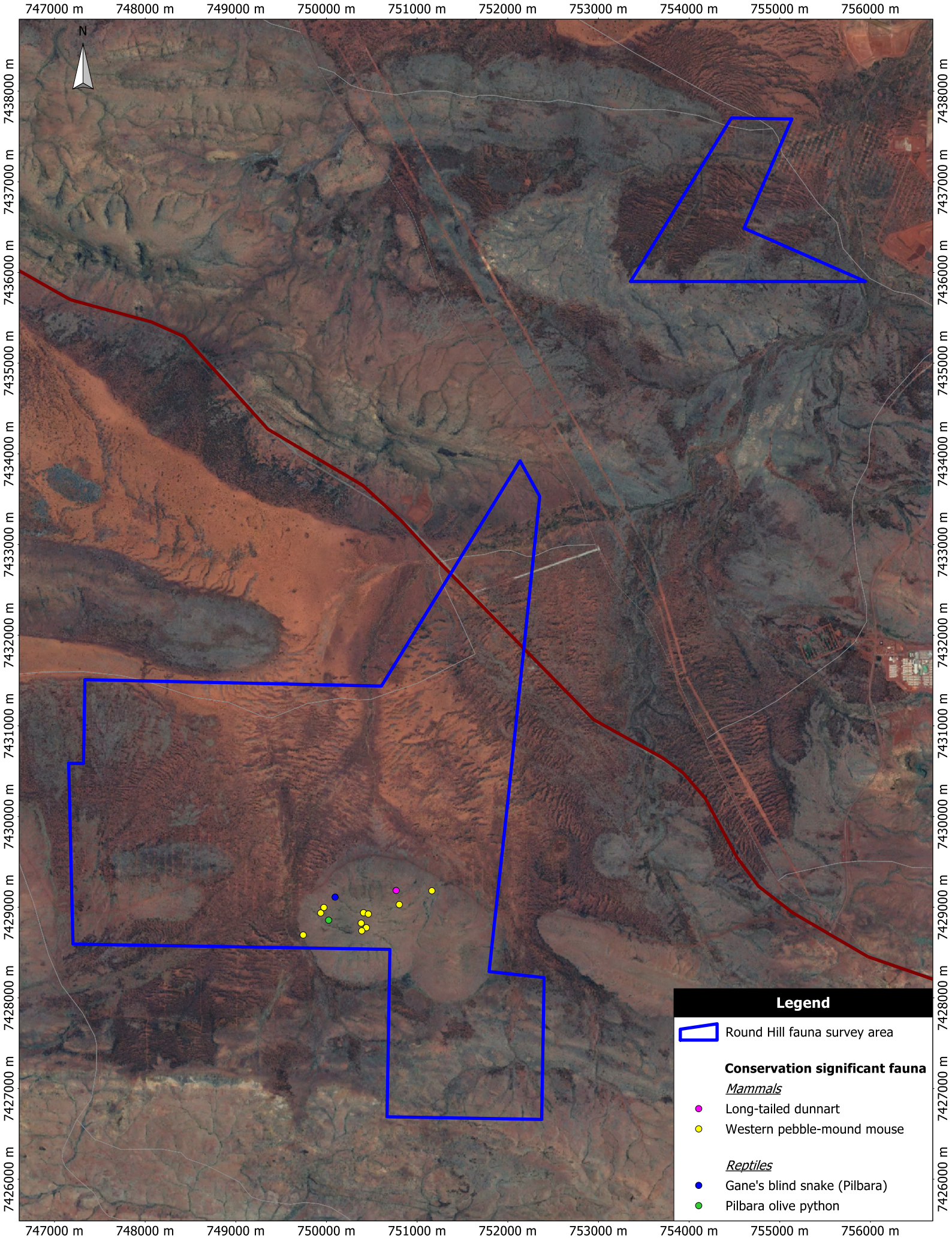
Hanroy / Hancock Prospecting
Round Hill Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4 Scale: 1:500,000
Datum: MGA94 Zone 50

0 25 km

**Figure 5.5**

Conservation significant fauna recorded to date within 50 kilometres of Round Hill (DBCA TPFa)




Rapallo environmental

Hanroy / Hancock Prospecting
Round Hill
Detailed vertebrate fauna survey
(August 2023, May 2024)

Original Size: A4
Scale: 1:50,000
Datum: MGA94 Zone 50

0 1.5 km

**Figure 5.6**

Conservation significant fauna recorded during the survey

**Table 5.5 Conservation significant fauna identified in the desktop, likelihood scores, and discussion**

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| **Birds** | | | |
| Common sandpiper<br>*Actitis hypoleucos*<br>BC Act / DBCA: MI<br>EPBC: MI | Possible | 10.5 km east | The common sandpiper favours tidal and reef flats, beaches, saltwork ponds, river pools, flooded claypans, freshwater soaks and ephemeral waters. It is usually sighted in singularly or in pairs, and occasionally in small parties (Johnstone *et al.* 2013).<br>The DBCA database search returned one record between approximately 10.5 km southeast of the survey area within the wider Round Hill Tenement, near Mount Newman. An additional 16 records from DBCA are between 20 – 50 km southeast of the survey area, in the area surrounding Newman. The date of the DBCA records varies from 1975 to 2013. The ALA search returned an additional 33 records ranging in age from 1999 to 2022, within 50 km of the survey area, half of which are located at Ophthalmia Dam.<br>Based on the number of records present within 50 km of the survey area, and potential habitat being present during periods of high rain fall, this species is considered to possibly occur in the survey area for foraging purposes on a sporadic basis. |
| Southern whiteface<br>*Aphelocephala leucopsis*<br>BC Act / DBCA: -<br>EPBC: VU | Possible | 18 km south | The distribution of southern whiteface within the Pilbara is largely outside the known mapped distribution, with the survey area mapped as the "species or species habitat may occur" (DCCEEW-Protected Matters Search Tool). Regarded by Johnstone et al. 2013 as possibly a rare inhabitant of far south-east of the Pilbara region, citing two confirmed records by G.Swann from West Jimblebar (41 km east of Newman) in 2007.<br>The southern whiteface inhabits a variety of open woodlands and shrublands containing an understorey of grasses or shrubs, or both. Typically, these woodlands are dominated by acacias or eucalyptus on ranges, foothills and lowlands and plains. Nesting often occurs in a hollow or crevice, and less frequently in low bushes, where nests are made of a combination of grass, bark and roots forming a large, dome-like shape (Higgins & Peter 2002).<br>The DBCA database did not return any records for the southern whiteface within 50 km of the survey area. A search of the ALA database did provide two records, one 18 km south of the survey area from 1981 and the second is 28km northwest of the survey area from 2007.<br>Based on the habitat present within the survey area, and records within 50 km of the survey area, it is possible that this species may occasionally occur within the survey area, although none were observed during the survey period. |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| Pacific swift (Fork-tailed swift)<br>*Apus pacificus*<br>BC Act / DBCA: MI<br>EPBC: MI | Possible | 29 km northwest | The Pacific swift (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. The species usually arrives in Australia in October, where it remains in various parts of the continent to as long as April. The species is often observed during foraging or migration, with flocks ranging from 10 to 1,000 individuals (Higgins 1999). When in Australia, this species is can be present throughout much of the Pilbara region, from the south-west Pilbara through to the north and eastern Kimberely regions near Wyndham, with sparse scattered records inland in the Wheatbelt, Lake Annean and Wittenoom (Higgins 1999).<br>This species of swift is almost exclusively aerial and occurs over a wide range of habitats. Typically they can be found over dry or open habitats such as inland plains, riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh, but can also be found over urban areas and cities, treeless grassland and sandplains covered with spinifex, open farmland, as well as above rainforests, open forest or pine plantations (Higgins 1999). The fork-tailed swift is migratory, and would forage above the survey area during summer (Johnstone & Storr 1998), feeding on insects that can be found in the air such as small bees and wasps.<br>The DBCA database search returned three records of the fork-tailed swift between 20-50 km from the survey area, with record dates from 2011, 2014 and 2022. ALA provided an additional five records of this species between 20 – 50 km of the survey area, with four of the records from 2011 and the remaining record from 2022.<br>Due to its highly aerial nature, this species is unlikely to utilise the habitats of the survey area, but it is possible it may be present above it based on the habitats present within the survey area and records within 50 km. |
| Sharp-tailed sandpiper<br>*Calidris acuminata*<br>BC Act / DBCA: MI<br>EPBC: MI + VU | Possible | 28 km southeast | The sharp-tailed sandpiper is a small to medium sized wader that spends the non-breeding season in Australia and New Zealand, where they become widespread in both inland and coastal locations in freshwater and saline habitats. Whilst in Australia, this species inhabits edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation, such as lagoons, mangroves, swamps, lakes and pools near the coast, dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes. They have also been known to utilise flooded paddocks, sedgelands and other ephemeral wetlands, but leave these locations when they dry out (Department of Climate Change, Energy, the Environment and Water 2024c). Less common but widespread inland with most records associated with areas of temporary flooding (e.g. cyclonic rains) (Johnstone *et al.* 2013).<br>In 2021, this species was assessed by the IUCN Red list and changed from a species of least concern to vulnerable due to a rapid population decline as a result of habitat degradation, pollution and climate |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | change (BirdLife International 2022). As of the 5th January 2024, the sharp-tailed sandpiper has been listed as Vulnerable under the EPBC Act.<br>The DBCA database search returned 7 records between 20-50 km from the survey area, five of which are from 1981 while the remaining two are from 2001 and 2009. The ALA database returned a further eight records, with records between 2001 to 2008. All records were located east to south-east of the survey area near Newman, Opthalmia Dam, the Fortescue River, and associated tributaries of these waterbodies.<br>Given the records within 50 km of the survey area, and the habitats present, it may be possible that this species is present in the survey area during periods of high rainfall for foraging purposes on a sporadic basis. |
| Curlew sandpiper<br>*Calidris ferruginea*<br>BC Act / DBCA: MI<br>EPBC: MI + CR | Unlikely | 44 km southeast | The curlew sandpiper inhabits intertidal mudflats in sheltered coastal areas (i.e. estuaries, bays, inlets and lagoons) (Geering *et al.* 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 *et al.* 2007).<br>The DBCA search yielded one record within 50 km of the survey area, at Opthalmia dam. The only ALA record was from a location approximately 45 km east of the survey area, north of Ophthalmia Dam.<br>The curlew sandpiper is rare, the survey area does not contain suitable habitat, and there are few nearby records. The species is considered unlikely to occur in the survey area due to a lack of suitable habitat. |
| Pectoral sandpiper<br>*Calidris melanotos*<br>BC Act / DBCA: MI<br>EPBC: MI | Possible | 30 km southeast | The pectoral sandpiper inhabits coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (Johnstone & Storr 2004, Johnstone *et al.* 2013). It prefers wetlands with open fringing mudflats and low, emergent or fringing vegetation (Geering *et al.* 2007).<br>The DBCA search yielded one record within 50 km of the survey area, near the Newman townsite from 1981, meanwhile ALA provided five records within 50 km of the survey area, three of which are from 2008 while the remaining two do not have a date listed. The ALA records are located at Ophthalmia Dam and the Fortescue River.<br>It is possible that this species may be present on the survey area during periods of high rainfall for foraging purposes. |
| Red-necked stint<br>*Calidris ruficollis*<br>BC Act / DBCA: MI | Unlikely | 43 km southeast | The red-necked stint is the smallest shorebird in Australia, weighing 25 grams and a wingspan between 29 – 33 cm (Geering *et al.* 2007). This species is most commonly found in protected coastal regions such as sheltered inlets, bays, lagoons, estuaries with intertidal mudflats, saltmarshes, ephemeral or permanent shallow wetlands near the coast or inland and protected sandy or coralline shores. They have |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| EPBC: MI | | | also been known to utilise flooded paddocks and damp grasslands (Department of Climate Change, Energy, the Environment and Water 2024d). This species forages in on bare wet mud on intertidal mud or sand flats; mostly in areas of shallow water or a film of surface water, and may also forage in samphire or the mud beneath mangroves grasslands (Department of Climate Change, Energy, the Environment and Water 2024d).<br>The DBCA database search returned two records from 2005, southeast of the survey area at Ophthalmia Dam, which is a permanent water body near Newman.<br>Given that the lack of suitable habitat for this species in the survey area, and the very limited number of records nearby, it is unlikely that this species is present in the survey area. |
| Long-toed stint<br>*Calidris subminuta*<br>BC Act / DBCA: MI<br>EPBC: MI | Unlikely | 30 km southeast | The long-toed stint is a migratory species that breeds in Siberia in the Northern Hemisphere and migrates south after breeding, towards China, Malaysia, Philippines, Burma, Bangladesh, Napal, Sri Lanka, and the Maldive Islands, and is a visitor to New Guinea and Australia. During this after breeding period, this species utilises a variety of wetland habitats including shallow freshwater or brackish areas, lake, swamps, floodplains, marshes, lagoons, muddy shores and sewage ponds (iNaturalist 2024).<br>In Western Australia, most records are from the coast ranging from the southwest of the state to the north, with a few scattered records from inland. It is widespread between the Pilbara and Kimberely regions between Karratha and Wyndham-Kununurra, and is recorded inland at Lake Brown, Hannan Lake, Lake Biolet, Newman Sewage Farm and Lake Gregory (Department of Climate Change, Energy, the Environment and Water 2024e).<br>DBCA database search returned three records of this species, two of which are from 1981 and the other from 2001. All three records are from in and around Newman and Ophthalmia dam to the East of the survey area. A search of the ALA database returned an additional two records from 2008 in similar locations to the DBCA search.<br>Given that there is not suitable habitat within the survey area for this species, and the lack of records nearby within the last 15 years, it is unlikely that they are present in the survey area. |
| Oriental plover<br>*Charadrius veredus*<br>BC Act / DBCA: MI<br>EPBC: MI | Unlikely | 29 km southeast | The oriental plover is a migratory species that utilises a 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). Birdata shows the species may be sighted year-round, but with the greater majority occurring in the period of September to December. The majority of sightings are concentrated in coastal areas, with only casual records from the Pilbara (Johnstone *et al.* 2013, Birdlife Australia 2024a). Oriental plover are regarded as casual in the Pilbara interior (Johnstone *et al.* 2013). |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | A DBCA database search returned a single record of this species from 1981, and only a single ALA record without a date was also available between 20-50 km from the survey area.<br>Although there is potential foraging habitat within the tussock grassland areas of the survey area, it is unlikely that this species is present as there have been no records within 50 km of the survey area for over 25 years. |
| Letter-winged kite<br>*Elanus scriptus*<br>BC Act / DBCA: P4<br>EPBC: - | Unlikely | 30 km northwest | The letter-winged kite is a small to medium sized raptor that hunts mostly at night and is endemic to Australia. It is usually seen in flocks or pairs (Johnstone & Storr 2004). During the day it roosts in leafy trees (Pizzey & Knight 2012). This species is described as irruptive, as populations suddenly increase during favourable conditions due to their variable breeding periods (Birdlife Australia 2024b). The preferred habitat of the letter-winged kite is arid and semi-arid open, shrubby or grassy country, across the arid interior of the continent. This species is rarely recorded in Western Australia but present during periods of drought in eastern arid Australia (Johnstone et al. 2013), it is known to across the Barkly Tableland, northern South Australia, and inner regions of western Queensland (Marchant & Higgins 1993a). It typically inhabits tree-lined creeks and hunts over low vegetation (Morcombe 2004).<br>The DBCA database and ALA database searches did not return any records for the letter winged-kite within 50 km of the survey area, this species is instead considered as it was recorded from a nearby Astron (2019) during a detailed survey of Hope Downs 2, approximately 30 km northwest of the survey area.<br>As this species of raptor is a rare sight in Western Australia (Marchant & Higgins 1993a), in addition to the lack of records in public databases it is considered unlikely to be present within the survey area. |
| Red goshawk<br>*Erythrotriorchis radiatus*<br>BC Act / DBCA: VU<br>EPBC: EN | Unlikely | No publicly available records within 50km | Red goshawks mostly occur in northern Australia, where they occur at scattered sites from the Kimberley in WA, through the Top End in the Northern Territory and Cape York Peninsula and north-eastern Queensland, and a few scattered sites in between; a few also occurred in south-eastern Queensland and adjacent areas of north-eastern NSW but this population is likely to now be extinct. Inhabiting tropical and warm-temperate woodlands and forests, the red goshawk prefers areas with a mosaic of vegetation types, often near wetlands. They often occur at the boundary between two vegetation types, and often favour forests or woodlands dominated by eucalypts or paperbarks. They avoid very dense or very open habitats (Birdlife Australia 2017). In Western Australia, the habitat is described as well-wooded country (Johnstone & Storr 1998).<br>The DBCA database and ALA database searches did not return any publicly available records for the red goshawk within 50 km of the survey area. This species has only been considered due to the results of a Protected Matters search. |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | As this species is uncommon in the Pilbara, and a lack of well-wooded habitat within the survey area, the red goshawk is unlikely to occur in the survey area. |
| Grey falcon<br>*Falco hypoleucos*<br>BC Act / DBCA: VU<br>EPBC: VU | Likely | 10 km northwest | The grey falcon commonly nests in timbered areas, particularly tall trees along watercourses, and forages in open or more sparsely vegetated habitats (Garnett *et al.* 2011). This species has been observed hunting in treeless areas as well as frequenting tussock grasslands and open woodlands, especially in winter (Olsen & Olsen 1986, Schoenjahn 2018). It persists at unusually low densities exclusively in the arid and semi-arid zones of Australia (Schoenjahn 2013). Grey falcons are generally nomadic, albeit with a distinct element of reluctance (Schoenjahn 2018). The data suggesting that they leave an area only when absolutely necessary, move no farther than absolutely necessary, and rather forego breeding than taking the risk of searching far and long for more favourable conditions (Schoenjahn 2018). Nesting usually occurs in the tallest trees along watercourses, particularly in river red gums (*Eucalyptus camaldulensis*) and white river gums (*Eucalyptus vitirix*), but falcons also nest in telecommunication towers (Marchant & Higgins 1993b, Falkenberg, 2011, Schoenjahn 2013, 2018).<br>The DBCA database search did not return any publicly available records for the grey falcon within 50 km of the survey area, but the ALA database search returned two results, one approximately 10 km northwest of the survey area and the other 29km southeast, near Mount Whaleback mine.<br>Based on the habitat present, and the nearby records of this species, it is likely that the grey falcon may occur within the survey area for foraging purposes. Tall trees along water courses and telecommunication towers for nesting are present near the survey area and in the wider tenements, but not within the survey area. |
| Peregrine falcon<br>*Falco peregrinus*<br>BC Act / DBCA: OS<br>EPBC: - | Possible | 11 km east | In arid areas, the peregrine falcon 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 & Olsen 1989). The peregrine falcon is considered rare over much of its range (Johnstone & Storr 1998).<br>The peregrine falcon prefers areas with cliffs and rocky escarpments for nesting. Water ecotones and tree covered areas provide productive habitat for prey species. However, peregrine falcons are an open country hunters (Ratcliffe 1993, Jenkins 2000) and some level of open country is essential for them to access prey (Jenkins & Hockey 2001).<br>The DBCA database search returned nine records of peregrine falcon, with records ranging in age from 2002 to 2011. The ALA database provided an additional 13 records, the closest of which is 11 km from the survey area, with record dates ranging from 2011 to as recently as 2023. |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | Given the number of recent records in proximity to the survey area, and the foraging habitat available it is possible that this species may occur in the survey area, although nesting habitat is only present in the wider tenement and not within the survey area. |
| Gull-billed tern<br>*Gelochelidon nilotica*<br>BC Act / DBCA: MI<br>EPBC: MI | Unlikely | 28 km southeast | Nomadic visitor (mostly May–Nov.), uncommon to moderately common between De Grey and Fortescue Rivers, seldom recorded further south. Favours inundated samphire flats, tidal creeks, saltwork ponds, river pools, sewage ponds and sheltered seas.<br>The DBCA database search returned seven records between 20-50 km of the survey area from between 1978 and 2008. The ALA search returned 13 records within the same distance range as the DBCA search with dates ranging between 1999 to 2016. Both sets of records were all located to the east to southeast of the survey area towards Newman near locations such as Ophthalmia Dam, Fortescue River and Kalgan River.<br>Given the lack of suitable habitat for this species within the survey area, it is deemed unlikely to occur, despite the records within 50 km of the survey area. |
| Barn swallow<br>*Hirundo rustica*<br>BC Act / DBCA: MI<br>EPBC: MI | Highly Unlikely | No publicly available records nearby | The barn swallow is a non-breeding summer visitor to the Pilbara, with nearly all records from near the coast (Atlas of Living Australia 2023, Birdlife Australia 2024a). The barn swallow is recorded in open country in coastal lowlands, often near water, towns, and cities. Found near freshwater wetlands, paperbark *Melaleuca* woodland, mesophyll shrub thickets and tussock grassland (Schodde & Mason 1999). The barn swallow favours areas near water (Johnstone *et al.* 2013). Birdata maps show this species is only recorded near coastal areas, with no inland records (Birdlife Australia 2024a).<br>Both the DBCA and ALA database searches did not provide any records within 50 km of the survey area for barn swallows. This species has been considered as it was a result in a Protected Matters search.<br>Due to both a lack of records and lack of suitable habitat in the survey area, it is highly unlikely that this species is within the survey area. |
| Caspian tern<br>*Hydroprogne caspia*<br>BC Act / DBCA: MI<br>EPBC: MI | Unlikely | 15 km north | The Caspian tern favours sheltered seas (including estuaries and tidal creeks), flooded coastal samphire flats, brackish pools on lower courses of rivers and saltwork ponds (lower-salinity ponds). Generally this species prefers areas with clear rather than turbid water (Johnstone *et al.* 2013). Occurs on all coasts, including many islands (as far offshore as Bedout, Legendre and Montebellos); rare or accidental inland, e.g. >30 birds at Fortescue Marsh, Aug. 1999 (Johnstone *et al.* 2013).<br>The DBCA database search returned five records, from 2004 to 2022, two of which are approximately 14.5 km north of the survey area while the remaining three are located near Ophthalmia dam. The ALA database search returned 6 records, from 2004 to 2016, within 50 km of the survey area located to the east near the Fortescue River and Ophthalmia Dam. |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | Given the lack of suitable water bodies within the survey area, it is unlikely that this species would be present in the survey area. |
| Southern giant petrel<br>*Macronectes giganteus*<br>BC Act / DBCA: MI<br>EPBC: MI +EN | Highly unlikely | 35 km northeast | The southern giant petrel is the largest petrel species and is widespread across the Southern Ocean (Woehler et al. 2001, Pizzey & Knight 2012), occurring from the Antarctic continent and pack-ice to subtropical waters (both inshore and pelagically) off of South America, South Africa, Australia and New Zealand (Marchant & Higgins 1990). In Australia this species breeds on Macquarie Island, Heard Island and McDonald Island in the Southern Ocean, as well as Giganteus Island, Hawker Island, and Frazier Island in the Australian Antarctic Territories (Woehler et al. 2001). This species is an opportunistic scavenger and predator, known to consume seal and whale carrion as well as hunting and killing smaller seabirds, penguin chicks, cephalopods (octopus and squid), krill, crustaceans, fish, jellyfish, kelp and scavenge offal from fishing vessels (Marchant & Higgins 1990).<br>The DBCA database search returned three records from 2011 of this species.<br>Despite their being DBCA records of this species within 50 km of the survey area the southern giant petrel is not typically found in inland Australia, as it is a marine species, and the survey area doesn't contain either roosting or foraging habitat, this species is highly unlikely to be present in the survey area. |
| Grey wagtail<br>*Motacilla cinerea*<br>BC Act / DBCA: MI<br>EPBC: MI | Highly unlikely | No publicly available records nearby | The grey wagtail is a rare visitor to Western Australia (Johnstone & Storr 2004). It mainly occurs in fast-running freshwater habitats such as rivers, creeks, streams, and around waterfalls, but occurs almost anywhere during migration.<br>Both the DBCA and ALA database searches did not provide any records within 50 km of the survey area for grey wagtails. This species has been considered as it was a result in a Protected Matters search.<br>Due to both a lack of records and lack of suitable habitat in the survey area, in addition to being a rare visitor to Western Australia, it is highly unlikely that this species is within the survey area. |
| Night parrot<br>*Pezoporus occidentalis*<br>BC ACT / DBCA: CR<br>EPBC: EN | Unlikely | ~70 km north | Based on accepted records, night parrot habitat comprises long-unburnt mature *Triodia* grasslands forming mosaics with samphire and chenopod shrublands (Jackett et al. 2017, McDougall et al. 2009, Murphy, Silcock, et al. 2017) including genera such as *Atriplex, Bassia* and *Maireana,* on floodplains and claypans, and on the margins of salt lakes, creeks or other sources of water (McGilp 1931, Wilson 1937). Contemporary Western Australian Pilbara/Murchison records include five publicly known populations located in the following area; north east of Wiluna (Hamilton *et al.* 2017, Jackett *et al.* 2017), Lake Disappointment (Great Sandy Desert) (Harewood 2018), Great Sandy Desert (Caccetta 2018), salt lake systems on Martu County (Michelmore & Birch 2020) and near the Fortescue Marsh (Davis & Metcalf 2008, Young 2021). |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | Murphy *et al.* (2017) found that GPS tracked individuals travelled from *Triodia* roosts relatively large distances into non-*Triodia* habitats, making use of fertile, diverse but ephemeral parts of the landscape: floodplains, run-on areas and gilgais. Murphy (2016) cited in (Threatened Species Scientific Committee 2016) suggested that night parrot may not rely on surface water, and instead may derive sufficient metabolic water from foraging on succulent plants, such as *Sclerolaena* , however, it is likely that the species needs access to free-standing water, at least during hot conditions (Kearney *et al.* 2016).<br><br>Updated DBCA (2024) guidelines for determining the likely presence and habitat usage of night parrot in Western Australia were published after the first field survey had been completed, and only a couple weeks prior to the second field survey in 2024. These guidelines suggest the focus should be on *Triodia*-dominated roosting habitat, although the possibility that night parrots use chenopod dominated habitats should also be considered. Initial analysis should utilise all available data to determine whether there are areas of both open, long unburnt Triodia for roosting, and open floodplain or run-on areas for foraging. At the local (site) level, long-term stable roost sites are found in areas that support long unburnt *Triodia* hummocks, particularly *Triodia* species that are ring-forming. Areas should ideally contain structurally complex *Triodia*, with a mix of hummock sizes present. The *Triodia* may occur as large, connected expanses, or isolated patches (DBCA 2024). The other factor to consider is how open the habitat is. All areas where long-term stable roost sites have been detected in both Queensland and Western Australia have been open (Jackett et al. 2017, S. Murphy, N. Leseberg unpublished data cited in Leseberg et al. 2021). While there may be some scattered shrubs or isolated trees, these sites are practically treeless (Leseberg et al. 2021).<br><br>In 2005 three night parrots were observed at Minga Well, a station bore and livestock watering point with large pools of water near Fortescue Marsh (Davis & Metcalf 2008). FMG have confirmed recent records from cloud break (Young 2021). No obvious signs or calls of night parrot were detected during the survey, noting that deployment of acoustic recorders were opportunistic only.<br><br>The DBCA database typically removes the locations of night parrot from their search results to protect the species and/or due to this data belonging to local ranger groups, and so no database records have been provided for this species, although there is a known population located near the Fortescue Marsh approximately 70 km north of the survey area.<br><br>The night parrot is considered unlikely to occur in the survey area, based predominantly on the areas with suitable spinifex containing a density of trees and shrubs that is above what is preferred by this species (treeless plains). |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| Glossy ibis<br>*Plegadis falcinellus*<br>BC Act / DBCA: MI<br>EPBC: MI | Possible | 28 km south | The glossy ibis occurs in freshwater wetlands, irrigated areas, margins of dams, floodplains, brackish and saline wetlands, tidal mudflats, pastures, lawns and public gardens (Johnstone *et al.* 2013). It requires shallow water and mudflats for foraging (Birdlife Australia 2021). The species is nomadic, described as a rare to very common visitor or drought refugee (Johnstone *et al.* 2013).<br>The DBCA database search returned 12 records for this species, from 1978 to 2022, between 20-50 km from the survey area. The ALA database search supplied 28 records of glossy ibis, from 2000 to 2023, within the same distances as the DBCA results. These records are all located near bodies of water, such as near Newman, Ophthalmia Dam, Fortescue River, West Creek and active mine sites.<br>It is possible that this species may occur sporadically within the survey area during periods of high rainfall for foraging purposes. |
| Princess parrot<br>*Polytelis alexandrae*<br>BC Act / DBCA: P4<br>EPBC: VU | Possible | 35 km northeast | The princess parrot is a highly nomadic species that occupies eastern deserts of Western Australia and is patchily distributed in family parties and small flocks in the Great Sandy, Gibson, Tanami and Great Victoria Deserts (Storr 1981). They are known to inhabit sand dunes and sand flats, in addition to savannah woodlands and shrublands that consist of *Eucalyptus* species, *Casuarina* or *Allocasuarina* trees; an understorey of shrubs such as *Acacia, Cassia, Eremophila, Grevillea, Hakea* and *Senna*; with ground cover dominated by *Triodia* species. Princess parrots typically nest in hollows or holes in *Eucalyptus* trees (including *Eucalyptus camaldulensis*) close to watercourses (North 1917, McGilp 1935, Storr 1977, Forshaw & Cooper 2002) or occasionally in *Allocasuarina decaisneana* trees away from water (Forshaw & Cooper 2002).<br>The DBCA database search returned two records, both from 2012, while a single ALA record is also available, proximal to the DBCA records, without a date provided.<br>Given the distance to the database records, and the potential habitat that may be used by this species it is possible that this species may occur in the survey area, albeit not commonly. |
| Australian painted snipe<br>*Rostratula australis*<br>BC Act / DBCA: EN<br>EPBC: EN | Unlikely | 44 km northeast | The Australian painted snipe is a stocky wading bird, generally seen singly or in pairs. It is a cryptic bird, which can be difficult to detect. It has been recorded in wetlands across Australia but is most common on the east coast. Overall, the species is rare, with less than 5000 pairs estimated across Australia (DAWE 2021). The Australian painted snipe occupies shallow terrestrial freshwater wetlands (i.e. temporary and permanent lakes, swamps and claypans) with emergent tussocks of grass, sedges, rushes or reeds, or samphire (Johnstone & Storr 1998).<br>The DBCA database search returned no records within 50 km of the survey area, although the ALA database returned a single record from 2012 to the northeast of the survey area. This species was also listed in the results of the Protected Matters search for consideration. |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | Given both the lack of suitable habitat for this species and the limited number of records within 50 km of the survey area, the Australian painted snipe is considered unlikely to occur in the survey area. |
| Wood sandpiper<br>*Tringa glareola*<br>BC Act / DBCA: MI<br>EPBC: MI | Possible | 19 km northwest | The wood sandpiper is found mainly on river pools, sewage ponds, flooded claypans, freshwater lagoons and bore overflows (Johnstone *et al.* 2013). Birdata maps show this species occurs along the coast as well as in inland areas with water (Birdlife Australia 2024a).<br>The DBCA database search returned four records, with two from 1981, one from 2006 and the final from 2007. Meanwhile the ALA database returned 45 records ranging from 2006 to 2023. The vast majority of records were from locations with bodies of water present such as Ophthalmia Dam.<br>It is possible that this species may be present in the survey area sporadically during period of high rainfall. |
| Common greenshank<br>*Tringa nebularia*<br>BC Act / DBCA: MI<br>EPBC: MI + EN | Unlikely | 27 km southeast | Uncommon south of Dampier and in the interior. This species inhabits tidal mudflats, mangrove, creeks, flooded samphire flats, beaches, river pools and saltwork and sewage ponds (Johnstone *et al.* 2013).<br>The DBCA database search returned five records, from 1981 to 2016, while the ALA database provided 21 records from 2007 to 2022. All records are located east to southeast of the survey area near bodies of water such as Ophthalmia Dam, creeks and active mine sites.<br>Based on the habitats present in the survey area it is unlikely that the common greenshank is present within the survey area. |
| Marsh sandpiper<br>*Tringa stagnatilis*<br>BC Act / DBCA: MI<br>EPBC: MI | Highly unlikely | 43 km southeast | Recorded in near-coastal brackish lagoons and freshwater soaks, flooded samphire flats and saltwork and sewage ponds. At Port Hedland Saltworks 100–200 birds are regularly observed; occasionally they may frequent hypersaline ponds (Johnstone *et al.* 2013).<br>The DBCA database search provided a single record within 50 km of the survey area near Ophthalmia Dam, from 2005, while the ALA database provided a similar single record form the same year and area.<br>Due to the limited records that are almost 20 years old, and lack of suitable habitat, it is highly unlikely that this species would be present in the survey area. |
| Common redshank<br>*Tringa totanus*<br>BC Act / DBCA: MI<br>EPBC: MI | Unlikely | 27 km southeast | The common redshank is a stocky born wader species with bright orange legs and the same bright at the base of their beaks with black on the end. Records of this species are scattered across Australia from Queensland to New South Wales, South Australia, the Northern Territory and Western Australia. In WA there are vagrant south west records at Peel Inlet, Coodanup, the Gascoyne region, Coral Bay and Carnarvon, but is more regular and widespread in the north west between the Dampier Saltfields to Roebuck Bay and Broome, with a record as far north as Ashmore Reef.<br>This species is common found in sheltered coastal wetlands such as bays, river estuaries, lagoons, inlets and saltmarsh (with bare open flats and banks of mud or sand), as well as saltlakes, freshwater lagoons, |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | artificial wetlands and saltworks and sewage farms (Higgins & Davies 1996). Common redshanks feed in shallow water, on wet bare mud or sand, or on algal deposits, round the edges of wetlands, near rocks or samphire and have been observed roosting small elevated areas such as estuarine sandbars and muddy islets surrounded by water (Higgins & Davies 1996).<br><br>The DBCA database search returned a single record of this species approximately 27 km southeast near Mount Whaleback mine outside of Newman, from 2012.<br>Due to a lack of recent records, and a lack of suitable habitat in the survey area it is unlikely that the common redshank is present in the survey area. |
| **Mammals** | | | |
| Long-tailed dunnart *Antechinomys longicaudatus*<br>BC Act / DBCA: P4<br>EPBC: - | Confirmed | within survey area<br><br>DBCA TPFA database search: 2 km east | The long-tailed dunnart is patchily distributed through the Pilbara, northeastern Goldfields and Gibson desert, south to the Nullarbor Plain, to central Northern Territory and western South Australia. Its core habitat includes rocky scree slopes with hummock grass and shrubs, and tall open Acacia shrubland and woodlands (Mckenzie et al. 2008), but is also known to inhabit stony soils with hummock grasses, flat-topped hills, sparse mulga over spinifex, lateritic plateaus, sandstone ranges and breakaways (Western Australian Museum 2023).<br>The DBCA TPFA database search returned five records within 10 km of the survey area, and an additional record within 50 km of the survey area. The Atlas of Living Australia also returned another record within 50 km of the survey area.<br>Camera traps recorded one long-tailed dunnart during the first survey season in 2023 near trap site 6 at the rocky lower foothills of Round Hill, thus confirming this species in the survey area.<br><br>NB. (Westerman et al. 2023) reassigned the long-tailed dunnart (formerly *Sminthopsis longicaudata*) to *Antechinomys*, but this update is not yet reflected in the Biodiversity Act wherein the species is still listed under its former name. |
| Brush-tailed mulgara *Dasycercus blythi*<br>BC Act / DBCA: P4<br>EPBC: - | Possible | 46 km northeast | The brush-tailed mulgara occurs in *Triodia* sand plain and gibber plain habitats (Pavey *et al.* 2012). Brush-tailed mulgaras are mostly found in areas with mature hummock (spinifex) grasslands. They also use other vegetation types next to hummock grasslands, or paleo-drainage systems or drainage lines in sandplain or sand dune habitats. Brush-tailed mulgara use multiple burrow systems within a home-range and changing these frequently.<br>The DBCA TPFA database search returned three records within 50 kilometres of the survey area, all from 2014. |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | It is possible that brush-tailed mulgara may occur within the survey area as gibber plains with *Triodia* do occur within the survey area, and there are records within 50 km. |
| Northern quoll<br>*Dasyurus hallucatus*<br>BC Act / DBCA: EN<br>EPBC: EN | Possible | 14 km east | The northern quoll is moderately common through parts of the Pilbara (within 150 km of the coast), usually where suitable rocky habitat is present, which provides denning habitat and safety from predators and fire (Hill & Ward 2010, Turpin & Bamford 2014). The northern quoll is both arboreal and terrestrial, inhabiting ironstone and sandstone ridges, scree slopes, granite boulders and outcrops, drainage lines, tree hollows and riverine habitats (Braithwaite & Griffiths 1994, Oakwood 2002). Habitat usually includes rocky areas or structurally diverse woodland or forest used for shelter, with surrounding vegetated habitats used for foraging and dispersal (DotEE 2016). 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 2002). Other microhabitat features important to the species include: rock cover, proximity to permanent water and time-since last fire (Woinarski *et al.* 2008). Close proximity to water sources has been suggested to correspond with higher northern quoll juvenile recruitment rates (Braithwaite & Griffiths 1994, Moore et al. 2019). Rocky-riparian areas may offer a protective environment where northern quolls can fulfill (most) of their shelter requirements (dens and temporary cover), and where relatively high floristic diversity and topographic complexity likely offer habitat resources for a relatively wider range of prey species (Hernandez-Santin et al. 2022).<br>In the Pilbara, shelter and denning habitats consists of rock habitats such as ranges, escarpments, mesas, gorges, breakaways, boulder fields and major drainage lines (DotEE 2016). Rocky habitat is a preferred habitat of northern quoll, and northern quolls are likely less exposed to predation in rocky habitat because they provide high densities of structural refuges (Hernandez Santin 2016).<br>There is not enough information on what constitutes a northern quoll den, with the understanding that den characteristics may vary according to the purpose for which the den is used (e.g., predator avoidance, daytime shelter, or the denning of young). In the Pilbara Hernandez-Santin (et al. 2022) regarded potential dens as holes roughly measuring 10 cm in diameter at the widest point (considered large enough for a northern quoll to enter, but not an adult feral cat) and Cowan et al. (2020) found that occupied dens were deeper than both unoccupied crevices and artificial dens, suggesting that quolls seek crevices with long, internal tunnels. Conversely, Hernandez-Santin et al. (2022) regarded temporary shelters to be debris, spinifex clumps, hollow trees, dense shrubs, thick grass, and rocky crevices that were not deep enough to be used as den.<br>Where shelter habitat occurs within the northern quolls predicted range, it is considered 'habitat critical to the survival of the species' (DotEE 2016). The referral guidelines recognise that all native vegetation |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | within 1 km of shelter habitat or Northern quoll records maybe considered foraging and dispersal habitat (DotEE 2016). Foraging and dispersal habitat may also be considered habitat critical to the survival of the species when it is connected to shelter habitat that supports an 'important population'. Moore et al. (2021) indicates that critical habitat for Northern quolls in the Pilbara is defined by large areas of condensed, complex rocky habitat, with intact vegetation occurring both within and the surrounding area.<br>The DBCA TPFA database search returned five records within 25 km of the survey area, and a further seven records of northern quoll between 25 - 50 km of the survey area, from between 2010 to 2022.<br>Although no obvious signs of northern quoll were observed during the detailed fauna survey, this species is classified as possible to occur in the survey area due to modern records within 50 km of the survey area and potential foraging, dispersal and temporary shelter habitat present. |
| Ghost bat<br>*Macroderma gigas*<br>BC Act / DBCA: VU<br>EPBC: VU | Likely | 9.9 km north-west | In the Hamersley IBRA subregion, ghost bat populations are often widespread and small, with 1 to 15 individuals typically encountered within a roost, and an estimated population of 350 ghost bats across the subregion (Bullen 2021a).<br>The ghost bat has declined significantly over the last 200 years, and currently has widespread but patchy distribution across northern Australia (Van Dyck & Strahan 2008). The availability of suitable roost caves is critical for the species' persistence and survival (Armstrong & Anstee 2000). The ghost bat will often forage more broadly across habitats, often utilising drainage lines and other habitats where prey species are likely to be most abundant (Richards *et al.* 2008, Tidemann *et al.* 1985).<br>Ghost bats are most commonly found roosting in caves and disused mineshafts in the Pilbara region, with this sites predominantly found in ironstone geologies (such as Brockman and Marra Mamba banded iron formation or Robe Pisolite channel iron deposit (CID) geology) and granite rockpiles (Bullen 2021a). One such roost location with high use is located near the survey area at Rhodes Ridge (Bullen 2021a).<br>No caves were observed in the survey area, although caves have been opportunistically observed in the wider exploration tenement.<br>The DBCA TPFA database search returned 105 records of ghost bat within 50 km of the survey area, six of which are within 10 km of the survey area. These records vary in age from 2012 to 2022. Due to the proximity of recent records, a known regional ghost bat roost and the survey area containing potential foraging habitat, ghost bats are classified as likely occurring in the survey area, although no ghost bat calls were recorded during the detailed fauna surveys. |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| Greater bilby<br>*Macrotis lagotis*<br>BC Act / DBCA: VU<br>EPBC: VU | Unlikely | 7 km west | The greater bilby is a medium-sized burrowing marsupial. Bilbies are omnivores that primarily dig for food (DotEE 2019). Within the Pilbara region the species is often sparsely distributed and occurs in relatively low abundance, making detection difficult (Southgate *et al.* 2018).<br>Populations of greater bilby exist in the Pilbara bioregion within the Chichester subregion, along the Fortescue River and north-east to Goldsworthy and Shay Gap. The species' distribution within the Pilbara region is highly fragmented (Cramer et al. 2017).<br>Greater bilbies are recorded as having low site fidelity and high mobility and can have large foraging ranges. Adult females have been known to move up to 1.5 km between burrows on consecutive days; while adult males regularly move 2–3 km and up to 5 km between burrows on consecutive days (Southgate et al. 2007) and have been recorded moving up to 15 km in a few weeks (Southgate & Possingham 1995). As greater bilbies are solitary in nature, lack territoriality and have large home ranges, it is likely that males adopt a roving strategy to find receptive females and may move in response to foraging potential (Southgate 1990a, Southgate et al. 2018).<br>Bilbies occupy a range of habitats including: open tussock grassland on uplands and hills; *Acacia aneura* (mulga) woodland/shrubland growing on ridges and rises; and hummock grassland in plains and alluvial areas (Woinarski et al. 2014). *Acacia bivenosa*, *A. colei*, *A.dictyophleba*, *A. melleodora*, *A. stellaticeps* and *A. trachycarpa* are all known to host root-dwelling (Cossidae) insect larvae in the Pilbara (Dziminski & Carpenter 2017). Associations with other plant species (e.g., *Senna notabilis*) have also been identified (Southgate et al. 2018). Minimal ground cover is a common feature in greater bilby habitats, as it allows easy foraging (Dawson et al. 2018).<br>In the Pilbara the species is most frequently recorded within spinifex sandplains associated with paleo-drainage lines and perched drainage lines where the substrate of sand, soil, sandy clay, or sandy gravel is suitable for burrowing (Dziminski & Carpenter 2017). Monitoring data from the railway that runs north-south from Port Hedland to Christmas Creek documented bilby from areas of sandy substrates dissected by significant drainages within the Macroy land system (Equinox 2016). Similarly, How et al. (1991) recorded active burrow systems in the vicinity of drainage tributaries of the Yule and Turner Rivers.<br>The DBCA TPFA database search returned one record from 1983 approximately seven km from the survey area, in addition to 14 other records from within 50 km of the survey area ranging in age from 1970 to 2013.<br>Mulga woodland can be utilised by bilby where there is suitable burrowing substrates and food resources, however, spinifex sandplain (not present on the survey area) is considered the preferred habitat (Southgate 1990b). Based on the lack of large sandplain/sand dune systems and large sandy |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | drainage systems proximal to the survey area, the habitats that contain substrate suitable for burrowing (mulga woodland, drainage, stony plain and rises) are regarded as marginal greater bilby habitat.<br>Given that there are no records from within the last 10 years, and the lack of preferred habitat, the greater bilby is classified as unlikely to occur within the survey area. |
| Black-flanked rock-wallaby, or, black-footed rock-wallaby<br>*Petrogale lateralis lateralis*<br>BC Act / DBCA: EN<br>EPBC: EN | Unlikely | 28 km east | The black-flanked rock-wallaby, or black-footed rock-wallaby, is a shy nocturnal species with several subspecies. The subspecies *Petrogale lateralis lateralis* is known to occur on Cape Range, offshore Pilbara islands and isolated outcrops in the wheatbelt (Department of Climate Change, Energy, the Environment and Water 2024f). The distribution of this species is patchy, with populations are scattered and restricted to sites with suitable rocky habitat that contains caves and crevices to provide refuge from the heat during the day (Pentland 2014). This species have a stronger preference for habitats with high rocky complexity than vegetation complexity and only foraging in open habitats that are in close vicinity of cover (Pentland 2014).<br>Since the arrival of foxes and feral cats in Australia, the black-flanked rock-wallaby, had shown a considerable decline in numbers due to predation. Other key threats for this species include grazing by introduced herbivores leading to habitat degradation and increase food competition, as well as weeds and increases in fire frequency/intensity (National Environmental Science Program Threatened Species Research Hub 2019).<br>The DBCA TPFA database search returned four records from within 50 km of the survey area, all from 1975, while ALA returned one additional record within the same distance without a date supplied.<br>Given the lack of suitable complex rocky habitat within the survey area, as well as the lack of contemporary records, it is unlikely that this threatened species is present within the survey area and it is possibly an erroneous record as the species is restricted to Cape Range, offshore Pilbara islands and isolated outcrops in the wheatbelt. |
| Western Pebble-mound Mouse<br>*Pseudomys chapmani*<br>BC Act / DBCA: P4<br>EPBC: - | Confirmed | multiple within survey area<br><br>DBCA TPFA database search: 4.5 km east | The western pebble-mound mouse is presently found throughout much of the central and eastern Pilbara, but was historically more widespread (Start 2008). The western pebble-mound mouse 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 & Armstrong 2001). Typically, the presence of western pebble-mound mouse is identified via observations of the pebble mound this species builds over its dens (as displayed in Table 5.6). Western pebble-mound mice are known to occur in social groups of up to 12 individuals per mound (Anstee et al. 1997). Within suitable habitats, pebble-mound mouse mounds can be found in high densities, although not all mounds |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | | are occupied at the same time, with individuals moving among mounds in their home range (Anstee 2000).<br>The DBCA TPFA database search returned 280 records of this species within 50 km of the survey area ranging in age from 1994 to 2022. Nineteen of these records are located with 10 km of the survey area. The Atlas of Living Australia search also returned an additional nine records within 50 km of the survey area.<br>Multiple mounds, both active and inactive were found opportunistically on Round Hill and in the stony spinifex plains and rises habitat proximal to it. |
| Pilbara Leaf-nosed bat<br>*Rhinonicteris aurantia* (Pilbara form)<br>BC Act / DBCA: VU<br>EPBC: VU | Possible | 15 km east | The Pilbara leaf-nosed bat requires deep caves with high levels of humidity and stable temperatures (Churchill 2008). This species has a very limited ability to conserve heat and water and requires very hot (28-32°C) and humid (96-100%) roost sites in caves and/or abandoned mines (Armstrong 2001). These types of caves/mines are relatively uncommon in the Pilbara, with only 48 confirmed permanent diurnal roost sites, which consist of 38 natural caves, six disused underground gold or copper mines of the eastern Pilbara and the remaining sites are not well defined (Bullen 2021b). Pilbara leaf-nosed bat forages in caves and along waterbodies with fringing vegetation (DoEE 2016).<br>Pilbara leaf-nosed bat are predicted to travel up to 20 km from roost caves during nightly foraging (Cramer et al. 2016), however, seasonal variation is known to occur, with foraging occurring up to 20 km in the dry season and up to 50 kilometres during the wet season (Bullen 2013). Long-distance movements by the species have also been recorded, with a single monitored individual recorded from two roost caves located 170 km and approximately 12 months apart (Bullen & Reiffer 2019).<br>The DBCA TPFA database search returned 225 records of this species from within 50 km of the survey area ranging in age from 2008 to 2022. Three of these records are located within 20 km of the survey areas.<br>Due to over 200 of the DBCA records of Pilbara leaf-nosed bat occurring from within the last 10 years within 50 km of the survey area, it is possible that this species may disperse through the survey area or use it for potential foraging. |
| **Reptiles** | | | |
| Gane's blind snake (Pilbara)<br>*Anilios ganei*<br>BC Act / DBCA: P1<br>EPBC: - | Confirmed | Recorded in survey area during separate fauna survey | Endemic to the Pilbara, the species has a disjunct distribution, so its exact range is not known. Gane's blind snake has been recorded from numerous habitats but is most likely to be present in rocky terrain and along drainage lines (Biologic 2020). Gane's blind snake was originally listed because it was known from only a few scattered records. The species has been recorded from five locations within the Mining Area C Development Envelope, including an open drainage line (ENV Australia 2007), rocky slope below |

| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | (Rapallo Environmental, 2025).<br><br>DBCA TPFA database search: 4.5 km south | the vertical wall of a gully, and from mulga woodland habitat (Biologic 2011). (Ecologia Environment 2021) recorded the species from mulga woodland and stony plain habitats at Mulga East. Rapallo (2024b) has also recorded two individuals of this species at the Bell Tenements (E45/1073 and E45/1074), approximately 100 kilometres north west of the survey area, at a trap site located within a major drainage habitat in March 2023. Little is known of the ecology of Gane's blind snake, but this species is often associated with moist soils and leaf litter within gorges and gullies (Wilson & Swan 2017) and potentially within a wide range of other stony habitats.<br>The DBCA database returned 10 records from within 50 km of the survey area, with records ranging in date 1985 to 2010. Two of these records occur approximately 4.5 km south of the survey area. An ALA search returned an additional seven records, with one as recent as 2020, within 50 km of the survey area.<br>Although a Gane's blind snake was not located during this survey, one was found during a targeted fauna survey of Round Hill in 2024 by Rapallo while spotlighting in a rocky drainage gully containing spinifex and leaf litter on the Round Hill. |
| Unpatterned robust slider<br>*Lerista macropisthopus remota*<br>BC Act / DBCA: P2<br>EPBC: - | Possible | 34.8 km northwest | *Lerista macropisthopus* is an elongated, smooth-scaled species of skink, typically found in the arid regions of Western Australia in woodlands and semi-arid scrub habitats (Cogger 2018). This species of skink is divided into four sub-species. The sub-species of interest, *Lerista macropisthopus remota,* is found in the central interior of Western Australia (Cogger 2018). Information available on this sub-species is extremely limited, hence its Priority 2 classification.<br>The DBCA database search returned three records from 2012, approximately 35 km north-west of the survey area, while the Atlas of Living provided an additional record approximately 48 km north-west of the survey area.<br>Given the proximity of the fauna database records, and the potential habitat that may be suitable for this species (as other species of slider were identified in the survey area), the unpatterned robust slider may possibly occur in the survey area. |
| Pilbara olive python<br>*Liasis olivaceus barroni*<br>BC Act / DBCA: VU<br>EPBC: VU | Confirmed | Sloughed skin recorded from survey area.<br><br>DBCA TPFA database search: 8 km northwest and | The Pilbara olive python is most often encountered near permanent waterholes in rocky ranges or among riverine vegetation (Pearson 1993). In the winter months, Pilbara olive pythons spend their time hidden in caves and rock crevices and become more active again around rocky outcrops and water holes during the warmer summer months (Department of Climate Change, Energy, the Environment and Water 2008). The survey area does not contain any known permanent waterbodies, but the drainage lines within the survey area may provide suitable foraging and dispersal habitat from the proximal rocky hills and temporary pools that fill after significant rainfall. Suitable habitat is also present in the wider tenement at the large rocky drainage gullies pictured in Table 5.3. Despite lack of records in the literature, this species is fairly widespread in the Pilbara region (Bush & Maryan 2011). |

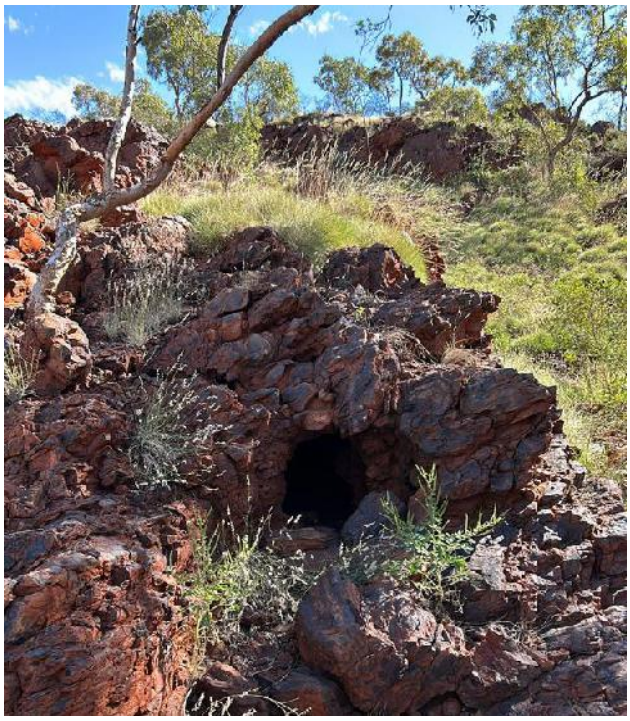
| Species | Likelihood | Nearest records | Discussion |
|---|---|---|---|
| | | 8 km southeast | The Pilbara olive python is separated from more northern populations of olive python in the Kimberely by the Great Sandy Desert, which does not provide suitable habitat for this species of python, resulting in two genetically distinct groups (Pearson *et al*. 2013).<br>The DBCA database search returned 19 records of Pilbara olive python from within 50 km of the survey area ranging in age from 1975 to 2021. Two of which were within 10 km of the survey area, and three records located between 10-20 km from the survey area. The ALA search also returned an additional four records within 50 km of the survey area.<br>A sloughed skin of a Pilbara olive python was located during the detailed survey in 2023 near the base of Round Hill in a rocky drainage gully as displayed in Table 5.6. The skin was measured to be 140 cm in length, although the tail was missing, leading to an estimated size of 150 cm. A mid-body scale count was completed multiple times, by two experienced herpetologists, who confirmed the identification of the sloughed skin to be a Pilbara olive python. |
| Great desert skink *Liopholis kintorei*<br>BC Act / DBCA: VU<br>EPBC: VU | Highly unlikely | No records within 50 km | Great desert skink can inhabit open spinifex sandplains and adjacent dune field swales but is rarely found in extensive dune fields or rocky outcrops. In the Tanami Desert and parts of the Great Sandy Desert (including Newhaven, Lake Mackay and Punmu subpopulations), Great desert skink also inhabit palaeo-drainage country featuring slightly saline depressions or chains of dry salt lakes, with soft spinifex (*T. pungens*), tea tree (Melaleuca spp.) shrubs and the salt tolerant sub-shrub *Pluchea ferdinandi-muelleri* (Indigenous Desert Alliance 2022).<br>The DBCA database search returned no records of this species within 50 km of the survey area, but it was instead highlighted by a Protected Matters search.<br>As a result of both the fauna database searches and the lack of suitable habitat, it is highly unlikely that the great desert skink is present within the survey area. |
| Pilbara barking gecko *Underwoodisaurus seorsus*<br>BC Act / DBCA: P2<br>EPBC: - | Unlikely | 44 km northwest | Pilbara barking gecko is a rock inhabiting, restricted-range species encountered at mid elevations in the Hamersley Ranges, which widely separates it from the closest populations of the related barking gecko species *Underwoodisaurus milii* in the northern Goldfields and Shark Bay in Western Australia (Doughty & Oliver 2011). This species of gecko often shelters under rocks on arid rocky slopes and gorges, that also consist of sparse trees and spinifex dominated ground cover (Cogger 2018).<br>To date there are very few records of this species, which occurs in a band from north of Tom Price in the western Hamersley to the south-eastern Hamersley near West Angelas mine proximal to Newman (Doughty & Oliver 2011). This species is recorded from several locations at Mining Area C and surrounds from gorge gully habitats (Biologic 2017).<br>The DBCA database returned three records of this species within 50 km of the survey area, in the vicinity of Hope Downs 1, with the three records being from 2010 and 2011.<br>Based on the preferred habitat and the records within 50 km of the survey area, it is unlikely that this species may be present in the survey area due to a lack of mid-high elevation slopes. |

**Table 5.6 Photographs relevant to the discussion of conservation significant fauna**

| Description | Photographs |
|---|---|
| **Long -tailed dunnart**<br>*Antechinomys longicaudatus*<br><br>This species is known to occur in areas of exposed rock and stony soils with hummock grasses and shrubs, lateritic plateaus, sandstone ranges, breakaways and flat-topped hills. They may also occur in areas of sparse mulga over spinifex (Western Australian Museum 2023).<br><br>Round Hill matches the habitat that is known for this species, with exposed rock and stony soils, as well as *Triodia* hummocks in addition to being a flat-topped hill. |  <br>  <br>Photos: Habitat where the long-tailed dunnart was captured on camera in season 1 near trapsite 6.<br>  <br>Photo: Image of the long-tailed dunnart from camera trap 41 near trap site 6. |

| Description | Photographs |
|---|---|
| **Western pebble-mound mouse**<br>*Pesudomys chapmani*<br><br>Both active, inactive and extinct pebble mounds, built by pebble mound mice over their dens, were located within the survey area often on rocky hill habitats or in the stoney plains and rises habitats. |  <br>Photo: Active pebble mound [Qy12, Survey 1]<br>  <br>Photo: Example of preferred habitat [Qy54, Survey 1] |
| **Pilbara olive python**<br>*Liasis olivaceus barroni*<br><br>In the cooler dry season months, Pilbara olive pythons spend their time hidden in caves and rock crevices, such as those pictured, and become more active again around rocky outcrops and water holes during the warmer months (Department of Climate Change, Energy, the Environment and Water 2008). |  <br>Photo: Habitat where Pilbara olive python skin was found [FS01, Survey 1]<br>  <br>Photo: Site where Pilbara olive python skin was found [FS01, Survey 1] |

| Description | Photographs |
|---|---|
| **Night parrot**<br>*Pezoporus occidentalis*<br><br>Examples of small patches of more mature *Triodia* from the survey area which could be suitable for night parrot roosting. |  <br>Photo: Parrot Box location 1, SN-5295, April, Survey 2<br>  <br>Photo: Parrot box location 2, SN-5295, May, Survey 2<br>  <br>Photo: Large spinifex hummock in the southern area of the southern survey section with a handheld radio (model IC-41pro) for size comparison |

| Description | Photographs |
|---|---|
| **Northern quoll**<br>*Dasyurus hallucatus*<br><br>Northern quoll are known to eat the fleshy fruits dropped by native fig species. Multiple patches of these figs were found within the minor drainage gullies on Round Hill in the survey area.<br><br>Shelter is also present on the Round Hill within the survey area with a variety of crevices and holes that could be used for temporary shelter for this species.<br><br>Round Hill contains both foraging and shelter habitat for this species. Refer to Table 5.5 for a discussion on denning suitability. |  <br>Photo: Mature ficus patch in minor drainge of Round Hill ["Fig trees - GPS11", survey 2]<br>  <br>Photo: Potential denning or shelter on Round Hill ["Holes under rock shelf", survey 2]<br>  <br>Photo: Potential shelter on Round Hill ["Small Hole", Point mapping, Survey 2] |

| Description | Photographs |
|---|---|
| **Gane's blind snake**<br>*Anilios ganei*<br><br>Examples of rocky habitat on Round Hill with leaf litter and spinifex where this species was found during a 2024 targeted fauna survey (Rapallo Environmental, 2025). |  <br>Photo: Example of habitat where Gane's blind snake was found during the targeted survey on Round Hill [JW gully3.3, point mapping, Survey 2] |

## 5.5 Survey adequacy and limitations

### *5.5.1 Level of assessment and survey timing*

The primary focus of the detailed terrestrial vertebrata fauna survey was to identify the faunal assemblages present in the survey area. For this reason, conducting the survey post summer rainfall, when faunal activity is typically high is appropriate. An increase in rainfall prior to the second season compared to the first season, is likely the main influence driving the increase in both bird and amphibian species detected during the second survey (76 bird species, two amphibian species) compared to the first survey (66 bird species, one amphibian species). The level of assessment and timing of the field surveys is summarised in Table 5.7.

**Table 5.7 Summary of survey assessment and timing**

| Assessment factors | | Timing |
|---|---|---|
| **Broad climatic region** | | Eremaean region |
| **EPA (2020) survey recommended timing** | Reptiles | September to April |
| | Birds and Amphibians | After rainfall events |
| | Mammals | No advised time period, can be completed alongside reptile surveys for convenience or in line with target species population cycles. |
| **Number of staff** | | 6 x Ecologists per survey |
| **Survey dates** | Survey 1 | 23 August to 7 September 2023 (including travel) |
| | Survey 2 | 24 April to 6 May 2024 (including travel) |
| **Total survey period** | | 29 days |
| **Number of trap sites** | | 8 trapping sites |

### *5.5.2 Survey completeness*

Species accumulation curves for trappable fauna and birds are presented in section 5.3.5. Species richness estimators indicate that the survey recorded over 100% of the estimated trappable fauna, and 100% of the estimated birds.

Additional trapping and bird surveys would not likely improve the known species richness of the survey area and would likely not to yield additional conservation significant species.

### *5.5.3 Survey limitations*

In accordance with EPA (2020) technical guidance, an assessment of the limitations of the survey is presented in Table 5.8.

**Table 5.8 Limitations of the fauna survey**

| Aspect | Limitation | Discussion |
|---|---|---|
| Scope and intensity | No | Scope and intensity of the survey were suitable to achieve the aims of a level 2 fauna survey as outlined in EPA (2020). |
| Availability of contextual information at a regional and local scale | No | Suitable database results and information were available to complete a desktop study for the survey. |
| Competency/experience of the team carrying out the survey, including experience in bioregion surveyed | No | All members of the survey team have experience in conducting fauna surveys in arid Western Australia. |
| Proportion of fauna recorded and/or collected, any identification issues | No | All observed vertebrate fauna was identified at the point of observation during the field surveys. All recorded bat calls were analysed, and species identified by an external expert.<br>The survey recorded 171 species of vertebrate fauna, including 83 bird species, 26 mammal species, 60 reptile species, and two frog species. The species accumulation curves for trappable fauna and birds indicated that additional trapping effort is unlikely to detect further species within project survey area. |
| Was the appropriate area fully surveyed (effort and extent) | No | The survey area was covered via 4WD or by foot which enabled access to all areas. The survey was completed as a dual season detailed vertebrate fauna survey.<br>While establishing trap sites in the first season, Rapallo field staff were informed that trap sites could not be placed or spread as originally intended and could only be established within certain boundaries. This has resulted in a heavier trapping effort in the southern section of the southern survey area as shown on the survey effort maps, but all fauna habitat types were trapped.<br>Due to client restrictions, head torching/spotlighting activities for nocturnal fauna could not be completed during the second survey period, although an extensive amount of spotlighting was completed during the first survey period. It should be noted that during a following targeted fauna survey (Rapallo Environmental, 2025) included head torching/spotlighting activities within the same survey area. |
| Access restrictions within the survey area | No | All survey areas were accessible by car or by foot. |
| Survey timing, rainfall, season of survey | No | No limitations regarding survey timing, rainfall or survey seasons. |
| Disturbances that may have affected the results of the survey (e.g. fire, flooding, clearing) | No | No disturbances have affected the results of the survey. |

# 6 Conclusion

The two-season detailed fauna survey recorded a total of 171 vertebrate species, including 83 birds, 60 reptiles, 26 mammals and two amphibians. The first season recorded 140 species, while the second season recorded 139 species.

The desktop study identified 39 conservation significant fauna species recorded within 50 kilometres of the survey area. Species are listed under the Western Australian Biodiversity Conservation Act 2016 (BC Act), the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and as priority species administered by the Department of Biodiversity Conversation and Attractions (DBCA).

At the time of writing, four species of conservation significant vertebrate terrestrial fauna have been recorded from the survey area (three from this detailed survey, and one from a following targeted survey in 2024 (Rapallo Environmental, 2025), these include:

- Long-tailed dunnart (*Antechinomys longicaudatus*) listed Priority 4 under DBCA – confirmed, recorded in the survey area in 2023 during the Rapallo detailed fauna survey.
- Pilbara olive python (*Liasis olivaceus barroni*) listed vulnerable under both the BC Act and the federal EPBC Act – confirmed, sloughed skink recorded in the survey area in 2023 during the Rapallo detailed fauna survey.
- Western pebble-mound mouse (*Pseudomys chapmani*) listed Priority 4 under DBCA – confirmed, recorded in the survey area in 2023 and 2024 during the Rapallo detailed fauna survey.
- Gane's blind snake (Pilbara) (*Anilios ganei*) listed Priority 1 under DBCA – confirmed, recorded on the survey area during targeted fauna surveying in 2024 (Rapallo Environmental, 2025). Also recorded proximal to the survey area in the desktop study.

Based on desktop records and habitat requirements two species have been ranked as likely to occur on the survey area, these include:

- Ghost bat (*Macroderma gigas*) - Vulnerable under both the BC Act and the federal EPBC Act
- Grey falcon (*Falco hypoleucos*) - Vulnerable under both the BC Act and the federal EPBC Act

With an additional 13 species considered as possibly occurring in the survey area, as listed below:

- Common sandpiper (*Actitis hypoleucos*) – Migratory under the BC Act and EPBC Act
- Glossy ibis (*Plegadis falcinellus*) - Migratory under the BC Act and EPBC Act
- Fork-tailed swift, also known as the Pacific Swift, (*Apus pacificus*) - Migratory under the BC Act and EPBC Act
- Pectoral sandpiper (*Calidris melanotos*) - Migratory under the BC Act and EPBC Act
- Peregrine falcon (*Falco peregrinus*) – Otherwise Specially protected under the BC Act
- Princess parrot (*Polytelis alexandrae*) – Priority 4 under DBCA and Vulnerable under the EPBC Act
- Sharp-tailed Sandpiper (*Calidris acuminata*) - Migratory under the BC Act, as well as Vulnerable under the EPBC Act
- Southern whiteface (*Aphelocephala leucopsis*) – Vulnerable under the EPBC Act
- Wood sandpiper (*Tringa glareola*) - Migratory under the BC Act and EPBC Act
- Brush-tailed mulgara (*Dasycercus blythi*) – Priority 4 under DBCA
- Northern quoll (*Dasyurus hallucatus*) - Endangered under the BC Act and EPBC Act

- Pilbara Leaf-nosed bat (*Rhinonicteris aurantia* (Pilbara form)) - Vulnerable under the BC Act and EPBC Act
- Unpatterned robust slider (*Lerista macropisthopus remota*) - Priority 2 under DBCA

The remaining 17 conservation significant species, including night parrot (*Pezoporus occidentalis*), are ranked as unlikely or highly unlikely to occur on the survey area due to the absence of suitable habitat, a lack of records and/or the survey area being well outside its currently known range.

Within the survey area, six broad fauna habitats were identified based topography, landforms, broad vegetation, soil type and surface substrate. These habitats, in order of largest extent in the survey area, were spinifex plains and rises, mulga woodlands, tussock grasslands, rocky hills, drainages and disturbed habitats. All non-disturbed habitats are known to support threatened and priority fauna under the EPBC Act, BC Act and/or DBCA. Habitats utilised by conservation significant species on the survey area are typically well represented regionally.

The spinifex plains and rises habitat was the most common habitat representing 34.8% of the survey area and is locally and regionally well represented. Conservation significant species that are either confirmed or may use the spinifex plains and rises habitat are the western pebble-mound mouse (denning and foraging habitat - confirmed), northern quoll (dispersal and foraging habitat), ghost bat (foraging habitat), Pilbara leaf-nosed bat (foraging habitat), grey falcon (foraging habitat) and brush-tail mulgara (foraging habitat).

The mulga woodlands habitat was the second most common habitat with and extent over 28.9% of survey area and extends outside of the survey area. This habitat type varied between banded and unbanded mulga formations in the survey area. Conservation significant species that may use this habitat are northern quoll (dispersal and foraging habitat), ghost bat (foraging habitat), brush-tail mulgara (foraging habitat when in proximity to spinifex plains).

The rocky hill habitat was less common, with an extent covering approximately 7.8% of the survey area but is common regionally throughout the Pilbara. Within the survey area this habitat it is known to support all four of the conservation significant fauna species that have been confirmed for the survey area - western pebble-mound mouse (denning and foraging habitat), long-tailed dunnart (foraging and shelter), Pilbara olive python (dispersal and shelter) and Gane's blind snake (foraging and shelter). All these confirmed species, except for the western pebble-mound mouse, were only recorded within this habitat type on the larger of the two hills present in the southern survey section. Other conservation significant species that could potentially be supported by this habitat are the northern quoll (shelter and foraging habitat) and the Pilbara barking gecko (shelter and foraging habitat).

At the time of the surveys, the heavily disturbed habitat was the least common habitat type and was predominantly localised to where Great Northern Highway passes through the survey area. Conservation significant species are unlikely to be present in this habitat type but may pass through it or exist on the edges of this habitat.

It is suggested that feral cat management be undertaken in the survey area as part of conservation significant species management activities.

# 7 References


360 Environmental (2023) Nyidinghu Iron Ore Project Detailed Terrestrial Fauna Survey. Report prepared for Fortescue Metals Group Limited, February 2023.

Anstee, S.D. (2000) The role of mining companies in mammal conservation: A Western Australian case study. Proceedings America Society of Mining and Reclamation.

Anstee, S.D. and Armstrong, K.N. (2001) The effect of familiarity and mound condition in translocations of the western pebble-mound mouse, Pseudomys chapmani, in the Pilbara region of Western Australia. Wildlife Research **28**, 135-140.

Anstee, S.D., Roberts, J.D. and O'Shea, J.E. (1997) Social structure and patterns of movement of the Western Pebble-mound Mouse, Pseudomys chapmani, at Marandoo, Western Australia. Wildlife Research **24**, 295-305.

Armstrong, K. (2001) The distribution and roost habitat of the Orange Leaf -nosed Bat, Rhinonicteris aurantius, in the Pilbara region of Western Australia. Wildlife Research **28**, 95–104.

Armstrong, K.N. and Anstee, S.D. (2000) The Ghost Bat in the Pilbara: 100 years on. Australian Mammalogy **22**, 93–101.

Astron Environmental Services (2019) Rio Tinto, Hope Downs 2 Proposal – Fauna Survey, March 2019.

Atlas of Living Australia (2023) Atlas of Living Australia. http://www.ala.org.au

Barnett, J. and Commander, D. (1986) Hyrdology of the Western Fortescue Valley, Pilbara Region, Western Australia. Department of mines, Western Australia, Perth.

Beard, J.S. (1975) Vegetation Survey of Western Australia, Pilbara 1:1 000 000. Map and Explanatory Notes to Sheet 7. Published by University of Western Australia Press., Perth.

Beard, J.S. (1990) Plant life of Western Australia. Kangaroo Press, Kenthurst, N.S.W.

Beard, J.S. (2018) Pre-European Vegetation - Western Australia (NVIS Compliant version 20110715). ArcView shapefiles published by the Department of Primary Industry and Regional Development. The major sources of data in this database are the published and unpublished mapping of J.S. Beard at 1:250,000 scale.

Biologic (2011) Area C and Surrounds Fauna Survey. Unpublished report for BHP Billiton Pty Ltd.

Biologic (2017) Proposed Mining Area C Development Envelope Vertebrate Fauna Desktop Assessment. Report prepared for BHP Iron Ore Pty Ltd. February 2017.

Biologic (2020) McPhee Creek Consolidated Terrestrial Fauna Report. McPhee Creek Project Report to Roy Hill and Atlas Iron Limited.

Biologic Environmental Survey (2022) Western Ridge Pipelines Vertebrate Fauna Survey. Report prepared for BHP WAIO, July 2022.

Biologic Environmental Survey (2024) Jinidi Targeted Vertebrate Fauna Survey. Report prepared for BHP WAOI. 13 May 2024.

Birdlife Australia (2017) Bird profiles: Red Goshawk. https://birdlife.org.au/bird-profiles/red-goshawk/

Birdlife Australia (2021) Birdlife Australia website. https://birdlife.org.au

Birdlife Australia (2023) Working List of Australian Birds, v4.3 October 2023.

Birdlife Australia (2024a) Birdata. https://birdata.birdlife.org.au/

Birdlife Australia (2024b) Letter-winged Kite. Birds in Backyards. https://www.birdsinbackyards.net/species/Elanus-scriptus

BirdLife International (2022) The IUCN Red List of Threatened Species 2022: Calidris acuminata. The IUCN Red List of Threatened Species. https://www.iucnredlist.org/species/22693414/152588591

Braithwaite, R.W. and Griffiths, A.D. (1994) Demographic variation and range contraction in the northern quoll, *Dasyurus hallucatus* (Marsupialia: Dasyuridae). Wildlife Research **21**, 203–217.

Bullen, R.D. (2013) Pilbara leaf-nosed bat (Rhinonicteris aurantia); summary of current data on distribution, energetics, threats. Paper presented at the Pilbara leaf-nosed bat workshop. Kensington WA.

Bullen, R.D. (2021a) A review of ghost bat ecology, threats and survey requirements. Prepared for Department of Agriculture, Water and Environment. Department of Agriculture, Water and Environment, Canberra.

Bullen, R.D. (2021b) A review of Pilbara leaf-nosed bat ecology, threats and survey requirements. Bat Call WA. Prepared for the Department of Agriculture, Water and Environment.

Bullen, R.D. and Reiffer, S. (2019) A record of movement of a Pilbara leaf-nosed bat between distant diurnal roosts using PIT tags. Australian Mammalogy **42**, 119–121.

Burbidge, A.H., Johnstone, R.E. and Pearson, D.J. (2010) Birds in a vast arid upland: avian biogeographical patterns in the Pilbara region of Western Australia. Records of the Western Australian Museum, Supplement **78**, 247–270.

Bureau of Meteorology (2024) Climate Data Online. Australian Government Bureau of Meteorology. http://www.bom.gov.au/climate/data/

Bush, B. and Maryan, B. (2011) Field Guide to Snakes of the Pilbara, Western Australia. Western Australian Museum, Perth, Western Australia.

Caccetta, W. (2018) Night parrot photographed twice in secret location. National Indigenous Times.

Churchill, S. (2008) Australian bats. Allen & Unwin, Crows Nest, N.S.W.

Cogger, H.G. (2018) Reptiles and Amphibians of Australia. Updated seventh edition, October 2018. CSIRO Publishing.

Colwell, R.K. (2013) EstimateS: Statistical estimation of species richness and shared species from samples. Version 9.1.0. Persistent URL <purl.oclc.org/estimates>.

Colwell, R.K., Chao, A., Gotelli, N.J., Lin, S.Y., Mao, C.X., Chazdon, R.L. and Longino, J.T. (2012) Models and estimators linking individual-based and sample-based rarefaction, extrapolation and comparison of assemblages. Journal of Plant Ecology **5**, 3–21.

Cowan, M., Dunlop, J.A, Turner, J.M and Nimmo, D.G. (2020) Artificial refuges to combat habitat loss for an endangered marsupial predator: How do they measure up? Conservation Science and Practice **2**.

Cramer, V.A., Armstrong, K.N., Bullen, R.D., Ellis, R., Gibson, L.A., McKenzie, N.L. and Van Leeuwen, S. (2016) Research priorities for the Pilbara leaf-nosed bat (Rhinonicteris aurantia Pilbara form). Australian Mammalogy.

Cramer, V.A., Dziminski, M.A., Southgate, R., Carpenter, F.M., Ellis, R.J. and Van Leeuwen, S. (2017) A conceptual framework for habitat use and research priorities for the greater bilby (Macrotis lagotis) in the north of Western Australia. Australian Mammalogy **39**, 137-151.

CSIRO Australia (2018) Australian Soil Resource Information System (ASRIS). http://www.asris.csiro.au/themes/Atlas.html

Davis and Metcalf (2008) The Night Parrot (Pezoporus occidentalis) in northern Western Australia: a recent sighting from the Pilbara region. Emu **108**, 233–236.

Dawson, S., Adams, P.J., Moseby, K.E., Waddington, K.I., Kobryn, H., Bateman, P.W. and Fleming, P.A. (2018) Peak hour in the bush: linear anthropogenic clearings funnel predator and prey species. Austral Ecology **43**, 159–171.

Department of Agriculture, Water and the Environment (2021) Species Profile and Threats Database. Rostratula australis - Australian painted snipe. www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=77037

Department of Biodiversity Conservation and Attractions (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. Government of Western Australia, Department of Biodiversity, Conservation and Attractions, Perth.

Department of Biodiversity Conservation and Attractions (2023) Priority Ecological Communities List. Last updated 19 June 2023.

Department of Biodiversity Conservation and Attractions (2024a) Threatened and Priority Fauna List 2024. Last updated April 2024.

Department of Biodiversity Conservation and Attractions (2024b) Guidelines for determining the likely presence and habitat usage of night parrot ( Pezoporus occidentalis ) in Western Australia. Version 1.

Department of Climate Change, Energy, the Environment and Water (2008) Approved Conservation Advice for Liasis olivaceus barroni (Olive Python – Pilbara subspecies) (Conservation Advice), Environment Protection and Biodiversity Conservation Act 1999.

Department of Climate Change, Energy, the Environment and Water (2023) Protected Matters Search Tool. https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool

Department of Climate Change, Energy, the Environment and Water (2024a) Protected Matters Search Tool. https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool

Department of Climate Change, Energy, the Environment and Water (2024b) EPBC Act List of Threatened Fauna. https://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl

Department of Climate Change, Energy, the Environment and Water (2024c) Species Profile and Threats Database (SPRAT): Liasis olivaceus barroni - Pilbara Olive Python. Species Profile and Threats Database. https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66699

Department of Climate Change, Energy, the Environment and Water (2024d) Species Profile and Threats Database (SPRAT): Calidris ruficollis — Red-necked Stint. Species Profile and Threats Database. http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=860

Department of Climate Change, Energy, the Environment and Water (2024e) Species Profile and Threats Database (SPRAT): Calidris subminuta — Long-toed Stint. Species Profile and Threats Database. http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=861

Department of Climate Change, Energy, the Environment and Water (2024f) Species Profile and Threats Database (SPRAT): Petrogale lateralis lateralis — Black-flanked Rock-wallaby, Moororong, Black-footed Rock Wallaby. Species Profile and Threats Database. https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=66647

Department of Environment Regulation (2014) A Guide to the Assessment of Applications to Clear Native Vegetation.

Department of Mines, Industry Regulation and Safety (2024) TENGRAPH Web. http://www.dmp.wa.gov.au/Tengraph_online.aspx

Department of Planning Lands and Heritage (2023) Crown land reserves. https://www.wa.gov.au/organisation/department-of-planning-lands-and-heritage/crown-land-reserves

Department of Primary Industries and Regional Development (2024) Western Australian Organism List (WAOL). www.agric.wa.gov.au/organisms

Department of the Environment (2016) Threatened Species Scientific Committee. Conservation Advice: Macroderma gigas Ghost Bat. http://www.environment.gov.au/biodiversity/threatened/species/pubs/174-conservation-advice-05052016.pdf

Department of the Environment and Energy (2012) Australia's bioregions (IBRA), Version 7. http://www.environment.gov.au/land/nrs/science/ibra

Department of the Environment and Energy (2016) EPBC Act referral guideline for the endangered northern quoll Dasyurus hallucatus. Canberra, Australian Capital Territory:

Department of the Environment and Energy (2019) Draft recovery plan for the Greater Bilby (Macrotis lagotis). March 2019.

Department of Water and Environmental Regulation (2019) Index of Biodiversity Surveys for Assessments (IBSA) portal. https://biocollect.ala.org.au/ibsa

Department of Water and Environmental Regulation (2021) Clearing Regulations - Schedule 1 Areas (DWER-057). Area shapefile of Schedule 1 areas as declared in Regulation 6 in Government Gazette No. 115 Environmental Protection (Clearing of Native Vegetation) Regulations 2004 - Schedule 1. Last updated 4 August 2021.

Department of Water and Environmental Regulation (2023) Clearing Regulations - Environmentally Sensitive Areas (DWER-046). Area shapefile of Environmentally Sensitive Areas as declared in Environmental Protection (Environmentally Sensitive Areas) Notice 2005, Government Gazette No. 55. Last updated 16 February 2023.

Department of Water and Environmental Regulation (2024) Clearing Permit System and Map Viewer. https://cps.dwer.wa.gov.au/main.html

Doughty, P. and Oliver, P.M. (2011) A new species of Underwoodisaurus (Squamata: Gekkota: Carphodactylidae) from the Pilbara region of Western Australia. Zootaxa **3010**, 20–30.

Doughty, P., Rolfe, J.K., Burbidge, A.H., Pearson, D.J. and Kendrick, P.G. (2011) Herpetological assemblages of the Pilbara biogeographic region, Western Australia: ecological associations, biogeographic patterns and conservation. Records of the Western Australian Museum, 315–341.

Dziminski, M. and Carpenter, F. (2017) The conservation and management of the bilby (Macrotis lagotis) in the Pilbara: Progress Report 2017. Perth, Western Australia:

Ecologia Environment (2021) Hancock Prospecting Pty Ltd Mulga East Baseline Terrestrial Vertebrate Fauna Assessment.

Enright, N.J. and Thomas, I. (2008) Pre-European Fire Regimes in Australian Ecosystems. Geography Compass **2**, 979–1011.

ENV Australia (2007) Area C R-deposit Fauna Assessment. Unpublished report for BHP Billiton Pty Ltd.

Environmental Protection Authority (2000) Position Statement No. 2: Clearing of Native vegetation, with particular Reference to the Agricultural Area. Environmental Protection Authority, Government of Western Australia.

Environmental Protection Authority (2016) Environmental Factor Guideline: Flora and Vegetation. EPA, Perth, Western Australia.

Environmental Protection Authority (2020) Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment. June 2020.

Equinox Environmental (2016) State of the Environment Report Rail Operations Final Report (ref. R-RP-EN-1097).

Falkenberg, I.D. (2011) Aspects of the ecology of the Grey Falcon Falco hypoleucos in the South Australian arid zone. Corella **35**, 23–28.

Forshaw, J.M. and Cooper, W.T. (2002) Australian Parrots, 3rd edition. Robina, Queensland: Alexander Editions.

Gardiner, S.J. (2003) Impacts of Mining and Mine Closure on Water Quality and the Nature of Shallow Aquifer, Yandi Iron Ore Mine (Master's Thesis).

Garnett, S.T., Szabo, J.K. and Dutson, G. (2011) The Action Plan for Australian Birds 2010. *CSIRO Publishing/Birds Australia, Melbourne.*

Geering, A., Agnew, L. and Harding, S. (2007) Shorebirds of Australia.

Gibson, L.A. and McKenzie, N.L. (2009) Environmental associations of small ground -dwelling mammals in the Pilbara region, Western Australia. Records of the Western Australian Museum Supplement **78**, 91–122.

Gotelli, N.J. and Colwell, R.K. (2011) Estimating species richness, in: Magurran, A., MgGill, B. (Eds.), Biological Diversity: Frontiers in Measurement and Assessment. Oxford University Press, Oxford, UK, pp. 39–54.

Government of Western Australia (2018) Wildlife Conservation (Specially Protected Fauna) Notice 2018. Western Australian Government Gazette **No. 135, 11 September 2018**, 3232–3242.

Government of Western Australia (2024) Data WA. https://data.wa.gov.au/

Hamilton, N.A., Onus, M., Withnell, B. and Withnell, K. (2017) Recent sightings of the Night Parrot Pezoporus occidentalis from Matuwa (Lorna Glen) and Milrose Station in Western Australia. Australian Field Ornithology 71–75.

Harewood, G. (2018) Night Parrot Survey Report. Lake Disappointment Potash Project. Reward Minerals Ltd.

Hernandez Santin, L. (2016) Ecology and predator associations of the northern quoll (Dasyurus hallucatus) in the Pilbara (Thesis). University of Queensland School of Biological Sciences.

Hernandez-Santin, L., Goldizen, A.W. and Fisher, D.O. (2022) Northern quolls in the Pilbara persist in high-quality habitat, despite a decline trajectory consistent with range eclipse by feral cats. Conservation Science and Practice **4**.

Higgins, P.J. (Ed.) (1999) Handbook of Australian, New Zealand and Antarctic birds. Volume 4. Parrots to Dollarbird. Oxford University Press, Melbourne :

Higgins, P.J. and Davies, S.J.J.F. (1996) Handbook of Australian, New Zealand and Antarctic Birds, Volume 3. Snipe to Pigeons.

Higgins, P.J. and Peter, J.M. (2002) Handbook of Australian, New Zealand and Antarctic Birds. Volume 6: Pardalotes to Shrike-thrushes. Oxford University Press, Melbourne.

Hill and Ward (2010) National Recovery Plan for the Northern Quoll Dasyurus hallucatus.

How, R.A., Dell, J. and Cooper, N.K. (1991) Ecological survey of Abydos -Woodstock Reserve, Western Australia. Records of the Western Australian Museum Supplement **37**, 78–125.

iNaturalist (2024) iNaturalist: Long-toed Stint Calidris subminuta. iNaturalist. https://www.inaturalist.org/taxa/3848-Calidris-subminuta

Indigenous Desert Alliance (2022) Looking after Tjakura, Tjalapa, Mulyamiji, Warrarna. A National Recovery Plan for the Great Desert Skink (Liopholis kintorei).

Jackett, N., Greatwich, B., Swann, G. and Boyle, A. (2017) A nesting record and vocalisations of the Night Parrot Pezoporus occidentalis from the East Murchison, Western Australia. Australian Field Ornithology, 34, 144-150.

James, C., Landsberg, J. and Morton, S. (1995) Ecological functioning in arid Australia and research to assist conservation of biodiversity. Pacific Conservation Biology **2**, 126–142.

Jenkins, A.R. (2000) Hunting mode and success of African Peregrines Falco peregrinus minor, does nesting habitat quality affect foraging efficiency? Ibis **142**, 235–246.

Jenkins, A.R. and Hockey, P.A.R. (2001) Prey availability influences habitat tolerance: an explanation for the rarity of Peregrine Falcons in the tropics. Ecography **24**, 359–367.

Johnstone, R.E., Burbidge, A.H. and Darnell, J.C. (2013) Birds of the Pilbara region, including seas and offshore islands, Western Australia: distribution, status and historical changes. Records of the Western Australian Museum Supplement **78**, 343–441.

Johnstone, R.E. and Storr, G.M. (1998) Handbook of Western Australian birds. Volume I: Non-passerines (Emu to Dollarbird). Western Australian Museum, Perth, W.A.

Johnstone, R.E. and Storr, G.M. (2004) Handbook of Western Australian birds. Volume II: Passerines (Blue-winged Pitta to Goldfinch). Western Australian Museum, Perth, W.A.

Kearney, M.R., Porter, W.P. and Murphy, S.A. (2016) An estimate of the water budget for the endangered night parrot of Australia under recent and future climates. Climate Change Responses **3**, 14–31.

Kendrick, P. (2001) Pilbara 3 (PIL3 - Hamersley subregion), in: Cowan, M., Graham, G., McKenzie, N. (Eds.), A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management.

Key Biodiversity Areas Partnership (2024) Key Biodiversity Areas factsheet: Fortescue Marshes.

Landgate (2020) Reserves Data dictionary. July 2020. Version: v1.3.

Leseberg, N.P., Healy, A.H. and Murphy, S.A. (2021) CopperString 2.0 Project: Potential Night Parrot Habitat Desktop Analysis. Report to GHD. Adaptive NRM, Malanda, QLD.

Marchant, S. and Higgins, P.J. (1990) Handbook of Australian, New Zealand & Antarctic birds. Volume 1. Ratites to Ducks. Oxford University Press, Melbourne.

Marchant, S. and Higgins, P.J. (Eds.) (1993a) Handbook of Australian, New Zealand & Antarctic birds. Volume 2. Raptors to Lapwings. Oxford University Press, Melbourne :

Marchant, S. and Higgins, P.J. (1993b) Handbook of Australian, New Zealand & Antarctic birds. Volume 2, Raptors to Lapwings. Oxford University Press, Melbourne [Vic.].

Mariani, M., Connor, S.E., Theuerkauf, M., Herbert, A., Kuneš, P., Bowman, D., Fletcher, M.-S., Head, L., Kershaw, A.P., Haberle, S.G., Stevenson, J., Adeleye, M., Cadd, H., Hopf, F. and Briles, C. (2022) Disruption of cultural burning promotes shrub encroachment and unprecedented wildfires. Frontiers in Ecology and the Environment **20**, 292–300.

McDougall, A., Porter, G., Cupitt, R., Joseph, L. and Burbidge, A. (2009) Another piece in an Australian ornithological puzzle - a second night parrot is found dead in Queensland. Emu - Austral Ornithology, **109**, 198–203.

McGilp, J. (1931) Geopsittacus occidentalis, Night-Parrot. South Australian Ornithologist, 11, 68-70.

McGilp, J.N. (1935) Birds of the Musgrave Ranges. Emu **34**, 163–176.

Mckenzie, N., Woinarski, J. and Burbidge, A.A. (2008) Long-tailed Dunnart, Sminthopsis longicaudata. Retrieved 2 September 2013, from IUCN.

Medellin, R.A., Wiederholt, R. and Lopez-Hoffman, L. (2017) Conservation relevance of bat caves for biodiversity and ecosystem services. Biological Conservation **211 (Part B)**, 45–50.

Michelmore, K. and Birch, L. (2020) Night parrot located by KJ rangers on Martu country in the Pilbara. ABC Pilbara.

Moore, H.A., Dunlop, J., Valentine, A.E., Woinarski, J.C.Z., Richie, E.G., Watson, D.M. and Nimmo, D.G. (2019) Topographic ruggedness and rainfall mediate geographic range contraction of a threatened marsupial predator. Diversity and Distribution **10**.

Moore, H.A., Michael, D.R., Ritchie, E.G., Dunlop, J.A., Valentine, L.E., Hobbs, R.J. and Nimmo, D.G. (2021) A rocky heart in a spinifex sea: occurrence of an endangered marsupial predator is multiscale dependent in naturally fragmented landscapes. Landscape Ecology.

Morcombe, M. (2004) Field Guide to Australian Birds. Oxford University Press, South Melbourne, Australia.

Murphy, S., Austin, J., Murphy, R., Silcock, J.L., Joseph, L., Garnett, S.T. and Burbidge, A.H. (2017) Observations on breeding Night Parrots (Pezoporus occidentalis) in western Queensland. Emu - Austral Ornithology **117**, 107–113.

Murphy, S., Silcock, J.L., Murphy, R., Reid, J. and Austin, J. (2017) Movements and habitat use of the night parrot Pezoporus occidentalis in south-western Queensland. Austral Ecology **42**, 858–868.

Murray, B.B.R., Zeppel, M.J., Hose, G.C. and Eamus, D. (2003) Groundwater-dependent ecosystems in Australia: It's more than just water for rivers. Ecological Management & Restoration **4**, 110–113.

NAFI (2024) North Australia & Rangelands Fire Information. https://firenorth.org.au/nafi3/

National Environmental Science Program Threatened Species Research Hub (2019) Threatened Species Strategy – Year 3 Priority Species Scorecard - Black-footed Rock-wallaby Petrogale lateralis.

Ninox Wildlife Consulting (2009) A fauna survey of the proposed Hope Downs 4 Mining Area, near Newman, Western Australia. Unpublished report for Mattiske consulting on behalf of Pilbara Iron Company (Services) Pty Ltd.

North, A.J. (1917) Nests and Eggs of Birds Found Breeding in Australia and Tasmania. In: Special Catalogue 1. 3. Sydney: Australian Museum.

Oakwood, M. (2002) Spatial and social organization of a carnivorous marsupial Dasyurus hallucatus (Marsupialia: Dasyuridae). Journal of Zoology **257**, 237–248.

Olsen, P.D. and Olsen, J. (1986) Distribution, Status, Movements and Breeding of the Grey Falcon, *Falco hypoleucos*. Emu **86**, 47–51.

Olsen, P.D. and Olsen, J. (1989) Breeding of the Peregrine Falcon Falco peregrinus. III. Weather, nest quality and breeding success. Emu **89**, 6–14.

Pavey, C.R., Nano, C.E., Cooper, S.J., Cole, J.R. and McDonald, P.J. (2012) Habitat use, population dynamics and species identification of mulgara, *Dasycercus blythi* and *D. cristicauda*, in a zone of sympatry in central Australia. Australian Journal of Zoology **59**, 156–169.

Pearson (1993) Distribution, status and conservation of Pythons in Western Australia, in: D. Lunney, D. Ayers (Eds.), Herpetology in Australia, a Diverse Discipline. Surrey Beatty & Sons, pp. 383–395.

Pearson, D., Spencer, P., Hillyer, M. and How, R.A. (2013) Genetic survey of the Pilbara Olive Python (Liasis olivaceaus barroni). Department of Parks and Wildlife, Science division.

Pentland, C. (2014) Behavioural ecology of the black-flanked rockwallaby (Petrogale lateralis lateralis): Refuge importance in a variable environment (Doctor of Philosophy Thesis).

Pizzey, G. and Knight, F. (2012) Field Guide to the Birds of Australia. Harper Collins Publishers, Sydney, New South Wales.

Rapallo Environmental (2024a) Detailed flora and vegetation survey of the Round Hill project (E47/1313). (Report No. J022498). Prepared for HanRoy Pty Ltd.

Rapallo Environmental (2024b) Detailed terrestrial fauna survey of the Bell Tenements (E45/1073 and E45/1074) (Biological survey Report No. J021990). Prepared for Hancock Prospecting Pty Ltd.

Rapallo Environmental (2025) Round Hill targeted fauna survey and MNES fauna review (Report No. J023151). Prepared for HanRoy Pty Ltd.

Ratcliffe, D.A. (1993) The Peregrine Falcon, 2nd ed. T & AD Poyser Ltd, London.

Richards, G.C., Hand, S., Armstrong, K.N. and Hall, L.S. (2008) Ghost Bat. In S. Van Dyck & R. Strahan (Eds.)., Mammals of Australia 3rd Edition. ed. Sydney: Reed New Holland.

Ruprecht, J. and Ivanescu, S. (2000) Surface Hydrology of the Pilbara Region (Summary Report No. SWH 32), Surface water hydrology series. Water and Rivers Commision.

Schodde, R. and Mason, I. (1999) Directory of Australian Birds - Passerines.*Melbounre, CSIRO.*

Schoenjahn, J. (2013) A hot environment and one type of prey: investigating why the Grey Falcon (Falco hypoleucos) is Australia's rarest falcon. Emu **113**, 19–25.

Schoenjahn, J. (2018) Adaptations of the rare endemic Grey Falcon Falco hypoleucos that enable its permanent residence in the arid zone of Australia (PhD Thesis). University of Queensland.

Shepherd, D., Beeston, G. and Hopkins, A. (2002) Native Vegetation in Western Australia: Extent, type, and status. Resource Management Technical Report 249. Department of Agriculture, South Perth, Western Australia.

Southgate, R., Dziminski, M.A., Paltridge, R., Schubert, A. and Gaikhorst, G. (2018) Verifying bilby presence and the systematic sampling of wild populations using sign-based protocols – with notes on aerial and ground survey techniques and asserting absence. Australian Mammalogy **41**.

Southgate, R., Paltridge, R., Masters, P. and Carthew, S. (2007) Bilby distribution and fire: a test of alternative models of habitat suitability in the Tanami Desert, Australia. Ecography, 30(6), 759-776. doi:10.1111/j.2007.0906-7590.04956.x.

Southgate, R. and Possingham, H. (1995) Modelling the reintroduction of the Greater Bilby Macrotis lagotis using the metapopulation model analysis of the likelihood of extinction (ALEX). Biological Conservation **73**, 151–160.

Southgate, R.I. (1990a) Distribution and abundance of the greater bilby *Macrotis lagotis*., in: Seebeck, J., Brown, P., Wallis, R., Kemper, C. (Eds.), Bandicoots and Bilbies. Surrey Beatty & Sons, Sydney, pp. 293–302.

Southgate, R.I. (1990b) Habitats and diet of the greater bilby *Macrotis lagotis*., in: Seebeck, J., Brown, P., Wallis, R., Kemper, C. (Eds.), Bandicoots and Bilbies. Surrey Beatty & Sons, Sydney, pp. 303–309.

Start, A.N. (2008) Western Pebble-mouse Pseudomys chapmani, in: The Mammals of Australia 3rd Edition, Van Dyck, S. and Strahan, R. (Eds.). Reed New Holland, Sydney.

Storr, G.M. (1977) Birds of the Northern Territory. Special Publications of the Western Australian Museum **7**, 130.

Storr, G.M. (1981) Birds of the Northeastern Interior of Western Australia. Records of the Western Australian Museum **9**, 65–99.

Thackway, R. and Cresswell, I. (Eds.) (1995) An interim biogeographic regionalisation for Australia : a framework for setting priorities in the National Reserves System Cooperative Program / edited by R Thackway and I D Cresswell. Australian Nature Conservation Agency, Reserve Systems Unit, Canberra.

Thompson, S.A. and Thompson, G.G. (2010) Terrestrial Vertebrate Fauna Assessments for Ecological Impact Assessment.

Threatened Species Scientific Committee (2016) Threatened Species Scientific Committee. Conservation Advice: Pezoporus occidentalis, Night Parrot.Commonwealth of Australia, Canberra, Australian Capital Territory.

http://www.environment.gov.au/biodiversity/threatened/species/pubs/59350-conservation-advice-15072016.pdf

Tidemann, C.R., Priddel, D.M., Nelson, J.E. and Pettigrew, J.D. (1985) Foraging behaviour of the Australian Ghost Bat, Macroderma gigas (Microchiroptera: Megadermatidae). Australian Journal of Zoology. **33**, 705–713.

Turpin, J. and Bamford, M. (2014) A new population of the northern quoll (Dasyurus hallucatus) on the edge of the Little Sandy Desert, Western Australia. Australian Mammalogy **37**, 86–91.

Van Dyck, S. and Strahan, R. (2008) The mammals of Australia. New Holland Publishers, Sydney.

Van Vreeswyk, A.M.E., Payne, A.L., Leighton, K.A. and Hennig, P. (2004) Inventory and condition survey of the Pilbara region, Western Australia. Technical Bulletin No. 92. Department of Agriculture and Food, Western Australia, Perth, W.A.

Vavrek, M.V. (2011) fossil: Palaeoecological and palaeogeographical analysis tools. Palaeontologia Electronica **14**, 16p.

WA Parks Foundation (2024) Fortescue Marsh – a nationally significant wetland. https://www.ourwaparks.org.au/fortescue-marsh-a-nationally-significant-wetland/

Westerman, M., Umbrello, L. and Woolley, P.A. (2023) On the composition of Antechinomys Marsupialia: Dasyuridae): how many species? Australian Journal of Zoology **70**, 95–103.

Western Australian Museum (2023) Long-tailed Dunnart - Sminthopsis longicaudata. WA Museum Collections & Research. https://museum.wa.gov.au/online-collections/names/sminthopsis-longicaudata#:~:text=Habitat&text=Exposed%20rock%20and%20stony%20soils,Sparse%20mulga%20over%20spinifex.

Western Australian Museum (2024) Checklist of the Terrestrial Vertebrate Fauna of Western Australia. Updated June 2024. http://museum.wa.gov.au/research/departments/terrestrial-zoology/checklist-terrestrial-vertebrate-fauna-western-australia

Wilson, H. (1937) Notes on the Night Parrot, with references to recent occurrences. 37, 79-87.

Wilson, S. and Swan, G. (2017) Complete Guide to Reptiles of Australia. 5th Edition. New Holland Publishers, Chatswood, NSW.

Woehler, E.J., Cooper, J., Croxall, J.P., Fraser, W.R., Kooyman, G.L., Miller, G.D., Nel, D.C., Patterson, D.L., Peter, H.U., Ribic, C.A., Salwicka, K., Trivelpiece, W.Z. and Weimerskirch, H. (2001) A statistical assessment of the status and trends of Antarctic and subantarctic seabirds. Report on SCAR BBS Workshop on Southern Ocean seabird populations. Scientific Committee for Antarctic Research, British Antartic Survey.

Woinarski, J.C.Z., Burbidge, A.A. and Harrison, P.L. (2014) The Action Plan for Australian Mammals 2012. CSIRO Publishing, Collingwood, Victoria.

Woinarski, J.C.Z., Oakwood, M., Winter, J., Burnett, S., Milne, D., Foster, P., Myles, H. and Holmes, B. (2008) Surviving the toads: patterns of persistence of the northern quoll Dasyurus hallucatus in Queensland. Department of Natural Resources, Environment and the Arts, Darwin.

Young, E. (2021) FMG confirms population of elusive night parrot at WA iron ore mine. Sydney Morning Herald. June 25, 2021.

# 8 Appendices

| No | Title |
|---|---|
| Appendix I | Conservation codes for Australian flora and fauna |
| Appendix II | Matrix to assess likelihood of occurrence for vertebrate fauna species |
| Appendix III | Desktop results: All vertebrate fauna species |
| Appendix IV | Desktop results: Conservation significant vertebrate fauna |
| Appendix V | Vertebrate fauna recorded during the survey |
| Appendix VI | Conservation significant fauna recorded during detailed fauna survey |
| Appendix VIII | Survey activity coordinates |
| Appendix IX | Habitat Assessments |

# Appendix I Conservation codes for Australian flora and fauna

**Conservation codes for Australian flora and fauna under the federal *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act)**

Threatened fauna and flora may be listed under Section 178 of the EPBC Act in any one of the following categories:

EX Extinct
EW Extinct in the wild
CR Critically endangered
EN Endangered
VU Vulnerable
CD Conservation dependent

Migratory and Marine species may be listed under respectively Section 209 and Section 248 of the EPBC Act.

MI Migratory
MA Marine

**Conservation codes for Western Australian flora and fauna under the Western Australian *Biodiversity Conservation Act 2016***

Threatened, Extinct and Specially Protected fauna or flora are species which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016*.

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

**Threatened species**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

**CR Critically endangered species**

Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.

Published under **schedule 1** of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

**EN Endangered species**

Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under **schedule 2** of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora*.

**VU Vulnerable species**

Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines". Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.

Published under **schedule 3** of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

**Extinct species**

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

**EX Extinct species**

Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under **schedule 4** of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018 for extinct flora*.

**EW Extinct in the wild species**

Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

**Specially protected species**

**MI Migratory species**

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program.

Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species. Published as migratory birds protected under an international agreement under **schedule 5** of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

**CD Species of conservation interest (conservation dependent fauna)**

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Published as conservation dependent fauna under **schedule 6** of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018.*

**OS Other specially protected species**

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Published as other specially protected fauna under **schedule 7** of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

**Priority species**

Priority species are possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations. In this report, priority species are given the codes P1, P2, P3 and P4.

**P1 Priority 1: Poorly-known species**

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

**P2 Priority 2: Poorly-known species**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

**P3 Priority 3: Poorly-known species**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

**P4 Priority 4: Rare, Near Threatened and other species in need of monitoring**

(a) **Rare**. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) **Near Threatened**. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

# Appendix II Matrix to assess likelihood of occurrence for vertebrate fauna species

| Species records relative to survey area | Habitat suitability | | | |
|---|---|---|---|---|
| | High (breeding and foraging) | Medium (foraging habitat) | Low (dispersal habitat) | Unsuitable [6] |
| Records within 10 km [1] | Highly Likely | Likely | Likely | Possible |
| Records within 50 km [2] | Likely | Possible | Possible | Unlikely |
| Records within 100 km [3] | Possible | Possible | Possible | Unlikely |
| Records within 200 km [4] | Possible | Unlikely | Unlikely | Highly unlikely |
| No records within 200 km [5] | Unlikely | Unlikely | Unlikely | Highly unlikely |

*Footnotes for highly cryptic or poorly known species for which there are few records, and for under-surveyed areas:*
*1 – Survey area occurs within currently known range and species has high dispersal capability.*
*2 – Survey area occurs within currently known range and species has low dispersal capability.*
*3 – Survey area occurs on margin of currently known range and species has high dispersal capability.*
*4 – Survey area occurs outside of currently known range and species has high dispersal capability.*
*5 – Survey area occurs outside of currently known range and species has low dispersal capability.*
*Footnotes with habitat suitability:*
*6 – Depending on a species' ecology, 'unsuitable' can either mean 'not preferred' or 'not containing resources', or it can be 'prohibitive' (i.e. absence of water for aquatic species). This distinction affects the final likelihood score in this column.*
*Note: Likelihood rankings may be downgraded when records are older than 10 years, 15 years or 20 years, dependent on the longevity and mobility of each species under consideration, with consideration taken in regard to the number and age of other proximal records that are available for that species.*

## Appendix III Desktop results: All vertebrate fauna species

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| **AMPHIBIAN** | | | | | | | | | | | |
| *Cyclorana maini* | Sheep frog | | | | | X | | | X | X | X |
| *Litoria rubella* | Desert tree frog | | | | | X | | | | X | |
| *Neobatrachus kunapalari* | Kunapalari frog | | | | | X | | | | | |
| *Pseudophryne douglasi* | Gorge toadlet | | | | | X | | | | | |
| *Uperoleia saxatilis* | Pilbara toadlet | | | | | X | | | | | |
| **BIRD** | | | | | | | | | | | |
| *Acanthagenys rufogularis* | Spiny-cheeked honeyeater | | | | | X | | X | X | X | X |
| *Acanthiza apicalis* | Inland thornbill (broad-tailed thornbill) | | | | | X | | | | X | X |
| *Acanthiza chrysorrhoa* | Yellow-rumped thornbill | | | | | X | | | | | |
| *Acanthiza robustirostris* | Slaty-backed thornbill | | | | | X | | | | X | |
| *Acanthiza uropygialis* | Chestnut-rumped thornbill | | | | | X | | X | X | X | X |
| *Accipiter cirrocephalus* | Collared sparrowhawk | | | | | X | | | | | |
| *Accipiter fasciatus* | Brown goshawk | | | | | X | | X | X | X | |
| *Acrocephalus australis* | Australian reed warbler | | | | | X | | | X | | |
| *Actitis hypoleucos* | Common sandpiper | MI | MI | X | X | X | | | | | |
| *Aegotheles cristatus* | Australian owlet-nightjar | | | | | X | | X | | X | |
| *Amytornis whitei* | Pilbara grasswren | | | | | X | | X | X | X | |
| *Anas gracilis* | Grey teal | | | | | X | | X | | | |
| *Anas superciliosa* | Pacific black duck | | | | | X | | X | X | | |
| *Anhinga novaehollandiae* | Australasian darter | | | | | X | | X | | | |
| *Anseranas semipalmata* | Magpie goose (pied goose) | | | | | X | | | | | |
| *Anthus australis* | Australian pipit | | | | | X | | X | | X | X |
| *Aphelocephala leucopsis* | Southern whiteface | | VU | | X | X | | | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Apus pacificus* | Pacific swift (fork-tailed swift) | MI | MI | X | X | X | | | | | |
| *Aquila audax* | Wedge-tailed eagle | | | | | X | | X | X | X | |
| *Ardea alba* | Great egret (eastern great egret) | | | | | X | | | | | |
| *Ardea alba modesta* | Eastern great egret | | | | | X | | | | | |
| *Ardea intermedia* | Intermediate egret | | | | | X | | | | | |
| *Ardea pacifica* | White-necked heron | | | | | X | | | X | | |
| *Ardeotis australis* | Australian bustard | | | | | X | | | X | X | X |
| *Artamus cinereus* | Black-faced woodswallow | | | | | X | | X | X | X | X |
| *Artamus cyanopterus* | Dusky woodswallow | | | | | X | | | | | |
| *Artamus minor* | Little woodswallow | | | | | X | | | X | X | |
| *Artamus personatus* | Masked woodswallow | | | | | X | | X | | X | |
| *Artamus superciliosus* | White-browed woodswallow | | | | | X | | | | | |
| *Aythya australis* | Hardhead | | | | | X | | | X | | |
| *Barnardius zonarius* | Australian ringneck | | | | | X | | X | X | X | X |
| *Barnardius zonarius zonarius* | Port Lincoln parrot | | | | | X | | | | | |
| *Biziura lobata* | Musk duck | | | | | X | | | | | |
| *Bubulcus coromandus* | Eastern cattle egret | | | | | X | | | | | |
| *Burhinus grallarius* | Bush stone-curlew (bush thick-knee) | | | | | X | | X | | | |
| *Cacatua leadbeateri* | Pink cockatoo (major Mitchell's cockatoo) | | | | | X | | | | | |
| *Cacatua sanguinea* | Little corella | | | | | X | | X | X | X | X |
| *Calidris acuminata* | Sharp-tailed sandpiper | MI | VU & MI | X | X | X | | | | | |
| *Calidris ferruginea* | Curlew sandpiper | CR | CR & MI | X | X | X | | | | | |
| *Calidris melanotos* | Pectoral sandpiper | MI | MI | X | X | X | | | | | |
| *Calidris ruficollis* | Red-necked stint | MI | MI | X | | X | | | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Calidris subminuta* | Long-toed stint | MI | MI | X | | X | | | | | |
| *Calyptorhynchus banksii* | Red-tailed black cockatoo | | | | | X | | | | | |
| *Centropus phasianinus* | Pheasant coucal | | | | | X | | | X | | |
| *Certhionyx variegatus* | Pied honeyeater | | | | | X | | | | | |
| *Chalcites basalis* | Horsfield's bronze cuckoo | | | | | X | | X | X | X | X |
| *Chalcites osculans* | Black-eared cuckoo | | | | | X | | X | | X | |
| *Charadrius melanops* | Black-fronted dotterel | | | | | | | | X | | |
| *Charadrius ruficapillus* | Red-capped plover | | | | | X | | | | | |
| *Charadrius veredus* | Oriental plover | MI | MI | X | X | X | | | | X | |
| *Chenonetta jubata* | Australian wood duck (wood duck, maned duck) | | | | | X | | X | X | | |
| *Cheramoeca leucosterna* | White-backed swallow | | | | | X | | | | | |
| *Chlamydera guttata* | Western bowerbird | | | | | X | | X | | X | |
| *Chlidonias hybrida* | Whiskered tern | | | | | X | | | | | |
| *Chroicocephalus novaehollandiae* | Silver gull | | | | | X | | | | | |
| *Cincloramphus cruralis* | Brown songlark | | | | | X | | | X | | |
| *Cincloramphus mathewsi* | Rufous songlark | | | | | X | | X | | X | |
| *Cinclosoma clarum* | Western chestnut quail-thrush (copperback quail-thrush) | | | | | X | | | | | |
| *Cinclosoma marginatum* | Western quail-thrush | | | | | X | | | | | |
| *Circus approximans* | Swamp harrier | | | | | X | | | | | |
| *Circus assimilis* | Spotted harrier | | | | | X | | | | X | |
| *Cladorhynchus leucocephalus* | Banded stilt | | | | | X | | | | | |
| *Climacteris melanurus* | Black-tailed treecreeper | | | | | X | | | | | |
| *Colluricincla harmonica* | Grey shrikethrush | | | | | X | | X | X | X | X |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Conopophila whitei* | Grey honeyeater | | | | | X | | | | | |
| *Coracina maxima* | Ground cuckooshrike | | | | | X | | | | | X |
| *Coracina novaehollandiae* | Black-faced cuckooshrike | | | | | X | | X | X | X | X |
| *Corvus bennetti* | Little crow | | | | | X | | | | X | |
| *Corvus orru* | Torresian crow | | | | | X | | X | X | X | X |
| *Coturnix pectoralis* | Stubble quail | | | | | X | | | | | |
| *Cracticus nigrogularis* | Pied butcherbird | | | | | X | | X | X | X | X |
| *Cracticus torquatus* | Grey butcherbird | | | | | X | | X | X | X | X |
| *Cygnus atratus* | Black swan | | | | | X | | X | | | |
| *Dacelo leachii* | Blue-winged kookaburra | | | | | X | | X | X | X | |
| *Daphoenositta chrysoptera* | Varied sittella | | | | | X | | X | | | |
| *Dendrocygna arcuata* | Wandering whistling duck (chestnut whistling duck) | | | | | X | | | | | |
| *Dendrocygna eytoni* | Plumed whistling duck | | | | | X | | | X | | |
| *Dicaeum hirundinaceum* | Mistletoebird | | | | | X | | | | | |
| *Dromaius novaehollandiae* | Emu | | | | | X | | | X | X | |
| *Egretta garzetta* | Little egret | | | | | X | | | | | |
| *Egretta novaehollandiae* | White-faced heron | | | | | X | | | X | | |
| *Elanus axillaris* | Black-shouldered kite | | | | | X | | | | X | |
| *Elanus scriptus* | Letter-winged kite | P4 | | | | | | | | X | |
| *Elseyornis melanops* | Black-fronted dotterel | | | | | X | | | | | |
| *Emblema pictum* | Painted finch | | | | | X | | X | X | X | X |
| *Eolophus roseicapilla* | Galah | | | | | X | | X | X | X | X |
| *Ephippiorhynchus asiaticus* | Black-necked stork | | | | | X | | | | | |
| *Epthianura aurifrons* | Orange chat | | | | | X | | | | | |
| *Epthianura tricolor* | Crimson chat | | | | | X | | X | | | |
| *Erythrogonys cinctus* | Red-kneed dotterel | | | | | X | | | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Erythrotriorchis radiatus* | Red goshawk | VU | EN | | X | | | | | | |
| *Eurostopodus argus* | Spotted nightjar | | | | | X | | X | X | X | X |
| *Eurystomus orientalis* | Oriental dollarbird | | | | | X | | | | | |
| *Falco berigora* | Brown falcon | | | | | X | | X | X | X | X |
| *Falco cenchroides* | Australian kestrel (nankeen kestrel) | | | | | X | | X | X | X | |
| *Falco hypoleucos* | Grey falcon | VU | VU | | X | X | | | | | |
| *Falco longipennis* | Australian hobby | | | | | X | | | | X | |
| *Falco peregrinus* | Peregrine falcon | OS | | X | | X | | | | | |
| *Fulica atra* | Eurasian coot | | | | | X | | | | | |
| *Fulica atra australis* | Australian coot | | | | | X | | | | | |
| *Gallinula tenebrosa* | Dusky moorhen | | | | | X | | | | | |
| *Gavicalis virescens* | Singing honeyeater | | | | | X | | X | X | X | X |
| *Gelochelidon macrotarsa* | Australian gull-billed tern | | | | | X | | | | | |
| *Gelochelidon nilotica* | Gull-billed tern | MI | MI | X | | X | | | | | |
| *Geopelia cuneata* | Diamond dove | | | | | X | | X | X | X | X |
| *Geopelia humeralis* | Bar-shouldered dove | | | | | X | | | | | |
| *Geopelia striata placida* | Peaceful dove | | | | | X | | | X | | |
| *Geophaps plumifera* | Spinifex pigeon | | | | | X | | X | X | X | |
| *Gerygone fusca* | Western gerygone | | | | | X | | | X | X | X |
| *Gerygone fusca mungi* | Desert gerygone | | | | | X | | | | | |
| *Grallina cyanoleuca* | Magpie-lark | | | | | X | | X | X | X | X |
| *Gymnorhina tibicen* | Australian magpie | | | | | X | | X | | X | X |
| *Haliaeetus leucogaster* | White-bellied sea-eagle | | | | | X | | | | | |
| *Haliastur sphenurus* | Whistling kite | | | | | X | | X | X | X | |
| *Hamirostra melanosternon* | Black-breasted buzzard | | | | | X | | | | X | |
| *Heteroscenes pallidus* | Pallid cuckoo | | | | | X | | X | | X | X |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Hieraaetus morphnoides* | Little eagle | | | | | X | | X | | X | |
| *Himantopus himantopus* | Black-winged stilt | | | | | X | | | X | | |
| *Himantopus himantopus leucocephalus* | Pied stilt (white-headed stilt) | | | | | X | | | | | |
| *Hirundo neoxena* | Welcome swallow | | | | | X | | | | | |
| *Hirundo rustica* | Barn swallow | MI | MI | | X | | | | | | |
| *Hydroprogne caspia* | Caspian tern | MI | MI | X | | X | | | | | |
| *Hypotaenidia philippensis* | Buff-banded rail | | | | | X | | | | | |
| *Ixobrychus flavicollis* | Black bittern | | | | | X | | | | | |
| *Lacustroica whitei* | Grey honeyeater | | | | | | | | X | | |
| *Lalage tricolor* | White-winged triller | | | | | X | | X | | X | |
| *Lichmera indistincta* | Brown honeyeater | | | | | X | | X | X | X | |
| *Lophoictinia isura* | Square-tailed kite | | | | | X | | | | | X |
| *Macronectes giganteus* | Southern giant petrel | MI | EN & MI | X | | | | | | | |
| *Malacorhynchus membranaceus* | Pink-eared duck | | | | | X | | X | X | | |
| *Malurus assimilis* | Purple-backed fairywren | | | | | X | | X | X | X | X |
| *Malurus leucopterus* | White-winged fairywren | | | | | X | | X | | X | |
| *Malurus melanocephalus* | Red-backed fairywren | | | | | X | | | | | |
| *Malurus splendens* | Splendid fairywren | | | | | X | | | | | |
| *Manorina flavigula* | Yellow-throated miner | | | | | X | | X | X | X | X |
| *Melanodryas cucullata* | Hooded robin | | | | | X | | X | X | X | |
| *Melithreptus gularis* | Black-chinned honeyeater | | | | | X | | | | | |
| *Melithreptus gularis laetior* | Golden-backed honeyeater | | | | | X | | | | | |
| *Melopsittacus undulatus* | Budgerigar | | | | | X | | X | X | X | X |
| *Merops ornatus* | Rainbow bee-eater | | | | | X | | X | X | X | |
| *Microcarbo melanoleucos* | Little pied cormorant | | | | | X | | | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Milvus migrans* | Black kite | | | | | X | | | X | | |
| *Mirafra javanica* | Horsfield's bush lark | | | | | X | | X | | X | |
| *Motacilla cinerea* | Grey wagtail | MI | MI | | X | | | | | | |
| *Motacilla tschutschensis* | Eastern yellow wagtail | | | | X | | | | | | |
| *Neochmia ruficauda* | Star finch | | | | | X | | | X | | |
| *Neopsephotus bourkii* | Bourke's parrot | | | | | X | | X | X | X | |
| *Ninox boobook* | Boobook owl | | | | | X | | X | X | X | |
| *Ninox connivens* | Barking owl | | | | | X | | X | | | |
| *Nycticorax caledonicus* | Nankeen night heron (rufous night heron) | | | | | X | | | | | |
| *Nymphicus hollandicus* | Cockatiel | | | | | X | | X | X | X | |
| *Ocyphaps lophotes* | Crested pigeon | | | | | X | | X | X | X | |
| *Oreoica gutturalis* | Crested bellbird | | | | | X | | X | X | X | X |
| *Pachycephala rufiventris* | Rufous whistler | | | | | X | | X | X | X | X |
| *Pardalotus rubricatus* | Red-browed pardalote | | | | | X | | | X | X | |
| *Pardalotus striatus* | Striated pardalote | | | | | X | | | | X | |
| *Pelecanus conspicillatus* | Australian pelican | | | | | X | | | | | |
| *Petrochelidon ariel* | Fairy martin | | | | | X | | | | X | |
| *Petrochelidon nigricans* | Tree martin | | | | | X | | | | X | X |
| *Petroica goodenovii* | Red-capped robin | | | | | X | | X | | X | X |
| *Pezoporus occidentalis* | Night parrot | CR | EN | | X | | | | | | |
| *Phalacrocorax carbo* | Great cormorant | | | | | X | | | | | |
| *Phalacrocorax sulcirostris* | Little black cormorant | | | | | X | | | | | |
| *Phalacrocorax varius* | Pied cormorant (Australian pied cormorant) | | | | | X | | | | | |
| *Phaps chalcoptera* | Common bronzewing | | | | | X | | X | X | X | |
| *Platalea flavipes* | Yellow-billed spoonbill | | | | | X | | | X | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Platalea regia* | Royal spoonbill | | | | | X | | | X | | |
| *Plegadis falcinellus* | Glossy ibis | MI | MI | X | | X | | | | | |
| *Podargus strigoides* | Tawny frogmouth | | | | | X | | | | X | |
| *Podiceps cristatus* | Great crested grebe | | | | | X | | | | | |
| *Poliocephalus poliocephalus* | Hoary-headed grebe | | | | | X | | | | | |
| *Polytelis alexandrae* | Princess parrot | P4 | VU | X | X | X | | | | | |
| *Pomatostomus superciliosus* | White-browed babbler | | | | | X | | | X | | |
| *Pomatostomus temporalis* | Grey-crowned babbler | | | | | X | | X | X | X | X |
| *Poodytes carteri* | Spinifexbird | | | | | X | | X | X | X | |
| *Poodytes gramineus* | Little grassbird | | | | | X | | | | | |
| *Porphyrio melanotus* | Australasian swamphen | | | | | X | | | X | | |
| *Porzana fluminea* | Australian spotted crake (Australian crake) | | | | | X | | | | | |
| *Psephotellus varius* | Mulga parrot | | | | | X | | | | X | |
| *Psophodes occidentalis* | Western wedgebill (chiming wedgebill) | | | | | X | | | | X | |
| *Ptilotula keartlandi* | Grey-headed honeyeater | | | | | X | | X | X | X | X |
| *Ptilotula penicillata* | White-plumed honeyeater | | | | | X | | X | X | X | |
| *Ptilotula penicillata carteri* | Carter's white-plumed honeyeater | | | | | X | | | | | |
| *Ptilotula plumula* | Grey-fronted honeyeater | | | | | X | | | | | |
| *Purnella albifrons* | White-fronted honeyeater | | | | | X | | X | | | |
| *Pyrrholaemus brunneus* | Redthroat | | | | | X | | X | | | |
| *Recurvirostra novaehollandiae* | Red-necked avocet | | | | | X | | | | | |
| *Rhipidura albiscapa* | Grey fantail | | | | | X | | | | X | X |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Rhipidura albiscapa albicauda* | White-tailed fantail | | | | | X | | | | | |
| *Rhipidura leucophrys* | Willie wagtail | | | | | X | | X | X | X | X |
| *Rostratula australis* | Australian painted snipe | EN | EN | | X | X | | | | | |
| *Smicrornis brevirostris* | Weebill | | | | | X | | X | X | X | X |
| *Spatula rhynchotis* | Australasian shoveler | | | | | X | | | | | |
| *Stictonetta naevosa* | Freckled duck | | | | | X | | | | | |
| *Stiltia isabella* | Australian pratincole | | | | | X | | | | | |
| *Stipiturus ruficeps* | Rufous-crowned emu-wren | | | | | X | | | | X | |
| *Sugomel nigrum* | Black honeyeater | | | | | X | | | | | |
| *Synoicus ypsilophorus* | Brown quail | | | | | X | | X | X | X | |
| *Tachybaptus novaehollandiae* | Australasian grebe (black-throated grebe) | | | | | X | | | X | | |
| *Tadorna tadornoides* | Australian shelduck (mountain duck) | | | | | X | | | | | |
| *Taeniopygia castanotis* | Australian zebra finch | | | | | X | | X | X | X | X |
| *Threskiornis molucca* | Australian white ibis | | | | | X | | | | | |
| *Threskiornis spinicollis* | Straw-necked ibis | | | | | X | | | X | X | |
| *Todiramphus pyrrhopygius* | Red-backed kingfisher | | | | | X | | X | | X | X |
| *Todiramphus sanctus* | Sacred kingfisher | | | | | X | | X | | X | |
| *Tribonyx ventralis* | Black-tailed nativehen | | | | | X | | | | | |
| *Tringa glareola* | Wood sandpiper | MI | MI | X | | X | | | | | |
| *Tringa nebularia* | Common greenshank | MI | EN & MI | X | | X | | | | | |
| *Tringa stagnatilis* | Marsh sandpiper | MI | MI | X | | X | | | | | |
| *Tringa totanus* | Common redshank | MI | MI | X | | | | | | | |
| *Turnix velox* | Little buttonquail | | | | | X | | X | X | X | |
| *Tyto alba* | Barn owl | | | | | X | | | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Vanellus miles* | Masked lapwing | | | | | X | | | | | |
| *Vanellus tricolor* | Banded lapwing | | | | | X | | X | | | |
| *Zapornia pusilla* | Baillon's crake | | | | | X | | | | | |
| *Zapornia tabuensis* | Spotless crake | | | | | X | | | | | |
| **MAMMAL** | | | | | | | | | | | |
| *Antechinomys longicaudatus* | Long-tailed dunnart | P4 | | X | | X | | | | | |
| *Austronomus australis* | White-striped free-tailed bat | | | | | | | | X | X | |
| *Bos taurus* | European cattle | Permitted - s11 | | | | X | | X | X | X | |
| *Camelus dromedarius* | Dromedary, camel | Declared Pest - s22(2) (C3 Exempt) | | | | X | | | X | X | |
| Canis familiaris sp. | Dingo/dog | | | | | X | | X | X | X | X |
| *Chaerephon jobensis* | Greater northern free-tailed bat | | | | | X | | X | X | X | X |
| *Chalinolobus gouldii* | Gould's wattled bat | | | | | X | | X | X | X | X |
| *Chalinolobus morio* | Chocolate wattled bat | | | | | X | | | | | |
| *Dasycercus blythi* | Brush-tailed mulgara | P4 | | X | | | X | | | | |
| *Dasykaluta rosamondae* | Kaluta | | | | | X | | | X | X | |
| *Dasyurus hallucatus* | Northern quoll | EN | EN | X | X | | X | | | X | |
| *Equus africanus asinus* | Donkey | | | | | | | | | X | |
| *Felis catus* | Cat | Declared Pest - s22(2) (Exempt) | | | | X | | X | X | X | |
| *Macroderma gigas* | Ghost bat | VU | VU | X | X | X | X | | X | X | |
| *Macrotis lagotis* | Bilby | VU | VU | X | X | | | | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Mus musculus* | House mouse | Permitted - s11 (Exempt) | | | | X | | | X | X | |
| *Ningaui ridei* | Wongai ningaui | | | | | X | | | | | |
| *Ningaui timealeyi* | Pilbara ningaui | | | | | X | | | X | X | |
| *Notomys alexis alexis* | Spinifex hopping-mouse | | | | | X | | | X | | |
| *Nyctophilus geoffroyi geoffroyi* | Lesser long-eared bat | | | | | X | | X | X | X | |
| *Oryctolagus cuniculus* | Rabbit | Declared Pest - s22(2) (C3 Prohibited) | | | | X | | | X | X | |
| *Osphranter robustus erubescens* | Euro | | | | | X | | | X | X | |
| *Osphranter rufus* | Red kangaroo | | | | | X | | X | X | X | |
| *Ozimops lumsdenae* | Northern free-tailed bat | | | | | X | | X | X | X | |
| *Petrogale lateralis lateralis* | Black-footed rock-wallaby | EN | EN | X | | X | | | | | |
| *Petrogale rothschildi* | Rothschild's rock-wallaby | | | | | X | | | X | X | |
| *Planigale ingrami* | Long-tailed planigale | | | | | X | | | X | | |
| *Planigale kendricki* | Orange-headed Pilbara planigale | | | | | | | | | X | |
| *Pseudantechinus woolleyae* | Woolley's pseudantechinus | | | | | X | | | | | |
| *Pseudomys chapmani* | Western pebble-mound mouse | P4 | | X | | X | X | X | X | X | X |
| *Pseudomys desertor* | Desert mouse | | | | | X | | | X | X | X |
| *Pseudomys hermannsburgensis* | Sandy inland mouse | | | | | X | | | X | X | X |
| *Rhinonicteris aurantia* (Pilbara form) | Pilbara leaf-nosed bat | VU | VU | X | X | | | | X | X | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Saccolaimus flaviventris* | Yellow-bellied sheath-tailed bat | | | | | X | | | X | X | X |
| *Scotorepens greyii* | Little broad-nosed bat | | | | | X | | X | X | X | |
| *Sminthopsis macroura* | Stripe-faced dunnart | | | | | X | | | X | X | |
| *Sminthopsis ooldea* | Ooldea dunnart | | | | | X | | | | X | |
| *Sminthopsis youngsoni* | Lesser hairy-footed dunnart | | | | | X | | | X | | |
| *Tachyglossus aculeatus acanthion* | Short-beaked echidna | | | | | | | | | X | |
| *Taphozous georgianus* | Common sheath-tailed bat | | | | | X | | | X | X | X |
| *Taphozous hilli* | Hill's sheath-tailed bat | | | | | X | | X | X | X | |
| *Vespadelus finlaysoni* | Finlayson's cave bat | | | | | X | | X | X | X | X |
| *Vulpes vulpes* | Red fox | Declared Pest - s22(2) (C1 Prohibited, C3 Prohibited) | | | | X | | | | | |
| *Zyzomys argurus* | Common rock-rat | | | | | X | | | X | X | |
| ***REPTILE*** | | | | | | | | | | | |
| *Acanthophis wellsi* | Pilbara death adder | | | | | X | | | | X | |
| *Anilios ammodytes* | Sand-diving blind snake | | | | | X | | | X | X | |
| *Anilios ganei* | Gane's blind snake (Pilbara) | P1 | | X | | X | | | X | | |
| *Anilios grypus* | Long-beaked blind snake | | | | | X | | | X | X | |
| *Anilios hamatus* | Pale-headed blind snake | | | | | X | | | | X | |
| *Anilios pilbarensis* | Pilbara blind snake | | | | | | | | X | | |
| *Anilios waitii* | Beaked blind snake | | | | | X | | | | | |
| *Antaresia perthensis* | Pygmy python | | | | | X | | | | | |
| *Aspidites melanocephalus* | Black-headed python | | | | | X | | | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Brachyurophis approximans* | North-western shovel-nosed snake | | | | | X | | | | X | |
| *Carlia munda* | Shaded-litter rainbow-skink | | | | | X | | X | X | | X |
| *Carlia triacantha* | Desert rainbow-skink | | | | | X | | | X | | |
| *Chelodina steindachneri* | Flat-shelled turtle | | | | | X | | X | X | X | |
| *Christinus marmoratus* | Marbled gecko | | | | | X | | | | | |
| *Cryptoblepharus buchananii* | Buchanan's snake-eyed skink | | | | | X | | | | | |
| *Cryptoblepharus plagiocephalus* | Peron's snake-eyed skink | | | | | X | | | | | |
| *Cryptoblepharus ustulatus* | Russet snake-eyed skink | | | | | X | | | | X | |
| *Ctenophorus caudicinctus* | Western ring-tailed dragon | | | | | X | | X | X | X | X |
| *Ctenophorus isolepis* | Central military dragon | | | | | X | | X | X | X | |
| *Ctenophorus nuchalis* | Central netted dragon | | | | | X | | | X | | |
| *Ctenophorus reticulatus* | Western netted dragon | | | | | X | | | | | X |
| *Ctenotus ariadnae* | Ariadna's ctenotus | | | | | X | | | X | | |
| *Ctenotus duricola* | Eastern Pilbara lined ctenotus | | | | | X | | | | | X |
| *Ctenotus grandis* | Grand ctenotus | | | | | | | | X | X | |
| *Ctenotus hanloni* | Nimble ctenotus | | | | | | | | X | | |
| *Ctenotus helenae* | Clay-soil ctenotus | | | | | X | | | X | X | |
| *Ctenotus inornatus* | Bar-shouldered ctenotus | | | | | X | | X | | | |
| *Ctenotus leonhardii* | Common desert skink (Leonhardi's ctenotus) | | | | | X | | | X | | |
| *Ctenotus pallasotus* | Western Pilbara lined ctenotus | | | | | X | | | | X | |
| *Ctenotus pantherinus* | Leopard skink | | | | | X | | | X | X | X |
| *Ctenotus quattuordecimlineatus* | Fourteen-lined ctenotus | | | | | X | | | X | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Ctenotus rubicundus* | Ruddy ctenotus | | | | | X | | | | | |
| *Ctenotus rutilans* | Rusty-shouldered ctenotus | | | | | X | | | X | X | X |
| *Ctenotus saxatilis* | Rock ctenotus | | | | | | | | | X | X |
| *Ctenotus schomburgkii* | Barred wedge-snout ctenotus | | | | | X | | | | X | X |
| *Ctenotus serventyi* | North-western sandy-loam ctenotus | | | | | X | | | X | | |
| *Ctenotus uber* | Spotted ctenotus | | | | | X | | | X | X | |
| *Cyclodomorphus melanops* | Spinifex slender blue-tongue | | | | | X | | | | | X |
| *Cyclorana maini* | Sheep frog | | | | | | | X | | | |
| *Delma butleri* | Spinifex delma (Butler's delma) | | | | | X | | | X | | |
| *Delma nasuta* | Sharp-snouted delma | | | | | X | | | X | X | X |
| *Delma pax* | Peace delma | | | | | X | | | X | X | X |
| *Delma tincta* | Excitable delma | | | | | | | | | | X |
| *Demansia reticulata* | Reticulated whipsnake | | | | | X | | | X | X | X |
| *Demansia rufescens* | Rufous whipsnake | | | | | X | | | X | | |
| *Diplodactylus conspicillatus* | Variable fat-tailed gecko | | | | | X | | | | | |
| *Diplodactylus granariensis rex* | Giant stone gecko | | | | | X | | | | | |
| *Diplodactylus laevis* | Desert fat-tailed gecko | | | | | X | | | X | | |
| *Diplodactylus mitchelli* | Pilbara stone gecko | | | | | X | | | | | |
| *Diplodactylus pulcher* | Fine-faced gecko | | | | | | | | X | X | |
| *Diplodactylus savagei* | Southern pilbara beak-faced gecko | | | | | X | | | | | |
| *Diporiphora amphiboluroides* | Mulga dragon | | | | | X | | | | | X |
| *Egernia cygnitos* | Western pilbara spiny-tailed skink | | | | | X | | | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Egernia depressa* | Southern pygmy spiny-tailed skink | | | | | X | | | | | |
| *Egernia formosa* | Goldfields crevice-skink | | | | | X | | | | X | |
| *Eremiascincus isolepis* | Northern bar-lipped skink | | | | | X | | | | | |
| *Eremiascincus richardsonii* | Broad-banded sand swimmer | | | | | X | | | | | X |
| *Furina ornata* | Moon snake | | | | | X | | | X | X | |
| *Gehyra crypta* | Western cryptic gehyra | | | | | X | | | | | |
| *Gehyra fenestrula* | Hamersley Range spotted gehyra | | | | | X | | | | | |
| *Gehyra micra* | Small Pilbara spotted rock gehyra | | | | | X | | | | | |
| *Gehyra montium* | Centralian dtella | | | | | X | | | | | |
| *Gehyra pilbara* | Pilbara dtella | | | | | X | | | | | |
| *Gehyra punctata* | Spotted Pilbara rock gehyra | | | | | X | | | X | X | |
| *Gehyra purpurascens* | Purple dtella | | | | | | | | | X | |
| *Gehyra variegata* | Variegated gehyra | | | | | X | | X | X | X | X |
| *Gowidon longirostris* | Long-nosed dragon | | | | | X | | X | X | X | X |
| *Heteronotia binoei* | Bynoe's gecko | | | | | X | | X | X | X | X |
| *Heteronotia planiceps* | North-west prickly gecko | | | | | X | | | | | |
| *Heteronotia spelea* | Pilbara cave gecko | | | | | X | | | | X | |
| *Lerista amicorum* | Fortescue three-toed slider | | | | | | | | X | | |
| *Lerista bipes* | Western two-toed slider | | | | | | | | X | | |
| *Lerista chalybura* | Pilbara blue-tailed slider | | | | | X | | | | | |
| *Lerista labialis* | Southern sandslider | | | | | X | | | | | |
| *Lerista macropisthopus remota* | Unpatterned robust slider | P2 | | X | | X | | | | X | |
| *Lerista muelleri* | Mueller's three-toed slider | | | | | X | | | | X | X |
| *Lerista neander* | Pilbara robust slider | | | | | X | | | | X | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Lerista vermicularis* | Slender duneslider | | | | | | | | X | | |
| *Lialis burtonis* | Burton's snake-lizard | | | | | X | | | X | X | X |
| *Liasis olivaceus barroni* | Pilbara olive python | VU | VU | X | X | X | X | X | | | |
| *Liopholis kintorei* | Great desert skink | VU | VU | | X | | | | | | |
| *Litoria rubella* | Little red tree frog | | | | | | | X | | | |
| *Lophognathus gilberti* | Top end ta-ta dragon | | | | | X | | | | | |
| *Lucasium stenodactylus* | Western sandplain gecko | | | | | X | | | X | X | |
| *Lucasium wombeyi* | Pilbara ground gecko (Wombey's gecko) | | | | | X | | | | | |
| *Lucasium woodwardi* | Pilbara ground gecko | | | | | | | | X | | |
| *Menetia greyii* | Common dwarf skink | | | | | X | | | X | X | X |
| *Morethia ruficauda* | Fire-tailed skink | | | | | X | | | X | | |
| *Morethia ruficauda exquisita* | Exquisite fire-tailed skink | | | | | | | X | | X | |
| *Nephrurus cinctus* | Northern banded knob-tailed gecko | | | | | | | | | X | |
| *Nephrurus wheeleri* | Southern banded knob-tailed gecko | | | | | X | | | | | |
| *Notoscincus ornatus ornatus* | Ornate soil-crevice skink | | | | | | | | X | | |
| *Oedura fimbria* | Western marbled velvet gecko | | | | | X | | | | X | |
| *Pogona minor* | Dwarf bearded dragon | | | | | X | | | | X | X |
| *Pogona minor minor* | Western bearded dragon | | | | | | | | X | | |
| *Proablepharus reginae* | Western soil-crevice skink (spinifex snake-eyed skink) | | | | | X | | | X | | |
| *Pseudechis australis* | Mulga snake | | | | | X | | | X | X | |
| *Pseudonaja mengdeni* | Western brown snake | | | | | X | | | | | |
| *Pseudonaja modesta* | Ringed brown snake | | | | | X | | X | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Pseudonaja nuchalis* | Gwardar; northern brown snake | | | | | | | | X | X | |
| *Pygopus nigriceps* | Western hooded scaly-foot | | | | | X | | | | | |
| *Rhynchoedura ornata* | Western beaked gecko | | | | | X | | | X | X | |
| *Strophurus elderi* | Jewelled gecko | | | | | X | | | | X | |
| *Strophurus jeanae* | Southern phasmid gecko (Jean's spiny-tailed gecko) | | | | | X | | | X | | |
| *Strophurus wellingtonae* | Wellington's spiny-tailed gecko | | | | | X | | | | X | |
| *Suta fasciata* | Rosen's snake | | | | | X | | | | | |
| *Suta gaikhorstorum* | Pilbara hooded snake | | | | | X | | | | | |
| *Suta monachus* | Inland hooded snake (Monk snake) | | | | | | | | X | | |
| *Tiliqua multifasciata* | Central blue-tongue | | | | | X | | | X | X | X |
| *Tympanocryptis diabolicus* | Hamersley pebble-mimic dragons | | | | | X | | | | | |
| *Underwoodisaurus seorsus* | Pilbara barking gecko | P2 | | X | | | | | | | |
| *Varanus acanthurus* | Spiny-tailed goanna | | | | | X | | X | | X | |
| *Varanus brevicauda* | Short-tailed pygmy goanna | | | | | X | | | X | X | |
| *Varanus bushi* | Pilbara mulga goanna | | | | | X | | | X | X | |
| *Varanus caudolineatus* | Stripe-tailed monitor | | | | | X | | | | X | |
| *Varanus eremius* | Pygmy desert goanna | | | | | | | | X | | |
| *Varanus giganteus* | Perentie | | | | | X | | | X | X | |
| *Varanus gouldii* | Sand goanna (Gould's monitor) | | | | | X | | | X | X | |
| *Varanus hamersleyensis* | Southern Pilbara rock goanna | | | | | X | | | | | |
| *Varanus panoptes* | Yellow-spotted monitor | | | | | X | | | X | X | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Varanus tristis* | Black-headed monitor (Racehorse goanna) | | | | | X | | | X | X | |
| **FISH** | | | | | | | | | | | |
| *Leiopotherapon unicolor* | Spangled perch | | | | | X | | | X | | |
| *Melanotaenia australis* | Western rainbowfish | | | | | X | | | | | |
| *Neosilurus hyrtlii* | Hyrtl's catfish | | | | | X | | | | | |
| *Poecilia latipinna* | Sailfin molly | | | | | X | | | | | |

**General notes for the region** [2]

**Reptiles**

Nephrurus cinctus previously a subspecies of Nephrurus wheeleri.

Diplodactylus conspicillatus (sensu stricto), D. bilybara and D. laevis all previously included within D. conspicillatus (sensu lato). Older records of D. conspicillatus may be referrable to any of these species, though D. conspicillatus and D. laevis most likely in the region based on distributions.

Oedura fimbria previously included within O. marmoratus.

Gehyra punctata complex: G. punctata split into several species in 2018 (Doughty et al. 2018), and specimens previously recorded from the region as G. punctata may be referrable to any of G. punctata, G. fenestrula or G. micra.

Gehyra variegata complex: G. variegate split into several species in 2018, and G. purpurescens and G. montium were re-described (Kealley et al. 2018). Specimens previously recorded from the region as G. variegata may be any of G. variegata, G. crypta, G. montium, G. incognita or G. purpurescens.

Delma butleri is synonymous with D. haroldi.

Diporiphora amphiboluroides previously placed in its own genus as Caimanops amphiboluroides.

Gowidon longirostris formerly both Amphibolurus longirostris and Lophognathus longirostris.

Lophognathus horneri previously included within L. gilberti or Amphibolurus gilberti.

Tympanocryptis cephalus split into several species, records from the region most likely referrable to T. fortescuensis, and T. diabolicus.

Cryptoblepharus buchananii and C. ustulatus both previously included within C. plagiocephalus, some old records listed as such.

Blind snakes Anilios spp. previously Ramphotyphlops spp..

[2] Reports and databases used to generate the desktop will have differing taxonomy due to age of the reports and the taxonomic approach. This is a list from the region that can be used to assist interpretation of the desktop, it is not exhaustive.

Stimson's Python (Antaresia stimsoni) now included within Children's Python (Antaresia children).
Western Brown Snake/Gwardar (Pseudonaja mengdeni) previously included within Northern Brown Snake (P. nuchalis).
Parasuta monachus in the Pilbara region re-described as Suta gaikhorstorum.

**Frogs**

Cyclorana occidentalis formerly included within C. platycephala some previous records may be listed as such
Uperoleia saxatilis previously included within U. russelli, some previous records may be listed as such

**Mammals**

White-striped Free-tailed Bat (Austronomus australis) previously included in genus Tadarida. Northern Free-tailed Bat (Ozimops lumsdenae) previously Mormopterus beccarii and Mormopterus lumsdenae.
Planigales in the Pilbara considered to comprise two species. Formerly listed as P. maculata and/or P. ingrami.
Planigale kendricki (Orange-headed Pilbara planigale) (formerly known as 'Planigale 1')
P. tealei (Cracking-clay Pilbara planigale), (formerly known as 'Planigale sp. Mt Tom Price') and 'Planigale sp. 2' in some literature.
Pseudantechinus woolleyae formerly included within P. macdonnellensis, some old records listed as such.
Long-tailed Dunnart, (Antechinomys longicaudatus), formerly known as Sminthopsis longicaudata
Common Brushtail Possum. Pilbara population formerly included within listed northern subspecies arnhemincus, now shown to be genetically aligned with non-listed south-western subspecies.
Records of black-flanked rock-wallaby (Petrogale lateralis lateralis) from 1975– considered erroneous as species restricted Cape Range, offshore Pilbara islands and isolated outcrops in the Wheatbelt.

**Birds**

Fork-tailed Swift split into four species, Pacific Swift (A. pacificus) now taxon occurring in Australia.
Pied Stilt (Himantopus leucocephalus) previously included within Black-winged Stilt (H. himantopus).
Australian Painted Snipe (Rostratula australis) formerly included within [Greater] Painted Snipe (R. benghalensis).
Australian [Gull-billed] Tern (Gelochelidon [nilotica] macrotarsa) Australian subspecies macrotarsa of Gull-billed Tern now considered a separate species Australian Tern (or Australian Gull-billed Tern) Gelochelidon macrotarsa.
Eastern Cattle Egret (Bubulcus coromandus) Previously included within Cattle Egret (Ardea ibis or Bubulcus ibis).
Great Egret (Ardea alba) At times has been considered a distinct species, Eastern Great Egret Ardea modesta.
Eastern Barn Owl (Tyto javanica) Previously included within Barn Owl (Tyto alba).
Australian Boobook (Ninox boobook) Previously included within Southern Boobook.
Western Bowerbird (Chlamydera guttata) Previously included as a subspecies of Spotted Bowerbird (P. maculatus).
Rufous Grasswren (Amytornis whitei) or Pilbara Grasswren (Amytornis whitei) previously considered a subspecies of Striated Grasswren (A. striatus).
Western Quail-thrush (Cinclosoma marginatum) previously considered a subspecies of Chestnut-breasted Quail-thrush (C. castaneothorax).
Eastern Yellow Wagtail (Motacilla tschutschensis) previously considered a subspecies of (Western) Yellow Wagtail (M. flava).
(Australian Pipit (Anthus australis) previously included within Australasian Pipit (A. novaeseelandiae) and prior to that Richard's Pipit (A. richardi).
Note: Records of Dusky Woodswallow (Artamus cyanopterus), Grey-fronted Honeyeater (Ptilotula plumula), and Copperback Quail-thrush (Cinclosoma clarum) are potentially erroneous as these records are well outside usual range for these species, records may not have been verified

# Appendix IV Desktop results: Conservation significant vertebrate fauna

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| **BIRD** | | | | | | | | | | | |
| *Actitis hypoleucos* | Common sandpiper | MI | MI | X | X | X | | | | | |
| *Aphelocephala leucopsis* | Southern whiteface | - | VU | | X | X | | | | | |
| *Apus pacificus* | Pacific swift (fork-tailed swift) | MI | MI | X | X | X | | | | | |
| *Calidris acuminata* | Sharp-tailed sandpiper | MI | VU & MI | X | X | X | | | | | |
| *Calidris ferruginea* | Curlew sandpiper | CR | CR & MI | X | X | X | | | | | |
| *Calidris melanotos* | Pectoral sandpiper | MI | MI | X | X | X | | | | | |
| *Calidris ruficollis* | Red-necked stint | MI | MI | X | | X | | | | | |
| *Calidris subminuta* | Long-toed stint | MI | MI | X | | X | | | | X | |
| *Charadrius veredus* | Oriental plover | MI | MI | X | X | X | | | | X | |
| *Elanus scriptus* | Letter-winged kite | P4 | - | | | | | | | X | |
| *Erythrotriorchis radiatus* | Red goshawk | VU | EN | | X | | | | | | |
| *Falco hypoleucos* | Grey falcon | VU | VU | | X | X | | | | | |
| *Falco peregrinus* | Peregrine falcon | OS | - | X | | X | | | | | |
| *Gelochelidon nilotica* | Gull-billed tern | MI | MI | X | | X | | | | | |
| *Hirundo rustica* | Barn swallow | MI | MI | | X | | | | | | |
| *Hydroprogne caspia* | Caspian tern | MI | MI | X | | X | | | | | |
| *Macronectes giganteus* | Southern giant petrel | MI | EN & MI | X | | | | | | | |
| *Motacilla cinerea* | Grey wagtail | MI | MI | | X | | | | | | |
| *Pezoporus occidentalis* | Night parrot | CR | EN | | X | | | | | | |
| *Plegadis falcinellus* | Glossy ibis | MI | MI | X | | X | | | | | |
| *Polytelis alexandrae* | Princess parrot | P4 | VU | X | X | X | | | | | |
| *Rostratula australis* | Australian painted snipe | EN | EN | | X | X | | | | | |
| *Tringa glareola* | Wood sandpiper | MI | MI | X | | X | | | | | |

| Scientific Name | Common Name | Conservation status | | Data source | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC | DBCA | Protected Matters | ALA | Biologic 2024 | Biologic 2022 | 360 Enviro. 2023 | Astron 2019 | Ninox 2009 |
| *Tringa nebularia* | Common greenshank | MI | EN & MI | X | | X | | | | | |
| *Tringa stagnatilis* | Marsh sandpiper | MI | MI | X | | X | | | | | |
| *Tringa totanus* | Common redshank | MI | MI | X | | | | | | | |
| **MAMMAL** | | | | | | | | | | | |
| *Antechinomys longicaudatus* | Long-tailed dunnart | P4 | - | X | | X | | | | | |
| *Dasycercus blythi* | Brush-tailed mulgara | P4 | - | X | | | X | | | X | |
| *Dasyurus hallucatus* | Northern quoll | EN | EN | X | X | | X | | X | X | |
| *Macroderma gigas* | Ghost bat | VU | VU | X | X | X | X | | | | |
| *Macrotis lagotis* | Bilby | VU | VU | X | X | | | | | | |
| *Petrogale lateralis lateralis* | Black-footed rock-wallaby | EN | EN | X | | X | | | X | X | X |
| *Pseudomys chapmani* | Western pebble-mound mouse | P4 | - | X | | X | X | X | X | X | |
| *Rhinonicteris aurantia* (Pilbara form) | Pilbara leaf-nosed bat | VU | VU | X | X | | | | | | |
| **REPTILE** | | | | | | | | | | | |
| *Anilios ganei* | Gane's blind snake (Pilbara) | P1 | - | X | | X | | | | X | |
| *Lerista macropisthopus remota* | Unpatterned robust slider | P2 | - | X | | X | | | | | |
| *Liasis olivaceus barroni* | Pilbara olive python | VU | VU | X | X | X | X | X | | | |
| *Liopholis kintorei* | Great desert skink | VU | VU | | X | | | | | | |
| *Underwoodisaurus seorsus* | Pilbara barking gecko | P2 | - | X | | | | | | | |

# Appendix V Vertebrate fauna recorded during the survey

| Scientific name | Common name | BC Act | EPBC Act | Observation method | | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Active foraging | | Camera trap | | Opportunistic | | SM4 audio recorder | | Timed bird census | | Trapping | | |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | |
| **AMPHIBIAN** | | | | | | | | | | | | | | | | |
| *Litoria rubella* | Desert tree frog | | | 1 | | | | | 2 | | | | | | | **3** |
| *Neobatrachus sutor* | Shoemaker frog | | | | | | | | 1 | | | | | | | **1** |
| **AVES** | | | | | | | | | | | | | | | | |
| *Acanthagenys rufogularis* | Spiny-cheeked honeyeater | | | | | | | 2 | 2 | | | 16 | 32 | | | **52** |
| *Acanthiza apicalis* | Inland thornbill (broad-tailed thornbill) | | | | | | | 5 | | | | 13 | 21 | | | **39** |
| *Acanthiza robustirostris* | Slaty-backed thornbill | | | | | | | 2 | | | | 4 | 7 | | | **13** |
| *Acanthiza uropygialis* | Chestnut-rumped thornbill | | | | | | | 2 | | | | 4 | 8 | | | **14** |
| *Accipiter cirrocephalus* | Collared sparrowhawk | | | | | | | 1 | 2 | | | 1 | 1 | | | **5** |
| *Accipiter fasciatus* | Brown goshawk | | | | | | | 1 | 4 | | | | 3 | | | **8** |
| *Aegotheles cristatus* | Australian owlet-nightjar | | | 2 | | | 1 | | 1 | | | | 2 | | | **6** |
| *Amytornis whitei* | Rufous grasswren | | | | | | | 9 | 2 | | | 2 | 2 | | | **15** |
| *Aquila audax* | Wedge-tailed eagle | | | | | | | | 3 | | | | | | | **3** |
| *Ardeotis australis* | Australian bustard | | | | | | | 1 | 5 | | | | 2 | | | **8** |
| *Artamus cinereus* | Black-faced woodswallow | | | | | 3 | | 9 | | | | 20 | 15 | | | **47** |
| *Artamus minor* | Little woodswallow | | | | | | | 2 | 2 | | | 2 | 7 | | | **13** |
| *Artamus personatus* | Masked woodswallow | | | | | | | 2 | | | | | 40 | | | **42** |
| *Barnardius zonarius* | Australian ringneck | | | | | | | 10 | | | | 19 | 8 | | | **37** |
| *Cacatua sanguinea* | Little corella | | | | | | | | | | | 10 | | | | **10** |
| *Chalcites basalis* | Horsfield's bronze cuckoo | | | | | | | 1 | 2 | | | | 4 | | | **7** |
| *Chlamydera guttata* | Western bowerbird | | | | | 4 | | 1 | | | | | 2 | | | **7** |
| *Cincloramphus mathewsi* | Rufous songlark | | | | | | | | 1 | | | 2 | | | | **3** |

| Scientific name | Common name | BC Act | EPBC Act | Observation method | | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Active foraging | | Camera trap | | Opportunistic | | SM4 audio recorder | | Timed bird census | | Trapping | | |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | |
| *Cinclosoma castaneothorax* | Chestnut quail-thrush | | | | | | | | | | | | 4 | | | **4** |
| *Circus assimilis* | Spotted harrier | | | | | | | | 4 | | | | 2 | | | **6** |
| *Colluricincla harmonica* | Grey shrikethrush | | | | | 3 | | 2 | | | | 4 | 5 | | | **14** |
| *Conopophila whitei* | Grey honeyeater | | | | | | | 2 | | | | 4 | 3 | | | **9** |
| *Coracina maxima* | Ground cuckooshrike | | | | | | | 3 | 2 | | | | | | | **5** |
| *Coracina novaehollandiae* | Black-faced cuckooshrike | | | | | | | 5 | | | | 5 | 19 | | | **29** |
| *Corvus orru* | Torresian crow | | | | | 228 | 5 | 3 | 7 | | | 13 | 6 | | | **262** |
| *Cracticus nigrogularis* | Pied butcherbird | | | | | 1 | | 6 | 2 | | | 2 | 10 | | | **21** |
| *Cracticus torquatus* | Grey butcherbird | | | | | | | | | | | 7 | 1 | | | **8** |
| *Dromaius novaehollandiae* | Emu | | | | | | | | 1 | | | | | | | **1** |
| *Elanus axillaris* | Black-shouldered kite | | | | | | | | 1 | | | | | | | **1** |
| *Emblema pictum* | Painted finch | | | | | | | | 6 | | | 12 | 78 | | | **96** |
| *Eolophus roseicapilla* | Galah | | | | | | | 10 | 10 | | | 2 | 11 | | | **33** |
| *Epthianura tricolor* | Crimson chat | | | | | | | | 8 | | | | 3 | | | **11** |
| *Eurostopodus argus* | Spotted nightjar | | | 3 | | | | 1 | 3 | | | 1 | | | | **8** |
| *Falco berigora* | Brown falcon | | | | | | | 4 | 2 | | | 4 | 6 | | | **16** |
| *Falco cenchroides* | Australian kestrel (nankeen kestrel) | | | | | | | 2 | 3 | | | | 10 | | | **15** |
| *Falco longipennis* | Australian hobby | | | | | | | | 1 | | | | | | | **1** |
| *Gavicalis virescens* | Singing honeyeater | | | | | 6 | | 10 | 4 | | | 26 | 24 | | | **70** |
| *Geopelia cuneata* | Diamond dove | | | | | | | 2 | 30 | | | 1 | 152 | | | **185** |
| *Geopelia striata placida* | Peaceful dove | | | | | | | | 1 | | | | | | | **1** |
| *Geophaps plumifera* | Spinifex pigeon | | | | | | | 4 | | | | 10 | | | | **14** |
| *Gerygone fusca* | Western gerygone | | | | | | | 1 | 1 | | | 13 | 5 | | | **20** |
| *Grallina cyanoleuca* | Magpie-lark | | | | | | | 2 | | | | | 3 | | | **5** |

| Scientific name | Common name | BC Act | EPBC Act | Observation method | | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Active foraging | | Camera trap | | Opportunistic | | SM4 audio recorder | | Timed bird census | | Trapping | | |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | |
| *Gymnorhina tibicen* | Australian magpie | | | | | | | 7 | 3 | | | 1 | 6 | | | **17** |
| *Haliastur sphenurus* | Whistling kite | | | | | | | 2 | 4 | | | | 2 | | | **8** |
| *Hamirostra melanosternon* | Black-breasted buzzard | | | | | | | 2 | 1 | | | | 1 | | | **4** |
| *Heteroscenes pallidus* | Pallid cuckoo | | | | | | | | 2 | | | | 2 | | | **4** |
| *Lalage tricolor* | White-winged triller | | | | | | | | | | | 1 | 3 | | | **4** |
| *Lichmera indistincta* | Brown honeyeater | | | | | | | 1 | | | | | 5 | | | **6** |
| *Malurus assimilis* | Purple-backed fairywren | | | | | | | 17 | | | | 48 | 12 | | | **77** |
| *Malurus leucopterus* | White-winged fairywren | | | | | | | 5 | | | | 1 | 2 | | | **8** |
| *Malurus splendens* | Splendid fairywren | | | | | | | | 1 | | | 4 | 4 | | | **9** |
| *Manorina flavigula* | Yellow-throated miner | | | | | | | 9 | | | | 23 | 12 | | | **44** |
| *Melanodryas cucullata* | Hooded robin | | | | | | | 3 | 2 | | | 4 | 5 | | | **14** |
| *Melopsittacus undulatus* | Budgerigar | | | | | | | 15 | 31 | | | 2 | 452 | | | **500** |
| *Merops ornatus* | Rainbow bee-eater | | | | | | | 1 | | | | 12 | | | | **13** |
| *Milvus migrans* | Black kite | | | | | | | | | | | | 1 | | | **1** |
| *Mirafra javanica* | Horsfield's bush lark | | | | | | | | 1 | | | | 2 | | | **3** |
| *Ninox boobook* | Boobook owl | | | | 1 | | | | 2 | | | | 1 | | | **4** |
| *Nymphicus hollandicus* | Cockatiel | | | | | | | | 11 | | | | 40 | | | **51** |
| *Ocyphaps lophotes* | Crested pigeon | | | | | | | 2 | 30 | | | 5 | 22 | | | **59** |
| *Oreoica gutturalis* | Crested bellbird | | | | | 1 | | 6 | 4 | | | 7 | 30 | | | **48** |
| *Pachycephala rufiventris* | Rufous whistler | | | | | | | 2 | 1 | | | 12 | 17 | | | **32** |
| *Pardalotus rubricatus* | Red-browed pardalote | | | | | | | 1 | | | | | 1 | | | **2** |
| *Pardalotus striatus* | Striated pardalote | | | | | | | 1 | | | | 1 | 6 | | | **8** |
| *Peltohyas australis* | Inland dotterel | | | | | | | | | | | | 2 | | | **2** |
| *Petrochelidon ariel* | Fairy martin | | | | | | | 10 | | | | | | | | **10** |
| *Petroica goodenovii* | Red-capped robin | | | | | | | | | | | | 1 | | | **1** |

| Scientific name | Common name | BC Act | EPBC Act | Observation method | | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Active foraging | | Camera trap | | Opportunistic | | SM4 audio recorder | | Timed bird census | | Trapping | | |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | |
| *Phaps chalcoptera* | Common bronzewing | | | | | 1 | | 5 | | | | 4 | 3 | | | **13** |
| *Pomatostomus superciliosus* | White-browed babbler | | | | | | | 6 | | | | 20 | 17 | | | **43** |
| *Pomatostomus temporalis* | Grey-crowned babbler | | | | | | | 6 | 2 | | | 6 | 6 | | | **20** |
| *Poodytes carteri* | Spinifexbird | | | | | | | | 5 | | | 2 | 4 | | | **11** |
| *Psephotellus varius* | Mulga parrot | | | | | | | 1 | | | | 1 | | | | **2** |
| *Psophodes occidentalis* | Western wedgebill (chiming wedgebill) | | | | | | | | 1 | | | | | | | **1** |
| *Ptilotula keartlandi* | Grey-headed honeyeater | | | | | | | 5 | 1 | | | 4 | 12 | | | **22** |
| *Ptilotula penicillata* | White-plumed honeyeater | | | | | | | 1 | | | | 4 | 1 | | | **6** |
| *Rhipidura albiscapa* | Grey fantail | | | | | 1 | | | 1 | | | 3 | | | | **5** |
| *Rhipidura leucophrys* | Willie wagtail | | | | | 3 | | 5 | | | | 17 | 20 | | | **45** |
| *Smicrornis brevirostris* | Weebill | | | | | | | 7 | 2 | | | 26 | 36 | | | **71** |
| *Stipiturus ruficeps* | Rufous-crowned emu-wren | | | | | | | | | | | 2 | | | | **2** |
| *Taeniopygia castanotis* | Australian zebra finch | | | | | | | 3 | 33 | | | 22 | 255 | | | **313** |
| *Todiramphus pyrrhopygius* | Red-backed kingfisher | | | | | | | 2 | 3 | | | | 9 | | | **14** |
| *Turnix velox* | Little buttonquail | | | | | | | 1 | | | | 1 | 3 | | 3 | **8** |
| **MAMMALS** | | | | | | | | | | | | | | | | |
| *Antechinomys longicaudatus* | Long-tailed dunnart | P4 | | | | 1 | | | | | | | | | | **1** |
| *Bos primigenius taurus* | European cattle | Permitted - s11 | | | | | | 2 | 1 | | | | | | | **3** |
| *Camelus dromedarius* | Dromedary, camel | Declared Pest - s22(2) (C3 Exempt) | | | | | | 2 | 1 | | | | | | | **3** |
| *Canis familiaris* | Dingo/dog | | | | | 3 | 1 | 2 | 1 | | | | | | | **7** |
| *Chaerephon jobensis* | Greater northern free-tailed bat | | | | | | | | | 3 | 1 | | | | | **4** |
| *Chalinolobus gouldii* | Gould's wattled bat | | | | | | | | | 3 | 3 | | | | | **6** |

| Scientific name | Common name | BC Act | EPBC Act | Observation method | | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Active foraging | | Camera trap | | Opportunistic | | SM4 audio recorder | | Timed bird census | | Trapping | | |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | |
| *Dasykaluta rosamondae* | Kaluta | | | | | 3 | | | | | | | | 6 | 17 | **26** |
| *Felis catus* | Cat | Declared Pest - s22(2) (Exempt) | | 1 | | 2 | | | | | | | | | | **3** |
| *Macropod sp.* | Macropod sp. | | | | | | | | 1 | | | | | | | **1** |
| *Mus musculus* | House mouse | Permitted - s11 (Exempt) | | | | | | | | | | | | | 1 | **1** |
| *Ningaui timealeyi* | Pilbara ningaui | | | | | | | | | | | | | 5 | 2 | **7** |
| *Nyctophilus geoffroyi geoffroyi* | Lesser long-eared bat | | | | | | | | | 2 | | | | | | **2** |
| *Osphranter robustus* | Euro | | | 1 | | 1 | | 3 | 1 | | | | | | | **6** |
| *Osphranter rufus* | Red kangaroo | | | | | | | 3 | 5 | | | | | | | **8** |
| *Petrogale rothschildi* | Rothschild's rock-wallaby | | | 1 | | 2 | | | | | | | | | | **3** |
| *Pseudantechinus woolleyae* | Woolley's pseudantechinus | | | 2 | | 60 | | | 3 | | | | | | | **65** |
| *Pseudomys chapmani* | Western pebble-mound mouse | P4 | | | | | | 7 | 4 | | | | | | | **11** |
| *Pseudomys desertor* | Desert mouse | | | | | | | | | | | | | 12 | 2 | **14** |
| *Pseudomys hermannsburgensis* | Sandy inland mouse | | | | | 1 | 3 | | | | | | | 5 | 10 | **19** |
| *Pseudomys sp.* | Pseudomys sp. | | | | | | 1 | | | | | | | | | **1** |
| *Scotorepens greyii* | Little broad-nosed bat | | | | | | | | | 3 | 3 | | | | | **6** |
| *Sminthopsis macroura* | Stripe-faced dunnart | | | | | | | | | | | | | 2 | 4 | **6** |
| *Sminthopsis ooldea* | Ooldea dunnart | | | | | | | | | | | | | 2 | | **2** |
| *Sminthopsis sp.* | Dunnart sp. | | | | | 2 | | | | | | | | | | **2** |
| *Tachyglossus aculeatus acanthion* | Short-beaked echidna | | | | | | | | 2 | | | | | | | **2** |
| *Taphozous georgianus* | Common sheath-tailed bat | | | 15 | | | | | | | | | | | | **15** |
| *Taphozous hilli* | Hill's sheath-tailed bat | | | | | | | | 1 | 2 | | | | | | **3** |
| *Taphozous spp.* | Taphozous spp. | | | | | | | | | | 2 | | | | | **2** |

| Scientific name | Common name | BC Act | EPBC Act | Observation method | | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Active foraging | | Camera trap | | Opportunistic | | SM4 audio recorder | | Timed bird census | | Trapping | | |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | |
| *Vespadelus finlaysoni* | Finlayson's cave bat | | | 1 | | | | | | 3 | 2 | | | | | **6** |
| *Zyzomys argurus* | Common rock-rat | | | | | 41 | 3 | | | | | | | | | **44** |
| **REPTILES** | | | | | | | | | | | | | | | | |
| *Anilios grypus* | Long-beaked blind snake | | | 1 | | | | | | | | | | 8 | 1 | **10** |
| *Antaresia childreni* | Children's python | | | 1 | | | | | | | | | | 1 | | **2** |
| *Antaresia perthensis* | Pygmy python | | | 7 | 3 | | | | 1 | | | | | | | **11** |
| *Brachyurophis approximans* | North-western shovel-nosed snake | | | 1 | | | | | | | | | | | | **1** |
| *Carlia munda* | Shaded-litter rainbow-skink | | | 2 | | | | | | | | | | 2 | 3 | **7** |
| *Carlia triacantha* | Desert rainbow-skink | | | | | | | | | | | | | 7 | 2 | **9** |
| *Cryptoblepharus buchananii* | Buchanan's snake-eyed skink | | | | 1 | | | | | | | | | 1 | | **2** |
| *Cryptoblepharus ustulatus* | Russet snake-eyed skink | | | 1 | 3 | | | 1 | 2 | | | | | | | **7** |
| *Ctenophorus caudicinctus* | Western ring-tailed dragon | | | 3 | 8 | | | | 4 | | | | | 1 | 1 | **17** |
| *Ctenophorus reticulatus* | Western netted dragon | | | | | | | | 1 | | | | | | | **1** |
| *Ctenotus helenae* | Clay-soil ctenotus | | | | | | | | | | | | | 2 | 11 | **13** |
| *Ctenotus pallasotus* | Western pilbara lined ctenotus | | | | | | | | | | | | | 3 | | **3** |
| *Ctenotus pantherinus* | Leopard skink | | | 2 | | | | 1 | | | | | | 9 | 18 | **30** |
| *Ctenotus rubicundus* | Ruddy ctenotus | | | | 1 | | | | 1 | | | | | | | **2** |
| *Ctenotus rutilans* | Rusty-shouldered ctenotus | | | | | | | | 2 | | | | | | | **2** |
| *Ctenotus saxatilis* | Rock ctenotus | | | 9 | 1 | | 3 | | 1 | | | | | 1 | 12 | **27** |
| *Ctenotus schomburgkii* | Barred wedge-snout ctenotus | | | | | | | | 1 | | | | | 6 | 17 | **24** |
| *Ctenotus sp.* | | | | | | | 2 | | | | | | | | | **2** |
| *Ctenotus uber* | Spotted ctenotus | | | | 1 | | | | | | | | | | 6 | **7** |
| *Cyclodomorphus melanops* | Spinifex slender blue-tongue | | | 2 | | | | 1 | 2 | | | | | 1 | | **6** |

| Scientific name | Common name | BC Act | EPBC Act | Observation method | | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Active foraging | | Camera trap | | Opportunistic | | SM4 audio recorder | | Timed bird census | | Trapping | | |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | |
| *Delma nasuta* | Sharp-snouted delma | | | | | | | | | | | | | | 2 | **2** |
| *Delma pax* | Peace delma | | | 1 | | | | | | | | | | | | **1** |
| *Delma sp.* | Delma sp.* | | | 2 | | | | | | | | | | | | **2** |
| *Delma tincta* | Excitable delma | | | | | | | | 1 | | | | | | | **1** |
| *Demansia reticulata* | Reticulated whipsnake | | | 1 | | | | | | | | | | 1 | 6 | **8** |
| *Diplodactylus pulcher* | Fine-faced gecko | | | 1 | | | | | | | | | | 4 | 4 | **9** |
| *Diporiphora amphiboluroides* | Mulga dragon | | | | | | | | 2 | | | | | 2 | 1 | **5** |
| *Egernia cygnitos* | Western pilbara spiny-tailed skink | | | 5 | | | | 1 | 2 | | | | | | | **8** |
| *Egernia formosa* | Goldfields crevice-skink | | | 2 | | 1 | | | | | | | | | | **3** |
| *Gehyra crypta* | Western cryptic gehyra | | | | | | | | | | | | | 1 | | **1** |
| *Gehyra micra* | Small pilbara spotted rock gehyra | | | 7 | | | | | | | | | | | | **7** |
| *Gehyra punctata* | Spotted pilbara rock gehyra | | | 27 | | | | | | | | | | | | **27** |
| *Gehyra sp.* | Gehyra sp. | | | | | 1 | | | 2 | | | | | | | **3** |
| *Gehyra variegata* | Variegated gehyra | | | 3 | 3 | | | 2 | 1 | | | | | 2 | 1 | **12** |
| *Gowidon longirostris* | Long-nosed dragon | | | 1 | 1 | | | 2 | 2 | | | | | 1 | 8 | **15** |
| *Heteronotia binoei* | Bynoe's gecko | | | 4 | | | | | | | | | | 3 | 6 | **13** |
| *Heteronotia spelea* | Pilbara cave gecko | | | 4 | | | | | | | | | | | | **4** |
| *Lerista chalybura* | Pilbara blue-tailed slider | | | 5 | 1 | | | | | | | | | | | **6** |
| *Lerista muelleri* | Mueller's three-toed slider | | | 2 | | | | | 1 | | | | | 4 | | **7** |
| *Lerista neander* | Pilbara robust slider | | | 7 | 3 | | | 1 | 1 | | | | | | | **12** |
| *Lialis burtonis* | Burton's snake-lizard | | | | | | | | 2 | | | | | | 2 | **4** |
| *Liasis olivaceus barroni* | Pilbara olive python* | VU | VU | 1 | | | | | | | | | | | | **1** |
| *Lucasium stenodactylus* | Western sandplain gecko | | | | | | | | | | | | | | 5 | **5** |
| *Lucasium woodwardi* | Pilbara ground gecko | | | | | | | | | | | | | 1 | | **1** |
| *Menetia greyii* | Common dwarf skink | | | | | | | | | | | | | 3 | | **3** |

| Scientific name | Common name | BC Act | EPBC Act | Observation method | | | | | | | | | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Active foraging | | Camera trap | | Opportunistic | | SM4 audio recorder | | Timed bird census | | Trapping | | |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | |
| *Morethia ruficauda* | Fire-tailed skink | | | 1 | | 2 | | | | | | | | | | **3** |
| *Morethia ruficauda exquisita* | Exquisite fire-tail skink | | | 1 | | | | 1 | | | | | | | | **2** |
| *Oedura fimbria* | Western marbled velvet gecko | | | 9 | | | | | | | | | | | | **9** |
| *Pogona minor minor* | Western bearded dragon | | | | | | | 1 | 1 | | | | | 4 | | **6** |
| *Pseudechis australis* | Mulga snake | | | | | | | | 1 | | | | | | | **1** |
| *Pseudonaja mengdeni* | Western brown snake | | | | | | | 1 | | | | | | | | **1** |
| *Pygopus nigriceps* | Western hooded scaly-foot | | | 1 | | | | | | | | | | | | **1** |
| *Rhynchoedura ornata* | Western beaked gecko | | | 2 | | | | | | | | | | 2 | 10 | **14** |
| *Scincidae sp.* | Skink sp. | | | | | 1 | | | | | | | | | | **1** |
| *Strophurus wellingtonae* | Wellington's spiny-tailed gecko | | | 7 | | | | | | | | | | 2 | 1 | **10** |
| *Suta gaikhorstorum* | Pilbara hooded snake | | | | | | | | | | | | | 2 | 1 | **3** |
| *Tiliqua multifasciata* | Central blue-tongue | | | | | 1 | | 5 | 1 | | | | | 2 | | **9** |
| *Varanus acanthurus* | Spiny-tailed goanna | | | | | | | | 1 | | | | | 1 | 1 | **3** |
| *Varanus brevicauda* | Short-tailed pygmy goanna | | | | | | | | | | | | | | 1 | **1** |
| *Varanus bushi* | Pilbara mulga goanna | | | | | | | 2 | | | | | | | 1 | **3** |
| *Varanus gouldii* | Sand goanna (Gould's monitor) | | | | | 9 | | | | | | | | | | **9** |
| *Varanus hamersleyensis* | Southern Pilbara rock goanna | | | | | | | 1 | 1 | | | | | | | **2** |
| *Varanus panoptes* | Yellow-spotted monitor | | | | | | 2 | | | | | | | | | **2** |
| *Varanus tristis* | Black-headed monitor | | | | | 1 | | | | | | | | 1 | | **2** |
| **Grand total** | | | | **150** | **27** | **383** | **21** | **270** | **308** | **16** | **11** | **430** | **1491** | **110** | **160** | **3377** |
| *Observation based on sloughed skin | | | | | | | | | | | | | | | | |

# Appendix VI Conservation significant fauna recorded during detailed fauna survey

| Scientific Name | Common Name | Conservation status | | Observation method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BC Act (WA) | EPBC Act | Camera trap | | Opportunistic | | SM4 audio recorder | | Spot Lighting | | Targeted Bilby Search | Timed Bird Census | | Trapping | | Total |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S2 | S1 | S2 | S1 | S2 | |
| **MAMMALS** | | | | | | | | | | | | | | | | | |
| *Antechinomys longicaudatus* | Long-tailed dunnart | P4 | | 1 | | | | | | | | | | | | | 1 |
| *Pseudomys chapmani* | Western pebble-mound mouse | P4 | | | | 7 | 4 | | | | | | | | | | 11 |
| **REPTILES** | | | | | | | | | | | | | | | | | |
| *Liasis olivaceus barroni* | Pilbara olive python | VU | | | | 1 | | | | | | | | | | | 1 |

# Appendix VII Introduced fauna recorded during survey

| Scientific Name | Common Name | Conservation status | | Observation method | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | WA | EPBC Act | Camera trap | | Opportunistic | | SM4 audio recorder | | Spot Lighting | | Targeted Bilby Search | Timed Bird Census | | Trapping | | Total |
| | | | | S1 | S2 | S1 | S2 | S1 | S2 | S1 | S2 | S2 | S1 | S2 | S1 | S2 | |
| **MAMMALS** | | | | | | | | | | | | | | | | | |
| *Bos primigenius taurus* | European cattle | Permitted - s11 | | | | 2 | 2 | | | | | | | | | | 4 |
| *Camelus dromedarius* | Dromedary, camel | Declared Pest - s22(2) (C3 Exempt) | | | | 2 | 1 | | | | | | | | | | 3 |
| *Felis catus* | Cat | Declared Pest - s22(2) (Exempt) | | | | 1 | | | | | | | | | | | 1 |

# Appendix VIII Survey activity coordinates

**Table 8.1 Fauna trap site location and details**

| Site Name | Survey round | Latitude | Longitude | Broad Habitat |
|---|---|---|---|---|
| Trap Site 1 | 1 & 2 | -23.2293 | 119.4347 | Mulga woodland |
| Trap Site 2 | 1 & 2 | -23.2308 | 119.4395 | Drainage |
| Trap Site 3 | 1 & 2 | -23.2243 | 119.4212 | Spinifex on stony plain and rises |
| Trap Site 4 | 1 & 2 | -23.2277 | 119.4546 | Spinifex on stony plain and rises |
| Trap Site 5 | 1 & 2 | -23.2271 | 119.4389 | Mulga woodland |
| Trap Site 6 | 1 & 2 | -23.2271 | 119.4511 | Rocky Hill |
| Trap Site 7 | 1 & 2 | -23.2073 | 119.4202 | Spinifex on stony plain and rises |
| Trap Site 8 | 1 & 2 | -23.2077 | 119.4273 | Tussock Grassland |

**Table 8.2 Camera trap locations and details**

| Location | MDC site ID | Camera ID | Survey Round | Latitude | Longitude | Date deployed | Date retrieved | Trap nights |
|---|---|---|---|---|---|---|---|---|
| Southern section | RAP01-S1 | RAP01 | 1 | -23.2305 | 119.4499 | 2/09/2023 | 25/09/2023 | 23 |
| Northern section | RAP02-S2 | RAP02 | 2 | -23.1633 | 119.4860 | 2/05/2024 | 4/05/2024 | 2 |
| Southern section | RAP03-S2 | RAP03 | 2 | -23.2307 | 119.4494 | 30/04/2024 | 4/05/2024 | 4 |
| Southern section | RAP04-S1 | RAP04 | 1 | -23.2274 | 119.4552 | 31/08/2023 | 5/09/2023 | 5 |
| Southern section | RAP04-S2(A) | RAP04 | 2 | -23.2275 | 119.4544 | 30/04/2024 | 5/05/2024 | 5 |
| Southern section | RAP04-S2(B) | RAP04 | 2 | -23.2284 | 119.4442 | 1/05/2024 | 5/05/2024 | 4 |
| Southern section | RAP05-S1 | RAP05 | 1 | -23.227 | 119.4385 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP05-S2 | RAP05 | 2 | -23.2282 | 119.4439 | 1/05/2024 | 5/05/2024 | 4 |
| Southern section | RAP06-S1 | RAP06 | 1 | -23.2301 | 119.4338 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP07-S1 | RAP07 | 1 | -23.2305 | 119.4499 | 2/09/2023 | 25/09/2023 | 23 |
| Southern section | RAP08-S1 | RAP08 | 1 | -23.2276 | 119.4515 | 31/08/2023 | 5/09/2023 | 5 |
| Southern section | RAP08-S2 | RAP08 | 2 | -23.2304 | 119.4430 | 30/04/2024 | 5/05/2024 | 5 |
| Northern section | RAP09-S2 | RAP09 | 2 | -23.1644 | 119.4854 | 2/05/2024 | 4/05/2024 | 2 |
| Southern section | RAP10-S1 | RAP10 | 1 | -23.2299 | 119.4348 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP10-S2 | RAP10 | 2 | -23.2252 | 119.4305 | 1/05/2024 | 5/05/2024 | 4 |
| Southern section | RAP11-S1 | RAP11 | 1 | -23.2318 | 119.4394 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP11-S2 | RAP11 | 2 | -23.2305 | 119.4434 | 30/04/2024 | 5/05/2024 | 5 |
| Southern section | RAP12-S1 | RAP12 | 1 | -23.2072 | 119.4275 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP12-S2 | RAP12 | 2 | -23.2252 | 119.4297 | 1/05/2024 | 5/05/2024 | 4 |
| Southern section | RAP13-S2 | RAP13 | 2 | -23.228 | 119.4438 | 1/05/2024 | 5/05/2024 | 4 |
| Southern section | RAP14-S1 | RAP14 | 1 | -23.208 | 119.4189 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP14-S2 | RAP14 | 2 | -23.2293 | 119.4495 | 30/04/2024 | 4/05/2024 | 4 |
| Southern section | RAP15-S1 | RAP15 | 1 | -23.2265 | 119.4391 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP15-S2 | RAP15 | 2 | -23.2284 | 119.4441 | 1/05/2024 | 5/05/2024 | 4 |
| Southern section | RAP16-S1 | RAP16 | 1 | -23.2046 | 119.4561 | 2/09/2023 | 5/09/2023 | 3 |
| Southern section | RAP19-S1 | RAP19 | 1 | -23.2312 | 119.4448 | 3/09/2023 | 24/09/2023 | 21 |
| Northern section | RAP20-S1 | RAP20 | 1 | -23.1544 | 119.4837 | 30/08/2023 | 3/09/2023 | 4 |
| Wider tenement | RAP20-S2 | RAP20 | 2 | -23.2004 | 119.5812 | 3/05/2024 | 5/05/2024 | 2 |
| Wider tenement | RAP21-S2 | RAP21 | 2 | -23.2014 | 119.5807 | 3/05/2024 | 5/05/2024 | 2 |
| Wider tenement | RAP22-S1 | RAP22 | 1 | -23.1998 | 119.5814 | 4/09/2023 | 6/09/2023 | 2 |
| Southern section | RAP22-S2 | RAP22 | 2 | -23.2305 | 119.4426 | 30/04/2024 | 5/05/2024 | 5 |
| Southern section | RAP24-S2 | RAP24 | 2 | -23.2305 | 119.4441 | 30/04/2024 | 5/05/2024 | 5 |
| Southern section | RAP25-S2 | RAP25 | 2 | -23.2286 | 119.4444 | 1/05/2024 | 5/05/2024 | 4 |
| Southern section | RAP26-S1 | RAP26 | 1 | -23.2072 | 119.4252 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP26-S2 | RAP26 | 2 | -23.2304 | 119.4439 | 30/04/2024 | 5/05/2024 | 5 |
| Northern section | RAP27-S1 | RAP27 | 1 | -23.1543 | 119.4895 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP27-S2 | RAP27 | 2 | -23.2295 | 119.4494 | 30/04/2024 | 4/05/2024 | 4 |
| Southern section | RAP28-S1 | RAP28 | 1 | -23.2314 | 119.4444 | 3/09/2023 | 24/09/2023 | 21 |
| Southern section | RAP29-S1 | RAP29 | 1 | -23.2305 | 119.4433 | 3/09/2023 | 24/09/2023 | 21 |
| Southern section | RAP30-S2 | RAP30 | 2 | -23.2284 | 119.4439 | 1/05/2024 | 5/05/2024 | 4 |
| Wider tenement | RAP31-S1 | RAP31 | 1 | -23.2021 | 119.5803 | 3/09/2023 | 6/09/2023 | 3 |

| Location | MDC site ID | Camera ID | Survey Round | Latitude | Longitude | Date deployed | Date retrieved | Trap nights |
|---|---|---|---|---|---|---|---|---|
| Southern section | RAP31-S2 | RAP31 | 2 | -23.2288 | 119.4446 | 1/05/2024 | 5/05/2024 | 4 |
| Northern section | RAP32-S1 | RAP32 | 1 | -23.1523 | 119.4857 | 30/08/2023 | 3/09/2023 | 4 |
| Southern section | RAP32-S2 | RAP32 | 2 | -23.2304 | 119.4436 | 30/04/2024 | 5/05/2024 | 5 |
| Northern section | RAP33-S2 | RAP33 | 2 | -23.1628 | 119.4864 | 2/05/2024 | 4/05/2024 | 2 |
| Northern section | RAP34-S2 | RAP34 | 2 | -23.1601 | 119.4861 | 2/05/2024 | 4/05/2024 | 2 |
| Southern section | RAP35-S2 | RAP35 | 2 | -23.2285 | 119.4442 | 1/05/2024 | 5/05/2024 | 4 |
| Southern section | RAP38-S1 | RAP38 | 1 | -23.2075 | 119.4204 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP38-S2 | RAP38 | 2 | -23.2253 | 119.4303 | 1/05/2024 | 5/05/2024 | 4 |
| Southern section | RAP39-S1 | RAP39 | 1 | -23.2274 | 119.4544 | 31/08/2023 | 5/09/2023 | 5 |
| Southern section | RAP39-S2 | RAP39 | 2 | -23.2305 | 119.4429 | 30/04/2024 | 5/05/2024 | 5 |
| Southern section | RAP41-S1 | RAP41 | 1 | -23.2275 | 119.4505 | 31/08/2023 | 5/09/2023 | 5 |
| Wider tenement | RAP42-S2 | RAP42 | 2 | -23.2016 | 119.5808 | 3/05/2024 | 5/05/2024 | 2 |
| Southern section | RAP43-S2 | RAP43 | 2 | -23.2307 | 119.4491 | 30/04/2024 | 4/05/2024 | 4 |
| Southern section | RAP44-S1 | RAP44 | 1 | -23.2307 | 119.4394 | 30/08/2023 | 5/09/2023 | 6 |
| Wider tenement | RAP45-S1 | RAP45 | 1 | -23.2019 | 119.5804 | 4/09/2023 | 6/09/2023 | 2 |
| Northern section | RAP45-S2 | RAP45 | 2 | -23.1638 | 119.4856 | 2/05/2024 | 4/05/2024 | 2 |
| Southern section | RAP46-S1 | RAP46 | 1 | -23.2294 | 119.4494 | 2/09/2023 | 25/09/2023 | 23 |
| Southern section | RAP47-S1 | RAP47 | 1 | -23.2246 | 119.4208 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP47-S2 | RAP47 | 2 | -23.2305 | 119.4433 | 30/04/2024 | 5/05/2024 | 5 |
| Southern section | RAP49-S1 | RAP49 | 1 | -23.2245 | 119.4198 | 30/08/2023 | 5/09/2023 | 6 |
| Southern section | RAP49-S2 | RAP49 | 2 | -23.2287 | 119.4444 | 1/05/2024 | 5/05/2024 | 4 |
| Wider tenement | RAP50-S1 | RAP50 | 1 | -23.2014 | 119.5807 | 3/09/2023 | 6/09/2023 | 3 |
| Southern section | RAP50-S2 | RAP50 | 2 | -23.2284 | 119.4440 | 1/05/2024 | 5/05/2024 | 4 |

**Table 8.3 SM4-U and SM4-A unit locations and details**

| Site Name | Device | Date deployed | Date Retrieved | Survey nights | Latitude | Longitude | Survey Period | Habitat notes |
|---|---|---|---|---|---|---|---|---|
| Site 7 | NP recorder | 30/08/2023 | 6/09/2023 | 7 | -23.2083 | 119.4207 | 1 | Mulga over spinifex on gravely loam plain |
| Gorge Bat box | Bat recorder | 4/09/2023 | 6/09/2023 | 2 | -23.2015 | 119.5806 | 1 | By water in gorge (wider tenements) |
| Shark Fin bat box | Bat recorder | 30/08/2023 | 3/09/2023 | 4 | -23.1541 | 119.4896 | 1 | Placed in Northern survey section |
| Site 5 | Bat recorder | 30/08/2023 | 2/09/2023 | 3 | -23.2270 | 119.4395 | 1 | Drainage |
| Track 2 NP Box | NP recorder | 28/04/2024 | 1/05/2024 | 3 | -23.2085 | 119.4416 | 2 | Tussock grassland next to a puddle of water |
| JK Hill transect 1 Bat box | Bat recorder | 30/04/2024 | 5/05/2024 | 5 | -23.2304 | 119.4433 | 2 | Mid-slope of round hill adjacent to Pilbara olive python skin location |
| Shark fin NP box | NP recorder | 1/05/2024 | 4/05/2024 | 3 | -23.1645 | 119.4853 | 2 | Lots of spinifex on undulating rises stoney rises |
| Kalgan Bat | Bat recorder | 3/05/2024 | 5/05/2024 | 2 | -23.2015 | 119.5808 | 2 | Rocky gorge with holes and small caves (wider tenements) |
| Track 2 Bat Box | Bat recorder | 28/04/2024 | 1/05/2024 | 3 | -23.2085 | 119.4416 | 2 | Tussock grassland |

**Table 8.4 Timed Bird Census locations and relevant data**

| Site ID | Survey round | Date | Latitude | Longitude | No. of species detected |
|---|---|---|---|---|---|
| Kalgan Waterhole bird | 2 | 5/05/2024 | -23.20156922 | 119.5809 | 13 |
| Round Hill west side | 2 | 5/05/2024 | -23.22890286 | 119.4423 | 6 |
| Round Hill east side camera traps | 2 | 4/05/2024 | -23.22878292 | 119.4516 | 5 |
| DH S2 bird 4 (Shark fin) | 2 | 4/05/2024 | -23.1610284 | 119.4864 | 11 |
| DH S2 bird 1 | 2 | 1/05/2024 | -23.22561092 | 119.4303 | 6 |
| Trapsite 1 | 2 | 1/05/2024 | -23.22926851 | 119.4348 | 16 |
| Trapsite 5 | 2 | 1/05/2024 | -23.22716345 | 119.4388 | 12 |
| Trapsite 3 | 2 | 1/05/2024 | -23.2241102 | 119.4204 | 4 |
| Trapsite 6 | 2 | 1/05/2024 | -23.22710465 | 119.4517 | 3 |
| Trapsite 4 | 2 | 1/05/2024 | -23.22746939 | 119.4544 | 7 |
| Trapsite 2 | 2 | 30/04/2024 | -23.23055427 | 119.4397 | 7 |
| Trapsite 8 | 2 | 30/04/2024 | -23.2076924 | 119.4274 | 13 |
| Trapsite 7 | 2 | 29/04/2024 | -23.2079991 | 119.4201 | 14 |
| Trapsite 2 | 2 | 28/04/2024 | -23.20864008 | 119.4415 | 8 |
| Trapsite 3 | 2 | 28/04/2024 | -23.2242634 | 119.421 | 9 |
| Trapsite 6 | 2 | 4/05/2024 | -23.22715244 | 119.4518 | 11 |
| Trapsite 4 | 2 | 4/05/2024 | -23.22745186 | 119.4548 | 9 |
| Waypoint 038 | 2 | 4/05/2024 | -23.22736187 | 119.4303 | 18 |
| DH S2 bird 2 | 2 | 2/05/2024 | -23.23661705 | 119.4507 | 9 |
| Waterhole-Kalgan Creek bird | 2 | 3/05/2024 | -23.20148115 | 119.5807 | 11 |
| Trapsite 8 | 2 | 3/05/2024 | -23.20747505 | 119.4246 | 17 |
| Trapsite 7 | 2 | 3/05/2024 | -23.2070951 | 119.4201 | 7 |
| Trapsite 3 | 2 | 3/05/2024 | -23.22372716 | 119.4205 | 12 |
| DH S2 bird 3 | 2 | 2/05/2024 | -23.24443743 | 119.4525 | 2 |
| Trapsite 1 | 2 | 2/05/2024 | -23.22954759 | 119.4352 | 7 |
| Trapsite 6 | 2 | 2/05/2024 | -23.22483641 | 119.4517 | 9 |
| Trapsite 4 | 2 | 2/05/2024 | -23.22742054 | 119.4545 | 8 |
| Trapsite 8 | 2 | 2/05/2024 | -23.20738359 | 119.4252 | 11 |
| DH S2 bird 5 (Shark fin) | 2 | 1/05/2024 | -23.15980564 | 119.4858 | 16 |
| Trapsite 3 | 2 | 30/04/2024 | -23.22414271 | 119.4204 | 13 |
| Trapsite 5 | 2 | 30/04/2024 | -23.22730611 | 119.4388 | 9 |
| Waterhole Track 2 | 2 | 29/04/2024 | -23.20874065 | 119.4419 | 18 |
| Trapsite 2 | 2 | 29/04/2024 | -23.2306129 | 119.4399 | 22 |
| DH5 | 1 | 6/09/2023 | -23.18033308 | 119.5008 | 5 |
| Hill drainage | 1 | 5/09/2023 | -23.23609073 | 119.4517 | 12 |
| Had2 | 1 | 5/09/2023 | -23.18116046 | 119.502 | 1 |
| Had01 | 1 | 5/09/2023 | -23.18027996 | 119.5046 | 2 |
| Hill drainage | 1 | 5/09/2023 | -23.23472826 | 119.4528 | 10 |
| Tbs59b | 1 | 5/09/2023 | -23.21480432 | 119.4045 | 5 |
| DH9 | 1 | 4/09/2023 | -23.20939885 | 119.4596 | 4 |
| Tbs 5 9 a | 1 | 5/09/2023 | -23.20542008 | 119.4561 | 11 |
| Tbs1 | 1 | 4/09/2023 | -23.19475529 | 119.3955 | 6 |
| Tin Dog Creek 1 | 1 | 4/09/2023 | -23.21707463 | 119.4769 | 2 |

| Site ID | Survey round | Date | Latitude | Longitude | No. of species detected |
|---|---|---|---|---|---|
| Tin Dog Creek 2 | 1 | 4/09/2023 | -23.21351437 | 119.4772 | 13 |
| Gun Hab2 | 1 | 3/09/2023 | -23.23607348 | 119.5718 | 4 |
| DH10 | 1 | 3/09/2023 | -23.2049325 | 119.5786 | 2 |
| JKHA-Gun1 | 1 | 3/09/2023 | -23.23504629 | 119.5689 | 4 |
| Grasswren waterhole | 1 | 2/09/2023 | -23.20124256 | 119.5809 | 8 |
| Grasswren waterhole | 1 | 2/09/2023 | -23.20152125 | 119.5821 | 3 |
| Truck laydown | 1 | 1/09/2023 | -23.22937505 | 119.4377 | 7 |
| Trapsite 7 | 1 | 1/09/2023 | -23.20760079 | 119.4193 | 7 |
| Trapsite 7 | 1 | 31/08/2023 | -23.20878339 | 119.4413 | 2 |
| DH12 | 1 | 31/08/2023 | -23.20489022 | 119.4565 | 9 |
| Trapsite 8 | 1 | 31/08/2023 | -23.2080155 | 119.4275 | 5 |
| Trapsite 8 | 1 | 31/08/2023 | -23.20735107 | 119.4231 | 7 |
| Trapsite 7 | 1 | 31/08/2023 | -23.20711313 | 119.4205 | 9 |
| Trapsite 6 | 1 | 31/08/2023 | -23.22390648 | 119.4204 | 5 |
| Trapsite 1 | 1 | 31/08/2023 | -23.22958029 | 119.435 | 7 |
| Trapsite 5 | 1 | 31/08/2023 | -23.22738365 | 119.4386 | 10 |
| Trapsite 2 | 1 | 31/08/2023 | -23.23061863 | 119.4396 | 6 |
| Trapsite 6 | 1 | 31/08/2023 | -23.22777346 | 119.4516 | 3 |
| Trapsite 4 | 1 | 31/08/2023 | -23.22780857 | 119.4553 | 3 |
| Trapsite 6 | 1 | 30/08/2023 | -23.22380826 | 119.4203 | 2 |
| Trapsite 7 | 1 | 30/08/2023 | -23.20696487 | 119.42 | 3 |
| Trapsite 8 | 1 | 30/08/2023 | -23.20799216 | 119.4277 | 3 |
| Trapsite 3 | 1 | 30/08/2023 | -23.22407637 | 119.4205 | 5 |
| Trapsite 1 | 1 | 30/08/2023 | -23.22944595 | 119.435 | 9 |
| Trapsite 7 | 1 | 30/08/2023 | -23.20693977 | 119.4198 | 5 |
| Trapsite 8 | 1 | 30/08/2023 | -23.20770103 | 119.4273 | 6 |
| Trapsite 3 | 1 | 29/08/2023 | -23.22417132 | 119.4204 | 2 |
| Trapsite 5 | 1 | 29/08/2023 | -23.22744115 | 119.4387 | 9 |
| Trapsite 2 | 1 | 29/08/2023 | -23.23051439 | 119.4396 | 4 |
| Trapsite 6 | 1 | 29/08/2023 | -23.22686017 | 119.4518 | 3 |
| Trapsite 4 | 1 | 29/08/2023 | -23.22820537 | 119.4544 | 4 |

# Appendix IX Habitat Assessments

<table>
<tr><td>Site ID</td><td>Trap Site 1</td><td>Date</td><td>8/30/2023</td></tr>
<tr><td>Latitude</td><td>-23.2295</td><td>Longitude</td><td>119.4345</td></tr>
<tr><td>General Area</td><td>Southern Survey section</td><td rowspan="4">Representative Photo:</td><td rowspan="4">  </td></tr>
<tr><td>Broad Fauna Habitat</td><td>Mulga woodland</td></tr>
<tr><td>Landform</td><td>Plain</td></tr>
<tr><td>Land System</td><td>Spearhole Landsystem</td></tr>
<tr><td>General Topography</td><td>Flat</td><td>Disturbance</td><td>Some old camel and/or cattle footprints</td></tr>
<tr><td>Soil Type</td><td>Surface stone over over sandy loam</td><td>Burrowing Suitability</td><td>Moderate (loamier soils and or presence of stones in the substrate)</td></tr>
<tr><td>Surface Rock Size</td><td>Pebbles size (0-50 mm)</td><td>Leaf Litter Cover</td><td>Negligible</td></tr>
<tr><td>Triodia Dominant or Co-Dominant in Understorey</td><td>No</td><td>Chenopods Dominant or Co-Dominant in Understorey</td><td>No</td></tr>
<tr><td>Triodia Description</td><td colspan="3">Triodia not dominant</td></tr>
<tr><td>Site Habitat Description</td><td colspan="3">Mulga on gibber/stoney plains. Spinifex is present but sparse throughout site.</td></tr>
<tr><td>Fire History</td><td>Within 10 years</td><td>Fire Intensity</td><td>Unable to tell</td></tr>
<tr><td>Caves Present?</td><td>No</td><td>Water Body Present?</td><td>No</td></tr>
<tr><td>Termite Mounds Present?</td><td>Yes</td><td>Wood debris for Refugia</td><td>Small to Medium fallen logs - many</td></tr>
<tr><td>Rocky Outcroppings</td><td>No Exposed Rock Outcropping</td><td>Cracks, Crevices, or Holes for Refugia</td><td>Nil</td></tr>
<tr><td>Large Trees Present?</td><td>No</td><td>Tree Hollow Notes</td><td>N/A</td></tr>
<tr><td>Habitat Assessment Comments</td><td colspan="3"></td></tr>
</table>

| | | | |
|---|---|---|---|
| **Site ID** | Trap Site 2 | **Date** | 8/30/2023 |
| **Latitude** | -23.2317 | **Longitude** | 119.4398 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Drainage | | |
| **Landform** | Non incised drainage | | |
| **Land System** | Border of Newman and Spearhole Landsystems | | |
| **General Topography** | Undulating | **Disturbance** | Exploration (drilling, pads sumps etc), road or tracks near by |
| **Soil Type** | Occasional stones over sandy clay loam | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | 2-5cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | No | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | Triodia not dominant | | |
| **Site Habitat Description** | Mulga over spinifex on sandy-loam flats and plains with tussock grasses (including buffel) associated with drainage. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Medium Intensity (all ground and shrubs were burnt) trees blackened but alive |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Large fallen logs – some<br>Small to Medium fallen logs - many |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Low to Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | Trap Site 3 | **Date** | 8/30/2023 |
| **Latitude** | -23.2239 | **Longitude** | 119.4208 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Spinifex plains and rises | | |
| **Landform** | Gibber Plain | | |
| **Land System** | Border of Newman and Spearhole Landsystems | | |
| **General Topography** | Flat | **Disturbance** | Exploration (drilling, pads sumps etc), road or tracks |
| **Soil Type** | Surface stone cover over sandy clay loam | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Range from pebble to cobble size | **Leaf Litter Cover** | 2-5cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | <40cm tall (approx below knee). Senescent. Ground can be seen when viewing from above triodia hummock. Large ring form species, no long- runs of connected hummocks, plants have clumped together to form large hummocks. Suitable hummocks occur, but area dominated by unsuitable hummocks. | | |
| **Site Habitat Description** | Mulga over spinifex on gibber/stoney plains. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Mosaic of different fire intensities |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Large fallen logs - none,<br>Small to Medium fallen logs - many |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | Trap Site 4 | **Date** | 8/31/2023 |
| **Latitude** | -23.2275 | **Longitude** | 119.4551 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Spinifex plains and rises | | |
| **Landform** | Small hills bisected by minor drainage lines (Lower slope) | | |
| **Land System** | Newman Landsystem | | |
| **General Topography** | Undulating | **Disturbance** | Exploration (drilling, pads sumps etc), road or tracks |
| **Soil Type** | Gravel surface rock cover over sandy loam. | **Burrowing Suitability** | Difficult (hard clays and or rocky substrates - specialised diggers) |
| **Surface Rock Size** | Cobble size (51-250 mm) | **Leaf Litter Cover** | 1-2cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | Troida height is variable at this site. Mature, some senescence. Ground cannot be seen when viewing from above triodia hummock. Plants have clumped together to form large and small hummocks. Suitable hummocks occur, but area dominated by unsuitable hummocks. | | |
| **Site Habitat Description** | Corymbia and Eucalyptus over spinifex and mixed shrubs on stony hills and rises. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Mosaic of different fire intensities |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Large fallen logs - none<br>Small to Medium fallen logs - some |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Low |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | Trap Site 5 | **Date** | 8/30/2023 |
| **Latitude** | -23.2270 | **Longitude** | 119.4393 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Mulga woodland | | |
| **Landform** | Drainage plain/ Valley floor | | |
| **Land System** | Spearhole Landsystem | | |
| **General Topography** | Flat | **Disturbance** | Signs of grazing animals (cow track and scats) |
| **Soil Type** | Pacthes of surface gravel over sandy clay loam | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | 2-5cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | No | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | Triodia not dominant | | |
| **Site Habitat Description** | Mixed shrubland associated with drainage on loamier soils and mulga over spinifex on sandy-loam flats and plains. | | |
| **Fire History** | Long Unburnt | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Large fallen logs - some<br>Small to Medium fallen logs - many |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Low to Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | Trap site 6 | **Date** | 8/31/2023 |
| **Latitude** | -23.2274 | **Longitude** | 119.4514 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Rocky Hill | | |
| **Landform** | Foot hills of large hill, bisected with minor drainge (Lower slope). | | |
| **Land System** | Newman Landsystem | | |
| **General Topography** | Undulating to low hills/rises | **Disturbance** | Road or tracks |
| **Soil Type** | Gravel surface stones over sandy clay loam | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Range from pebble to cobble size | **Leaf Litter Cover** | 1-2cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | <40cm tall (approx below knee). Ground can be seen when viewing triodia from above triodia hummock. Predominantly individual triodia plants | | |
| **Site Habitat Description** | Corymbia and Eucalyptus over spinifex on very stony, loam soils. Minor drainages at base of hill. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | Minor drainage |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Large fallen logs – few<br>Small to Medium fallen logs - few |
| **Rocky Outcroppings** | <20% exposed rock outcrop | **Cracks, Crevices, or Holes for Refugia** | Moderate |
| **Large Trees Present?** | Yes | **Tree Hollow Notes** | One large observed - contianed an owlet nightjar (*Aegotheles cristatus*) in survey 2.<br>Some small hollows present in large trees. |
| **Habitat Assessment Comments** | | | |

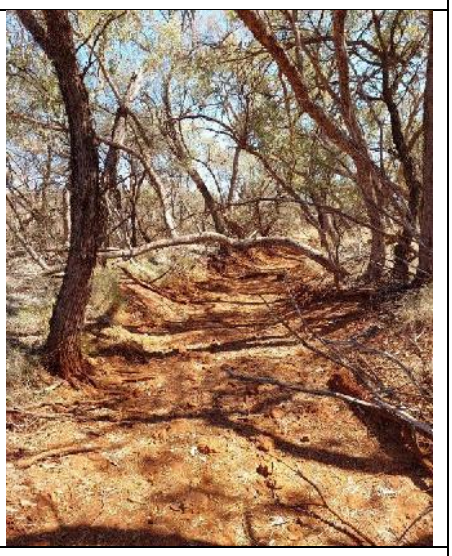
| | | | |
|---|---|---|---|
| **Site ID** | Trap Site 7 | **Date** | 8/30/2023 |
| **Latitude** | -23.2073 | **Longitude** | 119.4201 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Spinifex plains and rises | | |
| **Landform** | Plain | | |
| **Land System** | Border of Spearhole and Wannamunna Landsystems | | |
| **General Topography** | Flat | **Disturbance** | Some old camel and/or cattle footprints |
| **Soil Type** | Some surface rocks over sandy clay loam | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Cobble size (51-250 mm) | **Leaf Litter Cover** | Negligible |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | >40cm tall (approx above knee). Mature, some senescence. Ground cannot be seen when viewing from above triodia hummock. Hummock and large ring forming spinifex present. | | |
| **Site Habitat Description** | Mulga over spinifex on flat gibber/stoney plains. | | |
| **Fire History** | Long Unburnt | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Small to Medium fallen logs - few |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | Trap site 8 | **Date** | 8/30/2023 |
| **Latitude** | -23.2073 | **Longitude** | 119.4274 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Tussock grasslands | | |
| **Landform** | Plain | | |
| **Land System** | Wannamunna Landsystem | | |
| **General Topography** | Flat | **Disturbance** | None |
| **Soil Type** | Compacted Clay (minimal loose soil) | **Burrowing Suitability** | Difficult (hard clays and or rocky substrates - specialised diggers) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | Negligible |
| **Triodia Dominant or Co-Dominant in Understorey** | No | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | Triodia not dominant | | |
| **Site Habitat Description** | Tussock grassland on clay soils with occasional/sparse mulga. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Medium Intensity (all ground and shrubs were burnt) trees blackened but alive |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Large fallen logs - few |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | Hill drainage | **Date** | 9/5/2023 |
| **Latitude** | -23.2365 | **Longitude** | 119.4522 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Drainage | | |
| **Landform** | Medium drainage channel on a plain. | | |
| **Land System** | Spearhole Landsystem | | |
| **General Topography** | Flat | **Disturbance** | None |
| **Soil Type** | Loam | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | 2-5cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | >40cm tall (aprox above knee). Mature, some senescence. Ground cannot be seen when viewing from above triodia hummock. Large hummocks have larges spaces in between them, some clumping but not much. Some scattered suitable hummocks among unsuitable matrix (other plants). | | |
| **Site Habitat Description** | Mixed shrubland associated with drainage on loamier soils. | | |
| **Fire History** | Long Unburnt | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Small to Medium fallen logs - some |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Nil |
| **Large Trees Present?** | Yes | **Tree Hollow Notes** | Small Hollows |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | RA19 | **Date** | 9/3/2023 |
| **Latitude** | -23.2312 | **Longitude** | 119.4448 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Rocky Hill | | |
| **Landform** | Small Hill (Midslope). | | |
| **Land System** | Newman Landsystem | | |
| **General Topography** | Steep Slope | **Disturbance** | None |
| **Soil Type** | Gravel, no soil (100% rock), rock mulch, surface rock cover | **Burrowing Suitability** | Very Difficult to Impossible (Rock outcrop or rock mulch) |
| **Surface Rock Size** | Cobble size (51-250 mm) | **Leaf Litter Cover** | Negligible |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | <40cm tall (aprox below knee). Mature. Ground can be seen when viewing from above triodia hummock. Linear habitat patch following drainage, long- runs of connected hummocks, plants have clumped together to form small hummocks, some clumping but not much. Hummocks largely unsuitable. | | |
| **Site Habitat Description** | Drainage on a small hill crest/hillslope (closed system), spinifex dominated with occasional snappy gum and mixed shrubs. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Unable to tell |
| **Caves Present?** | Yes | **Water Body Present?** | No |
| **Termite Mounds Present?** | No | **Wood debris for Refugia** | Large fallen logs - some,<br>Small to Medium fallen logs - many |
| **Rocky Outcroppings** | >50% exposed rock outcropping | **Cracks, Crevices, or Holes for Refugia** | Moderate |
| **Large Trees Present?** | Yes | **Tree Hollow Notes** | Cracks in timber, small Hollows |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | SF camera RA20 | **Date** | 8/30/2023 |
| **Latitude** | -23.1543 | **Longitude** | 119.4836 |
| **General Area** | Northern Survey Section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Spinifex plains and rises | | |
| **Landform** | Plain | | |
| **Land System** | Spearhole Landsystem | | |
| **General Topography** | Flat | **Disturbance** | Road or tracks near by |
| **Soil Type** | Minimal loose soil due to erosion (Gibbers) | **Burrowing Suitability** | Difficult (hard clays and or rocky substrates - specialised diggers) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | 1-2cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | <40cm tall (aprox below knee). Mature, some senescence. Ground can be seen when viewing from above triodia hummock. Large hummocks have larges spaces in between them, large ring form species, some clumping but not much. Hummocks largely unsuitable. | | |
| **Site Habitat Description** | Mulga over spinifex on gibber/stoney plains. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Small to Medium fallen logs - some |
| **Rocky Outcroppings** | Some outcropping hard clay gibber | **Cracks, Crevices, or Holes for Refugia** | Low |
| **Large Trees Present?** | Yes | **Tree Hollow Notes** | Cracks in timber |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | Schembri HA 1 | **Date** | 9/2/2023 |
| **Latitude** | -23.2044 | **Longitude** | 119.4561 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Drainage | | |
| **Landform** | Medium Drainage | | |
| **Land System** | Wannamunna Landsystem | | |
| **General Topography** | Flat | **Disturbance** | Road or tracks near by and across the creek |
| **Soil Type** | Surface rock cover over clay loam | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Range from pebble to cobble size | **Leaf Litter Cover** | 2-5cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | No | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | Triodia not dominant | | |
| **Site Habitat Description** | Medium drainage. | | |
| **Fire History** | Long Unburnt | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | Dry creek bed |
| **Termite Mounds Present?** | No | **Wood debris for Refugia** | Small to Medium fallen logs - some |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Low |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | GPS 3, Wp 85I5 | **Date** | 8/31/2023 |
| **Latitude** | -23.2226 | **Longitude** | 119.4526 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Spinifex plains and rises | | |
| **Landform** | Gibber Plain | | |
| **Land System** | Spearhole Landsystem | | |
| **General Topography** | Flat | **Disturbance** | Clearing (non natural wide open spaces), road or tracks, rubbish |
| **Soil Type** | Minimal loose soil due to erosion (Gibbers) | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Cobble size (51-250 mm) | **Leaf Litter Cover** | 1-2cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | No | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | Triodia not dominant | | |
| **Site Habitat Description** | Open mulga and *Acacia pruinocarpa* over patches of tussock grass and spinifex on stony plain. | | |
| **Fire History** | Within 5 years | **Fire Intensity** | Low Intensity (only low shrubs and herbs appeared burnt), trees and shrubs alive |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Negligible fallen timber for refugia |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | Jk HA 1 | **Date** | 8/31/2023 |
| **Latitude** | -23.2289 | **Longitude** | 119.4488 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Rocky Hill | | |
| **Landform** | Big Hill (Midslope) | | |
| **Land System** | Newman Landsystem | | |
| **General Topography** | Undulating | **Disturbance** | None |
| **Soil Type** | 99% Rock and some sandy clay loam underneath/between rocks | **Burrowing Suitability** | Very Difficult to Impossible (Rock outcrop or rock mulch) |
| **Surface Rock Size** | Pebble to boulder size | **Leaf Litter Cover** | 1-2cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | <40cm tall (approx below knee). Mature. Ground cannot be seen when viewing from above triodia hummock. Plants have clumped together to form small hummocks,some clumping, not much. Hummocks largely unsuitable. | | |
| **Site Habitat Description** | Large rocky hill with Eucalyptus and occasional Corymbia over spinifex. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Unable to tell |
| **Caves Present?** | Yes | **Water Body Present?** | No |
| **Termite Mounds Present?** | No | **Wood debris for Refugia** | Small to Medium fallen logs - some |
| **Rocky Outcroppings** | 20-50% exposed rock outcropping | **Cracks, Crevices, or Holes for Refugia** | Moderate |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | R32 | **Date** | 8/30/2023 |
| **Latitude** | -23.1522 | **Longitude** | 119.4854 |
| **General Area** | Northern Survey Section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Spinifex plains and rises | | |
| **Landform** | Plain (gently undulating raised plain), bisected with minor drainage | | |
| **Land System** | Spearhole Landsystem | | |
| **General Topography** | Undulating | **Disturbance** | Road or tracks |
| **Soil Type** | Minimal loose soil due to erosion (Gibbers) | **Burrowing Suitability** | Difficult (hard clays and or rocky substrates - specialised diggers) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | Negligible |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | <40cm tall (approx below knee). Mature, some senescence. Ground can be seen when viewing from above triodia hummock. Large ring form species, long- runs of connected hummocks, plants have clumped together to form small hummocks. Some scattered suitable hummocks among unsuitable matrix (other plants). | | |
| **Site Habitat Description** | Mulga over spinifex on gibber/stoney plains. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Negligible fallen timber for refugia |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Low |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | SM4-U + camera site | **Date** | 8/30/2023 |
| **Latitude** | -23.1541 | **Longitude** | 119.4896 |
| **General Area** | Northern Survey Section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Drainage | | |
| **Landform** | Plain | | |
| **Land System** | Spearhole Landsystem | | |
| **General Topography** | Undulating | **Disturbance** | None |
| **Soil Type** | Some surface gravel present, over clay loam | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | 1-2cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | >40cm tall (approx above knee). Mature, some senescence. Ground cannot be seen when viewing from above triodia hummock. Some clumping of hummocks occuring, some forming short runs. | | |
| **Site Habitat Description** | Minor drainage (the drainage sub habitats that bisect the broad habitat). | | |
| **Fire History** | Long Unburnt | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | Dry creek bed |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Small to Medium fallen logs - some |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Low |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | GPS11 WP001 | **Date** | 4/28/2024 |
| **Latitude** | -23.2085 | **Longitude** | 119.4415 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Tussock grasslands | | |
| **Landform** | Plain | | |
| **Land System** | Wannamunna Landsystem | | |
| **General Topography** | Flat | **Disturbance** | Road or tracks, signs of grazing, weeds |
| **Soil Type** | Compacted clay loam soils | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Cobble size (51-250 mm) | **Leaf Litter Cover** | Negligible |
| **Triodia Dominant or Co-Dominant in Understorey** | No | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | Triodia not dominant | | |
| **Site Habitat Description** | Tussock dominanted grassland with Mulga over mixed shrubs on loamy soil. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Mosaic of different fire intensities |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Small to Medium fallen logs - some |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | Parrot box SF | **Date** | 5/1/2024 |
| **Latitude** | -23.1645 | **Longitude** | 119.4853 |
| **General Area** | Northern Survey Section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Spinifex plains and rises | | |
| **Landform** | Low hills and rises (Lower slope) | | |
| **Land System** | Spearhole Landsystem | | |
| **General Topography** | Undulating | **Disturbance** | None |
| **Soil Type** | Minimal loose soil due to erosion (Gibbers) | **Burrowing Suitability** | Difficult (hard clays and or rocky substrates - specialised diggers) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | 1-2cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | >40cm tall (approx above knee). Mature. Ground cannot be seen when veiwing from above triodia hummock. Plants have clumped together to form small to large hummocks. | | |
| **Site Habitat Description** | Mallee and mixed Acacia on hard rocky substrate with big structural spinifex. | | |
| **Fire History** | Long Unburnt | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | No | **Wood debris for Refugia** | Small to Medium fallen logs - some |
| **Rocky Outcroppings** | <10% exposed rock outcropping | **Cracks, Crevices, or Holes for Refugia** | Low |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | RHQ31 | **Date** | 9/28/2023 |
| **Latitude** | -23.2411 | **Longitude** | 119.4577 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Mulga woodland | | |
| **Landform** | Giber plain | | |
| **Land System** | Spearhole Landsystem | | |
| **General Topography** | Flat | **Disturbance** | None |
| **Soil Type** | Some surface stones over sandy loam | **Burrowing Suitability** | Moderate (loamier soils and or presence of stones in the substrate) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | 1-2cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | No | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | Triodia not dominant | | |
| **Site Habitat Description** | Mulga over mixed shrubs on loamy soil. | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Low Intensity - Only low shrubs and herbs appeared burnt, trees and shrubs alive |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Small to Medium fallen logs - many |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | RHQ35 | **Date** | 9/28/2023 |
| **Latitude** | -23.2453 | **Longitude** | 119.4550 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Spinifex plains and rises | | |
| **Landform** | Plain | | |
| **Land System** | Rocklea Landsystem | | |
| **General Topography** | Flat | **Disturbance** | None |
| **Soil Type** | Surface gravel cover over sandy clay loam | **Burrowing Suitability** | Difficult (hard clays and or rocky substrates - specialised diggers) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | 2-5cm (Patchy under shrubs or rocks/logs) |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | <40cm tall (approx below knee). Mature. Ground can be seen when veiwing from above triodia hummock. Some clumping present forming small to large hummocks, with bare ground present between hummocks. | | |
| **Site Habitat Description** | Mixed Acacia shrubland over spinifex. | | |
| **Fire History** | Long Unburnt | **Fire Intensity** | Unable to tell |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | No | **Wood debris for Refugia** | Negligible fallen timber for refugia |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |

| | | | |
|---|---|---|---|
| **Site ID** | RHR03 | **Date** | 9/27/2023 |
| **Latitude** | -23.1959 | **Longitude** | 119.4616 |
| **General Area** | Southern Survey section | **Representative Photo:** |  |
| **Broad Fauna Habitat** | Mulga woodland | | |
| **Landform** | Plain | | |
| **Land System** | Spearhole Landsystem | | |
| **General Topography** | Flat | **Disturbance** | Road or tracks near by |
| **Soil Type** | Clay | **Burrowing Suitability** | Difficult (hard clays and or rocky substrates - specialised diggers) |
| **Surface Rock Size** | Pebbles size (0-50 mm) | **Leaf Litter Cover** | Negligible |
| **Triodia Dominant or Co-Dominant in Understorey** | Yes | **Chenopods Dominant or Co-Dominant in Understorey** | No |
| **Triodia Description** | >40cm tall (approx above knee). Mature. Ground cannot be seen when viewing from above triodia hummock. Large hummocks present with larges spaces in between them. | | |
| **Site Habitat Description** | Mulga over spinifex on gibber/stoney plains | | |
| **Fire History** | Within 10 years | **Fire Intensity** | Mosaic of different fire intensities |
| **Caves Present?** | No | **Water Body Present?** | No |
| **Termite Mounds Present?** | Yes | **Wood debris for Refugia** | Small to Medium fallen logs - some |
| **Rocky Outcroppings** | No Exposed Rock Outcropping | **Cracks, Crevices, or Holes for Refugia** | Nil |
| **Large Trees Present?** | No | **Tree Hollow Notes** | N/A |
| **Habitat Assessment Comments** | | | |