Tabba Tabba Project

Detailed and Targeted Vertebrate Fauna Survey 2025

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Executive Summary

Introduction

Wildcat Resources Limited proposes to develop the Tabba Tabba Project, located in the Pilbara region of Western Australia, approximately 48km south-east of Port Hedland.

Western Wildlife was commissioned to carry out a two-phase detailed and targeted fauna survey of the Tabba Tabba study area. The purpose of the fauna survey was to gather baseline fauna data to inform environmental impact assessment as part of Project approvals. This report includes the findings of a two-phase baseline vertebrate fauna survey and targeted surveys conducted in 2025.

Methods

The fauna survey was undertaken in accordance with the Technical Guidance: terrestrial vertebrate fauna surveys for environmental impact assessment (EPA 2020) and relevant State and Federal Guidelines on surveying conservation significant fauna. The fauna survey comprised three field trips (11 – 24 April, 2 – 7 August and 1 – 12 September 2025) and included the following methods:

- habitat assessment at 175 sites
- trapping at nine sites for seven nights, each with ten pitfall traps, ten funnel traps, ten Elliott traps and two cage traps
- bird surveys at each trapping site and opportunistically
- bat surveys with ultrasonic detectors
- camera trap survey at 153 sites, particularly targeting Northern Quoll (*Dasyurus hallucatus*)
- nocturnal transects and searches
- diurnal transects and searches, particularly targeting the Bilby (*Macrotis lagotis*)
- keeping opportunistic records of fauna

Additional on-site data were also available from a previous field survey in April 2024 by Ecoscape (2024).

Species of conservation significance were classified as: **Threatened** if listed as Extinct in the Wild, Critically Endangered, Endangered or Vulnerable under *The Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or *Biodiversity Conservation Act 2016* (BC Act); **Migratory** if listed as Migratory under the EPBC Act and/or BC Act, excluding those species also listed as threatened; **Specially Protected** if listed as Other Specially Protected Species or Conservation Dependent Fauna under the BC Act; **Priority** if listed as Priority by DBCA and **Locally Significant** if considered by the author to potentially be of local significance.

Results and Discussion

Eight fauna habitats were identified in the study area:

- Cleared
- Dam
- Low Stony Hills
- Major River
- Minor River
- Rocky Outcrops
- Sandy Plain
- Stony Plain

Of these, the Rocky Outcrops habitat is limited in extent in both the study area and the wider region. The Major River is an ecological linkage and an area of higher productivity due to the presence of seasonal waterholes.

The predicted faunal assemblage includes up to eight frogs, 111 reptiles, 157 birds, 35 native mammals and eight introduced mammals. The observed assemblage thus far includes four frogs, 53 reptiles, 86 birds, 26 native mammals and five introduced mammals.

Twenty-eight conservation significant fauna have either been recorded or may occur in the study area, nine Threatened, eight Migratory, one Specially Protected, eight Priority and two Locally Significant.

The nine **Threatened** species are:

- Northern Quoll (*Dasyurus hallucatus*) – EBPC Act (Endangered), BC Act (Endangered)
- Common Greenshank (*Tringa nebularia*) – EBPC Act (Endangered, Migratory), BC Act (Endangered)
- Sharp-tailed Sandpiper (*Calidris acuminata*) – EBPC Act (Vulnerable, Migratory), BC Act (Vulnerable)
- Pilbara Olive Python (*Liasis olivaceous barroni*) – EBPC Act (Vulnerable), BC Act (Vulnerable)
- Grey Falcon (*Falco hypoleucos*) – EBPC Act (Vulnerable), BC Act (Vulnerable)
- Night Parrot (*Pezoporus occidentalis*) – EBPC Act (Critically Endangered), BC Act (Critically Endangered)
- Bilby (*Macrotis lagotis*) – EBPC Act (Vulnerable), BC Act (Vulnerable)
- Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) – EBPC Act (Vulnerable), BC Act (Vulnerable)
- Ghost Bat (*Macroderma gigas*) – EBPC Act (Vulnerable), BC Act (Vulnerable)

The Northern Quoll was commonly recorded on this survey and the study area provides Rocky Outcrop breeding habitat and dispersal/foraging habitat critical to the survival of the species. The Rocky Outcrop and Major River habitats may also support the Pilbara Olive Python, although this species was not recorded. A pair of Grey Falcons were recorded nearby and may breed in the Major River habitat.

The Common Greenshank and Sharp-tailed Sandpiper possibly occur on Dams, waterholes in the Major River habitat and claypans in the Sandy Plain habitat, but the study area is unlikely to regularly support nationally or internationally significant numbers.

Although not recorded on this survey, the Bilby is known from nearby records and the Sandy Plain habitat in the study area may comprise critical habitat, although it is more likely to support dispersing individuals than a resident population. The Pilbara Leaf-nosed Bat was not recorded and although they possibly occur on occasion, the study area is unlikely to regularly support this species. The study area provides foraging habitat and nocturnal refuges for the Ghost Bat, but no critical habitat (diurnal roosts) are likely to be present for this species. The study area is unlikely to provide habitat critical to the survival of the Night Parrot, as it lacks long-unburnt Spinifex.

The eight **Migratory** species are:

- Fork-tailed Swift (*Apus pacificus*)
- Oriental Plover (*Charadrius veredus*)
- Pectoral Sandpiper (*Calidris melanotos*)
- Red-necked Stint (*Calidris ruficollis*)
- Wood Sandpiper (*Tringa glareola*)
- Marsh Sandpiper (*Tringa stagnatilis*)
- Common Sandpiper (*Actitis hypoleucos*)
- Oriental Pratincole (*Glareola maldivarum*)

Of the Migratory species predicted to occur, none were recorded on the survey, although the Oriental Plover was recorded opportunistically within 5km. Most species may be non-breeding summer visitors to the study area, many being shorebirds that may use Dams, waterholes in the Major River habitat and claypans in the Sandy Plain habitat. In general, the study area is unlikely to provide important habitat to listed Migratory fauna.

The one **Specially Protected** species is:

- Peregrine Falcon (*Falco peregrinus*)

Peregrine Falcon was recorded in the study area and potentially breeds on Rocky Outcrops.

The eight **Priority** species are:

- Pin-striped Finesnout Ctenotus (*Ctenotus nigrilineatus*) – Priority 1
- Gane's Blind Snake (*Anilios ganei*) – Priority 1
- Northern Coastal Free-tailed Bat (*Ozimops cobourgianus*) – Priority 1
- Long-tailed Dunnart (*Antechinomys longicaudata*) – Priority 4
- Brush-tailed Mulgara (*Dasycercus blythi*) – Priority 4
- Spectacled Hare-wallaby (*Lagorchestes conspicillatus*) – Priority 4
- Northern Short-tailed Mouse (*Leggadina lakedownensis*) – Priority 4
- Western Pebble-mound Mouse (*Pseudomys chapmani*) - Priority 4

The Pin-striped Finesnout Ctenotus and Gane's Blind Snake are poorly known but possibly occur in the study area. The Northern Coastal Free-tailed Bat possibly occurs and may forage in the study area, roosting in tree hollows. The Long-tailed Dunnart is known from the region and potentially occurs in the Low Stony Hills and Rocky Outcrops. The Brush-tailed Mulgara was recorded in the Sandy Plain habitat on this survey and is widely recorded on sandplains in the region. The Spectacled Hare-wallaby was also recorded in the Sandy Plain and Stony Plain habitats and is only likely to be present where there is mature spinifex to provide shelter. The Northern Short-tailed Mouse potentially occurs in most habitats. Active mounds of the Western Pebble-mound Mouse were recorded in the Low Stony Hills habitat.

The two **Locally Significant** species are:

- Rufous-crowned Emu-wren (*Stipiturus rufus*)
- Common Brushtail Possum (*Trichosurus vulpecula*)

The Rufous-crowned Emu-wren was not recorded on the survey and is only likely to occur where there is mature spinifex. It is likely to be locally extinct in areas that experience frequent fires. The Common Brushtail Possum was recorded in the Major River habitat and is likely to be an uncommon resident of this habitat.

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Tables, Figures and Plates

1. Introduction

Wildcat Resources Limited proposes to develop the Tabba Tabba Project, located in the Pilbara region of Western Australia, approximately 48km south-east of Port Hedland (Figure 1). The study area is situated across Wallareenya and Strelley Stations and spans two local government areas: the Town of Port Hedland and the Shire of East Pilbara.

Western Wildlife was commissioned to carry out a two-phase detailed and targeted fauna survey of the study area. The purpose of the fauna survey was to gather baseline fauna data to inform environmental impact assessment as part of Project approvals. The key objectives of the fauna survey were to:

- Identify and describe the fauna habitats present.
- List the vertebrate fauna that were recorded and/or have the potential to occur.
- Identify species of conservation significance, or habitats of particular importance for fauna, that may occur.

This report includes the findings of the two-phase baseline vertebrate fauna survey and targeted surveys conducted in 2025.

1.1 Regional Context

1.1.1 IBRA Bioregion

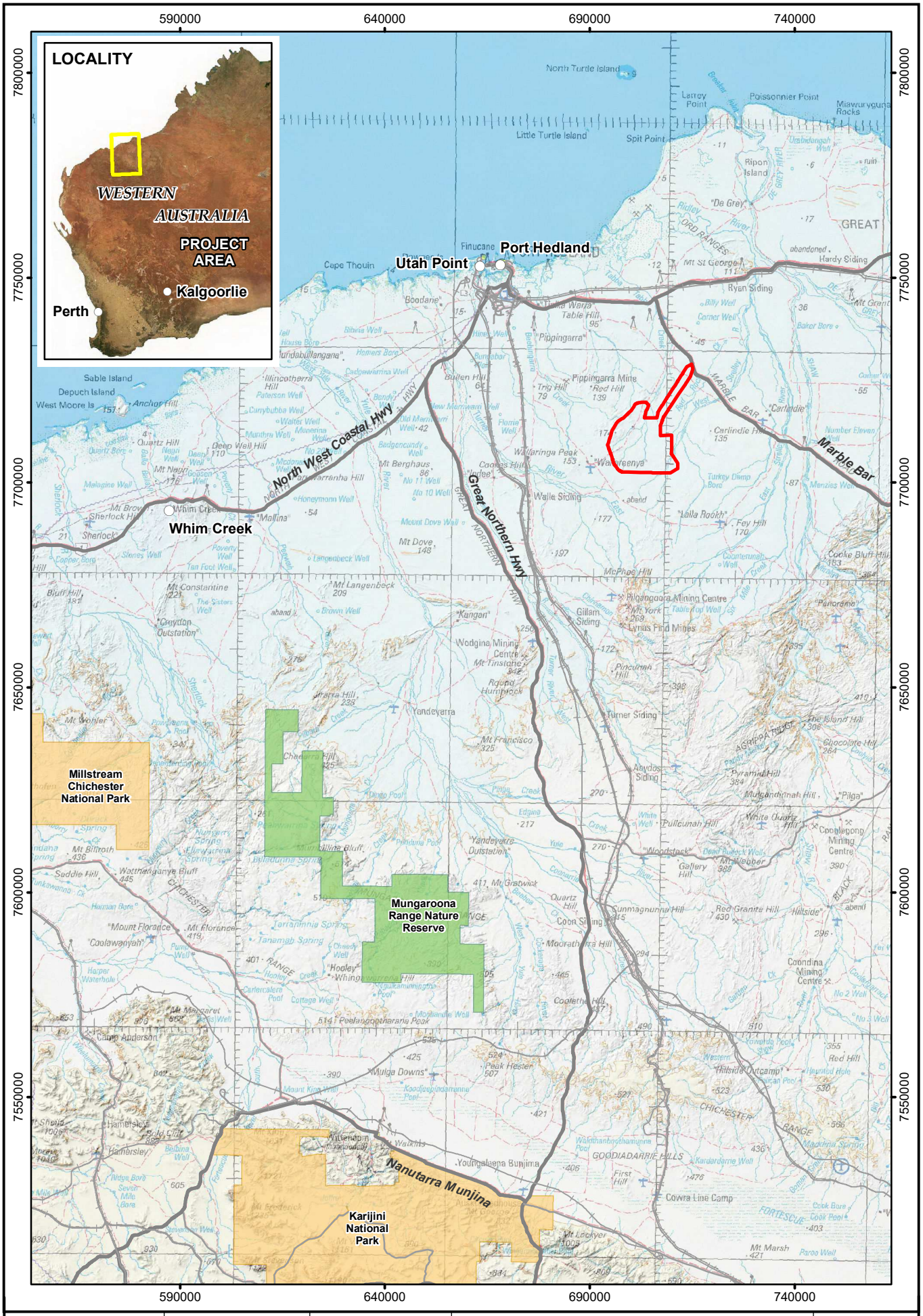
The Interim Biogeographic Regionalisation for Australia (IBRA) classifies the land surface of Australia into 89 Bioregions and 419 subregions, each defined by a set of environmental influences that impact the occurrence of flora and fauna and their interaction with the physical environment (DCCEEW 2020).

The Project is situated in the Chichester subregion of the Pilbara Bioregion. The Chichester subregion is comprised of undulating plains of Achaean granite and basalt, with basalt ranges (Kendrick and McKenzie 2001). The plains support open shrublands of *Acacia* over spinifex hummock grasslands, and the ranges support an open tree-steppe of *Eucalyptus leucophloia* over spinifex hummock grasslands (Kendrick and McKenzie 2001).

The dominant land-uses are grazing on native pastures, Aboriginal lands and reserves, Unallocated Crown Land and Crown Reserves, Conservation and Mining (Kendrick and McKenzie 2001).

1.1.2 Botanical Province

The Botanical Provinces are determined by vegetation mapping (Beard 1980) and broadly correspond to climactic regions; the Southwest (Bassian) Province experiencing warm dry summers and cool wet winters, the Northern Province experiencing warm wet summers and cool dry winters and the Eremaean Province experiencing low, irregular rainfall. The study area is in the Eremaean Province.



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1.1.3 Parks and Reserves

There are no reserves in or directly adjacent to the study area. The nearest reserve is Mungaroona Nature Reserve, 100km south-west of the study area (Figure 1).

1.1.4 Threatened or Priority Ecological Communities

No Threatened or Priority Ecological Communities are known to occur in the study area.

1.1.5 Land Systems

Land systems are broad descriptions of landform, geology and soils. The study area intersects six land systems (Figure 2), which are characterised as follows:

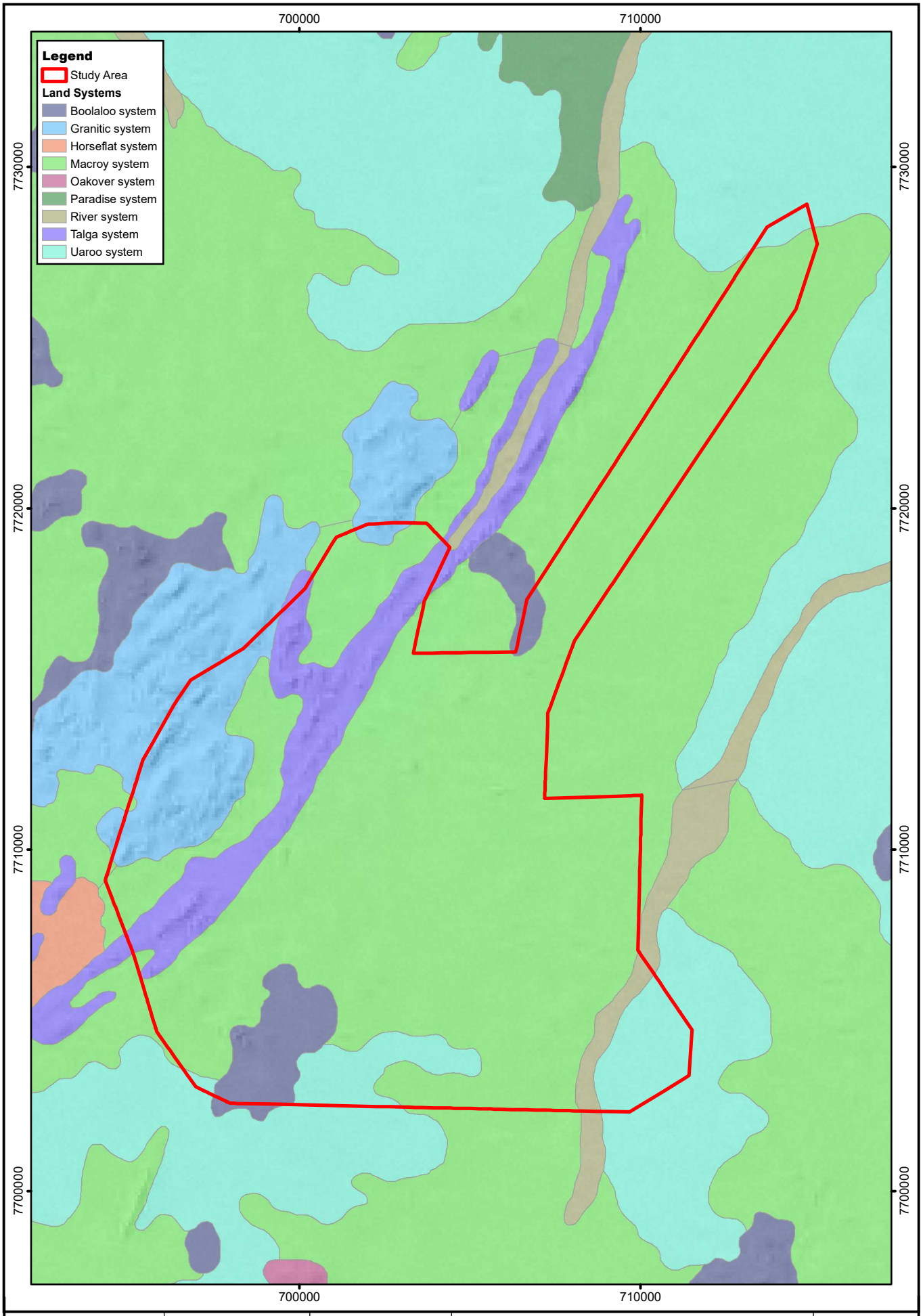
- **Macroy System:** Stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands.
- **Uaroo System:** Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.
- **River System:** Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex.
- **Talga System:** Hills and ridges of greenstone and chert and stony plains supporting hard and soft spinifex grasslands.
- **Granitic System:** Rugged granitic hills supporting shrubby hard and soft spinifex grasslands.
- **Boolaloo System:** Granite hills, domes, tor fields and sandy plains supporting spinifex grasslands with scattered shrubs.

1.1.6 Fire History

The regional fire history is shown on Figure 3, as sourced from *Northern Australia & Rangelands Fire Information* (NAFI 2025). The majority of the study area has been burnt within the last 20 years. Large parts of the study area were burnt in the two years prior to the fauna survey.

1.2 Study Area

The study area is 22,658.7ha in total and is shown in Figure 4. The study area is located on Wallareenya and Strelley Stations. Most of the area is under native vegetation, over which the dominant land use is cattle grazing. There are several wells with cattle troughs, some with open water. The study area includes small portions of Tabba Tabba Creek and tributary of the West Strelley River. A previous fauna survey was undertaken across a portion of the study area in 2024 (Ecoscape 2024), and the survey area extent is shown on Figure 4. Also shown on Figure 4 is a small extension area that was mapped in March 2026.



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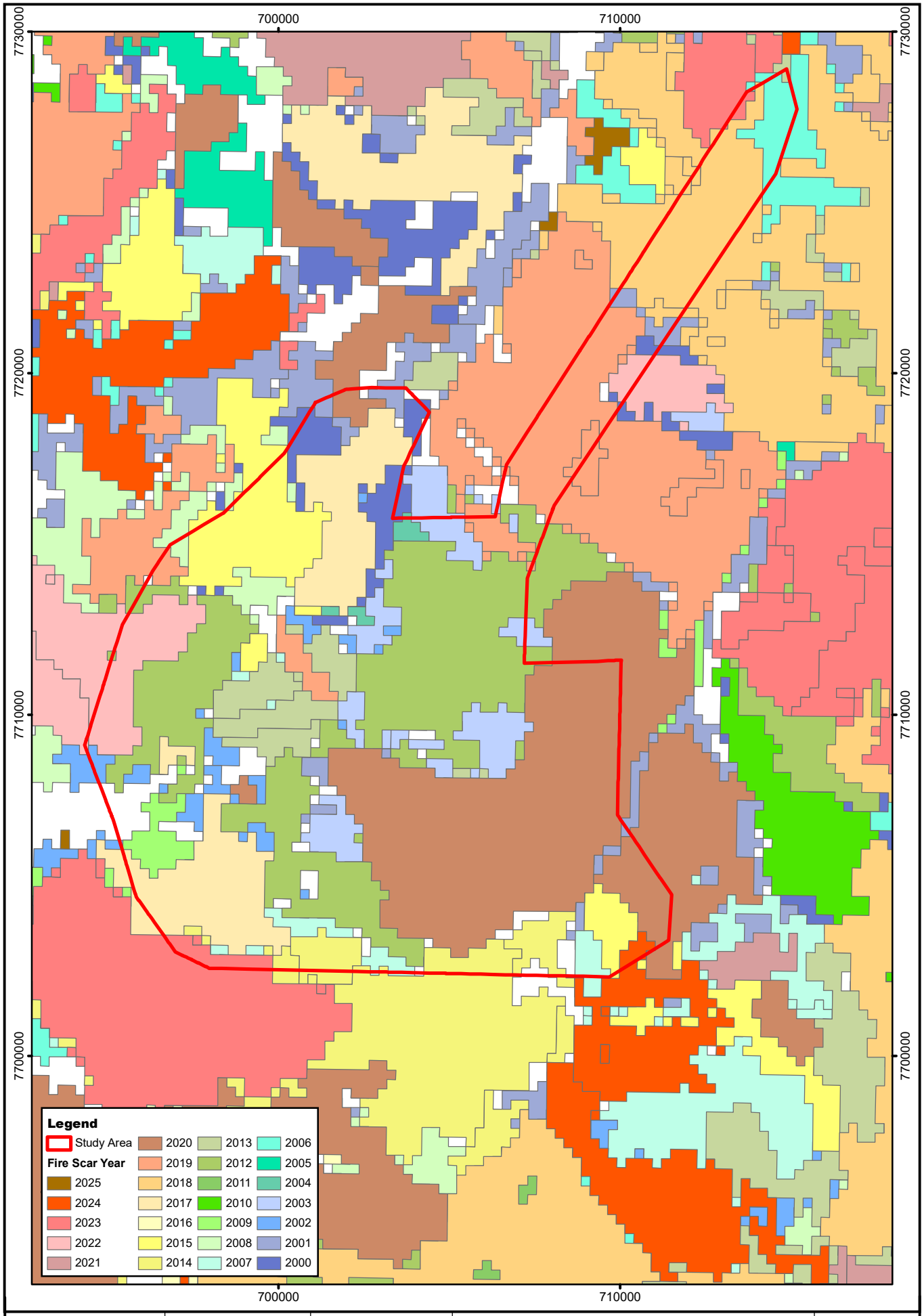
Tabba Tabba Project
Land Systems

Figure: **2**



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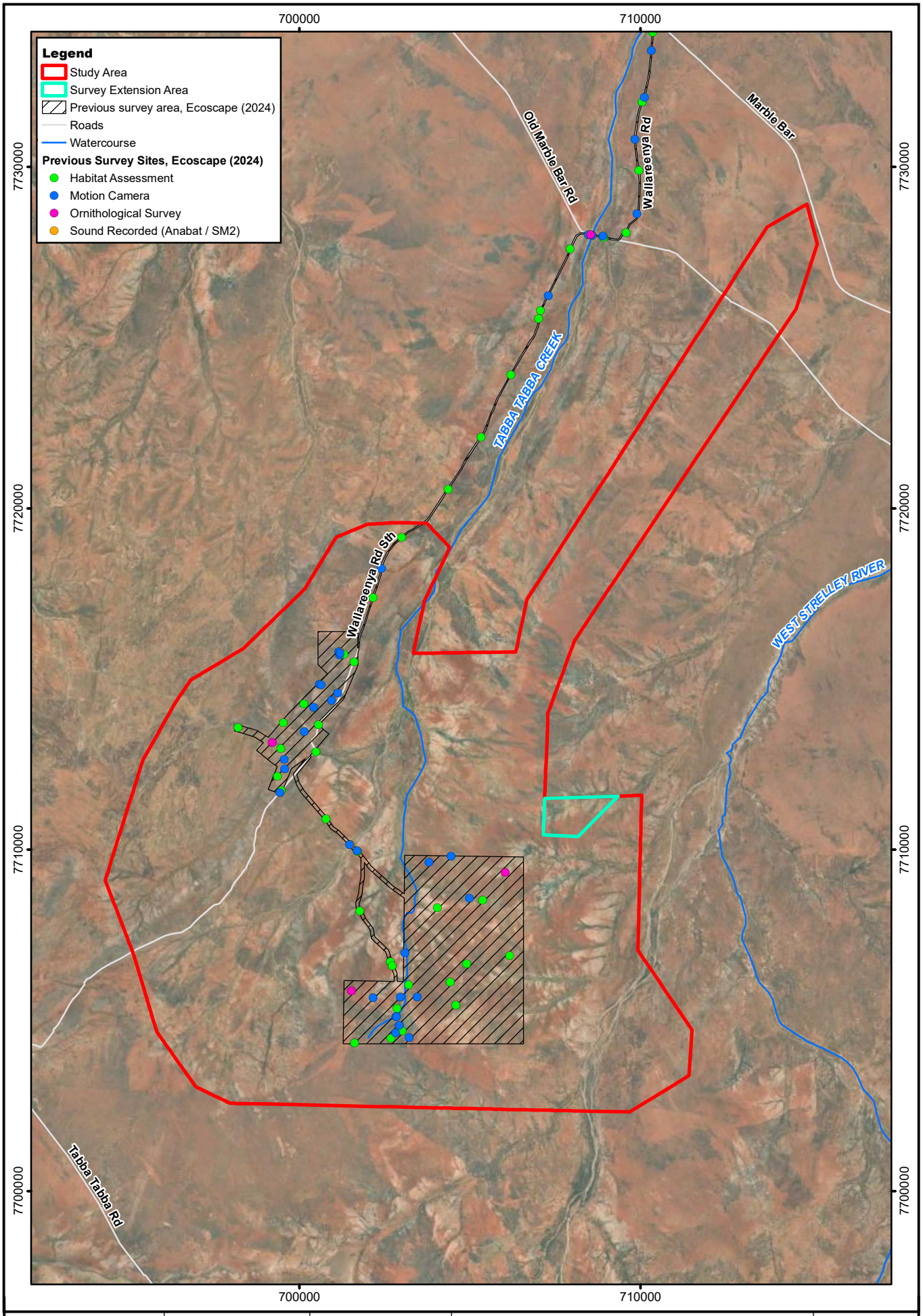

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1.3 Climate and Weather

The nearest weather station is Port Hedland Airport (site number 004032), about 48km north-west of the study area. The mean monthly maximum and minimum temperatures and rainfall for this weather station are presented in Figure 5. The data indicate that the highest rainfall and temperatures occur in the summer months.

The long-term average annual rainfall for Port Hedland is 313.9mm, based on data between 1942 and 2025 (Bureau of Meteorology 2025). Annual rainfall was above average in 2022 (385.0mm) and well below average in 2023 (183.0mm) and 2024 (101.4mm), however, rainfall in 2025 was above average (416.0mm), with very high falls recorded in the January and February prior to the first field survey (Figure 5). Weather during the first phase of the detailed survey was characterised by warm nights, hot days and very high humidity. In the second phase the weather was warm and dry. The daily temperatures and rainfall prior to and during each field survey (as recorded at Port Hedland), are presented in Appendix 1.

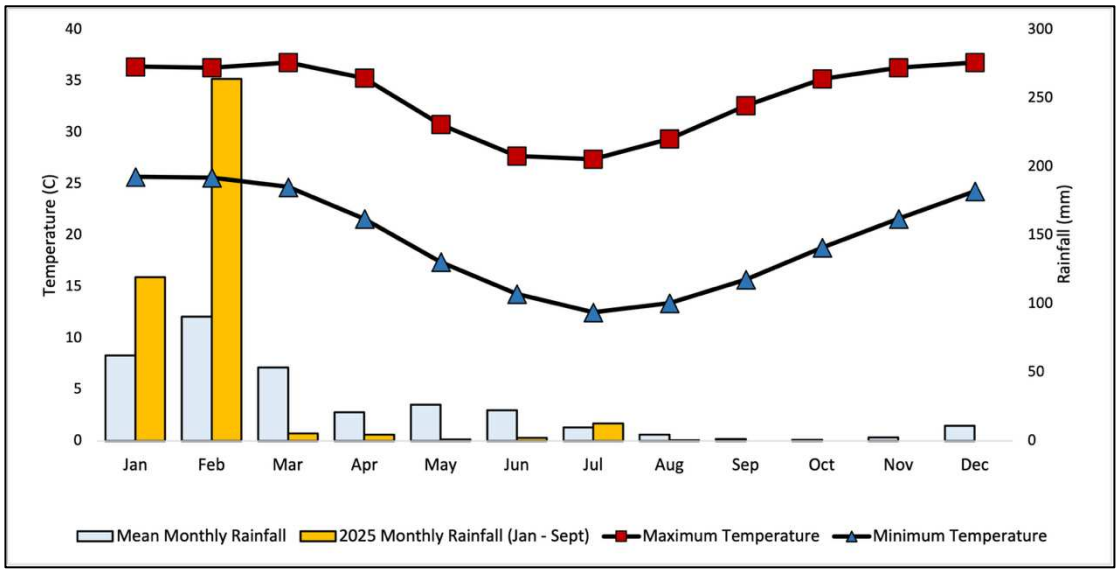


Figure 5. Monthly Climate Statistics for Port Hedland Airport.

2. Methods

2.1 Overview

A two-phase detailed vertebrate fauna survey and targeted fauna surveys were conducted across the study area in April, August and September 2025. Surveys targeting conservation significant fauna, including the Northern Quoll (*Dasyurus hallucatus*) and Bilby (*Macrotis lagotis*) were undertaken where there was habitat that potentially supported each species. The methods are further described in the sections below.

2.2 Guidance Documents

The fauna survey was conducted with reference to the following documents:

- Technical guidance: terrestrial vertebrate fauna surveys for environmental impact assessment (EPA 2020)
- Guidelines for determining the likely presence and habitat usage of night parrot *(Pezoporus occidentalis)* in Western Australia (DBCA 2024)
- EPBC Act Referral Guideline for the Endangered Northern Quoll (DoE 2016)
- Guidelines for Surveys to Detect the Presence of Bilbies and to Assess the Importance of Habitat in Western Australia (DBCA 2017)
- Survey Guidelines for Australia's Threatened Mammals (DSEWPaC 2011a)
- Survey Guidelines for Australia's Threatened Bats (DEWHA 2010a)
- Survey Guidelines for Australia's Threatened Birds (DEWHA 2010b)
- Survey Guidelines for Australia's Threatened Reptiles (DSEWPaC 2011b)
- A review of ghost bat ecology, threats and survey requirements (Bat Call WA 2021a)
- A review of Pilbara leaf- nosed bat ecology, threats and survey requirements (Bat Call WA 2021b).

2.3 Personnel

Two to four zoologists undertook each phase of the fieldwork, with bat call analysis provided by Specialised Zoological. Details of the survey team and their experience are shown in Table 1. This report was prepared by Ms Jenny Wilcox.

Table 1. Fauna survey personnel.

Name	Role	Qualification	Experience	Survey
Jenny Wilcox	Supervising vertebrate zoologist (plan and lead fieldwork, analyse data, prepare report)	BSc.Biol/Env.Sci., Hons.	>20 years	Apr 2025 Aug 2025 Sept 2025
Mike Brown	Vertebrate zoologist (fieldwork)	BSc.Env.Sci.	>15 years	Apr 2025 Aug 2025 Sept 2025
Samantha Lostrom	Vertebrate zoologist (fieldwork)	BSc.Biol., Hons.	>10 years	Apr 2025
Brenden Metcalf	Vertebrate zoologist (fieldwork)	BSc.Biol., Hons.	>20 years	Apr 2025 Sept 2025
Amy Griffiths	Vertebrate zoologist (fieldwork)	BSc.Biol., Hons.	>10 years	Sept 2025
Kyle Armstrong	Bat call analysis	PhD. Zool.	>20 years	-

2.4 Taxonomy and Nomenclature

Taxonomy and nomenclature for fauna species used in this report follow the Western Australian Museum checklists. In the text, common names are used where appropriate, and all scientific names are given in species lists. Where a species lacks a common name, they are referred to by their scientific name.

2.5 Literature Review

Lists of fauna expected to occur in the study area were produced using information from several sources. These included publications that provide information on general patterns of distribution of frogs (Tyler *et al*. 2000), reptiles (Storr *et al*. 1983, 1990, 1999 and 2002, Wilson and Swan 2020), birds (Barrett *et al*. 2003; Johnstone and Storr 1998; Johnstone and Storr 2004) and mammals (Churchill 2007, Menkhorst and Knight 2011; Van Dyck and Strahan 2008).

The databases in Table 2 were searched for fauna records in and around the study area. In all cases the extent of the database search was larger than the extent of the study area in order to pick up records of species in the wider area that may also occur in the study area.

Table 2. Databases used in the preparation of this report.

Database	Type of records held	Area searched
DBCA's Threatened and Priority Fauna Database (DBCA 2025b)	Information and records on Threatened and Priority species in Western Australia. Includes records collated from Birds Australia, the Fauna Survey Returns Database and the Western Australian Museum Database.	Study area with a 40km buffer
Dandjoo (DBCA 2025a)	Records of fauna, excluding Threatened and Priority Fauna from several sources including industry and research.	A point central to the study area (-20.94851°S, 118.07281°E) with a 40km buffer
Atlas of Living Australia (ALA) Database (ALA 2025)	• Birds Australia Atlas Database - records of bird observations in Australia, 1998-2009. • Birdata - records of bird observations in Australia, 2010-current. • WA Museum Specimen Databases for reptiles frogs, birds and mammals - records of specimens held in the Western Australian Museum. Includes historical records. • Records from other Australian museums	Study area with a 40km buffer
Index of Biological Surveys for Assessment (IBSA) Database	Reports and spatial data from fauna surveys undertaken for environmental impact assessment in Western Australia.	Surveys in the Pilbara Bioregion, within 50km of the study area.
EPBC Act Protected Matters Search Tool	Information and modelled distributions for matters protected under the EPBC Act, including threatened species and ecological communities, migratory species and marine species.	Study area with a 5km buffer

Some species may occur on database results that are not likely to be present in the study area, usually due either to lack of suitable habitat or the study area being outside the known range of the species (i.e., erroneous records or records of vagrants). Some records may be historical, with the species known to be locally or regionally extinct. These species are generally not included in lists of expected fauna unless some discussion is thought to be necessary.

In addition, the results of the following fauna survey reports from Projects within 50km of the study area were used to compile the fauna lists:

- 360 Environmental. (2018a). *Flora, Vegetation and Fauna Assessment Wodgina Mine and Proposed Airstrip*. Unpublished report prepared for Mineral Resources Limited.
- 360 Environmental. (2018b). *Wodgina Mine and Additional Gas Pipeline: Flora, Vegetation, Fauna and Northern Quoll Assessment*. Unpublished report prepared for Mineral Resources Limited.
- Biologic (2018a). *Wodgina DSO Project: Northern Quoll Monitoring Survey*. Unpublished report to Atlas Iron Limited.
- Biologic (2018b). *Wodgina DSO Project: Pilbara Leaf-nosed Bat and Ghost Bat Monitoring Survey*. Unpublished report to Atlas Iron Limited.
- Biota (2002a) *An Assessment of the Distribution of the Mulgara* Dasycercus cristicauda *and Bilby* Macrotis lagotis *Along and Adjacent to the Proposed Hope Downs to Port Hedland Rail Corridor*. Unpublished report to Hope Downs Management Services.
- Biota (2002b) *Proposed Hope Downs Rail Corridor from Weeli Wolli Siding to Port Hedland – Vertebrate Fauna Survey*. Unpublished report to Hope Downs Management Services.
- Biota (2004) *Fauna Habitats and Fauna Assemblage of the Proposed FMG Stage A Rail Corridor.* Unpublished report to Fortescue Metals Group.
- Outback Ecology (2009). *Wodgina DSO Project: Terrestrial Vertebrate Fauna Assessment*. Unpublished report prepared for Atlas Iron Limited.
- Outback Ecology (2011). *Mt Dove DSO Project: Vertebrate Fauna Assessment*. Unpublished report to Atlas Iron Limited.
- Outback Ecology (2012). *Hercules Project: Terrestrial Vertebrate Fauna Baseline Survey*. Unpublished report prepared for Atlas Iron Limited.
- Stantec (2017). *Northern Quoll Monitoring Survey 2017*. Unpublished report prepared for Atlas Iron Limited.
- Stantec (2018a). *Results of the Wodgina Supplementary Bat Survey*. Unpublished memo to Mineral Resources Limited, November 2018.
- Stantec (2018b). *Wodgina Project: Level 1 fauna Survey, targeted conservation significant fauna survey and desktop assessment*. Unpublished report prepared for Mineral Resources Limited, September 2018.
- Western Wildlife (2024) *Hemi Gold Project: Detailed Vertebrate Fauna Survey 2021 – 2024*. Unpublished report to De Grey Mining Limited.

Of most relevance, a fauna survey was undertaken within a smaller portion of the study area in April 2024 (Ecoscape 2024). This survey involved no trapping, but did include habitat assessment, camera trapping, a bat survey with ultrasonic detectors, diurnal transects and keeping opportunistic records of fauna. The extent of the survey area is shown on Figure 4.

2.6 Field Survey

2.6.1 Licensing

The fauna survey was carried out under Regulation 27 Fauna Taking (Biological Assessment) License BA27001288 issued by the Department of Biodiversity, Conservation and Attractions (DBCA) and Section 40 Authorisation to Take or Disturb Threatened Species TFA 2425-0237.

2.6.2 Timing

The fieldwork was undertaken on the following dates:

- 11 - 24 April 2025 (detailed survey, phase 1)
- 2 – 7 August 2025 (targeted surveys for Northern Quoll and Bilby)
- 1 – 12 September 2025 (detailed survey, phase 2)

The detailed survey was undertaken within the recommended September – April survey period for reptiles in the Eremaean region. The April survey was timed to follow summer rainfall, targeting birds and mammals (EPA 2020).

2.6.3 Trapping for Terrestrial Fauna

Trapping for terrestrial fauna (frogs, reptiles and small mammals) was undertaken using a combination of pitfall traps, Elliot traps, funnel traps and cage traps.

Eight trapping sites were installed in April 2025, each site consisting of ten pitfall traps, ten funnel traps, 10 Elliott traps and two cage traps open for seven nights (Figure 6, Figures 10.1 – 10.7, Table 3). One site (T Site 6) was removed at the end of the April survey due to concerns over excessive ants. In September 2025 a ninth site was installed to replace T Site 6.

The number and types of traps were chosen to sample the likely faunal assemblage while allowing for timely checking of traps to preserve animal welfare in hot conditions. Recently burnt areas were avoided due to the lack of cover for trapped animals and the likelihood that faunal populations were still recovering after fire. The Rocky Outcrop habitat was not trapped, but this habitat was targeted with camera traps and nocturnal searches.

Each pitfall trap consisted of a 40cm deep, white 20L bucket. Each pair of pitfall traps was placed on a 15m flywire drift fence. A piece of egg carton and a small amount on native soil was used as shelter for any fauna in the trap. Two funnel traps were set with each pair of pitfall traps with the drift-fence bisecting the funnel entrances. Funnel traps were shaded with a reflective ‘aircell’ insulation cover and spinifex (Plate 1).

Elliot traps were placed in a separate transect with the cage traps at either end. All cage and Elliot traps were placed under vegetation to shade any captured animals and cage traps were covered with a hessian sack. All Elliott and cage traps were baited with a mixture of rolled oats, sardines, peanut butter and vanilla essence.

Site photographs are shown in Plates 2 – 10. Trap sites were open for seven nights in both April and September 2025, except T Site 6 (only open in April) and T Site 9 (only open in September) (Table 3). The number of trap-nights for each trap type totalled 1,120 (pitfalls), 1,120 (funnel traps), 1,120 (Elliott traps) and 224 (cage traps), giving a total of 3,584 trap-nights overall. All animals caught were identified and recorded and generally released immediately at the site of capture.

Table 3. Trapping site locations.

Site	Dates open	Zone	Easting	Northing	Habitat
T Site 1	• 15 – 22/4/25 • 2 – 9/9/25	50	700604	7714121	**Low Stony Hills.** Sparse *Acacia* shrubland over spinifex hummock grassland on low stony hills. Plate 2.
T Site 2	• 15 – 22/4/25 • 2 – 9/9/25	50	699895	7712839	**Major River.** *Eucalyptus* canopy over tall *Acacia* shrubland, spinifex and buffel grass on open sandy river. Impacted by cattle. Plate 3.
T Site 3	• 15 – 22/4/25 • 3 – 10/9/25	50	703089	7704008	**Sandy Plain.** Sparse *Corymbia* canopy over patchy *Acacia* shrubland over Spinifex on shallow sandy soil. Plate 4.
T Site 4	• 15 – 22/4/25 • 4 – 11/9/25	50	702957	7718681	**Stony Plain. Near Minor River.** Sparse *Corymbia* canopy over sparse tall *Acacia* shrubland over Spinifex and Poverty Bush on a stony plain, near a *Corymbia*-lined minor river. Plate 5.
T Site 5	• 14 – 21/4/25 • 4 – 11/9/25	50	713706	7725472	**Sandy Plain.** Sparse *Corymbia* canopy over patchy *Acacia* shrubland over Spinifex on moderately deep, red sandy soil. Plate 6.
T Site 6	• 15 – 22/4/25	50	696566	7707447	**Minor River.** *Corymbia* canopy over tall *Acacia* shrubland over Spinifex and Buffel Grass on red clayey watercourse edge. Impacted by cattle. Plate 7.
T Site 7	• 14 – 21/4/25 • 3 – 10/9/25	50	700504	7711232	**Stony Plain.** Sparse *Corymbia* canopy over patchy *Acacia* shrubland over Spinifex on stony plain with consolidated sand. Plate 8.
T Site 8	• 15 – 22/4/25 • 3 – 10/9/25	50	698842	7702622	**Sandy Plain. Near granite outcrops.** Sparse *Corymbia* canopy over patchy *Acacia* shrubland over Spinifex on moderately deep, red sandy soil. Plate 9.
T Site 9	• 2 – 9/9/25	50	701620	7710029	**Sandy Plain. Near Major River.** Sparse *Corymbia* canopy over patchy *Acacia* shrubland over Spinifex on shallow sandy soil with drainage influences. Plate 10.

Plate 1. Examples of trap line set-up.

Plate 2. T Site 1.

Plate 3. T Site 2.

Plate 4. T Site 3.

Plate 5. T Site 4.

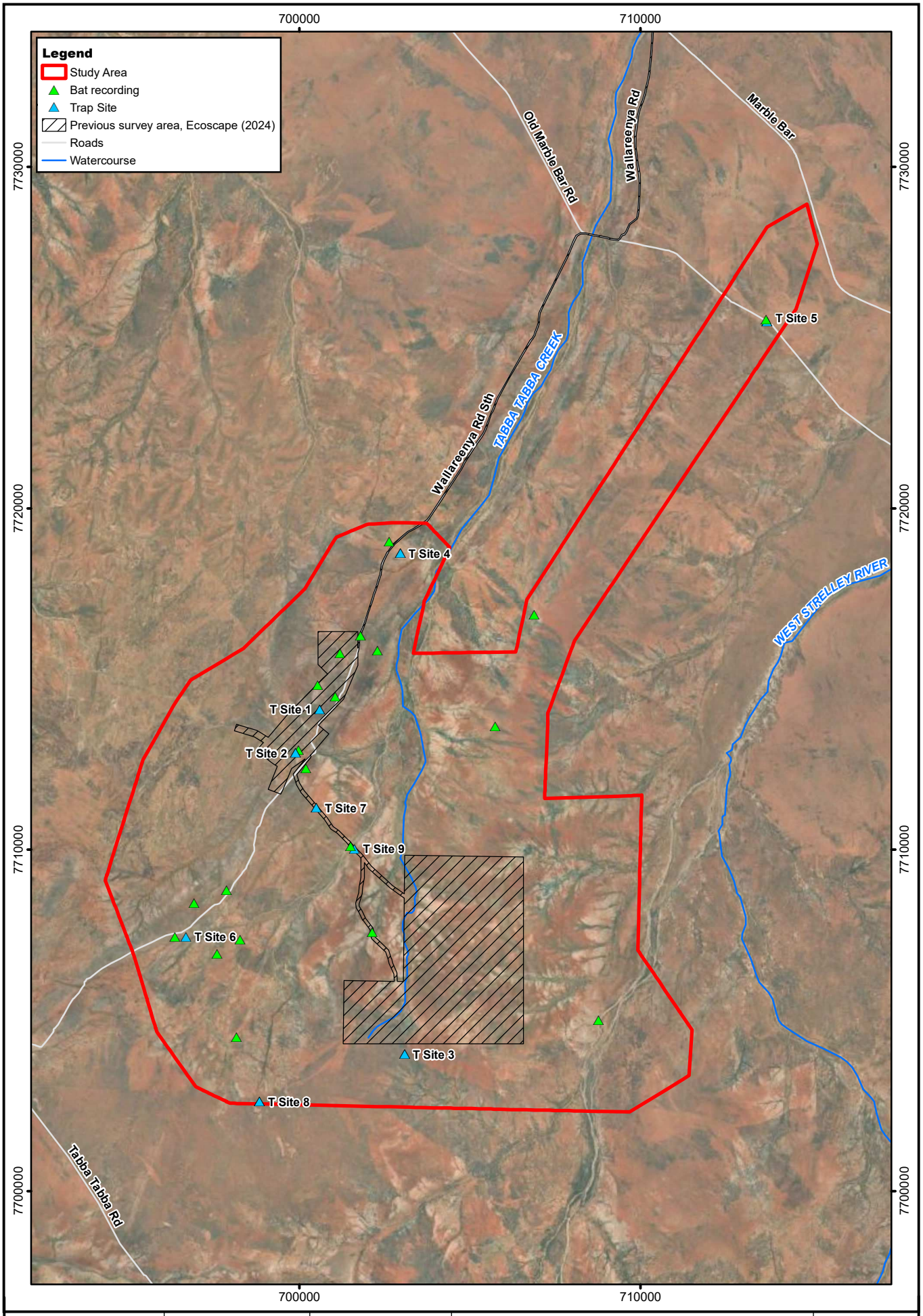
Plate 6. T Site 5.

Plate 7. T Site 6.

Plate 8. T Site 7.

Plate 9. T Site 8.

Plate 10. T Site 9.



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2.6.4 Bird Surveys

Bird surveys were undertaken at each trapping site to give a total of six 20-minute surveys at each site, resulting in 48 surveys or 16 hours of survey in total. Surveys were within 300m of the trapping site and were undertaken concurrently with morning trap checks, between sunrise and approximately 9am. Birds were recorded if seen or heard. Birds were recorded as present only, and a frequency of occurrence calculated for each site. Birds were also recorded opportunistically throughout the study area, including during diurnal searches, nocturnal searches and habitat assessments.

2.6.5 Bat Surveys

Bat calls were recorded using Anabat Ranger call detectors set to record between dusk and dawn. In April, detectors were deployed at 11 sites across the study area (22 nights recordings in total), and in September detectors were deployed at nine sites (18 nights recordings in total). (Figure 6, Figures 10.1 – 10.7, Appendix 2). The calls were then analysed by Specialised Zoological (2025), and the bat calls identified to species level where possible (Appendix 10).

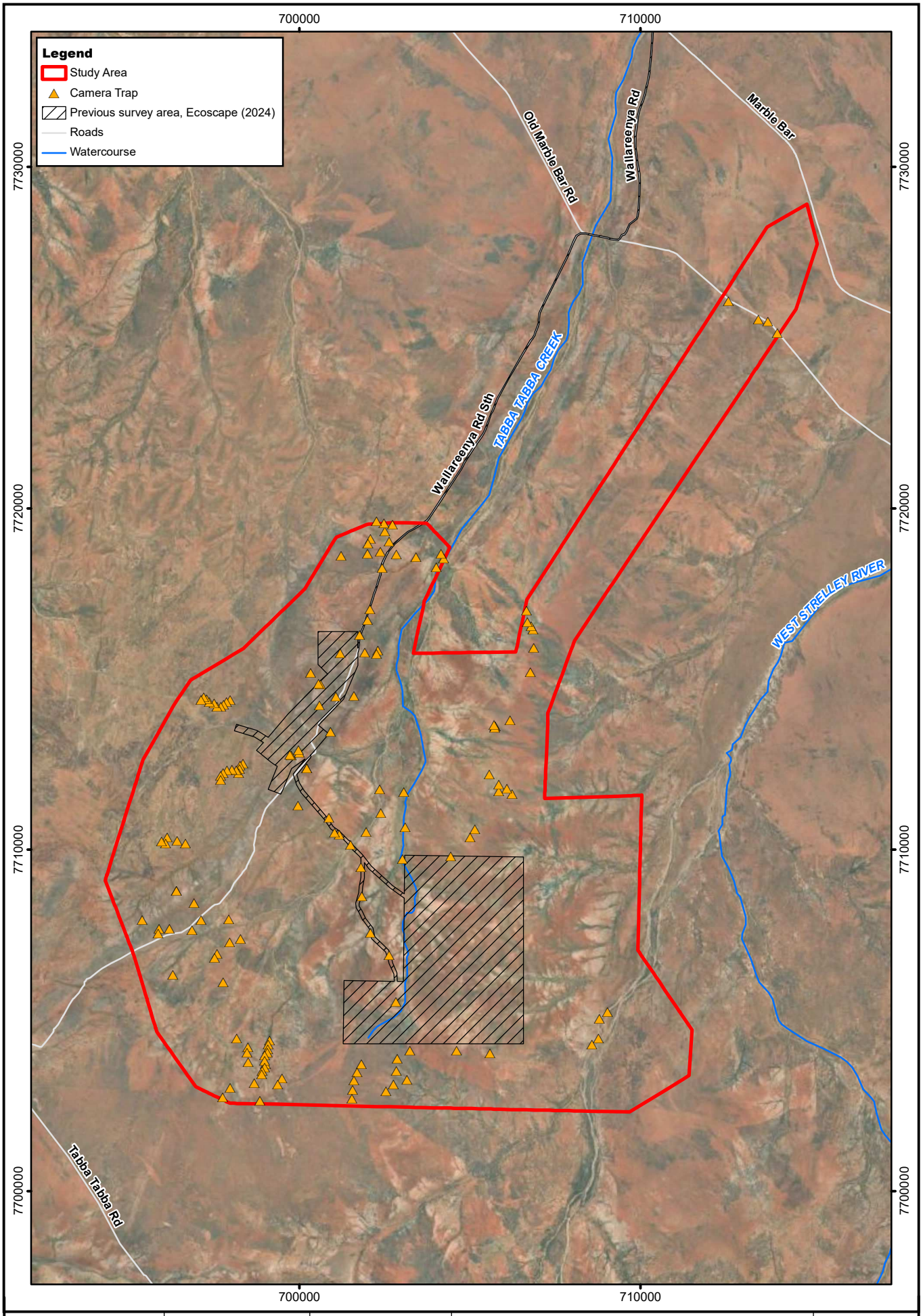
The rocky ridges were searched for caves that may be potential bat roosting habitat. Any potential caves were sampled with a Anabat detector to determine likelihood of roosting conservation significant bats through the pattern of call activity.

2.6.6 Camera Trap Survey

Camera traps were deployed at 153 sites across the study area for a total of 1,112 trap-nights (Figure 7, Figures 10.1 – 10.7, Appendix 2). Cameras were primarily deployed to target rocky or riverine habitats that may support the Northern Quoll (*Dasyurus hallucatus*) and sandplains that may support the Spectacled Hare-wallaby (*Lagorchestes conspicillatus*), Bilby (*Macrotis lagotis*) or Brush-tailed Mulgara (*Dasycercus blythi*). Most cameras were baited with a mixture of rolled oats, peanut butter and sardines and each individual camera was set for between five and nine nights.

2.6.7 Nocturnal Searches

Spotlighting was carried out on the 22nd and 23rd April and 10th September 2025 for the three hours following sunset. On each night, two personnel undertook a combination of road-spotting using vehicle headlights with targeted hand-searching using head-torches. The routes followed are shown on Figure 8.



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Western Wildlife

Tabba Tabba Project
Camera trap sites

Figure: **7**

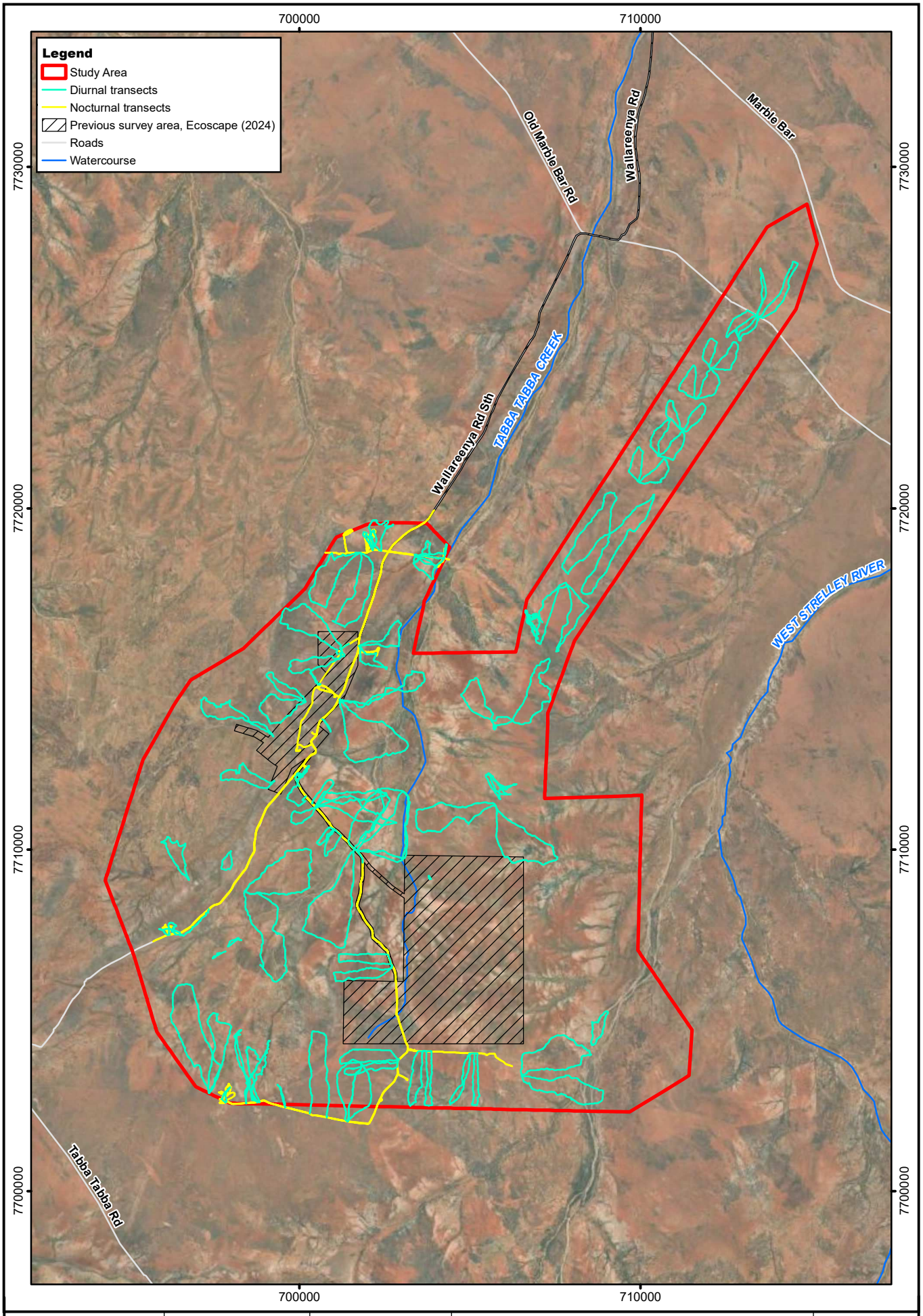
2.6.8 Targeted Diurnal Searches

Transects and point searches for fauna were undertaken across the study area (Figure 8). Although all vertebrate fauna were recorded, the diurnal searches were particularly focused on detecting conservation significant species. Searches were undertaken for:

- Burrows, diggings, tracks or scats of the Bilby (*Macrotis lagotis*) in sandplain habitats.
- Scats of the Northern Quoll (*Dasyurus hallucatus*) in rocky habitats and tracks in sandy habitats such as riverbeds.
- Burrows, diggings, tracks or scats of the Brush-tailed Mulgara (*Dasycercus blythi*) in sandplain habitats.
- The presence of the Peregrine Falcon (*Falco peregrinus*), Grey Falcon (*Falco hypoleucos*) and Fork-tailed Swift (*Apus pacificus*) using general vigilance.
- Presence of Migratory shorebirds such as the Common Sandpiper (*Actitis hypoleucos*) and other conservation significant waterbirds at water sources.
- Pebble-mounds of the Western Pebble-mound Mouse (*Pseudomys chapmani*) in stony habitats.

2.6.9 Opportunistic Records

At all times, observations of fauna were noted when they contributed to the accumulation of information on the fauna of the site. These included casual observations of reptiles, mammals and birds seen while travelling between sites or while undertaking other activities. Opportunistic observations were recorded to a general location for common species, and conservation significant species were recorded with a GPS location.



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2.7 Habitat Assessment

2.7.1 Habitat Assessment Sites

Habitat assessments were undertaken at 175 points across the study area (Figure 9, Figures 10.1 – 10.7, Appendices 2 and 3). At each habitat assessment point the following were recorded:

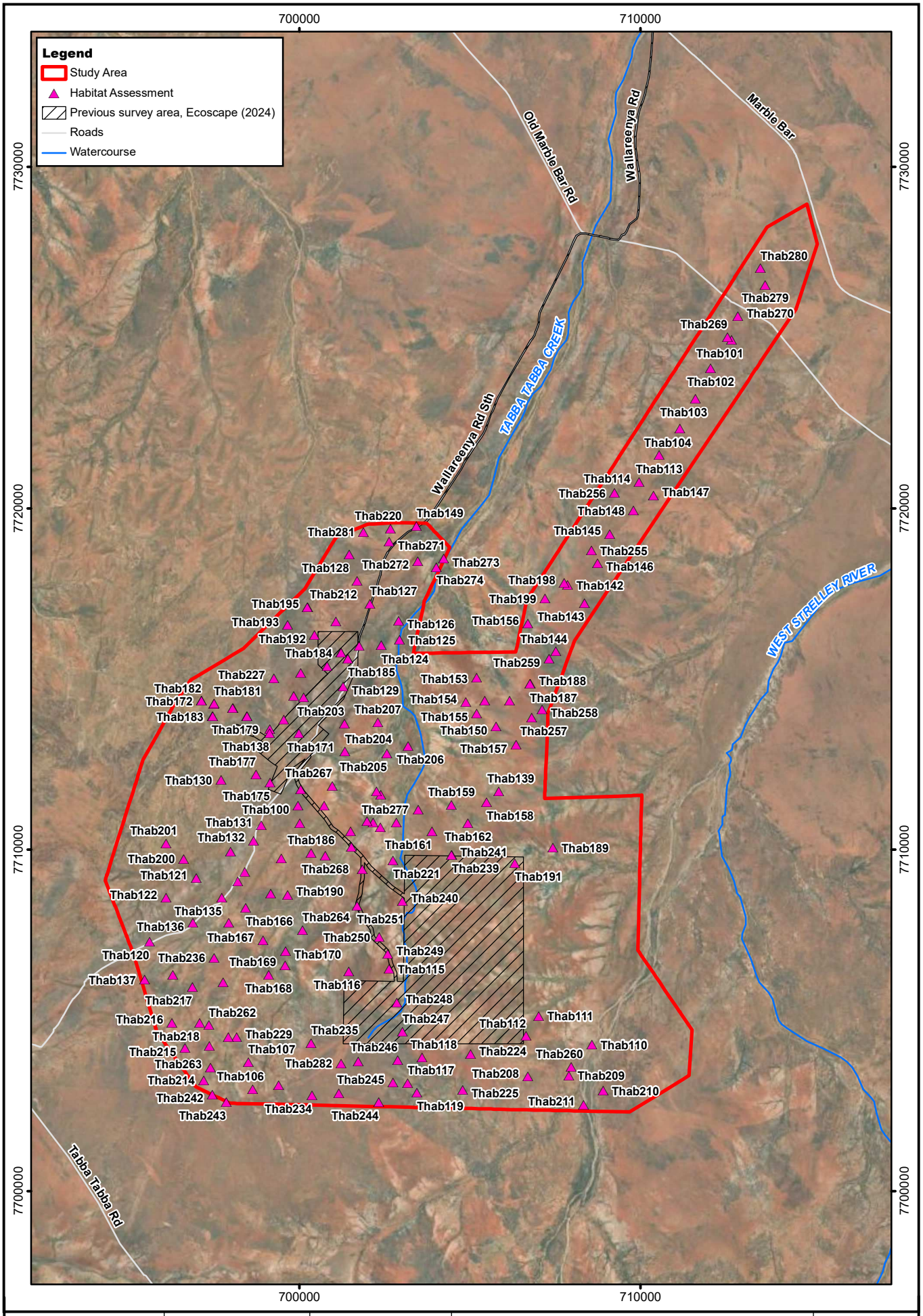
- GPS co-ordinates
- Representative photographs
- Habitat name
- Landform
- Vegetation (brief description of structure and dominant species, if known)
- Evidence of fire
- Disturbance (e.g., weeds, grazing, firewood collection)
- Soil colour and type
- Rock type and presence of any outcropping
- Important habitat elements, including, but not limited to the presence of:
    - Leaf litter accumulations
    - Woody debris and logs
    - Tree hollows or crevices
    - Soils suitable for burrowing
    - Long-unburnt vegetation
    - Water
    - Caves or rock crevices
    - Dense shelter vegetation
    - Important plant species for conservation significant fauna
- Presence of wetlands
- Any fauna

2.7.2 Night Parrot Habitat Assessment

The potential presence of Night Parrot roosting habitat was determined using a combination of high-resolution aerial photography, historical aerial photography available on Google Earth, fire scar mapping (Figure 3) and habitat assessments. Aerial photography was examined to search for stands of long-unburnt (>20 years) open Spinifex on flat or gently sloping plains, with a tree and shrub density of <15 per hectare.

2.7.3 Habitat Mapping

The fauna habitats were identified and mapped using the habitat assessments (Appendix 3), observations made in the field during the fauna survey, interpretation of vegetation mapping (Ecoscape 2024), aerial photography and land system mapping. Northern Quoll dispersal and foraging habitat was mapped by buffering critical shelter habitat and any Northern Quoll records by 1km as described in the referral guidelines for this species (DoE 2016), with the addition of any other habitat types considered important for foraging and dispersal.



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Date: March 2026 | Rev: A		Author: J. Wilcox			

2.8 Species Accumulation Curves

A species accumulation curve at its most simple is a graph of the number of detected species against sampling effort. However, the curve is usually derived through sub-sampling the dataset to find a mean curve, otherwise known as a sample-based rarefaction curve.

Species accumulation curves were calculated for reptiles, mammals and birds for all habitats combined. For frogs, reptiles and mammals, an individuals-based approach was used. This means that the species richness was graphed against the number of individuals caught, rather than per each sample. The sampling unit for birds was all species observed in a 20-minute bird survey at a trapping site.

The statistical package EstimateS (Colwell 2013) was used to find a non-parametric estimator of species richness; either Chao1, ICE (Incidence-based Coverage Estimator) or Chao2. Chao1 uses abundance data to provide an estimation of the lower bound of species richness and is a good estimator of the actual species richness when the sample size is large or the rare species in the sample have similar detection probabilities (Chao and Chiu 2016). ICE or Chao2 are similar, but uses incidence (presence only, no abundance) data only.

EstimateS (Colwell 2013) uses a bias-corrected form of Chao1 and Chao2 as a default, though these become imprecise when the co-efficient of variation or incidence distribution >0.5. In these cases, the classic Chao1 and Chao2 were used, and the larger estimate of Chao1(classic) and ACE (Abundance-based Coverage Estimator) or Chao2(classic) and ICE (Incidence-based Coverage Estimator) is used as the estimate of species richness. For large sample sizes, if Chao 1 or Chao 2 are equal to the observed number of species, then the accumulation of species is assumed to have reached an asymptote (Colwell 2013).

Jackknife estimators of species richness are not used, as they typically underestimate the true species richness when the sample is small, (as is often the case in detailed surveys) and overestimate when the sample is large. Thus, there is only a small window when the Jackknife estimators are close to the true species richness (Chao and Chiu 2016).

2.9 Assessment of Conservation Significance

2.9.1 Legislative Protection for Fauna

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Commonwealth Government's primary piece of environmental legislation. Listed under Part 3 of the EPBC Act are 'Matters of National Environmental Significance' (MNES); these include threatened species, threatened ecological communities and migratory species. Threatened fauna species are assessed against categories based on International Union for Conservation of Nature (IUCN) criteria.

The migratory species listed under the EPBC Act are those recognised under international agreements. These agreements are the China-Australia Migratory Bird Agreement (CAMBA), the Japan-Australia Migratory Bird Agreement (JAMBA), the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA), or species listed under the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) for which Australia is a range state.

Matters of National Environmental Significance (MNES) include the following categories:

- **Extinct in the wild (EW)**: Taxa known to survive only in captivity.
- **Critically Endangered (Cr)**: Taxa facing an extremely high risk of extinction in the wild in the immediate future.
- **Endangered (En)**: Taxa facing a very high risk of extinction in the wild in the near future.
- **Vulnerable (Vu)**: Taxa facing a very high risk of extinction in the wild in the medium-term future.
- **Migratory (Mi):** Taxa listed under international agreements to which Australia is a party.

Reports on the conservation status of most vertebrate fauna species have been produced by the federal Department of Climate Change, Energy, the Environment and Water (DCCEEW)) in the form of Action Plans. An Action Plan is a review of the conservation status of a taxonomic group against IUCN categories. Action Plans have been prepared for amphibians (Tyler 1998), reptiles (Cogger *et al*. 1993), lizards and snakes (Chapple *et al*. 2019), birds (Garnett and Barker 2020) and mammals (Woinarski *et al*. 2014). These publications also use categories similar to those used by the EPBC Act. The information presented in some of the earlier Action Plans may be out of date due to changes since publication.

The *Biodiversity Conservation Act 2016* (BC Act) is State legislation that aims to conserve and protect biodiversity and biodiversity components in Western Australia, including threatened fauna. It is administered by the Department of Biodiversity, Conservation and Attractions (DBCA). In addition to threatened fauna, the BC Act has scope to protect threatened ecological communities and important habitats.

Fauna species are listed under the BC Act as threatened species using IUCN categories, or as specially protected species, as described below.

Threatened Species:

- **Extinct in the wild (EW)**: Taxa known to survive only in captivity.
- **Critically Endangered (Cr)**: Taxa facing an extremely high risk of extinction in the wild in the immediate future.
- **Endangered (En)**: Taxa facing a very high risk of extinction in the wild in the near future.
- **Vulnerable (Vu)**: Taxa facing a very high risk of extinction in the wild in the medium-term future.

Specially Protected Species:

- **Migratory (Mi)**: A subset of the migratory fauna that are known to visit Western Australia that are protected under the international agreements or treaties, excluding species that are listed as Threatened species.
- **Conservation dependent fauna (CD):** Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.

- **Other specially protected species (OS):** fauna in need of special protection to ensure their conservation.

Priority species are not listed under State or Commonwealth Acts. In Western Australia, DBCA maintains a list of Priority Fauna made up of species that are possibly Threatened but do not meet adequacy of survey requirements or are otherwise data deficient. There are four levels of Priority as defined by DBCA, as listed below.

- **Priority 1:** Poorly known species (on threatened lands).
- **Priority 2:** Poorly known species in few locations (some on conservation lands).
- **Priority 3:** Poorly known species in several locations (some on conservation lands).
- **Priority 4:** Rare, near threatened and other species in need of monitoring.

2.9.2 Levels of Conservation Significance in this report

Five levels of conservation significance are used within this report to indicate the level of significance of fauna species, according to the following criteria:

- **Threatened (T):** Taxa listed as Extinct in the Wild, Critically Endangered, Endangered or Vulnerable under the EPBC Act and/or BC Act. These species are grouped as they are all species considered to be at risk of extinction, are often rare and are likely to be subject to on-going threatening processes.
- **Migratory (Mi):** Taxa listed as Migratory under the EPBC Act and/or BC Act, excluding those species also listed as threatened. These species are grouped as they are not necessarily rare but may be dependent on specific habitats for a portion of their life-cycle. For these species, loss of important foraging, breeding or stop-over sites may have a disproportionately large impact on populations.
- **Specially Protected (SP):** Taxa listed as Other Specially Protected Species or Conservation Dependent Fauna under the BC Act. These species are not necessarily rare but may be dependent on ongoing conservation to ensure their protection.
- **Priority (P):** Taxa listed as Priority by DBCA. These species are grouped as they are either conservation dependent or data deficient and in need of further survey.
- **Locally Significant (LS):** Locally significant taxa are not listed under State or Commonwealth Acts or in publications on threatened fauna or as Priority species by DBCA but are considered by the author to potentially be of local significance because they are at the limit of their distribution in the area, they have a very restricted range or restricted habitat requirements, or they occur in breeding colonies (e.g. some waterbirds). This level of significance has no legislative recognition and is based on interpretation of information on the species patterns of distribution. For example, the Government of Western Australia (2000) used this sort of interpretation to identify significant bird species in the Perth metropolitan area as part of Bush Forever. Recognition of such species is consistent with the aim of preserving regional biodiversity.

2.10 Likelihood of Occurrence

Fauna of conservation significance were assessed and ranked for their likelihood of occurrence in the study area, according to the criteria in Table 4.

Table 4. Criteria for assessing likelihood of occurrence.

Likelihood	Criteria
Unlikely	• The study area is outside the current known distribution of the species as presented in the literature. • No suitable habitat was identified as being present during the field survey. • For some species, individuals may occur occasionally as vagrants, especially if suitable habitat is located nearby, but the study area itself would not support the species. • May include species generally accepted as being locally extinct.
Possible	• The study area is within or just outside the current known distribution of the species, as presented in the literature. • Any habitat present is either limited in extent or of marginal quality at best. • No recent or nearby records of the species on databases. • The species is generally known to be less common in the vicinity of the study area (e.g., for inland sites, where the species usually occurs on the coast).
Potential	• The study area is within the current known distribution of the species, as presented in the literature. • Habitat of reasonable quality was identified as being present during the field survey. • There are some recent and/or nearby records of the species of databases.
Likely	• The study area is well within the current known distribution of the species, as presented in the literature. • Habitat of good quality was identified as being present during the field survey. • Many recent and nearby records of the species on databases.
Known to occur	• The species was positively identified in the study area during this field survey or recorded as occurring in the study area on previous recent field surveys. • Note that for a species 'known to occur', the habitat may still be marginal and therefore the population may be small, or the species may visit the site irregularly.

3. Survey Limitations

Various factors can limit the effectiveness of a fauna survey. Pursuant to EPA Technical Guidance (EPA 2020), these factors have been identified and their potential to impact on the effectiveness of the surveys has been assessed in Table 5.

All fauna surveys have limitations, and not all fauna species present on the site are likely to be sampled during a survey. Fauna may not be recorded because they are rare, they are difficult to trap or observe, or because they are only present on the site for part of the year.

Table 5. Fauna survey limitations.

Potential Limitation	Extent of limitation for the fauna survey
Availability of data and information	**Not Limiting.** The Pilbara is a relatively well-studied region due to the prevalence of mining activities. The Pilbara Biological Survey also gives context to fauna studies in this region. There are numerous records in the vicinity of the study area on databases and other fauna surveys have been undertaken nearby.
Competency/experience of the survey team, including experience in the bioregion surveyed	**Not Limiting.** Key personnel have over 20 years' experience with fauna surveys in Western Australia and are experienced with targeted surveys for Northern Quoll, Night Parrot, Bilby and conservation significant bats. All personnel have undertaken previous surveys, including detailed fauna surveys, in the Pilbara Bioregion.
Scope of survey (e.g., faunal groups excluded from the survey)	**Not Limiting.** The detailed survey covered all vertebrate faunal groups. Conservation significant species were targeted with a variety of methods including camera traps and searches for secondary signs.
Timing, weather and season	**Not limiting.** The timing of the survey was consistent with that recommended in the Technical Guidelines (EPA 2020). The weather during the survey was warm to hot and suitable for trapping and spot-lighting.
Disturbance that may have affected the results	**Minor Limitation.** Parts of the study area were recently burnt and therefore temporarily unlikely to support key species such as the Bilby. Much of the study area is burnt on a regular basis (for pastoralism) which is likely to have resulted in a smaller extent of mature spinifex.
The proportion of fauna identified, recorded or collected	**Not Limiting.** Approximately half of the potentially occurring species were recorded during the survey. The field component of the survey was supported with a literature review.
The adequacy of the survey intensity and proportion of survey achieved (e.g., extent to which the area was surveyed)	**Not Limiting.** The intensity and coverage of the fauna survey was adequate and appropriate for the level of survey. A representative portion of all habitats were visited during the survey. Trapping was undertaken in all habitats except the Rocky Outcrop habitat, which was sampled using other methods including diurnal transects and camera traps.
Access problems	**Not limiting.** Although vehicle access was limited in some areas, a proportion of all habitats were accessible by vehicle and/or on foot and a representative portion of each habitat was able to be surveyed.
Problems with data and analysis, including sampling biases	**Not Limiting.** No complex analyses were undertaken, and no problems were noted.

4. Fauna Habitat

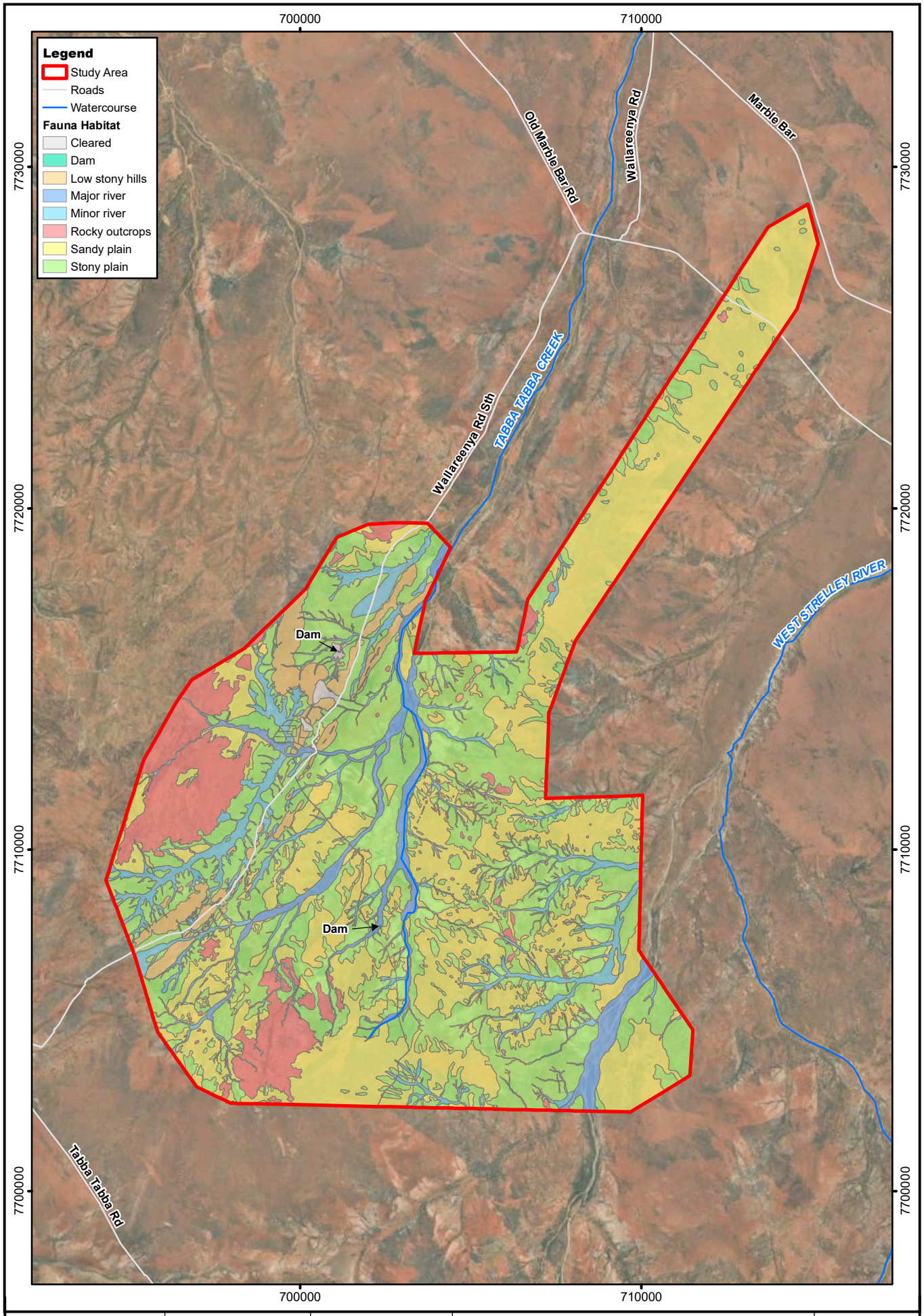
4.1 Habitats of the Study Area

Eight fauna habitats, including cleared areas, were identified in the study area (Table 6, Figure 10). They are described in the following sections, with the vegetation descriptions drawn from Ecoscape (2024) and field observations. Most of these habitats are widespread in the region. The majority of the study area is comprised of Sandy and Stony Plains. The Rocky Outcrops habitat is more limited in extent in the study area and uncommon in surrounding areas.

The main disturbance noted was from old mining activities (e.g., drilling access tracks, drill pads, service areas) and pastoral activities (e.g., station tracks, bores, livestock). Areas around rivers, wells and stands of trees showed trampling by livestock cattle. Parts of the study area were recently burnt.

Table 6. Fauna habitats in the study area.

Habitat	Key Habitat Elements	Area (ha)
Cleared	• Limited value to fauna	81.7 (0.4%)
Dam	• Provides habitat for bathing and drinking, as well as habitat for waterbirds and breeding habitat for frogs.	0.4 (<0.1%)
Low Stony Hills	• Small stones suitable for Western Pebble-mound Mouse mounds. • Minor rocky outcrops provide shelter for saxicoline reptiles.	819.1 (3.6%)
Major River	• Likely to function as a corridor for fauna movement. • Waterholes provide habitat for bathing and drinking, as well as habitat for waterbirds and breeding habitat for frogs. • Tree hollows for arboreal reptiles, bats and hollow-nesting birds. • Leaf litter accumulations and woody debris in the creek bed provides habitat for reptiles.	872.0 (3.8%)
Minor River	• Likely to function as a corridor for fauna movement. • Dense vegetation provides shelter and nesting habitat for birds.	1,720.3 (7.6%)
Rocky Outcrops	• Outcropping rocky areas, small caves, boulders, overhangs and rock crevices provide shelter for reptiles and mammals. • Provides breeding habitat for the Northern Quoll. • Vantage points and possible nesting habitat for birds of prey.	1,1856.1 (8.2%)
Sandy Plain	• Consolidated sands suitable for burrowing reptiles and mammals. • Small claypans that hold water may be breeding habitat for frogs and support waterbirds.	8,278.8 (36.5%)
Stony Plain	• Small stones suitable for Western Pebble-mound Mouse mounds.	9,030.3 (39.9%)
	Total:	**22,658.7 (100%)**



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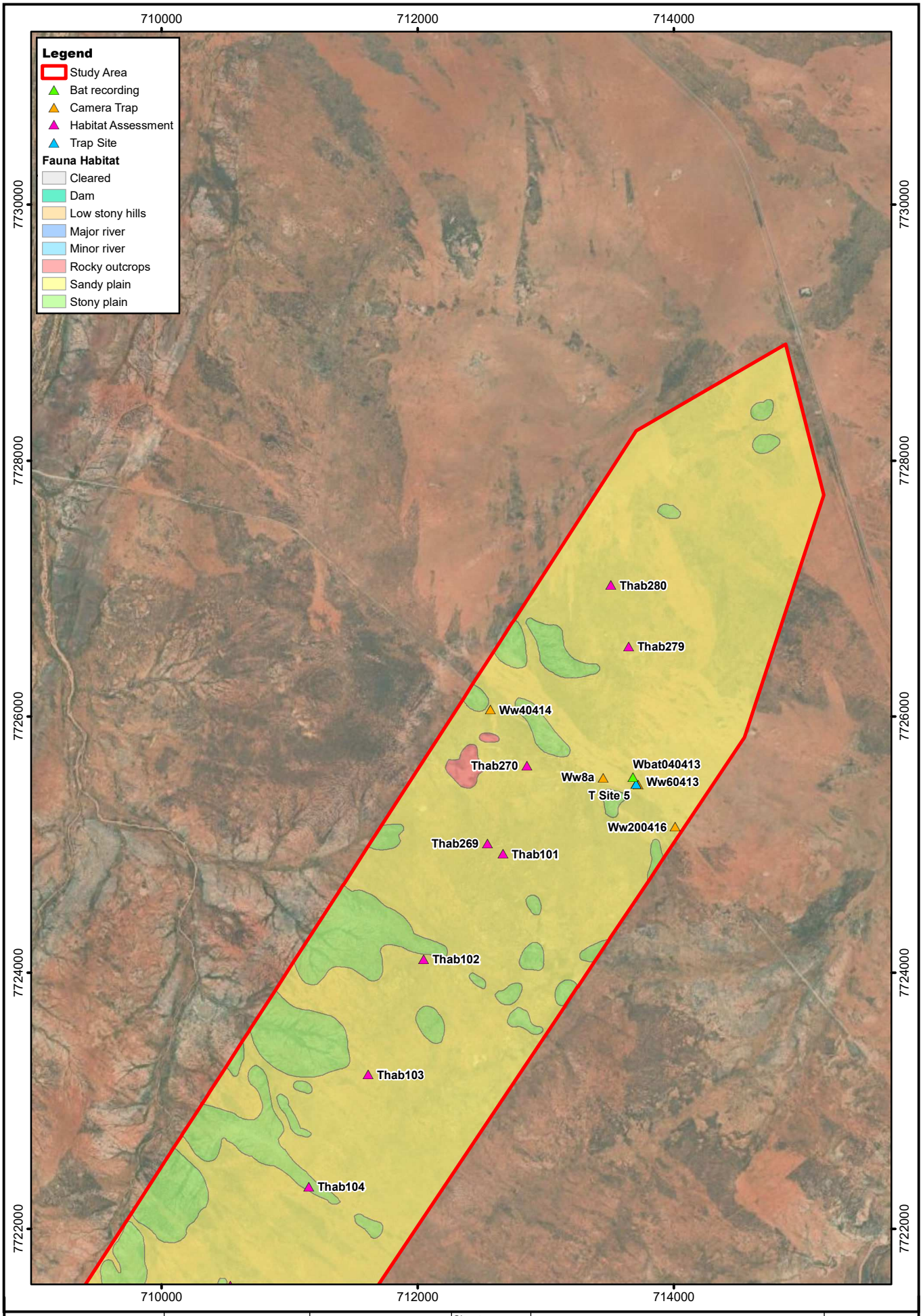

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Tabba Tabba Project
Fauna habitat

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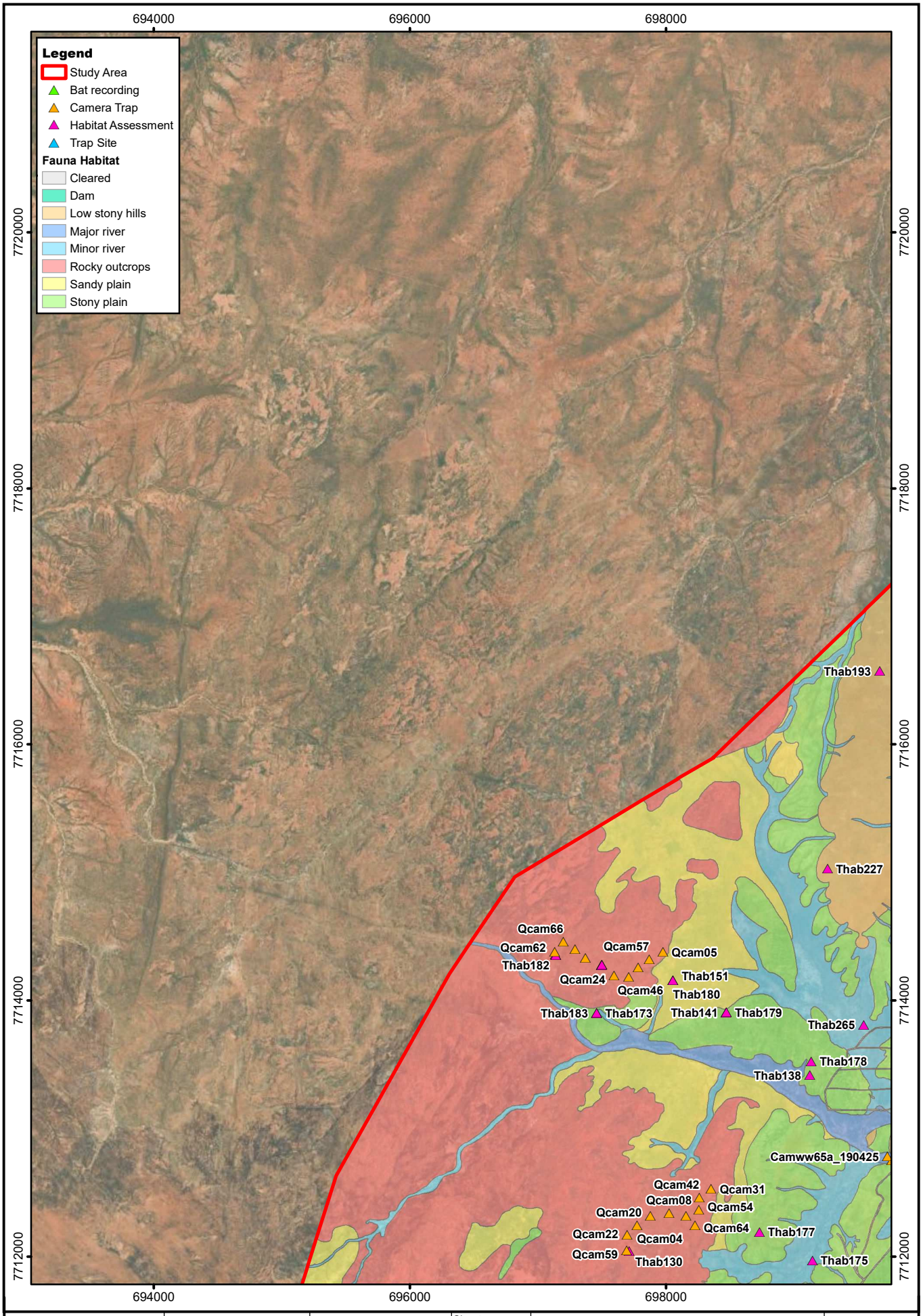
10.1



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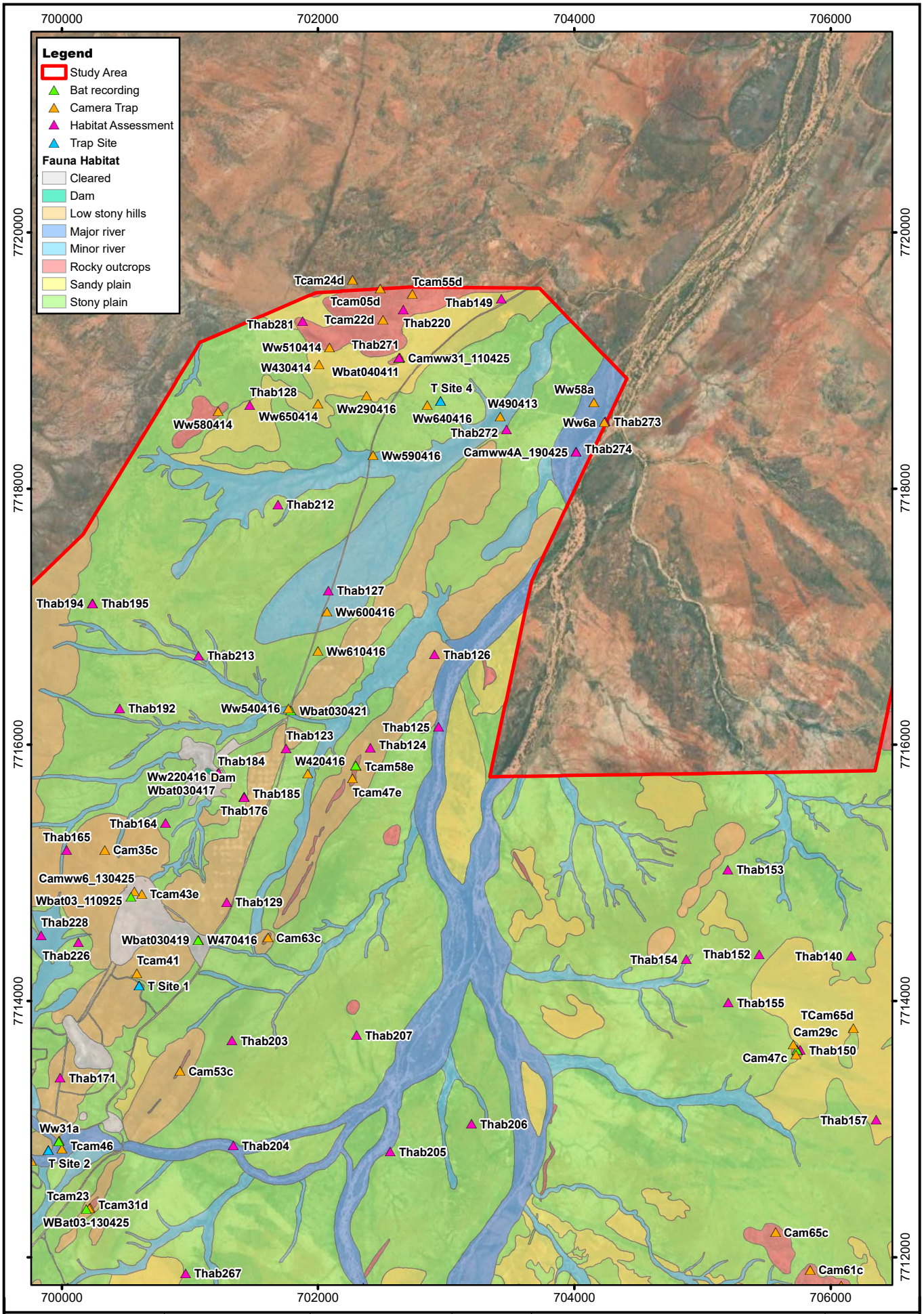

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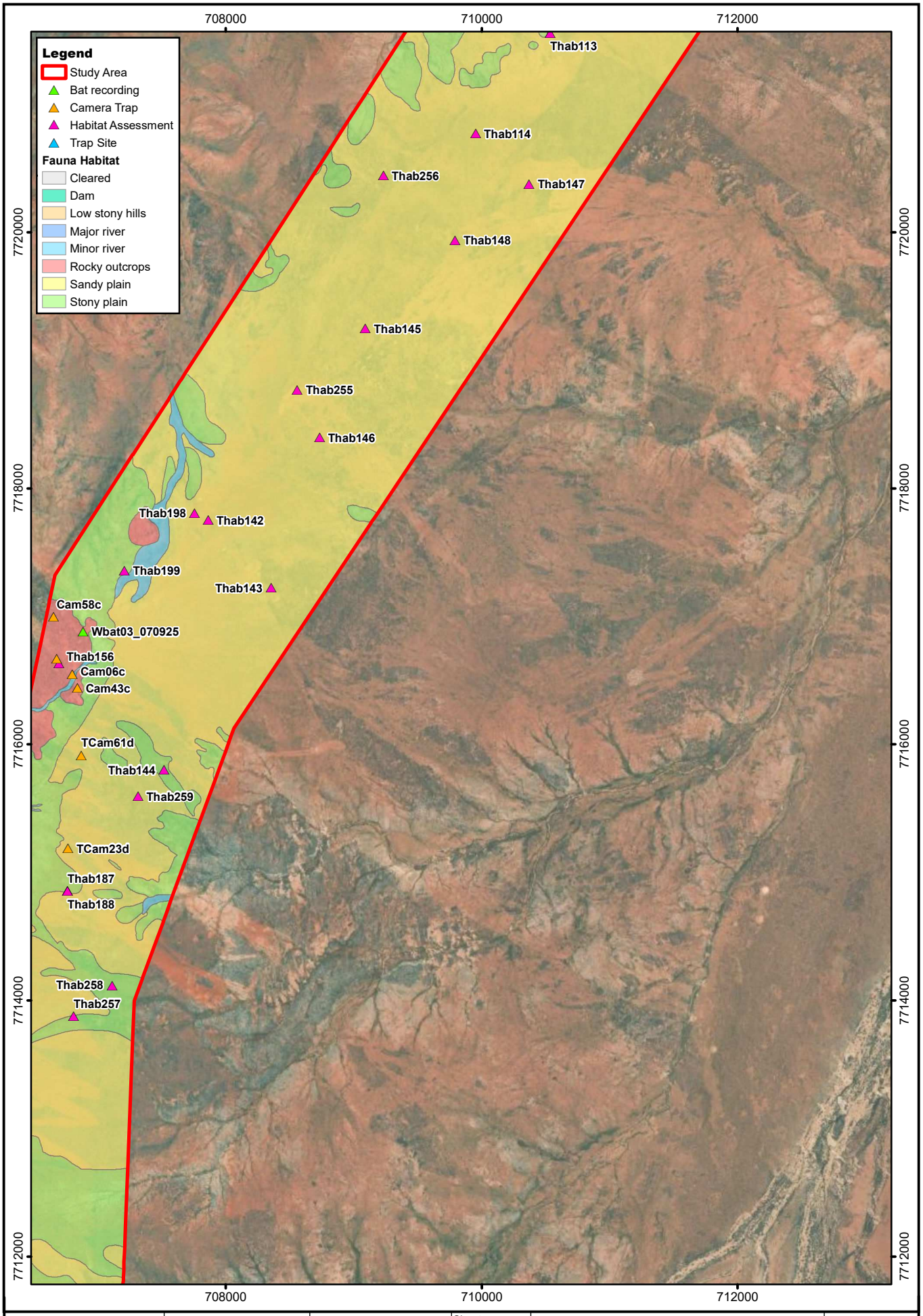

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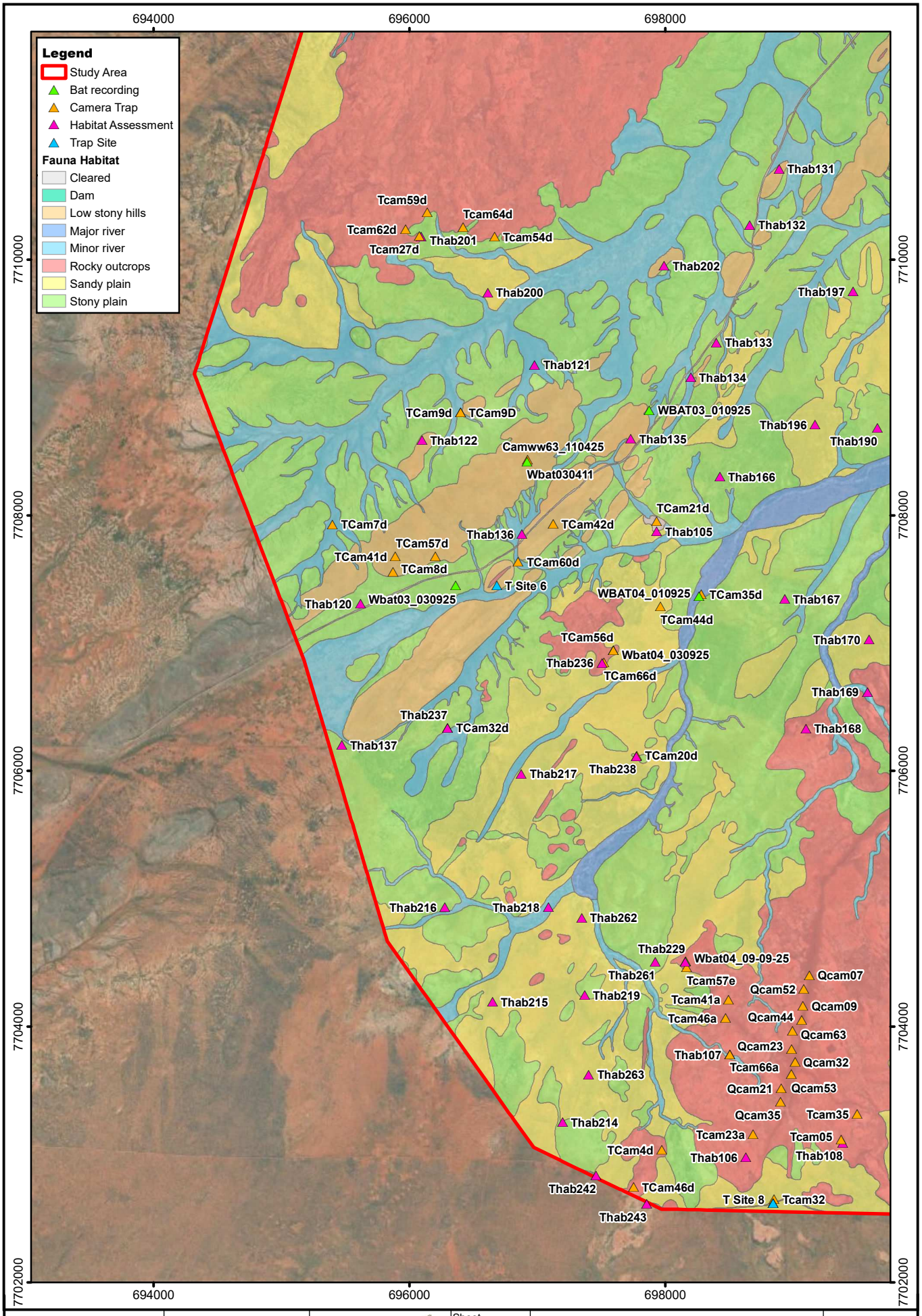

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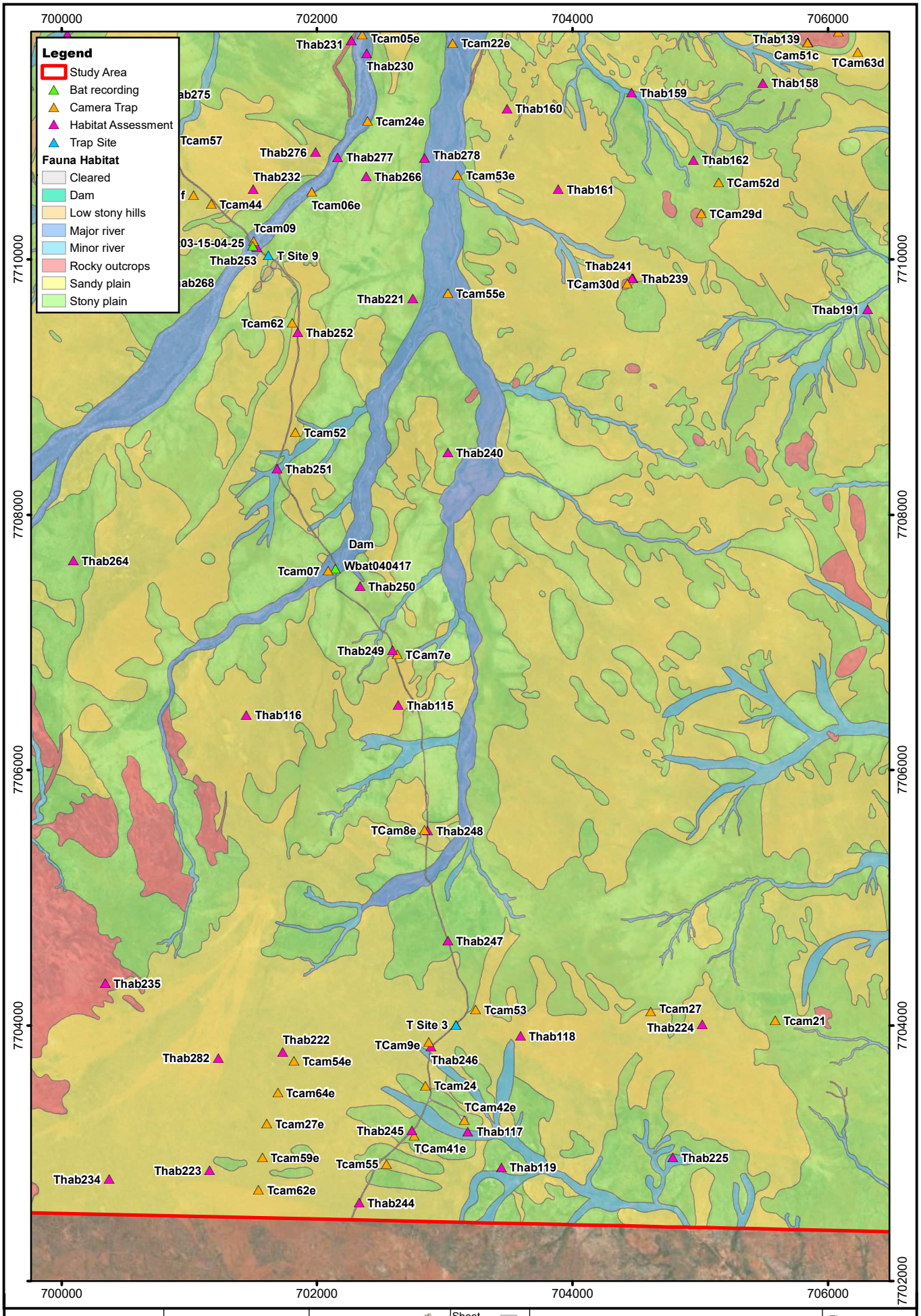

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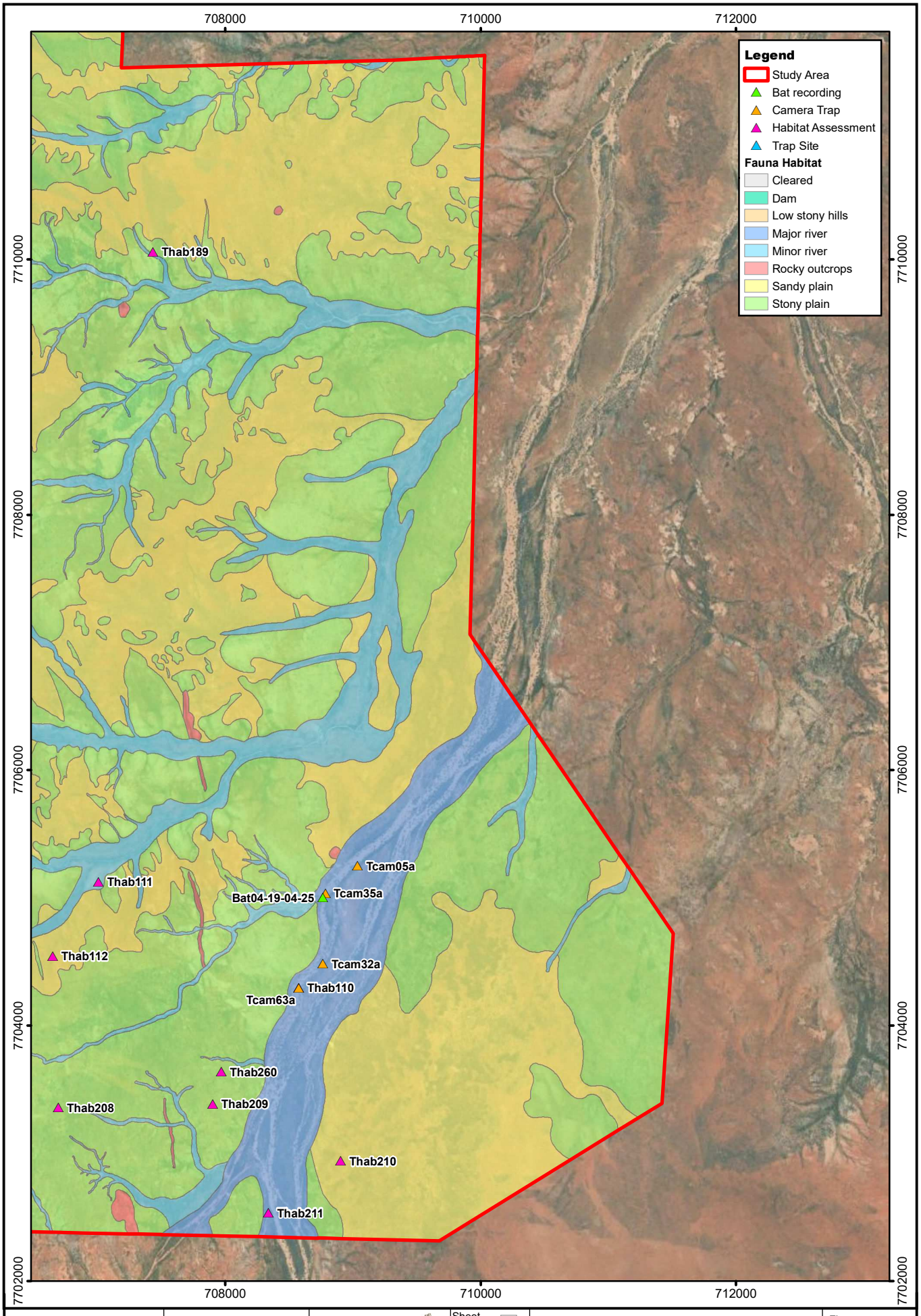

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Tabba Tabba Project
Fauna habitat

Figure:
10.7

4.1.1 Cleared

A small portion of the study area is cleared, including access tracks and old mining disturbance. No Conservation Significant fauna are likely to be associated with this habitat.

4.1.2 Dam

Dams provide permanent or semi-permanent water in an otherwise arid landscape (Plate 11). Two dams are present in the study area and these artificial water sources may occasionally support very small numbers of conservation significant Migratory shorebirds.

Plate 11. Dam.

4.1.3 Low Stony Hills

Low stony hills, some with minor rock outcropping, support a grassland of Spinifex (*Triodia wiseana* and *Triodia epactica*), sometimes with Poverty Bush (*Acacia stellaticeps*) and scattered tall *Acacia* shrubs (e.g. *Acacia orthocarpa*) (Plates 12 - 13). At the time of survey, some of this habitat was recently burnt. This habitat roughly corresponds to the Talga and Robe Land Systems.

A Conservation Significant fauna species associated with this habitat is the Western Pebble-mound Mouse (*Pseudomys chapmani*: Priority 4) and possibly the Long-tailed Dunnart (*Antechinomys longicaudata*: Priority 4).

Plate 12. Low Stony Hills.

Plate 13. Low Stony Hills.

4.1.4 Major River

The Major River habitat supports an open woodland of River Red Gum (*Eucalyptus camaldulensis*), Little Ghost Gum (*Eucalyptus victrix*) and Silver Cadjuput (*Melaleuca argentea*) over Acacia shrubland (*Acacia trachycarpa*) over grasses and Spinifex (Plates 14 - 16). There are also considerable expanses of open stony or sandy riverbed. The study area includes several waterholes, although these were small and seemed unlikely to be permanent. Small rocky outcrops, some with crevices that may shelter fauna, also occur on the riverbed and are too small to be mapped separately as the Rocky Outcrop habitat. This habitat roughly corresponds to the River Land System.

Conservation Significant fauna that may be associated with this habitat are the Northern Quoll (*Dasyurus hallucatus*: Endangered), Grey Falcon (*Falco hypoleucos*: Vulnerable), Pilbara Olive Python (*Liasis olivaceous barroni*: Vulnerable), Common Sandpiper (*Actitis hypoleucos*: Migratory), Common Greenshank (*Tringa nebularia*: Endangered) and other shorebirds listed as Migratory.

Plate 14. Major River.

Plate 15. Major River.

Plate 16. Major River - small waterhole.

4.1.5 Minor River

A complex network of minor rivers occur due to the undulating terrain (Plates 17 – 19). These may have a small channel and are usually lined with *Corymbia hamersleyana* and a mix of *Acacia* species, or sometimes just *Acacia*, over spinifex, grasses and herbs. Some areas, particularly near wells, are highly impacted by cattle grazing and trampling, and include areas of buffel grass.

Conservation Significant fauna that may be associated with this habitat are the Northern Quoll (*Dasyurus hallucatus*: Endangered) and Grey Falcon (*Falco hypoleucos*: Vulnerable), although to a lesser extent compared to the Major River habitat.

Plate 17. Minor River.

Plate 18. Minor River.

Plate 19. Minor River.

4.1.6 Rocky Outcrop

Fairly extensive areas of rocky outcrop occur in the study area (Plates 20 - 23). Much of this habitat occurs as large granite outcrops, with smaller areas of isolated granite outcrop and small linear rocky ridges. Small caves, boulders and rocky crevices provide shelter for fauna. This habitat roughly corresponds to parts of the Talga, Granite and Boolaloo Land Systems.

Conservation Significant fauna that may be associated with this habitat are the Northern Quoll (*Dasyurus hallucatus*: Endangered), Ghost Bat (*Macroderma gigas*: Vulnerable), Pilbara Olive Python (*Liasis olivaceous barroni*: Vulnerable) and possibly the Long-tailed Dunnart (*Antechinomys longicaudata*: Priority 4) or Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*: Vulnerable).

Plate 20. Rocky Outcrop – small linear ridge.

Plate 21. Rocky Outcrop – granite outcrop.

Plate 22. Rocky Outcrop – granite outcrop.

Plate 23. Rocky Outcrop - isolated granite outcrop, isolated small rocky hill in distance.

4.1.7 Sandy Plain

Sandy plains of varying depth, sometimes with small patches of stony plain or granite outcrop, support an open spinifex hummock grassland sometimes with a low shrubland of Poverty Bush (*Acacia stellaticeps*), and a variable open shrubland of Acacia shrubs (e.g. *Acacia inaequilatra*, *Acacia trachycarpa, Acacia bivenosa* and/or *Acacia orthocarpa*) (Plates 24 - 28). Some areas include a sparse tree cover of *Corymbia hamersleyana*. Small areas of open claypan are likely to hold water after heavy rains. This habitat roughly corresponds to the Macroy and Uaroo Land Systems, with the deeper sands associated with the Uaroo Land System at the northern and southern edges of the study area, and the shallower granitic sands associated with the Macroy Land System through much of the central part of the study area. Relatively large areas of this habitat were recently burnt at the time of survey.

Conservation Significant fauna that may be associated with this habitat are the Bilby (*Macrotis lagotis*: Vulnerable), Spectacled Hare-wallaby (*Lagorchestes conspicillatus leichardtii*: Priority 4) and Brush-tailed Mulgara (*Dasycercus blythi*: Priority 4). When inundated, the claypans within this habitat may provide habitat for very small numbers of Migratory shorebirds, including but not limited to the Common Greenshank (*Tringa nebularia*: Endangered) and Common Sandpiper (*Actitis hypoleucos:* Migratory).

Plate 24. Sandy Plain.

Plate 25. Sandy Plain.

Plate 26. Recently burnt Sandy Plain.

Plate 27. Very recently burnt Sandy Plain.

Plate 28. Small claypan within Sandy Plain habitat.

4.1.8 Stony Plain

Stony plains were widespread and variable, often incorporating small patches of sandy plain. These plains supported an open spinifex hummock grassland, sometimes with a low shrubland of Poverty Bush (*Acacia stellaticeps*), and a variable open shrubland of Acacia (e.g. *Acacia inaequilatra*, *Acacia bivenosa* and/or *Acacia orthocarpa*) (Plates 29 – 32). This habitat corresponds roughly with parts of the Macroy and Talga Land Systems. Relatively large areas of this habitat were recently burnt at the time of survey.

A Conservation Significant fauna species associated with this habitat is the Western Pebble-mound Mouse (*Pseudomys chapmani*: Priority 4).

Plate 29. Stony Plain.

Plate 30. Stony Plain.

Plate 31. Stony Plain.

Plate 32. Recently burnt Stony Plain.

5. Faunal Assemblage of the Study Area

5.1 Vertebrate Fauna Assemblage

The results of the literature review and field survey were combined to create a list of all the vertebrate fauna potentially occurring at in the study area (Appendices 4 - 7). Indicated in the fauna lists are all the species observed in the study area during the fauna survey and those recorded in the region as part of the literature review.

The potentially occurring faunal assemblage is summarised in Table 7. The overall vertebrate faunal assemblage is likely to be largely intact, with the exception of species that are extinct or greatly reduced in their distribution in the Bioregion. The faunal assemblage and conservation significant species likely to occur are further discussed in the sections below.

Table 7. Summary of vertebrate fauna predicted to occur in the study area.

Taxon	Total Species Predicted	Total Species Recorded	Conservation significant species				
			Threatened (T)	Migratory (Mi)	Specially Protected (SP)	DBCA Priority (P)	Locally significant (LS)
Frogs	8	4	-	-	-	-	-
Reptiles	111	53	1	-	-	2	-
Birds	157	86	4	8	1	-	1
Native Mammals	35	26	4	-	-	6	1
Int. Mammals	8	5	-	-	-	-	-
Totals:	**319**	**174**	**9**	**8**	**1**	**8**	**2**

5.1.1 Frogs

Eight species of frog potentially occur, of which four were recorded in the study area on this survey (Table 8, Appendix 4). The frog species potentially occurring in the study area are common and widely distributed in the semi-arid zone.

Three species were trapped in or near the Major River habitat (Plate 33, Table 8). The Desert Tree Frog (*Litoria rubella*) is likely to be common, occurring in the Major River habitat and also using artificial water sources such as dams, wells and cattle troughs. Burrowing frogs aestivate underground when conditions are dry, so are difficult to sample except immediately after wet conditions. Burrowing frogs are likely to occur in the vicinity of the Major and Minor Rivers, and in association with small claypans in the Sandy Plain habitat. The Desert Spadefoot (*Notaden nichollsi*) is a species that burrows in sandy soil, breeding in temporary pools formed after cyclonic summer rain, the tadpoles developing into frogs very quickly. Adult frogs of this and other burrowing species also forage in adjacent terrestrial habitats when conditions are suitable. Ephemeral pools on granite outcrops may also provide breeding habitat for frogs.

Table 8. Frogs recorded in the study area.

Species	Number of captures at each site (Apr/Sep)									Other methods*
	T Site 1	T Site 2	T Site 3	T Site 4	T Site 5	T Site 6	T Site 7	T Site 8	T Site 9	
Cyclorana maini		1/0								
Litoria rubella										N
Platyplectrum spenceri		71/11							-/2	
Uperoleia glandulosa		21/0								
Total species:	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**

Other methods: N= Night sighting.

Plate 33. *Platyplectrum spenceri* and *Uperoleia glandulosa*, trapped in the Major River habitat.

5.1.2 Reptiles

There are 111 species of reptile that have the potential to occur, of which 53 were recorded in the study area (Table 9, Appendix 5). The reptile assemblage of the Pilbara Bioregion is very diverse, including a suite of endemic species associated with rocky surfaces (Doughty *et al*. 2011). As the reptile assemblage is generally informed by the ground surface (e.g. sandy, clayey or rocky surfaces) the study area is likely to support several distinct assemblages. Despite this, many reptile species are likely to occur across all habitats, although they may be more common in one.

Of the 53 species recorded during this survey, 41 were captured in trapping sites and 12 were recorded only through other methods, mainly nocturnal searches and camera traps (Table 9). Species richness at each site ranged from 13 to 19 species, noting that TSite 6 and TSite 9 were only trapped in a single season. Many species were recorded in more than one habitat (Table 9).

Tree hollows are common in the Major River habitat, providing habitat for Bush's Monitor (*Varanus bushi*), the Black-tailed Monitor (*Varanus tristis*) and other arboreal species. Other species commonly associated with Major River habitat are the Long-nosed Dragon (*Gowidon longirostris*) and Flat-shelled Turtle (*Chelodina steindachneri*).

A suite of species favour stony-surfaced habitats, including the Large Pilbara Rock Gehyra (*Gehyra macra*)(Plate 34), Medium Pilbara Rock Gehyra (*Gehyra media*), Ring-tailed Dragon (*Ctenophorus caudicinctus*) and Rock Ctenotus (*Ctenotus saxatilis*). These species are likely to occur mainly on Low Stony Hills and Rocky Outcrop habitats, with some also occurring on Stony Plains. Many species are likely to shelter and forage in crevices in the Rocky Outcrop habitat.

Plate 34. *Gehyra macra* was recorded in the Rocky Outcrop habitat.

Sandy Plains are a common habitat in the study area, and species that favour this habitat include those that burrow to lay their eggs, such as the Bearded Dragon (*Pogona minor*) and Gould's Monitor (*Varanus gouldii*), and fossorial species such as the Northwestern Sand Slider (*Lerista bipes*). These species are also likely to occur in sandy soils along Major or Minor Rivers.

Table 9. Reptiles recorded in the study area.

Species	Number of captures at each site (Apr/Sep)									Other methods*
	T Site 1	T Site 2	T Site 3	T Site 4	T Site 5	T Site 6	T Site 7	T Site 8	T Site 9	
Anilios ammodytes		1/1	1/1	1/0		1/-	0/1	1/0		
Anilios grypus		2/0		1/0		1/-				
Antaresia childreni										N
Aspidites melanocephalus										N
Carlia triacantha									-/1	N
Ctenophorus caudicinctus	4/7			3/6		1/-		1/0		D
Ctenophorus isolepis			6/0	0/1	11/3	1/-	2/7	4/0	-/6	D
Ctenophorus nuchalis								1/0		
Ctenotus duricola	1/0		3/1		4/0		3/4	4/0		
Ctenotus grandis		1/1	4/0		7/3	1/-	2	9/8	-/1	
Ctenotus helenae	1/0	1/0	15/1	3/1	5/1	4/-	7/2	6/3	-/2	C
Ctenotus pantherinus			9/3	1/4	10/8	1/-	7/2		-/1	C
Ctenotus saxatilis	26/3	5/0	7/1	9/4	1/0	12/-	5/0	9/0		C
Ctenotus schomburgkii										C
Ctenotus serventyi				2/0	1/0					
Cyclodomorphus melanops	1/0									
Delma butleri						1/-		0/2		
Delma pax	1/1	1/0			0/1			1/0		
Delma tincta	1/0					1/-				
Demansia reticulata				1/0						
Demansia rufescens					0/1					
Diplodactylus bilybara	1/0		2/0	2/0	12/0	1/-	2/0	7/2	-/1	
Egernia epsisolus										C, D
Eremiascincus pallidus		20/2								
Furina ornata	1/0						0/2			
Gehyra incognita		2/0		1/0						
Gehyra macra										N
Gehyra media	0/1						1/0			N
Gehyra micra	1/0									
Gehyra montium		1/0	0/1		2/0			1/0		N
Gehyra punctata										N
Gehyra variegata		1/1	0/1	1/1						N
Gowidon longirostris		19/8				2/-	1/0			C, D
Heteronotia binoei		1/1		1/1						

Table 9. (cont.)

Species	Number of captures at each site (Apr/Sep)									Other methods*
	T Site 1	T Site 2	T Site 3	T Site 4	T Site 5	T Site 6	T Site 7	T Site 8	T Site 9	
Lerista bipes		11/8	21/4	6/6	63/11		3/0	27/11	-/9	
Lialis burtonis						2/-		1/0		
Lucasium woodwardi	0/1		3/1	6/3	0/1	2/-	2/0	0/1	-/3	N
Menetia greyii			2/2	1/0	0/3				-/2	
Morethia ruficauda	0/1		2/4	0/3	0/3		2/4	3/8	-/3	
Pogona minor			2/0	3/0	0/2		0/1			
Proablepharus reginae	0/1	1/0	1/0						-/1	
Pseudechis australis										D
Pseudonaja mengdeni										N
Suta punctata									-/1	
Tiliqua multifasciata		1/0	0/2		1/0			1/0		D
Varanus acanthurus	0/1	0/1	1/0				0/1			
Varanus brevicauda			2/0		0/1		1/1			
Varanus bushi										D
Varanus eremius							1/0	0/1	-/1	
Varanus giganteus										C
Varanus gouldii								1/0		C
Varanus panoptes										C, D
Varanus pilbarensis										C, D
Total species:	**15**	**16**	**19**	**18**	**18**	**14**	**18**	**19**	**13**	

*C = camera trap, N = night sighting, D = day sighting.

5.1.3 Birds

There are 157 species of bird that potentially occur in the study area, of which 83 species were recorded on this survey (Table 10, Appendix 6). An additional three species were recorded by Ecoscape (2024), bringing the total known from the study area to 86. The terrestrial bird fauna of the Pilbara region is considered to be generally uniform, with a higher species richness where there is riparian vegetation such as tall *Eucalyptus* or *Melaleuca* trees (Burbidge *et al*. 2010). Most of the potentially occurring bird species have wide distributions through the Pilbara Bioregion, many occurring in a variety of habitats.

Of the 86 species recorded, 29 were recorded opportunistically outside of bird surveys and many were recorded in more than one habitat (Table 10). The most species rich sites included the Major and Minor River habitats (TSite 2 and TSite 6), with 29 species at each site, and this is likely to be due to the more complex vegetation structure in these habitats. More open habitats are likely to support less species due to a less complex vegetation structure. TSite 8 in the Sandy Plain habitat was also species rich with 29 species, and this is likely to be due in part to the proximity of ephemeral pools on the nearby granite outcrops. The presence of water is likely to draw a broader range of bird species in from the surrounding area to drink.

The Major River habitat is likely to support a range of waterbirds when inundated after heavy rainfall. A small number of wetland dependent bird species, such as ducks, grebes, ibis and plovers, were recorded during the current survey (Table 10). Waterholes on rivers also provide habitat for terrestrial birds to drink and bathe. The Major River habitat offers tree hollows for hollow nesting birds such as parrots, pardalotes, owls, woodswallows and the Tree Martin (*Petrochelidon nigricans*). Tall trees also provide nesting habitat for birds of prey. The Minor River habitat is likely to offer similar features, but to a lesser extent. Both Major and Minor Rivers have vegetation that is denser than surrounding habitats, providing nesting and roosting sites for many species.

Few species are likely to be unique to the Rocky Outcrop habitat, except the Striated Grasswren (*Amytornis striatus*) and the Little Woodswallow (*Artamus minor*). Rocky outcrops also provide nesting habitat for the Fairy Martin (*Petrochelidon ariel*) and some birds of prey (Plate 35). Granite outcrops also provide ephemeral water pools for birds to drink and shaded roosts during hot days.

The bird assemblage is likely to include species that are resident in the study area, and species that make regular or nomadic movements into and through the study area. Resident species include many of the small insectivores such as fairywrens, whistlers and robins. Resident species are present all year, though their populations may fluctuate in response to rainfall and fire. Birds that make regular seasonal movements include the Rainbow Bee-eater (*Merops ornatus*), cuckoos and some birds of prey. Honeyeaters are also likely to make seasonal or nomadic movements to take advantage of flowering events. Although not present all year, these species are likely to use the study area for foraging, breeding or shelter on a seasonal basis or when site conditions are suitable.

Table 10. Birds recorded in the study area.

Species	Frequency of occurrence at each site (n=6)									Other methods*
	T Site 1	T Site 2	T Site 3	T Site 4	T Site 5	T Site 6	T Site 7	T Site 8	T Site 9	
Australasian Grebe										P
Australian Bustard								1/1		D, S
Australian Hobby					1/0		1/0			
Australian Magpie							0/1			D
Australian Owlet-nightjar										N
Australian Pipit	0/1				1/0			0/1		D
Black Kite	1/0			1/0	1/0					
Black-chinned Honeyeater		0/1								
Black-faced Cuckoo-shrike	1/2	4/1		3/1		1/-	2/1	2/1		D
Black-faced Woodswallow	1/1				1/4		0/2	1/1	-/1	D, N
Black-fronted Dotterel										C
Black-necked Stork										P
Blue-winged Kookaburra		0/2								D
Brown Falcon	1/2	1/0	2/1			1/-		3/3	-/1	D
Brown Goshawk										D
Brown Honeyeater					1/0	1/-				
Brown Quail										D
Brown Songlark										D
Budgerigar	2/1	3/0	3/0	5/0	4/0	5/-	5/0	6/0	-/1	D
Bush Stone-curlew		1/0								C, N, S
Cockatiel		1/1	0/2	2/0	6/0	1/-	1/1	3/0	-/4	D
Collared Sparrowhawk		1/0								D
Common Bronzewing										D
Crested Bellbird		0/1	1/2	2/0			0/1	2/3	-/3	D
Crested Pigeon		2/1			1/2	1/-		1/0		D
Crimson Chat				0/1	2/0	1/-		2/0		D
Diamond Dove	1/3	5/2	1/0	1/0	1/0	2/-	2/0	2/0	-/1	D, C
Emu										S
Fairy Martin	0/1									S
Galah	2/0	1/2	3/1	3/1			4/4	6/1	-/3	D
Grey Butcherbird							0/1			
Grey Shrike-thrush										D, C
Grey Teal										C
Grey-crowned Babbler										D
Grey-headed Honeyeater				0/1				1/6		D
Hoary-headed Grebe										C
Horsfield's Bronze-cuckoo						1/-				
Horsfield's Bushlark					0/3				-/1	D
Inland Thornbill										P
Little Button-quail			1/3			1/-	0/3	1/0		D, N
Little Corella		0/1								D

Table 10. (cont.)

Species	Frequency of occurrence at each site (n=6)									Other methods*
	T Site 1	T Site 2	T Site 3	T Site 4	T Site 5	T Site 6	T Site 7	T Site 8	T Site 9	
Little Eagle				0/1						D
Little Woodswallow										D
Magpie-lark	0/3	5/5	1/0			1/-		0/1	-/1	D, C
Masked Woodswallow	1/0		1/0	1/0	4/0	1/-	2/0	3/0		D
Nankeen Kestrel	2/2	1/0	2/0		5/2	2/-	2/0	6/0		D
Pacific Black Duck										C
Painted Finch	2/6	3/5		1/0		2/-	1/2	2/0		D, C
Pallid Cuckoo						1/-				
Peaceful Dove	0/1	0/2							-/1	D
Peregrine Falcon										D
Pied Butcherbird	1/2	1/0	1/0	3/0	1/0	3/-	3/1	1/3	-/4	D, C
Pied Honeyeater						1/-				
Purple-backed Fairy-wren										D
Rainbow Bee-eater	1/1	5/3				1/-			-/4	D
Red-backed Kingfisher	1/2	0/5					1/0	2/0	-/1	D
Red-browed Pardalote	0/2	0/1		1/0			0/1	0/1	-/4	D
Rufous Songlark		3/3								D
Rufous Whistler						3/-				D
Sacred Kingfisher										C
Singing Honeyeater	3/5		5/5	4/5	4/6	6/-	3/3	4/4		D
Southern Boobook										P
Spinifex Pigeon	1/0									D, C
Spinifexbird	2/4		2/3		2/1	1/-		1/0		D
Spotted Harrier	1/0		1/0	2/0	0/1	1/-		1/0		D
Spotted Nightjar					1/0	1/-	1/0			N
Square-tailed Kite									-/1	D
Straw-necked Ibis										C
Striated Grasswren										D
Swamp Harrier										D
Tawny Frogmouth										D
Torresian Crow	3/5	5/2	1/1	1/0	2/0	1/-	1/0	1/2		D, C
Tree Martin		1/0								
Wedge-tailed Eagle										D
Welcome Swallow										D
Western Bowerbird										D
Western Quail-thrush										D
Whistling Kite										P
White-breasted Woodswallow										P
White-necked Heron										D
White-plumed Honeyeater		6/6				1/-			-/1	D
White-winged Fairy-wren				0/1	2/0		0/2		-/1	D

Table 10. (cont.)

Species	Frequency of occurrence at each site (n=6)									Other methods*
	T Site 1	T Site 2	T Site 3	T Site 4	T Site 5	T Site 6	T Site 7	T Site 8	T Site 9	
White-winged Triller		1/0		0/1		3/-		1/0		D
Willie Wagtail	1/0	5/1				2/-		3/2		D, C
Yellow-throated Miner		2/1	1/0			5/-	0/2	2/1		D
Zebra Finch	4/0	2/0	5/0	5/0	6/0	3/-	6/0	6/0		D, C
	25	**29**	**17**	**20**	**21**	**29**	**23**	**29**	**17**	

*C = camera trap, N = night sighting, D = day sighting, S = Secondary signs (tracks, scats, nests etc.), P = previous survey (Ecoscape 2024).

Plate 35. Fairy Martin (*Petrochelidon arial*) nests.

5.1.4 Mammals

There are 41 species of mammal that potentially occur in the study area, of which 35 are native and eight introduced (Appendix 7). A total of 31 species were recorded on this survey, of which 26 were native and five introduced (Table 11). The mammal assemblage is likely to be relatively intact, with the exception of species that are extinct in the Pilbara Bioregion. Australia has a history of mammal extinctions since European settlement, most likely due to changed fire regimes and the impacts of feral Cats and Foxes (Woinarski *et al*. 2015). Of the mammals known from the Pilbara Bioregion, 15% are now extinct (McKenzie *et al*. 2009).

Between one and five species were trapped at each site, but most species were recorded by other methods including camera trapping, bat call records and opportunistic observation of secondary signs (Table 11).

A small suite of species favour rocky habitats, including Woolley's False Antechinus (*Pseudantechinus woolleyae*), Long-tailed Dunnart (*Sminthopsis longicaudata:* Priority 4), Common Rock-rat (*Zyzomys argurus*), Rothschild's Rock-wallaby (*Petrogale rothschildi*), Northern Quoll (*Dasyurus hallucatus:* Endangered) and several bat species (Plate 36). Where present, these species are likely to occur in the Rocky Outcrop habitat, although they may also move between habitat patches.

Species that favour sandy soils are likely to be widespread across the study area and favour the Sandy Plain, Minor River and Major River habitats. This includes the Lesser Hairy-footed Dunnart (*Sminthopsis youngsoni*), Spinifex Hopping Mouse (*Notomys alexis*) and Desert Mouse (*Pseudomys desertor*). The Sandy Inland Mouse (*Pseudomys hermannsburgensis*) prefers sandy sites, but was trapped at most sites (Table 11, Plate 36). The Little Red Kaluta (*Dasykaluta rosamondae*) is similarly widespread and occurred in both the Sandy Plain and Stony Plain habitats in this survey (Table 11).

Plate 36. Woolley's False Antechinus (left) and Sandy Inland Mouse (right).

Table 11. Mammals recorded in the study area.

Species	Number of captures at each site (Apr/Sep)									Other methods*
	T Site 1	T Site 2	T Site 3	T Site 4	T Site 5	T Site 6	T Site 7	T Site 8	T Site 9	
Echidna										
Tachyglossus aculeatus										C
Dasyurid Marsupials										
Dasycercus blythi (P4)										C
Dasykaluta rosamondae			1/14		18/15		4/6			C
Dasyurus hallucatus (En)	0/1									C
Ningaui timealeyi	0/2									
Planigale kendricki	0/3					1/-				
Pseudantechinus woolleyae										C
Sminthopsis macroura			1/0			1/-				
Sminthopsis youngsoni			1/11		1/2		0/1	0/5	-/6	
Possums										
Trichosurus vulpecula (LS)										C
Kangaroos and wallabies										
Lagorchestes conspicillatus (P4)										C, S
Osphranter robustus										D
Osphranter rufus										D, N, C
Petrogale rothschildi										C, D
Rodents										
Notomys alexis								0/1		
Pseudomys chapmani (P4)										S
Pseudomys desertor			0/2							
Pseudomys hermannsburgensis	0/1	1/1	-/6	0/1	1/12		0/3	0/1		
Zyzomys argurus										C
Bats										
Macroderma gigas (Vu)										X
Saccolaimus flaviventris										A
Taphozous georgianus										A
Chaerephon jobensis										A
Chalinolobus gouldii										A
Scotorepens greyii										A
Vespadelus finlaysoni										A

Table 11. (cont.)

Species	Number of captures at each site (Apr/Sep)									Other methods*
	T Site 1	T Site 2	T Site 3	T Site 4	T Site 5	T Site 6	T Site 7	T Site 8	T Site 9	
Introduced Mammals										
Bos taurus										C, S
Camelus dromedarius										D, S
Canis familiaris dingo										C
Equus caballus										D
Felis catus										N, C
Total species:	**4**	**1**	**5**	**1**	**3**	**2**	**3**	**3**	**1**	

*A = Anabat call recording, S = secondary signs, C = camera trap, N = night sighting, D = day sighting, X = dead specimen.

Five introduced mammal species were recorded in the study area (Table 11, Appendix 7). Cattle (*Bos taurus*), Camels (*Camelus dromedarius*) and Horses (*Equus caballus*) are all introduced herbivores and were generally observed opportunistically. The Cat (*Felis catus*) and Dingo (*Canis familiaris dingo*) were recorded on camera traps (Plates 37 - 38). These species are feral predators known to prey on native fauna species, although the Dingo has been naturalised over a considerably longer time. 'Predation by Feral Cats' and 'Predation by the European Red Fox' are listed as a key threatening processes under the EPBC Act. Foxes prey on critical weight range mammals (i.e. those between 35g and 5.5kg) and ground-nesting birds (Commonwealth of Australia 2018). Feral Cats have contributed to the extinction of many small to medium sized native mammals and ground-nesting birds in the arid zone (Commonwealth of Australia 2015). Though mammals tend to be the dominant prey (Commonwealth of Australia 2015), each Feral Cat in natural environments kills on average 225 reptiles per year, with cats in arid areas taking even more, equating to the predation of about 1.8 million reptiles per day (Woinarski *et al*. 2018).

Plate 37. Dingo (*Canis familiaris dingo*) on camera.

Plate 38. Cat (*Felis catus*) on camera.

5.2 Vertebrate Fauna of Conservation Significance

Twenty-eight conservation significant fauna have either been recorded or may occur in the study area; nine Threatened, eight Migratory, one Specially Protected, eight Priority and two Locally Significant (Table 12). Each species is summarised in Table 12 and discussed in the sections below. The results of the DBCA Threatened and Priority Fauna Database extract are shown on Figure 11 and the conservation significant fauna recorded on this survey are shown in Figure 12 as well as individual Figures for some species. The results of the EPBC Act Protected Matters Search Tool extract are shown in Appendix 8.

Several conservation significant species listed on database searches in the area have been omitted from the list of potential fauna in Appendices 4 – 7 and the discussion below. These species are listed in Appendix 9 and includes Migratory shorebirds that primarily occur in coastal habitats, seabirds, marine turtles and species only likely to occur as vagrants. The study area does not provide habitat likely to regularly support these species.

Table 12. Summary of conservation significant fauna.

Key to status: Cr = Critically Endangered, En = Endangered, Vu = Vulnerable, Mi = Migratory, OS = Other Specially Protected, P1 – P4 = Priority 1 – 4, LS = Locally Significant.

Species	Conservation Status				Likelihood of Occurrence*	Notes
	EPBC Act	BC Act	DBCA Priority	Locally significant		
Threatened Species						
Pezoporus occidentalis **Night Parrot**	En	Cr			Possible	This species is known from very few records anywhere. It is possible that this species occurs in the region, although there are no nearby records, and the habitats of the study area are unlikely to be suitable for this species.
Dasyurus hallucatus **Northern Quoll**	En	En			Known to occur	**Recorded in the study area, April 2024 and April, August and September 2025.** Likely to be a common breeding resident of the Rocky Outcrops habitat. Dispersal and foraging is likely to occur along Major Rivers and in habitats adjacent to breeding habitat.
Tringa nebularia **Common Greenshank**	En & Mi	En & Mi			Possible	Possible non-breeding summer visitor to dams, waterholes on Major Rivers and/or small claypans in the Sandy Plain.
Calidris acuminata **Sharp-tailed Sandpiper**	Vu & Mi	Vu & Mi			Possible	Possible non-breeding summer visitor to dams or waterholes on Major Rivers.
Macrotis lagotis **Bilby**	Vu	Vu			Potential	Known to occur nearby. Potentially an uncommon resident or visitor to the Sandy Plain or Major River habitat**.**
Rhinonicteris aurantia (Pilbara form) **Pilbara Leaf-nosed Bat**	Vu	Vu			Possible	Possible foraging visitor on occasion but not recorded in the study area and no diurnal roosting habitat in the study area.
Macroderma gigas **Ghost Bat**	Vu	Vu			Known to occur	**Recorded in the study area September 2025.** Likely to be a regular foraging visitor in small numbers to all habitats. No critical diurnal roosting habitat likely in the study area.
Liasis olivaceus barroni **Pilbara Olive Python**	Vu	Vu			Potential	Known to occur in the region (Figure 11), this species may be a foraging visitor and possible breeding resident of the Major River and Rocky Outcrop habitats.
Falco hypoleucos **Grey Falcon**	Vu	Vu			Likely	Recorded opportunistically nearby in September 2025 (Figure 12), this species is likely to be a foraging visitor to open habitats and possible breeding resident of the Major River habitat.

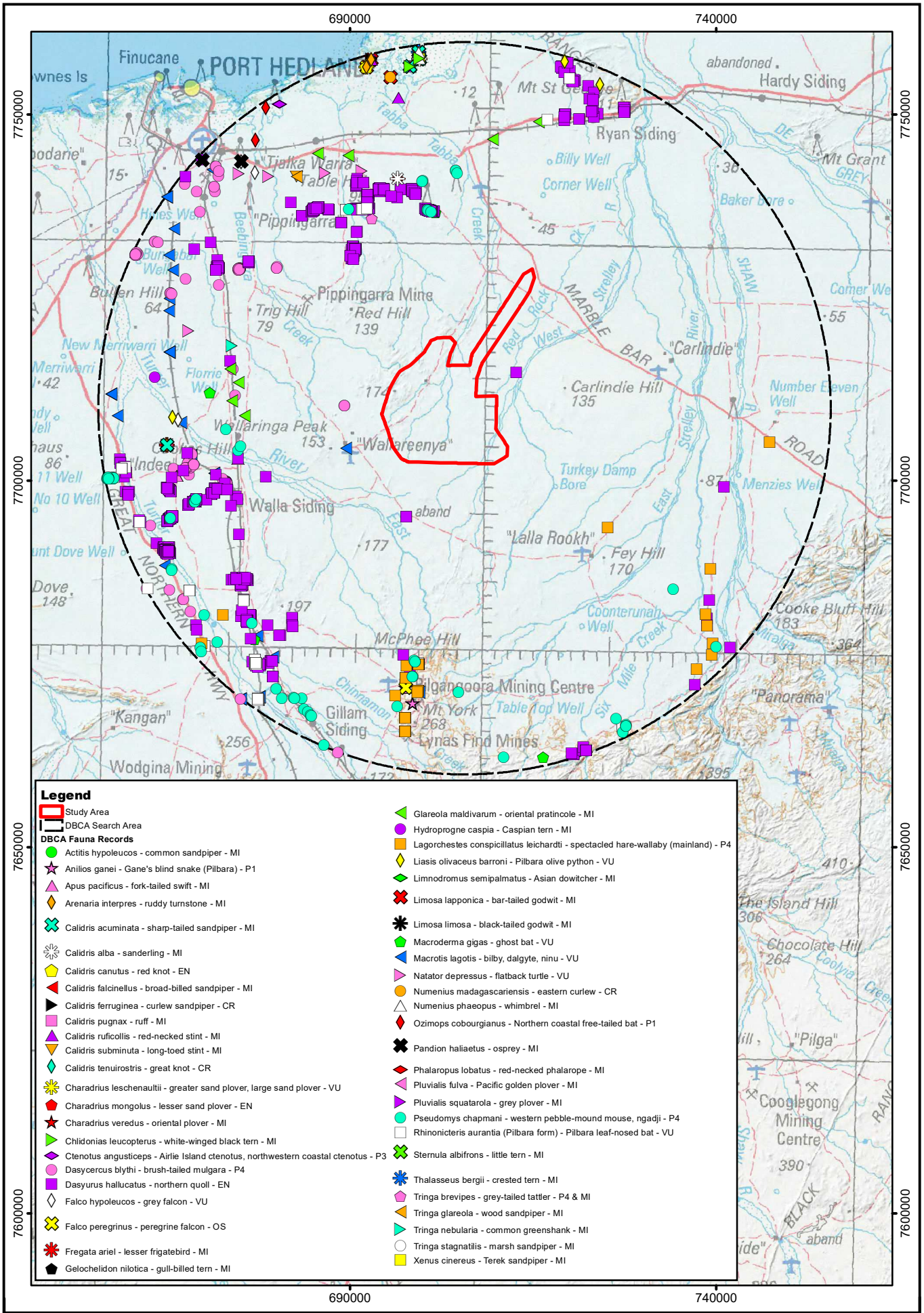
Table 12. (cont.)

Species	Conservation Status				Likelihood of Occurrence*	Notes
	EPBC Act	BC Act	DBCA Priority	Locally significant		
Migratory Species						
Charadrius veredus **Oriental Plover**	Mi	Mi			Likely	Recorded opportunistically nearby. Likely to be an irregular non-breeding summer visitor to open plains and recently burnt areas, occurring in small numbers only.
Actitis hypoleucos **Common Sandpiper**	Mi	Mi			Potential	Potential non-breeding summer visitor to dams, waterholes on Major Rivers and/or small claypans in the Sandy Plain.
Calidris melanotos **Pectoral Sandpiper**	Mi	Mi			Possible	Possible non-breeding summer visitor to dams or waterholes on Major Rivers.
Calidris ruficollis **Red-necked Stint**	Mi	Mi			Possible	Possible non-breeding summer visitor to dams, waterholes on Major Rivers and/or small claypans in the Sandy Plain.
Tringa glareola **Wood Sandpiper**	Mi	Mi			Possible	Possible non-breeding summer visitor to dams, waterholes on Major Rivers and/or small claypans in the Sandy Plain.
Tringa stagnatilis **Marsh Sandpiper**	Mi	Mi			Possible	Possible non-breeding summer visitor to dams, waterholes on Major Rivers and/or small claypans in the Sandy Plain.
Apus pacificus **Fork-tailed Swift**	Mi	Mi			Likely	Although likely to occur on occasion, this species is largely aerial in Australia so the terrestrial habitats in the study area are unlikely to be of particular importance to the species.
Glareola maldivarum **Oriental Pratincole**	Mi	Mi			Potential	Non-breeding summer visitor to open plains or claypans in the Sandy Plain habitat.
Specially Protected						
Falco peregrinus **Peregrine Falcon**		OS			Known to occur	**Recorded in the study area April and September 2025.** This species potentially occurs as a foraging visitor but breeding habitat is limited in the study area.
Priority Species						
Ctenotus nigrilineatus **Pin-striped Finesnout Ctenotus**			P1		Possible	This species is known from very few records, but habitats in the study area may be suitable.
Anilios ganei **Gane's Blind Snake**			P1		Possible	This species is known from very few records, but habitats in the study area may be suitable.

Table 12. (cont.)

Species	Conservation Status				Likelihood of Occurrence*	Notes
	EPBC Act	BC Act	DBCA Priority	Locally significant		
Ozimops cobourgiana **Northern Coastal Free-tailed Bat**			P1		Possible	Known to occur nearby. Likely to be a foraging visitor to most habitats, may roost in tree hollows in the Major River habitat.
Dasycercus blythi **Brush-tailed Mulgara**			P4		Known to occur	**Recorded in the study area in April 2024 and April 2025.** Likely to be a common resident of the Sandy Plain habitat.
Lagorchestes conspicillatus **Spectacled Hare-wallaby**			P4		Known to occur	**Recorded in the study area April 2024, April and September 2025.** This species is known to occur in the region and suitable habitat is present in the Sandy Plain habitat.
Antechinomys longicaudata **Long-tailed Dunnart**			P4		Potential	This species is known to occur in the region, and potentially suitable habitat is present in the Low Stony Hills and Rocky Outcrops.
Leggadina lakedownensis **Northern Short-tailed Mouse**			P4		Potential	This species is known to occur in the region, and most habitats are potentially suitable.
Pseudomys chapmani **Western Pebble-mound Mouse**			P4		Known to occur	**Active mounds recorded in the study area April and September 2025.** Likely to be a common resident of the Stony Hills habitat.
Locally Significant Species						
Stipiturus ruficeps **Rufous-crowned Emu-wren**				LS	Likely	Likely to occur on Sandy or Stony Plains where mature spinifex is present.
Trichosurus vulpecula **Common Brushtail Possum**				LS	Known to occur	**Recorded on a camera trap in April and September 2025.** Likely to be an uncommon resident of Major Rivers and possibly Rocky Outcrops.

* See Table 4.



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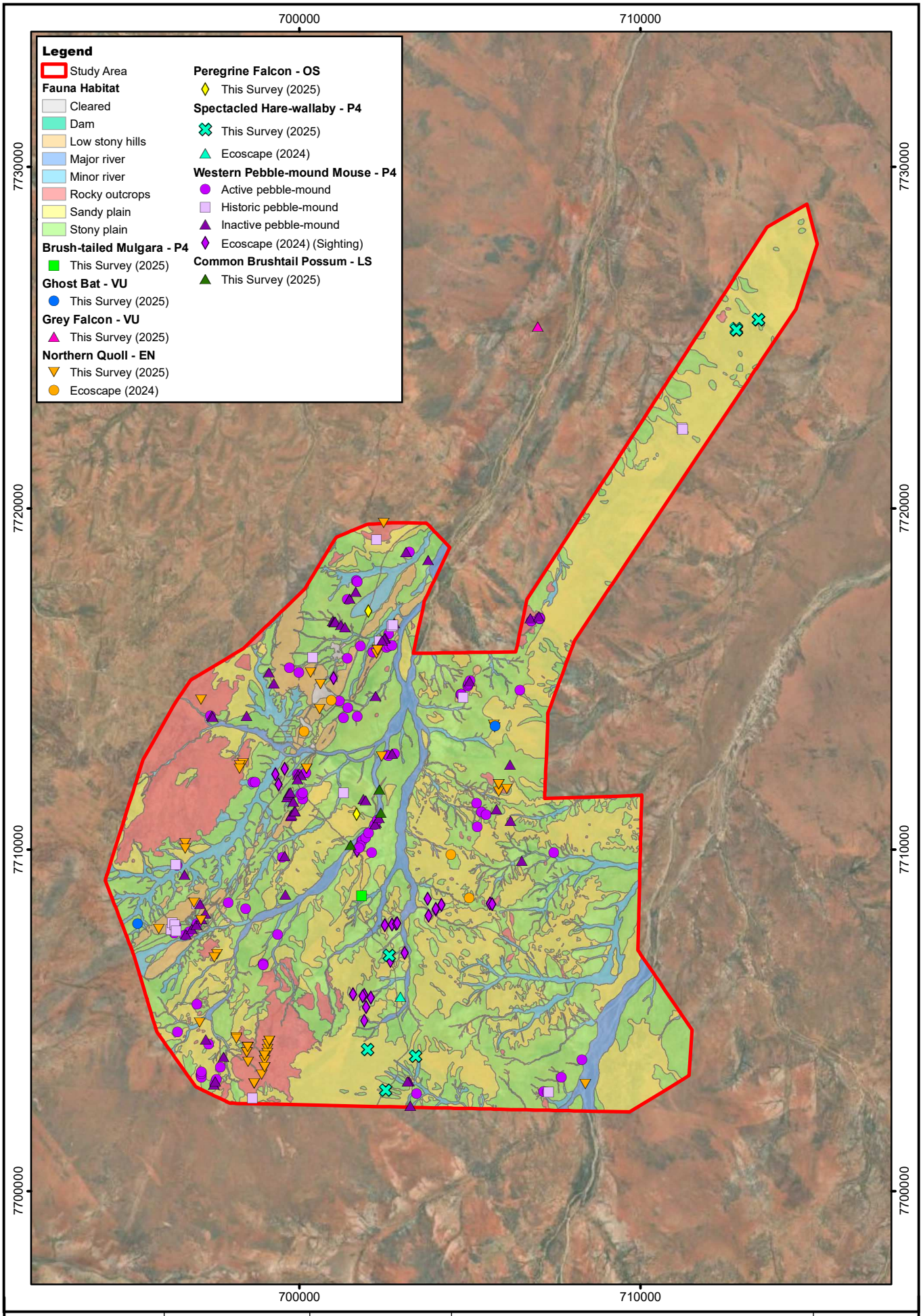
MGA94 (Zone 50)

Author: J. Wilcox

Western Wildlife

Tabba Tabba Project
DBCA Threatened and Priority Fauna Database records

Figure: **11**



Drawn: CAD Resources www.cadresources.com.au Tel: (08) 9246 3242	N 0 1 2 km Scale: 1:150,000 MGA94 (Zone 50)	Western Wildlife	**Tabba Tabba Project** **Conservation significant fauna recorded**	Figure: **12**
CAD Ref: a3168Fa011 A4				
Date: March 2026 Rev: A	Author: J. Wilcox			

5.2.1 Threatened Fauna

There are nine Threatened species that were recorded or may occur in the study area (Table 12).

Threatened species are those that are considered in danger of extinction as their populations have declined and/or are still declining, and their total population size is small and/or fragmented or geographically restricted. Sites that support these species may be important for their long-term conservation, particularly if the site supports a resident or breeding population.

Night Parrot – *Pezoporus occidentalis*

The Night Parrot is listed as Critically Endangered under the EPBC Act and BC Act.

Historically, the Night Parrot was recorded across a large range in the arid and semi-arid interior of Australia (Garnett *et al*. 2011). In recent times however, there are very few verified records of the species. Western Australia records are from six sites including Lake Gregory, a site near Wiluna and near the Fortescue Marsh in the Pilbara (NPRT 2019, Davis and Metcalf 2008, Garnett and Baker 2021). Across Australia, no more than 30 individual Night Parrots were detected 2013 – 2020, and sampling with passive acoustic detectors over the last few years generally failed to find any further birds (Garnett and Baker 2021). An exception to this is the recent find of up to 50 birds in a remote region of the Great Sandy Desert, close to the Northern Territory border.

Based on current knowledge, the Night Parrot's two key habitats are low, dense vegetation for roosting during the day, and floodplains or other low-lying areas for foraging at night (DBCA 2024). Contemporary records of roosting habitat are in structurally complex stands of long-unburnt (>20 years) mature Spinifex (DCCEEW 2025, DBCA 2024, Garnett and Baker 2021). There are often large ring-forming Spinifex clumps, with records of roosting often in *Triodia longiceps* or similar species (DPAW 2017, DBCA 2024). Typically, roosting sites are a few hectares in area, and although very small patches can be suitable, these patches are widespread at a landscape level where roosting has persisted over time (DBCA 2024). At known sites, long-unburnt Spinifex has persisted due to complex topography or bare stony ground providing a barrier to fire.

Foraging habitat varies but includes high productivity areas such as floodplains, claypans, chenopod-dominated systems around salt lakes and run-on areas (DBCA 2024, Garnett and Baker 2021). Foraging species are likely to vary across Australia, but include herbs, grasses, grass-like plants, *Sclerolaena spp*. and other chenopods (DPAW 2017). When mass seeding, Spinifex is also likely to provide a foraging resource (DBCA 2024). Foraging habitat is not necessarily in close proximity to roosting habitat, as birds have been known to fly up to 10km from roosting sites to forage (DBCA 2024).

Both foraging and roosting sites are flat or gently sloping and are very open with few trees or shrubs (DBCA 2024). Tree and shrub density at known Night Parrot roosting sites is typically 10 – 15 stems/ha or lower (Adaptive NRM 2021).

As the Night Parrot is so rare, all sub-populations are considered to be 'important populations' (DCCEEW 2025). Critical habitat for the Night Parrot has been defined in the Conservation Advice for the species (DCCEEW 2025), and includes:

- Roosting habitat
- Foraging habitat
- Flyways (between roosting and foraging sites)
- Water sources
- Gastrolith sources

Key threats to the Night Parrot include predation by foxes and cats, habitat degradation due to large-scale over-grazing by introduced herbivores, habitat and water changes due to pastoralism, habitat loss due to potash or other mining, fire regimes that result in loss of mature spinifex and collision with fences or vehicles (DCCEEW 2025, Garnett and Baker 2021).

Knowledge about the Night Parrot's current distribution and habitat requirements in Western Australia is based on relatively few records, therefore, there is considerable uncertainty when assessing the likelihood of occurrence of this species. The study area falls within the Chichester IBRA subregion, considered to be part of the high priority area for survey (DBCA 2024). The study area is outside the area modelled as 'species or species habitat likely to occur', but inside the area modelled as 'species or species habitat may occur', according to the Species Profile and Threats Database (DCCEEW 2026). No Night Parrots have been recorded within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11).

In the study area, small claypans within the Sandy Plains habitat may be potential Night Parrot foraging habitat. For the majority of the study area, however, the surrounding vegetation is likely to be too heavily wooded, as the Night Parrot favours open habitats (DCCEEW 2025). Only small parts of the northeastern extension of the study area may possibly be sufficiently open to be favourable for the Night Parrot. Any foraging habitat present would only be considered critical habitat if within the foraging range of a roost, about 10km. Thus far no Night Parrots have been recorded within 40km (DBCA 2025).

Potential roosting habitat appears to be absent from the study area. The habitats in the study area are generally too wooded to be favourable for roosting birds, with a fairly dense Acacia shrub layer in most areas of the Sandy Plains and Stony Plains habitats, and many areas also being lightly treed (e.g. Plates 25 – 26). In addition, much of the study area is regularly burnt for pastoralism (Figure 3), resulting in a lack of complex stands of mature Spinifex on areas of plains. Examination of fire scar mapping and aerial photography (including historical imagery on Google Earth) failed to find any stands of open Spinifex approaching >20 years old. Contemporary Western Australian records of this species have been associated with inland salt lakes and dissected rocky areas where Spinifex has been protected from regular fires, (DPAW 2017, DBCA 2024), and although the study area has small claypans that act as firebreaks these appear to be too small and scattered to protect long unburnt patches in the long term. The study area is set within a region of similar pastoral country, also subject to regular fire.

Although the Night Parrot possibly occurs over the study area on occasion, when transiting between sites, the likelihood is extremely low, and the habitats of the study area are unlikely to comprise critical habitat.

Northern Quoll – *Dasyurus hallucatus*

The Northern Quoll is listed as Endangered under the EPBC Act and BC Act.

The Northern Quoll occurs across the northern parts of Australia including Western Australia, the Northern Territory, Queensland and some offshore islands (Van Dyck and Strahan, 2008). The Northern Quoll has declined, now occurring as several disjunct populations, of which the Pilbara population is one (Braithwaite and Griffiths, 1994). The reduction in population size is estimated at 50% over the last decade, with a further 25% reduction expected over the next decade (Woinarski *et al*., 2014). An 'important population' is defined as one that is important to the long-term survival of the Northern Quoll (DoE 2016). This may be a population that is high density, a population free of Cane Toads and where Cane Toads are unlikely to gain a foothold, or a population subject to on-going research (DoE 2016).

The Northern Quoll is reproductively mature at 11 months, and breed in their first year (Van Dyck and Strahan, 2008). Breeding occurs between July and September and is usually synchronised within a population. At about two months old the young are left in a den while the mother forages, and the young are weaned at six months (Van Dyck and Strahan 2008). In general, all adults die after breeding, though some females have been recorded living up to three years in the wild (Van Dyck and Strahan 2008).

The Northern Quoll occurs in a variety of habitats across its range, but favours dissected rocky escarpments in the Pilbara (Hill and Ward 2010, Van Dyck and Strahan 2008). Where shelter habitat occurs within the Northern Quolls predicted range, it is considered 'habitat critical to the survival of the species' (DoE, 2016). In the Pilbara, shelter and denning habitat consists of rocky habitats such as ranges, escarpments, mesas, gorges, breakaways and boulder fields (DoE, 2016). Northern Quoll habitat preferences have been modelled (Molloy *et al.*, 2017; Shaw *et al*. 2022), with granite areas south of Port Hedland identified as a habitat stronghold.

Little is known about Northern Quoll foraging and dispersal habitats, however, the EPBC Act referral guidelines recognise that all native vegetation within 1km of shelter habitat or Northern Quoll records should be considered foraging and dispersal habitat (DoE 2016). Recent studies have shown that Northern Quolls in the Pilbara form two subpopulations (roughly east and west) with a great deal of mixing, indicating that individuals have a great capacity for dispersal (Shaw *et al*. 2022). Females tend to stay close (about 2km) to their maternal dens, whereas males disperse further (4-10 km) (Shaw *et al*. 2022). Higher dispersal capacity is linked to proximity to watercourses (Shaw *et al*. 2022). Denning females from Dolphin Island and around the Turner River were captured across a broad area and tracked back to dens that were sparsely separated across the landscape (Chan 2017, Cowan 2019).

Cane Toads are considered the main threat to the Northern Quoll in the parts of its range that overlap the Cane Toad distribution (Hill and Ward 2010). As yet the Pilbara is free of Cane Toads, though it is uncertain whether this will be the case in the future.

Feral Predators, such as the Fox (*Vulpes vulpes*) and Cat (*Felis catus*), are likely to prey on Northern Quolls. Henandez-Santin (2018) suggests that in the Pilbara, cats may exclude quolls from open spinifex plains where there is less shelter, restricting them to more protected rocky habitats where they can escape predation. Inappropriate fire regimes, such as too-frequent fires, appear to impact Northern Quolls, possibly through decreased cover resulting in increased predation, changes to habitat structure or reduction in food availability, however, these mechanisms are not well understood (Hill and Ward 2010).

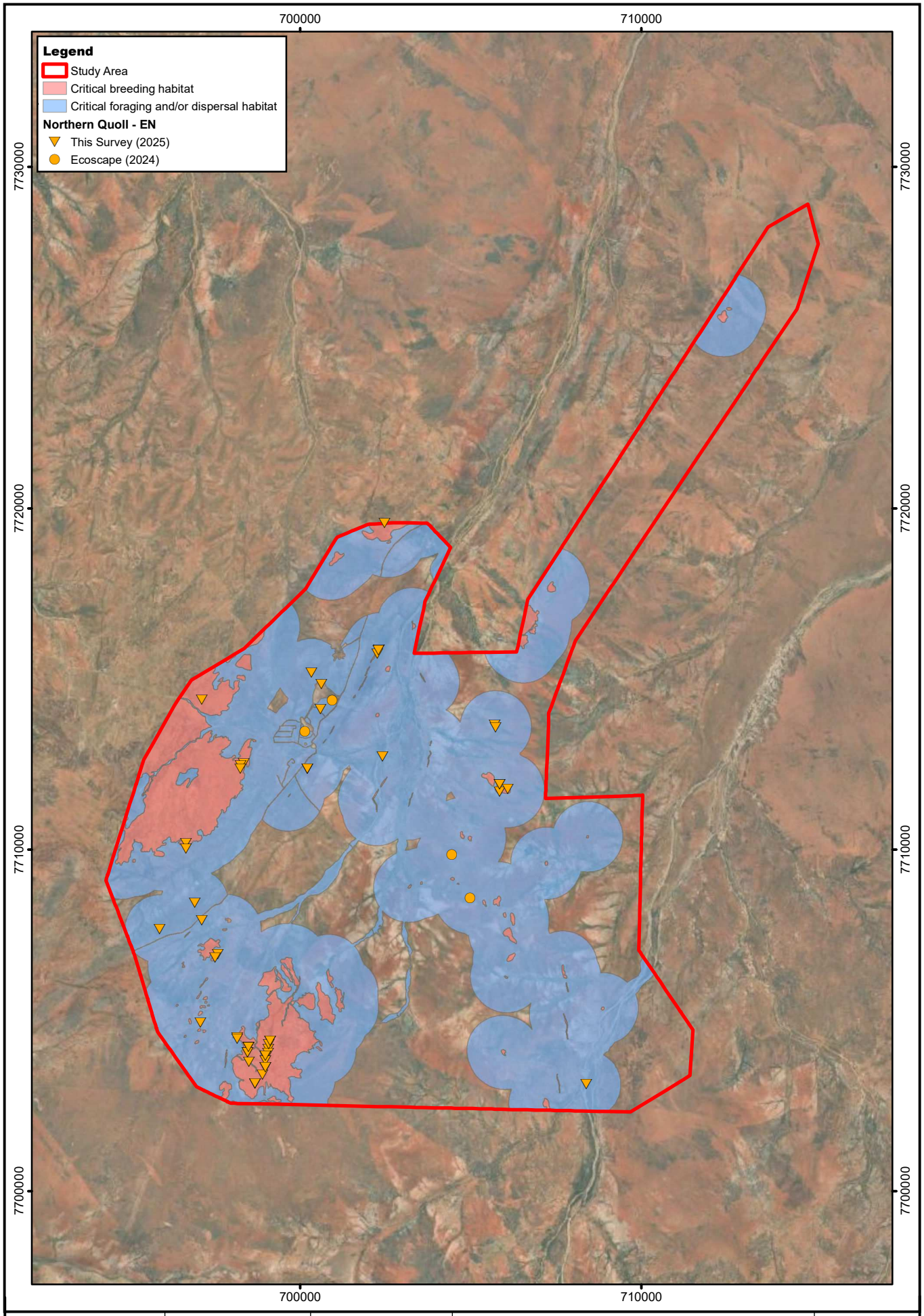
Habitat degradation caused by livestock is of concern in the northern savannah habitats, and together with inappropriate fire regimes, may be the cause of declines of this species in the Pilbara (Hill and Ward 2010). Habitat destruction occurs through developments such as mining, housing and agriculture, and though it occurs on a smaller scale than habitat degradation, it may still have a significant impact on critical habitat (Hill and Ward 2010).

The Northern Quoll was recorded in the study area and there are many records within 40km on DBCA's Threatened and Priority Fauna Database (Plate 39, Figures 11 and 12). The Northern Quolls in the study area are considered to be an 'important population' as they appear to be abundant and they occur in refuge-rich granite habitats: two criteria listed in the referral guidelines for the species (DoEE 2016).

Shelter habitat for Northern Quoll in the study area is primarily within the Rocky Outcrop habitat (Figure 13). The Major River habitat is likely to be important for foraging and dispersal, as it contains shelter such as tree hollows and is likely to be a higher productivity foraging environment due the seasonal presence of water. Breeding is likely to be restricted to Rocky Outcrops. Northern Quolls have been found to generally avoid spinifex sandplain habitat, and when found in this habitat they remain close to rocky areas and unburnt areas with higher vegetation cover (Dunlop *et al*. 2023). Lack of genetic structuring in the Northern Quoll population, however, suggests that males must move through spinifex sandplains when dispersing (Dunlop *et al*. 2023).

It is likely that the Rocky Outcrop habitat is critical breeding habitat for the Northern Quoll. Foraging and dispersal habitat within 1km of the Rocky Outcrop habitat, within 1km of a Northern Quoll record or in the Major River habitat, is also considered critical habitat (Figure 13).

Plate 39. Northern Quoll on camera in the study area.



Drawn: CAD Resources www.cadresources.com.au Tel: (08) 9246 3242	N 0 1 2 km Scale: 1:150,000 MGA94 (Zone 50)	Western Wildlife	**Tabba Tabba Project** **Northern Quoll records and critical habitat**	Figure: **13**
CAD Ref: a3168Fa012 A4				
Date: March 2026 Rev: A	Author: J. Wilcox			

Common Greenshank – *Tringa nebularia*

The Common Greenshank is listed as Migratory under the BC Act and both Endangered and Migratory under the EPBC Act.

The Common Greenshank breeds in the northern hemisphere and is a visitor to Australia generally between September and March (Johnstone and Storr 1998). Threats to this species occur mainly outside Australia in its coastal stopover locations (Garnett and Baker, 2021). Within Australia the key threats include increased frequency and length of droughts and sea level rise due to climate change, loss and degradation of coastal and wetland habitats and disturbance at foraging and roosting sites (Garnett and Barker 2021; DCCEEW 2024b). Critical habitat for this species is defined in the Conservation Advice and includes a mosaic of foraging and roosting habitat, occurring in marine, freshwater or artificial wetlands (DCCEEW 2024b). The Common Greenshank avoids open coastlines, but has been recorded in swamps, lakes, large rivers, sewage farms, saltworks, inundated rice fields, reservoirs, flooded grasslands, saltmarsh, sandy or muddy coastal flats, mangroves estuaries, lagoons and pools on tidal reefs (DCCEEW 2024b). To be considered critical habitat, the site would need to support nationally or internationally important numbers of birds (Table 13).

There are few records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). Although not recorded in the study area, this species is a possible non-breeding visitor to Dams, waterholes on Major Rivers or claypans in the Sandy Plain habitat when these are inundated after summer rain. These habitats are not likely to regularly support more than a few individuals so are unlikely to be considered critical habitat.

Sharp-tailed Sandpiper – *Calidris acuminata*

The Sharp-tailed Sandpiper is listed as Migratory under the BC Act and both Vulnerable and Migratory under the EPBC Act.

This species was recently listed as Vulnerable due to population decline (DCCEEW 2024a). The Sharp-tailed Sandpiper favours non-tidal freshwater, brackish or hypersaline wetlands, though it also occurs in other habitats including coasts and sewage farms (Geering *et al*. 2007, Garnett and Baker 2021, DCCEEW 2024a). It occurs on both coastal and inland waters, and in years of heavy inland rainfall they may remain at ephemeral wetlands instead of migrating to Southern Australia (Weller *et al*. 2019). This species is a non-breeding visitor to the southwest, mostly between September and March (Johnstone and Storr 1998).

Threats to this species occur mainly outside Australia in its coastal stopover locations (Garnett and Baker 2021). Within Australia the key threats include increased frequency and length of droughts and sea level rise due to climate change, loss and degradation of wetland habitats (Garnett and Barker 2021, DCCEEW 2024a). Critical habitat for this species is defined in the Conservation Advice, and it is noted that this species is more adaptable in its habitat choice compared to other shorebirds, using both coasts and inland waters, with some of the highest densities occurring in the grassy edges of shallow inland freshwaters (DCCEEW 2024a). To be considered critical habitat, the site would need to support nationally or internationally important numbers of birds (Table 13).

There are few records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). Although not recorded in the study area, this species is a possible non-breeding visitor to Dams, waterholes on Major Rivers or claypans in the Sandy Plain habitat when these are inundated after summer rain. These habitats are not likely to regularly support more than a few individuals so are unlikely to be considered critical habitat.

Bilby – *Macrotis lagotis*

The Bilby is listed as Vulnerable under the BC Act and EPBC Act.

The Bilby currently occurs patchily across the Pilbara and inland northern Australia with the total population estimated at less than 10,000 individuals and in decline (Woinarski *et al*. 2014). The Bilby inhabits spinifex on plains and alluvial areas, Mulga on ridges and rises and tussock grasslands on uplands and hills (Pavey 2006). The Bilby is omnivorous, foraging on a range of invertebrates, bulbs, seeds and fungi. They extract root-dwelling invertebrate larvae from a range of species, usually *Acacia* (Southgate *et al*. 2018). Home-range size is not known for many populations but can be large as the Bilby is highly mobile (DCCEEW 2023). In the Tanami, burrows used in consecutive nights were occasionally up to 1.5km apart for females and 2.6km apart for males (Southgate *et al*. 2007). In Queensland, mean home-rages were 203ha for females and 511ha for males (McRae 2004), while in South Australia mean home-ranges were found to be 18ha for females and 316ha for males, over an 18-month period (Moseby and O'Donnell 2003).

Key threats to the Bilby are introduced predators (foxes and cats), inappropriate fire regimes, and habitat fragmentation and degradation due to Rabbits, livestock and/or mining (Woinarski *et al*. 2014, DCCEEW 2023).

Critical habitat for the Bilby can be difficult to define as they use a variety of habitats across their range. In the recovery plan, critical habitat is defined as any area where the species is known or likely to occur as modelled on the Species Profile and Threats Database (SPRAT), anywhere the Bilby is found to occur, or any areas in between that the Bilby may periodically occupy (DCCEEW 2023).

There are 30 records of the Bilby within 40km of the study area on DBCA's Threatened and Priority Fauna Database, all to the west of the study area (Figure 11). Although not recorded during this survey, the study area is within the current known range of the species and contains potentially suitable Sandy Plain habitat, although much of the habitat is of marginal quality for Bilby. Although the Sandy Plains include plant species that support root-dwelling larvae, such as *Acacia bivenosa*, *Acacia stellaticeps* and *Acacia trachycarpa* (Southgate *et al*. 2018), their incidence is patchy. Soils in the central part of the study area are sandy at the surface, but overlay very hard soils, and are unlikely to be suitable for burrowing. Soils become sandier, and therefore more suitable, in the northern and southern parts of the study area.

By the definition given in the recovery plan, the Sandy Plains habitat would comprise critical habitat, however, based on soil and vegetation, this habitat is most likely to be used for dispersal and unlikely to be regularly occupied. Unlike critical habitat for other Threatened species, Bilby habitat is often widespread. As the Bilby can move its home range in response to the changing availability of food (Van Dyck and Strahan 2008), they may not always be present despite suitable habitat being available.

Pilbara Leaf-nosed Bat – *Rhinonicteris aurantia* (Pilbara form)

The Pilbara Leaf-nosed Bat is listed as Vulnerable under the EPBC Act and BC Act.

The Pilbara Leaf-nosed Bat requires warm, humid diurnal (daytime) roost sites and forages in gorges, along watercourses and over low Spinifex-covered hills (TSSC 2016d). The local distribution of the Pilbara Leaf-nosed Bat is mostly strongly influenced by the suitability of roost caves (hot and with a high humidity level) rather than habitat type. The species is heavily reliant on warm (28 - 32°C), humid (85 - 100%) sites for roosting, which enables individuals to reduce water loss and energy expenditure (Baudinette *et al*. 2000). Core roost sites are thought to be restricted to caves where at least semi-permanent water is nearby (Armstrong 2001, Churchill 2008), although significant roosts have also become established in man-made structures such as abandoned mines in the Pilbara region (Churchill 1991).

The TSSC (2016d) lists nine threats to the conservation status of the Pilbara Leaf-nosed Bat:

- heat and water loss: the species is known for its poor ability to maintain these
- mine collapse: resulting in direct mortality
- flooding: resulting in destruction of roost sites and possibly direct mortality
- natural predators
- mine development: may result in the destruction of roost sites
- blasting in adjacent workings: resulting in abandoning of roost sites by bats
- human entry of roosts: resulting in animals abandoning the site
- road kills: direct mortality resulting from increased vehicle activity
- site rehabilitation.

For the Pilbara Leaf-nosed Bat, 'habitat critical to the survival of the species' is defined by TSSC (2016d) as underground diurnal roosts with warm temperatures and high humidity, listed in order of priority for conservation, they are:

- **Permanent Diurnal Roost**:

  "occupied year-round and likely the focus for some part of the 9-month breeding cycle; considered as critical habitat that is essential for the daily survival of the Pilbara leaf-nosed bat."

- **Non-Permanent Diurnal Roost**:

  "*evidence of usage during some part of the 9-month breeding cycle (July–March), but not occupied year-round; considered as critical habitat that is essential for both the daily and long-term survival of the Pilbara leaf-nosed bat*."

- **Transitory Diurnal Roost:**

  "occupied for part of the year only, outside the breeding season (April–June), and which could facilitate long distance dispersal in the region; considered as critical habitat that is essential for both the daily and long-term survival of the Pilbara leaf-nosed bat."

Habitat important for the persistence of the local population, although not considered to be critical habitat, is:

- **Nocturnal Refuge:**

  "occupied or entered at night for resting, feeding or other purposes, with perching not a requirement. Excludes overhangs. Not considered critical habitat but are important for persistence in a local area."

It is difficult to define critical foraging habitat (TSSC 2016d). Foraging habitat appears to be diverse and not a restricting factor, however, suitable foraging habitat located within vicinity of a diurnal roost in order of priority for conservation includes gorges with pools (Priority 1), gullies (Priority 2), rocky outcrops (Priority 3), major watercourses (Priority 4) and open grasslands and woodlands (Priority 5). Bats are thought to primarily forage within 20km from a roost, occasionally up to 30km in April and May (Bat Call WA 2021b).

Although there are 59 records of the Pilbara Leaf-nosed Bat within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11), they are all 20km or more from the study area and this species was not recorded on this survey. No caves likely to support diurnal roosting were detected or considered likely to occur in the study area. The nearest known roost is 24km south of the study area, but this was abandoned in 2019 after two dry years, and all other known permanent diurnal roosts are >30km away (Bat Call WA 2021b). The nearest known permanent diurnal roost is at Lalla Rookh Mine, about 42km southeast of the study area. This Roost supported >200 bats in 2020 (Bat Call WA 2021b). Bats from this roost are unlikely to forage in the study area due to the distance. From the data collected across two seasons, it appears that the study area does not regularly support the Pilbara leaf-nosed Bat, and no critical habitat is likely to be present. Although foraging habitat is present, as it appears not to be regularly used by this species it is of limited importance.

Ghost Bat – *Macroderma gigas*

The Ghost Bat is listed as Vulnerable under the EPBC Act and BC Act.

The Ghost Bats of the Pilbara region are disjunct and genetically distinct to those that occur in the Kimberley, Northern Territory and Queensland. The Pilbara population is divided between those in the Hamersley Ranges and those in the Chichester Ranges, though the genetic differentiation is low, suggesting bats move between these populations (Ottewell *et al*. 2017). Ghost Bats in the study area would fall within the Chichester Range subpopulation, which is estimated to be about 1,500 individuals (TSSC 2016a).

In the Chichester region, Ghost Bats are often found in large maternal roosts and these congregations are important for the survival of the species. However, smaller roosts are also likely to be important, allowing bats to occupy and forage through more of the landscape, resulting in dispersal and gene-flow between larger roosts. As the overall Chichester population is so small, all populations are likely to be important.

Ghost Bats utilise several diurnal and nocturnal roost caves within an area for feeding, resting, breeding and maternity. In the Pilbara, a number of natural formations are used by the Ghost Bat intermittently as short-term transient roosts and for feeding activity for single or small numbers of individuals, whilst others are used by maternity colonies (Armstrong and Anstee, 2000).

The structure of a roost site is largely indicative of its use. Transient day roosts or feeding sites for Ghost Bats are often shallower with microclimates similar to ambient conditions (Armstrong and Anstee, 2000). Breeding activity for Ghost Bats is associated with roost sites that have a relative humidity of above 80% (Armstrong and Anstee, 2000). These roosts are restricted to gorges and escarpments in the Pilbara where access to surface water, particularly where permanent or semi-permanent rock pools are present, is reasonably accessible. Individuals and small groups may shelter in deep rock crevices and abandoned mine shafts.

Although the foraging ecology of the Ghost Bat has not been well-studied, a Queensland study found that male Ghost Bats forage up to 11.8km from the roost, while lactating females forage within 3km (Augusteyn *et al*. 2018). A study in the Northern Territory found that bats foraged on average 1.9km from their diurnal roost (Tidemann *et al*. 1985). Radio-tracking studies in the Pilbara have recorded bats transiting to foraging sites 20-30km distant from the roost site (Bat Call WA 2021a).

Ghost Bats have large wings and can fly considerable distances to forage, but there is uncertainty around the relative importance of close versus distant foraging habitats. If bats are forced to fly further to forage, this may impact on breeding success and cause population decline (Augusteyn *et al*. 2018). Therefore, at the minimum any foraging habitat within 3km of a diurnal roost or potential maternity roost may be considered important, as these habitats are likely to support lactating females.

Ghost Bats forage mainly by sight, perching in vegetation to ambush prey or gleaning prey from the ground while in flight. Habitats used for foraging have not been well-quantified, but in Queensland bats mostly foraging over open agricultural areas, on the edges of woodlands or along ephemeral creeks (Augusteyn *et al*. 2018). Pilbara studies found that bats foraged over lightly wooded productive plains, using isolated trees and trees on the edge of watercourses or open woodlands as vantage points (Biologic 2019, Bat Call WA 2021a).

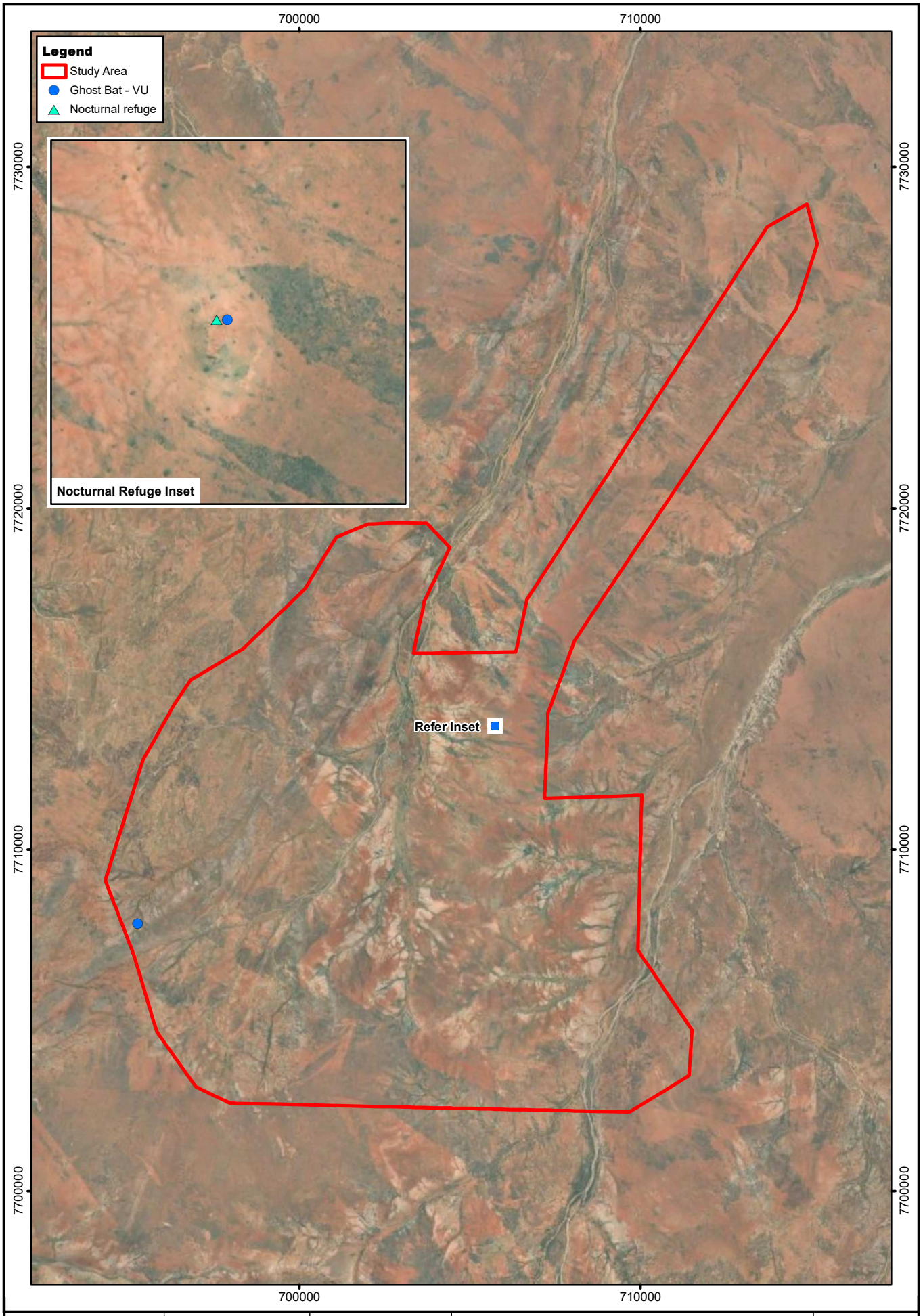
Threats to the conservation status of the Ghost Bat include:

- direct heat and water loss: the species is known for its poor ability to maintain body temperature and water
- wide fluctuations in cave temperature and humidity due to extrinsic disturbances, especially maternity caves, leading to direct mortality and cave abandonment
- mine/cave collapse: resulting in direct mortality
- flooding: resulting in destruction of roost sites and possibly direct mortality
- mine development: may result in the destruction of roost sites
- blasting in adjacent workings: resulting in abandoning of roost sites by bats
- human entry of roosts: resulting in animals abandoning the site.

There are 69 scattered records of the Ghost Bat within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). The Ghost Bat was recorded in the study area, with a dead specimen on a fence observed opportunistically (Plate 40), and a small cave provided a nocturnal refuge, with scats, feeding remains and dead specimens recorded (Figure 14). Nocturnal refuges are not considered to be critical habitat (Bat Call WA 2021a).

No critical diurnal roosting habitat was detected or considered likely to occur, however, nocturnal refuges are likely to be present in the Rocky Outcrop habitat and granite rockpiles are known to be used by Ghost Bats (Armstrong and Anstee 2000). The nearest known diurnal roosts are at Poondano, 20km north of the study area, Lalla Rookh, 42km southeast of the study area, and Wodgina, 53km southwest of the study area. As these known roosts are at a considerable distance from the study area, it is probable that bats in the study area hail from an undetected roost outside the study area. Foraging habitat in the study area potentially includes all habitat types, as all habitats have open plains and/or treed areas for perching. Although foraging habitat is important, it is also widespread and unlikely to be habitat critical to the survival of the species.

Plate 40. Ghost Bat, dead on barbed wire fence.



Drawn: CAD Resources www.cadresources.com.au Tel: (08) 9246 3242	N 0 1 2 km Scale: 1:150,000 MGA94 (Zone 50)	Western Wildlife	**Tabba Tabba Project** **Ghost Bat records and nocturnal refuge**	Figure: **14**
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Date: March 2026 | Rev: A	Author: J. Wilcox			

Pilbara Olive Python – *Liasis olivaceous barroni*

The Pilbara Olive Python is listed as Vulnerable under the EPBC Act and BC Act.

An iconic species of the Pilbara region, the Pilbara Olive Python is large and mostly nocturnal. Adults are usually around 2.5m long, with individuals reliably measured up to 4.5m long (Pearson, 2003). Due to its cryptic habits, there are no reliable estimates of population size (DEWHA, 2008), however, it was thought to be uncommon with the initial description of the subspecies in 1981 performed on a mere eight specimens collected over 65 years (Pearson, 2003).

Within its range, the Pilbara Olive Python has been found to be widely distributed with many sizable populations (Pearson, 2003). It is generally associated with large river systems, such as the Coongan, Shaw, Yule, Harding, Fortescue, Ashburton and Robe Rivers (DSEWPaC 2011). The favoured habitat of the Pilbara Olive Python is generally considered to be deep gorges with waterholes, however, it also occurs in riverine habitats (DSEWPaC 2011) and on the Burrup Peninsula it inhabits large rock piles in spinifex grasslands (Tutt *et al*. 2004). Radio-tracking studies on the Robe and Fortescue Rivers have found that in summer pythons range along rivers, visiting permanent pools, and in winter they shelter in rocky areas away from water, including caves in flat-topped hills (Pearson 2003, DEWHA 2008). Artificial waters, such as sewage ponds and recreational lakes, are also used (Pearson 2003).

Breeding occurs in winter, with males travelling up to three or four kilometres in search of females (Tutt *et al*., 2004, Pearson 2003). Females only breed every 3 to 4 years (DPAW 2013). Nest sites have been observed under large slabs of rock at a considerable distance from water (DPAW 2013, Pearson 2003). In January the eggs hatch, and the young disperse (Pearson 2003). Although only preliminary results are available, on the Burrup Peninsula the Pilbara Olive Python has been found to occupy a large and distinct home-range (Tutt *et al*. 2004). Females have been found to have a highly localised home-range of 89.76 – 365.33 ha (based on three individuals) and males wander widely in search of females and have a home range of 449.26 ha (based on a single individual) (Tutt *et al*. 2004, DPAW 2013).

Threats to the Pilbara Olive Python are listed in the Conservation Advice for the species (DEWHA 2008):

- Direct predation by feral cats (*Felis catus*) and foxes (*Vulpes vulpes*), particularly of juveniles.
- Loss of prey species, such as Northern Quolls (*Dasyurus hallucatus*) and rock-wallabies (*Petrogale spp*.) to predation by foxes.
- Loss of habitat to gas and mining developments, including changes to hydrology and downstream impacts such as sedimentation or pollution.
- Deliberate road-kills.
- Killed due to being mis-identified as a venomous snake species.

There is still a lack of information on the basic ecology of the Pilbara Olive Python. Although radio-tracking studies have been completed in several Pilbara locations, these datasets remain largely unpublished. The cryptic habits of this species make it difficult to systematically survey, as even a large-scale survey may fail to record any individuals.

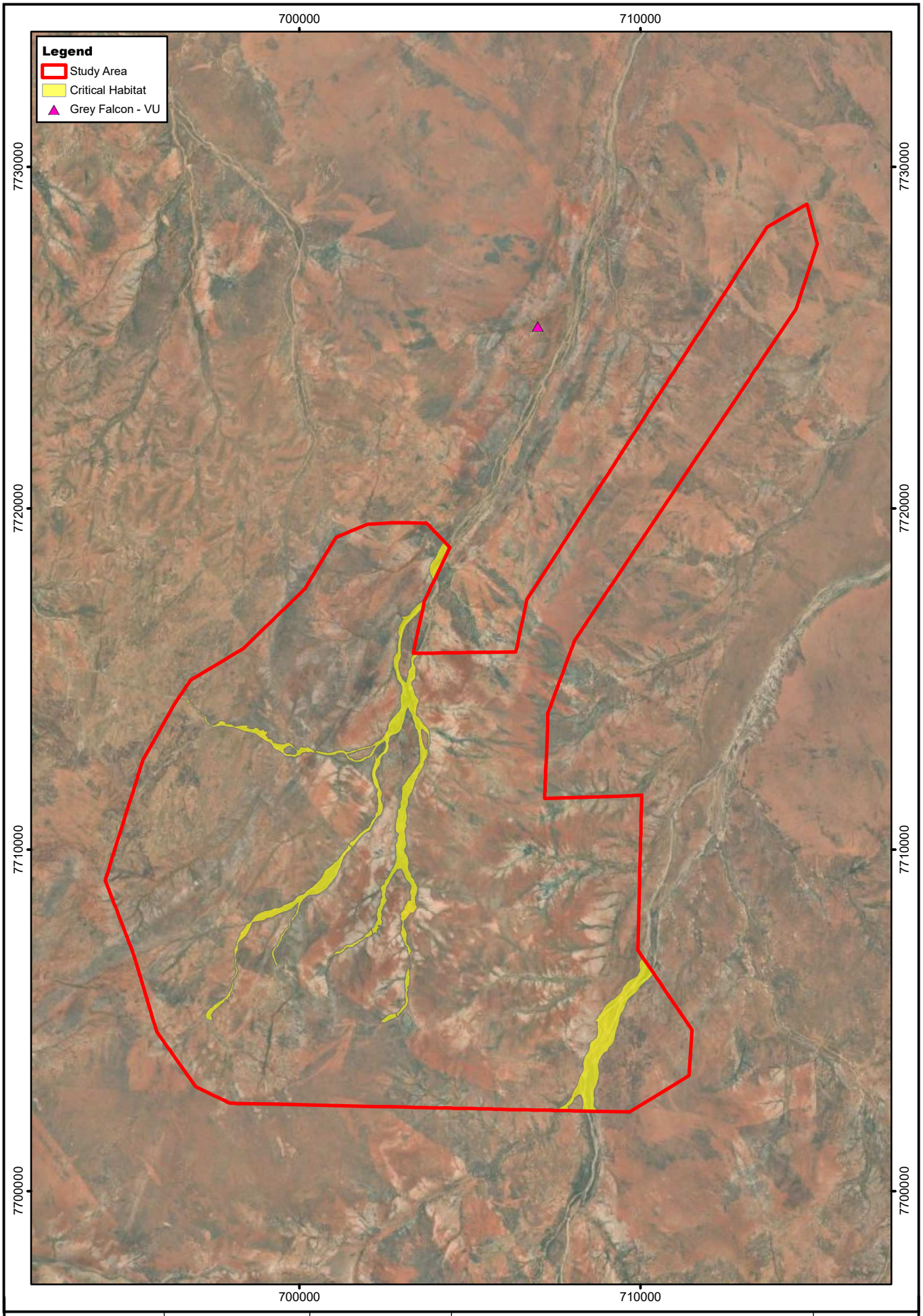
There are three records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). Although not recorded in this survey, the Pilbara Olive Python potentially occurs in the study area in low numbers. This species potentially occurs in a variety of habitats when dispersing and looking for mates, however, habitats in the study area likely to be habitat critical for survival are the Major River and Rocky Outcrop habitats.

Grey Falcon – *Falco hypoleucos*

The Grey Falcon is listed as Vulnerable under the EPBC Act and BC Act.

The Grey Falcon may number fewer than 1000 individuals, though it occurs across a large portion of arid and semi-arid Australia with its distribution centred on inland drainages (Garnett *et al*. 2011). It forages over timbered plains, including *Acacia* shrublands, also ranging out onto treeless plains. The Grey Falcon nests in tall trees on watercourses (Garnett *et al*. 2011) and occasionally on man-made structures such as transmission line towers (pers. obs.). Threats to this species are unknown but may include habitat degradation due to overgrazing or clearing and provision of water in arid areas favouring the closely related Peregrine Falcon (Garnet *et al*. 2011).

There are eight scattered records of the Grey Falcon within 40km on DBCA's Threatened and Priority Fauna Database (Figure 11). A pair of Grey Falcon were recorded just outside the study area on the fauna survey (Figure 15), so this species is likely to occur in the study area. This species is likely to forage over the sandy and stony plains, with potential breeding habitat present in the Major River habitat. Breeding habitat, although relatively common in the region, is habitat critical to the survival of this species (Figure 15).



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Author: J. Wilcox

Western Wildlife

Tabba Tabba Project
Grey Falcon record and critical habitat

Figure: **15**

5.2.2 Migratory Fauna

There are eight Migratory species that may occur in the study area (Table 12), noting that two additional species (Common Greenshank and Sharp-tailed Sandpiper) are also listed as Threatened and were thus discussed previously in section 5.2.1. Other migratory shorebird species are present in the region but are either vagrants or favour coastal habitats such as beaches, mangroves and intertidal mudflats, habitats that are absent from the study area.

Migratory species are not always present at a site, but a particular site may have significance as a seasonal or ephemeral foraging, breeding or shelter area. Impacts to these sites may then impact the population both within the site and further afield. The study area is only considered to be an internationally significant site for Migratory shorebirds if it supports 20,000 birds or 1% or more of the flyway population of a species, or a nationally significant site if it supports 2,000 birds or 0.1% or more of the flyway population of a species (DoEE 2017, Hansen *et al*. 2016). The flyway population estimates, 1% and 0.1% criteria for selected shorebirds are given in Table 13.

Table 13. Flyway population estimates for selected migratory shorebirds.

Species	Flyway Population Estimate*	1% Flyway Population Criterion*	0.1% Flyway Population Criterion*
Oriental Plover	230,000	2,300	230
Common Sandpiper	190,000	1,900	190
Sharp-tailed Sandpiper	85,000	850	85
Pectoral Sandpiper	1,220,000 – 1,930,000	12,200	1,220
Red-necked Stint	475,000	4,750	475
Wood Sandpiper	130,000	1,300	130
Common Greenshank	110,000	1,100	110
Marsh Sandpiper	130,00	1,300	130
Oriental Pratincole	2,880,000	28,800	2,880

*Data from Hansen *et al*. (2016).

Oriental Plover – *Charadrius veredus*

The Oriental Plover is listed as Migratory under the BC Act and EPBC Act.

The Oriental Plover favours dry grasslands and open plains, including recently burnt areas (Geering *et al*., 2007). This species is a non-breeding summer visitor to Australia, migrating from northern China and Mongolia through the East Asian-Australasian Flyway (Geering *et al*. 2007).

There is a single record of the Oriental Plover within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11), and a single bird was observed opportunistically 5km west of the study area during the fauna survey (Figure 12). When present, the Oriental Plover is likely to favour open plains habitats including recently burnt areas and trampled areas around wells. The Oriental Plover is likely to occur as a non-breeding visitor to the study area in small numbers, however, an ecologically important proportion of the population is not likely to occur.

Common Sandpiper – *Actitis hypoleucos*

The Common Sandpiper is listed as Migratory under the BC Act and EPBC Act.

The Common Sandpiper may be present at any time of the year, but more likely between September and March (Johnstone and Storr, 1998). This species occurs in a range of salt and freshwater habitats, including coasts, river pools, drying swamps and floodwaters (Johnstone and Storr 1998), however, it is most common on the coast (Geering *et al*. 2007).

There are six records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database, some of which are on rivers (Figure 9). Although not recorded on this survey, the Common Sandpiper is likely to occur on waterholes in the Major River habitat and may also occur on flooded claypans in the Sandy Plain habitat. It is likely to be a regular visitor in very small numbers, but the study area is not likely to support a nationally or internationally important proportion of the population.

Red-necked Stint – *Calidris ruficollis*

The Red-necked Stint is listed as Migratory under the BC Act and EPBC Act.

The Red-necked Stint was listed as 'Near Threatened' in the *Action Plan for Australian Birds 2020* as recent analyses have suggested that slow declines in this species have accelerated in the last decade (Garnett and Baker 2021). The Red-necked Stint occurs in a range of freshwater and saltwater habitats, both on the coast and inland (Geering *et al*. 2007). Threats to this species within Australia are considered relatively minor compared to destruction of migratory stop-over sites outside Australia (Garnett and Baker 2021).

There are seven records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database, primarily on the coast but also on rivers (Figure 11). Although not recorded on this survey, this species is a possible non-breeding visitor to Dams, waterholes in the Major River habitat and may also occur on claypans in the Sandy Plain habitat. These habitats are not likely to regularly support more than a few individuals.

Pectoral Sandpiper – *Calidris melanotos*

The Pectoral Sandpiper is listed as Migratory under the BC Act and EPBC Act.

The Pectoral Sandpiper favours freshwater wetlands, although it may also occur on brackish waters or samphire flats (Geering *et al.* 2007, Johnstone and Storr 1998). It is an uncommon non-breeding visitor to Australia between December and March (Johnstone and Storr, 1998).

There are no records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). Although not recorded on this survey, this species is a possible non-breeding visitor to Dams, waterholes in the Major River habitat and may also occur on claypans in the Sandy Plain habitat. These habitats are not likely to regularly support more than a few individuals and this species is generally uncommon as only a small proportion of the global population overwinters in Western Australia.

Wood Sandpiper – *Tringa glareola*

The Wood Sandpiper is listed as Migratory under the BC Act and EPBC Act.

In northern Australia, the Wood Sandpiper inhabits inland freshwater wetlands (Geering *et al*., 2007), using habitats such as river pools, claypans and dams (Johnstone and Storr, 1998).

There is a single record of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database, from an inland site (Figure 11). Although not recorded on this survey, this species is a possible non-breeding visitor to Dams, waterholes in the Major River habitat and may also occur on claypans in the Sandy Plain habitat. These habitats are not likely to regularly support more than a few individuals.

Marsh Sandpiper – *Tringa stagnatilis*

The Marsh Sandpiper is listed as Migratory under the BC Act and EPBC Act.

The Marsh Sandpiper occurs on coastal and inland freshwater and saltwater wetlands, generally avoiding intertidal mudflats (Geering *et al*. 2007).

There are five records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database, from both coastal and inland waters (Figure 11). Although not recorded on this survey, this species is likely to be a non-breeding visitor to waterholes in the study area and may also occur on claypans in the Sandy Plain habitat. These habitats are not likely to regularly support more than a few individuals.

Oriental Pratincole – *Glareola maldivarum*

The Oriental Pratincole is listed as Migratory under the BC Act and EPBC Act.

The Oriental Pratincole inhabits open plains, and wetland margins, occurring in flocks of a few birds up to very large flocks, including the notable record of 2.88 million birds on Eighty Mile Beach in 2004 (Geering *et al*. 2007).

There are 11 records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database, including a record of 100 birds on Indee Station (Figure 9). Although not recorded on this survey, this species may be a non-breeding visitor to open areas and claypans in the Sandy Plain habitat. It is unlikely that a nationally or internationally significant proportion of the population would ever be present (Table 13), and its movements in Australia are unpredictable, possibly based on patterns of rainfall (Geering *et al*. 2007).

Fork-tailed Swift – *Apus pacificus*

The Fork-tailed Swift is listed as Migratory under the EPBC Act and BC Act.

The Fork-tailed Swift is a non-breeding visitor to Australia between September and April (Boehm 1962, Johnstone and Storr 1998). The bird is primarily observed foraging for insects in proximity to cyclonic weather (Boehm 1962). Although a migratory species, the Fork-tailed Swift has a large range and a large population that appears to be stable (BirdLife International 2025).

There are eight records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). Although not recorded in the study area, the Fork-tailed Swift is likely to be a regular summer visitor in small numbers. As it is a largely aerial species in Australia, it is unlikely to be reliant on any terrestrial habitat.

5.2.3 Specially Protected Fauna

There is one specially protected vertebrate species that occurs in the study area (Table 12). The populations of Specially Protected species are large enough that they are not considered to be Threatened. However, they require on-going conservation intervention (i.e., Conservation Dependent) or be specially protected in order to prevent them from becoming Threatened.

Peregrine Falcon – *Falco peregrinus*

The Peregrine Falcon is listed as Other Specially Protected Fauna under the BC Act.

The Peregrine Falcon is a widespread bird of prey that globally has a very large range and a very large population that appears to be stable (BirdLife International 2025). In Western Australia the population is secure, although this species may experience reductions at a local level due to human disturbance at nesting sites (Debus 2019). The Peregrine Falcon nests mainly on ledges on cliffs or rocky outcrops, and it may also use tall trees (Johnstone and Storr 1998). This species often takes advantage of man-made structures such as abandoned open pits or quarries.

There is a single record of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). The Peregrine Falcon was recorded on the fauna survey (Figure 12). It may nest on Rocky Outcrops or tall trees in the Major River habitat, and forage over open plains in the study area.

5.2.4 Priority Fauna

There are eight Priority fauna species that were recorded or may occur in the study area (Table 12).

Priority 1, 2 or 3 species need further survey effort, as insufficient data exist to adequately determine their status. Many Priority 1, 2 and 3 species are known from only a few records in a limited number of locations, thus determining their status in the study area may be problematic. Priority 4 species are considered to require regular monitoring, as although they are adequately known, they are either rare, near threatened or recently removed from the threatened list.

Pin-striped Finesnout Ctenotus – *Ctenotus nigrilineatus*

This species is listed as Priority 1 by DBCA.

The Pin-striped Finesnout Ctenotus is a small lizard that is confined to a small area of the Pilbara interior. It is only known from a few records near Woodstock, Meentheena and Nullagine, and its distribution is thought to be patchy (Chapple *et al*. 2019). Little is known of the species, but those trapped have been from Spinifex plains on granitic soils near watercourses. It is possible that its rarity is natural and there are no known threats to the species (Chapple *et al*. 2019).

There are no records of this species in the vicinity of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11) and it was not recorded during the fauna survey. The study area is currently just outside the known range of this species, but as it is rarely recorded and its distribution is patchy, it possibly occurs. If present, it may occur on the in association with Sandy Plain and Major River habitats.

Gane's Blind Snake – *Anilios ganei*

Gane's Blind Snake is listed as Priority 1 by DBCA.

The habitat requirements for Gane's Blind Snake are poorly known, as this species is known from relatively few records and was only formally described in 1998. It is endemic to the Pilbara, occurring between Newman and Pannawonica. This species is tentatively associated with moist gorges and gullies, though some of the early specimens are from the Newman townsite and Mt Whaleback waste dump (Aplin 1998). It is considered unlikely that its population is declining and as it is fairly widespread and no major threats are known, it has been assessed as 'Least Concern' in the *Action Plan for Australian Lizards and Snakes 2017* (Chapple *et al*. 2019).

There are two records of Gane's Blind Snake within 40km of the study area on DBCA's Threatened and Priority Fauna Database, from ranges to the south (Figure 11). It is unknown, but possible, that the habitats of the study area are suitable for Gane's Blind Snake, and it is possible that the study area falls within the range of this species. Therefore, although not recorded on this survey, this species may possibly occur in the study area.

Northern Coastal Free-tailed Bat – *Ozimops cobourgiana*

This bat is listed as Priority 1 by DBCA.

This bat occurs within 100km of the coast in the Pilbara and Kimberley, as well as in the Northern Territory (Woinarski *et al*. 2014). Although generally associated with mangroves, it has also been recorded in other habitats including *Melaleuca* forests, rainforest, eucalypt forest, woodlands, open floodplains and coastal flats (Woinarski *et al*. 2014). This bat usually roosts in tree hollows. Although considered data deficient by DBCA, this species is listed as 'Least Concern' in the *Action Plan for Australian Mammals 2012*, as it has a large range, its population size is likely to be more than 10,000 and there is no evidence of a decline (Woinarski *et al*. 2014). Threats to the species are habitat loss on a local level around coastal developments and the future risk of sea-level rises due to climate change.

There are no records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11) and it was not recorded on the fauna survey, however, it has been recorded 50km to the west (Western Wildlife 2024). If present, this species may forage across all habitats, potentially roosting in tree hollows in the Major River habitat. It is possible that this species uses the Major River habitat to disperse into the region from coastal mangrove habitats, however, the movements of this species are poorly known.

Brush-tailed Mulgara – *Dasycercus blythi*

The Brush-tailed Mulgara is listed as Priority 4 by DBCA.

This species is widely distributed across arid Australia, and though its population has declined in the past, it is currently thought to be stable or declining only slowly (Woinarski *et al*. 2014). It is thought that its ability to use a variety of food resources, tolerate severe declines in bodyweight, enter torpor and dig deep burrows has buffered the species from the impacts of feral predators and a variable climate and resource availability (Masters and Dickman 2012). It is therefore listed as of 'Least Concern' in the *Action Plan for Australian Mammals 2012* (Woinarski *et al*. 2014). The Brush-tailed Mulgara occurs mostly on Spinifex grasslands, sheltering during the day in burrows.

The Brush-tailed Mulgara was recorded on a camera trap in the Sandy Plain habitat on this survey (Figure 12, Plate 41), as well as in April 2024 (Ecoscape 2024). There are also 104 records within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). This species is likely to be a relatively common resident of the Sandy Plains habitat in the study area, although its population will fluctuate from year to year depending on prevailing environmental conditions.

Plate 41. Brush-tailed Mulgara on camera in the study area.

Long-tailed Dunnart – *Antechinomys longicaudata*

The Long-tailed Dunnart is listed as Priority 4 by DBCA.

The Long-tailed Dunnart occurs in the Pilbara, Mid-West and the central deserts of Western Australian and Northern Territory. It is associated with breakaways and scree slopes but also occurs on gravel or stony plains (Van Dyck and Strahan 2008).

There are no records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). Although not recorded on the fauna survey, the Long-tailed Dunnart possibly occurs in the study area, in the Low Stony Hills or Rocky Outcrops habitat.

Spectacled Hare-wallaby – *Lagorchestes conspicillatus leichardtii*

The mainland population of the Spectacled Hare-wallaby is listed as Priority 4 by DBCA.

On the mainland, the Spectacled Hare-wallaby is sparsely distributed and generally uncommon (Woinarski *et al.* 2014). It occurs in a range of tropical grassland habitats, sheltering in large spinifex hummocks when in spinifex grasslands (Van Dyck and Strahan 2008). It is listed as 'Near Threatened' in the *Action Plan for Australian Mammals 2012*, due to past and continuing declines in its population (Woinarski *et al*. 2014). In Western Australia it currently occurs in isolated populations in the Pilbara, Kimberley and north-eastern Great Sandy Desert. Threats to the species include predation by foxes and feral cats and inappropriate fire regimes (Woinarski *et al*. 2014). The Pilbara population has declined significantly, possibly due to frequent fires preventing large Spinifex clumps from forming, as well as predation by foxes (Van Dyck and Strahan 2008).

There are several records of the Spectacled Hare-wallaby within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). This species was recorded on the fauna survey, with camera trap records and opportunistic observations of tracks in the Sandy Plain and Stony Plain habitats (Figure 12, Plate 42). This species is likely to occur in low densities in the Sandy Plain and Stony Plain habitats, where there are large, long-unburnt spinifex hummocks in which to shelter. The south-eastern part of the study area is generally too recently burnt to currently support this species, with a large fire scar from 2025 (Figure 3).

Plate 42. Spectacled Hare-wallaby on camera trap in the study area.

Northern Short-tailed Mouse – *Leggadina lakedownensis*

The Northern Short-tailed Mouse is listed as Priority 4 by DBCA.

The Northern Short-tailed Mouse (also known as the Lakeland Downs Mouse) favours cracking and gilgaied clays (Gibson and McKenzie, 2009), but it also occurs in a range of other habitats, including spinifex grasslands and stony ranges (Van Dyck and Strahan 2008). Populations of this species can fluctuate dramatically (Van Dyck and Strahan 2008), so it may be common in one year and virtually absent in another.

The Northern Short-tailed Mouse was not recorded on the fauna survey, and there are no records of this species within 40km on DBCA's Threatened and Priority Fauna Database (Figure 11). As the study area is within the known range of the species, the Northern Short-tailed Mouse potentially occurs in the study area, possibly favouring the Minor River habitat.

Western Pebble-mound Mouse – *Pseudomys chapmani*

The Western Pebble-Mound Mouse is listed as Priority 4 by DBCA.

The Western Pebble-Mound Mouse occurs in the ranges of the central and southern Pilbara, and the smaller ranges of the Little Sandy Desert. It inhabits gentle stony slopes where it constructs its pebble mounds, often situating them near *Acacia*-lined minor drainages (Van Dyck and Strahan 2008). This species has disappeared from parts of its range along the Pilbara coast, Murchison and Gascoyne, possibly due to the fox and introduced herbivores (Van Dyck and Strahan 2008). Despite this, mining is not considered to be a threatening process for this species, as its habitat is relatively widespread (Woinarski *et al*. 2014).

There are many records of this species within 40km of the study area on DBCA's Threatened and Priority Fauna Database (Figure 11). Active, inactive and historic mounds of this species were recorded on stony hills and plains on this survey, and mounds were also sighted by Ecoscape (2024) (Figure 12, Plate 43). The Western Pebble-mound Mouse is likely to occur throughout the Low Stony Hills and Stony Plains habitats of the study area and the wider region.

Plate 43. Western Pebble-mound Mouse (*Pseudomys chapmani*) mound in the study area.

5.2.5 Locally Significant Fauna

Two locally significant species were identified as potentially occurring: the Rufous-crowned Emu-wren (*Stipiturus ruficeps*) and the Common Brushtail Possum (*Trichosurus vulpecula*).

Although widespread across arid Australia, the Rufous-crowned Emu-wren relies on mature spinifex for habitat, usually in association with low shrubs. In areas where fires are frequent, this species may become locally extinct as it is likely to be a poor disperser. The Rufous-crowned Emu-wren was not recorded on this survey but is likely to inhabit long-unburnt areas within the Sandy Plain habitat.

Despite its name, the Common Brushtail Possum is uncommon in the Pilbara region. This species was recorded on camera traps in the Major River habitat and is likely to be an uncommon resident of the study area (Figure 12, Plate 44).

Plate 44. Common Brushtail Possum recorded on a camera trap in the study area.

6. Survey Adequacy

6.1 Species Accumulation Curves

Species accumulation curves were calculated for frogs, reptiles, mammals and birds for all habitats combined (Figures 16 - 19). Estimates of species richness for frogs, reptiles and mammals are given in Table 14, using the Chao1 estimator for abundance-based trapping data and the Chao-2 estimator for incidence-based bird survey data. These are good indicators of the lower bound of the total species richness with small sample sizes. There are several singletons (unique records) in the reptile and bird samples, indicating that the sample size may be low, and the accuracy of these estimates is likely to be poor. This is a common feature of all detailed fauna surveys, with many species represented by a single capture or observation and is ameliorated by using other survey techniques to increase the number of species recorded across the overall study area.

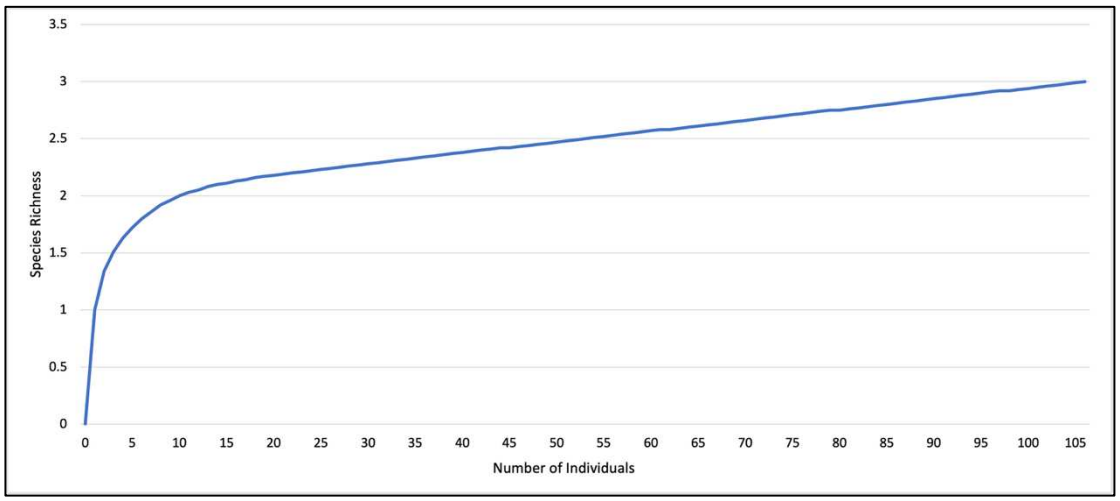

Figure 16. Species accumulation curve for frogs in all habitats.

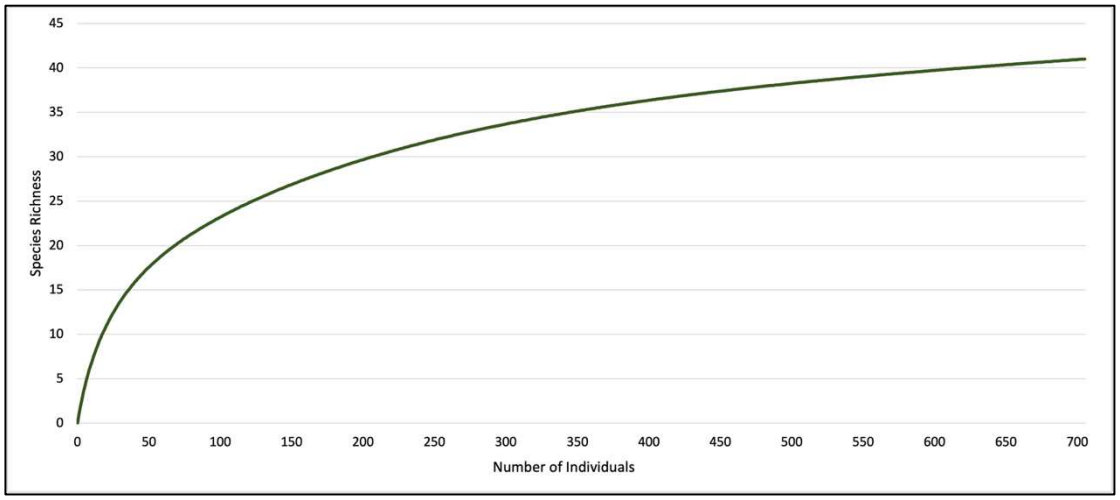

Figure 17. Species accumulation curve for reptiles in all habitats.

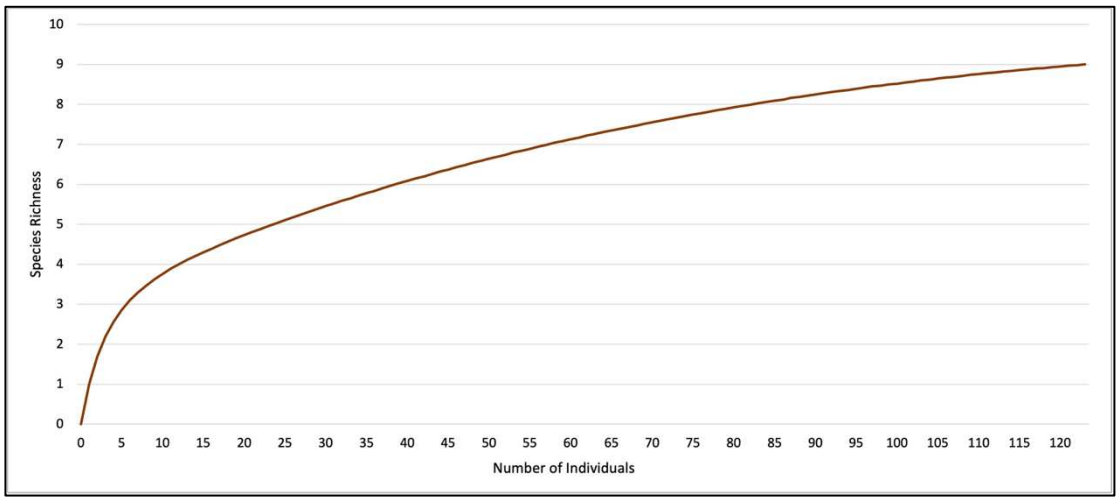

Figure 18. Species accumulation curve for mammals in all habitats.

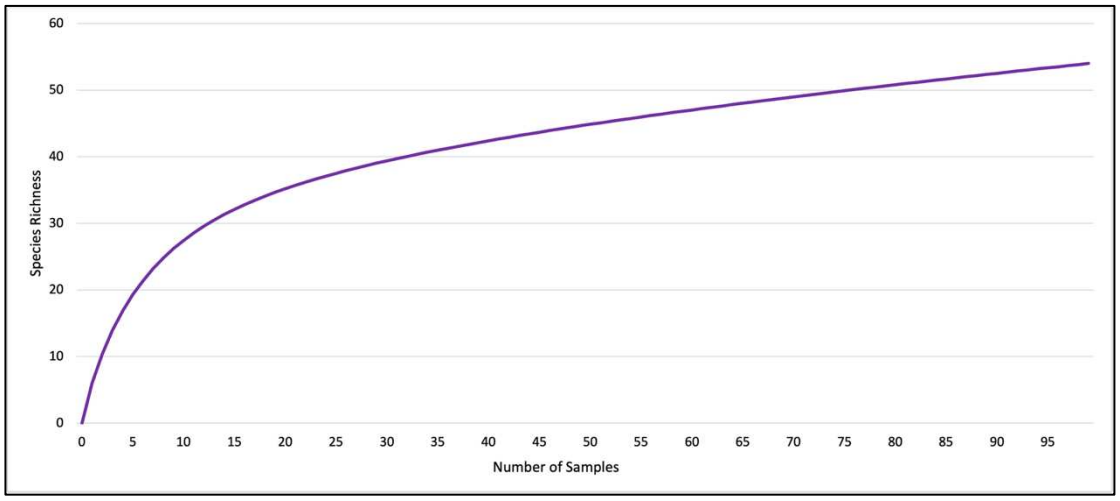

Figure 19. Species accumulation curve for birds in all habitats.

When interpreting species accumulation curves and estimators of species richness in the context of a detailed fauna survey, it is vital to remember that the data collected is influenced by the sampling methods. All sampling methods have inherent biases that favour the detection of some species over others, i.e. some species will be readily trapped and others may be trapped rarely or not at all. Thus, the species accumulation curves and estimates of species richness are that of the 'trappable' component of the fauna only. Species may not be trappable if they are temporarily absent from the site (e.g. migratory, nomadic species or irruptive species), are too large to be targeted by standard trapping techniques (e.g. kangaroos) or are shy of entering traps. Fauna may also be patchy in their distribution within a habitat and may only be trapped if the trapping site intersects their home-range. The trappable component of the fauna is also likely to vary due to the prevailing conditions, e.g. burrowing frogs may be trappable after heavy rains, but virtually impossible to sample in dry conditions. Long-term drought conditions may reduce some species to undetectable levels, or cool conditions may result in reptiles being inactive.

Table 14. Estimated species richness for each species group.

Species Group	Observed species richness (systematic data only)	Sample Size (number of records)	Number of uniques in the sample	Chao1 Estimate of species richness (± SD)	Chao2 Estimate of species richness (± SD)
Frogs	3	106 (individuals)	1	3.0 ± 0.48	-
Reptiles	41	705 (individuals)	8	47.99 ± 6.65	-
Mammals	9	123 (individuals)	2	9.25 ± 0.73	-
Birds	54	99 (samples)	16	-	96.24 ± 32.91

For both frogs and mammals, the species accumulation curve was close to asymptote, with estimate of species richness similar to the observed species richness (Figures 16 and 18, Table 14). This suggests that almost all of the trappable frog and mammal fauna had been recorded and if trapping had continued, few, if any species would have been added to the list of observed species.

For reptiles, the species accumulation curve was approaching asymptote. The estimated species richness was higher than the observed, with about 48 species estimated and 41 species recorded systematically on the survey (Figure 17, Table 14). This suggests that further sampling is likely to have resulted in a small number of additional species being recorded.

For birds, the species accumulation curve did not reach asymptote, with the estimated species richness much higher than the species richness observed in the systematically collected data (Figure 19, Table 14). The estimated species richness for birds was about 96 species (Table 14) and 83 species were recorded in the study area through all methods (Table 7).

Overall, it appears that a reasonable proportion of the fauna able to be recorded through systematic methods were recorded, and this is consistent with typical detailed fauna survey results.

6.2 Proportion of the Fauna Identified

Species accumulation curves are not the complete picture, as they are based only on the systematically collected trapping and bird survey data. Many species are observed opportunistically or through targeted surveys, and these records often add considerably to the total species inventory. The total number of species observed can be compared to the number of species potentially occurring on the site. A total of eight frogs, 111 reptiles, 157 birds, 35 native mammals and eight introduced mammals potentially occur, based on the literature review (Table 7, Appendices 4 - 7). Of these, 50.0% of frogs, 47.7% of reptiles, 54.8% of birds, 74.3% of native mammals and 62.5% of introduced mammals were recorded in the study area (Figure 20).

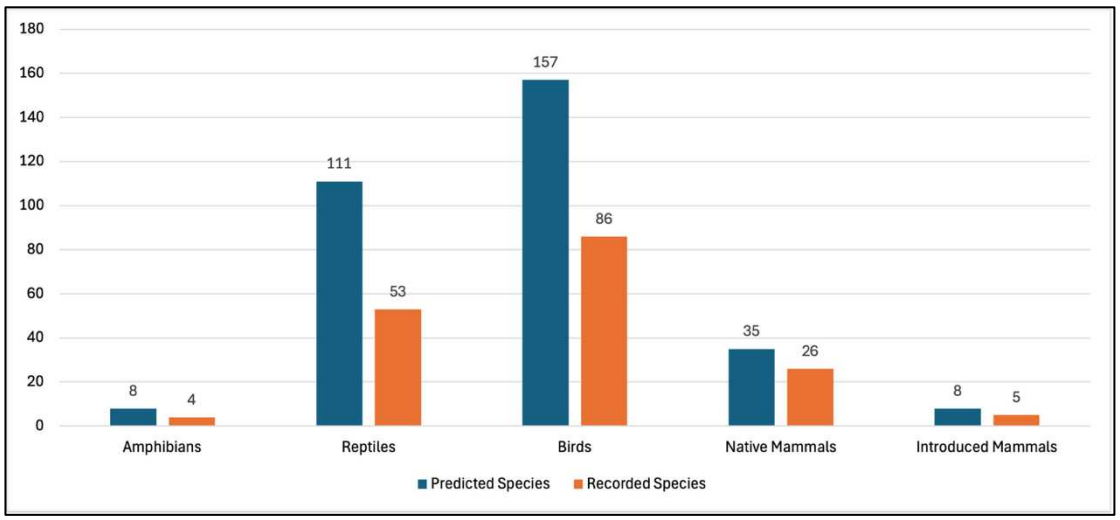

Figure 20. Proportion of the vertebrate fauna identified.

As the list of potentially occurring species in Appendices 4 - 7 is relatively conservative, it is quite likely that some of the unrecorded species, although known from the wider region, do not in fact occur in the study area. Some of the predicted species are on the edge of their known range in the study area and it is probable that for at least some of these species, their range does not extend into the study area.

Bird species that remain unrecorded include several waterbird species that may occur when river pools or claypans are flooded, irruptive species that may move into the area during flowering events or after a fire, and sparsely distributed species such as some birds of prey.

It is likely that further work in the study area would result in more species being recorded. This is the case with all fauna surveys, as the short survey periods only provide a 'snapshot' of the fauna occurring in the study area. Despite these limitations, this fauna survey has resulted in a significant proportion of the predicted fauna being recorded.

7. Conclusions

7.1 Faunal Assemblage

The predicted faunal assemblage includes up to eight frogs, 111 reptiles, 157 birds, 35 native mammals and eight introduced mammals. The observed assemblage to date includes four frogs, 53 reptiles, 86 birds, 26 native mammals and five introduced mammals.

7.2 Important Habitats

All habitats have some importance in that they support native fauna, however, habitats may be of particular importance if they:

- support very diverse or unique faunal assemblages
- are restricted or rare in the region (and thus the faunal assemblages are restricted or rare)
- are refugia (e.g. from drought or fire)
- provide ecological linkage
- support conservation significant fauna

None of the habitats sampled supported a particularly unique faunal assemblage, as although relatively diverse, the fauna present are typical of the Pilbara Bioregion.

The Rocky Outcrop habitat is limited in extent in both the study area and the region. This habitat provides cracks and crevices for shelter, offering breeding and roosting sites for a range of native fauna. Although there are no caves likely to support diurnal roosting by conservation significant bats, this habitat is habitat critical to the survival of the Northern Quoll (*Dasyurus hallucatus*: Endangered) and Pilbara Olive Python (*Liasis olivaceous barroni*: Vulnerable), noting that the Pilbara Olive Python has yet to be recorded in the study area.

The Major River habitat is likely to function as an ecological linkage, as well as providing habitat that is more productive than surrounding areas due to the presence of water. The higher productivity is likely to support a greater abundance and diversity of fauna, and there are many species that are only likely to occur in this habitat, such as waterbirds. Waterholes in the rivers provide water to fauna in an otherwise relatively dry landscape. Waterholes offer a refuge for fauna in dry conditions, although those in the study area are not likely to be present all year. The open riverbed may provide a refuge from fire and a natural firebreak.

The Major River habitat supports several conservation significant species. There are several shorebirds that may forage at waterholes in the summer, including the Common Sandpiper (*Actitis hypoleucos*: Migratory), Common Greenshank (*Tringa nebularia*: Endangered) and Sharp-tailed Sandpiper (*Calidris acuminata*: Vulnerable), however, the is habitat is not likely to support nationally or internationally important numbers of shorebirds and is not considered to be of regional importance.

The Major River habitat is likely to be habitat critical to the survival of the Northern Quoll (*Dasyurus hallucatus*: Endangered), Pilbara Olive Python (*Liasis olivaceous barroni*: Vulnerable) and Grey Falcon (*Falco hypoleucos*: Vulnerable). The Northern Quoll and Pilbara Olive Python are likely to forage and disperse through the area, with tree hollows providing shelter sites for the Northern Quoll. The larger trees potentially provide nesting habitat for the Grey Falcon.

The Sandy Plain habitat supports conservation significant species, including the Brush-tailed Mulgara (*Dasycercus blythi*: Priority 4) and Spectacled Hare-wallaby (*Lagorchestes conspicillatus leichardtii*: Priority 4). The Bilby (*Macrotis lagotis*: Vulnerable) also potentially occurs on Sandy Plains, more likely as dispersing individuals rather than a resident population. The Sandy Plain habitat is relatively contiguous and widespread in the region, so its importance is comparatively lower than habitats that are more limited in extent. These habitats may still be vulnerable to threats that operate on a widespread level, such as homogenising fires, grazing pressure and the presence of introduced predators supported by watering points.

The Low Stony Hills support the Western Pebble Mound Mouse (*Pseudomys chapmani*: Priority 4) and potentially the Long-tailed Dunnart (*Sminthopsis longicaudata*: Priority 4) but this habitat is also comparatively common in the region.

8. References

360 Environmental. (2018a). Flora, Vegetation and Fauna Assessment Wodgina Mine and Proposed Airstrip. Unpublished report prepared for Mineral Resources Limited.

360 Environmental. (2018b). Wodgina Mine and Additional Gas Pipeline: Flora, Vegetation, Fauna and Northern Quoll Assessment. Unpublished report prepared for Mineral Resources Limited.

Adaptive NRM (2021). *OZ Minerals Ltd West Musgrave Copper and Nickel Project: Night Parrot Desktop Habitat Analysis*. Unpublished report to OZ Minerals Ltd.

Adaptive NRM (2022). Results of acoustic surveys conducted for the Night Parrot (*Pezoporus occidentalis*) at the Mallina Gold Project. Unpublished report to Western Wildlife.

ALA (Atlas of Living Australia) Database (2025). Database extract study area +40km buffer 2025.

Aplin, K.P. (1998). The new blindsnakes (Squamata:Typhlopidae) from northwestern Australia. *Records of the Western Australian Museum* 19: 1-12.

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

Armstrong, K. N. (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.

Augusteyn J., Hughes J., Armstrong G., Real K. and Pacioni C. (2018). Tracking and tracing central Queensland's Macroderma–determining the size of the Mount Etna ghost bat population and potential threats. *Australian Mammalogy*, 40(2), pp.243-253.

Barrett, G., Silcocks, A., Barry, S., Cunningham, R. and Poulter, R. (2003). *The New Atlas of Australian Birds*. Royal Australasian Ornithologists Union, Victoria.

Bat Call WA (2021a). *A review of ghost bat ecology, threats and survey requirements,* report prepared for the Department of Agriculture, Water and the Environment, Canberra.

Bat Call WA (2021b). *A review of Pilbara leaf- nosed bat ecology, threats and survey requirements,* report prepared for the Department of Agriculture, Water and the Environment, Canberra.

Baudinette, R.V., S.K. Churchill, K.A. Christian, J.E. Nelson & P.J. Hudson (2000). Energy, water balance and the roost microenvironment in three Australian cave-dwelling bats (Microchiroptera). *Journal of Comparative Physiology*. B 170:439-446.

Biologic (2018a). *Wodgina DSO Project: Northern Quoll Monitoring Survey*. Unpublished report to Atlas Iron Limited.

Biologic (2018b). *Wodgina DSO Project: Pilbara Leaf-nosed Bat and Ghost Bat Monitoring Survey*. Unpublished report to Atlas Iron Limited.

Biota (2002a) *An Assessment of the Distribution of the Mulgara* Dasycercus cristicauda *and Bilby* Macrotis lagotis *Along and Adjacent to the Proposed Hope Downs to Port Hedland Rail Corridor*. Unpublished report to Hope Downs Management Services.

Biota (2002b) *Proposed Hope Downs Rail Corridor From Weeli Wolli Siding to Port Hedland – Vertebrate Fauna Survey*. Unpublished report to Hope Downs Management Services.

Biota (2004). Fauna Habitats and Fauna Assemblage of the Proposed FMG Stage A Rail Corridor, Fortescue Metals Group Fauna Habitat and Fauna Assemblage Report. Unpublished report to Fortescue Metals Group

BirdLife International (2025) IUCN Red List for birds. URL: http://www.birdlife.org

Boehm, E.F. (1962). Some habits of the Fork-tailed Swift. *Emu* 61(4) 281-282.

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.

Burbidge, A.H., Johnstone, R.E., 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* 78: 247-270.

Bureau of Meterology (2025). Monthly Climate Statistics for Port Hedland Airport. URL: http://www.bom.gov.au/climate/

Carwardine, J., Nicol, S. Van Leeuwen, S., Walters, B., Firn, J., Reeson, A., Martin, T.G. and Chades, I (2014). *Priority Threat Management for Pilbara Species of Conservation Significance*. CSIRO Ecosystems Sciences, Brisbane.

Chan, R. (2017) 'Investigating mate choice, sexual selection and multiple paternity based on parentage testing in island and mainland populations of the northern quoll (Dasyurus hallucatus)', p. 92.

Chao, A. and Chiu, C. H. (2016). *Species richness: estimation and comparison*. Wiley StatsRef: Statistics Reference Online. 1-26.

Chapple, D.G., Tingley, R., Mitchell, N.J., Macdonald, S.L., Keogh, J.S., Shea, G.M., Bowles, P., Cox, N.A. and Woinarski, J.C.Z. (2019). *The Action Plan for Australian Lizards and Snakes 2017*. CSIRO Publishing, Victoria.

Churchill, S. K. (1991). Distribution, abundance and roost selection of the orange horseshoe bat *Rhinonicteris aurantius*, a Tropical Cave-dweller. *Wildlife Research* 18, 343-353.

Churchill, S. (2008). *Australian Bats*. 2nd Edition. Reed New Holland, Sydney.

Cogger, H.G., Cameron, E.E., Sadlier, R.A. and Eggler, P. (1993). *The Action Plan for Australian Reptiles*. Endangered Species Programme Project Number 124, Australian Nature Conservation Agency, Canberra.

Colwell, R.K. (2013). *EstimateS: Statistical estimation of species richness and shared species from samples*. Version 9. URL: purl.oclc.org/estimateS.

Commonwealth of Australia (2018). Threat abatement plan for predation by the European Red Fox.

Commonwealth of Australia (2015). Threat abatement plan for predation by feral cats.

Cowan, M.A. (2019) 'Denning requirements of the northern quoll (Dasyurus hallucatus) and the implications for artificial den construction in the Pilbara, Western Australia', p. 123.

Davis, R.A. and Metcalf, B.M. (2008). The Night Parrot (*Pezoporus occidentalis*) in northern Western Australia: a recent sighting from the Pilbara region. *Emu* 108(3) 233-236.

Debus, S. (2019). *The Birds of Prey of Australia: A Field Guide*. Third Edition. Oxford University Press, Australia.

DBCA (Department of Biodiversity, Conservation and Attractions) (2017). *Guidelines for Surveys to Detect the Presence of Bilbies and to Assess the Importance of Habitat in Western Australia*. Version 1 – August 2017.

DBCA (2024). *Guidelines for determining the likely presence and habitat usage of night parrot (Pezoporus occidentalis) in Western Australia*. DBCA, Perth. Western Australia.

DBCA (2025a). Dandjoo Search Accessed July 2025.

DBCA (2025b). Threatened and Priority Fauna Database extract, July 2025.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2020), Interim Biogeographic Regionalisation for Australia (Subregions) v. 7 (IBRA).

DCCEEW (2023). *Recovery Plan for the Greater Bilby (Macrotis lagotis)*, Department of Climate Change, Energy, the Environment and Water, Canberra.

DCCEEW (2024a). *Conservation Advice for* Calidris acuminata *(sharp-tailed sandpiper)*. Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/874-conservation-advice- 05012024.pdf. In effect under the EPBC Act from 05-Jan-2024.

DCCEEW (2024b). *Conservation Advice for* Tringa nebularia *(common greenshank)*. Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/832-conservation-advice- 05012024.pdf. In effect under the EPBC Act from 05-Jan-2024.

DCCEEW (2025). *Conservation Advice for* Pezoporus occidentalis *(night parrot)*. Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/59350-conservation-advice-05092025.pdf. In effect under the EPBC Act from 05-Sep-2025.

DCCEEW (2026). Species Profile and Threats Database (SPRAT).

DEWHA (Department of Environment, Water, Heritage and the Arts) (2008). *Approved Conservation Advice for* Liasis olivaceus barroni *(Olive Python - Pilbara subspecies)*. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/66699-conservation-advice.pdf.

DEWHA (2010a). *Survey Guidelines for Australia's Threatened Bats*. Commonwealth of Australia 2010.

DEWHA (2010b). *Survey Guidelines for Australia's Threatened Birds*. Commonwealth of Australia 2010.

DPAW (Department of Parks and Wildlife) (2013). *Pilbara Olive Python Workshop TalkBook*. Workshop held at Kieran McNamara Conservation Science Centre DPAW, Dick Perry Avenue, Kensington, facilitated by Craig Salt.

DPAW (2017). Interim guideline for preliminary surveys of night parrot (*Pezoporus occidentalis*) in Western Australia.

DoE (Department of Environment) (2015). Draft Referral Guideline for 14 birds listed as migratory under the EPBC Act. Australian Government, May 2015.

DoE (2016). *EPBC Act referral guideline for the endangered northern quoll* (*Dasyurus hallucatus*). EPBC Act Policy Statement. Commonwealth of Australia. January 2016.

DoEE (Department of Environment and Energy) (2017). EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species. Commonwealth of Australia.

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* 78: 315-341.

DSEWPaC (Department of Sustainability, Environment, Water, Population and Communities) (2011a). *Survey Guidelines for Australia's Threatened Mammals*. Commonwealth of Australia 2011.

DSEWPaC (2011b). *Survey Guidelines for Australia's Threatened Reptiles*. Commonwealth of Australia 2011.

Dunlop, D.J., Birch, N. and Moore, H. (2019) *Pilbara Northern Quoll Research Program*. Perth, Western Australia: DBCA.

Dunlop, J., Craig, M., Moore, H., Cowan, M. and Gibson., L. (2023). *Pilbara Northern Quoll Research Program: a review of progress* (2016-2021), DBCA, Perth.

Ecoscape (2024). *Tabba Tabba Lithium Project Flora and Fauna Assessments*. Unpublished report to Wildcat Resources.

EPA (Environmental Protection Authority) (2020). *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. EPA, Western Australia.

Garnett, S.T. and Barker, G.B. (2021). *The Action Plan for Australian Birds 2020*. CSIRO Publishing, Collingwood, Victoria.

Garnett, S.T. Szabo, J.K. and Dutson, G. (2011). *The Action Plan For Australian Birds 2010*. CSIRO Publishing, Collingwood, Victoria.

Geering, A., Agnew, L. and Harding, S. (2007). *Shorebirds of Australia*. CSIRO Publishing, Collingwood, Victoria.

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* 78: 91-122.

Government of Western Australia (2000). *Bush Forever Volume 2*. Department of Environmental Protection, Perth.

Hansen, B.D., Fuller, R.A., Watkins, D., Rogers, D.I., Clemens, R.S., Newman, M., Woehler, E.J. and Weller, D.R. (2016) *Revision of the East Asian-Australasian Flyway Population Estimates for 37 listed Migratory Shorebird Species*. Unpublished report for the Department of the Environment. BirdLife Australia, Melbourne.

Hernandez-Santin, L., Fisher, D. and Goldizen, A. (2018). *Ecology and predator associations of the northern quoll in the Pilbara*. 2018. Report of the National Environmental Science Program Threatened Species Recovery Hub.

Hill, B.M. and Ward, S.J. (2010). *National Recovery Plan for the Northern Quoll* Dasyurus hallucatus. Department of Natural Resources, Environment, The Arts and Sport, Darwin.

IUCN (2019). The IUCN Red List of Threatened Species. Version 2019-1. <http://www.iucnredlist.org>

Johnstone, R.E. & Storr, G.M. (1998). *Handbook of Western Australian Birds. Volume 1: Nonpasserines (Emu to Dollarbird)*. Western Australian Museum, Perth.

Johnstone, R.E. & Storr, G.M. (2004). *Handbook of Western Australian Birds. Volume 2: Passerines (Blue-winged Pitta to Goldfinch)*. Western Australian Museum, Perth.

Kendrick, P. and McKenzie, N. L. (2001). Pilbara 1 (PIL1 - Chichester subregion). In: A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002. Department of Conservation and Land Management, Kensington.

Kendrick, P. and Stanley, F. (2001). Pilbara 4 (PIL4 - Roebourne subregion). In: A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002. Department of Conservation and Land Management, Kensington.

King, D. R. (1989). An assessment of the hazard posed to Northern Quolls (Dasyurus hallucatus) by aerial baiting with 1080 to control Dingoes. *Australian Wildlife Research* 16: 569–574.

Masters, P. and Dickman, C. (2012). Population dynamics of *Dasycercus blythi* (Marsupialia: Dasyuridae) in central Australia: How does the mulgara persist? *Wildlife Research* 39(5), 419-428.

McKenzie, N, van Leeuwen, S and Pinder, A. (2009). *Introduction to the Pilbara Biodiversity Survey 2002 – 2007*. Records of the Western Australian Museum Supplement 78:3 – 89.

McRae PD (2004) Aspects of the ecology of the greater bilby, *Macrotis lagotis*, in Queensland. (Unpublished Master of Science thesis). University of Sydney, Australia.

Menkhorst, P. and Knight, F. (2011). *A field guide to the mammals of Australia*. 3rd Edition. Oxford University Press, South Melbourne.

Moseby KE & O'Donnell E (2003). Reintroduction of the greater bilby, *Macrotis lagotis* (Reid) (Marsupialia: Thylacomyidae), to northern South Australia: survival, ecology and notes on reintroduction protocols. *Wildlife Research* 30: 15–27.

MWH Australia (2014). Wodgina DSO Project: Northern Quoll Monitoring 2014. Unpublished report to Atlas Iron Limited.

NPRT (Night Parrot Recovery Team (2019). Night Parrot Recovery Team Website URL: https://nightparrot.com.au

Ottewell K, McArthur S, van Leeuwen S, Byrne M (2017). *Population genetics of the ghost bat (Macroderma gigas) in the Pilbara bioregion.* Department of Biodiversity, Conservation and Attractions, Kensington, WA.

Outback Ecology (2009). *Wodgina DSO Project: Terrestrial Vertebrate Fauna Assessment*. Unpublished report prepared for Atlas Iron Limited.

Outback Ecology (2010). *Turner River Hub: Terrestrial Vertebrate Fauna Baseline Survey*. Unpublished report prepared for Atlas Iron Limited.

Outback Ecology (2011). *Mt Dove DSO Project: Vertebrate Fauna Assessment*. Unpublished report prepared for Atlas Iron Limited.

Outback Ecology (2012). *Hercules Project: Terrestrial Vertebrate Fauna Baseline Survey*. Unpublished report prepared for Atlas Iron Limited.

Pavey, C. (2006). *National Recovery Plan for the Greater Bilby* Macrotis lagotis. Northern Territory Department of Natural Resources, Environment and the Arts. Available from: http://webarchive.nla.gov.au/awa/20221129063048/https://www.dcceew.gov.au/environment/biodiversity/threatened/recovery-plans/national-recovery-plan-greater-bilby-macrotis-lagotis. In effect under the EPBC Act from 09-May-2007. Ceased to be in effect under the EPBC Act from 11-Apr-2023.

Pearson, D. (2003). Giant Pythons of the Pilbara. *Landscope* 19 (1) 35 – 42.

Phoenix Environmental Sciences (2012). Tar*geted Fauna Surveys for the Buckland Projec*t. Unpublished report for Iron Ore Holdings Ltd, November 2012.

Schmitt, L. H., Bradley, A. J., Kemper, C. M., Kitchener, D. J., Humphreys, W. F. & How, R. A. (1989). Ecology and physiology of the northern quoll, *Dasyurus hallucatus* (Marsupialia, Dasyuridae), at Mitchell Plateau, Kimberley, Western Australia. *Journal of Zoology* 217: 539–558.

Shaw, R. (2022). Linking life history to landscape for threatened species conservation in a multi-use region, *Conservation Biology* 37(1):

Shaw, R., Spencer, P., Gibson, L., Dunlop, J., Kinloch, J., Mokany, K., Byrne, M., Moritz, C., Davie, H., Travouillon, K. & Ottewell, K.. (2022). Linking life history to landscape for threatened species conservation in a multiuse region. *Conservation Biology*. 37. 10.1111/cobi.13989.

Stantec (2017). *Wodgina DSO Project: Northern Quoll Monitoring Survey 2017*. Unpublished report to Atlas Iron Limited.

Stantec (2018a). *Results of the Wodgina Supplementary Bat Survey*. Unpublished memo to Mineral Resources Limited, November 2018.

Stantec (2018b). *Wodgina Project: Level 1 fauna Survey, targeted conservation significant fauna survey and desktop assessment*. Unpublished report prepared for Mineral Resources Limited, September 2018.

Storr, G.M., Smith, L.A. and Johnstone, R.E. (1983). *Lizards of Western Australia. II. Dragons and Monitors*. W.A. Museum, Perth.

Storr, G.M., Smith, L.A. and Johnstone, R.E. (2002). *Snakes of Western Australia*. W.A. Museum, Perth.

Storr, G.M., Smith, L.A. and Johnstone, R.E. (1990). *Lizards of Western Australia. III. Geckoes and Pygopods*. W.A. Museum, Perth.

Storr, G.M., Smith, L.A. and Johnstone, R.E. (1999). *Lizards of Western Australia. I. Skinks*. 2nd edition. W.A. Museum, Perth.

Southgate R., Paltridge R., Masters P. & Carthew S. (2007). Bilby distribution and fire: A test of alternative models of habitat suitability in the Tanami Desert, Australia. *Ecography* 30: 759–776.

Southgate R., Dziminski M.A., Paltridge R., Schubert A. & Gaikhorst G. (2018). Verifying bilby presence and the systematic sampling of wild populations using the 2 ha sign-based monitoring protocol – with notes on aerial and ground survey techniques and asserting absence. *Australian Mammalogy* 41, 27–38.

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

TSSC (Threatened Species Scientific Committee) (2016a). Conservation Advice – *Macroderma gigas*, Ghost Bat.

TSSC (Threatened Species Scientific Committee) (2016b). *Conservation Advice* Macrotis lagotis *greater bilby*. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/282-conservation-advice-15072016.pdf. In effect under the EPBC Act from 15-Jul-2016.

TSSC (2016c). *Conservation Advice* Pezoporus occidentalis *night parrot*. Canberra: Department of the Environment. URL: http://www.environment.gov.au/biodiversity/threatened/species/pubs/59350-conservation-advice-15072016.pdf. In effect under the EPBC Act from 15-Jul-2016.

TSSC (2016d). Conservation Advice – *Rhinonicteris aurantia* (Pilbara form), Pilbara Leaf-nosed Bat.

TSSC (2018). *Conservation Advice* Polytelis alexandrae *princess parrot*. Canberra: Department of the Environment and Energy. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/758-conservation-advice-01022018.pdf. In effect under the EPBC Act from 01-Feb-2018.

TSSC (2020). *Conservation Advice* Falco hypoleucos *Grey Falcon*. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/929-conservation-advice-09072020.pdf. In effect under the EPBC Act from 09-Jul-2020.

Tutt, M. Fekete, S. Mitchell, S., Brace, P. and Pearson, D. (2004). *Unravelling the Mysteries of Pilbara Olive Python Ecology*. *Threatened Species Network Community Grants Final Report- Project WA11/101*. Karratha: Nickol Bay Naturalists' Club/WA CALM.

Tyler, M.J. (1998). *The Action Plan for Australian Frogs.* Environment Australia, Canberra.

Tyler, M.J., Smith, L.A. and Johnstone, R.E. (2000). *Frogs of Western Australia*. W.A. Museum, Perth.

Van Dyck and Strahan, R. (Ed.) (2008). *The Mammals of Australia*. 3rd Edition. Australian Museum/Reed Books, Sydney.

Western Wildlife (2020). *Wodgina Lithium Project: Level 2 Vertebrate Fauna Survey 2019*. Unpublished Report to MARBL Lithium Operation Pty Ltd.

Western Wildlife (2024). *Hemi Gold Project: Vertebrate Fauna Surveys 2021 – 2024.* Unpublished report to De Grey Mining Limited.

Wilson, S. and Swan, G. (2020). *A complete guide to the reptiles of Australia. 6th Edition*. New Holland Publishers (Australia).

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

Woinarski, J.C.Z, Burbidge, A.A, and Harrison, P.L. (2015). Ongoing unravelling of a continental fauna: Decline and extinction of Australian mammals since European settlement. *Proceedings of the National Academy of Science of the United States of America* 112(15): 4531-4540.

Woinarski, J.C.Z, Murphy, B. P., Palmer, R., Legge, S. M., Dickman, C. R., Doherty, T. S., Edwards, G., Nankivell, A., Read, J. L. and Stokeld, D. (2018). How many reptiles are killed by cats in Australia? *Wildlife Research* 45(3) 247-266.

Appendices.

Appendix 1. Daily weather observations for each survey.

Phase 1 Survey Weather (Data after BOM 2025).

Month and Year	Day	Survey Period	Daily Temperature (°C)		Rainfall (mm)
			Minimum	Maximum	
March 2025	26		25.7	40.2	0
	27		24.0	40.3	0
	28		25.7	38.5	0
	29		25.5	37.5	0
	30		28.5	37.8	0
	31		27.3	35.1	0
April 2025	1		24.6	33.1	0
	2		26.4	34.8	0
	3		23.6	36.4	0.8
	4		23.1	34.9	0
	5		23.1	35.5	0
	6		26.1	34.8	0
	7		26.1	37.2	0
	8		25.8	35.7	0
	9		27.2	36.4	0
	10		27.2	37.4	0
	11	Survey	26.7	39.1	1.6
	12	Survey	22.7	37.8	0
	13	Survey	23.4	36.9	0
	14	Survey	22.7	36.1	0
	15	Survey	23.3	38.8	0
	16	Survey	25.9	36.7	0
	17	Survey	25.2	33.6	0
	18	Survey	26.8	34.1	0
	19	Survey	21.7	35	0
	20	Survey	22.5	34.6	2.2
	21	Survey	23.9	37.2	0
	22	Survey	24.5	35.1	0
	23	Survey	25.5	34.8	0
	24	Survey	24.3	36.5	0

Targeted Survey Weather.

Month and Year	Day	Survey Period	Daily Temperature (°C)		Rainfall (mm)
			Minimum	Maximum	
July 2025	8		12	30.9	0
	9		15.3	26.1	0
	10		9.8	25.2	0
	11		9.8	28.4	0
	12		11.7	28.5	0
	13		12.9	29	0
	14		13.9	32.5	0
	15		17.9	28.7	0
	16		14	29.5	0
	17		13.6	27.1	0
	18		11.4	29.7	0
	19		10.1	30	0
	20		11.3	27.5	0
	21		14.6	27.5	0
	22		11.1	24.8	0
	23		10.2	24.8	0
	24		18.2	25.8	12.4
	25		10	23	0.4
	26		8.4	22.6	0
	27		8.5	23.3	0
	28		12.6	24.5	0
	29		9.7	22.7	0
	30		7.9	23.8	0
	31		8.9	26.1	0
August 2025	1		9.3	27.7	0
	2	Survey	13.4	26.5	0
	3	Survey	20.3	29.1	0
	4	Survey	15.0	29.4	0
	5	Survey	18.7	25.6	0
	6	Survey	18.3	29.6	0
	7	Survey	14.9	30.7	0

Phase 2 Survey Weather.

Month and Year	Day	Survey Period	Daily Temperature (°C)		Rainfall (mm)
			Minimum	Maximum	
August 2025	10		19.0	32.0	0
	11		16.1	31.4	0
	12		15.4	33.1	0
	13		17.2	31.6	0
	14		15.4	31.3	0
	15		14.1	32.6	0
	16		16.4	33.3	0
	17		19.2	32.5	0
	18		15.2	29.7	0
	19		12.5	28.6	0
	20		12.2	27.9	0
	21		16.2	28.9	0.2
	22		20.9	31.0	0.2
	23		17.7	27.2	0
	24		21.5	27.1	0
	25		19.3	29.5	0
	26		13.4	26.8	0
	27		10.3	27.5	0
	28		10.5	29.2	0
	29		13.9	29.2	0
	30		14.1	29.0	0
	31		14.6	32.9	0
September 2025	1	Survey	16.0	32.0	0
	2	Survey	15.0	33.4	0
	3	Survey	15.3	32.0	0
	4	Survey	16.4	34.2	0
	5	Survey	17.3	33.3	0
	6	Survey	18.5	30.3	0
	7	Survey	13.2	28.9	0
	8	Survey	11.8	32.8	0
	9	Survey	13.4	33.8	0
	10	Survey	18.7	32.6	0
	11	Survey	18.7	32.3	0
	12	Survey	18.8	33.5	0

Appendix 2. Sampling Locations.

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Bat recording	Bat03-15-04-25	50	701499	7710103	15/4/2025	17/4/2025
Bat recording	Bat04-19-04-25	50	708767	7705003	19/4/2025	21/4/2025
Bat recording	WBAT03_010925	50	697875	7708822	1/9/2025	3/9/2025
Bat recording	Wbat03_030925	50	696554	7707404	3/9/2025	5/9/2025
Bat recording	Wbat03_050925	50	705737	7713618	5/9/2025	7/9/2025
Bat recording	Wbat03_070925	50	706888	7716881	7/9/2025	10/9/2025
Bat recording	Wbat03_110925	50	700540	7714813	11/9/2025	12/9/2025
Bat recording	WBat03-130425	50	700191	7712375	13/4/2025	15/4/2025
Bat recording	Wbat030411	50	696921	7708423	11/4/2025	13/4/2025
Bat recording	Wbat030417	50	701199	7715749	17/4/2025	19/4/2025
Bat recording	Wbat030419	50	701063	7714478	19/4/2025	21/4/2025
Bat recording	Wbat030421	50	701790	7716267	21/4/2025	23/4/2025
Bat recording	WBAT04_010925	50	698264	7707368	1/9/2025	3/9/2025
Bat recording	Wbat04_030925	50	697595	7706941	3/9/2025	6/9/2025
Bat recording	Wbat04_09-09-25	50	698160	7704511	9/9/2025	11/9/2025
Bat recording	Wbat04_11-09-25	50	702294	7715839	11/9/2025	12/9/2025
Bat recording	Wbat040411	50	702632	7719016	11/4/2025	13/4/2025
Bat recording	Wbat040413	50	713683	7725528	13/4/2025	15/4/2025
Bat recording	Wbat040417	50	702143	7707578	17/4/2025	19/4/2025
Bat recording	Wbat40415	50	699977	7712908	15/4/2025	17/4/2025
Camera Trap	Cam06c	50	706802	7716545	5/8/2025	5/9/2025
Camera Trap	Cam29c	50	705709	7713662	5/8/2025	5/9/2025
Camera Trap	Cam30c	50	706681	7716669	5/8/2025	5/9/2025
Camera Trap	Cam35c	50	700335	7715178	6/8/2025	4/9/2025
Camera Trap	Cam43c	50	706843	7716443	5/8/2025	5/9/2025
Camera Trap	Cam47c	50	705729	7713585	5/8/2025	5/9/2025
Camera Trap	Cam49c	50	706081	7711780	5/8/2025	5/9/2025
Camera Trap	Cam51c	50	705841	7711699	3/8/2025	5/9/2025
Camera Trap	Cam53c	50	700923	7713455	7/8/2025	5/9/2025
Camera Trap	Cam58c	50	706656	7716998	5/8/2025	5/9/2025
Camera Trap	Cam61c	50	705840	7711902	5/8/2025	5/9/2025
Camera Trap	Cam63c	50	701609	7714495	7/8/2025	4/9/2025
Camera Trap	Cam65c	50	705569	7712196	4/8/2025	4/9/2025
Camera Trap	Camww31_110425	50	702637	7719020	11/4/2025	18/4/2025
Camera Trap	Camww4A_190425	50	704014	7718286	19/4/2025	23/4/2025
Camera Trap	Camww6_130425	50	700565	7714858	13/4/2025	19/4/2025

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Camera Trap	Camww63_110425	50	696923	7708436	11/4/2025	18/4/2025
Camera Trap	Camww65a_190425	50	699730	7712780	19/4/2025	23/4/2025
Camera Trap	Qcam04	50	697772	7712247	2/8/2025	6/8/2025
Camera Trap	Qcam05	50	697977	7714378	2/8/2025	6/8/2025
Camera Trap	Qcam07	50	699127	7704404	2/8/2025	6/8/2025
Camera Trap	Qcam08	50	698023	7712342	2/8/2025	6/8/2025
Camera Trap	Qcam09	50	699078	7704166	2/8/2025	6/8/2025
Camera Trap	Qcam20	50	697879	7712321	2/8/2025	6/8/2025
Camera Trap	Qcam21	50	698907	7703519	2/8/2025	6/8/2025
Camera Trap	Qcam22	50	697694	7712168	2/8/2025	6/8/2025
Camera Trap	Qcam23	50	698987	7703825	2/8/2025	6/8/2025
Camera Trap	Qcam24	50	697595	7714193	2/8/2025	6/8/2025
Camera Trap	Qcam27	50	697288	7714403	2/8/2025	6/8/2025
Camera Trap	Qcam31	50	698351	7712528	2/8/2025	6/8/2025
Camera Trap	Qcam32	50	699016	7703722	2/8/2025	6/8/2025
Camera Trap	Qcam35	50	698901	7703413	2/8/2025	6/8/2025
Camera Trap	Qcam41	50	697499	7714283	2/8/2025	6/8/2025
Camera Trap	Qcam42	50	698262	7712462	2/8/2025	6/8/2025
Camera Trap	Qcam44	50	699067	7704053	2/8/2025	6/8/2025
Camera Trap	Qcam46	50	697710	7714185	2/8/2025	6/8/2025
Camera Trap	Qcam52	50	699085	7704297	2/8/2025	6/8/2025
Camera Trap	Qcam53	50	698987	7703627	2/8/2025	6/8/2025
Camera Trap	Qcam54	50	698259	7712364	2/8/2025	6/8/2025
Camera Trap	Qcam55	50	697785	7714260	2/8/2025	6/8/2025
Camera Trap	Qcam56	50	697369	7714336	2/8/2025	6/8/2025
Camera Trap	Qcam57	50	697867	7714322	2/8/2025	6/8/2025
Camera Trap	Qcam59	50	697693	7712048	2/8/2025	6/8/2025
Camera Trap	Qcam60	50	698156	7712322	2/8/2025	6/8/2025
Camera Trap	Qcam62	50	697129	7714381	2/8/2025	6/8/2025
Camera Trap	Qcam63	50	698994	7703969	2/8/2025	6/8/2025
Camera Trap	Qcam64	50	698228	7712246	2/8/2025	6/8/2025
Camera Trap	Qcam66	50	697197	7714460	2/8/2025	6/8/2025
Camera Trap	Tcam05	50	699374	7703116	14/4/2025	18/4/2025
Camera Trap	Tcam05a	50	709037	7705252	19/4/2025	23/4/2025
Camera Trap	Tcam05d	50	702486	7719564	1/9/2025	6/9/2025
Camera Trap	Tcam05e	50	702355	7711761	6/9/2025	10/9/2025
Camera Trap	Tcam06e	50	701958	7710528	6/9/2025	10/9/2025

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Camera Trap	Tcam07	50	702087	7707561	16/4/2025	23/4/2025
Camera Trap	Tcam09	50	701504	7710143	15/4/2025	23/4/2025
Camera Trap	TCam20d	50	697776	7706121	3/9/2025	9/9/2025
Camera Trap	Tcam21	50	705586	7704042	16/4/2025	23/4/2025
Camera Trap	TCam21d	50	697933	7707956	1/9/2025	9/9/2025
Camera Trap	Tcam22d	50	702505	7719320	1/9/2025	6/9/2025
Camera Trap	Tcam22e	50	703062	7711693	6/9/2025	10/9/2025
Camera Trap	Tcam23	50	700215	7712381	13/4/2025	17/4/2025
Camera Trap	Tcam23a	50	698689	7703156	18/4/2025	23/4/2025
Camera Trap	TCam23d	50	706770	7715191	6/9/2025	10/9/2025
Camera Trap	Tcam24	50	702849	7703531	16/4/2025	23/4/2025
Camera Trap	Tcam24d	50	702270	7719630	1/9/2025	6/9/2025
Camera Trap	Tcam24e	50	702393	7711084	6/9/2025	10/9/2025
Camera Trap	Tcam27	50	704612	7704111	16/4/2025	23/4/2025
Camera Trap	Tcam27d	50	696078	7710184	2/9/2025	7/9/2025
Camera Trap	Tcam27e	50	701606	7703234	7/9/2025	11/9/2025
Camera Trap	TCam29d	50	705008	7710361	6/9/2025	10/9/2025
Camera Trap	TCam30d	50	704430	7709809	6/9/2025	10/9/2025
Camera Trap	Tcam31d	50	700221	7712387	4/9/2025	8/9/2025
Camera Trap	Tcam31f	50	701034	7710504	9/9/2025	11/9/2025
Camera Trap	Tcam32	50	698851	7702650	14/4/2025	18/4/2025
Camera Trap	Tcam32a	50	708766	7704483	19/4/2025	23/4/2025
Camera Trap	TCam32d	50	696298	7706338	3/9/2025	9/9/2025
Camera Trap	Tcam35	50	699501	7703316	14/4/2025	18/4/2025
Camera Trap	Tcam35a	50	708786	7705037	19/4/2025	23/4/2025
Camera Trap	TCam35d	50	698281	7707383	1/9/2025	9/9/2025
Camera Trap	Tcam41	50	700586	7714218	13/4/2025	17/4/2025
Camera Trap	Tcam41a	50	698496	7704214	18/4/2025	23/4/2025
Camera Trap	TCam41d	50	695888	7707680	2/9/2025	8/9/2025
Camera Trap	TCam41e	50	702759	7703141	8/9/2025	11/9/2025
Camera Trap	TCam42d	50	697123	7707931	2/9/2025	8/9/2025
Camera Trap	TCam42e	50	703154	7703264	8/9/2025	11/9/2025
Camera Trap	Tcam43e	50	700623	7714838	6/9/2025	10/9/2025
Camera Trap	Tcam44	50	701171	7710435	16/4/2025	23/4/2025
Camera Trap	TCam44d	50	697964	7707289	1/9/2025	9/9/2025
Camera Trap	Tcam46	50	700001	7712849	13/4/2025	17/4/2025
Camera Trap	Tcam46a	50	698470	7704067	18/4/2025	23/4/2025

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Camera Trap	TCam46d	50	697753	7702743	2/9/2025	11/9/2025
Camera Trap	Tcam47e	50	702268	7715736	6/9/2025	10/9/2025
Camera Trap	TCam49d	50	705739	7713614	5/9/2025	10/9/2025
Camera Trap	TCam4d	50	697972	7703038	2/9/2025	11/9/2025
Camera Trap	TCam51d	50	705740	7713614	5/9/2025	10/9/2025
Camera Trap	Tcam52	50	701829	7708644	16/4/2025	23/4/2025
Camera Trap	TCam52d	50	705143	7710604	6/9/2025	10/9/2025
Camera Trap	Tcam53	50	703242	7704126	16/4/2025	23/4/2025
Camera Trap	Tcam53e	50	703099	7710661	6/9/2025	10/9/2025
Camera Trap	Tcam54d	50	696666	7710178	2/9/2025	7/9/2025
Camera Trap	Tcam54e	50	701819	7703723	7/9/2025	11/9/2025
Camera Trap	Tcam55	50	702544	7702918	16/4/2025	23/4/2025
Camera Trap	Tcam55d	50	702738	7719518	1/9/2025	6/9/2025
Camera Trap	Tcam55e	50	703024	7709736	6/9/2025	10/9/2025
Camera Trap	Tcam56	50	699972	7711284	15/4/2025	23/4/2025
Camera Trap	TCam56d	50	697595	7706946	3/9/2025	9/9/2025
Camera Trap	Tcam57	50	700864	7710930	16/4/2025	23/4/2025
Camera Trap	TCam57d	50	696202	7707681	2/9/2025	8/9/2025
Camera Trap	Tcam57e	50	698165	7704466	9/9/2025	11/9/2025
Camera Trap	Tcam58e	50	702297	7715834	6/9/2025	10/9/2025
Camera Trap	Tcam59d	50	696139	7710371	2/9/2025	7/9/2025
Camera Trap	Tcam59e	50	701570	7702968	7/9/2025	11/9/2025
Camera Trap	TCam60d	50	696850	7707637	2/9/2025	12/9/2025
Camera Trap	TCam61d	50	706874	7715914	5/9/2025	10/9/2025
Camera Trap	Tcam62	50	701804	7709501	16/4/2025	23/4/2025
Camera Trap	Tcam62d	50	695969	7710239	2/9/2025	7/9/2025
Camera Trap	Tcam62e	50	701543	7702716	7/9/2025	11/9/2025
Camera Trap	Tcam63a	50	708575	7704298	19/4/2025	23/4/2025
Camera Trap	TCam63d	50	706235	7711623	6/9/2025	12/9/2025
Camera Trap	Tcam64d	50	696420	7710257	2/9/2025	7/9/2025
Camera Trap	Tcam64e	50	701693	7703477	7/9/2025	11/9/2025
Camera Trap	TCam65d	50	706177	7713792	6/9/2025	10/9/2025
Camera Trap	Tcam66	50	699765	7712753	13/4/2025	17/4/2025
Camera Trap	Tcam66a	50	698506	7703784	18/4/2025	23/4/2025
Camera Trap	TCam66d	50	697519	7706848	3/9/2025	9/9/2025
Camera Trap	TCam7d	50	695397	7707929	1/9/2025	8/9/2025
Camera Trap	TCam7e	50	702628	7706908	8/9/2025	11/9/2025

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Camera Trap	TCam8d	50	695870	7707558	2/9/2025	8/9/2025
Camera Trap	TCam8e	50	702842	7705529	8/9/2025	11/9/2025
Camera Trap	TCam9D	50	696399	7708803	1/9/2025	8/9/2025
Camera Trap	TCam9d	50	696399	7708803	1/9/2025	8/9/2025
Camera Trap	TCam9e	50	702875	7703875	8/9/2025	11/9/2025
Camera Trap	W420416	50	701919	7715777	16/4/2025	23/4/2025
Camera Trap	W430414	50	702010	7718970	14/4/2025	22/4/2025
Camera Trap	W470416	50	701069	7714478	16/4/2025	23/4/2025
Camera Trap	W490413	50	703420	7718564	13/4/2025	23/4/2025
Camera Trap	Ww200416	50	714012	7725140	16/4/2025	23/4/2025
Camera Trap	Ww220416	50	701195	7715757	16/4/2025	23/4/2025
Camera Trap	Ww290416	50	702379	7718726	16/4/2025	23/4/2025
Camera Trap	Ww31a	50	699981	7712909	18/4/2025	23/4/2025
Camera Trap	Ww40414	50	712570	7726058	14/4/2025	17/4/2025
Camera Trap	Ww510414	50	702091	7719103	14/4/2025	22/4/2025
Camera Trap	Ww540416	50	701769	7716286	16/4/2025	23/4/2025
Camera Trap	Ww580414	50	701219	7718606	14/4/2025	18/4/2025
Camera Trap	Ww58a	50	704150	7718675	19/4/2025	23/4/2025
Camera Trap	Ww590416	50	702429	7718258	16/4/2025	23/4/2025
Camera Trap	Ww600416	50	702070	7717039	16/4/2025	23/4/2025
Camera Trap	Ww60413	50	713722	7725468	13/4/2025	18/4/2025
Camera Trap	Ww610416	50	701999	7716735	16/4/2025	23/4/2025
Camera Trap	Ww640416	50	702852	7718653	16/4/2025	23/4/2025
Camera Trap	Ww650414	50	702000	7718667	14/4/2025	18/4/2025
Camera Trap	Ww6a	50	704234	7718519	19/4/2025	23/4/2025
Camera Trap	Ww8a	50	713449	7725523	18/4/2025	23/4/2025
Habitat Assessment	Thab100	50	699971	7711284	15/4/2025	15/4/2025
Habitat Assessment	Thab101	50	712668	7724927	17/4/2025	17/4/2025
Habitat Assessment	Thab102	50	712046	7724107	17/4/2025	17/4/2025
Habitat Assessment	Thab103	50	711614	7723205	17/4/2025	17/4/2025
Habitat Assessment	Thab104	50	711152	7722332	17/4/2025	17/4/2025
Habitat Assessment	Thab105	50	697933	7707873	18/4/2025	18/4/2025
Habitat Assessment	Thab106	50	698631	7702980	18/4/2025	18/4/2025
Habitat Assessment	Thab107	50	698506	7703783	18/4/2025	18/4/2025
Habitat Assessment	Thab108	50	699390	7703094	19/4/2025	19/4/2025
Habitat Assessment	Thab110	50	708576	7704299	19/4/2025	19/4/2025
Habitat Assessment	Thab111	50	707009	7705129	19/4/2025	19/4/2025

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Habitat Assessment	Thab112	50	706650	7704546	19/4/2025	19/4/2025
Habitat Assessment	Thab113	50	710536	7721556	20/4/2025	20/4/2025
Habitat Assessment	Thab114	50	709954	7720772	20/4/2025	20/4/2025
Habitat Assessment	Thab115	50	702635	7706511	21/4/2025	21/4/2025
Habitat Assessment	Thab116	50	701448	7706432	21/4/2025	21/4/2025
Habitat Assessment	Thab117	50	703181	7703173	21/4/2025	21/4/2025
Habitat Assessment	Thab118	50	703591	7703919	21/4/2025	21/4/2025
Habitat Assessment	Thab119	50	703443	7702890	21/4/2025	21/4/2025
Habitat Assessment	Thab120	50	695616	7707310	21/4/2025	21/4/2025
Habitat Assessment	Thab121	50	696980	7709177	21/4/2025	21/4/2025
Habitat Assessment	Thab122	50	696097	7708588	21/4/2025	21/4/2025
Habitat Assessment	Thab123	50	701750	7715972	22/4/2025	22/4/2025
Habitat Assessment	Thab124	50	702408	7715977	23/4/2025	23/4/2025
Habitat Assessment	Thab125	50	702940	7716142	24/4/2025	24/4/2025
Habitat Assessment	Thab126	50	702908	7716706	25/4/2025	25/4/2025
Habitat Assessment	Thab127	50	702079	7717207	26/4/2025	26/4/2025
Habitat Assessment	Thab128	50	701466	7718652	27/4/2025	27/4/2025
Habitat Assessment	Thab129	50	701286	7714772	28/4/2025	28/4/2025
Habitat Assessment	Thab130	50	697712	7712045	3/8/2025	3/8/2025
Habitat Assessment	Thab131	50	698890	7710710	3/8/2025	3/8/2025
Habitat Assessment	Thab132	50	698662	7710271	3/8/2025	3/8/2025
Habitat Assessment	Thab133	50	698400	7709352	3/8/2025	3/8/2025
Habitat Assessment	Thab134	50	698200	7709078	3/8/2025	3/8/2025
Habitat Assessment	Thab135	50	697730	7708597	3/8/2025	3/8/2025
Habitat Assessment	Thab136	50	696880	7707855	3/8/2025	3/8/2025
Habitat Assessment	Thab137	50	695470	7706203	3/8/2025	3/8/2025
Habitat Assessment	Thab138	50	699123	7713416	2/8/2025	2/8/2025
Habitat Assessment	Thab139	50	705845	7711700	3/8/2025	3/8/2025
Habitat Assessment	Thab140	50	706158	7714353	4/8/2025	4/8/2025
Habitat Assessment	Thab141	50	698473	7713908	2/8/2025	2/8/2025
Habitat Assessment	Thab142	50	707864	7717750	4/8/2025	4/8/2025
Habitat Assessment	Thab143	50	708355	7717226	4/8/2025	4/8/2025
Habitat Assessment	Thab144	50	707519	7715804	4/8/2025	4/8/2025
Habitat Assessment	Thab145	50	709092	7719249	4/8/2025	4/8/2025
Habitat Assessment	Thab146	50	708734	7718397	4/8/2025	4/8/2025
Habitat Assessment	Thab147	50	710371	7720380	4/8/2025	4/8/2025
Habitat Assessment	Thab148	50	709792	7719938	4/8/2025	4/8/2025

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Habitat Assessment	Thab149	50	703430	7719482	4/8/2025	4/8/2025
Habitat Assessment	Thab150	50	705763	7713617	5/8/2025	5/8/2025
Habitat Assessment	Thab151	50	698056	7714159	2/8/2025	2/8/2025
Habitat Assessment	Thab152	50	705441	7714367	5/8/2025	5/8/2025
Habitat Assessment	Thab153	50	705199	7715027	5/8/2025	5/8/2025
Habitat Assessment	Thab154	50	704873	7714328	5/8/2025	5/8/2025
Habitat Assessment	Thab155	50	705199	7713989	5/8/2025	5/8/2025
Habitat Assessment	Thab156	50	706696	7716630	5/8/2025	5/8/2025
Habitat Assessment	Thab157	50	706355	7713072	5/8/2025	5/8/2025
Habitat Assessment	Thab158	50	705489	7711382	5/8/2025	5/8/2025
Habitat Assessment	Thab159	50	704463	7711305	5/8/2025	5/8/2025
Habitat Assessment	Thab160	50	703488	7711181	5/8/2025	5/8/2025
Habitat Assessment	Thab161	50	703889	7710547	5/8/2025	5/8/2025
Habitat Assessment	Thab162	50	704947	7710778	5/8/2025	5/8/2025
Habitat Assessment	Thab163	50	697498	7714282	3/8/2025	3/8/2025
Habitat Assessment	Thab164	50	700811	7715389	6/8/2025	6/8/2025
Habitat Assessment	Thab165	50	700038	7715178	6/8/2025	6/8/2025
Habitat Assessment	Thab166	50	698426	7708302	6/8/2025	6/8/2025
Habitat Assessment	Thab167	50	698935	7707345	6/8/2025	6/8/2025
Habitat Assessment	Thab168	50	699099	7706333	6/8/2025	6/8/2025
Habitat Assessment	Thab169	50	699581	7706618	6/8/2025	6/8/2025
Habitat Assessment	Thab170	50	699594	7707030	6/8/2025	6/8/2025
Habitat Assessment	Thab171	50	699989	7713401	6/8/2025	6/8/2025
Habitat Assessment	Thab172	50	697139	7714357	3/8/2025	3/8/2025
Habitat Assessment	Thab173	50	697459	7713902	3/8/2025	3/8/2025
Habitat Assessment	Thab174	50	701222	7715781	3/8/2025	3/8/2025
Habitat Assessment	Thab175	50	699144	7711970	3/8/2025	3/8/2025
Habitat Assessment	Thab176	50	701422	7715592	3/8/2025	3/8/2025
Habitat Assessment	Thab177	50	698731	7712193	3/8/2025	3/8/2025
Habitat Assessment	Thab178	50	699136	7713527	3/8/2025	3/8/2025
Habitat Assessment	Thab186	50	700343	7709903	5/8/2025	5/8/2025
Habitat Assessment	Thab187	50	706764	7714856	5/8/2025	5/8/2025
Habitat Assessment	Thab188	50	706765	7714856	5/8/2025	5/8/2025
Habitat Assessment	Thab189	50	707437	7710062	5/8/2025	5/8/2025
Habitat Assessment	Thab190	50	699659	7708685	5/8/2025	5/8/2025
Habitat Assessment	Thab191	50	706310	7709607	5/8/2025	5/8/2025
Habitat Assessment	Thab192	50	700452	7716287	5/8/2025	5/8/2025

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Habitat Assessment	Thab193	50	699668	7716576	5/8/2025	5/8/2025
Habitat Assessment	Thab194	50	700239	7717105	5/8/2025	5/8/2025
Habitat Assessment	Thab195	50	700240	7717105	5/8/2025	5/8/2025
Habitat Assessment	Thab196	50	699173	7708708	5/8/2025	5/8/2025
Habitat Assessment	Thab197	50	699471	7709751	5/8/2025	5/8/2025
Habitat Assessment	Thab198	50	707758	7717809	5/8/2025	5/8/2025
Habitat Assessment	Thab199	50	707209	7717360	5/8/2025	5/8/2025
Habitat Assessment	Thab200	50	696612	7709742	2/9/2025	2/9/2025
Habitat Assessment	Thab201	50	696092	7710181	2/9/2025	2/9/2025
Habitat Assessment	Thab202	50	697992	7709952	2/9/2025	2/9/2025
Habitat Assessment	Thab203	50	701328	7713691	3/9/2025	3/9/2025
Habitat Assessment	Thab204	50	701337	7712875	3/9/2025	3/9/2025
Habitat Assessment	Thab205	50	702565	7712824	3/9/2025	3/9/2025
Habitat Assessment	Thab206	50	703197	7713041	3/9/2025	3/9/2025
Habitat Assessment	Thab207	50	702300	7713735	3/9/2025	3/9/2025
Habitat Assessment	Thab208	50	706695	7703360	4/9/2025	4/9/2025
Habitat Assessment	Thab209	50	707903	7703387	4/9/2025	4/9/2025
Habitat Assessment	Thab210	50	708905	7702940	4/9/2025	4/9/2025
Habitat Assessment	Thab211	50	708338	7702537	4/9/2025	4/9/2025
Habitat Assessment	Thab212	50	701687	7717877	5/9/2025	5/9/2025
Habitat Assessment	Thab213	50	701069	7716699	5/9/2025	5/9/2025
Habitat Assessment	Thab214	50	697198	7703251	5/9/2025	5/9/2025
Habitat Assessment	Thab215	50	696648	7704195	5/9/2025	5/9/2025
Habitat Assessment	Thab216	50	696278	7704936	5/9/2025	5/9/2025
Habitat Assessment	Thab217	50	696874	7705979	5/9/2025	5/9/2025
Habitat Assessment	Thab218	50	697085	7704938	5/9/2025	5/9/2025
Habitat Assessment	Thab219	50	697370	7704249	5/9/2025	5/9/2025
Habitat Assessment	Thab220	50	702665	7719398	6/9/2025	6/9/2025
Habitat Assessment	Thab221	50	702749	7709691	6/9/2025	6/9/2025
Habitat Assessment	Thab222	50	701731	7703792	7/9/2025	7/9/2025
Habitat Assessment	Thab223	50	701160	7702867	7/9/2025	7/9/2025
Habitat Assessment	Thab224	50	705016	7704011	7/9/2025	7/9/2025
Habitat Assessment	Thab225	50	704785	7702967	7/9/2025	7/9/2025
Habitat Assessment	Thab226	50	700129	7714459	9/9/2025	9/9/2025
Habitat Assessment	Thab227	50	699262	7715030	9/9/2025	9/9/2025
Habitat Assessment	Thab228	50	699839	7714516	9/9/2025	9/9/2025
Habitat Assessment	Thab229	50	698158	7704509	9/9/2025	9/9/2025

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Habitat Assessment	Thab230	50	702388	7711615	10/9/2025	10/9/2025
Habitat Assessment	Thab231	50	702271	7711712	10/9/2025	10/9/2025
Habitat Assessment	Thab232	50	701502	7710550	10/9/2025	10/9/2025
Habitat Assessment	Thab233	50	700014	7710783	10/9/2025	10/9/2025
Habitat Assessment	Thab234	50	700372	7702800	11/9/2025	11/9/2025
Habitat Assessment	Thab235	50	700343	7704335	11/9/2025	11/9/2025
Habitat Assessment	Thab236	50	697506	7706845	3/9/2025	3/9/2025
Habitat Assessment	Thab237	50	696297	7706338	3/9/2025	3/9/2025
Habitat Assessment	Thab238	50	697773	7706117	3/9/2025	3/9/2025
Habitat Assessment	Thab239	50	704473	7709851	6/9/2025	6/9/2025
Habitat Assessment	Thab240	50	703023	7708486	10/9/2025	10/9/2025
Habitat Assessment	Thab241	50	704467	7709850	10/9/2025	10/9/2025
Habitat Assessment	Thab242	50	697458	7702836	11/9/2025	11/9/2025
Habitat Assessment	Thab243	50	697855	7702613	11/9/2025	11/9/2025
Habitat Assessment	Thab244	50	702329	7702612	11/9/2025	11/9/2025
Habitat Assessment	Thab245	50	702744	7703180	11/9/2025	11/9/2025
Habitat Assessment	Thab246	50	702891	7703834	11/9/2025	11/9/2025
Habitat Assessment	Thab247	50	703024	7704666	11/9/2025	11/9/2025
Habitat Assessment	Thab248	50	702866	7705526	11/9/2025	11/9/2025
Habitat Assessment	Thab249	50	702591	7706938	11/9/2025	11/9/2025
Habitat Assessment	Thab250	50	702336	7707441	11/9/2025	11/9/2025
Habitat Assessment	Thab251	50	701687	7708361	11/9/2025	11/9/2025
Habitat Assessment	Thab252	50	701849	7709426	11/9/2025	11/9/2025
Habitat Assessment	Thab253	50	701529	7710094	11/9/2025	11/9/2025
Habitat Assessment	Thab254	50	700044	7711763	11/9/2025	11/9/2025
Habitat Assessment	Thab255	50	708561	7718771	5/8/2025	5/8/2025
Habitat Assessment	Thab256	50	709232	7720445	5/8/2025	5/8/2025
Habitat Assessment	Thab257	50	706814	7713878	5/8/2025	5/8/2025
Habitat Assessment	Thab258	50	707113	7714120	5/8/2025	5/8/2025
Habitat Assessment	Thab259	50	707316	7715597	5/8/2025	5/8/2025
Habitat Assessment	Thab260	50	707969	7703640	4/9/2025	4/9/2025
Habitat Assessment	Thab261	50	697922	7704507	5/9/2025	5/9/2025
Habitat Assessment	Thab262	50	697346	7704855	5/9/2025	5/9/2025
Habitat Assessment	Thab263	50	697402	7703626	5/9/2025	5/9/2025
Habitat Assessment	Thab264	50	700092	7707642	6/9/2025	6/9/2025
Habitat Assessment	Thab265	50	699543	7713812	9/9/2025	9/9/2025
Habitat Assessment	Thab266	50	702384	7710650	10/9/2025	10/9/2025

Appendix 2						
Site Type	**Site Name**	**Zone**	**Easting**	**Northing**	**Start Date**	**Stop Date**
Habitat Assessment	Thab267	50	700965	7711875	10/9/2025	10/9/2025
Habitat Assessment	Thab268	50	700761	7709819	17/4/2025	17/4/2025
Habitat Assessment	Thab269	50	712547	7725010	17/4/2025	17/4/2025
Habitat Assessment	Thab270	50	712853	7725620	18/4/2025	18/4/2025
Habitat Assessment	Thab271	50	702632	7719022	18/4/2025	18/4/2025
Habitat Assessment	Thab272	50	703470	7718462	19/4/2025	19/4/2025
Habitat Assessment	Thab273	50	704238	7718523	19/4/2025	19/4/2025
Habitat Assessment	Thab274	50	704014	7718286	19/4/2025	19/4/2025
Habitat Assessment	Thab275	50	700732	7711293	20/4/2025	20/4/2025
Habitat Assessment	Thab276	50	701988	7710838	20/4/2025	20/4/2025
Habitat Assessment	Thab277	50	702162	7710799	20/4/2025	20/4/2025
Habitat Assessment	Thab278	50	702843	7710790	20/4/2025	20/4/2025
Habitat Assessment	Thab279	50	713648	7726550	21/4/2025	21/4/2025
Habitat Assessment	Thab280	50	713510	7727028	21/4/2025	21/4/2025
Habitat Assessment	Thab281	50	701881	7719308	21/4/2025	21/4/2025
Habitat Assessment	Thab282	50	701225	7703747	22/4/2025	22/4/2025
Trap Site	T Site 1	50	700604	7714121	15/4/2025	22/4/2025
Trap Site	T Site 1	50	700604	7714121	2/9/2025	9/9/2025
Trap Site	T Site 2	50	699895	7712839	15/4/2025	22/4/2025
Trap Site	T Site 2	50	699895	7712839	2/9/2025	9/9/2025
Trap Site	T Site 3	50	703089	7704008	15/4/2025	22/4/2025
Trap Site	T Site 3	50	703089	7704008	3/9/2025	10/9/2025
Trap Site	T Site 4	50	702957	7718681	15/4/2025	22/4/2025
Trap Site	T Site 4	50	702957	7718681	4/9/2025	11/9/2025
Trap Site	T Site 5	50	713706	7725472	14/4/2025	21/4/2025
Trap Site	T Site 5	50	713706	7725472	4/9/2025	11/9/2025
Trap Site	T Site 6	50	696566	7707447	15/4/2025	22/4/2025
Trap Site	T Site 7	50	700504	7711232	14/4/2025	21/4/2025
Trap Site	T Site 7	50	700504	7711232	3/9/2025	10/9/2025
Trap Site	T Site 8	50	698842	7702622	15/4/2025	22/4/2025
Trap Site	T Site 8	50	698842	7702622	3/9/2025	10/9/2025
Trap Site	T Site 9	50	701621	7710029	2/9/2025	9/9/2025

Appendix 3. Habitat Assessment.

Appendix 3	
Habitat Assessment	
Thab100 **Habitat**: Rocky outcrops **Landform**: low ridge **Vegetation**: Sparse Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: weeds (buffel) **Soil**: brown sand **Rock**: Rock outcropping **Important elements**: Rock crevices **Wetlands**: none	
Thab101 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: camel **Soil**: red sand **Rock**: Fine surface gravel **Important elements**: Sand suitable for burrowing **Wetlands**: occasional claypan	
Thab102 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: Fine surface gravel **Important elements**: Sand suitable for burrowing **Wetlands**: occasional claypan	

Appendix 3	
Habitat Assessment	
Thab103 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: Fine surface quartz gravel **Important elements**: Sand suitable for burrowing **Wetlands**: occasional claypan	
Thab104 **Habitat**: Sandy plain **Landform**: Low rise **Vegetation**: Open tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: Surface quartz stones **Important elements**: Sand suitable for burrowing **Wetlands**: occasional claypan	
Thab105 **Habitat**: Stony plain **Landform**: Plain **Vegetation**: Occasional Corymbia over open tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow, weeds (buffel) **Soil**: brown sand **Rock**: Stony surface (quartz, calcrete) **Important elements**: none noted **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab106 **Habitat**: Rocky outcrops **Landform**: hill **Vegetation**: None **Fire age**: no recent fire **Disturbance**: none **Soil**: none **Rock**: Granite dome rock outcropping **Important elements**: Ephemeral pools, exfoliating rock crevices **Wetlands**: ephemeral pools	
Thab107 **Habitat**: Rocky outcrops **Landform**: low rise **Vegetation**: Sparse Acacia shrubs over sparse spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Granite rock outcropping, boulders **Important elements**: Rock crevices **Wetlands**: none	
Thab108 **Habitat**: Rocky outcrops **Landform**: low rise **Vegetation**: Sparse Acacia shrubs over sparse spinifex grassland. **Fire age**: no recent fire **Disturbance**: weeds (buffel), cows **Soil**: pale brown sand **Rock**: Granite rock outcropping, boulders **Important elements**: Rock crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab109 **Habitat**: Major river **Landform**: drainage channel **Vegetation**: Eucalyptus over Melaleuca and Acacia shrubs over open spinifex grassland. **Fire age**: no recent fire **Disturbance**: weeds (buffel), cow **Soil**: brown sand **Rock**: Minor rock outcropping **Important elements**: Tree hollows, leaf litter and woody debris, waterholes. **Wetlands**: seasonal waterflow, seasonal pools	
Thab110 **Habitat**: Major river **Landform**: drainage channel **Vegetation**: Eucalyptus over Melaleuca and Acacia shrubs over open spinifex grassland. **Fire age**: no recent fire **Disturbance**: weeds (buffel), cow **Soil**: brown sand **Rock**: none **Important elements**: Tree hollows, leaf litter and woody debris, waterholes **Wetlands**: seasonal waterflow, seasonal pools	
Thab111 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: Fine surface gravel **Important elements**: Sand suitable for burrowing **Wetlands**: drainage influence into nearby river	

Appendix 3	
Habitat Assessment	
Thab112 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: Fine surface gravel **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab113 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow, camel **Soil**: red sand **Rock**: Fine surface gravel **Important elements**: Sand suitable for burrowing, mature spinifex **Wetlands**: none	
Thab114 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia and Grevillea shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: Fine surface gravel **Important elements**: Sand suitable for burrowing, Grevillea sp. supports honeyeaters. **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab115 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia and Grevillea shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: Fine surface gravel **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab116 **Habitat**: Rocky outcrops **Landform**: low rise **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Granite dome rock outcropping **Important elements**: Some rock crevices **Wetlands**: none	
Thab117 **Habitat**: Minor river **Landform**: valley **Vegetation**: Corymbia over Acacia shrubs over spinifex grassland and herbs. **Fire age**: no recent fire **Disturbance**: weeds (buffel), cows near well **Soil**: red sand **Rock**: none **Important elements**: Dense vegetation **Wetlands**: seasonal water flows	

Appendix 3	
Habitat Assessment	
Thab118 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab119 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Mix of low Acacia shrubs and spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: pale brown sand **Rock**: surface cover of calcrete stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab120 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Occasional Acacia shrub over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab121 **Habitat**: Minor river **Landform**: valley **Vegetation**: Occasional Corymbia over Acacia shrubs over spinifex grassland and herbs. **Fire age**: no recent fire **Disturbance**: weeds (buffel), cows **Soil**: brown clay **Rock**: none **Important elements**: Dense vegetation **Wetlands**: seasonal water flows	
Thab122 **Habitat**: Low stony hill **Landform**: slope **Vegetation**: Sparse Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab123 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia, open tall Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow, old drilling **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: near minor drainage	

Appendix 3	
Habitat Assessment	
Thab124 **Habitat**: Low stony hill, rocky outcrop in background **Landform**: slope **Vegetation**: Occasional Corymbia, open tall Acacia shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab125 **Habitat**: Major river **Landform**: drainage channel **Vegetation**: Eucalyptus over Melaleuca and Acacia shrubs over open spinifex grassland. **Fire age**: no recent fire **Disturbance**: weeds (buffel), cow **Soil**: brown sand **Rock**: none **Important elements**: Tree hollows, leaf litter and woody debris **Wetlands**: seasonal waterflow	
Thab126 **Habitat**: Low stony hill **Landform**: slope **Vegetation**: Occasional Corymbia, open tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface **Important elements**: small pebbles suitable for pebble-mound mice, small crevices, tree hollows **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab127 **Habitat**: Minor river **Landform**: shallow valley **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow, lots of trampling **Soil**: red sandy loam **Rock**: Fine surface gravel **Important elements**: none noted **Wetlands**: drainage influence into nearby river	
Thab128 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: granite pebbles from nearby outcrop **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab129 **Habitat**: Low stony hill **Landform**: slope **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab130 **Habitat**: Rocky outcrops **Landform**: low rise **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Granite dome rock outcropping, boulders **Important elements**: Rock crevices **Wetlands**: none	
Thab131 **Habitat**: Low stony hill **Landform**: low rise **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface **Important elements**: small pebbles suitable for pebble-mound mice, small crevices **Wetlands**: none	
Thab132 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia, open tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab133 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open tall Acacia shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab134 **Habitat**: Minor river **Landform**: shallow valley **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sandy loam **Rock**: none **Important elements**: mature spinifex **Wetlands**: seasonally wet	
Thab135 **Habitat**: Low stony hill **Landform**: low rise **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface **Important elements**: small pebbles suitable for pebble-mound mice, small crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab136 **Habitat**: Minor river **Landform**: shallow valley **Vegetation**: Open Acacia and Grevillea shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sandy clay **Rock**: none **Important elements**: mature spinifex **Wetlands**: seasonally wet	
Thab137 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open tall Acacia shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: near minor drainage	
Thab138 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: near minor drainage	

Appendix 3	
Habitat Assessment	
Thab139 **Habitat**: Rocky outcrops **Landform**: low rise **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Granite dome rock outcropping, boulders **Important elements**: Rock crevices **Wetlands**: none	
Thab140 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia, open tall Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones, occasional granite boulder **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab141 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab142 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia, open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: some surface stones **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab143 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia and Grevillea shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing, mature spinifex **Wetlands**: none	
Thab144 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia, open tall Acacia shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sandy clay **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab145 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: small claypans	
Thab146 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1yr) **Disturbance**: cow, burnt **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: small claypans	
Thab147 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia and Grevillea shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab148 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Sparse Acacia and Grevillea shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: some surface pebbles **Important elements**: Sand suitable for burrowing **Wetlands**: small claypans	
Thab149 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: none noted **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab150 **Habitat**: Rocky outcrops **Landform**: low hill **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: brown sand **Rock**: surface rocks, rocky outcrops **Important elements**: rock crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab151 **Habitat**: Minor river **Landform**: shallow valley **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sandy loam **Rock**: none **Important elements**: mature spinifex **Wetlands**: seasonally wet	
Thab152 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia, open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small hollows **Wetlands**: none	
Thab153 **Habitat**: Low stony hill **Landform**: low hill **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface, small outcrops **Important elements**: small pebbles suitable for pebble-mound mice, small crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab154 **Habitat**: Minor river **Landform**: shallow valley **Vegetation**: Occasional Corymbia over open Acacia shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow, cat **Soil**: red sand **Rock**: none **Important elements**: none noted **Wetlands**: seasonally wet	
Thab155 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab156 **Habitat**: Rocky outcrops **Landform**: low rise **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none noted **Soil**: pale brown sand **Rock**: granite dome, exfoliating rock **Important elements**: rock crevices, pools **Wetlands**: ephemeral pools	

Appendix 3	
Habitat Assessment	
Thab157 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: some surface pebbles **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab158 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia, open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface cover of stones **Important elements**: small hollows **Wetlands**: none	
Thab159 **Habitat**: Minor river **Landform**: shallow valley **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: pale red sand **Rock**: none **Important elements**: small hollows **Wetlands**: seasonally wet	

Appendix 3	
Habitat Assessment	
Thab160 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: some surface pebbles **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab161 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: some surface pebbles **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab162 **Habitat**: Low stony hill **Landform**: low hill **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface, small outcrops **Important elements**: small pebbles suitable for pebble-mound mice, small crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab163 **Habitat**: Rocky outcrops **Landform**: hill **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Granite dome rock outcropping, boulders **Important elements**: Rock crevices **Wetlands**: none	
Thab164 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia, open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab165 **Habitat**: Low stony hill **Landform**: low hill **Vegetation**: Occasional Corymbia over sparse Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface, small outcrops **Important elements**: small pebbles suitable for pebble-mound mice, small crevices, mature spinifex in gully **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab166 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab167 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia, open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab168 **Habitat**: Rocky outcrops **Landform**: Low rise **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: pale brown sand **Rock**: Granite dome rock outcropping, boulders **Important elements**: Rock crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab169 **Habitat**: Minor river **Landform**: shallow valley **Vegetation**: Occasional Eucalypt over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow, Cat, Dog **Soil**: pale red sand **Rock**: adjacent to granite outcrops **Important elements**: tree hollows, woody debris **Wetlands**: seasonally wet	
Thab170 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab171 **Habitat**: Low stony hill **Landform**: low hill **Vegetation**: Sparse Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: exploration activities **Soil**: brown sand **Rock**: Stony surface, small outcrops **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab172 **Habitat**: Rocky outcrops **Landform**: slope **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Granite outcropping, boulders **Important elements**: Rock crevices **Wetlands**: none	
Thab173 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab174 **Habitat**: Dam **Landform**: depression **Vegetation**: Occasional Eucalyptus over open Acacia shrubs over weeds. **Fire age**: no recent fire **Disturbance**: cow, weeds **Soil**: brown clay **Rock**: none **Important elements**: water **Wetlands**: permanent ? Water	

Appendix 3	
Habitat Assessment	
Thab175 **Habitat**: Minor river **Landform**: drainage channel **Vegetation**: Occasional Eucalyptus over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sandy clay **Rock**: none **Important elements**: tree hollows, leaf litter **Wetlands**: seasonally wet	
Thab176 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab177 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia, open tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: surface cover of stones **Important elements**: none noted **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab178 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface cover of stones **Important elements**: none noted **Wetlands**: none	
Thab186 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab187 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab188 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	
Thab189 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Sparse Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	
Thab190 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab191 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	
Thab192 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open tall Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab193 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Sparse Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones, some outcropping **Important elements**: rock crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab194 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Sparse Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones, some outcropping **Important elements**: rock crevices **Wetlands**: none	
Thab195 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab196 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open tall Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab197 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Sparse Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab198 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab199 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab200 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab201 **Habitat**: Rocky outcrops **Landform**: Low rise **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: pale brown sand **Rock**: Granite dome rock outcropping, boulders **Important elements**: Rock crevices **Wetlands**: none	
Thab202 **Habitat**: Low stony hill **Landform**: low hill **Vegetation**: Sparse tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface, small outcrops **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab203 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Occasional Corymbia over sparse Acacia shrubs over open spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab204 **Habitat**: Major river **Landform**: drainage channel **Vegetation**: Eucalyptus over dense Acacia shrubs over open spinifex grassland. **Fire age**: no recent fire **Disturbance**: weeds (buffel), cow **Soil**: brown sand **Rock**: none **Important elements**: Tree hollows, leaf litter and woody debris **Wetlands**: seasonal waterflow	
Thab205 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Eucalyptus over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: pale brown sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: Drainage influences, drains into nearby river	

Appendix 3	
Habitat Assessment	
Thab206 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab207 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Open Acacia shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: none noted **Soil**: pale brown sand **Rock**: surface stones, rocks and small outcrops **Important elements**: small pebbles suitable for pebble-mound mice, small outcrops, crevices **Wetlands**: none	
Thab208 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab209 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones, some flat granite outcropping **Important elements**: some rock crevices **Wetlands**: none	
Thab210 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia and Grevillea shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow, camel **Soil**: red sand **Rock**: some surface gravel **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab211 **Habitat**: Major river **Landform**: drainage channel **Vegetation**: Eucalyptus over dense Acacia shrubs over open spinifex grassland. **Fire age**: no recent fire **Disturbance**: weeds (buffel), cow, cat, dog **Soil**: brown sand **Rock**: none **Important elements**: Tree hollows, leaf litter and woody debris **Wetlands**: seasonal waterflow	

Appendix 3	
Habitat Assessment	
Thab212 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	
Thab213 **Habitat**: Minor river **Landform**: drainage channel **Vegetation**: Corymbia over tall Acacia shrubs over spinifex and grasses. **Fire age**: no recent fire **Disturbance**: cow, weeds (buffel) **Soil**: red clayey sand **Rock**: none **Important elements**: tree hollows, leaf litter **Wetlands**: seasonally wet	
Thab214 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1yr) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab215 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow, camel **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing, mature spinifex **Wetlands**: none	
Thab216 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones, small outcrops **Important elements**: rock crevices **Wetlands**: none	
Thab217 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab218 **Habitat**: Minor river **Landform**: drainage channel **Vegetation**: Eucalyptus and Corymbia over tall Acacia shrubs over spinifex and grasses. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: tree hollows, leaf litter **Wetlands**: seasonally wet	
Thab219 **Habitat**: Low stony hill **Landform**: low hill **Vegetation**: Sparse Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab220 **Habitat**: Rocky outcrops **Landform**: Low hill **Vegetation**: Open Acacia shrubs over open spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: pale brown sand **Rock**: Granite dome rock outcropping, boulders **Important elements**: Rock crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab221 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab222 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab223 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing, termite mounds **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab224 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab225 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Low spinifex grassland. **Fire age**: no recent fire **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: drainage influences, drains into nearby minor river	
Thab226 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice, mature spinifex **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab227 **Habitat**: Low stony hill **Landform**: low hill **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Stony surface **Important elements**: small pebbles suitable for pebble-mound mice, small crevices **Wetlands**: none	
Thab228 **Habitat**: Minor river **Landform**: drainage channel **Vegetation**: Corymbia over Acacia shrubs over spinifex. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sandy clay **Rock**: none **Important elements**: tree hollows **Wetlands**: seasonally wet	
Thab229 **Habitat**: Rocky outcrops **Landform**: Hill **Vegetation**: Open Acacia shrubs over spinifex and grasses. **Fire age**: no recent fire **Disturbance**: none **Soil**: pale brown sand **Rock**: Granite dome rock outcropping, boulders **Important elements**: Rock crevices, overhang **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab230 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Eucalyptus and Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing, mature spinifex **Wetlands**: near river	
Thab231 **Habitat**: Rocky outcrops **Landform**: low rise **Vegetation**: Open tall Acacia shrubs over spinifex and grasses. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: Dolerite boulders **Important elements**: Rock crevices, **Wetlands**: none	
Thab232 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex and grasses. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: surface gravel **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab233 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: surface gravel **Important elements**: Sand suitable for burrowing **Wetlands**: near minor river	
Thab234 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: occasional granite flat **Important elements**: Sand suitable for burrowing, mature spinifex **Wetlands**: near minor river	
Thab235 **Habitat**: Rocky outcrops **Landform**: low rise **Vegetation**: Open tall Acacia and Grevillea shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: none **Soil**: brown sand **Rock**: granite flat **Important elements**: Rock crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab236 **Habitat**: Rocky outcrops/ Sandy plain **Landform**: low rise **Vegetation**: Open Acacia shrubs over spinifex. **Fire age**: no recent fire **Disturbance**: none **Soil**: red sandy loam **Rock**: granite outcropping **Important elements**: Rock crevices, sand suitable for burrowing **Wetlands**: none	
Thab237 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: surface granite pebbles **Important elements**: Sand suitable for burrowing **Wetlands**: near minor river	
Thab238 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over a mix of poverty bush and spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: minor granite outcrops **Important elements**: Sand suitable for burrowing, small tree hollows, rock crevices **Wetlands**: near minor river	

Appendix 3	
Habitat Assessment	
Thab239 **Habitat**: Sandy plain/ Rocky outcrop **Landform**: plain **Vegetation**: Occasional Eucalyptus over open Acacia shrubs over a mix of poverty bush and spinifex grassland **Fire age**: no recent fire **Disturbance**: cow **Soil**: red sand **Rock**: minor granite outcrops **Important elements**: Sand suitable for burrowing, small tree hollows, rock crevices **Wetlands**: none	
Thab240 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over a mix of poverty bush and spinifex grassland **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: minor granite outcrops **Important elements**: Sand suitable for burrowing, rock crevices **Wetlands**: none	
Thab241 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over a mix of poverty bush and spinifex grassland **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: minor granite outcrops **Important elements**: Sand suitable for burrowing, small tree hollows, rock crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab242 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over a mix of poverty bush and spinifex grassland **Fire age**: recently burnt (1yr) **Disturbance**: cow, burnt **Soil**: red sand **Rock**: minor granite outcrops **Important elements**: Sand suitable for burrowing, rock crevices **Wetlands**: none	
Thab243 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1yr) **Disturbance**: cow, burnt **Soil**: red loamy sand **Rock**: minor granite outcrops **Important elements**: Sand suitable for burrowing, rock crevices **Wetlands**: drainage influences	
Thab244 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia and Hakea shrubs over a mix of poverty bush and spinifex grassland **Fire age**: no recent fire **Disturbance**: cow **Soil**: red loamy sand **Rock**: none **Important elements**: Sand suitable for burrowing, small tree hollows **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab245 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sandy clay **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice, small tree hollows **Wetlands**: none	
Thab246 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia and Hakea shrubs over a mix of poverty bush and spinifex grassland **Fire age**: no recent fire **Disturbance**: cow **Soil**: red loamy sand **Rock**: none **Important elements**: Sand suitable for burrowing, small tree hollows **Wetlands**: none	
Thab247 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over a mix of poverty bush and spinifex grassland **Fire age**: no recent fire **Disturbance**: none noted **Soil**: brown sandy clay **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice, small tree hollows **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab248 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland **Fire age**: no recent fire **Disturbance**: none noted **Soil**: red loamy sand **Rock**: surface stones **Important elements**: Sand suitable for burrowing, small tree hollows **Wetlands**: none	
Thab249 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex and grasses **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: pale brown sand **Rock**: none **Important elements**: small tree hollows **Wetlands**: Drainage influences, drains into nearby river	
Thab250 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: brown sandy clay **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice, small tree hollows **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab251 **Habitat**: Minor river **Landform**: drainage channel **Vegetation**: Occasional Corymbia over tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sandy clay **Rock**: surface pebbles **Important elements**: tree hollows, leaf litter **Wetlands**: seasonally wet	
Thab252 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: red loamy sand **Rock**: surface stones **Important elements**: Sand suitable for burrowing, small tree hollows **Wetlands**: none	
Thab253 **Habitat**: Major river **Landform**: drainage channel **Vegetation**: Eucalyptus over tall Acacia shrubs over spinifex and grasses. **Fire age**: no recent fire **Disturbance**: cow **Soil**: orange sand **Rock**: none **Important elements**: tree hollows, leaf litter **Wetlands**: seasonally wet	

Appendix 3	
Habitat Assessment	
Thab254 **Habitat**: Minor river **Landform**: drainage channel **Vegetation**: Occasional Corymbia over tall Acacia shrubs over spinifex grassland. **Fire age**: no recent fire **Disturbance**: cow **Soil**: brown sandy clay **Rock**: none **Important elements**: tree hollows, leaf litter **Wetlands**: seasonally wet	
Thab255 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Tall open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1yrs) **Disturbance**: burnt **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab256 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: red sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab257 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab258 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	
Thab259 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: red sand **Rock**: occasional granite boulder **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab260 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	
Thab261 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Open Acacia shrubs a mix of poverty bush and spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: brown sand **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab262 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs a mix of poverty bush and spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab263 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs a mix of poverty bush and spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab264 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: pale brown sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	
Thab265 **Habitat**: Minor River **Landform**: plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: cow **Soil**: pale red loam **Rock**: surface stones **Important elements**: none noted **Wetlands**: seasonally wet drainage channels	

Appendix 3	
Habitat Assessment	
Thab266 **Habitat**: Stony plain **Landform**: plain **Vegetation**: Occasional Corymbia over sparse Acacia shrubs over low spinifex grassland. **Fire age**: Recently burnt (1-3yrs) **Disturbance**: cow **Soil**: pale brown sand **Rock**: surface stones **Important elements**: none noted **Wetlands**: none	
Thab267 **Habitat**: Stony plain **Landform**: gently sloping plain **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: No evidence of fire **Disturbance**: none noted **Soil**: brown sand **Rock**: surface stones **Important elements**: small pebbles suitable for pebble-mound mice **Wetlands**: none	
Thab268 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no evidence of fire **Disturbance**: none noted **Soil**: red sand **Rock**: areas of exposed granite **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab269 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Low spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: red sand **Rock**: areas of exposed granite **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab270 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Mix of poverty bush and spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: red sand **Rock**: scattered surface quartz stones, some exposed granite **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab271 **Habitat**: Rocky outcrop **Landform**: gentle slope **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: no evidence of fire **Disturbance**: none noted **Soil**: red-orange coarse sand **Rock**: granite outcropping, boulders **Important elements**: rock crevices **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab272 **Habitat**: Sandy plain **Landform**: gently sloping plain **Vegetation**: Low spinifex grassland. **Fire age**: no evidence of fire **Disturbance**: cow **Soil**: red sandy-loam **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: drainage influences, sloping towards major river	
Thab273 **Habitat**: Major river **Landform**: drainage channel **Vegetation**: Melaleucas over Acacia and other shrubs over spinifex and grasses **Fire age**: no evidence of fire **Disturbance**: Weeds (Calotropis) **Soil**: pale brown sand **Rock**: none **Important elements**: woody debris **Wetlands**: seasonal watercourse	
Thab274 **Habitat**: Major river **Landform**: drainage channel **Vegetation**: Melaleucas over Acacia and other shrubs over spinifex and grasses **Fire age**: no evidence of fire **Disturbance**: Weeds (Calotropis) **Soil**: pale brown sand **Rock**: none **Important elements**: woody debris, waterholes **Wetlands**: seasonal watercourse	

Appendix 3	
Habitat Assessment	
Thab275 **Habitat**: Minor river **Landform**: drainage channel **Vegetation**: Scattered Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no evidence of fire **Disturbance**: cow **Soil**: brown clay-loam **Rock**: granite rock outcropping **Important elements**: rock crevices **Wetlands**: seasonal watercourse	
Thab276 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: no evidence of fire **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: drainage influences, sloping towards major river	
Thab277 **Habitat**: Major river **Landform**: drainage channel **Vegetation**: Eucalyptus over Acacia and other shrubs over spinifex and grasses **Fire age**: no evidence of fire **Disturbance**: cow **Soil**: pale brown sand **Rock**: none **Important elements**: woody debris **Wetlands**: seasonal watercourse	

Appendix 3	
Habitat Assessment	
Thab278 **Habitat**: Minor river **Landform**: valley **Vegetation**: Scattered Eucalypt over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: brown clay-loam **Rock**: none **Important elements**: none noted **Wetlands**: seasonally wet	
Thab279 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	
Thab280 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: cow **Soil**: red sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 3	
Habitat Assessment	
Thab281 **Habitat**: Rocky outcrop **Landform**: gentle slope **Vegetation**: Open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: brown coarse sand **Rock**: granite outcropping, boulders **Important elements**: rock crevices **Wetlands**: none	
Thab282 **Habitat**: Sandy plain **Landform**: plain **Vegetation**: Occasional Corymbia over open Acacia shrubs over spinifex grassland. **Fire age**: recently burnt (1-3yrs) **Disturbance**: none noted **Soil**: red loamy sand **Rock**: none **Important elements**: Sand suitable for burrowing **Wetlands**: none	

Appendix 4. Amphibians potentially occurring in the Study Area.

Key to records:
- Recorded = recorded in the study area on this survey or by Ecoscape (2024).
- Hemi Project = species recorded at the Hemi Project 2021 – 2024 (Western Wildlife 2024).
- Wodgina Project = species recorded at the Wodgina Project 2009 – 2019 by Western Wildlife (2020), 360 Environmental (2018a), Stantec (2017), Outback Ecology (2012) and/or Outback Ecology (2009).
- Wodgina Pipeline = species recorded on the Wodgina Pipeline and Mine in 2018 (Stantec 2018b).
- Mt Dove Project = species recorded at the Mt Dove Project in 2010 (Outback Ecology 2011).
- FMG Stage A Rail = species recorded in the northern section of the FMG Stage A Rail in 2004 (Biota 2004).
- Hope Downs Rail = species recorded in the northern section of the Hope Downs Rail Corridor in 2001 (Biota 2002a, 2002b).

EPBC = modelled occurrence of species or species habitat in the area on the EPBC Protected Matters Search Tool.
DBCA = species recorded in the area on DBCA's Threatened and Priority Fauna Database (DBCA 2025).
Dandjoo = species recorded within 100km on the Dandjoo Database (DBCA 2025)
ALA = species recorded within 40km on ALA Database (ALA 2025).

Species	Conservation Status	Recorded	Records									
			Surveys						Databases			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Pelodraydidae (tree frogs and water-holding frogs)												
Giant Frog *Cyclorana australis*							+	+			+	+
Main's Frog *Cyclorana maini*		+	+	+		+	+	+			+	+
Desert Tree Frog *Litoria rubella*		+	+	+			+	+				+
Limnodynastidae (burrowing frogs)												
Centralian Burrowing Frog *Platyplectrum spenceri*		+	+				+	+			+	+
Northern Burrowing Frog *Neobatrachus aquilonius*												+
Desert Spadefoot *Notaden nichollsi*			+	+			+	+			+	+
Myobatrachidae (ground frogs)												
Glandular Toadlet *Uperoleia glandulosa*		+	+									+
Pilbara Toadlet *Uperoleia saxatilis*			+	+			+	+			+	+
Number of frog species predicted:	**8**											

Appendix 5. Reptiles potentially occurring in the Study Area.

Key to records:

- Recorded = recorded in the study area on this survey or by Ecoscape (2024).
- Hemi Project = species recorded at the Hemi Project 2021 – 2024 (Western Wildlife 2024).
- Wodgina Project = species recorded at the Wodgina Project 2009 – 2019 by Western Wildlife (2020), 360 Environmental (2018a), Stantec (2017), Outback Ecology (2012) and/or Outback Ecology (2009).
- Wodgina Pipeline = species recorded on the Wodgina Pipeline and Mine in 2018 (Stantec 2018b).
- Mt Dove Project = species recorded at the Mt Dove Project in 2010 (Outback Ecology 2011).
- FMG Stage A Rail = species recorded in the northern section of the FMG Stage A Rail in 2004 (Biota 2004).
- Hope Downs Rail = species recorded in the northern section of the Hope Downs Rail Corridor (Biota 2002a, 2002b).

EPBC = modelled occurrence of species or species habitat in the area on the EPBC Protected Matters Search Tool.
DBCA = species recorded in the area on DBCA's Threatened and Priority Fauna Database (DBCA 2025).
Dandjoo = species recorded within 100km on the Dandjoo Database (DBCA 2025)
ALA = species recorded within 40km on ALA Database (ALA 2025).

Species	Conservation Status	Recorded	Records									
			Survey						Database			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Cheloniidae												
Flat-shelled Turtle *Chelodina steindachneri*							+					
Carphodactylidae (knob-tailed geckoes)												
Smooth Knob-tailed Gecko *Nephrurus levis*			+	+			+					+
Diplodactylidae (ground geckoes)												
Clawless Gecko *Crenadactylus pilbarensis*												
Western Fat-tailed Gecko *Diplodactylus bilybara*		+		+		?	?	?			?	+
Northern Pilbara Beak-faced Gecko *Diplodactylus galaxias*				+								
Desert Fat-tailed Gecko *Diplodactylus laevis*			+	?		?	?	?			?	+
Southern Pilbara Beak-faced Gecko *Diplodactylus savagei*				+							+	+
Pilbara Ground Gecko *Lucasium woodwardi (stenodactylum)*		+	+	+		+	+	+				+
Lucasium wombeyi				+			+					+
Western Marbled Velvet Gecko *Oedura fimbria*				+		+						
Beaked Gecko *Rhynchoedura ornata*			+	+		+						+
Northern Spiny-tailed Gecko *Strophurus ciliaris*			+					+				+
Jewelled Gecko *Strophurus elderi*				+			+	+			+	+
Strophurus jeanae							+					+
Gekkonidae (geckoes)												
Northern Cryptic Gehyra *Gehyra incognita*		+										+
Large Pilbara Rock Gehyra *Gehyra macra*		+	+									+
Medium Pilbara Spotted Rock Gehyra *Gehyra media*		+	+									+
Small Pilbara Spotted Rock Gehyra *Gehyra micra*		+	+									+
Gehyra montium		+	+									+
Pilbara Dtella *Gehyra pilbara*				+		+						
Spotted Dtella *Gehyra punctata*		+		+				+			+	+
Purplish Dtella *Gehyra purpurascens*						+	+					+
Variegated Dtella *Gehyra variegata*		+		+		+	+	+				+

Appendix 5. (cont.)

25Species		Conservation Status	Recorded	Records									
				Survey						Database			
				Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Gekkonidae (cont.)													
Bynoe's Gecko	*Heteronotia binoei*		+	+	+		+	+	+				+
Pilbara Cave Gecko	*Heteronotia spelea*				+								+
Asian House Gecko	*Hemidactylus frenatus*	Int.											+
Pygopodidae (legless lizards)													
	Delma butleri		+	+	+							+	+
	Delma nasuta				+			+	+				+
	Delma pax		+	+	+			+	+			+	+
	Delma tincta		+		+			+	+			+	+
Burton's Legless Lizard	*Lialis burtonis*		+	+	+		+	+	+			+	+
Hooded Scaly-foot	*Pygopus nigriceps*			+					+			+	+
Agamidae (dragon lizards)													
Western Ring-tailed Dragon	*Ctenophorus caudicinctus*		+	+	+	+	+	+	+				+
Military Dragon	*Ctenophorus isolepis*		+	+	+	+	+	+	+			+	+
Central Netted Dragon	*Ctenophorus nuchalis*		+	+			+		+			+	+
Pindan Dragon	*Diporiphora pindan*			+									+
Northern Pilbara Tree Dragon	*Diporiphora vescus*				?		?		?				+
Long-nosed Dragon	*Gowidon longirostris*		+	+	+			+	+				+
Bearded Dragon	*Pogona minor*		+	+	+		+		+			+	+
Scincidae (skink lizards)													
	Carlia munda			+	+		+	+	+				+
	Carlia triacantha		+	+	+		+	+	+			+	+
	Cryptoblepharus buchananii												
	Cryptoblepharus ustulatus												
	Ctenotus duricola		+		+		+	+	+			+	+
	Ctenotus grandis		+	+	+		+	+	+			+	+
Nimble Ctenotus	*Ctenotus hanloni*			+	+								+
	Ctenotus helenae		+	+	+		+	+	+				+
	Ctenotus leonhardii				+								
Pin-striped Finesnout Ctenotus	*Ctenotus nigrilineatus*	P											
	Ctenotus pallasotus			+									
Leopard Ctenotus	*Ctenotus pantherinus*		+	+	+		+	+	+			+	+
	Ctenotus piankai											+	
Fourteen-lined Ctenotus	*Ctenotus quattuordecimlineatus*			+									

Appendix 5. (cont.)

Species		Conservation Status	Recorded	Records									
				Survey						Database			
				Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Scincidae (cont.)													
	Ctenotus rubicundus				+			+				+	
Rufous Finesnout Ctenotus	*Ctenotus rufescens*			+								+	+
Rock Ctenotus	*Ctenotus saxatilis*		+	+	+		+	+	+				+
	Ctenotus schomburgkii		+	+				+					
	Ctenotus serventyi		+									+	+
Sharp-browed Ctenotus	*Ctenotus superciliaris*												
Slender Blue-tongue	*Cyclodomorphus melanops*		+		+			+	+				+
Eastern Pilbara Spiny-tailed Skink	*Egernia epsisolus*		+	+	+				+				+
	Egernia formosa												
Pilbara Skink	*Egernia pilbarensis*				+								
Northern Bar-lipped Skink	*Eremiascincus isolepis*												+
Mosaic Desert Skink	*Eremiascincus musivus*											+	
Western Narrow-banded Skink	*Eremiascincus pallidus*		+	+	+								+
Broad-banded Sand Swimmer	*Eremiascincus richardsonii*								+			+	+
North-western Sandslider	*Lerista bipes*		+	+	+		+	+	+			+	+
	Lerista clara			+									+
	Lerista jacksoni				+							+	+
	Lerista muelleri				+			+	+			+	
	Lerista verhmens											+	+
Night Skink	*Liopholis striata*						+						
Dwarf Skink	*Menetia greyii*		+	+	+			+	+			+	+
	Menetia surda				+								
	Morethia ruficauda		+	+	+	+	+	+	+			+	+
	Notoscincus ornatus							+					+
	Proablepharus reginae		+					+	+			+	+
Central Bluetongue	*Tiliqua multifasciata*		+	+	+			+	+			+	+
Varanidae (goanna or monitor lizards)													
Spiny-tailed Goanna	*Varanus acanthurus*		+	+	+			+	+			+	+
Short-tailed Pygmy Goanna	*Varanus brevicauda*		+	+	+			+	+			+	+
Bush's Monitor	*Varanus bushi*		+	+								+	
Pygmy Desert Goanna	*Varanus eremius*		+	+	+		+	+	+			+	+
Perentie	*Varanus giganteus*		+	+	+	+			+				
Gould's Monitor	*Varanus gouldii*		+	+	+		+	+	+			+	+
	Varanus panoptes		+	+	+			+				+	+
Northern Pilbara Rock Monitor	*Varanus pilbarensis*		+		+							+	+
Black-tailed Monitor	*Varanus tristis*			+									+

Appendix 5. (cont.)

Species		Conservation Status	Recorded	Records									
				Survey						Database			
				Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Typhlopidae (blind snakes)													
	Anilios ammodytes		+	+	+		+	+				+	+
Gane's Blind Snake	*Anilios ganei*	P									+		+
Beaked Blind Snake	*Anilios grypus*		+		+			+				+	+
	Anilios hamatus			+									
Pilbara Blind Snake	*Anilios pilbarensis*				+		+						+
Boidae (pythons)													
Pygmy Python	*Antaresia perthensis*				+			+	+			+	+
Children's Python	*Antaresia childreni (stimsoni)*		+		+			+	+				+
Black-headed Python	*Aspidites melanocephalus*		+		+			+				+	
Woma	*Aspidites ramsayi*			+								+	
Pilbara Olive Python	*Liasis olivaceus barroni*	T								+	+		+
Elapidae (front-fanged snakes)													
Desert Death Adder	*Acanthophis pyrrhus*												+
Northwestern Shovel-nosed Snake	*Brachyurophis approximans*				+			+					+
Narrow-banded Shovel-nosed Snake	*Brachyurophis fasciolatus*				+								
Yellow-faced Whipsnake	*Demansia reticulata (psammophis)*		+	+	+			+	+				+
Rufous Whipsnake	*Demansia rufescens*		+	+	+			+				+	
Moon Snake	*Furina ornata*		+	+	+		+	+				+	+
Mulga Snake	*Pseudechis australis*		+	+	+			+	+			+	+
Ringed Brown Snake	*Pseudonaja modesta*		+	+			+						+
Gwardar	*Pseudonaja mengdeni*		+	+	+				+			+	+
Desert Banded Snake	*Simoselaps anomalus*			+					+			+	+
Rosen's Snake	*Suta fasciata*				+			+					
Spotted Snake	*Suta punctata*		+					+	+			+	+
Pilbara Bandy-bandy	*Vermicella snelli*												
# reptile species predicted:			**111 (110 native, 1 introduced)**										

Appendix 6. Birds potentially occurring in the Study Area.

Key to records:

- Recorded = recorded in the study area on this survey or by Ecoscape (2024).
- Hemi Project = species recorded at the Hemi Project 2021 – 2024 (Western Wildlife 2024).
- Wodgina Project = species recorded at the Wodgina Project 2009 – 2019 by Western Wildlife (2020), 360 Environmental (2018a), Stantec (2017), Outback Ecology (2012) and/or Outback Ecology (2009).
- Wodgina Pipeline = species recorded on the Wodgina Pipeline and Mine in 2018 (Stantec 2018b).
- Mt Dove Project = species recorded at the Mt Dove Project in 2010 (Outback Ecology 2011).
- FMG Stage A Rail = species recorded in the northern section of the FMG Stage A Rail in 2004 (Biota 2004).
- Hope Downs Rail = species recorded in the northern section of the Hope Downs Rail Corridor (Biota 2002a, 2002b).

EPBC = modelled occurrence of species or species habitat in the area on the EPBC Protected Matters Search Tool.
DBCA = species recorded in the area on DBCA's Threatened and Priority Fauna Database (DBCA 2025).
Dandjoo = species recorded within 100km on the Dandjoo Database (DBCA 2025)
ALA = species recorded within 40km on ALA Database (ALA 2025).

Species	Conservation Status	Recorded	Records									
			Surveys						Database			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Dromaiidae (emus)												
Emu *Dromaius novaehollandiae*		+	+			+	+	+			+	+
Anatidae (ducks & swans)												
Grey Teal *Anas gracilis*		+	+	+							+	+
Pacific Black Duck *Anas superciliosa*		+	+	+			+	+			+	+
Hardhead *Aythya australis*				+								+
Australian Wood Duck *Chenonetta jubata*											+	+
Black Swan *Cygnus atratus*												+
Plumed Whistling Duck *Dendrocygna eytoni*												+
Pink-eared Duck *Malacorhynchus membranaceus*												+
Phasianidae (quails)												
Stubble Quail *Coturnix pectoralis*							+					+
Brown Quail *Synoicus ypsilophora*		+	+			+					+	+
Podicipedidae (grebes)												
Hoary-headed Grebe *Poliocephalus poliocephalus*		+									+	+
Australasian Grebe *Tachybaptus novaehollandiae*		+		+				+			+	+
Ciconiidae (storks)												
Black-necked Stork *Ephippiorhynchus asiaticus*		+	+	+			+	+			+	+
Threskiornithidae (ibis & spoonbills)												
Yellow-billed Spoonbill *Platalea flavipes*												+
Royal Spoonbill *Platalea regia*												+
Australian White Ibis *Threskiornis moluccus*								+				+
Straw-necked Ibis *Threskiornis spinicollis*		+	+					+			+	+

Appendix 6. (cont.)

Species	Conservation Status	Recorded	Records									
			Surveys						Database			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Ardeidae (herons, egrets, bitterns & night-herons)												
Little Egret *Ardea garzetta*								+				+
Eastern Great Egret *Ardea modesta*			+					+				+
White-faced Heron *Egretta novaehollandiae*			+				+					+
Cattle Egret *Ardea ibis*												+
White-necked Heron *Ardea pacifica*		+		+	+			+			+	+
Rufous Night-heron *Nycticorax caledonicus*			+					+				+
Pelecanidae (pelicans)												
Australian Pelican *Pelecanus conspicillatus*			+					+				+
Phalacrocoracidae (cormorants)												
Great Cormorant *Phalacrocorax carbo*												+
Little Black Cormorant *Phalacrocorax sulcirostris*			+					+			+	+
Pied Cormorant *Phalacrocorax varius*								+				+
Little Pied Cormorant *Microcarbo melanoleucos*			+					+				+
Anhingidae (darter)												
Australasian Darter *Anhinga novaehollandiae*			+				+	+				+
Accipitridae (osprey, hawks, eagles & harriers)												
Black-shouldered Kite *Elanus axillaris*				+			+	+				+
Square-tailed Kite *Lophoictinia isura*		+					+					+
Black-breasted Buzzard *Hamirostra melanosternon*					+		+	+				
Black Kite *Milvus migrans*		+	+	+	+		+	+			+	+
Whistling Kite *Haliastur sphenurus*		+	+	+	+	+	+	+			+	+
White-bellied Sea-eagle *Haliaeetus leucogaster*												+
Brown Goshawk *Accipiter fasciatus*		+	+	+			+	+			+	+
Collared Sparrowhawk *Accipiter cirrocephalus*		+	+				+					+
Little Eagle *Hieraaetus morphnoides*		+	+				+	+				
Wedge-tailed Eagle *Aquila audax*		+	+	+	+	+	+	+			+	+
Swamp Harrier *Circus approximans*		+					+					
Spotted Harrier *Circus assimilis*		+	+	+			+	+			+	
Otididae (bustard)												
Australian Bustard *Ardeotis australis*		+	+	+		+	+	+			+	+
Rallidae (crakes, rails and gallinules)												
Eurasian Coot *Fulica atra*				+								+
Buff-banded Rail *Gallirallus philippensis*												+
Purple Swamp Hen *Porphyrio porphyrio*				+								+
Black-tailed Native-hen *Tribonyx ventralis*												+

Appendix 6. (cont.)

Species	Conservation Status	Recorded	Records									
			Surveys						Database			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Turnicidae (button-quails)												
Little Button-Quail *Turnix velox*		+	+	+	+		+	+			+	+
Burhinidae (stone-curlews)												
Bush Stone-Curlew *Burhinus grallarius*		+	+	+			+	+			+	+
Recurvirostridae (stilts & avocets)												
Black-winged Stilt *Himantopus himantopus*							+	+			+	+
Red-necked Avocet *Recurvirostra novaehollandiae*												+
Charadriidae (plovers, dotterels & lapwings)												
Oriental Plover *Charadrius veredus*	Mi								+	+		+
Black-fronted Dotterel *Elseyornis melanops*		+	+	+			+	+			+	+
Red-kneed Dotterel *Erythrogonys cinctus*											+	+
Masked Lapwing *Vanellus miles*												+
Banded Lapwing *Vanellus tricolor*			+									
Scolopacidae (sandpipers, tattlers, godwits & allies)												
Common Sandpiper *Actitis hypoleucos*	Mi			+				+	+	+		+
Sharp-tailed Sandpiper *Calidris acuminata*	T								+	+		+
Pectoral Sandpiper *Calidris melanotos*	Mi								+			+
Red-necked Stint *Calidris ruficollis*	Mi									+		+
Wood Sandpiper *Tringa glareola*	Mi			+						+		+
Common Greenshank *Tringa nebularia*	T									+		+
Marsh Sandpiper *Tringa stagnatilis*	Mi									+		+
Glareolidae (pratincoles)												
Oriental Pratincole *Glareola maldivarum*	Mi								+	+		+
Australian Pratincole *Stiltia isabella*												+
Laridae (noddies, gulls & terns)												
Silver Gull *Chroicocephalus novaehollandiae*								+			+	+
Whiskered Tern *Sterna hybrida*												+
Columbidae (pigeons and doves)												
Common Bronzewing *Phaps chalcoptera*		+	+	+		+		+			+	+
Flock Bronzewing *Phaps histrionica*											+	+
Crested Pigeon *Ocyphaps lophotes*		+	+	+	+	+	+	+			+	+
Spinifex Pigeon *Geophaps plumifera*		+	+	+	+	+	+	+			+	+
Diamond Dove *Geopelia cuneata*		+	+	+	+		+	+			+	+
Bar-shouldered Dove *Geopelia humeralis*			+					+				+
Peaceful Dove *Geopelia striata*		+	+	+				+			+	+

Appendix 6. (cont.)

Species		Conservation Status	Recorded	Records									
				Surveys						Database			
				Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Cuculidae (cuckoos)													
Pheasant-Coucal	*Centropus phasianinus*			+					+				+
Pallid Cuckoo	*Heteroscenes pallidus*		+	+	+			+	+				+
Black-eared Cuckoo	*Chalcites osculans*			+					+				+
Horsfield's Bronze-Cuckoo	*Chalcites basalis*		+	+	+		+	+	+			+	+
Tytonidae (barn owls)													
Eastern Barn Owl	*Tyto javanica*												+
Strigidae (hawk owls)													
Barking Owl	*Ninox connivens*			+									+
Southern Boobook	*Ninox boobook*		+	+		+	+	+	+				+
Podargidae (frogmouths)													
Tawny Frogmouth	*Podargus strigoides*		+		+			+	+				+
Caprimulgidae (nightjars)													
Spotted Nightjar	*Eurostopodus argus*		+	+	+	+	+	+	+			+	+
Aegothelidae (owlet-nightjars)													
Australian Owlet-Nightjar	*Aegotheles cristatus*		+	+	+			+	+				+
Apodidae (swifts)													
Fork-tailed Swift	*Apus pacificus*	Mi		+				+	+	+	+		+
Alcedinidae (kingfishers)													
Blue-winged Kookaburra	*Dacelo leachii*		+	+	+	+		+	+			+	+
Red-backed Kingfisher	*Todiramphus pyrrhopygius*		+	+	+	+	+	+	+			+	+
Sacred Kingfisher	*Todiramphus sanctus*		+	+	+			+	+			+	+
Meropidae (bee-eaters)													
Rainbow Bee-eater	*Merops ornatus*		+	+	+	+	+	+	+			+	+
Falconidae (falcons)													
Brown Falcon	*Falco berigora*		+	+	+		+	+	+			+	+
Nankeen Kestrel	*Falco cenchroides*		+	+	+	+	+	+	+			+	+
Australian Hobby	*Falco longipennis*		+	+	+			+	+				+
Grey Falcon	*Falco hypoleucos*	T	+					+		+	+		+
Peregrine Falcon	*Falco peregrinus*	OS	+					+	+		+		+
Black Falcon	*Falco subniger*				+								+
Cacatuidae (cockatoos)													
Galah	*Eolophus roseicapilla*		+	+	+	+	+	+	+			+	+
Little Corella	*Cacatua sanguinea*		+	+	+	+	+	+	+			+	+
Cockatiel	*Nymphicus hollandicus*		+	+	+			+	+			+	+

Appendix 6. (cont.)

Species	Conservation Status	Recorded	Records									
			Surveys						Database			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Psittacidae (parrots, lorikeets and rosellas)												
Australian Ringneck *Barnardius zonarius*		+	+	+		+	+	+			+	+
Budgerigar *Melopsittacus undulatus*		+	+	+	+		+	+			+	+
Night Parrot *Pezoporus occidentalis*	T								+			
Ptilonorhynchidae (bowerbirds)												
Western Bowerbird *Chlamydera guttata*		+	+	+		+		+				+
Climacteridae (treecreepers)												
Black-tailed Treecreeper *Climacteris melanurus*												+
Maluridae (fairy-wrens, grasswrens and emu-wrens)												
Striated Grasswren *Amytornis striatus*		+		+			+				+	+
Purple-backed (Variegated) Fairy-wren *Malurus assimilis*		+	+	+		+	+	+			+	+
White-winged Fairy-wren *Malurus leucopterus*		+	+	+		+	+	+			+	+
Rufous-crowned Emu-wren *Stipiturus ruficeps*	LS		+					+				+
Meliphagidae (honeyeaters and chats)												
Brown Honeyeater *Lichmera indistincta*		+	+	+	+		+	+			+	+
Black Honeyeater *Sugomel niger*				+			+	+				+
Pied Honeyeater *Certhionyx variegatus*		+		+			+					+
Singing Honeyeater *Gavicalis virescens*		+	+	+	+	+	+	+			+	+
Grey-headed Honeyeater *Ptilotula keartlandi*		+	+	+	+		+	+			+	+
White-plumed Honeyeater *Ptilotula penicillata*		+	+	+	+	+	+	+			+	+
Black-chinned Honeyeater *Melithreptus gularis*		+					+					+
White-fronted Honeyeater *Purnella albifrons*												
Yellow-throated Miner *Manorina flavigula*		+	+	+	+	+	+	+			+	+
Spiny-cheeked Honeyeater *Acanthagenys rufogularis*				+			+	+				
Crimson Chat *Epthianura tricolor*		+	+	+		+	+	+				+
Pardalotidae (pardalotes)												
Red-browed Pardalote *Pardalotus rubricatus*		+	+	+			+	+			+	+
Striated Pardalote *Pardalotus striatus*				+			+					+
Acanthizidae (thornbills, gerygones & allies)												
Inland Thornbill *Acanthiza apicalis*		+										
Weebill *Smicrornis brevirostris*							+	+				+
Western Gerygone *Gerygone fusca*				+								+
Pomatostomidae (babblers)												
Grey-crowned Babbler *Pomatostomus temporalis*		+	+	+	+			+				+
Cinclosomatidae (quail-thrushes)												
Western Quail-thrush *Cinclosoma marginatum*		+										

Appendix 6. (cont.)

Species	Conservation Status	Recorded	Records									
			Surveys						Database			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Artamidae (woodswallows)												
White-breasted Woodswallow *Artamus leucorynchus*		+									+	+
Masked Woodswallow *Artamus personatus*		+	+				+				+	+
Black-faced Woodswallow *Artamus cinereus*		+	+	+	+	+	+	+			+	+
Little Woodswallow *Artamus minor*		+		+				+			+	+
Cracticidae (butcherbirds & magpie)												
Grey Butcherbird *Cracticus torquatus*				+		+	+	+				+
Pied Butcherbird *Cracticus nigrogularis*		+	+	+		+	+	+			+	+
Australian Magpie *Gymnorhina tibicen*		+	+	+			+	+			+	+
Campephagidae (cuckoo-shrikes and trillers)												
Black-faced Cuckoo-shrike *Coracina novaehollandiae*		+	+	+	+	+	+	+			+	+
White-winged Triller *Lalage tricolor*		+	+	+			+	+			+	+
Oreoicidae (bellbirds)												
Crested Bellbird *Oreoica gutturalis*		+	+	+		+	+	+				+
Pachycephalidae (shrike-tits, whistlers and allies)												
Rufous Whistler *Pachycephala rufiventris*		+	+	+		+	+	+			+	+
Grey Shrike-thrush *Colluricincla harmonica*		+	+	+			+				+	+
Rhipiduridae (fantails)												
Grey Fantail *Rhipidura albiscapa*												+
Willie Wagtail *Rhipidura leucophrys*		+	+	+	+	+	+	+			+	+
Monarchidae (flycatchers, monarchs and magpie-lark)												
Magpie-lark *Grallina cyanoleuca*		+	+	+	+	+	+	+			+	+
Corvidae (ravens & crows)												
Torresian Crow *Corvus orru*		+	+	+	+	+	+	+			+	+
Little Crow *Corvus bennetti*			+	+				+			+	+
Petroicidae (robins)												
Red-capped Robin *Petroica goodenovii*							+	+				+
Hooded Robin *Melanodryas cucullata*							+					+
Alaudidae (larks)												
Horsfield's Bushlark *Mirafra javanica*		+	+				+	+			+	+
Hirundinidae (swallows & martins)												
White-backed Swallow *Cheramoeca leucosterna*												+
Welcome Swallow *Hirundo neoxena*		+		+								+
Tree Martin *Petrochelidon nigricans*		+	+	+			+	+				+
Fairy Martin *Petrochelidon ariel*		+	+	+			+	+				+

Appendix 6. (cont.)

Species	Conservation Status	Recorded	Records									
			Surveys						Database			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Acrocephalidae (reed warblers)												
Australian Reed Warbler *Acrocephalus australis*			+	+				+				+
Locustellidae (warblers, songlarks and grassbirds)												
Spinifexbird *Poodytes carteri*		+	+	+	+	+	+	+			+	+
Rufous Songlark *Cincloramphus mathewsi*		+	+	+	+		+	+				+
Brown Songlark *Cincloramphus cruralis*		+		+		+	+	+			+	+
Dicaeidae (flowerpeckers)												
Mistletoebird *Dicaeum hirundinaceum*							+	+			+	+
Estrildidae (grassfinches, sparrows & allies)												
Zebra Finch *Taeniopygia castanotis*		+	+	+	+	+	+	+			+	+
Star Finch *Neochmia ruficauda*			+	+								+
Painted Finch *Emblema pictum*		+	+	+	+	+	+	+			+	+
Motacillidae (pipits & true wagtails)												
Australian Pipit *Anthus australis*		+	+	+		+	+	+			+	+
# bird species predicted:		**157**										

Appendix 7. Mammals potentially occurring in the Study Area.

Key to records:

- Recorded = recorded in the study area on this survey or by Ecoscape (2024).
- Hemi Project = species recorded at the Hemi Project 2021 – 2024 (Western Wildlife 2024).
- Wodgina Project = species recorded at the Wodgina Project 2009 – 2019 by Western Wildlife (2020), 360 Environmental (2018a), Stantec (2017), Outback Ecology (2012) and/or Outback Ecology (2009).
- Wodgina Pipeline = species recorded on the Wodgina Pipeline and Mine in 2018 (Stantec 2018b).
- Mt Dove Project = species recorded at the Mt Dove Project in 2010 (Outback Ecology 2011).
- FMG Stage A Rail = species recorded in the northern section of the FMG Stage A Rail in 2004 (Biota 2004).
- Hope Downs Rail = species recorded in the northern section of the Hope Downs Rail Corridor (Biota 2002a, 2002b).

EPBC = modelled occurrence of species or species habitat in the area on the EPBC Protected Matters Search Tool.
DBCA = species recorded in the area on DBCA's Threatened and Priority Fauna Database (DBCA 2025).
Dandjoo = species recorded within 100km on the Dandjoo Database (DBCA 2025)
ALA = species recorded within 40km on ALA Database (ALA 2025).

Species	Conservation Status	Recorded	Records									
			Other Survey						Database			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Tachyglossidae (echidnas)												
Echidna *Tachyglossus aculeatus*		+	+	+	+	+	+	+				
Dasyuridae (dasyurid marsupials)												
Brush-tailed Mulgara *Dasycercus blythi*	P	+	+				+	+		+		
Little Red Kaluta *Dasykaluta rosamondae*		+	+	+	+	+	+	+			+	+
Northern Quoll *Dasyurus hallucatus*	T	+	+	+	+	+	+	+	+	+		+
Woolley's Pseudantechinus *Pseudantechinus woolleyae*		+		+				+			+	+
Pilbara Ningaui *Ningaui timealeyi*		+	+	+			+	+			+	+
Orange-headed Pilbara Planigale *Planigale kendricki*		+	+	+		+	+	+				+
Long-tailed Dunnart *Sminthopsis longicaudata*	P			+								
Striped-faced Dunnart *Sminthopsis macroura*		+			+	+	+	+			+	+
Lesser Hairy-footed Dunnart *Sminthopsis youngsoni*		+	+				+	+			+	+
Thylacomyidae (bilbies)												
Bilby *Macrotis lagotis*	T		+					+	+	+		
Phalangeridae. (possums)												
Common Brushtail Possum *Trichosurus vulpecula*	LS	+										
Macropodidae (kangaroos and wallabies)												
Spectacled Hare-wallaby *Lagorchestes conspicillatus*	P	+			+					+		+
Euro *Osphranter robustus*		+	+	+	+	+	+	+				+
Red Kangaroo *Osphranter rufus*		+	+			+		+				+
Rothschild's Rock-wallaby *Petrogale rothschildi*		+		+	+		+	+			+	
Muridae (rats and mice)												
Lakeland Downs Mouse *Leggadina lakedownensis*	P						+	+				
House Mouse *Mus musculus*	Int.		+	+			+	+			+	+
Spinifex Hopping Mouse *Notomys alexis*		+	+	+	+	+		+			+	+
Western Pebble-mound Mouse *Pseudomys chapmani*	P	+	+	+	+	+				+		+
Delicate Mouse *Pseudomys delicatulus*							+	+			+	+

Appendix 7. (cont.)

Species	Conservation Status	Recorded	Records									
			Other Survey						Database			
			Hemi Project	Wodgina Project	Wodgina Pipeline	Mt Dove Project	FMG Stage A Rail	Hope Downs Rail	EPBC	DBCA	Dandjoo	ALA
Muridae (cont.)												
Desert Mouse *Pseudomys desertor*		+	+	+			+	+			+	+
Sandy Inland Mouse *Pseudomys hermannsburgensis*		+	+	+		+	+	+			+	+
Common Rock-rat *Zyzomys argurus*		+		+	+		+	+			+	+
Rhinonycteridae (orange leaf-nosed bats)												
Pilbara Leaf-nosed Bat *Rhinonicteris aurantia (Pilbara)*	T		+	+	+	+			+	+		
Megadermatidae (ghost bat)												
Ghost Bat *Macroderma gigas*	T	+		+	+	+		+	+	+		
Emballonuridae (sheathtail bats)												
Yellow-bellied Sheathtail Bat *Saccolaimus flaviventris*		+	+	+		+					+	
Common Sheathtail Bat *Taphozous georgianus*		+	+	+	+	+		+				+
Molossidae (freetail bats)												
Greater Northern Freetail Bat *Chaerephon jobensis*		+	+	+				+				
Northern Coastal Free-tailed Bat *Ozimops cobourgiana*	P		+							+		
Northern Freetail Bat *Ozimops lumsdenae*												
White-striped Freetail Bat *Austronomus australis*				+	+			+				
Vespertilionidae (ordinary bats)												
Gould's Wattled Bat *Chalinolobus gouldii*		+	+	+	+	+	+	+			+	
Lesser Long-eared Bat *Nyctophilus geoffroyi*												
Little Broad-nosed Bat *Scotorepens greyii*		+	+	+	+	+	+	+			+	
Finlayson's Cave Bat *Vespadelus finlaysoni*		+	+	+	+	+		+			+	+
Canidae (dogs and foxes)												
Dog / Dingo *Canis familiaris dingo*	Int.	+	+	+	+	+	+	+				+
Fox *Vulpes vulpes*	Int.		+		+	+						
Felidae (cats)												
Feral / House Cat *Felis catus*	Int.	+	+	+	+	+	+	+			+	+
Equidae (horses)												
Donkey *Equus asinus*	Int.					+	+	+				
Horse *Equus caballus*	Int.	+		+								
Camelidae (camels)												
Camel *Camelus dromedarius*	Int.	+	+			+	+					+
Bovidae (horned ruminants)												
Cow *Bos taurus*	Int.	+	+	+	+	+						+
Number of Mammals Predicted:		**43 (35 native, 8 introduced)**										

Appendix 8. EPBC Protected Matters Search Tool results.

Species	EPBC Act Status	Type of Presence
Calidris ferruginea **Curlew Sandpiper**	Critically Endangered, Migratory	Species or species habitat **MAY** occur within area
Pezoporus occidentalis **Night Parrot**	Endangered	Species or species habitat **MAY** occur within area
Dasyurus hallucatus **Northern Quoll**	Endangered	Species or species habitat **KNOWN** to occur within area
Rostratula australis **Australian Painted Snipe**	Endangered	Species or species habitat **MAY** occur within area
Erythrotriornis radiatus **Red Goshawk**	Endangered	Species or species habitat **MAY** occur within area
Macrotis lagotis **Bilby**	Vulnerable	Species or species habitat **KNOWN** to occur within area
Rhinonicteris aurantia **Pilbara Leaf-nosed Bat**	Vulnerable	Species or species habitat **LIKELY** to occur within area
Macroderma gigas **Ghost Bat**	Vulnerable	Species or species habitat **LIKELY** to occur within area
Liasis olivaceus barroni **Pilbara Olive Python**	Vulnerable	Species or species habitat **MAY** occur within area
Falco hypoleucos **Grey Falcon**	Vulnerable	Species or species habitat **LIKELY** to occur within area
Charadrius veredus **Oriental Plover**	Migratory	Species or species habitat **MAY** occur within area
Actitis hypoleucos **Common Sandpiper**	Migratory	Species or species habitat **KNOWN** to occur within area
Calidris acuminata **Sharp-tailed Sandpiper**	Vulnerable, Migratory	Species or species habitat **MAY** occur within area
Calidris melanotos **Pectoral Sandpiper**	Migratory	Species or species habitat **MAY** occur within area
Pandion cristatus **Eastern Osprey**	Migratory	Species or species habitat **MAY** occur within area
Apus pacificus **Fork-tailed Swift**	Migratory	Species or species habitat **LIKELY** to occur within area
Glareola maldivarum **Oriental Pratincole**	Migratory	Species or species habitat **MAY** occur within area
Hirundo rustica **Barn Swallow**	Migratory	Species or species habitat **MAY** occur within area
Motacilla cinerea **Grey Wagtail**	Migratory	Species or species habitat **MAY** occur within area
Motacilla flava **Yellow Wagtail**	Migratory	Species or species habitat **MAY** occur within area
Crocodylus porosus **Saltwater Crocodile**	Migratory	Species or species habitat **MAY** occur within area

Appendix 9. Excluded Fauna

Fauna recorded on the DBCA's Threatened and Priority Fauna Database (Figure 11, DBCA 2025) or the EPBC Act Protected Matters Search Tool (Appendix 8) but excluded from the lists of predicted fauna in Appendices 4 – 7.

Species	Status		Database		Reason for Exclusion
	EPBC Act	BC Act	DBCA	EPBC	
Australian Painted Snipe (*Rostratula australis*)	En	En		+	Vagrant to the region.
Bar-tailed Godwit (*Limosa lapponica*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Barn Swallow (*Hirundo rustica*)	Mi	Mi		+	Vagrant to the region.
Caspian Tern (*Hydroprogne caspia*)	Mi	Mi	+		Seabird that primarily uses coastal habitats and large pools on the lower reaches of rivers.
Crested Tern (*Thalasseus bergii*)	Mi	Mi	+		Seabird that forages and breeds on coasts and offshore islands.
Curlew Sandpiper (*Calidris ferruginea*)	Cr, Mi	Cr, Mi		+	Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Eastern Curlew (*Numenius madagascariensis*)	Cr, Mi	Cr, Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Eastern Osprey (*Pandion cristatus*)	Mi	Mi	+	+	Coastal bird that may also occur on the lower reaches of rivers, unlikely to occur upstream.
Flatback Turtle (*Natator depressus*)	Mi	Mi	+		Marine turtle, does not use inland waters.
Great Knot (*Calidris tenuirostris*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Greater Sand Plover (*Charadrius leschenaultii*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Green Turtle (*Chelonia mydas*)	Mi	Mi	+		Marine turtle, does not use inland waters.
Grey Plover (*Pluvialis squatarola*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Grey Wagtail (*Motacilla cinera*)	Mi	Mi		+	Vagrant to the region.
Grey-tailed Tattler (*Tringa brevipes*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Gull-billed Tern (*Geochelidon nilotica*)	Mi	Mi	+		Seabird that primarily uses coastal habitats occurs inland on large salt lakes and claypans.
Lesser Frigatebird (*Fregata ariel*)	Mi	Mi	+		Seabird that forages and breeds on coasts and offshore islands.
Lesser Sand Plover (*Charadrius mongolus*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Little Curlew (*Numenius minutus*)	Mi	Mi	+		Shorebird that primarily uses short dry grasslands and the grassy edges of freshwater wetlands.
Long-toed Stint (*Calidris subminuta*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)

Appendix 9. (cont.)

Species	Status		Database		Reason for Exclusion
	EPBC Act	BC Act	DBCA	EPBC	
Pacific Golden Plover (*Pluvialis fulva*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Red Goshawk (*Erythrotrichochis radiatus*)	Vu	Vu		+	Kimberley species, vagrant to the region.
Red Knot (*Calidris canutus*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Ruddy Turnstone (*Arenaria interpres*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Ruff/Reeve (*Philomachus pugnax*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Saltwater Crocodile (*Crocodylus porosus*)	Mi	Mi		+	Uncommon marine species in this region, not likely to occur in rivers.
Sanderling (*Calidris alba*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Terek Sandpiper (*Xenus cinereus*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
Wedge-tailed Shearwater (*Ardenna pacifica*)	Mi	Mi	+		Seabird that forages and breeds on coasts and offshore islands.
Whimbrel (*Numenius phaeopus*)	Mi	Mi	+		Shorebird that primarily uses coastal habitats (mudflats, mangroves, beaches)
White-winged Black Tern (*Chlidonius leucopterus*)	Mi	Mi	+		Seabird that forages and breeds on coasts and offshore islands.
Yellow Wagtail (*Motacilla flava*)	Mi	Mi		+	Vagrant to the region.

Appendix 10. Bat Call Analysis Report

Specialised Zoological

Acoustic analysis and bat call identification from Tabba Tabba, Western Australia

Prepared for **Western Wildlife Pty Ltd**

Version **12 November 2025**

SZ project reference **SZ783**

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This report should be included as an appendix in any larger submission to Government, and cited as:

Specialised Zoological (2025). Acoustic analysis and bat call identification from Tabba Tabba, Western Australia. Unpublished report by Specialised Zoological for Western Wildlife Pty Ltd, version 2025-11-12, project reference SZ783.

Version history

Date	Note
2025-11-12	Final version

Summary

Bat identifications from bat detector sound files are provided from recordings made in the Tabba Tabba project area, c. 50 km south of Port Hedland in the Pilbara region of Western Australia.

The scope of the analysis extended to the identification of all bat species present, but with particular attention given to the detection of species of conservation significance: Ghost Bat *Macroderma gigas* (Megadermatidae) and Pilbara Leaf-nosed Bat *Rhinonicteris aurantia* (Rhinonycteridae). Separate analyses targeted these two species.

The dataset submitted for analysis included:

- A total of 43,720 WAV format sound files from 22 recording nights made at 11 recording sites between 11 and 22 April 2025;
- A total of 29,083 WAV format sound files from 18 recording nights made at 9 recording sites between 1 and 11 September 2025.

Six species of bat were detected in the recordings (**Tables 1** and **2**; **Figure 1**). The Ghost Bat and Pilbara Leaf-nosed Bat were not detected.

Further information is available if verification is required.

Methods

The ultrasonic recordings provided were recorded in WAV format sound files with Titley Scientific Anabat Ranger bat detectors.

A multi-step acoustic analysis procedure developed to process large full spectrum echolocation recording datasets from insectivorous bats (Armstrong et al. 2021a,b) was applied to the passive site-based recordings made on the survey. Firstly, the WAV files were scanned for bat echolocation calls using several parameter sets in the software SCAN'R version 1.8.3 (Binary Acoustic Technology), which also provides measurements (SCAN'R parameters) from each putative bat pulse. The outputs were then used to determine if putative bat pulses measured in SCAN'R could be identified to species. This was done using a custom [R] language application that performed three tasks:

1. undertook a Discriminant Function Analysis on training data from representative calls from the Pilbara;

2. from the measurements of each putative bat pulse from SCAN'R, calculated values for the first two Discriminant Functions that could separate the echolocation call types derived from the analysis of training data, and plotted these resulting coordinates over data ellipses representing one standard deviation of the variation for the defined call types; and

3. facilitated an inspection in a spectrogram of multiple examples of each call type for each recording night by opening the original WAV files containing pulses of interest in Adobe Audition version 25.0.

Species identifications were made based on measurements of characteristic frequency and observation of pulse shape, and with reference to information in McKenzie and Bullen (2009). Nomenclature follows Jackson and Groves (2015). Distribution information for all bat species considered here was checked against the BatMap resource hosted by the Australasian Bat Society, Inc (https://www.ausbats.org.au/batmap.html) (Milne et al. 2023).

Limitations

The identifications presented in this report have been made within the following context:

1. The identifications made herein were based on the ultrasonic acoustic data recorded and provided by a 'third party' (the client named on the front of this report).
2. The scope of this report extended to providing information on the identification of bat species in bulk ultrasonic recordings. Further extended comment on these species and the possible impacts of a planned project on bat species were not part of the scope.
3. In the case of the present report, the recording equipment was not set up and supplied by Specialised Zoological. The equipment was operated by the third party during the survey.
4. Other than the general location of the study area, Specialised Zoological has not been provided with detailed information of the survey area, has not made a visit to observe the habitats available for bats, nor have we visited the specific project areas on a previous occasion.
5. Specialised Zoological has had no input into the overall design and timing of this bat survey, recording site placement, nor the degree of recording site replication.
6. While Specialised Zoological has made identifications to the best of our ability given the available materials, and reserves the right to re-examine the data and revise any identification following a query, it is the client's and / or proponent's responsibility to provide supporting evidence for any identification, which might require follow-up trapping effort or non-invasive methods such as video recordings. Specialised Zoological bears no liability for any follow-up work that may be required to support an identification based initially on the analysis of acoustic recordings undertaken and reported on here.
7. There are a variety of factors that affect the 'detectability' of each bat species, given the frequency, power and shape characteristics of their calls. Further information on the analysis and the various factors that can impinge on the reliability of identifications can be requested.
8. The analysis of ultrasonic recordings is one of several methods that can be used to survey for bats, and comprehensive surveys typically employ more than one method. If an identification in the present report is ambiguous or in question, a trapping programme would help to resolve the presence of the possibilities in the project area.
9. This version of the document supersedes any previous version. Previous drafts are not authorised by us for submission to the regulator or the public domain.

References

Armstrong K.N., Clarke S., Linke A., Scanlon A., Roetman P., Hitch, A.T. and Donnellan S.C. (2021a). Citizen science implements the first intensive acoustics-based survey of insectivorous bat species across the Murray-Darling Basin of South Australia. *Australian Journal of Zoology* 68: 364–381. https://doi.org/10.1071/ZO20051

Armstrong K.N., Broken-Brow J., Hoye G., Ford G., Thomas M. and Corben C. (2021b). Effective detection and identification of sheath-tailed bats of Australian forests and woodlands. *Australian Journal of Zoology* 68:346–363. https://doi.org/10.1071/ZO20044

Jackson, S.M. and Groves, C.P. (2015). *Taxonomy of Australian mammals*. CSIRO Publishing, Victoria.

McKenzie, N.L. and Bullen, R.D. (2009). The echolocation calls, habitat relationships, foraging niches and communities of Pilbara microbats. *Records of the Western Australian Museum* Supplement 78: 123–155.

Milne D.J., Reardon T.B. and Ford G. (2023) BatMap – authoritative distribution maps for Australian bats. *Australian Mammalogy*. 45: 350–355. https://doi.org/10.1071/AM23005

Table 1. Species identified from all sites combined.

EMBALLONURIDAE	
Yellow-bellied Sheath-tailed Bat	*Saccolaimus flaviventris*
Common Sheath-tailed Bat	*Taphozous georgianus*
VESPERTILIONIDAE	
Gould's Wattled Bat	*Chalinolobus gouldii*
Little Broad-nosed Bat	*Scotorepens greyii*
Finlayson's Cave Bat	*Vespadelus finlaysoni*
MOLOSSIDAE	
Greater Northern Free-tailed Bat	*Chaerephon jobensis*

Table 2. Species identifications summarised for all nights across each recording site (see *Table 1* for full species names).

Recording unit	Night	Coordinates	*C. gouldii*	*C. jobensis*	*S. flaviventris*	*S. greyii*	*T. georgianus*	*V. finlaysoni*
April 2025								
Wbat03-111462	11/04/2025	-20.713417, 118.890953	.	X	.	.	X	.
Wbat03-111462	12/04/2025	-20.713367, 118.891045	.	.	.	.	X	.
Wbat03-111462	13/04/2025	-20.677366, 118.921829	.	.	.	X	.	X
Wbat03-111462	14/04/2025	-20.677364, 118.921844	X	.	.	X	X	X
Wbat03-111462	15/04/2025	-20.697792, 118.934898	.	.	.	X	.	X
Wbat03-111462	16/04/2025	-20.697731, 118.934700	X	X	.	X	.	X
Wbat03-111462	17/04/2025	-20.646582, 118.931168	X	.	.	X	X	X
Wbat03-111462	18/04/2025	-20.646725, 118.931137	X	X	.	X	X	X
Wbat03-111462	19/04/2025	-20.658413, 118.930107	.	X	.	X	.	X
Wbat03-111462	20/04/2025	-20.658293, 118.930405	X	X	.	X	.	X
Wbat03-111462	21/04/2025	-20.642134, 118.936539	.	.	.	X	X	X
Wbat03-111462	22/04/2025	-20.642061, 118.936768	.	.	.	.	.	.
Wbat04-111443	11/04/2025	-20.617163, 118.944565	X	.	.	X	X	X
Wbat04-111443	12/04/2025	-20.617184, 118.944534	X	.	.	.	X	X
Wbat04-111443	13/04/2025	-20.557137, 119.049576	.	.	.	X	.	.
Wbat04-111443	14/04/2025	-20.557138, 119.049850	X	.	.	.	.	.
Wbat04-111443	15/04/2025	-20.672646, 118.919968	.	.	.	.	.	X
Wbat04-111443	16/04/2025	-20.672695, 118.919907	.	.	.	.	.	.
Wbat04-111443	17/04/2025	-20.720594, 118.941521	X	X	X	X	X	X
Wbat04-111443	18/04/2025	-20.720478, 118.941093	X	.	.	X	.	X
Wbat04-111443	19/04/2025	-20.743313, 119.004684	X	X	.	X	.	.
Wbat04-111443	20/04/2025	-20.743015, 119.005081	.	.	.	X	.	.
September 2025								
Bat03-111462	1/09/2025	-20.709661, 118.900032	.	.	.	.	X	X
Bat03-111462	2/09/2025	-20.709648, 118.900017	.	X	.	.	.	X
Bat03-111462	3/09/2025	-20.722874, 118.887337	.	X	.	.	.	X
Bat03-111462	4/09/2025	-20.722639, 118.887550	.	.	.	.	.	X
Bat03-111462	5/09/2025	-20.665438, 118.974854	.	X	.	.	.	.
Bat03-111462	6/09/2025	-20.665445, 118.974922	.	.	.	.	X	.
Bat03-111462	7/09/2025	-20.635881, 118.985695	.	.	.	.	.	.
Bat03-111462	8/09/2025	-20.635853, 118.985825	.	.	.	.	.	.
Bat03-111462	9/09/2025	-20.635956, 118.985580	.	X	.	X	.	X
Bat03-111462	11/09/2025	-20.655367, 118.924690	.	X	.	.	X	X
Bat04-111443	1/09/2025	-20.722750, 118.903877	X	.	.	X	.	X
Bat04-111443	2/09/2025	-20.722719, 118.903877	.	X	.	X	X	X
Bat04-111443	3/09/2025	-20.726414, 118.898125	.	X	.	X	X	X
Bat04-111443	4/09/2025	-20.726889, 118.897606	.	X	.	X	X	X
Bat04-111443	5/09/2025	-20.726686, 118.897591	.	X	.	.	.	X
Bat04-111443	9/09/2025	-20.748560, 118.903252	.	.	.	.	X	X
Bat04-111443	10/09/2025	-20.748512, 118.903236	.	X	.	.	X	X
Bat04-111443	11/09/2025	-20.645876, 118.941750	.	.	.	X	X	X

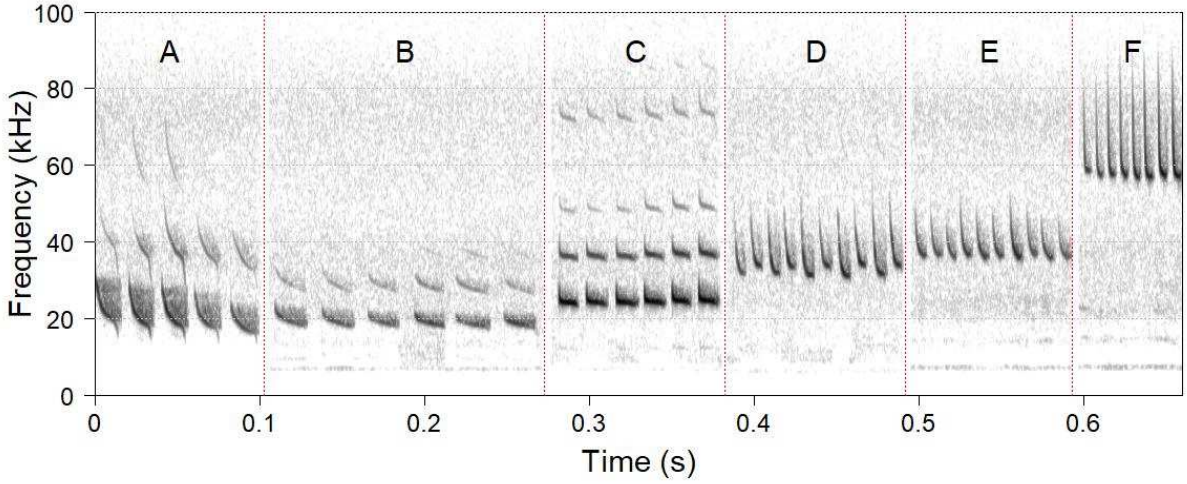

Figure 1. Representative echolocation call sequence portions of the species identified (**A**: *Chaerephon jobensis*; **B**: *Saccolaimus flaviventris*; **C**: *Taphozous georgianus*; **D**: *Chalinolobus gouldii*; **E**: *Scotorepens greyii*; **F**: *Vespadelus finlaysoni*; time between pulses has been compressed).