Breakaway and Marillana South Basic Terrestrial Vertebrate Fauna Survey

Biologic Environmental Survey

Report to BHP WAIO

January 2024

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EXECUTIVE SUMMARY

BHP Western Australian Iron Ore (BHP WAIO) required a basic terrestrial vertebrate fauna survey covering the Breakaway tenement (E47/1239) and Marillana South tenement (E47/4245) (hereafter referred to as the Study Area) to provide local and contextual information to inform future environmental approvals for the area. The Study Area is located approximately 95 kilometres northwest of Newman and covers an area of approximately 3,165.95 hectares (ha). BHP WAIO commissioned Biologic Environmental Survey Pty Ltd to undertake a single season basic terrestrial vertebrate fauna survey of the Study Area. This report documents the findings of this assessment, which consisted of a desktop assessment and a basic field survey.

A detailed desktop assessment was conducted prior to the field survey to identify vertebrate fauna species which have previously been recorded or have the potential to occur in the vicinity of the Study Area. The field survey was undertaken by two experienced zoologists between the 27th of July and the 1st of August 2022. The primary objective of the survey was to identify the occurrence of terrestrial vertebrate fauna species and their supporting habitats within the Study Area, with a focus on significant species. Significant species comprises species listed as Threatened and/or Migratory under the *Environmental Protection and Biodiversity Conservation Act 1999*, *Biodiversity Conservation Act 2016*, and/or as Priority by the Department of Biodiversity, Conservation and Attractions. Seven species considered as Matters of National Environmental Significance (MNES) under the EPBC Act were targeted during the survey, including northern quoll (*Dasyurus hallucatus*), greater bilby (*Macrotis lagotis*), ghost bat (*Macroderma gigas*), Pilbara leaf-nosed bat (*Rhinonicteris aurantius* 'Pilbara form'), Pilbara olive python (*Liasis olivaceus barroni*), night parrot (*Pezoporus occidentalis*) and grey falcon (*Falco hypoleucos*). Specific methods included targeted searches, active foraging, camera traps, ultrasonic sound recordings for bats and habitat assessments.

Seven broad fauna habitat types were recorded and mapped within the Study Area, comprising, in decreasing order of extent, Hillcrest/ Hillslope (2,526.92 ha, 79.82%), Gorge/ Gully (186.57 ha, 5.89%), Drainage Area/ Floodplain (129.70 ha, 4.10%), Major Drainage Line (94.48 ha, 2.98%), Minor Drainage Line 86.76 ha, 2.74%), Breakaway/ Cliff (72.16 ha, 2.28%) and Basalt Outcrop (12.34 ha, 0.39%). The remaining 1.80% (57.03 ha) of the Study Area was mapped as Cleared/ Disturbed. All seven fauna habitats mapped are broadly distributed and well represented across the Pilbara bioregion, and therefore support fauna assemblages which are generally common and widespread. Of the seven fauna habitats mapped within the Study Area, six are considered to provide critical habitat for targeted MNES species. In total, four caves and four water features, which often proved a greater level of importance to some significant species, were recorded within the Study Area.

The desktop assessment identified a total of 377 vertebrate fauna species as potentially occurring within the Study Area, comprising 57 mammals (including 47 native and ten non-native), 179 birds, 130 reptiles and 11 amphibians. A total of 69 vertebrate fauna species, comprising 16 mammal species (13 native and three introduced), 44 bird species and nine reptile species were recorded during the field survey.

Of the 39 significant species identified in the desktop assessment, two were Confirmed to occur within the Study Area. Ghost bat presence was detected at one cave (CBKA-02) via one fresh scat (<1 month old). The western pebble-mound mouse (*Pseudomys chapmani*) was recorded from 26 mounds of which three were active mounds, 12 recently inactive mounds and 11 inactive mounds. All pebble-mounds were recorded in Hillcrest/ Hillslope habitat. Based on known species' distributions, previous records and the habitats present within the Study Area, a further four species were deemed Highly Likely to occur. These included northern quoll, Pilbara olive python, peregrine falcon (*Falco peregrinus*) and Pilbara flat-headed blind-snake (*Anilios ganei*). A further five species were deemed Possible to occur: brush-tailed mulgara (*Dasycercus blythi*), long-tailed dunnart (*Sminthopsis longicaudata*), fork-tailed swift (*Apus pacificus*), Pilbara barking gecko (*Underwoodisaurus seorsus*) and spotted ctenotus (*Ctenotus uber johnstonei*). The remaining 28 species were considered Unlikely or Highly Unlikely to occur within the Study Area, based on distance of previous records to the Study Area and/or the absence of suitable permanent or seasonal habitats and/or specific micro-habitats occurring within the Study Area.

1 INTRODUCTION

1.1 Background

BHP Western Australian Iron Ore (BHP WAIO) required a Basic vertebrate fauna survey covering the Breakaway tenement (E47/1239) and Marillana South tenement (E47/4245) (hereafter referred to as the Study Area) to provide local and contextual information to inform future environmental approvals for the area. The Study Area is located approximately 95 kilometres (km) northwest of Newman and covers an area of approximately 3,165.95 hectares (ha). Specifically, the Breakaway tenement is located approximately nine km east of Spinifex Camp (Yandi) and Marillana South tenement approximately 20 km northeast of Yandi (Figure 1.1).

Of particular interest is the potential for the Study Area to support significant species, which includes those listed as threatened and/or migratory under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or *Biodiversity and Conservation Act 2016* (BC Act) or listed as Priority by the Department of Biodiversity, Conservation and Attractions (DBCA). Significant species considered to be Matters of National Environmental Significance (MNES) under the EPBC Act (and their EPBC Act conservation status) were the primary focus of the assessment. These included:

- northern quoll (*Dasyurus hallucatus*) – Endangered;
- greater bilby (*Macrotis lagotis*) – Vulnerable;
- ghost bat (*Macroderma gigas*) – Vulnerable;
- Pilbara leaf-nosed bat (*Rhinonicteris aurantius* 'Pilbara form') – Vulnerable;
- night parrot (*Pezoporus occidentalis*) – Endangered;
- grey falcon (*Falco hypoleucos*) – Vulnerable; and
- Pilbara olive python (*Liasis olivaceus* subsp. *barroni*) – Vulnerable.

1.2 Survey Objectives

BHP WAIO commissioned Biologic Environmental Survey Pty Ltd (Biologic) to undertake a single season basic terrestrial vertebrate fauna survey of the Study Area. The overarching objectives of this fauna assessment were to:

- conduct a comprehensive desktop assessment (database searches and literature review) to identify vertebrate fauna species potentially occurring within the Study Area;
- undertake a basic vertebrate fauna survey to identify the occurrence of terrestrial vertebrate fauna species and their supporting habitats within the Study Area, with a focus on significant species (those listed as threatened and/or migratory under the EPBC Act and/or BC Act, or listed as Priority by DBCA), particularly those considered to be MNES;
- define and delineate broad fauna habitats occurring within the Study Area, and describe their significance to vertebrate fauna, particularly significant species; and
- assess the likelihood and distribution of significant species occurring within the Study Area.

1.3 Compliance

This assessment was carried out in a manner consistent with the following documents developed by the Western Australian Environmental Protection Authority (EPA), the Department of Climate Change, Energy, the Environment and Water (DCCEEW - formerly the Department of Environment [DoE], Department of Sustainability, Water, Population, and Communities [DSEWPaC], Department of Environment, Water, Heritage and Arts [DEWHA]), the DBCA (formerly the Department of Parks and Wildlife [DPaW]), relevant survey-specific license conditions, species specialists and BHP WAIO. These included:

- Bat Call. (2021a). A review of ghost bat ecology, threats and survey requirements.
- Bat Call (2021b) A review of Pilbara leaf-nosed bat ecology, threats and survey requirements;
- Bullen (2021) Pilbara ghost bat: review of current ecological knowledge;
- BHP WAIO (2022) Vertebrate fauna surveys in Western Australia procedure (document number: SPR-IEN-EMS-012) version: 9;
- BHP (2018) Biological survey spatial data requirements (SPR-IEN-EMS-015);
- DEWHA (2010a) Survey guidelines for Australia's threatened bats;
- DEWHA (2010b) Survey guidelines for Australia's threatened birds;
- DoE (2013) Significant impact guidelines 1.1: Matters of national environmental significance;
- DSEWPaC (2011a) Survey guidelines for Australia's threatened mammals;
- DSEWPaC (2011b) Survey guidelines for Australia's threatened reptiles;
- EPA (2020b) Technical guidance: terrestrial vertebrate fauna surveys for environmental impact assessment;
- EPA (2020a) Statement of environmental principles, factors and objectives;
- EPA (2016) Environmental factor guidelines – terrestrial fauna; and
- DPaW (2017) Interim guidelines for the preliminary surveys of night parrot (*Pezoporus occidentalis*) in Western Australia.

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Yandi Rail Spur Line

Yandi Rail Spur Line

M279SA

Mining Area C Railway

Yandicoogina Rail

Legend

- Study Area
- Live Mining Tenement
- Rail

IBRA Region

- Pilbara

IBRA Subregion

- Chichester
- Fortescue
- Hamersley
- Roebourne

N

biologic Environmental Survey

Scale: 1:80,000

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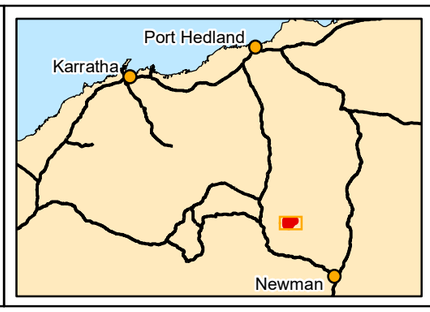
Projection: Transverse Mercator
Datum: GDA2020 Created 18/01/2024



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Breakaway and Marillana South Basic Terrestrial Fauna Survey

Figure 1.1: Study Area and regional context

1.4 Background to Protection of Fauna

Terrestrial fauna may be significant for a range of reasons, including:

- being identified as a threatened or priority species;
- being a species with restricted distribution;
- enduring a degree of historical impact from threatening processes; or
- providing an important function required to maintain the ecological integrity of a significant ecosystem (EPA, 2016).

All native fauna in Western Australia (WA) are protected at a state level under the BC Act and at a national level under the EPBC Act. Any action that has the potential to impact native fauna needs to be approved by relevant state and/or federal departments in accordance with the *WA Environmental Protection Act 1986* (EP Act) and the federal EPBC Act.

While all native fauna are protected under these Acts, some species are afforded extra protection. These include species that are considered Threatened under the EPBC Act and/or BC Act, or migratory bird species that are protected under international agreements and subsequently listed as Migratory under the EPBC Act and/or BC Act (Table 1.1; Appendix A). Furthermore, any species that may be threatened but for which there is insufficient information available to allocate a threatened status under the EPBC Act and/or BC Act, can also be listed as Priority species by the WA DBCA (Table 1.1; Appendix A). The primary focus of the current assessment are the seven MNES species listed in Section 1.1, with consideration also given to other significant species identified during the desktop assessment.

Table 1.1: Definitions and terms for significant species

Act, Agreement or List	Status Codes[1]
Federal	
EPBC Act In Australia, native fauna is protected under the EPBC Act. This Act makes provisions for an independent committee (the Threatened Species Scientific Committee [TSSC]), which is charged with maintaining a list of threatened species. Threatened species are listed under one of six categories, depending on their specific conservation status. Migratory bird species are those listed under international agreements and protected under the EPBC Act as a MNES. Relevant international agreements include the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA), and Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).	*Extinct:* • EX – Extinct • EW – Extinct in the Wild *Threatened:* • CR – Critically Endangered • EN – Endangered • VU – Vulnerable • CD – Conservation Dependent *Other:* • MI – Migratory
State	
BC Act In WA, native fauna is protected under the BC Act. Species in special need of protection are listed as being Extinct, Threatened or Specially Protected. Within these groups, species are listed under one of eight categories, depending on their specific conservation status. Migratory bird species are those listed under the Bonn Convention and/or CAMBA, JAMBA and ROKAMBA agreements.	*Extinct:* • EX – Extinct *Threatened:* • CR – Critically Endangered • EN – Endangered • VU – Vulnerable *Specially Protected:* • MI – Migratory • CD – Conservation Dependent • OS – Other specially protected fauna
DBCA Priority List The DBCA maintains a list of Priority species that are considered to be possibly threatened but have not been assigned statutory protection under the BC Act, as not enough information is available for an accurate determination of conservation status. These species are generally in urgent need of survey to determine their distribution and abundance.	*Poorly Known:* • P1 – Priority 1 • P2 – Priority 2 • P3 – Priority 3 *Rare, Near Threatened and other* • P4 – Priority

[1]See Appendix A for definitions of status codes.

2 EXISTING ENVIRONMENT

2.1 Biogeography

The Study Area is located within the Pilbara bioregion and Hamersley subregion (PIL03), as defined by the Interim Biogeographic Regionalisation of Australia (IBRA; Thackway & Cresswell, 1995) (Figure 1.1). The Pilbara bioregion is characterised by vast coastal plains and inland mountain ranges with cliffs and deep gorges (Thackway & Cresswell, 1995). Vegetation is predominantly mulga low woodlands or snappy gum over bunch and hummock grasses (Bastin, 2008). The Hamersley subregion is characterised by mountainous areas of Proterozoic sedimentary ranges (ironstone ranges) and plateaux dissected by gullies and gorges (Kendrick, 2001). Mulga low woodland over bunch grasses on fine-textured soils dominates in valley floors, while skeletal soils of the ranges are dominated by snappy gum (*Eucalyptus leucophloia*) over *Triodia brizoides* (Kendrick, 2001). Drainage is typically into the Fortescue River to the north, the Ashburton River to the south, or the Robe River to the west (Kendrick, 2001).

2.2 Climate

The Pilbara bioregion has a semi-desert to tropical climate, with rainfall occurring sporadically throughout the year, although mostly during summer (Thackway & Cresswell, 1995). Summer rainfall is usually the result of tropical low pressure systems and cyclonic activity in the region (Leighton, 2004). Winter rainfall is generally lighter and are often associated with cold fronts moving north easterly across the state (Leighton, 2004). The average annual rainfall ranges from 200–350 mm (BoM, 2020; McKenzie *et al.*, 2009).

2.3 Geology

The Hamersley subregion contains Proterozoic sedimentary ranges and gorges of basalt, shale and dolerite. This subregion also contains calcrete deposits (Kendrick, 2001).

The Study Area occurs across two broad (1:500,000) geological units (Table 2.1; Figure 2.1). The dominant geological unit occurring within the Study Area is the Weeli Wolli formation, occupying approximately 78.81% (2,495.15 ha), followed by the Brockman Iron formation (21.19%, 670.81 ha) (Table 2.1; Figure 2.1).

Table 2.1: Geology units within the Study Area

Geological unit	Description	Extent in Study Area	
		Hectares	%
P_-HAj-xci-od	Banded iron-formation (commonly jaspilitic), mudstone, siltstone, and numerous dolerite sills; metamorphosed	2,495.15	78.81
P_-HAb-cib	Banded iron-formation, chert, mudstone, and siltstone; metamorphosed	670.81	21.19
Total		**3,165.95**	**100%**

2.4 Soils

The CSIRO (2009) Atlas of Australian Soils described and mapped the soils of Australia following Bettany *et al.* (1967). The Study Area occurs across one soil unit, Fa13 (Figure 2.2). Fa13 comprises ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations, with some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. The soil unit Fa13 is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and there are extensive areas without soil cover (Bettany *et al.*, 1967).

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Yandi Rail Spur Line

M279SA

Mining Area C Railway

Yandicoogina Rail

Legend

- Study Area
- Live Mining Tenement
- Rail

1:500k Interpreted Bedrock Geology

- A-HAd-kd; Wittenoom Formation
- AP-HAu-xsl-ci; Mount McRae Shale and Mount Sylvia Formation
- P-HAb-cib; Brockman Iron Formation
- P-HAj-xci-od; Weeli Wolli Formation

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Scale: 1:80,000

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Projection: Transverse Mercator
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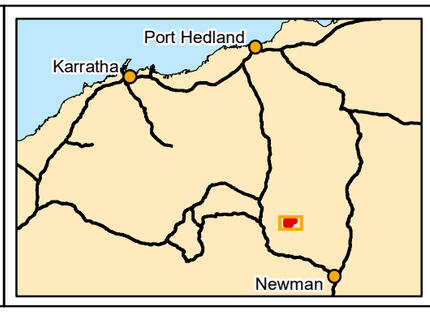

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Figure 2.1: Broad Geology of the Study Area

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Yandi Rail Spur Line

Yandi Rail Spur Line

M279SA

Mining Area C Railway

Yandicoogina Rail

Legend

- Study Area
- Live Mining Tenement
- Rail

Soil Unit

- Fa13
- Fb3
- My55
- Oc71

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Scale: 1:80,000

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Projection: Transverse Mercator
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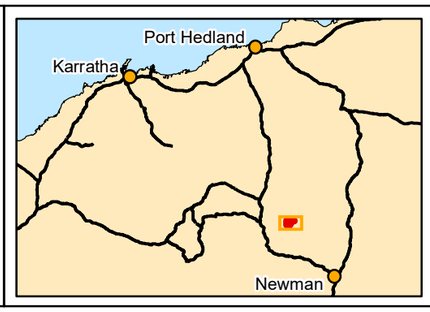

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Breakaway and Marillana South Basic Terrestrial Fauna Survey

Figure 2.2: Soils of the Study Area

2.5 Land Systems

Payne *et al.* (1988) and Van Vreeswyk *et al*. (2004) classified and mapped the land systems of the Pilbara bioregions according to similarities in landform, soil, vegetation, geology and geomorphology. An assessment of land systems provides an indication of the diversity and distribution of fauna habitats present within the Study Area.

There are five land systems occurring within the Study Area (Figure 2.3; Table 2.2). The dominant land system is the Platform land system, covering approximately 54.22% of the Study Area (Figure 2.3; Table 2.2). The Platform land system is defined as "Dissected slopes and raised plains supporting hard spinifex grasslands" (van Vreeswyk *et al.*, 2004). The second most dominant land system is the Newman land system, covering approximately 36.08% of the Study Area. The remaining three land systems are the McKay (6.00%), Robe (2.71%) and Rocklea (0.99%) land systems (Figure 2.3; Table 2.2).

Of the five land systems occurring within the Study Area, the Newman and Robe land system contains the most significant habitats for many of the MNES species. The rocky ridges and mountains associated with these land systems can support important refugia and foraging habitats for Pilbara olive python and northern quoll.

Table 2.2: Land systems of the Study Area

Land system	Land type	Description	Extent in Study Area	
			Area (ha)	%
Platform	Stony plains with spinifex grasslands	Dissected slopes and raised plains supporting hard spinifex grasslands.	1716.62	54.22
Newman	Hills and ranges with spinifex grasslands	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.	1142.15	36.08
McKay	Hills and ranges with spinifex grasslands	Hills, ridges, plateaux remnants and breakaways of meta sedimentary and sedimentary rocks supporting hard spinifex grasslands.	189.90	6.00
Robe	Mesas, breakaways and stony plains with spinifex grasslands	Low plateaux, mesas and buttes of limonites supporting soft spinifex (and occasionally hard spinifex) grasslands.	85.80	2.71
Rocklea	Hills and ranges with spinifex grasslands	Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex (and occasionally soft spinifex) grasslands.	31.49	0.99
Total			**3,165.95**	**100%**

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Yandi Rail Spur Line

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Mining Area C Railway

Yandicoogina Rail

Legend

- Study Area
- Live Mining Tenement
- Rail

Land System

- Boolgeeda System
- Fortescue System
- McKay System
- Newman System
- Platform System
- River System
- Robe System
- Rocklea System

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Scale: 1:80,000

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Coordinate System: GDA2020 MGA Zone 50
Projection: Transverse Mercator
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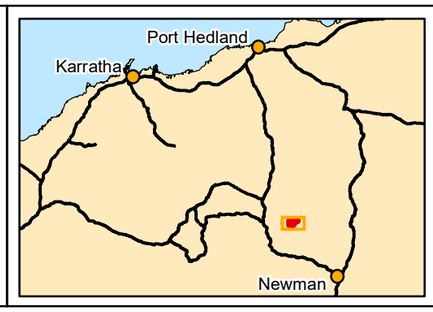

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Figure 2.3: Land Systems of the Study Area

2.6 Hydrology and Surface Drainage

The Study Area occurs along two major watercourses, Marillana Creek (Figure 2.4). Marillana Creek is located approximately 1.9 km south of the Study Area. Marillana Creek is an important source of surface water runoff to Weeli Wolli Creek, which flows to the north and discharges into the Fortescue River Valley and into the Fortescue Marsh (a nationally important wetland, located approximately 14.5 km to the north of the Study Area) (EPA, 2018). Marillana Creek typically only flows during the wet season following significant rainfall such as those associated with cyclonic weather events. Marillana Creek is also a source of recharge to the Marillana Creek CID groundwater aquifer (WRC, 2003).

2.7 Pre-European Vegetation

Beard (1975) broadly (1:1,000,000) mapped the major structural vegetation types of WA. Shepherd *et al.* (2002) reinterpreted and updated the vegetation association mapping to reflect the National Vegetation Information System (NVIS) standards (ESCAVI, 2003). This update also accounts for extensive clearing since Beard (1975) mapping.

Two vegetation associations occur within the Study Area (Table 2.3; Figure 2.5). The dominant vegetation association is HAMMERSLEY-18, which covers approximately 56.82% (1,798.90 ha) of the Study Area. The second largest vegetation association is HAMMERSLEY-82, covering approximately 43.18% (1,367.06 ha) of the Study Area. HAMMERSLEY-18 comprises low Mulga woodland dominated by *Acacia aneura,* HAMMERSLEY-82 association comprises hummock grasslands, low tree steppe and snappy gums over *Triodia wiseana*. (Shepherd *et al.*, 2002).

Table 2.3: Vegetation associations within the Study Area

Vegetation Association	Description	Extent in Study Area	
		Area (ha)	%
18	Mulga (*Acacia aneura*) low woodland	1,798.90	56.82
82	*Eucalyptus leucophloia* over *Triodia wiseana* hummock grasslands/ low tree steppe	1,367.06	43.18
Total		**3,165.95**	**100%**

2.8 Land Use and Tenure

The south-eastern section of the Study Area is located upon pastoral lease (Marillana Station) and the western portion of the Study Area is located upon Unallocated Crown Land – East of Karijini. Two exploration licences (E47/1239 and E47/4245) held by BHP WAIO are located within the Study Area.

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Yandi Rail Spur Line

Weeli Wolli Creek

Yandi Rail Spur Line

M279SA

Marillana Creek

Mining Area C Railway

Lamb Creek

Marillana Creek

Yandicoogina Rail

Legend

- Study Area
- Live Mining Tenement
- Rail

Surface Hydrology

- Minor
- Major

Subcatchment

- Unnnamed
- Weeli Wolli/Marillana

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Scale: 1:80,000

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Projection: Transverse Mercator
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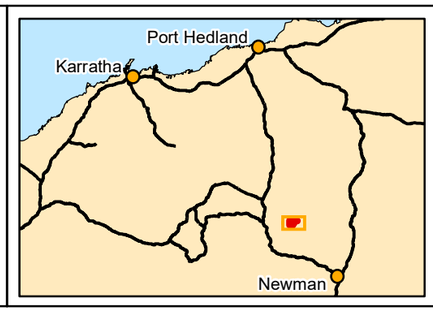

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Figure 2.4: Hydrology of the Study Area

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Yandi Rail Spur Line

Yandi Rail Spur Line

M279SA

Mining Area C Railway

Yandicoogina Rail

Legend

- Study Area
- Live Mining Tenement
- Rail

Vegetation Association

- Fortescue Valley 29
- Fortescue Valley 111
- Hammersley 18
- Hammersley 82

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biologic Environmental Survey

Scale: 1:80,000

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Coordinate System: GDA2020 MGA Zone 50
Projection: Transverse Mercator
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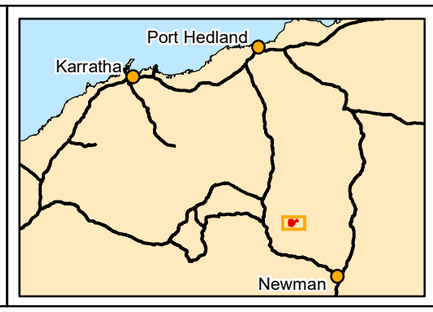

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Breakaway and Marillana South Basic Terrestrial Fauna Survey

Figure 2.5: Pre-European vegetation assocations of the Study Area

2.9 Threatened and Priority Ecological Communities

No Threatened Ecological Community (TEC) and no Priority Ecological Communities (PECs) occur within the Study Area (Figure 2.6). However, several PECs occur within the vicinity of the Study Area. The nearest are the Priority 1 (P1) Fortescue Marsh (9.4 km north) and the P3 Fortescue Valley Sand Dunes (9.6 km north).

650000 700000 750000 800000

7550000 7500000 7450000

Nanutarra Munjina Rd
Great Northern Hwy
Karijini Dr
Fortescue Metal Group Railway
Roy Hill Railway
Christmas Creek Extension
Yandicoogina Rail
M279SA
Mining Area C Railway
West Angelas Rail
Port Hedland Newman Railway

Threatened and Priority Ecological Community

Community - Category

- Brockman Iron cracking clay communities - Priority 1
- Coolibah - Lignum Flats, sub type 2 - Priority 1
- Fortescue Marsh - Priority 1
- Freshwater claypans of the Fortescue Valley - Priority 1
- Weeli Wolli - Priority 1
- West Angelas - Priority 1
- Wona Land System - Priority 1
- Riparian communities of springs and Pools Pilbara - Priority 2
- Riparian communities of the Pilbara Region - Priority 2
- Fortescue Valley Sand Dunes - Priority 3
- Kumina Land System - Priority 3

Legend

- Study Area
- Live Mining Tenement
- State Road
- Rail

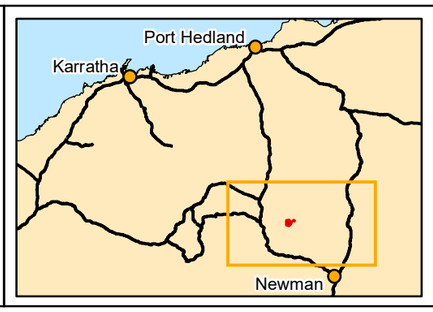
N

biologic Environmental Survey

Scale: 1:540,000

0 10 20 30 Km

Coordinate System: GDA2020 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA2020 Created 18/01/2024



BHP WAIO

Breakaway and Marillana South Basic Terrestrial Fauna Survey

Figure 2.6: Threatened and Priority Ecological Communities identified in the desktop assessment

3 DESKTOP ASSESSMENT

3.1 Methods

A desktop assessment, comprising database searches and a literature review, was undertaken for the Study Area prior to the field survey. The purpose of the desktop assessment was to identify vertebrate fauna potentially occurring in the Study Area, with a focus on significant species.

3.1.1 Database Searches

Six fauna databases were searched (Table 3.1), three to obtain information on all species previously recorded (NatureMap, Birdata and BHP WAIO Fauna Records Database), one to identify significant species previously recorded (DBCA Threatened and Priority Fauna Database), one to record TECs and PECs within the Study Area (DBCA Threatened and Priority Ecological Communities), and one to identify significant species known or likely to occur within the region (Protected Matters Database).

Table 3.1: Details of database searches conducted

Database	Data Access/ Receival Date	Search Area
DBCA (2022b) NatureMap	14/03/2022	Approximate central point of the Study Area (-22.7448° S, 119.8015° E) with a 50 km buffer (NatureMap 40 km)
DBCA (2022c) Threatened and Priority Fauna Database	14/03/2022	
BirdLife Australia (2022) Birdata	24/02/2022	
DBCA (2022c) Threatened and Priority Ecological Communities	03/03/2022	
DoE (2022) Protected Matters Search Tool	24/02/2022	
BHP (2022) BHP WAIO Fauna Records Database	06/02/2022	

3.1.2 Literature Review

A total of 71 assessments were reviewed, comprising one desktop, 21 basic, two targeted, 42 detailed, two basic/ detailed and three detailed/ targeted assessments (Table 3.2). Of the 71 assessments reviewed, nine assessments overlapped with the Study Area, 14 assessments were within 10 km, 16 assessments were within 10–20 km and 32 assessments were within 20–50 km of the Study Area.

Table 3.2: Literature sources used for the review

Reference number	Report title	Survey type	Distance from Study Area
Overlapping Study Area			
1	Biologic (2011c). Barimunya Camp Vertebrate Fauna Survey.	Basic	overlaps
2	Biologic (2011f). Yandi Vertebrate Fauna Review. Unpublished report prepared for BHP.	Basic	overlaps
3	Biologic (2013b). Marillana Vertebrate Fauna Survey.	Two-phase Detailed	overlaps

Reference number	Report title	Survey type	Distance from Study Area
4	Biota (2013a). Area C West to Yandi level 2 Vertebrate Fauna Survey.	Three-phase Detailed	overlaps
5	Ecologia (1995). Yandi Stage II Iron Ore Project: Biological Assessment Survey.	Detailed	overlaps
6	Ecologia (2006b). Marillana Terrestrial Vertebrate Fauna Survey.	Two-phase Detailed	overlaps
7	Ecologia (2008b). Marillana Creek (Yandi) Iron Ore Mine Modification Level 2 Fauna Survey	Detailed	overlaps
8	HGM (1999). Marillana Creek Western Access Corridor - Biological Assessment.	Basic	overlaps
9	Maunsell and Bamford Consulting (2003). Yandi Life of Mine Fauna and Flora.	Basic	overlaps
Outside Study Area			
10	Phoenix (2014). Terrestrial Fauna Survey for the Extension Project.	Basic	1.1 km
11	Biota (2012c). Koodaideri Project Targeted Fauna Survey.	Detailed and Targeted	1.5 km
12	Ecologia (2004c). Yandi Overland Conveyor and Stockyard Fauna and Flora Assessment. Unpublished	Desktop	1.6 km
13	ENV (2009b). Newman to Yandi Transmission Line Terrestrial Vertebrate Fauna Assessment.	Basic	1.9 km
14	Ecologia (2009). Marillana Iron Ore Project Vertebrate Fauna Assessment.	Two-phase Detailed	6.1 km
15	Biologic (2018b). Ministers North to Yandi Corridor Two Phase Targeted Fauna Survey.	Two-phase Targeted	6.5 km
16	ENV (2008d). Rapid Growth Project 5: M270SA Fauna Assessment.	Three-phase Detailed	6.6 km
17	Biota (2010). Yandicoogina Junction Southwest and Oxbow Fauna Survey.	Detailed	7.0 km
18	Biota (2002). Proposed Hope Downs Rail Corridor from Weeli Wolli Siding to Port Hedland - Vertebrate Fauna Survey.	Three-phase Detailed	8.1 km
19	Ecologia (1998a). Mining Area C Biological Survey.	Detailed	8.3 km
20	Biologic (2011b). Area C to Yandi Fauna Survey.	Basic	8.4 km
21	Biologic (2012a). Jinidi to Mainline Vertebrate Fauna Survey.	Two-phase Detailed	9.0 km
22	Biota (2012a). Koodaideri Northern Extension Fauna Survey.	Detailed	9.9 km
23	Biota (2012d). Koodaideri Southern Infrastructure Corridor Fauna Survey.	Three-phase Detailed	9.9 km

Reference number	Report title	Survey type	Distance from Study Area
24	Ecologia (2005c). Upper Marillana Exploration Project Biological Survey.	Basic	10.1 km
25	Ecologia (2006c). Ministers North Biological Survey.	Basic	10.2 km
26	ENV (2009a). Munjina and Ministers North (Yandi Hub) Fauna Assessment.	Detailed	10.2 km
27	Biologic (2017). Ministers North level 2 vertebrate fauna survey.	Two-phase detailed	10.2 km
28	360 Environmental (2017). Upper Marillana and Munjina Baseline Vertebrate Fauna survey.	Detailed	10.2 km
29	ENV (2007d). Upper Marillana Exploration Lease Fauna Assessment.	Basic	10.3 km
30	ENV (2011). Upper Marillana and Munjina Flora, Vegetation and Fauna Assessment.	Basic	10.3 km
31	Bamford Consulting (2012a). Fauna Assessment Nyidinghu Iron Ore Project.	Two-phase Detailed	16.6 km
32	Bamford Consulting (2012b). Vertebrate Fauna Assessment of the Iron Valley Project Area.	Two-phase Detailed and Targeted	16.8 km
33	Biota (2014). Yandi Billiards Phase 1 Seasonal Fauna Survey.	Two-phase Detailed	17.1 km
34	Outback Ecology (2010). Area C to Jinaryi to Mount Newman Railway Terrestrial Vertebrate Fauna Survey.	Two-phase Basic and Detailed	18.1 km
35	ENV (2007b). Coondiner and Mindy East Exploration Leases Fauna Assessment.	Detailed	19.0 km
36	ENV (2007c). Mindy North Exploration Lease Fauna Assessment.	Basic	19.0 km
37	Biologic (2011a). Area C and Surrounds Vertebrate Fauna Survey.	Two-phase Detailed	19.0 km
38	Biologic (2010). East Packsaddle Level 1 Vertebrate Fauna Study.	Two-phase Targeted	19.7 km
39	Ecologia (2004b). Packsaddle Range Biological Survey.	Basic	19.7 km
40	Biota (2004). Fauna Habitats and Fauna Assemblage of the Proposed FMG Stage A Rail Corridor.	Detailed	20.6 km
41	Biota (2005). Fauna Habitats and Fauna Assemblage of the Proposed FMG Stage B Rail Corridor and Mindy Mindy, Christmas Creek, Mt Lewin and Mt Nicholas Mine Areas.	Two-phase Detailed	20.6 km
42	Ecologia (2005a). Mindy-Coondiner Exploration Project Biological Survey.	Basic	21.2 km

Reference number	Report title	Survey type	Distance from Study Area
43	Rapallo (2012). Level 2 Fauna Survey and Targeted Northern Quoll Survey of the Lamb Creek.	Two-phase Detailed	21.7 km
44	Ecologia (1998b). Weeli Wolli Creek Biological Assessment Survey.	Detailed	22.0 km
45	Outback Ecology (2008). Area C Mining Operation Environmental Management Plan (Revision 4) A, D, P1 and P3 Deposits: Terrestrial Vertebrate Fauna Assessment.	Detailed	22.9 km
46	Ninox (2009). A Fauna Survey of the Proposed Hope Downs 4 Mining Area, Near Newman, WA.	Two-phase Detailed	23.1 km
47	Biologic (2011d). Jinidi Vertebrate Fauna Survey.	Basic	23.4 km
48	Ecologia (1997). Hope Downs Biological Survey.	Two-phase Detailed	24.6 km
49	Biota (2012e). South Flank to Jinidi Level 2 Vertebrate Fauna Survey.	Three-phase Detailed	25.3 km
50	ENV (2008c). Jinaryi Vertebrate Fauna Assessment.	Detailed	27.0 km
51	ENV (2007a). Area C R-Deposit Fauna Assessment. 349.	Detailed	27.6 km
52	ENV (2010b). Jinaryi Access Road Vertebrate Fauna Survey.	Detailed	27.7 km
53	Biologic (2011e). Southern Flank Vertebrate Fauna Study.	Two-phase Detailed	28.0 km
54	ENV (2010c). Jinaryi Mining Lease Vertebrate Fauna Survey.	Detailed	28.0 km
55	Ecologia (2004a). Area C: Deposits D, E and F Biological Survey.	Detailed	28.4 km
56	Ecologia (2006a). Jirridi Terrestrial Vertebrate Fauna Survey.	Two-phase Detailed	30.4 km
57	Biologic (2013a). Area C West Vertebrate Fauna Survey.	Two-phase Detailed	31.6 km
58	ENV (2008a). Area C Southern Flank Deposit Fauna Assessment.	Basic	31.7 km
59	Onshore and Biologic (2011). Camp Hill Exploration Leases Level 2 Flora & Vegetation Survey and Level 1 Fauna Assessment.	Basic	31.5 km
60	Astron (2010). West Packsaddle Flora and Fauna Assessment.	Basic	33.5 km
61	Biologic (2019). Pineapple Hill Detailed Vertebrate Fauna Survey.	Two-phase Detailed	33.6 km
62	Ecologia (2008a). Area A and Additional Areas Level 2 Terrestrial Fauna Survey.	Two-phase Detailed	33.7 km
63	Biota (2013b). South Parmelia Level 2 Vertebrate Fauna Survey.	Two-phase Detailed	34.7 km

Reference number	Report title	Survey type	Distance from Study Area
64	Onshore and Biologic (2009). South Parmelia Exploration Leases.	Basic	34.8 km
65	Biologic (2013c). Mudlark Vertebrate Fauna Survey.	Three-phase Detailed	34.9 km
66	Bamford Consulting (2005). Fauna Survey of Proposed Iron Ore Mine, Cloud Break.	Two-phase Detailed and Targeted	37.2 km
67	ENV (2010a). Area C West NVCP Flora, Vegetation and Fauna Assessment.	2010 - Basic 2007 – Detailed	41.7 km
68	ecologia (1999). West Angelas Iron Ore Project Mine Access Road Corridor Vertebrate Fauna Assessment Survey.	Basic	45.1 km
69	ENV (2008b). Area C West Fauna Assessment.	Detailed	45.5. km
70	ENV (2008e). RGP5: Quarry 6 Fauna Assessment.	Basic	46.2 km
71	Ecologia (2005b). Mudlark Well Exploration Project Biological Survey.	Detailed	47.0 km

3.2 Results

The literature review and database searches identified a total of 377 species of vertebrate fauna, which have previously been recorded and/or have the potential to occur within the Study Area. This comprised 57 mammals (including 47 native and 10 non-native), 179 birds, 130 reptiles and 11 amphibians (Table 3.3; Appendix B). Due to the size of the desktop assessment search area, and likelihood of encompassing habitats which may not occur within the Study Area, results of the desktop review are likely to include species which may not occur within the Study Area. Additionally, many species tend to be patchily distributed even where appropriate habitats are present, and many species of birds can occur as regular migrants, occasional visitors or vagrants.

Table 3.3: Summary of fauna species recorded within and in the vicinity of the Study Area in the desktop assessment

Reference Number	Mammals (introduced)	Mammals (native)	Birds	Reptiles	Amphibians	Total
Literature Sources						
1	0	1	17	3	0	**21**
2	2	6	53	12	2	**75**
3	5	22	77	65	2	**171**
4	4	23	83	56	3	**169**
5	4	15	74	33	3	**129**
6	1	16	55	36	2	**110**
7	3	15	56	36	3	**113**
8	2	3	43	2	0	**50**

Reference Number	Mammals (introduced)	Mammals (native)	Birds	Reptiles	Amphibians	Total
9	2	2	68	8	0	**80**
10	4	10	32	27	2	**75**
11	2	2	0	6	0	**10**
12	0	1	0	0	0	**1**
13	3	3	59	9	0	**74**
14	6	17	82	41	0	**146**
15	1	15	54	22	0	**92**
16	5	14	74	18	2	**113**
17	2	10	46	14	0	**72**
18	6	25	65	66	6	**168**
19	3	17	80	43	2	**145**
20	3	13	45	10	1	**72**
21	4	27	90	67	4	**192**
22	1	14	31	39	0	**85**
23	5	22	76	59	2	**164**
24	5	11	37	15	0	**68**
25	0	12	42	17	1	**72**
26	6	16	68	44	1	**135**
27	2	14	54	41	2	**113**
28	5	14	77	27	2	**125**
29	5	14	79	18	2	**118**
30	4	2	35	4	0	**45**
31	3	17	83	50	2	**155**
32	2	11	58	24	1	**96**
33	0	2	4	1	0	**7**
34	6	19	96	72	4	**197**
35	2	12	63	39	1	**117**
36	1	3	57	19	0	**80**
37	3	22	76	59	4	**164**
38	3	17	48	39	4	**111**
39	1	9	55	20	0	**85**
40	6	17	82	56	6	**167**
41	3	19	97	37	2	**158**
42	2	3	29	5	0	**39**
43	3	19	73	55	2	**152**
45	3	14	84	30	3	**134**
44	3	8	61	25	2	**99**
46	1	17	75	45	1	**139**
47	2	13	59	16	2	**92**
48	4	19	79	36	1	**139**
49	3	23	78	60	5	**169**
50	5	21	65	60	1	**152**
51	0	14	68	25	1	**108**

Reference Number	Mammals (introduced)	Mammals (native)	Birds	Reptiles	Amphibians	Total
52	3	12	47	28	2	**92**
53	7	26	68	58	2	**161**
54	5	21	65	15	1	**107**
55	2	15	55	29	0	**101**
56	3	18	70	47	2	**140**
57	5	27	99	77	3	**211**
58	4	13	56	22	4	**99**
59	3	12	59	12	0	**86**
60	2	7	62	14	0	**85**
61	5	22	69	29	0	**125**
62	2	19	67	36	0	**124**
63	5	18	70	42	4	**139**
64	2	9	50	9	1	**71**
65	5	24	74	63	2	**168**
66	6	19	93	27	1	**146**
67	5	4	46	17	0	**72**
68	2	7	51	17	0	**77**
69	2	16	72	31	1	**122**
70	0	0	31	2	0	**33**
71	1	9	30	18	0	**58**
Database Searches						
NatureMap (40 km)	7	33	124	97	8	**269**
EPBC (50 km)	0	9	5	2	0	**16**
DBCA Priority and Threatened Database (50 km)	0	9	24	7	0	**40**
Birdlife (50 km)	0	0	143	0	0	**143**
Total Species Recorded	**10**	**47**	**179**	**130**	**11**	**377**
Significant Species	**0**	**9**	**24**	**6**	**0**	**39**

Of the 377 species of vertebrate fauna identified by the desktop assessment, 39 significant species were identified during the desktop assessment as having previously been recorded and/or have the potential to occur within the Study Area, including nine mammals, 24 birds and six reptiles (Table 3.4; Appendix B). Two significant species (ghost bat, and western pebble-mound mouse), have previously been recorded within the Study Area (BHP, 2022; Ecologia, 2008b).

Several species recorded in the desktop assessment may be inaccurate as the Study Area is outside of the distribution of the species of concern. Consequently, the following species have not been included hereafter: princess parrot (*Polytelis alexandrae*); striated grasswren (*Amytornis striatus striatus*); dwarf bearded dragon (*Pogona minor minima*); Gunther's skink (*Cyclodomorphus branchialis*), *Aprasia haroldi*; *Liopholis kintorei* and *Lerista macropisthopus remota*. The northern brushtail possum (*Trichosurus vulpecula* subsp. *arnhemensis*) (Vulnerable EPBC/BC Act) was identified in the desktop assessment (38.1 km southwest of the Study Area). However, recent molecular analysis indicates that

the population in the Pilbara region represents a different species to *Trichosurus vulpecula arnhemensis* (Biologic, 2021).

Table 3.4: Significant species identified and their conservation status

Scientific name	Common name	Conservation status			
		EPBC Act	BC Act	DBCA	IUCN
Mammals					
Dasyuridae					
Dasycercus blythi	Brush-tailed mulgara			P4	
Dasyurus hallucatus	Northern quoll	EN	EN		EN
Sminthopsis longicaudata	Long-tailed dunnart			P4	
Macropodidae					
Petrogale lateralis subsp. *lateralis*	Black-flanked rock-wallaby	EN	EN		VU
Megadermatidae					
Macroderma gigas	Ghost bat	VU	VU		VU
Muridae					
Leggadina lakedownensis	Northern short-tailed mouse			P4	
Pseudomys chapmani	Western pebble-mound mouse			P4	
Rhinonycteridae					
Rhinonicteris aurantia	Pilbara leaf-nosed bat	VU	VU		
Thylacomyidae					
Macrotis lagotis	Greater bilby	VU	VU		VU
Birds					
Accipitridae					
Elanus scriptus	Letter-winged kite			P4	NT
Pandion haliaetus	Eastern osprey	MI	MI		
Apodidae					
Apus pacificus	Fork-tailed swift	MI	MI		
Charadriidae					
Charadrius veredus	Oriental plover	MI	MI		
Falconidae					
Falco hypoleucos	Grey falcon	VU	VU		VU
Falco peregrinus	Peregrine falcon		OS		
Laridae					
Gelochelidon nilotica	Gull-billed tern	MI	MI		
Sterna caspia	Caspian tern	MI	MI		
Sternula albifrons	Little tern	MI	MI		
Motacillidae					
Motacilla cinerea	Grey wagtail	MI	MI		
Procellariidae					
Macronectes giganteus	Southern giant petrel	EN/MI	MI		
Psittacidae					
Pezoporus occidentalis	Night parrot	EN	CR		EN
Rostratulidae					

Scientific name	Common name	Conservation status			
		EPBC Act	BC Act	DBCA	IUCN
Rostratula australis	Australian painted snipe	EN	EN		EN
Scolopacidae					
Calidris acuminata	Sharp-tailed sandpiper	MI	MI		
Calidris ferruginea	Curlew sandpiper	CR/MI	CR/MI		NT
Calidris melanotos	Pectoral sandpiper	MI	MI		
Calidris ruficollis	Red-necked stint	MI	MI		NT
Calidris subminuta	Long-toed stint	MI	MI		
Tringa glareola	Wood sandpiper	MI	MI		
Actitis hypoleucos	Common sandpiper	MI	MI		
Tringa nebularia	Common greenshank	MI	MI		
Tringa stagnatilis	Marsh sandpiper	MI	MI		
Tringa totanus	Common redshank	MI	MI		
Threskiornithidae					
Plegadis falcinellus	Glossy ibis	MI	MI		
Reptiles					
Carphodactylidae					
Underwoodisaurus seorsus	Pilbara barking gecko			P2	
Pythonidae					
Liasis olivaceus subsp. barroni	Pilbara olive python	VU	VU		
Scincidae					
Ctenotus nigrilineatus	Pin-striped fine-snout skink			P1	
Ctenotus uber subsp. *johnstonei*	Spotted ctenotus			P2	
Notoscincus butleri	Lined soil-crevice skink			P4	
Typhlopidae					
Anilios ganei	Blind-snake			P1	

550000 600000 650000 700000 750000 800000 850000 900000

7550000 7500000 7450000 7400000

Roy Hill Railway
Nullagine
Solomon Rail Alignment
Nanutarra Munjina Rd
Brockman Railway
Mt Tom Price Railway
Marandoo Rail
Karijini Dr
Tom Price
Tom Price Rd
Paraburdoo Rd
Port Hedland Newman Railway
Marble Bar Rd
Yandi Rail Spur Line
Newman
Great Northern Hwy

DBCA (2022)

Bird

- Night parrot - CR
- Australian painted snipe - EN
- Grey falcon - VU
- Letter-winged kite - P4
- Caspian Tern - MI
- Common greenshank - MI
- Common redshank - MI
- Common sandpiper - MI
- Eastern osprey - MI
- Fork-tailed swift - MI
- Glossy ibis - MI
- Grey wagtail - MI
- Gull-billed tern - MI
- Little tern - MI
- Long-toed stint - MI
- Marsh sandpiper - MI
- Oriental plover - MI
- Pectoral sandpiper - MI
- Red-necked stint - MI
- Sharp-tailed sandpiper - MI
- Southern giant petrel - MI
- Wood sandpiper - MI
- Peregrine falcon - OS

Mammal

- Black-flanked rock-wallaby - EN
- Northern quoll - EN
- Ghost bat - VU
- Greater bilby - VU
- Pilbara leaf-nosed bat - VU
- Brush-tailed mulgara - P4
- Crest-tailed mulgara - P4
- Long-tailed dunnart - P4
- Northern short-tailed mouse - P4
- Western pebble-mound mouse - P4

Reptile

- Pilbara olive python - VU
- Gane's blind snake (Pilbara) - P1
- Pilbara barking gecko - P2
- Spotted ctenotus (northeast) - P2

BHP (2022)

Bird

- Grey falcon - VU
- Common greenshank - MI
- Eastern osprey - MI
- Fork-tailed swift - MI
- Gull-billed tern - MI
- Wood sandpiper - MI
- Peregrine falcon - OS

Mammal

- Northern quoll - EN
- Chocolate wattled bat - VU
- Ghost bat - VU
- Greater bilby - VU
- Northern brushtail possum - VU
- Pilbara leaf-nosed bat - VU
- Brush-tailed mulgara - P4
- Western pebble-mound mouse - P4

Reptile

- Pilbara olive python - VU
- Pilbara flat-headed blind-snake - P1
- Pilbara barking gecko - P2
- Spotted ctenotus - P2

Legend

- Study Area
- State Road
- Rail

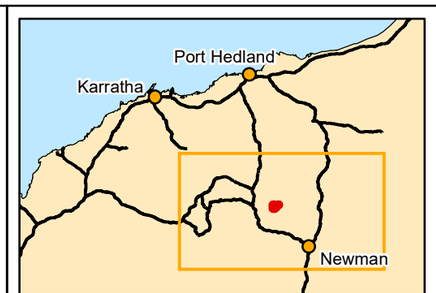
N

biologic Environmental Survey

Scale: 1:1,000,000

0 20 40 60 Km

Coordinate System: GDA2020 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA2020 Created 08/11/2022



BHP WAIO

Breakaway and Marillana South Basic Terrestrial Fauna Survey

Figure 3.1: Significant fauna records from the desktop assessment

4 FIELD SURVEY METHODS

4.1 Survey Timing and Personnel

This assessment was conducted over six days from 27th of July to the 1st of August 2022. The field survey was undertaken by experienced zoologists, who collectively have over 15 years of experience undertaking fauna surveys within the Pilbara region (Table 4.1).

Table 4.1: Survey personnel and experience

Personnel	Position and Role	Qualification	Experience
Chris Knuckey	Principal Zoologist	BSc (Hons) Environmental Management	11 years' fauna zoology/ ecology 11 years' EIA (consulting) 11 years' field survey
Jari Cornelis	Senior Zoologist	MSc Philosophy BSc Zoology and Ecology"	5 years' vertebrate zoology/ ecology 4 years' EIA (consulting) 5 years' field survey

4.2 Ethics and Licensing

The survey was conducted under the *Animal Welfare Act 2002*'s Licence to use animals for scientific purposes (License No. U244/2022-2024), administered through the Department of Primary Industries and Regional Development (DPIRD). This is enabled through Biologic's chosen Animal Ethics Committee (AEC), Murdoch University, under permit RW3354/21. The survey was conducted under a DBCA Regulation 27 "Fauna Taking (Biological Assessment) Licence" issued to Chris Knuckey (licence number BA27000560). Under Section 40 of the BC Act, threatened species sampling was completed under a DBCA "Authorisation to Take or Disturb Threatened Species" issued to Christopher Knuckey (authorisation number TFA 2021-0138).

4.3 Climate and Weather

Observed weather conditions prior to and during the survey are shown in Figure 4.1, alongside long-term climatic data for Newman Airport (station #007176). Newman Airport is located approximately 95 km southeast of the Study Area. In the 12 months prior to the survey, minimum and maximum temperatures recorded at Newman Airport were comparable to long-term averages (Figure 4.1)

Overall, rainfall received in the 12 months prior to the survey (July 2021 to June 2022, 226.80 mm) was below annual long-term average for the same period (314.2 mm; BoM, 2022). Prior to the survey (in May and June 2022), rainfall was well above the long-term average. However, no rain was recorded in July (comparatively the long-term averaging is 13.8 mm - Figure 4.1). During the survey, rainfall (0.2 mm) was only recorded on one day during the survey (Table 4.2).

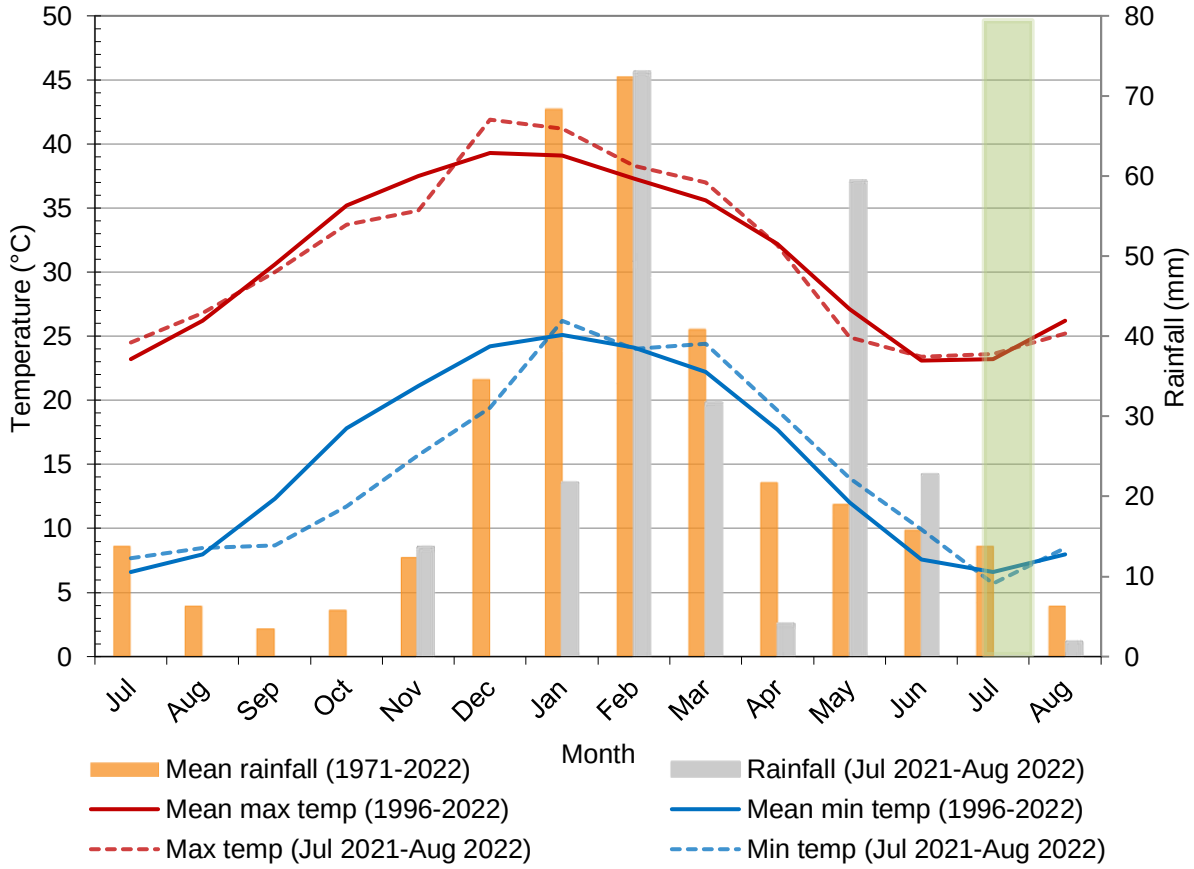


Figure 4.1: Long-term average and observed climate data recorded near the Study Area (BoM, 2022) with approximate survey timing shown in shaded box

Table 4.2: Climatic conditions recorded for Newman Airport during the field assessment

Date	Min. temp (°C)	Max. temp (°C)	Rainfall (mm)
27/07/2022	4.9	27.5	0
28/07/2022	9	26.6	0
29/07/2022	11.1	26	0
30/07/2022	15.5	21.3	0
31/07/2022	11.9	25	0
01/08/2022	15.1	26	0.2

4.4 Sampling and Survey Methods

4.4.1 Habitat Assessments and Mapping

Habitat assessments were undertaken in the field to characterise and define habitats and their significance to vertebrate fauna. Habitat assessments were undertaken at 36 locations across the Study Area, including at all sampling sites (Figure 4.2)

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

- site information, photo and location;
- landform: slope, relative inclination of slope, morphological type and landform type;
- vegetation: leaf litter %, wood litter, hollow bearing trees, broad floristic formation, vegetation structure (tall, mid and low), and dominant species;
- land surface: micro relief, sheet erosion, rill erosion, gully erosion, gully depth, abundance and size of coarse fragments, rock outcropping, water bodies, comments on nests, burrows, roosts and diggings;
- soil: texture, colour;
- substrate: bare ground, rock size, rock type, rock outcropping; and
- disturbance: time since last fire, evidence of weeds, grazing, or human disturbances.

Fauna habitat mapping was completed for the Study Area using the vertebrate fauna habitat assessments completed during the field surveys, as well as high-resolution aerial imagery, vegetation, topographical, geology and soil mapping. Habitats were delineated and mapped across the Study Area at a scale of approximately 1:20,000.

4.4.2 Ultrasonic Bat Recording

Overnight ultrasonic audio recordings of bat echolocation calls were undertaken with SongMeter (SM; Wildlife Acoustics Inc.) ultrasonic bat recorders at six locations within the Study Area during the survey (Table 4.3; Figure 4.2). At each location, recorders were placed in or in the vicinity of areas of prospective critical foraging habitats and features most likely to be utilised by bats for foraging and dispersal (such as water features, stands of trees or drainage lines) or roosting (such as caves). Recorders were deployed for between two and three consecutive nights at each location, resulting in a total of 15 recording nights (Table 4.3; Figure 4.2).

The audio settings used for the SM units followed the manufacturer's recommendations (Wildlife Acoustics, 2017) and were set to account for all species known to occur within the region (McKenzie & Bullen, 2009). All recordings were analysed by Robert Bullen of Bat Call WA.

4.4.3 Camera Traps

Individual camera traps were deployed at 14 locations within the Study Area to survey for larger and/or cryptic species (i.e. significant and introduced species) that may not be recorded by other sampling methods (Table 4.3; Figure 4.2). Cameras were placed opportunistically through the Study Area, either at habitat features (e.g. burrow entrances waterholes) or within areas of broader habitats that may support significant species. Camera traps were baited with universal bait (a mixture of oats, peanut butter and sardines) within a non-reward receptacle (perforated and capped PVC pipe). Camera traps remained in-situ for three consecutive nights for a total of 42 sampling nights.

4.4.4 Targeted Searches

Targeted searches were undertaken within areas considered to provide suitable habitat for significant species identified in the desktop assessment. Searches primarily focused on recording species from direct observation, secondary evidence (i.e. tracks, scats, remains, nests, burrows and/or mounds) and/or habitat features of importance (i.e. den sites, roosting caves and/or water features) likely to be utilised by particular species. Targeted searches were conducted in 22 locations across both surveys for a total of 32.33 person hours (Table 4.3, Figure 4.2). While undertaking targeted searches, time was also spent undertaking active foraging. Active foraging comprised searches of any observable microhabitats likely to support vertebrate fauna species. Searches aimed to record any species, from direct observation or secondary evidence. Techniques incorporated in active foraging included raking leaf litter and spoil heaps, overturning rocks and logs, investigating dead trees and logs, burrows, rock piles and identification of secondary evidence.

4.4.5 Opportunistic Records

At all times while surveying, all records pertaining to species not previously recorded during the survey, rare species, significant species or other fauna of interest were documented. These records include those from primary (i.e. direct observation of species) or secondary (e.g. burrows, scratching's, diggings, tracks and/or scats) evidence.

Table 4.3: Survey effort by sampling site

Site ID	Latitude	Longitude	Ultrasonic Recorder	Camera	Targeted Search (person hours)	Species Targeted
VBKA-01	-22.6583	119.0874	0	3	3	northern quoll, grey falcon, Pilbara leaf-nosed bat, ghost bat
VBKA-02	-22.6641	119.0895	0	3	0.5	grey falcon, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python, ghost bat
VBKA-03	-22.668	119.0908	0	3	-	-
VBKA-04	-22.6739	119.0918	0	3	-	-
VBKA-05	-22.6781	119.0947	0	3	1.17	grey falcon, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python, ghost bat
VBKA-06	-22.6822	119.0928	0	3	1	ghost bat, grey falcon, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python
VBKA-07	-22.6864	119.0995	0	3	-	-
VBKA-08	-22.6918	119.1000	0	3	-	-
VBKA-09	-22.6994	119.0991	0	3	-	-
VBKA-10	-22.6508	119.0916	2	3	3.5	ghost bat, grey falcon, Pilbara olive python, Pilbara leaf-nosed bat, northern quoll
VBKA-11	-22.6911	119.1072	2	3	1.0	ghost bat, grey falcon, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python
VBKA-12	-22.6498	119.1837	0	3	1.5	ghost bat, grey falcon, Pilbara olive python, Pilbara leaf-nosed bat, northern quoll
VBKA-13	-22.6700	119.1494	0	3	0.8	ghost bat, grey falcon, Pilbara olive python, Pilbara leaf-nosed bat, northern quoll
VBKA-14	-22.6688	119.1301	0	3	2.5	ghost bat, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python
VBKA-15	-22.6703	119.1394	2	0	1.0	ghost bat, grey falcon, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python
VBKA-16	-22.6691	119.1331	0	0	-	-
VBKA-17	-22.6745	119.1314	3	0	2	ghost bat, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python

Site ID	Latitude	Longitude	Ultrasonic Recorder	Camera	Targeted Search (person hours)	Species Targeted
VBKA-18	-22.6738	119.1349	0	0	3.5	ghost bat, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python
VBKA-19	-22.6641	119.1029	3	0	2	northern quoll, Pilbara leaf-nosed bat, grey falcon, ghost bat, Pilbara olive python
VBKA-20	-22.6884	119.1003	3	0	-	-
VBKA-21	-22.6753	119.0882	0	0	4	ghost bat, grey falcon, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python
VBKA-22	-22.6499	119.1907	0	0	1.3	western pebble-mound mouse
VBKA-23	-22.6481	119.1856	0	0	-	-
VBKA-24	-22.6498	119.1893	0	0	-	-
VBKA-25	-22.6735	119.1446	0	0	-	-
VBKA-26	-22.6932	119.1328	0	0	-	-
VBKA-27	-22.6872	119.1270	0	0	-	-
VBKA-28	-22.6988	119.1224	0	0	-	-
VBKA-29	-22.6964	119.0955	0	0	-	-
VBKA-30	-22.6955	119.0873	0	0	1.5	western pebble-mound mouse
VBKA-31	-22.6493	119.1875	0	0	-	-
VBKA-32	-22.6826	119.1363	0	0	-	-
VBKA-33	-22.6801	119.1244	0	0	0.5	western pebble-mound mouse
VBKA-34	-22.6787	119.0868	0	0		
VBKA-35	-22.6865	119.0951	0	0	1.5	ghost bat, northern quoll, Pilbara leaf-nosed bat, Pilbara olive python
VBKA-36	-22.7131	119.1103	0	0	-	-
Total			**15**	**42**	**32.33**	**-**

712000 715000 718000 721000 724000 727000

7494000 7491000 7488000

VBKA-10 VBKA-01 VBKA-02 VBKA-19 VBKA-03 VBKA-04 VBKA-21 VBKA-05 VBKA-34 VBKA-06 VBKA-35 VBKA-07 VBKA-20 VBKA-08 VBKA-11 VBKA-29 VBKA-09 VBKA-16 VBKA-14 VBKA-15 VBKA-13 VBKA-17 VBKA-25 VBKA-33 VBKA-32 VBKA-26 VBKA-28 VBKA-36 VBKA-23 VBKA-31 VBKA-22 VBKA-12 VBKA-24

Yandi Rail Spur Line

Marillana Creek Railway

Legend

Study Area

Rail

Sampling Method

Camera Trap

Habitat Assessment

Ultrasonic Recorder

Traverse

Fauna Habitat

Basalt Outcrop

Breakaway/ Cliff

Cleared/ Disturbed

Drainage Area/ Floodplain

Gorge/ Gully

Hillcrest/ Hillslope

Major Drainage Line

Minor Drainage Line

N

biologic Environmental Survey

Scale: 1:38,000

0 1 2 Km

Coordinate System: GDA2020 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA2020 Created 09/12/2022

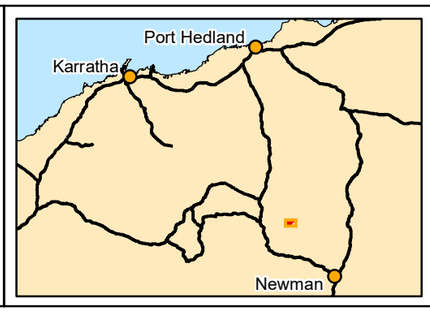


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Figure 4.2: Fauna sample sites and traverses

4.5 Likelihood of Vertebrate Fauna Occurrence

Significant species identified by the desktop assessment were assessed for their likelihood of occurring within the Study Area using a decision matrix which considers the suitability of habitat within the Study Area and the proximity of previous records (Table 4.4). Based on this decision matrix, each species was assigned to one of six categories of likelihood: Confirmed, Highly Likely, Likely, Possible, Unlikely, or Highly Unlikely.

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

Table 4.4: Species likelihood of occurrence decision matrix

		Habitat suitability of Study Area			
		Breeding habitat present	**Foraging and dispersal habitat present**	**Marginally suitable habitat[2] present**	**No suitable habitat present**
Species Records[1]	**Recorded in Study Area**	Confirmed	Confirmed	Confirmed	Confirmed
	Recorded within 10 km of Study Area	Highly Likely	Likely	Possible	Possible
	Recorded within 10–50 km of Study Area	Likely	Possible	Possible	Unlikely
	Recorded within 50–100 km of Study Area	Possible	Possible	Unlikely	Unlikely
	Recorded >100 km of Study Area	Possible	Unlikely	Unlikely	Highly Unlikely
	Species considered locally/ regionally extinct	Unlikely	Unlikely	Highly Unlikely	Highly Unlikely

[1] Only records within the previous 50 years are considered.

[2] Marginally suitable habitat is habitat which is possibly used by a species but is unlikely to be depended upon; for example, it may be used only when in proximity to core breeding, foraging or dispersal habitat.

4.6 Assessment of Significance

4.6.1 Fauna Habitats

Habitat units were categorised as providing critical, supporting or nil habitat for significant species confirmed or likely to occur. The categorisation of critical and supporting habitat followed that of BHP WAIO (2022). Due to differing habitat preferences of significant species (including habitat features and/or microhabitats), habitat significance was assessed on a species-by-species basis.

4.6.2 Significance of Species Occurrence

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

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

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

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

For the Pilbara leaf-nosed bat, the entire Pilbara is suggested to represent an 'important population' (TSSC, 2016b). Thus the significance of occurrence was based on the presence of Category 1 and 2 (permanent diurnal) roosts and Category 3 (semi-permanent diurnal) roosts, as stipulated by (Bat Call, 2021b).

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

- a geographically distinct regional population, or collection of local populations; or

- a population, or collection of local populations, that occurs within a particular bioregion.

5 FIELD SURVEY RESULTS AND DISCUSSION

5.1 Fauna Habitats of the Study Area

Seven broad fauna habitat types were recorded and mapped within the Study Area, comprising, in decreasing order of extent, Hillcrest/ Hillslope (2,526.92 ha, 79.82%), Gorge/ Gully (186.57 ha, 5.89%), Drainage Area/ Floodplain (129.70 ha, 4.10%), Major Drainage Line (94.48 ha, 2.98%), Minor Drainage Line 86.76 ha, 2.74%), Breakaway/ Cliff (72.16 ha, 2.28%) and Basalt Outcrop (12.34 ha, 0.39%). The remaining 1.80% (57.03 ha) of the Study Area was mapped as Cleared/ Disturbed (Table 5.1; Figure 5.1). Descriptions of the distinguishing characteristics and the occurrence within the Study Area for each of these habitat types are presented in Table 5.1, and the data from on-site habitat assessments are presented in Appendix C.

The seven habitats mapped are broadly distributed and well represented across the Pilbara bioregion and surrounding regions, and therefore support fauna assemblages which are generally common and widespread. The condition of habitats within the Study Area ranged from Excellent to Very Good. Disturbances were caused by grazing by cattle (*Bos taurus*), weed invasion and road/ access tracks.

Of the seven broad fauna habitats occurring within the Study Area, six habitats provide critical habitat for MNES species; Gorge/ Gully, Breakaway/ Cliff, Major Drainage Line, Minor Drainage Line, Basalt Outcrops and Drainage Area/ Floodplain (refer to Table 5.1 and Section 5.4.1 for further detail).

Table 5.1: Broad fauna habitats occurring within the Study Area

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Habitat for significant species	Photo
Hillcrest/ Hillslope **2,526.92 ha** **79.82%**	This habitat comprises rocky outcrops, ridges and stony plain on the tops of ranges, supporting *Triodia* hummock grassland with scattered *Eucalyptus* and *Acacia*. Such areas are not highly complex and generally have skeletal soils and sparse open vegetation that can provide pockets of protection from exposure.	Hillcrest/ Hillslope habitat is common and widespread habitat types within the Pilbara region. The vegetation and substrate which make up this habitat type are characteristic features of the region. **Breakaway**: Common and widespread throughout. **Marillana South:** Common and widespread throughout.	**MNES** Supporting habitat for: • **Pilbara leaf-nosed bat** –foraging and dispersal habitat **Other significant species** Medium significance for: • **Western pebble-mound mouse –**breeding foraging and dispersal habitat • **Pilbara flat-headed blind-snake -** foraging and dispersal habitat • **Peregrine falcon** –foraging and dispersal habitat	
Gorge/ Gully **186.57 ha** **5.89%**	Gorge/ Gully habitat comprised rugged, sometimes steep-sided rocky valleys incised into the surrounding landscape forming shallow gullies and gorges. Gorges tended to be deeply incised, with vertical cliff faces, while gullies were shallower and more open. Caves and water bodies were most often encountered in this habitat type. Vegetation within this habitat was variable depending on position in landscape and was dense and complex in areas of soil deposition and sparse and simple where erosion had occurred.	A reasonably common habitat in the Pilbara, usually associated with ranges; however, because this habitat type is narrow and linear, they only represent a small proportion of the total land area. **Breakaway:** Commonly occurs within the central and western portion of the Study Area. Absent eastern portion of the Study Area **Marillana South:** Gorge/ Gully habitat occurs throughout.	**MNES** Critical habitat for: • **Northern quoll** –breeding, foraging and dispersal • **Pilbara olive python** –breeding, foraging and dispersal Supporting habitat for: • **Ghost bat** –foraging and dispersal habitat where proximal to roosting habitat • **Pilbara leaf-nosed bat** –foraging and dispersal habitat **Other significant species** Medium significance for: • **Peregrine falcon** –foraging and dispersal habitat • **Pilbara flat-headed blind-snake -** breeding foraging and dispersal habitat	

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Habitat for significant species	Photo
Drainage Area/ Floodplain **129.70 ha** **4.10%**	Lower lying plain often subjected to sheet flow following large rainfall events. Vegetation and substrates of this habitat was variable, often comprising scattered *Eucalyptus* over *Acacia* and/or *Grevillea* shrubs with an understory dominated by *Triodia* hummock grasses and/or mixed tussock grasses on alluvial substrates, often comprising heavy clays and gravel.	This fauna habitat is common throughout the Pilbara bioregion. Across the region its structure and condition are variable as a result of rainfall events and disturbance (i.e. fire and cattle grazing). **Breakaway:** Absent from the western portion of Breakaway. Mostly associated with the Major Drainage Line. **Marillana South:** Does not occur within Marillana South	**MNES** Critical habitat for: • **Ghost bat** –foraging where proximal (<12 km) to roosting habitat Supporting habitat for: • **Pilbara leaf-nosed bat** –foraging and dispersal habitat • **Grey falcon** –foraging and dispersal habitat **Other significant species** Medium significance for: • **Western pebble-mound mouse –**foraging and dispersal habiat where adjacent to critical habitat • **Peregrine falcon** –foraging and dispersal habitat	
Major Drainage Line **94.48 ha** **2.98%**	This habitat supported an upper story of relatively tall *Eucalyptus*. Major Drainage Line is prone to flooding and is more likely to retain water when inundated. The structure and condition of vegetation often varies seasonally, particularly following rainfall events. Vegetation condition often subject to heavy cattle grazing.	This fauna habitat is widespread throughout the Pilbara bioregion, though its structure and condition is variable as a result of rainfall events and susceptible to degradation from cattle grazing. **Breakaway:** Common within the central and north-western portions of Breakaway **Marillana South:** Does not occur within Marillana South	**MNES** Critical habitat for: • **Northern quoll** –foraging and dispersal • **Ghost bat** –foraging where proximal (<12 km) to roosting habitat • **Grey falcon** –breeding, foraging and dispersal Supporting habitat for: • **Pilbara leaf-nosed bat** –foraging and dispersal habitat • **Pilbara olive python** –foraging and dispersal habitat **Other significant species** Medium significance for: • **Peregrine falcon** –foraging and dispersal habitat	
Minor Drainage Line **86.76 ha** **2.74%**	Minor Drainage Line habitat comprises low lying or sloping topography, particularly in Hillcrest/ Hillslope landforms where water flowing from higher to lower elevation follows existing sloping topography. Minor Drainage Line is also associated with the Drainage Area/ Floodplain. Vegetation was dominated by acacia shrubland	This fauna habitat is widespread throughout the Pilbara bioregion, though its structure and condition is variable as a result of rainfall events and susceptible to degradation from cattle grazing. **Breakaway**: Common and widespread throughout. **Marillana South:** Does not occur within Marillana South	**MNES** Critical habitat for: • **Ghost bat** –foraging where proximal (<12 km) to roosting habitat Supporting habitat for: • **Pilbara leaf-nosed bat** – foraging and dispersal habitat • **Grey falcon** –foraging and dispersal habitat **Pilbara olive python** –foraging and dispersal habitat **Other significant species** Medium significance for: • **Peregrine falcon** –foraging and dispersal habitat	

Habitat	Distinguishing habitat characteristics	Extent of the habitat	Habitat for significant species	Photo
Breakaway/ Cliff **72.16 ha** **2.28%**	Breakaway/ Cliff habitat comprises rugged, incised rocky hills and ranges. They tend to contain large rock fragments and more rock outcropping than other fauna habitats. Caves (a significant habitat feature) were sometimes encountered in this habitat type. Vegetation can be dense and complex in areas of soil deposition or sparse and simple where erosion has occurred.	A reasonably common habitat in the Pilbara, usually associated with ranges; however, because this habitat type is narrow and linear, they only represent a small proportion of the total land area. **Breakaway:** Occurs within the central and western portion of the Study Area and is usually proximal to drainage lines. Absent eastern portion of the Study Area **Marillana South:** Isolated to the eastern and southwestern portion of Marillana South	**MNES** Critical habitat for: • **Northern quoll** –breeding, foraging and dispersal • **Pilbara olive python** –breeding, foraging and dispersal Supporting habitat for: • **Pilbara leaf-nosed bat** –foraging and dispersal habitat **Other significant species** Medium significance for: • **Peregrine falcon** –breeding, foraging and dispersal • **Pilbara flat-headed blind-snake -** breeding foraging and dispersal habitat	
Basalt Outcrop **12.34 ha** **0.39%**	Basalt Outcrop habitat comprises moderate cracks and crevices. Vegetation was dominated by spinifex hummock grassland and tussock grassland.	**Breakaway:** Isolated to the south-eastern corner of Breakaway **Marillana South:** Does not occur within Marillana South	**MNES** Critical habitat for: • **Northern quoll** –breeding, foraging and dispersal **Other significant species** Medium significance for: • **Peregrine falcon** – foraging and dispersal habitat	
Cleared/ Disturbed **57.03 ha** **1.80%**	Cleared/ Disturbed areas include areas where the natural vegetation and microhabitats have been disrupted, usually devoid of native vegetation. This includes tracks, laydown areas, camps, major roads/ highways and historic, large-scale clearing.	Within the Study Area Cleared/ Disturbed areas are primarily restricted to Yandi camp.	**N/A**	No photo

712000 715000 718000 721000 724000 727000

7494000 7491000 7488000

WBKA-01
CBKA-02
WBKA-03
WBKA-04
CBKA-03
CBKA-04
WBKA-02
CBKA-01
Yandi Rail Spur Line
Marillana Creek Railway

Legend

- Study Area
- Rail
- Cave
- Water Feature

Ghost bat
- Scat

Western pebble-mound mouse
- Mound (active)
- Mound (recently inactive)
- Mound (inactive)

Fauna Habitat
- Basalt Outcrop
- Breakaway/ Cliff
- Cleared/ Disturbed
- Drainage Area/ Floodplain
- Gorge/ Gully
- Hillcrest/ Hillslope
- Major Drainage Line
- Minor Drainage Line

N

biologic Environmental Survey

Scale: 1:38,000

0 1 2 Km

Coordinate System: GDA2020 MGA Zone 50
Projection: Transverse Mercator
Datum: GDA2020 Created 09/12/2022

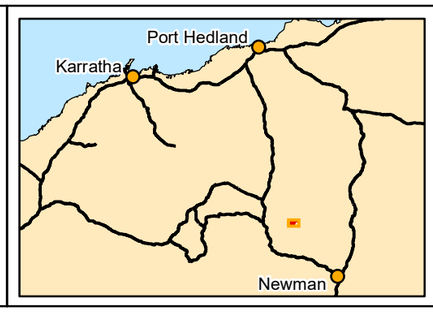

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Figure 5.1: Fauna habitats and significant species recorded in the Study Area

5.2 Habitat Features

5.2.1 Caves

Caves can be important features within a landscape, particularly in arid zone systems, often providing stable microclimates, shelter and protection (Medellin *et al.*, 2017). In total, four caves were recorded within the Study Area (Table 5.2; Appendix D). Of these, two caves (CBKA-03 and CBKA-04) were previously recorded during the Marillana Targeted Survey (Biologic, 2018a).

Three caves occur within Breakaway/ Cliff habitat and one cave (CBKA-01) occurs within Gorge/ Gully habitat. Based on results of the cave assessments, for ghost bat two caves (CBKA-02 and CBKA-03) were considered Category 3 roosts, one cave (CBKA-01) was considered a Category 4 roost, and one cave (CBKA-04) was considered unlikely to be of use to the species. Both Category 3 roosts were structurally suitable to potentially support diurnal roosting. These caves were deep and dark with a high or domed roof and a relatively stable microclimate, CBKA-02 also contained one fresh ghost bat scat (Table 5.2).

For Pilbara leaf-nosed bats, two caves (CBKA-01 and CBKA-02) were considered Category 4 roosts, and two caves (CBKA-03 and CBKA-04) were considered unlikely to be of use to species.

Table 5.2: Significance of caves to ghost bat within the Study Area

Cave ID	Coordinates		Records	PLNB Significance	GB Significance
	Latitude	Longitude			
CBKA-01	-22.6921	119.1064	**Current**: nil	Category 4	Category 4
CBKA-02	-22.6561	119.0864	**Current**: 1 fresh scat. Deep dark cave with domed roof and relatively stable microclimate	Category 4	Category 3
CBKA-03 (previously called MARI19)	-22.6883	119.1003	**Previous**: Deep cave with high roof **Current**: nil	No Usage	Category 3
CBKA-04 (previously called MARI18)	-22.6901	119.1015	**Previous**: Could not be accessed at the time due to rail **Current**: nil	No Usage	No Usage

5.2.2 Water Features

Water sources are a limiting factor for many ecosystems (James *et al.*, 1995), particularly within arid-zone ecosystems such as the Pilbara (Burbidge *et al.*, 2010; Doughty *et al.*, 2011) and often represent areas of comparatively high ecological productivity (Murray *et al.*, 2003). Water features have varying levels of significance to the target species of this assessment. For northern quolls, water features often represent areas of high productivity, and therefore may contain a relatively high abundance of feeding resources (Braithwaite & Griffiths, 1994; Oakwood, 2000), when in suitable habitat (e.g. rocky habitats, and to a lesser degree, drainage lines). For Pilbara leaf-nosed bats, water features can provide

significant drinking and foraging sources, and are a key component to 'gorges with pools' being recognised as the priority foraging habitat for the species (TSSC, 2016b). Water features can often act as important foraging locations for Pilbara olive pythons; for that reason the species is often associated with water features, particularly within rocky habitats, but also, within drainage habitats (Pearson, 1993).

The permanency of each water feature is documented in Table 5.3. Permanency was categorised as either persistent (lasting more than nine months), semi-persistent (lasting between three and nine months), ephemeral (lasting approximately three months) and temporary (lasting less than three months). Overall, four water features have been documented in the Study Area. Of these, one was considered persistent, one was considered semi-persistent and two were considered temporary. All water features assessed during the survey were located within Gorge/ Gully habitat (Table 5.3; Appendix E).

Table 5.3: Water features recorded in the Study Area during the current survey

Water Feature ID	Description	Coordinates		Habitat	Permanency
		Latitude	Longitude		
WBKA-01	Rock Pool	-22.6508	119.0916	Gorge/ Gully	Persistent
WBKA-02	Rock Pool	-22.6911	119.1072	Gorge/ Gully	Semi-persistent
WBKA-03	Rock Pool	-22.6683	119.1312	Gorge/ Gully	Temporary
WBKA-04	Rock Pool	-22.6740	119.1305	Gorge/ Gully	Temporary

5.3 Fauna Recorded

A total of 69 vertebrate fauna species, comprising 16 mammal species (13 native and three introduced), 44 bird species and nine reptile species were recorded during the field survey. (Appendix B). This comprises approximately 18.30% of the total number of species identified in the desktop assessment (*n* = 377) as potentially occurring within the Study Area (see section 3.2). In comparison with the results from previous surveys undertaken in the vicinity of the Study Area, the total species diversity recorded during the current survey was comparable to other basic surveys (average was 69 species – refer to Table 3.3). All species recorded during the survey were previously identified in the desktop assessment (Appendix B).

5.4 Significant Species

Two significant species were recorded within the Study Area during the current survey: ghost bat and western pebble-mound mouse (Figure 5.1; Table 5.4). Ghost bat was detected at one cave (CBKA-02) via one fresh scat (<1 month old) (refer to Table 5.4 and Section 5.4.1 for further detail). The western pebble-mound mouse was recorded from 26 mounds of which 22 were located within the Study Area. Of the 22 mounds within the Study Area, two were active mounds, nine were recently inactive mounds and 11 were inactive mounds. Of the four mounds located outside the Study Area (between 188m and

612m south of Marillana South), one mound was active and three mounds were recently inactive (refer to Table 5.4 and Section 5.4.2 for further detail). All pebble-mounds were recorded in Hillcrest/ Hillslope habitat (Table 5.4).

The occurrence of those significant species which are MNES are discussed in further detail below (Section 5.4.1). The occurrence of other significant species which have either been Confirmed as occurring in the Study Area or are considered Highly Likely to occur, Likely to occur, or to Possible to occur, is also discussed in more detail (Section 5.4.2 to 5.4.5). Consideration for some species as Unlikely or Highly Unlikely to occur within the Study Area is generally based on the absence of suitable permanent or seasonal habitats or micro habitats likely to support the species and/or the Study Area occurring outside the known distribution for the species (Table 5.5). Based on known species' distributions, previous records and the habitats present within the Study Area, a further four species were deemed Highly Likely to occur, five were deemed Possible and the remaining 28 were considered Unlikely or Highly Unlikely to occur (Table 5.5).

Table 5.4: Significant species recorded during the current survey

Common Name (Scientific Name)	Site	Location		Habitat	Record Type
		Latitude	Longitude		
Ghost bat (*Macroderma gigas*)	CBKA-02	-22.6561	119.0864	Cave	Scat
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6749	119.0925	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6775	119.0948	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6727	119.0904	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6758	119.0927	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP (outside SA)	-22.6517	119.1857	Hillcrest/ Hillslope	Mound (active)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP (outside SA)	-22.6555	119.1891	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6694	119.1411	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6704	119.1371	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6693	119.1338	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6745	119.1408	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6535	119.0893	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6532	119.0903	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP (outside SA)	-22.6531	119.1922	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6824	119.1290	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6529	119.0916	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6526	119.0920	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP (outside SA)	-22.6553	119.1879	Hillcrest/ Hillslope	Mound (recently inactive)

Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6752	119.1372	Hillcrest/ Hillslope	Mound (active)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6751	119.1366	Hillcrest/ Hillslope	Mound (active)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6749	119.1361	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6745	119.1357	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6747	119.1361	Hillcrest/ Hillslope	Mound (recently inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6989	119.0969	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6987	119.0966	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6980	119.0951	Hillcrest/ Hillslope	Mound (inactive)
Western pebble-mound mouse (*Pseudomys chapmani*)	OPP	-22.6972	119.0927	Hillcrest/ Hillslope	Mound (inactive)

Table 5.5: Significant species likelihood assessment

Common Name (Scientific Name)	Conservation Status				Preferred Broad Habitats	Nearest Record to the Study Area	Potential Critical Habitat Within the Study Area							Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA	IUCN			Gorge/ Gully	Breakaway/ Cliff	Major Drainage Line	Minor Drainage Line	Basalt Outcrops	Drainage Area/ Floodplain	Hillcrest/ Hillslope			
Mammals																
DASYURIDAE																
brush-tailed mulgara (*Dasycercus blythi*)			P4		Prefers spinifex *Triodia* spp. grasslands on sand plains and the swales between low dunes (Pavey *et al.*, 2012; Woolley, 2006). Mature spinifex hummocks appear to be important for protection from introduced predators (Körtner *et al.*, 2007).	11.4 km north in 2012 (Biologic, 2013b)						•		Possible	Resident	May occur as a resident in Drainage Area/ Floodplain habitat.
northern quoll (*Dasyurus hallucatus*)	EN	EN		EN	The species tends to inhabit rocky habitats which offer protection from predators and are generally more productive in terms of availability of resources (Braithwaite & Griffiths, 1994) (Oakwood, 2000). Other Microhabitat features important to the species include rock cover, proximity to permanent water and time-since last fire (Woinarski *et al.*, 2008).	0.8 km southwest in 2010 (BHP, 2022)	•	•	•		•			Highly Likely	Resident	Gorge/ Gully, Basalt Outcrop and Breakaway/ Cliff habitat is deemed critical denning/ shelter and foraging/ dispersal habitat. Major Drainage Line habitat represents critical foraging and dispersal habitat.
long-tailed dunnart (*Sminthopsis longicaudata*)			P4		Typically occurs on plateaus near breakaways and scree slopes, and on rugged boulder-strewn scree slopes (Burbidge *et al.*, 2008). Once considered rare but now shown to be relatively common and widespread in rocky habitats (Burbidge *et al.*, 2008).	84.4 km northeast in 2005 (DBCA, 2022c)		•					•	Possible	Resident	May occur as a resident in Breakaway/ Cliff and Hillcrest/ Hillslope habitat.
MACROPODIDAE																
black-flanked rock-wallaby (*Petrogale lateralis* subsp. *lateralis*)	EN	EN		NT	Rocky habitats, including gorges and gullies or outcrops with sufficient shelter habitat. Often vegetated with *Acacia* thickets and open low eucalypt woodlands with an understory of grasses and low shrubs (Willers *et al.*, 2011).	84.4 km southeast in 1975 (DBCA, 2022c)	•							Unlikely	Resident	May occur as a resident in Gorge/ Gully habitat. Extinct from the region
MEGADERMATIDAE																
ghost bat (*Macroderma gigas*)	VU	VU		VU	Ghost bats roost in deep, complex caves beneath bluffs of low, rounded hills, granite rock piles and abandoned Mines (Armstrong & Anstee, 2000). These features often occur within habitats including gorge/gully, hill crest/ hill slope and low hills (Armstrong & Anstee, 2000). Forages broadly across habitats, particularly woodland and open woodland habitats, including eucalypt and Mulga woodlands (Biologic, 2020; Richards *et al.*, 2008; Tidemann *et al.*, 1985; TSSC, 2016a).	Recorded within the Study Area			•	•		•		Recorded	Occasional to Frequent resident	Critical foraging habitat is provided by Category 3 and 4 roosts (CBKA-01, CBKA-02 and CBKA-03), Drainage Area/ Floodplain, Minor Drainage Line, and Major Drainage Line habitat
MURIDAE																
short-tailed mouse (*Leggadina lakedownensis*			P4		The species occupies a diverse range of habitats from the monsoon tropical coast to semiarid climates, including spinifex and tussock grasslands, samphire and sedgelands, *Acacia* shrublands, tropical eucalypt and Melaleuca woodlands and stony ranges; however, the species is usually found in seasonally inundated habitats on red or white sandy-clay soils (Moro & Kutt, 2008).	44.4 km southwest in 1997 48.2 km northwest in 2001 (DBCA, 2022c)								Unlikely	N/A	Suitable habitat not present
western pebble-mound mouse (*Pseudomys chapmani*)			P4		This species occurs on the gentler slopes of rocky ranges where the ground is covered with a stony mantle and vegetated by hard spinifex, often with a sparse overstorey of eucalypts and scattered shrubs (Anstee, 1996; Start *et al.*, 2000).	Recorded within the Study Area						•	•	Recorded	Resident	Recorded from 26 mounds of which three active mounds, 12 recently inactive mounds and 11 inactive mounds Likely to occur as a resident throughout Study Area where suitable stony habitat present.
RHINONYCTERIDAE																
Pilbara leaf-nosed bat (*Rhinonicteris aurantia* (Pilbara form))	VU	VU			Species roosts within caves and abandoned Mines with high humidity (95%) and temperature (32°C) (Armstrong, 2001). Species forages in caves and along waterbodies with fringing vegetation (TSSC, 2016b).	0.5 km northwest in 2008 (Ecologia, 2008c)				•		•	•	Likely	Infrequent visitor (foraging/	Given the distance from known Category 1 to 3 roosts, it is unlikely the Study Area contains critical habitat for the species. Hillcrest/

Common Name (Scientific Name)	Conservation Status				Preferred Broad Habitats	Nearest Record to the Study Area	Potential Critical Habitat Within the Study Area							Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA	IUCN			Gorge/ Gully	Breakaway/ Cliff	Major Drainage Line	Minor Drainage Line	Basalt Outcrops	Drainage Area/ Floodplain	Hillcrest/ Hillslope			
															dispersal only)	Hillslope, Drainage Area/ Floodplain and Minor Drainage Line habitat as well water features are likely to provide supporting foraging habitat.
THYLACOMYIDAE																
greater bilby (*Macrotis lagotis*)	VU	VU		VU	Variety of habitats including spinifex hummock grassland and *Acacia* shrubland, on soft soils (Burrows *et al.*, 2012). In the Pilbara often associated with major drainage line sandy terraces (How *et al.*, 1991).	24.2 km north in 2013 (DBCA, 2022c)								Unlikely	N/A	Suitable habitat not present.
Aves																
ACCIPITRIDAE																
letter-winged kite (*Elanus scriptus*)			P4		Habitats for this species include grasslands with trees and tree-lined watercourses (Pizzey & Knight, 2007).	45.0 km southwest in 2018 (DBCA, 2022c)								Unlikely	N/A	There are very few inland Pilbara records). Additionally, the species is a rare and infrequent visitor to the Pilbara region, therefore is unlikely to utilise any habitats within the Study Area specifically.
eastern osprey (*Pandion haliaetus cristatus*)	MI	MI			Occurs mainly in sheltered seas around islands, tidal creeks, estuaries and saltwork ponds, also large river pools (Johnstone *et al.*, 2013)	17.9 km southeast in 2011 (DBCA, 2022c)								Unlikely	N/A	Suitable habitat not present.
APODIDAE																
fork-tailed swift (*Apus pacificus*)	MI	MI			Inhabits dry/open habitats, inclusive of riparian woodlands and tea-tree swamps, low scrub, heathland or saltmarsh, as well as treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes (Johnstone & Storr, 1998). Almost exclusively aerial.	10.0 km south east in 2013 (Biologic, 2013b)	•	•	•	•	•	•	•	Possible	Infrequent visitor (foraging/ migration only)	May occasionally occur within the airspace above the Study Area to forage. Unlikely to land or nest within Study Area.
CHARADRIIDAE																
oriental plover (*Charadrius veredus*)	MI	MI			A variety of habitats, including coastal habitats, such as estuarine mudflats and sandbanks, on sandy or rocky ocean beaches as well as open inland environments such as, semi-arid or arid grasslands, where the grass is short and sparse (Johnstone & Storr, 2004).	60.9 km northeast in 2017 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
FALCONIDAE																
grey falcon (*Falco hypoleucos*)	VU	VU			Timbered lowlands, particularly Acacia shrubland and along inland drainage systems. Also frequent spinifex and tussock grassland (Burbidge *et al.*, 2010; Olsen & Olsen, 1986).	12.7 km northwest in 2014 (DBCA, 2022c)			•	•		•		Likely	Frequent visitor	Major Drainage Line habitat provides critical breeding and foraging habitat for the species. The Drainage Area/ Floodplain and Minor Drainage Line habitats may also provide supporting foraging habitat for the species.
peregrine falcon (*Falco peregrinus*)		OS			In arid areas, it is most often encountered along cliffs above rivers, ranges and wooded watercourses where it hunts birds (Johnstone & Storr, 1998). It typically nests on rocky ledges occurring on tall, vertical cliff faces between 25 m and 50 m high (Olsen *et al.*, 2004; Olsen & Olsen, 1989).	4.9 km northeast in 2013 (Biologic, 2013b)	•	•	•	•		•		Highly Likely	Frequent visitor	Frequent visitor. Potential for nesting provided by the Breakaway/ Cliff.

Common Name (Scientific Name)	Conservation Status				Preferred Broad Habitats	Nearest Record to the Study Area	Potential Critical Habitat Within the Study Area							Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA	IUCN			Gorge/ Gully	Breakaway/ Cliff	Major Drainage Line	Minor Drainage Line	Basalt Outcrops	Drainage Area/ Floodplain	Hillcrest/ Hillslope			
LARIDAE																
caspian tern (*Sterna caspia*)	MI	MI			Mainly sheltered seas, estuaries and tidal creeks; occasionally near-coastal salt lakes (including saltwork ponds) and brackish pools in lower courses of rivers; rarely fresh water (Johnstone & Storr, 1998).	36.9 km northwest in 2012 (DBCA, 2022c)								Unlikely	N/A	Suitable habitat not present.
gull-billed tern (*Gelochelidon nilotica*)	MI	MI			Shallow sheltered seas close to land, estuaries, tidal creeks; and inundated samphire flats, flooded salt lakes, claypans and watercourses in the interior (Johnstone & Storr, 1998).	20.2 km northwest in 2013 (Biologic, 2012b)								Unlikely	N/A	Suitable habitat not present.
little tern (*Sternula albifrons)*	MI	MI			Wide-spread on coast of north and east Australia, forages over sheltered waters and roost on exposed sandbars, splits or beaches. From Oct – Mar most Little Terns seen in Australia are non-breeding migrants from Asian breeding grounds. Nests in colonies in open sandy settings, close to tideline; beach-nesting populations of at least south east Australia (Menkhorst *et al.*, 2017).	81.6 km northwest in 1978 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
MOTACILLIDAE																
grey wagtail (*Motacilla cinerea*)	MI	MI			A rare vagrant to WA where it has been recorded within various habitats with open waterbodies (Johnstone & Storr, 2004).	42.0 km north in 2012 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
PROCELLARIIDAE																
southern giant petrel (*Macronectes giganteus*)	EN/ MG	S5			The southern giant-petrel is marine bird that occurs in Antarctic to subtropical waters. In summer, it mainly occurs over Antarctic waters, and it is widespread south as far as the pack-ice and onto the Antarctic continent. It occurs in both pelagic and inshore waters. It is attracted to land at sewage outfall (DoEE, 2018).	22.5 km southeast in 2011 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
PSITTACIDAE																
night parrot (*Pezoporus occidentalis*)	EN	CR		EN	The night parrot prefers sandy/stony plain habitat with old-growth spinifex for roosting and nesting in conjunction with native grasses and herbs for foraging (DPaW, 2017).	36.6 km north in 2005 (DBCA, 2022c)								Unlikely	N/A	Suitable habitat not present.
ROSTRATULIDAE																
Australian painted snipe (*Rostratula benghalensis* subsp. *australis*)	EN	EN		EN	Generally, occupies shallow terrestrial freshwater wetlands (i.e. temporary and permanent lakes, swamps and claypans) with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire (Johnstone & Storr, 1998)	48.5 km east in 2012 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
SCOLOPACIDAE																
sharp-tailed sandpiper (*Calidris acuminata*)	MI	MI			Favours flooded samphire flats and grasslands, mangrove creeks mudflats, beaches, river pools, saltwork ponds, sewage ponds and freshwater soaks (Johnstone *et al.*, 2013).	62.4 km northeast in 2007 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
curlew sandpiper (*Calidris ferruginea*)	CR/ MI	CR/ MI		NT	Inhabits intertidal mudflats in sheltered coastal areas (i.e. estuaries, bays, inlets and lagoons) (Geering *et al.*, 2007). This rare species generally roosts on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands (Geering *et al.*, 2007).	103.4 km southeast (no date) (ALA, 2022)								Highly Unlikely	N/A	Suitable habitat not present.
pectoral sandpiper (*Calidris melanotos*)	MI	MI			Coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (Johnstone & Storr, 2004; Johnstone *et al.*, 2013). It prefers wetlands with open fringing mudflats and low, emergent or fringing vegetation (Geering *et al.*, 2007)	96.8 km southeast in 1981 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
red-necked stint (*Calidris ruficollis*)	MI	MI		NT	Lives in permanent or ephemeral wetlands of varying salinity, and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In WA they prefer freshwater to marine	69.9 km northeast in 2017 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.

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	EPBC Act	BC Act	DBCA	IUCN			Gorge/ Gully	Breakaway/ Cliff	Major Drainage Line	Minor Drainage Line	Basalt Outcrops	Drainage Area/ Floodplain	Hillcrest/ Hillslope			
					environments. The species usually forages in shallow water at the edge of wetlands and roost or loaf on tidal mudflats, near low saltmarsh, and around inland swamps (Johnstone & Storr, 1998).											
long-toed stint (*Calidris subminuta*)	MI	MI			They prefer shallow freshwater or brackish wetlands but are also fond of muddy shorelines, growths of short grasses, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. The Long-toed Stint also frequents permanent wetlands and forages on wet mud or in shallow water, often among short grass, weeds and other vegetation on islets or around the edges of wetlands. They roost or loaf in sparse vegetation at the edges of wetlands and on damp mud near shallow water. It also roosts in small depressions in the mud (Johnstone & Storr, 1998).	95.8 km southeast in 1981 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
wood sandpiper (*Tringa glareola*)	MI	MI			Species occurs as a non-breeding summer migrant which occurs throughout the region. Occurs mainly in river pools, sewage ponds, flooded claypans, freshwater lagoons and bore overflows (Johnstone *et al.*, 2013).	34.9 km northeast in 2009 (DBCA, 2022c)								Unlikely	N/A	Suitable habitat not present.
common sandpiper (*Tringa hypoleucos*)	MI	MI			Estuaries and deltas of streams, as well as banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans (Geering *et al.*, 2007).	69.9 km northeast in 2018 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
common greenshank (*Tringa nebularia*)	MI	MI			Species occurs as a non-breeding summer Migrant which occurs throughout the region. Occurs mainly in Tidal mudflats, mangrove creeks, flooded samphire flats, beaches, river pools, and saltworks and sewage ponds (Johnstone *et al.*, 2013).	11.4 km southwest in 2011 (Biota, 2013a)								Unlikely	N/A	Suitable habitat not present.
marsh sandpiper (*Tringa stagnatilis*)	MI	MI			Lives in permanent or ephemeral wetlands of varying salinity, and also regularly at sewage farms and saltworks. They are recorded less often at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. In WA they prefer freshwater to marine environments. The species usually forages in shallow water at the edge of wetlands and roost or loaf on tidal mudflats, near low saltmarsh, and around inland swamps (Johnstone & Storr, 1998).	60.9 km northeast in 2016(DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
common redshank (*Tringa totanus*)	MI	MI			It is found at sheltered coastal wetlands with bare open flats and banks of mud or sand. They are also found around salt lakes, freshwater lagoons, artificial wetlands and saltworks and sewage farms. The species has been observed feeding in shallow water, on wet bare mud or sand, or on algal deposits and roosting on small elevated areas such as estuarine sandbars and muddy islets surrounded by water (Johnstone & Storr, 1998).	94.1 km southeast in 2012 (DBCA, 2022c)								Highly Unlikely	N/A	Suitable habitat not present.
THRESKIORNITHIDAE																
glossy ibis (*Plegadis falcinellus*)	MI	MI			Freshwater wetlands, irrigated areas, margins of dams, floodplains, brackish and saline wetlands, tidal mudflats, pastures, lawns and public gardens (Johnstone *et al.*, 2013).	34.9 km northeast in 2017 (DBCA, 2022c)								Unlikely	N/A	Suitable habitat not present.
Reptiles																
CARPHODACTYLIDAE																
Pilbara barking gecko (*Underwoodisaurus seorsus*)			P2		Little is known about the ecology of the Pilbara barking gecko, but the species is thought to prefer rocky areas with spinifex and low tree cover habitats (Wilson & Swan, 2014).	22.4 km south in 2010 (Biologic, 2011a)	•	•						Possible	Resident	Gorge/ Gully habitat and Breakaway/ Cliff habitat may provide suitable residence for the species, though this species is more frequently found on hills of higher elevation.
BOIDAE																
Pilbara olive python (*Liasis olivaceus* subsp. *barroni*)	VU	VU			Associated with drainage systems, including areas with localized drainage and watercourses (Pearson, 1993). In the inland Pilbara	3.0 km southwest in 2014 (DBCA, 2022c)	•	•	•	•				Highly Likely	Resident	Gorge/ Gully habitat and Breakaway/ Cliff potentially provide critical breeding and dispersal/ foraging

Common Name (Scientific Name)	Conservation Status				Preferred Broad Habitats	Nearest Record to the Study Area	Potential Critical Habitat Within the Study Area							Likelihood of Occurrence	Occurrence	Comments
	EPBC Act	BC Act	DBCA	IUCN			Gorge/ Gully	Breakaway/ Cliff	Major Drainage Line	Minor Drainage Line	Basalt Outcrops	Drainage Area/ Floodplain	Hillcrest/ Hillslope			
					the species is most often encountered near permanent waterholes in rocky ranges or among riverine vegetation (Pearson, 1993).											habitat. Persistent water feature WBKA-01 also represents a critical foraging location for the species.
SCINCIDAE																
spotted ctenotus (*Ctenotus uber* subsp. *johnstonei*)			P2		Within the Pilbara, the taxon is known from *Triodia* on hillslopes, *Acacia xiphophylla* over chenopods, and *Acacia xiphophylla* scattered tall shrubs to high open shrubland (Cogger, 2014).	27.2 km northwest in 2012 (Biologic, 2012b)							•	Possible	Resident	May occur in lower slopes of Hillcrest/ Hillslope habitats. Taxonomic status of the disjunct Pilbara population may represent an undescribed taxon (P. Doughty, WA Museum, *pers. comm.*).
lined soil-crevice skink (*Notoscincus butleri*)			P4		Habitat preferences appear to include shrublands of mallee & *Acacia* thicket on coastal dunes, where it is found under leaf litter under *Acacia rostellifera* thickets.	119.2 km west in 1995 (DBCA, 2022c)								Unlikely	N/A	Suitable habitat not present.
TYPHLOPIDAE																
Pilbara flat-headed blind-snake (*Anilios ganei*)			P1		Little is known of the species' ecology, but it is often associated with moist soils and leaf litter within gorges and gullies (Wilson & Swan, 2014).	2.5 km northeast in 2011 (Biologic, 2013b)							•	Highly Likely	Resident	May occur as a resident in Gorge/ Gully, Breakaway/ Cliff and to a lesser extent the lower slopes of Hillcrest/ Hillslope habitats.

5.4.1 EPBC Matters of National Environmental Significance

The sections below provide summaries on the MNES species (northern quoll, greater bilby, ghost bat, Pilbara leaf-nosed bat, night parrot, grey falcon and Pilbara olive python).

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

The northern quoll tends to inhabit rocky habitats which offer protection from predators and are generally more productive in terms of availability of resources (Braithwaite & Griffiths, 1994; DoE, 2016; Oakwood, 2000). Other microhabitat features important to the species include: rock cover; proximity to permanent water and time-since last fire (Woinarski *et al.*, 2008). Therefore, critical habitat for the northern quoll, includes denning and foraging habitat within the home range (35 ha to >100 ha in breeding season) of low rocky hills, gorges, escarpments, ranges, breakaways and boulder fields as well as areas within the home range of major drainage lines, tree lined creeks and structurally diverse woodland or forest (DSEWPaC, 2011a; Hill & Ward, 2010).

The Study Area falls within the current distribution of the northern quoll, whereby the species or species habitat may occur (DoE, 2016). Extensive sampling for northern quoll has been undertaken in the vicinity of the Study Area, with the species being recorded on at least 654 occasions within 50 km of the Study Area (BHP, 2022; DBCA, 2022c). The nearest northern quoll record to the Study Area is located approximately 0.8 km southwest of the Study Area from 2010 (BHP, 2022). A large cluster of records (including via camera trap, capture and secondary evidence) of the species are located approximately 7 km north of the Study Area at the Gudai-Darri (Koodaideri) mine, recorded between 2010 and 2018 (DBCA, 2022c). Despite a high number of previous contemporary and proximate records to the Study Area (DBCA, 2022c), no northern quoll individuals or evidence of the species presence was recorded during the survey.

Overall, the Study Area provides suitable habitat for northern quoll. The Gorge/ Gully, Basalt Outcrops and Breakaway/ Cliff habitat is deemed critical denning/ shelter and foraging/ dispersal habitat for the northern quoll within the Study Area. Major Drainage Line habitat represents critical foraging and dispersal habitat for northern quolls.

While there are a high number of contemporary and proximate records surrounding the Study Area, the lack of records within the Study Area, it is considered unlikely that the northern quoll occurs in high densities and therefore would not meet the definition of a “population important for the long-term survival of the northern quoll”, as defined by DoE (2016). The number and proximity of recent records does however suggest that it is Highly Likely that the species occurs in the Study Area.

Greater Bilby (*Macrotis lagotis*) – Vulnerable (EPBC/ BC Act)

Populations of greater bilby exist in the Pilbara bioregion (particularly within the Chichester subregion, along the Fortescue River and north-east to Goldsworthy and Shay Gap), in the Dampier bioregion (along 80 Mile Beach north to Beagle Bay) and in the Central Kimberley and Ord-Victoria Plains bioregions south of the Fitzroy and Margaret Rivers (Southgate, 1990a). Greater bilbies occupy three

major vegetation types - open tussock grassland on uplands and hills, mulga woodland/ shrubland growing on ridges and rises, and hummock grassland in plains and alluvial areas (Southgate, 1990b). Laterite and rock feature substrates are an important part of greater bilby habitat as they support shrub species, such as *Acacia kempeana, A. hilliana* and *A. rhodophylla*, which have root-dwelling larvae prone to supporting a constant food source (Dziminski & Carpenter, 2017; Southgate *et al.*, 2007). These habitats also contain spinifex hummocks, which are quite uniform and discrete, providing runways between hummocks and enabling easier movement and foraging (Southgate *et al.*, 2007). Minimal ground cover is a common feature in greater bilby habitats, as it allows easy foraging (Dawson *et al.*, 2018). Within the Pilbara region, the species is recorded within spinifex sandplains associated with paleo-drainage lines and perched drainage lines where the substrate of sand, soil, sandy clay, or sandy gravel is suitable for burrowing (Dziminski & Carpenter, 2017). Within these sandplain habitats, there is also an association with particular *Acacia* spp. containing root dwelling larvae that the species use for food resources (Dziminski & Carpenter, 2017).

The Study Area falls within the species current distribution, whereby the species or species habitat is likely to occur (DoEE, 2019). Greater bilbies have previously been recorded on 59 occasions within 50 km of the Study Area (DBCA, 2022c). The nearest record (dated 2013) of the species is located approximately 24.2 km north of the Study Area (DBCA, 2022c).

Plot sampling for greater bilby was not undertaken during the current survey, as neither critical nor supporting habitat was recorded within the Study Area. No evidence of greater bilby (tracks, scats, diggings, or burrows) was recorded opportunistically during the survey.

Due to the absence of any critical habitat within or in the vicinity of the Study Area, it is considered Unlikely that the greater bilby occurs within the Study Area or that the Study Area is capable of providing for an important population, as defined by DoE (2013).

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

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

In WA, the species has experienced a significant north-westward distribution contraction, presumably associated with increasing aridity (TSSC, 2016a). The Study Area falls within the western extent of the species current distribution, whereby the species or species habitat is likely to occur (DoEE, 2019). The desktop assessment returned 483 records of ghost bat within 50 km of the Study Area (Figure 3.1) (BHP, 2022; DBCA, 2022c). Of the total ghost bat records, 34 occur within 12 km of the Study Area (classified foraging range), with all records occurring between 2011 and 2018 (BHP, 2022; DBCA, 2022c). The nearest cluster of records (2.8 km north-east) are located at Marillana from between 2011 and 2018. To the south of the Study Area (between approximately 21-56 km), a large cluster of records, including known roosts, are located at Hope Downs, Jinaryi, Area C, Pineapple Hill, South Parmelia, West Angeles and Southern Flank (Biologic, 2011b, 2011e; Biota, 2012e; DBCA, 2022a; Ecologia, 2006a; ENV, 2008c; Onshore & Biologic, 2011; Rapallo, 2012). Numerous caves regarded as important for ghost bats are known to occur near the Study Area at Marillana, South Flank and West Angelas.

The species has previously been recorded within the north-western corner of the Study Area (BHP, 2022). During the current survey, four caves were recorded within the Study Area (Table 5.2; Appendix D). Based on results of the cave assessments, two caves (CBKA-02 and CBKA-03) were considered Category 3 roosts, one cave (CBKA-01) was considered a Category 4 roost, and one cave (CBKA-04) was considered unlikely to be of use to ghost bat. During the current survey, ghost bat was detected at one of these caves (CBKA-02) via one fresh scat (<1 month old).

The Study Area does not contain critical breeding habitat (i.e. Category 1 or Category 2 roosts) (Bat Call, 2021a; BHP WAIO, 2022; TSSC, 2016a). However, given that a known Category 2 roost occurs at Marillana approximately 3 km north-east of the Study Area (Biologic, 2018a), the Study Area is considered to provide critical foraging habitat. Critical foraging habitat is provided by productive plain areas with thin mature woodland over patchy or clumped tussock or hummock grass (*Triodia* spp.) on sand or stony ground, isolated trees and trees on the edge of thin thickets on the plains, trees along the edges of watercourse woodlands and gully or gorge system that opens onto a plain or riparian line (Bat Call, 2021a; TSSC, 2016a). Therefore, critical foraging and dispersal habitat within the Study Area is provided by Drainage Area/ Floodplain, Minor Drainage Line, and Major Drainage Line habitat when proximal (>12 km) to roosting caves. While Bat Call (2021a) recognises “gully or gorge system that opens onto a plain or riparian line” can represent foraging habitat, instances of this within the Study Area have been mapped to a finer scale and separated out as two discreet habitat types ‘Gorge/ Gully’ and ‘Minor Drainage Line’. Thus, any suitable foraging areas of gully and gorge systems, are already covered under the Minor Drainage Lines habitat unit that is regarded as critical foraging habitat.

Supporting habitat within the Study Area is provided by Category 3 roosts (CBKA-02 and CBKA-03) and Category 4 roosts (CBKA-01). In addition, Gorge/ Gully habitats provides supporting foraging and dispersal habitat. The suitability of this habitat, is however, variable depending particular characteristics of the habitat, including the abundance of foraging structures (tree perches) and density of understory vegetation present. Therefore, the species is considered to occur as an occasional to frequent resident within the Study Area.

Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) – Vulnerable (EPBC/ BC Act)

The Pilbara leaf-nosed bat's limited ability to conserve heat and water means it requires warm (28–32 ºC) and very humid (85 – 100%) roost sites in caves (Armstrong, 2001; Churchill, 1991) and/or mine shafts as these enable the individuals to persist in arid climates by limiting water loss and energy expenditure (van Dyck & Strahan, 2008). Such caves are relatively uncommon in the Pilbara (Armstrong, 2001), which limits the availability of diurnal roosts for this species. Pilbara leaf-nosed bats roost in undisturbed caves, deep fissures or abandoned mine shafts. The species forages within and in the vicinity of roost caves and more broadly along waterbodies with suitable fringing vegetation supporting prey species (TSSC, 2016b). Pilbara leaf-nosed bats are predicted to travel up to 20 km from roost caves during nightly foraging (Cramer *et al.*, 2016); however, seasonal variation is known to occur, with foraging occurring up to 20 km in the dry season and up to 50 km during the wet season (Bullen, 2013). Long-distance movements by the species have also been recorded, with a single monitored individual recorded from two roost caves located 170 km distant approximately 12 months apart (Bullen & Reiffer, 2019), suggesting the species may forage and/or disperse over greater distances than previously thought.

The Study Area is located within the species current distribution, whereby the species or species habitat is likely to occur (DoEE, 2019). A total of 1,476 records of Pilbara leaf-nosed bats have been recorded within 50 km of the Study Area (BHP, 2022; DBCA, 2022c). Of these, a high proportion are located within the Gudai-Darri (previously referred to as Koodaideri) area from between 2017 and 2018 (via deployment of ultrasonic recorders) (DBCA, 2022c). These records are represented by a colony of approximately 350 Pilbara leaf-nosed bats that are known to permanently reside within the Gudai-Darri Adit, some 11 km north of the Study Area (Biota, 2012b). The nearest record of the species (calls recorded from an ephemeral pool) is located approximately 0.5 km northwest of the Study Area from 2008 (Ecologia, 2008c).

No Pilbara leaf-nosed bats were recorded within the Study Area during the current survey. Based on detailed cave assessments completed and subsequent sampling (i.e. deployment of ultrasonic recorders), two caves (CBKA-01 and CBKA-02) were considered Category 4 roosts, and two caves (CBKA-03 and CBKA-04) were considered unlikely to be of use to the species.

Critical habitat for the Pilbara leaf-nosed bat is represented by Category 1 to 3 roosts and suitable foraging habitat (i.e. permanent water sources within 8.7 km, Gorge/ Gully, Breakaway/ Cliff and Major Drainage Line within 10 km of a known Category 1 to 3 roosts) (Bat Call, 2021b; TSSC, 2016b). Therefore, given the distance between the Study Area and the Gudai-Darri Adit, the Study Area is unlikely to represent critical habitat for the species.

Hillcrest/ Hillslope, Drainage Area/ Floodplain and Minor Drainage Line habitat may provide supporting habitat for the species. The Study Area also contains persistent (>8.7 km from known Category 1 to 3 roosts), semi-persistent and temporary water features likely to provide supporting foraging habitat for the Pilbara leaf-nosed bat.

The Pilbara population is regarded as representing a single interbreeding population (TSSC, 2016b; Umbrello *et al.*, 2022). Thus, the entire population of Pilbara leaf-nosed bat present in the Pilbara is suggested to represent an 'important population'. Hence, the significance was based on the presence/ absence of Category 1 and 2 (permanent diurnal) roosts and Category 3 (semi-permanent diurnal) roosts, as stipulated by Bat Call (2021b). Given the absence of a critical roost within the Study Area, the Study Area is unlikely to represents a significant area essential to the survival of this species. However, given the proximity of records and the presence of supporting habitat, the species is considered Likely to occur as an infrequent visitor for foraging or dispersal.

Night Parrot (*Pezoporus occidentalis*) – Endangered (EPBC/BC Act)

The night parrot inhabits arid and semi-arid areas that comprise dense, low vegetation (DPaW, 2017). Based on accepted records, the species' habitat consists of *Triodia* grasslands in stony or sandy environments (McGilp, 1931; North, 1898; Whitlock, 1924; Wilson, 1937), and of samphire and chenopod shrublands, including genera such as *Atriplex*, *Bassia* and *Maireana*, on floodplains and claypans, as well as on the margins of salt lakes, creeks or other sources of water (McGilp, 1931; Wilson, 1937). The current interim guidelines for preliminary surveys of night parrot in WA suggest the species requires old-growth spinifex (*Triodia*) (often more than 50 years' unburnt) for roosting and nesting (DPaW, 2017). Although little is known about foraging sites, habitats that comprise various grasses and herbs are thought to be suitable. Foraging areas include highly productive and floristically diverse alluvial habitats, stony herb fields, sparse ironstone pavements, and quaternary sand drifts and ridges (Night Parrot Recovery Team, 2017). Foraging habitat is not necessarily within or adjacent to roosting habitat as the night parrot has been known to fly up to 40 km in a single night to forage (Murphy *et al.*, 2017). However, foraging habitat is likely to be more important when it occurs adjacent to or within approximately 10 km of suitable roosting habitat (DPaW, 2017).

The distribution of the night parrot is very poorly understood in WA; however, the Study Area partly occurs within the species' potential distribution, towards the western extent, as currently mapped by DoEE (2019). The nearest records are located approximately 36.6 km north of the Study Area at Fortescue Marsh and Minga Well (3 km south of Cloudbreak mine site). Three individuals were purportedly sighted at dusk in Mulga woodland near a permanent water soak in 2005 (Bamford Consulting, 2005; Davis & Metcalf, 2008; DBCA, 2022c) and more recently acoustic calls recorded by FMG (2021) in Fortescue Marsh adjacent to Cloudbreak mine site (location not provided) in 2021 (Table 5.6). Another recent night parrot record in WA is from 2020, with Kanyirninpa Jukurrpa rangers recording night parrot calls at two locations on Martu country which is over 110 km north-east of the Study Area (Michelmore & Birch, 2020). It should be noted that the species is especially cryptic and rare in occurrence and therefore difficult to record.

Due to the large distances the species is assumed to travel, it can therefore be assumed that the distances between the nearest records to the Study Area (~45 km), are not necessarily a barrier to the species potential presence in the Study Area.

Table 5.6: Previous records of night parrot within WA

Location	Date	Source	Distance from Study Area	Recorded Habitat Type	Other comments
Cloudbreak	2021	FMG (2021)	36.6 km to the north	Fortescue Marsh	Acoustic recording
Minga Well, south of Cloudbreak mine site	12/04/2005	Bamford Consulting (2005)	36.6 km to the north	Mulga woodland. No understorey.	Permanent water soak. 3 individuals observed at dusk in a targeted survey
Martu country (Great Sandy and Little Sandy Deserts)	~2020 (exact date not provided)	Michelmore and Birch (2020)	>110 km north-east	Salt lake system.	Acoustic recording

The Study Area lacks critical or supporting habitat for the species. In addition, the absence of high-quality foraging habitat within 10 km of the Study Area reduces the likelihood of habitats within the Study Area being utilised by the species. However, the extent to which these habitats may still provide habitat for the species is unknown as little is known about the species' habitat preferences and occurrence, particularly within the Pilbara region. Given the lack of suitable habitat within the Study Area, acoustic sampling for night parrot was not undertaken during the current survey. Due to the lack of contemporary records in the region and the absence of high-quality habitat in the Study Area, the species is considered Unlikely to occur within the Study Area.

Grey falcon (*Falco hypoleucos*) – Vulnerable (EPBC/ BC Act)

The Pilbara is thought to potentially be a stronghold of the grey falcon (Sutton, 2010). Grey falcons do not appear to be associated with particular vegetation types (Schoenjahn *et al.*, 2019); they often sit motionless in the canopies of trees or dead branches of eucalypts (Falkenberg, 2010). The grey falcon tends to prefer sparsely-treed, open plains and creek lines for hunting (Olsen & Olsen, 1986). Breeding habitat for this species has been observed to be riparian habitat as well as other productive 'oases' within an arid environment, though not necessarily immediately adjacent to waterholes (Sutton, 2010). Nesting often occurs in the abandoned nest of a raptor or corvid in trees or tall infrastructure such as power line towers or communications towers (Olsen & Olsen, 1986; Schoenjahn *et al.*, 2019).

The desktop assessment returned 20 records of grey falcon within 50 km of the Study Area (BHP, 2022; DBCA, 2022c). The most proximate record to the Study Area is located 12.7 km north from 2014 at Gudai-Darri Springs (DBCA, 2022c). Other records in the region include an observation of an individual in 2008 foraging approximately 50 m in the air at Area C/ South Flank approximately 37.2 km south-east of the Study Area (ENV, 2008a), opportunistically at Area C/ Packsaddle by Ecologia (2004b), and a sighting of three birds (one adult and two immature individuals) over Cracking Clay in the FMG Stage A Rail Corridor (Biota, 2004). A pair of grey falcons were observed in eucalypt woodland along Sandy Creek at the Cloudbreak Mine, approximately 42.4 km north-east, and were recorded as likely to breed in the area (Bamford Consulting, 2005). Another opportunistic sighting exists near Sandy Creek at the Cook Pool drainage line in 2015, approximately 38.4 km north-east of the Study Area (DBCA, 2022c). No grey falcons were recorded during the current survey.

The Study Area provides critical breeding and foraging habitat for the species, in the form of the Major Drainage Line habitat. The Drainage Area/ Floodplain and Minor Drainage Line habitats may also provide supporting foraging habitat for the species. Therefore, the species is considered Likely to occurs, if not permanently, as a frequent visitor.

Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable (EPBC/ BC Act)

This species tends to shelter amongst rocky habitats, in small caves or under vegetation during the day. The species commonly inhabits moist areas such as gorges, rivers, pools and surrounding hills, but can be found in a range of habitats (Burbidge, 2004; DSEWPaC, 2011b). In the Hamersley region, the Pilbara olive python is most often encountered in the vicinity of permanent waterholes in rocky ranges or among riverine vegetation (DSEWPaC, 2011b; Pearson, 1993). It is a common misconception that the species is reliant and restricted to areas near permanent water; however, the species is likely to be attracted to these areas due to the productivity and abundance of suitably-sized prey (Pearson, 2003). Critical habitat for the Pilbara olive python is represented by rocky outcrops in proximity to deep gorges, gullies, and water holes within home range (88 – 450 ha) and dense riparian vegetated sites in association with permanent wetlands (spring fed) within the home range (88-450 ha) of the individual (DSEWPaC, 2011b).

Pilbara olive pythons are known to occur across the Pilbara bioregion, particularly within the Hamersley subregion. The Study Area is located at the south-eastern extent of the species current distribution, whereby the species or species habitat may occur (DoEE, 2019). The desktop assessment returned 78 records of the Pilbara olive python within 50 km of the Study Area (BHP, 2022; DBCA, 2022c). The nearest record of the species (dated 2014) occurs 3 km southwest of the Study Area (DBCA, 2022c). Regionally, records are found 4.5 km northeast of the Study Area at Marillana by Biologic (2013b), comprising two individuals and scat records from rock pools in Gorge/ Gully and Minor Drainage Line habitat. Pilbara Olive Pythons have been recorded on numerous occasions at Gudai-Darri, approximately 12.3 km north of the Study Area, from 2010 – 2014 (DBCA, 2022c). Records also exist south of the Study Area (from approximately 6.5 km) around Yandi (Biologic, 2011f), the Mining Area C and South Flank area (Biologic, 2013a, 2013c; Biota, 2013a, 2013b; Outback Ecology, 2008) and Jinidi to Mainline (Biologic, 2012a). No evidence of the Pilbara olive python was found within the Study Area during the current survey

Gorge/ Gully habitat and Breakaway/ Cliff potentially provide critical breeding and dispersal/ foraging habitat for the species within the Study Area. Additionally, one persistent water features (WBKA-01) are known within the Study Area. For Pilbara olive pythons, this water feature represents a critical foraging location. Major Drainage Line and Minor Drainage Line habitat (in areas that are prone to pooling and ponding, particularly following large rainfall events, and providing dispersal corridors throughout the landscape) and the remaining water features provide supporting habitat to the species. The Pilbara olive python may occur throughout the Study Area in these habitats, particularly where they facilitate connectivity between critical habitats.

It is considered Highly Likely that a population occurs within the Study Area based on previous records within and in the vicinity of the Study Area and the presence of critical breeding and foraging habitat. This population, if present, would be considered an 'important population' as defined by DoE (2013).

5.4.2 Species Confirmed within the Study Area

In addition to ghost bat discussed above (see Section 5.4.1), one other significant species was confirmed as occurring within the Study Area.

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

The Western Pebble-mound Mouse is a species endemic to the Pilbara region, though was previously distributed through the Gascoyne and Murchison regions (Start *et al.*, 2000). Using a readily available supply of stones, this species builds an above ground mound atop underground tunnels (Anstee & Armstrong, 2001; Dunlop & Pound, 1981). The Western Pebble-mound Mouse appears to inhabit a single primary mound during the day and visit secondary mounds within their home range during the night (Anstee, 1996). Due to the need for mound construction, the species almost exclusively occurs on gentle slopes of rocky ranges and undulating plains, where the ground is covered with a stony mantle and is vegetated by hard spinifex and often sparse overstorey of eucalypts and scattered shrubs (Anstee & Armstrong, 2001; Dunlop & Pound, 1981).

The species has previously been recorded on 102 occasions within the Study Area (BHP, 2022). During the current survey, the western pebble-mound mouse was recorded from 26 mounds of which three are active mounds, 12 recently inactive mounds and 11 inactive mounds (Table 5.4; Figure 5.1). All records were within Hillcrest/ Hillslope habitat (Table 5.4; Figure 5.1).

The species is considered to occur within the Study Area as a resident, where its occurrence is likely to be common and widespread across the lower slopes of Hillcrest/ Hillslope habitats. The species may also forage more broadly into Drainage Area/ Floodplain habitat where adjacent to habitat permitting burrowing and mound construction.

5.4.3 Species Highly Likely to Occur

In addition to northern quoll and the Pilbara olive python discussed above (see Section 5.4.1), two other significant species is considered Highly Likely to occur in the Study Area: peregrine falcon and Pilbara flat-headed blind-snake.

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

In arid areas of its distribution, the peregrine falcon is often recorded along cliffs above rivers, ranges and wooded watercourses where it hunts birds (Johnstone & Storr, 1998). It typically nests on rocky ledges occurring on tall, vertical cliff faces between 25–50 m high (Olsen & Olsen, 1989). It also appears to prefer nesting on ledges a reasonable distance (average of 13 m) from the top of the cliff (Olsen & Olsen, 1989), possibly to avoid predators. Nesting also occasionally occurs in tall trees along drainage lines, including use of abandoned nests of other large bird species (Olsen & Olsen, 1989).

The nearest record of the species (dated 2013) is located 4.9 km northeast of the Study Area (Biologic, 2013b). No peregrine falcons were recorded within the Study Area during the current survey.

The species is considered Highly Likely to occur within the Study Area to forage within all broad fauna habitats occurring. Due to the species broad foraging range and the widespread occurrence of these habitats in the broader vicinity of the Study Area, foraging is likely to occur over a much broader area and not confined to the Study Area. Suitable nesting habitat may be provided by the Breakaway/ Cliff habitat within the Study Area.

Pilbara Flat-headed Blind-snake (*Anilios ganei*) – Priority 1 (DBCA)

Little is known about the Pilbara flat-headed blind-snake; however, it can be assumed that its ecology and behaviour are similar to other blind snake species (Cogger, 2014). Due to its fossorial nature, the species is rarely encountered, and little is known of the species habitat preferences. Records of the species are often associated with moist gorges and gullies (Wilson & Swan, 2014).

The nearest record of the species (dated 2013) is located 2.5 km northeast of the Study Area (Biologic, 2013b). The Pilbara flat-headed blind-snake was not recorded during the current survey. It is Highly Likely to occur as a resident within Hillcrest/ Hillslope habitat, particularly in areas where leaf litter accumulates, and moisture is retained in leaf litter and substrates.

5.4.4 Species Likely to Occur

Other than the Pilbara leaf-nosed bat and grey falcon (as discussed above in Section 5.4.1), no other significant species were considered Likely to occur in the Study Area.

5.4.5 Species Possible to Occur

Within the Study Area, five significant species are considered to Possibly occur.

Brush-tailed Mulgara (*Dasycercus blythi*) – Priority 4 (DBCA)

The brush-tailed mulgara is often recorded from a range of sandy and stony plain habitats (Pavey *et al.*, 2012). The nearest record of the species to the Study Area is located approximately 11.4 km north (Biologic, 2013b). No evidence of the species was recorded during the current survey; however, the species is considered Possible to occur as a resident in Drainage Area/ Floodplain habitats where suitable vegetation cover and sandy or loamy substrates permitting burrowing are present.

Long-tailed Dunnart (*Sminthopsis longicaudata*) – Priority 4 (DBCA)

Despite the relatively widespread distribution of long-tailed dunnart, the species is often sparsely distributed and locally uncommon in the Pilbara region, where it often occurs in rugged rocky areas, scree slopes and stony plains and plateaus dominated by open shrubland and *Triodia* grassland vegetation (van Dyck *et al.*, 2013).

The species has previously being recorded approximately 84.4 km northeast of the Study Area (DBCA, 2022c). No evidence of the long-tailed dunnart was recorded within the Study Area during the current survey. Within the Study Area, the species is considered Possible to occur as a resident within

Breakaway/ Cliff and Hillcrest/ Hillslope, potentially moving into adjacent habitats to forage and/or disperse

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

The fork-tailed swift is a wide ranging but sparsely distributed species that occurs in a wide range of dry and/or open habitats (Johnstone & Storr, 1998). The species does not breed in Australia, migrating from breeding grounds in the northern Hemisphere. During its occurrence in Australia, the species is almost exclusively aerial, feeding and possibly also roosting aerially (DoE, 2018).

The nearest recent record (2013) is located approximately 10 km southeast of the Study Area (Biologic, 2013b). The fork-tailed swift was not recorded during the current survey. However, the species is considered Possible to occur as an infrequent visitor. The fork-tailed swift may forage in the airspace above all habitats occurring within the Study Area; however, landing or nesting within the Study Area unlikely.

Pilbara Barking Gecko (*Underwoodisaurus seorsus*) – Priority 2 (DBCA)

The Pilbara Barking Gecko is listed by the DBCA as a Priority 2 species. The species is only known from a small area of the Hamersley Range, from north of Tom Price to the West Angelas mine area, where it has been encountered in rocky areas, including within rocky gorges (Doughty & Oliver, 2011).

The Pilbara barking gecko has previously been recorded 22.4 km south in 2010 (Biologic, 2011a). Although the species was not recorded during the current field surveys it is considered Possible to occur. Within the Study Area. The species is most likely to occur within Gorge/ Gully and Breakaway/ Cliff habitat, although it typically occurs at higher altitudes than those recorded in the Study Area.

Spotted Ctenotus (*Ctenotus uber* subsp. *johnstonei*) – Priority 2 (DBCA)

Habitat preferences of the spotted ctenotus are poorly known; however, previous records of the subspecies in the Pilbara region are associated with stony hillslope and plain habitats with variable vegetation cover, often dominated by open *Acacia* shrubland and *Triodia* hummock grassland (Cogger, 2014). It should be noted that there is currently some taxonomic uncertainty regarding the isolated Pilbara population of this subspecies, and the population may represent an undescribed taxon (P. Doughty, WAn Museum, *pers. comm*.). However, until the taxa is formally recognised as independent of *Ctenotus uber* subsp. *johnstonei* and its taxonomic and conservation status is resolved, it is treated as such.

The species has previously been recorded 27.2 km northwest of the Study Area in 2012 (Biologic, 2012b). No evidence of the spotted ctenotus was recorded during the current survey. However, the species is considered Possible to occur as a resident in the Gorge/ Gully, Breakaway/ Cliff and to a lesser extent the lower slopes of Hillcrest/ Hillslope habitats.

5.5 Constraints and Limitations

The EPA (2020b) outlines several potential limitations to vertebrate fauna surveys. These aspects are assessed and discussed in Table 5.7 below. Access within the Study Area was poor, resulting in a reduced amount of survey coverage.

Table 5.7: Survey constraints and limitations

Potential limitation or constraint	Constraint	Applicability to this survey
Availability of data and information	No	A significant amount of survey work has been undertaken in the wider local area and the surrounding region, and most of these previous survey results were available for review at the time of reporting.
Competency/ experience of the survey team, including experience in the bioregion surveyed	No	The field personnel involved in the survey are experienced in undertaking fauna surveys of similar nature, including with the species of significance targeted during the survey. Technical personnel with relevant expertise assisted with analysis of ultrasonic recordings (Bob Bullen).
Scope of the survey, e.g. where faunal groups were excluded from the survey	No	The scope was a basic vertebrate fauna survey which was conducted within the EPA (2020b) framework.
Timing, weather, and season	No	Below average rainfall was recorded in the 11 months prior to the survey (September 2021 to June 2022), potentially reducing the abundance and activity levels of some vertebrate groups during sampling. However, prior to the survey (in May and June 2022), rainfall was well above the long-term average. Maximum temperatures recorded were slightly higher than the long-term averages. Minimum temperatures were also lower than the long-term average particularly during the survey period in July and August. However, these temperatures are unlikely to have impacted upon the detectability of fauna.
Disturbance that may have affected results, e.g. fire, flood	No	No temporary disturbance impinged on the results of this assessment.
Proportion of fauna identified, recorded or collected	No	All vertebrate fauna observed during the field surveys were identified to species level. Species identification of fauna recorded via camera traps and ultrasonic recordings were able to be accurately identified with the assistance of technical personnel with relevant expertise.
Adequacy of the survey intensity and proportion of the survey achieved, e.g. the extent to which the area was surveys	No	A basic survey was undertaken across the Study Area to assist with decisions on future environmental approvals. The sampling methods and survey intensity was appropriate to achieve the scope of the survey. The intent of the basic level survey was to collect preliminary and baseline information on site.
Access problems	Yes	Access within the Study Area was poor, resulting in a reduced amount of survey coverage.

Potential limitation or constraint	Constraint	Applicability to this survey
Problems with data and analysis, including sampling bias	No	No limitations with data collection and/or analysis were encountered during the field survey or during subsequent analysis.

6 CONCLUSION

Seven broad fauna habitat types were recorded and mapped within the Study Area, comprising, in decreasing order of extent, Hillcrest/ Hillslope (2,526.92 ha, 79.82%), Gorge/ Gully (186.57 ha, 5.89%), Drainage Area/ Floodplain (129.70 ha, 4.10%), Major Drainage Line (94.48 ha, 2.98%), Minor Drainage Line 86.76 ha, 2.74%), Breakaway/ Cliff (72.16 ha, 2.28%) and Basalt Outcrop (12.34 ha, 0.39%). The remaining 1.80% (57.03 ha) of the Study Area was mapped as Cleared/ Disturbed. All seven fauna habitats mapped are broadly distributed and well represented across Pilbara bioregions, and therefore support fauna assemblages which are generally common and widespread. In total, four caves and four water features, which are often of greater importance to some significant species, were recorded within the Study Area.

Of the seven fauna habitats mapped within the Study Area, six are considered to provide critical habitat for six of the seven targeted MNES species (northern quoll, ghost bat, Pilbara leaf-nosed bat, Pilbara olive python, night parrot and grey falcon). Gorge/ Gully provides critical breeding, foraging and dispersal for northern quoll and Pilbara olive python as well as supporting foraging and dispersal habitat for ghost bat and Pilbara leaf-nosed bat. Basalt Outcrop provides critical breeding, foraging and dispersal for northern quoll. Breakaway/ Cliff provides critical breeding, foraging and dispersal for northern quoll and Pilbara olive python as well as supporting foraging and dispersal habitat for Pilbara leaf-nosed bat. Drainage Area/ Floodplain provides critical foraging and dispersal for ghost bat and supporting foraging and dispersal habitat for Pilbara leaf-nosed bat and grey falcon. Major Drainage Line provides critical breeding, foraging and dispersal for grey falcon, critical foraging and dispersal for northern quoll and ghost bat as well as supporting foraging and dispersal habitat for Pilbara leaf-nosed bat and Pilbara olive python. Minor Drainage Line provides critical foraging and dispersal for ghost bat and supporting foraging and dispersal habitat for Pilbara leaf-nosed bat, grey falcon and Pilbara olive python. Hillcrest/ Hillslope also provides supporting foraging and dispersal habitat for Pilbara leaf-nosed bat. The Study Area also contains six habitats of medium significance to other significant species identified in the desktop assessment (including peregrine falcon, Pilbara flat-headed blind snake and western pebble-mound mouse).

The desktop assessment identified a total of 377 vertebrate fauna species as potentially occurring within the Study Area, comprising 57 mammals (including 47 native and 10 non-native), 179 birds, 130 reptiles and 11 amphibians. A total of 69 vertebrate fauna species, comprising 16 mammal species (13 native and three introduced), 44 bird species and nine reptile species were recorded during the field survey.

Of the 39 significant species identified in the desktop assessment, two were Confirmed to occur within the Study Area. Ghost bat presence was detected at one cave (CBKA-02) via one fresh scat (<1 month old). The western pebble-mound mouse was recorded from 26 mounds of which 22 were located within the Study Area. Of the 22 mounds within the Study Area, two were active mounds, nine were recently inactive mounds and 11 were inactive mounds. Of the four mounds located outside the Study Area (between 188 m and 612 m south of Marillana South), one mound was active and three mounds were

recently inactive. All pebble-mounds were recorded in Hillcrest/ Hillslope habitat. Based on known species' distributions, previous records and the habitats present within the Study Area, a further four species were deemed Highly Likely to occur. These included northern quoll (*Dasyurus hallucatus*), Pilbara olive python (*Liasis olivaceus barroni*), peregrine falcon (*Falco peregrinus*) and Pilbara flat-headed blind-snake (*Anilios ganei*). A further five species were deemed Possible to occur: brush-tailed mulgara (*Dasycercus blythi*), long-tailed dunnart (*Sminthopsis longicaudata*), fork-tailed swift (*Apus pacificus*), Pilbara barking gecko (*Underwoodisaurus seorsus*) and spotted ctenotus (*Ctenotus uber* subsp. *johnstonei*). The remaining 28 species were considered Unlikely or Highly Unlikely to occur within the Study Area, based on distance of previous records to the Study Area and/or the absence of suitable permanent or seasonal habitats and/or specific micro-habitats occurring within the Study Area.

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8 APPENDICES

Appendix A – Conservation Listings

International Union for Conservation of Nature

Category	Definition
Extinct (Ex)	A taxon is Extinct when there is no reasonable doubt that the last individual has died. A taxon is presumed Extinct when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Extinct in the Wild (Ex)	A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range. A taxon is presumed Extinct in the Wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
Critically Endangered (Cr)	A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V), and it is therefore considered to be facing an extremely high risk of extinction in the wild.
Endangered (En)	A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V), and it is therefore considered to be facing a very high risk of extinction in the wild.
Vulnerable (Vu)	A taxon is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V), and it is therefore considered to be facing a high risk of extinction in the wild.
Near Threatened (NT)	A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future
Data Deficient (DD)	A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution are lacking. Data Deficient is therefore not a category of threat. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases, great care should be exercised in choosing between DD and a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

Environment Protection and Biodiversity Conservation Act 1999

Category	Definition
Threatened	
Extinct (EX)	Presumed extinct i.e. there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild (EW)	Presumed extinct in the wild, only surviving in cultivation, captivity or as a naturalised population well outside its past range.
Critically Endangered (CE)	Taxa facing an extremely high risk of extinction in the wild in the immediate future (i.e. 50% chance of extinction in the immediate future).
Endangered (EN)	Taxa facing a very high risk of extinction in the wild in the near future i.e. 20% chance of extinction in the near future.
Vulnerable (VU)	Taxa facing a high risk of extinction in the wild in the medium-term future i.e. 10% chance of extinction in the medium-term future.
Conservation Dependent (CD)	Taxa which will become Vulnerable, Endangered or Critically Endangered if specific conservation efforts cease.
Other	
Migratory (MI)	Birds listed under international agreements relating to the protection of migratory birds i.e. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA) or Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Biodiversity Conservation Act 2016

Category	Definition
Extinct	
Extinct (EX)	Presumed extinct i.e. there is no reasonable doubt that the last member of the species has died.
Extinct in the Wild (EW)	Presumed extinct in the wild i.e. species which have been adequately searched for and there is no reasonable doubt that the last wild individual has died.
Threatened	
Critically Endangered (CE)	Taxa facing an extremely high risk of extinction in the wild.
Endangered (EN)	Taxa facing a very high risk of extinction in the wild.
Vulnerable (VU)	Taxa facing a high risk of extinction in the wild.
Specially Protected	
Migratory (MI)	Birds listed under international agreements relating to the protection of migratory birds i.e. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), China-Australia Migratory Bird Agreement (CAMBA), Japan-Australia Migratory Bird Agreement (JAMBA) or Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).
Conservation Dependent (CD)	Species dependent on ongoing conservation intervention to prevent them becoming eligible for listing as threatened.
Other specially protected fauna (OS)	Species otherwise in need of special protection to ensure their conservation.

Department of Biodiversity, Conservation and Attractions Priority codes

Category	Definition
Poorly known	
Priority 1 (P1)	Species that are known from one or a few locations which are potentially at risk. Species whose occurrences are either small, on lands not managed for conservation or otherwise threatened with habitat destruction or degradation. Species that are well known from one or more locations but are under immediate threat from threatening processes. In urgent need of further survey.
Priority 2 (P2)	Species that are known from one or a few locations, some of which are on lands managed for conservation. Species that are well known from one or more locations but are under threat from threatening processes. In urgent need of further survey. In need of further survey.
Priority 3 (P3)	Species that are well known from several locations and are not are under imminent threat. Species known from few but widespread locations with either a large population size or with large areas of suitable habitat remaining, much of which is not under imminent threat. Species that are well known from one or more locations and threatening processes exist that could affect them.
Rare, Near Threatened and other species in need of monitoring	
Priority 4 (P4)	*Rare* – Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection but could be if present circumstances change. *Near Threatened* – Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable but are not listed as Conservation Dependent. *In need of monitoring* - Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy

Appendix B – Vertebrate Fauna Recorded in the Desktop Assessment and Field Survey

Species		Conservation Status				Database review				Report																																
Scientific Name	Common Name	EPBC Act	BC Act	DBCA	IUCN	NatureMap (40 km)	EPBC (50km)	DBCA Priority and Threatened	Birdlife (50km)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
BOVIDAE																																										
**Bos taurus*	*Cow*					•						•	•	•				•	•				•		•	•	•	•	•	•			•		•		•	•	•	•	
**Capra hircus*	*Goat*																																•									
CAMELIDAE																																									
**Camelus dromedarius*	*Camel*					•						•	•												•					•					•			•			
CANIDAE																																									
**Canis familiaris*	*Dog*										•	•	•	•			•		•	•		•	•	•	•		•	•		•		•	•		•		•	•	•	•	•
**Vulpes vulpes*	*Fox*															•											•								•						
DASYURIDAE																																									
Dasycercus blythi	*Brush-tailed mulgara*			P4		•		•																						•											•
Dasykaluta rosamondae	*Little-red kaluta*					•						•	•	•	•	•							•				•	•		•	•	•			•		•			•	
Dasyurus hallucatus	*Northern quoll*	EN	EN		EN	•	•	•				•															•														
Ningaui ridei	*Wongai ningaui*					•																																			
Ningaui timealeyi	*Pilbara ningaui*					•						•	•	•	•	•										•	•	•		•		•			•	•			•	
Planigale ingrami	*Long-tailed planigale*					•							•														•				•	•								
Planigale sp. indet	*Undescribed pilbara planigale*											•		•	•	•												•		•					•		•				
Pseudantechinus macdonnellensis	*Fat-tailed antechinus*																										•														
Pseudantechinus roryi	*Rory's pseudantechinus*					•																																			
Pseudantechinus woolleyae	*Woolley's pseudantechinus*					•								•										•					•										•	
Sminthopsis crassicaudata	*Fat-tailed dunnart*																																								
Sminthopsis hirtipes	*Hairy-footed dunnart*																																							•	
Sminthopsis longicaudata	*Long-tailed dunnart*			P4		•		•																																
Sminthopsis macroura	*Stripe-faced dunnart*					•							•	•		•							•		•		•	•		•	•	•					•	•		
Sminthopsis ooldea	*Ooldea dunnart*					•																						•			•	•								
Sminthopsis youngsoni	*Lesser hairy-footed dunnart*					•						•											•				•		•											
EMBALLONURIDAE																																									
Saccolaimus flaviventris	*Yellow bellied sheath-tail bat*					•					•	•	•			•							•		•	•			•	•	•	•	•	•	•	•	•		•	•
Taphozous georgianus	*Common sheath-tailed bat*					•						•	•		•				•				•	•	•	•	•		•	•	•	•	•	•	•	•	•		•	•
Taphozous hilli	*Hill's sheathtail-bat*					•							•										•					•				•								
EQUIDAE																																									
**Equus asinus*	*Donkey*					•					•															•	•		•			•								
**Equus caballus*	*Horse*					•							•						•				•		•							•	•				•	•	•	
FELIDAE																																									
**Felis catus*	*Domestic cat*					•						•		•	•	•	•	•	•	•		•	•				•	•	•	•		•			•	•	•		•	•	•
LEPORIDAE																																									
**Oryctolagus cuniculus*	*European rabbit*					•																•	•		•								•				•				
MACROPODIDAE																																									
Osphranter robustus subsp. erubescens	*Euro*					•					•	•	•	•	•	•	•	•	•			•		•	•		•	•	•	•		•		•	•	•	•	•		•	•
Osphranter rufus	*Red kangaroo*					•						•		•	•		•						•	•	•		•			•	•	•	•		•		•	•	•	•	•
Petrogale lateralis subsp. lateralis	*Black-flanked rock-wallaby*	EN	EN		VU	•		•																																	
Petrogale rothschildi	*Rothschild's rock-wallaby*										•		•		•				•			•		•			•	•	•	•				•							
MEGADERMATIDAE																																									

Species		Conservation Status				Database review				Report																																
Scientific Name	Common Name	EPBC Act	BC Act	DBCA	IUCN	NatureMap (40 km)	EPBC (50km)	DBCA Priority and Threatened	Birdlife (50km)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Macroderma gigas	*Ghost bat*	*VU*	*VU*		*VU*	●	●	●				●																	●	●			●									
MOLOSSIDAE																																									
Austronomus australis	*White-striped free-tailed bat*					●						●	●	●		●								●	●	●	●		●	●								●			
Chaerephon jobensis subsp. colonicus	*Greater northern free-tailed bat*					●						●	●	●	●	●							●	●	●		●		●	●	●	●	●	●	●	●	●	●		●	●
Ozimops lumsdenae	*Northern free-tailed bat*												●	●	●	●							●	●	●			●		●	●	●	●	●	●	●	●				
MURIDAE																																									
Leggadina lakedownensis	*Northern short-tailed mouse*			*P4*		●		●																			●													
**Mus musculus*	*House mouse*					●						●		●		●							●				●				●	●			●	●	●				
Notomys alexis	*Spinifex hopping-mouse*					●						●			●								●				●			●											
Pseudomys chapmani	*Western pebble-mound mouse*			*P4*			●	●		●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pseudomys delicatulus	*Delicate mouse*						●																				●													
Pseudomys desertor	*Desert mouse*						●					●	●			●							●				●			●	●	●				●			●	
Pseudomys hermannsburgensis	*Sandy inland mouse*						●					●	●	●	●	●							●			●	●	●		●		●			●	●	●			●	
Pseudomys nanus	*Western chestnut mouse*						●																																		
Zyzomys argurus	*Common rock rat*					●						●	●	●	●	●				●				●		●	●	●		●		●			●					●	
PHALANGERIDAE																																									
Trichosurus vulpecula subsp. arnhemensis	*Northern brushtail possum*																																								
PTEROPODIDAE																																									
Pteropus alecto subsp. gouldii	*Black flying-fox*																																								
RHINONYCTERIDAE																																									
Rhinonicteris aurantia	*Pilbara leaf-nosed bat*	*VU*	*VU*			●	●	●					●						●													●								
TACHYGLOSSIDAE																																									
Tachyglossus aculeatus subsp. acanthion	*Short-beaked Echidna*					●						●							●					●			●	●		●										●
THYLACOMYIDAE																																									
Macrotis lagotis	*Greater bilby*	*VU*	*VU*		*VU*	●	●	●																			●													
VESPERTILIONIDAE																																									
Chalinolobus gouldii	*Gould's wattled bat*					●					●	●	●	●	●	●			●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Chalinolobus morio	*Chocolate wattled bat*					●							●												●					●		●				●		●		
Nyctophilus daedalus	*Northern long-eared bat*					●							●	●									●							●			●				●			
Nyctophilus geoffroyi subsp. geoffroyi	*Lesser long-eared bat*					●						●	●						●				●	●	●				●	●		●	●	●	●	●		●		●	
Scotorepens balstoni	*Inland broad-nosed bat*																											●													
Scotorepens greyii	*Little broad-nosed bat*					●					●	●	●		●	●			●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Vespadelus finlaysoni	*Finlayson's cave bat*					●						●	●		●				●				●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
ACANTHIZIDAE																																									
Acanthiza apicalis	*Broad-tailed thornbill or inland thornbill*					●			●			●	●				●								●		●	●		●		●	●				●	●			
Acanthiza chrysorrhoa	*Yellow-rumped thornbill*					●			●														●		●			●				●					●	●			
Acanthiza robustirostris	*Slaty-backed thornbill*					●			●																●		●	●		●		●						●			
Acanthiza uropygialis	*Chestnut-rumped thornbill*					●			●			●												●		●		●	●		●		●	●		●		●		●	
Aphelocephala leucopsis	*Southern whiteface*								●																																
Gerygone fusca	*Western gerygone*					●			●	●	●	●	●	●			●	●				●	●		●	●	●	●	●	●		●	●		●		●	●	●	●	
Pyrrholaemus brunneus	*Redthroat*					●			●																																

Species		Conservation Status				Database review				Report																																
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Smicrornis brevirostris	*Weebill*					•			•		•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ACCIPITRIDAE																																									
Accipiter cirrocephalus	*Collared sparrowhawk*					•			•			•		•				•					•	•				•	•	•		•			•					•	
Accipiter fasciatus	*Brown goshawk*					•			•		•	•	•	•		•						•	•		•		•	•		•			•			•	•	•		•	
Aquila audax	*Wedged-tailed eagle*					•			•			•	•	•	•	•								•		•		•	•		•		•			•			•		•	•
Circus approximans	*Swamp harrier*								•																						•										
Circus assimilis	*Spotted harrier*					•			•			•	•	•	•									•	•	•			•		•		•			•	•	•	•		•	
Elanus caeruleus subsp. axillaris	*Black-shouldered kite*					•			•							•		•					•	•	•		•			•					•			•			
Elanus scriptus	*Letter-winged kite*			*P4*	*NT*	•		•																																	
Haliaeetus leucogaster	*White-bellied sea-eagle*								•																																	
Haliastur sphenurus	*Whistling kite*					•			•		•	•	•			•		•					•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Lophoictinia isura	*Square-tailed kite*					•			•																					•											
Hamirostra melanosternon	*Black-breasted buzzard*					•			•			•				•							•	•	•	•				•					•			•		•	•
Hieraaetus morphnoides	*Little eagle*					•			•			•		•				•					•	•			•			•						•					•
Milvus migrans	*Black kite*					•			•		•	•	•			•		•						•	•	•		•			•					•	•	•	•		•	
Pandion haliaetus	*Eastern osprey*	*MI*	*MI*					•																																	
ACROCEPHALIDAE																																									
Acrocephalus australis	*Australian reed warbler*					•			•		•		•					•												•											
AEGOTHELIDAE																																									
Aegotheles cristatus	*Australian owlet-nightjar*					•			•		•	•	•		•		•	•							•			•		•				•	•	•	•	•		•	•
ALAUDIDAE																																									
Mirafra javanica	*Horsfield's bushlark*					•			•			•	•		•								•	•	•					•							•		•	•
ALCEDINIDAE																																									
Dacelo leachii subsp. leachii	*Blue-winged kookaburra*					•			•		•	•	•	•		•		•				•	•	•		•			•	•		•	•			•	•				
Todiramphus pyrrhopygius	*Red-backed kingfisher*					•			•		•	•	•	•	•	•		•					•	•	•	•	•		•	•	•	•				•	•	•		•	•
Todiramphus sanctus	*Sacred kingfisher*					•			•		•	•	•				•		•				•		•		•			•					•	•		•	•		
ANATIDAE																																									
Anas gracilis	*Grey teal*								•					•												•														•	
Anas superciliosa	*Pacific black duck*					•			•		•		•	•				•								•		•		•	•			•				•			
Aythya australis	*Hardhead*								•																									•							
Chenonetta jubata	*Australian wood duck*																						•		•												•				
Cygnus atratus	*Black swan*								•																															•	
Dendrocygna eytoni	*Plumed whistling duck*					•			•																																
Malacorhynchus membranaceus	*Pink-eared duck*								•																																
Tadorna tadornoides	*Australian shell duck*								•																															•	
ANHINGIDAE																																									
Anhinga novaehollandiae	*Australasian darter*					•			•				•																												
APODIDAE																																									
Apus pacificus	*Fork-tailed swift*	*MI*	*MI*			•		•	•		•	•																											•	
ARDEIDAE																																									
Ardea modesta	*Eastern great egret*								•									•																						•	
Ardea novaehollandiae	*White-faced heron*					•			•		•		•	•		•							•		•		•	•								•			•	

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Ardea pacifica	*White-necked heron*					•			•					•															•								•	•			•
Ixobrychus flavicollis	*Black bittern*					•																																		
Nycticorax caledonicus subsp. australasiae	*Nankeen night heron*								•				•	•				•												•										
Artamus cinereus	*Black-faced woodswallow*					•			•	•	•	•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Artamus cyanopterus	*Dusky woodswallow*					•																													•					
Artamus minor	*Little woodswallow*					•			•		•	•	•	•	•		•	•				•		•	•	•	•	•	•	•		•		•	•	•	•			•
Artamus personatus	*Masked woodswallow*					•			•			•	•				•					•	•	•		•		•		•		•		•		•	•	•
Cracticus nigrogularis	*Pied butcherbird*					•			•		•	•	•	•	•	•	•	•				•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•
Cracticus tibicen	*Australian magpie*					•			•		•	•	•	•		•	•	•				•	•	•	•			•	•		•	•	•		•	•	•	•	•	•
Cracticus torquatus	*Grey butcherbird*					•			•					•									•	•		•		•	•		•		•	•		•	•	•	•	
BURHINIDAE																																								
Burhinus grallarius	*Bush stone-curlew*					•			•																		•													
CACATUIDAE																																								
Cacatua roseicapilla	*Galah*					•			•			•	•	•	•	•		•				•	•	•	•		•	•		•	•	•	•		•	•	•	•	•	•
Cacatua sanguinea	*Little corella*					•			•		•	•	•		•		•	•	•			•	•	•	•	•	•	•		•		•			•		•	•	•	•
Nymphicus hollandicus	*Cockatiel*					•			•			•	•	•	•	•				•			•	•		•		•			•	•	•			•		•	•		•	•
CAMPEPHAGIDAE																																								
Coracina maxima	*Ground cuckoo-shrike*					•			•				•															•							•	•		•			
Coracina novaehollandiae subsp. subpallida	*Black-faced cuckoo-shrike*					•			•		•	•	•	•	•	•	•	•	•			•	•	•		•	•	•	•	•	•	•		•	•	•	•	•	•	•
Lalage tricolor	*White-winged triller*					•			•		•	•	•	•	•	•	•	•	•			•	•	•			•	•		•	•	•		•	•		•	•		•	•
CAPRIMULGIDAE																																								
Eurostopodus argus	*Spotted nightjar*					•			•		•		•		•			•				•	•	•	•			•				•	•	•	•	•	•		•	•
CASUARIIDAE																																								
Dromaius novaehollandiae	*Emu*					•			•			•	•	•				•	•				•				•	•		•		•			•				•	•
CHARADRIIDAE																																								
Charadrius ruficapillus	*Red-capped plover*								•																															
Charadrius veredus	*Oriental plover*	*MI*	*MI*					•																																
Elseyornis melanops	*Black-fronted dotterel*					•			•		•		•	•		•		•									•	•		•								•	
Erythrogonys cinctus	*Red-kneed dotterel*					•																																		
CICONIIDAE																																								
Ephippiorhynchus asiaticus	*Black-necked stork*																																							
CINCLOSOMATIDAE																																								
Cinclosoma castaneothorax	*Chestnut-breasted quail-thrush*								•																															
CLIMACTERIDAE																																								
Climacteris melanurus	*Black-tailed treecreeper*								•					•										•		•			•								•	•			
COLUMBIDAE																																								
Geopelia cuneata	*Diamond dove*					•			•	•		•	•	•	•	•	•	•	•				•	•	•	•	•	•	•		•	•	•		•	•	•	•	•	•
Geopelia striata subsp. placida	*Peaceful dove*					•			•		•			•		•		•	•				•		•	•	•		•	•	•		•	•	•	•	•	•			
Geophaps plumifera subsp. ferruginea	*Spinifex pigeon*					•			•	•	•	•	•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•		•		•	•	•	•		•	•
Ocyphaps lophotes	*Crested pigeon*					•			•		•	•	•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Phaps chalcoptera	*Common bronzewing*					•			•		•	•	•	•	•	•		•					•	•	•		•	•	•	•		•	•	•	•	•	•	•		•

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Phaps histrionica	*Flock bronzewing*								•																															
CORVIDAE																																								
Corvus bennetti	*Little crow*					•			•						•	•						•				•		•				•						•		
Corvus orru subsp. cecilae	*Torresian crow*					•			•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•			•	•	•	•		•	•	•	•	•	•	•	•
CUCULIDAE																																								
Cacomantis pallidus	*Pallid cuckoo*					•			•			•		•	•		•						•	•	•		•	•		•		•		•			•	•		•	•
Centropus phasianinus subsp. highami	*Pheasant coucal*					•			•														•			•				•										
Chrysococcyx basalis	*Horsfield's bronze cuckoo*					•			•			•	•	•	•	•		•					•	•	•	•	•	•		•		•	•	•			•		•	•
Chrysococcyx osculans	*Black-eared cuckoo*					•			•								•										•	•				•								
DICAEIDAE																																								
Dicaeum hirundinaceum	*Mistletoebird*					•			•					•				•					•				•	•		•		•		•	•		•			•	
ESTRILDIDAE																																								
Emblema pictum	*Painted finch*					•			•		•	•	•	•	•	•		•	•			•		•	•	•	•	•	•	•	•	•		•	•	•	•	•		•	•
Neochmia ruficauda subsp. subclarescens	*Star finch (western)*					•			•		•															•			•	•							•				
Taeniopygia guttata	*Zebra finch*					•			•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
FALCONIDAE																																								
Falco berigora	*Brown falcon*					•			•	•	•	•	•	•	•	•		•	•			•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•
Falco cenchroides	*Nankeen kestrel*					•			•	•		•	•	•	•	•	•	•	•			•	•	•	•	•	•	•		•		•			•	•	•	•		•	•
Falco hypoleucos	*Grey falcon*	*VU*	*VU*		*VU*	•	•	•																																
Falco longipennis	*Australian hobby*					•			•			•	•	•	•	•	•	•					•	•				•		•		•			•		•		•	•	
Falco peregrinus	*Peregrine falcon*		*OS*			•		•	•			•	•	•										•			•	•				•					•			•	
Falco subniger	*Black falcon*																																							
HIRUNDINIDAE																																								
Cheramoeca leucosterna	*White-backed swallow*								•																•											•				
Hirundo neoxena	*Welcome swallow*																						•																	
Petrochelidon ariel	*Fairy martin*					•			•				•		•				•				•		•					•					•			•		•	
Petrochelidon nigricans	*Tree martin*					•			•			•	•	•		•							•	•			•		•	•	•						•			•	
LARIDAE																																								
Gelochelidon nilotica	*Gull-billed tern*	*MI*	*MI*					•																															•	
Sterna caspia	*Caspian tern*	*MI*	*MI*						•																															
Sterna hybrida	*Whiskered tern*								•																														•	
Sternula albifrons	*Little tern*	*MI*	*MI*					•																																
LOCUSTELLIDAE																																								
Cincloramphus cruralis	*Brown songlark*								•			•	•	•									•							•		•			•					•
Cincloramphus mathewsi	*Rufous songlark*								•		•	•	•	•	•			•					•	•	•	•		•		•		•			•		•	•			•
Eremiornis carteri	*Spinifex bird*					•			•			•	•	•		•		•	•				•	•	•			•	•	•	•	•		•	•	•	•	•		•	•
Cincloramphus gramineus	*Little grassbird*																													•											
MALURIDAE																																								
Amytornis striatus subsp. whitei	*Striated grasswren*					•		•	•		•	•		•	•	•		•				•		•				•	•	•		•		•							
Malurus assimilis subsp. assimilis	*Purple-winged fairywren*					•			•		•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Malurus leucopterus subsp. leuconotus	*White-winged fairywren*					•			•	•		•	•	•		•		•	•			•	•		•		•	•	•	•	•	•	•		•		•	•	•	•	•

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Malurus splendens	*Splendid fairywren*					•			•													•			•												•			
Stipiturus ruficeps	*Rufous-crowned emu-wren*					•			•					•	•			•									•	•	•											•
MELIPHAGIDAE																																									
Acanthagenys rufogularis	*Spiny-cheeked honeyeater*					•			•			•	•		•	•		•	•			•	•		•	•		•		•		•		•	•		•	•	•	•	
Certhionyx variegatus	*Pied honeyeater*					•			•					•										•								•	•							
Epthianura aurifrons	*Orange chat*								•																																
Epthianura tricolor	*Crimson chat*					•			•			•	•	•	•			•				•	•		•					•	•	•		•			•	•		•	•
Gavicalis virescens subsp. virescens	*Inland Singing Honeyeater*					•			•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•
Conopophila whitei	*Grey honeyeater*					•			•																•					•						•	•				
Lichmera indistincta	*Brown honeyeater*					•			•			•	•	•	•	•	•	•	•			•	•	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•
Manorina flavigula	*Yellow-throated miner*					•			•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
Melithreptus gularis subsp. laetior	*Black-chinned honeyeater*					•			•		•	•	•		•	•		•							•			•	•	•		•			•		•	•			
Ptilotula keartlandi	*Grey-headed Honeyeater*					•			•		•	•	•	•	•	•		•				•	•	•	•	•	•	•	•	•	•		•		•	•	•		•	•	•
Ptilotula penicillata	*White-plumed honeyeater*					•			•	•	•	•	•	•		•	•	•	•			•	•	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•
Ptilotula plumula	*Grey-fronted honeyeater*								•																							•				•					
Purnella albifrons	*White-fronted honeyeater*					•			•					•									•									•					•				
Sugomel niger	*Black honeyeater*								•	•		•	•	•									•	•				•				•		•			•			•	•
MEROPIDAE																																									
Merops ornatus	*Rainbow bee-eater*					•			•		•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
MONARCHIDAE																																									
Grallina cyanoleuca	*Magpie-lark*					•			•		•	•	•	•		•	•	•	•			•	•	•	•	•		•	•	•		•	•	•	•	•	•	•	•	•
MOTACILLIDAE																																									
Anthus australis subsp. australis	*Australasian pipit*					•			•			•	•	•	•		•						•						•	•									•	
Motacilla cinerea	*Grey wagtail*	MI	MI			•	•	•																																
NEOSITTIDAE																																									
Daphoenositta chrysoptera	*Varied sittella*					•			•																		•									•				
OREOICIDAE																																									
Oreoica gutturalis	*Crested bellbird*					•			•	•	•	•	•	•	•	•	•	•				•	•	•	•	•	•	•		•	•	•	•	•		•	•	•	•	
OTIDIDAE																																									
Ardeotis australis	*Australian bustard*					•			•		•	•	•	•		•	•		•			•	•	•	•		•	•	•	•		•			•	•	•	•	•	•
PACHYCEPHALIDAE																																									
Colluricincla harmonica subsp. rufiventris	*Grey shrike thrush*					•			•	•	•	•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•			•	•	•	•		•	•
Pachycephala rufiventris subsp. rufiventris	*Rufous whistler*					•			•		•	•		•	•	•	•	•					•		•	•	•	•	•	•	•	•			•	•	•	•	•	•	•
PARDALOTIDAE																																									
Pardalotus punctatus	*Spotted pardalote*																																								
Pardalotus rubricatus	*Red-browed pardalote*					•			•			•	•		•			•					•			•	•	•	•	•		•		•		•		•	•	•	•
Pardalotus striatus subsp. murchisoni	*Striated pardalote*					•			•			•	•	•	•		•	•				•	•	•	•	•		•	•	•		•		•		•	•	•	•		
PELECANIDAE																																									
Pelecanus conspicillatus	*Australian pelican*					•			•				•														•													•	
PETROICIDAE																																									
Melanodryas cucullata	*Hooded robin*					•			•		•	•	•	•	•	•	•	•	•			•	•	•		•	•	•		•	•	•	•	•	•	•	•	•	•	•

Species		Conservation Status				Database review				Report																															
Scientific Name	Common Name	EPBC Act	BC Act	DBCA	IUCN	NatureMap (40 km)	EPBC (50km)	DBCA Priority and Threatened	Birdlife (50km)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Petroica goodenovii	*Red-capped robin*					•			•			•	•			•	•					•	•				•	•		•		•					•	•	•	•	
PHAETHONTIDAE																																								
Phalacrocorax melanoleucos	*Little pied cormorant*								•		•							•								•						•								
Phalacrocorax sulcirostris	*Little black cormorant*					•			•		•			•				•								•			•											
Phalacrocorax varius subsp. hypoleucos	*Pied cormorant*					•							•																											
PHASIANIDAE																																								
Coturnix pectoralis	*Stubble quail*								•																	•														
Synoicus ypsilophora	*Brown quail*					•			•			•										•	•						•					•	•	•				
PODARGIDAE																																								
Podargus strigoides	*Tawny frogmouth*					•			•				•	•	•				•			•	•		•			•	•						•			•		
PODICIPEDIDAE																																								
Poliocephalus poliocephalus	*Hoary-headed grebe*								•																															
Tachybaptus novaehollandiae	*Australasian grebe*								•																															
POMATOSTOMIDAE																																								
Pomatostomus superciliosus	*White-browed babbler*					•			•								•										•	•						•						
Pomatostomus temporalis subsp. rubeculus	*Grey-crowned babbler*					•			•		•	•	•					•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
PROCELLARIIDAE																																								
Macronectes giganteus	*Southern giant petrel*	*EN/MI*	*MI*			•		•																															
PSITTACIDAE																																								
Barnardius zonarius	Australian ringneck					•			•		•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Melopsittacus undulatus	*Budgerigar*					•			•	•		•	•	•	•	•	•		•			•	•		•		•	•		•		•		•	•	•	•	•		•	•
Neophema elegans	*Elegant parrot*																																							
Neopsephotus bourkii	*Bourke's parrot*					•			•																•			•							•			•			
Pezoporus occidentalis	*Night parrot*	*EN*	*CR*		*EN*		•	•																															
Psephotus varius	*Mulga parrot*					•			•																															
PSOPHODIDAE																																								
Psophodes occidentalis	*Chiming wedgebill*					•			•																															
PTILINORHYNCHIDAE																																								
Ptilonorhynchus maculatus subsp. guttatus	*Western bowerbird*					•			•		•	•	•	•	•	•	•	•						•	•		•	•		•		•		•	•	•	•		•	
RALLIDAE																																								
Fulica atra	*Eurasian coot*								•																															
Gallirallus philippensis	*Buff-banded rail*								•			•																												
Porzana tabuensis	*Spotless crake*					•																																		
Tribonyx ventralis	*Black-tailed nativehen*																																							
RECURVIROSTRIDAE																																								
Himantopus himantopus	*Black-winged stilt*					•			•																					•								•	
Recurvirostra novaehollandiae	*Red-necked avocet*								•																														•	
RHIPIDURIDAE																																								
Rhipidura albiscapa	*Grey fantail*					•			•				•									•			•		•	•	•	•					•		•	•			•
Rhipidura leucophrys subsp. leucophrys	*Willie wagtail*					•			•		•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
ROSTRATULIDAE																																								

Species		Conservation Status				Database review				Report																															
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Rostratula australis	*Australian painted snipe*	*EN*	*EN*		*EN*		●	●																																	
SCOLOPACIDAE																																									
Calidris acuminata	*Sharp-tailed sandpiper*	*MI*	*MI*					●																																	
Calidris ferruginea	*Curlew sandpiper*	*CR/MI*	*CR/MI*		*NT*		●																																		
Calidris melanotos	*Pectoral sandpiper*	*MI*	*MI*					●																																	
Calidris ruficollis	*Red-necked stint*	*MI*	*MI*		*NT*			●																																	
Calidris subminuta	*Long-toed stint*	*MI*	*MI*					●																																	
Tringa glareola	*Wood sandpiper*	*MI*	*MI*					●																																	
Actitis hypoleucos	*Common sandpiper*	*MI*	*MI*					●										●																							
Tringa nebularia	*Common greenshank*	*MI*	*MI*			●		●					●																												
Tringa stagnatilis	*Marsh sandpiper*	*MI*	*MI*					●																																	
Tringa totanus	*Common redshank*	*MI*	*MI*					●																																	
STRIGIDAE																																									
Ninox boobook	*Boobook owl*								●		●		●	●	●							●	●					●				●			●	●	●			●	●
Ninox connivens	*Barking owl*					●		●					●					●																			●				
THRESKIORNITHIDAE																																									
Plegadis falcinellus	*Glossy ibis*	*MI*	*MI*					●																																	
Threskiornis spinicollis	*Straw-necked ibis*					●			●														●																●	
TURNICIDAE																																									
Turnix velox	*Little button quail*					●			●	●		●	●	●	●	●	●						●	●	●		●	●		●	●	●			●	●	●	●		●	●
TYTONIDAE																																									
Tyto javanica	*Eastern barn owl*					●			●														●												●				●	
AGAMIDAE																																									
Ctenophorus caudicinctus	*Ring-tailed dragon*					●				●	●	●	●	●	●	●			●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Ctenophorus isolepis subsp. isolepis	*Crested dragon*										●	●	●	●	●			●				●	●	●	●	●	●		●	●	●			●			●		●	
Ctenophorus nuchalis	*Central netted dragon*					●						●											●				●			●									●	
Ctenophorus reticulatus	*Western netted dragon*					●						●							●						●		●			●		●					●			
Diporiphora amphiboluroides	*Mulga dragon*												●		●								●				●	●				●								
Diporiphora valens	*Southern pilbara tree dragon*					●							●														●					●					●		●	
Gowidon longirostris	*Long-nosed dragon*					●				●	●	●	●	●	●	●	●		●			●	●		●	●	●	●	●	●	●	●	●		●	●	●	●		●	●
Pogona minor subsp. minor	*Dwarf bearded dragon*					●						●	●	●	●		●		●			●			●			●							●			●			
Pogona minor subsp. mitchelli	*Dwarf bearded dragon*					●																																			
Tympanocryptis cephalus	*Earless pebble dragon*					●																	●							●										
Tympanocryptis diabolicus	*Pebble dragon*																																								
CARPHODACTYLIDAE																																									
Nephrurus levis subsp. pilbarensis	*Knob-tailed gecko*																																								
Nephrurus cinctus	Northern banded knob-tailed gecko					●						●	●										●				●			●	●	●							●
Underwoodisaurus seorsus	*Pilbara barking gecko*			*P2*		●		●																																	
CHELIDAE																																									
Chelodina steindachneri	*Flat-shelled turtle*																																								
DIPLODACTYLIDAE																																									

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Crenadactylus ocellatus subsp. horni	*Clawless gecko*					●																										●									
Crenadactylus pilbarensis	*Pilbara clawless gecko*																																	●	●	●					
Diplodactylus conspicillatus	*Fat-tailed gecko*											●			●	●							●				●			●	●				●					●	●
Diplodactylus pulcher	*Fine-faced gecko*					●																										●									
Diplodactylus savagei	*Southern pilbara beak-faced gecko*					●						●	●		●													●		●		●				●					
Lucasium stenodactylus	*Gecko*					●						●	●		●			●					●			●	●			●	●	●	●		●					●	●
Lucasium wombeyi	*Gecko*					●						●	●		●										●			●			●	●			●			●		●	●
Oedura fimbria	*Western marbled velvet gecko*					●					●	●	●	●	●			●	●	●		●		●		●	●	●		●	●	●		●	●	●	●				●
Rhynchoedura ornata	*Western beaked gecko*					●						●	●	●	●	●							●				●			●	●	●			●	●	●			●	●
Strophurus ciliaris subsp. aberrans	*Northern spiny-tailed gecko*																										●						●							
Strophurus elderi	*Jewelled gecko*					●						●		●	●	●											●			●		●			●					●	
Strophurus jeanae	*Gecko*					●						●			●															●	●									●	
Strophurus strophurus	*Gecko*													●		●							●																		
Strophurus wellingtonae	*Gecko*					●						●			●								●	●			●			●	●	●	●		●	●			●	
ELAPIDAE																																									
Acanthophis wellsi	*Pilbara death adder*					●										●								●			●								●						
Brachyurophis approximans	*North-western shovel-nosed snake*					●						●			●															●	●	●			●	●				●	
Demansia psammophis subsp. cupreiceps	*Yellow-faced whipsnake*					●						●	●	●		●							●			●	●			●		●				●				●	
Demansia rufescens	*Rufous whipsnake*					●						●	●	●	●															●		●				●					
Furina ornata	*Moon snake*					●							●	●		●		●									●				●					●					
Pseudechis australis	*Mulga snake*					●					●	●	●	●		●		●					●	●			●			●		●	●	●	●	●	●			●	●
Pseudonaja modesta	*Ringed brown snake*					●							●							●										●		●			●					
Pseudonaja nuchalis	*Gwardar*					●																																			
Simoselaps anomalus	*Desert banded snake*			*P4*																							●													
Suta fasciata	*Rosen's snake*					●						●															●	●							●					●
Suta monachus	*Snake*											●	●	●		●							●		●					●		●	●				●		●	
Suta punctata	*Little spotted snake*					●																	●				●			●										
Vermicella snelli	*Pilbara bandy bandy*					●																					●				●										
GEKKONIDAE																																									
Christinus marmoratus	*Marbled gecko*															●												●													
Gehyra montium	*Gecko*					●																														●					
Gehyra pilbara	*Pilbara dtella*					●							●						●									●							●						
Gehyra punctata	*Spotted dtella*					●						●	●	●	●	●			●			●	●	●		●	●	●		●	●	●		●	●	●	●		●		●
Gehyra purpurascens	*Gecko*					●																									●								●	●
Gehyra variegata	*Tree gecko*					●					●	●	●	●	●	●		●	●			●	●		●		●	●		●	●	●	●	●	●	●	●	●	●	●	●
Heteronotia binoei	*Binoe's gecko*					●						●	●	●	●	●		●	●				●	●	●		●	●		●	●	●			●	●		●		●	●
Heteronotia spelea	*Desert cave gecko*					●						●	●		●				●					●			●								●	●					●
PYGOPODIDAE																																									
Delma butleri	*Legless lizard*																											●							●				●	
Delma elegans	*Legless lizard*					●						●																												
Delma nasuta	*Long-nosed delma*					●							●	●	●											●	●			●	●	●								

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Delma pax	*Legless lizard*					•						•	•	•	•	•							•			•	•	•		•	•	•		•		•	•			•	
Delma tincta	*Legless lizard*					•							•		•								•				•	•		•		•								•	
Lialis burtonis	*Burton's legless lizard*					•						•	•	•	•	•			•				•				•			•	•	•		•	•	•			•	•
Pygopus nigriceps	*Legless lizard*					•						•											•				•			•	•	•			•				•	
Delma haroldi	*Neck-barred delma*					•																					•								•					
PYTHONIDAE																																									
Antaresia childreni	*Children's python*					•						•	•	•		•			•						•		•		•	•		•			•		•		•	
Antaresia perthensis	*Pygmy python*					•						•	•			•								•			•	•		•					•				•	
Aspidites melanocephalus	*Black-headed python*					•						•	•									•					•	•											•	•
Aspidites ramsayi	*Woma*																										•													
Liasis olivaceus subsp. barroni	*Pilbara olive python*	*VU*	*VU*			•	•	•			•	•		•				•												•								•	
SCINCIDAE																																									
Carlia munda	*Shaded-litter rainbow skink*					•						•	•	•		•			•				•			•	•	•	•	•		•	•		•	•	•			•	
Carlia triacantha	*Desert rainbow skink*					•						•	•														•			•	•									
Cryptoblepharus buchananii	*Buchanan's snake-eyed skink*					•																														•					
Cryptoblepharus plagiocephalus	*Skink*					•								•						•							•								•	•				
Cryptoblepharus ustulatus	*Russet snake-eyed skink*					•					•	•	•							•	•			•					•	•		•			•					•
Ctenotus ariadnae	*Ariadna's ctenotus*											•			•								•							•									•	
Ctenotus duricola	*Skink*					•						•	•	•	•	•			•								•	•		•	•	•				•	•			•	
Ctenotus grandis subsp. titan	*Grand ctenotus*					•						•			•				•				•				•			•	•	•							•	
Ctenotus hanloni	*Skink*															•										•		•		•									•	
Ctenotus helenae	*Skink*					•						•	•	•	•	•			•				•		•		•			•		•	•		•		•	•			
Ctenotus inornatus	*Skink*					•																		•												•					
Ctenotus leonhardii	*Skink*					•										•												•											•	
Ctenotus nigrilineatus	*Pin-striped fine-snout skink*			*P1*				•																																
Ctenotus pantherinus	*Leopard skink*					•				•		•	•	•	•	•			•				•	•	•	•	•	•		•	•	•			•	•	•	•	•	•
Ctenotus piankai	*Coarse sand ctenotus*																										•													
Ctenotus quattuordecimlineatus	*Fourteen-lined ctenotus*																														•									
Ctenotus robustus	*Robust ctenotus*					•																					•								•					
Ctenotus rubicundus	*Ruddy ctenotus*					•						•	•			•										•		•					•		•					
Ctenotus rutilans	*Skink*					•							•	•						•								•				•			•		•		•	
Ctenotus saxatilis	*Rock ctenotus*					•					•	•	•		•	•			•	•		•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
Ctenotus schomburgkii	*Skink*					•							•															•				•								
Ctenotus serventyi	*North-western sandy-loam ctenotus*					•								•																•									
Ctenotus uber	*Spotted ctenotus*					•																								•									
Ctenotus uber subsp. johnstonei	*Spotted ctenotus*			*P2*				•																•				•											
Cyclodomorphus melanops subsp. melanops	*Slender blue-tongue*					•						•	•			•								•	•	•	•	•	•		•		•			•		•	•	•	•
Egernia cygnitos	*Western Pilbara spiny-tailed skink*					•																																		
Egernia depressa	*Pygmy spiny-tailed skink*					•						•											•				•	•												
Egernia formosa	*Goldfields crevice-skink*					•					•	•	•											•				•	•	•		•				•					
Egernia pilbarensis	*Pilbara skink*																																		•						

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Eremiascincus isolepis	*Skink*					•																														•					
Eremiascincus pallidus	*Western narrow-banded skink*					•																														•					
Eremiascincus richardsonii	*Broad-banded sand swimmer*					•						•	•														•	•				•			•		•			•	
Lerista amicorum	*Skink*																																							•	
Lerista bipes	*Two-toed skink*																						•				•				•									•	
Lerista chalybura	*Pilbara blue-tailed slider*					•						•	•	•										•				•				•	•	•		•					•
Lerista flammicauda	*Pilbara flame-tailed slider*																		•																						
Lerista jacksoni	*Jackson's three-toed slider*																																							•	
Lerista labialis	*Southern sand-slider skink*											•																		•									•	
Lerista macropisthopus	*Skink*					•		•																																
Lerista muelleri	*Skink*					•						•	•	•									•	•	•		•	•		•	•	•		•	•	•	•	•		•	
Lerista neander	*Skink*					•																						•													
Lerista timida	*Timid slider*					•																								•									•	
Lerista verhmens	*Powerful lerista*					•																																		
Liopholis kintorei	*Great desert skink*	VU	VU		VU		•																																	
Menetia greyii	*Common dwarf skink*					•						•	•		•				•				•				•	•		•	•	•			•		•			•	
Menetia surda subsp. surda	*Skink*					•																										•									
Morethia ruficauda subsp. exquisita	*Fire-tailed skink*					•						•	•	•	•	•			•	•				•			•	•		•	•	•		•	•	•	•				•
Notoscincus butleri	*Lined soil-crevice skink*			P4				•																																	
Notoscincus ornatus	*Ornate soil-crevice skink*																													•											
Proablepharus reginae	*Skink*					•																					•				•					•					
Tiliqua multifasciata	*Central blue-tongue lizard*					•						•	•		•	•							•				•	•		•	•	•	•		•		•				•
TYPHLOPIDAE																																									
Anilios ammodytes	*Blind-snake*											•	•										•				•			•	•	•			•	•					
Anilios ganei	*Blind-snake*			P1		•		•				•																				•									
Anilios grypus	*Blind-snake*					•						•	•		•												•			•	•	•	•		•						
Anilios hamatus	*Blind-snake*					•										•														•											
Ramphotyphlops waitii	*A blind-snake*																															•									
Varanus acanthurus	*Spiny-tailed monitor*					•						•	•	•	•	•							•	•			•	•		•	•	•			•	•				•	
Varanus brevicauda	*Short-tailed pygmy monitor*					•						•	•										•				•			•	•	•									
Varanus bushi	*Pilbara mulga monitor*					•					•													•					•		•	•	•					•				
Varanus caudolineatus	*Stripe-tailed pygmy monitor*					•																		•							•		•								
Varanus eremius	*Pygmy desert monitor*											•			•									•				•			•	•								•	
Varanus giganteus	*Perentie*					•						•				•												•	•	•	•				•		•	•				
Varanus gilleni	*Pygmy mulga monitor*													•											•		•							•		•			•			
Varanus gouldii	*Bungarra*					•						•	•						•				•		•		•				•								•		•	
Varanus panoptes	*Yellow spotted monitor*					•						•	•	•		•								•	•		•	•		•				•	•	•		•		•	
Varanus pilbarensis	*Pilbara rock monitor*					•						•	•					•	•	•								•	•	•				•	•	•				•	
Varanus tristis subsp. tristis	*Racehorse goanna*					•					•	•	•			•								•			•			•		•				•	•			•	
LIMNODYNASTIDAE																																									
Neobatrachus aquilonius	*Northern burrowing frog*					•																																			
Neobatrachus sutor	*Shoemaker frog*					•																																			

Species		Conservation Status				Database review				Report																																
Scientific Name	Common Name	EPBC Act	BC Act	DBCA	IUCN	NatureMap (40 km)	EPBC (50km)	DBCA Priority and Threatened	Birdlife (50km)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Notaden nichollsi	*Desert spadefoot*																										•														
Platyplectrum spenceri	*Centralian burrowing frog*																										•														
MYOBATRACHIDAE																																									
Pseudophryne douglasi	*Gorge toadlet*					•																								•										
Uperoleia russelli	*Russell's toadlet*					•								•		•											•														
Uperoleia saxatilis	*Pilbara toadlet*					•							•																	•						•					
PELODRYADIDAE																																									
Cyclorana australis	*Giant frog*																										•														
Cyclorana maini	*Sheep frog*					•					•	•	•	•	•	•			•						•		•	•	•	•		•				•	•		•	
Cyclorana platycephala	*Water-holding frog*					•								•		•																									
Litoria rubella	*Little red tree frog*					•					•	•	•		•				•						•		•	•		•		•		•	•	•	•	•		•	•

Species		Conservation Status				Reports																																								
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**current**
BOVIDAE																																														
**Bos taurus*	*Cow*							●	●		●	●		●		●	●	●	●		●	●	●	●		●	●	●		●	●	●	●	●	●	●			●		●					●
**Capra hircus*	*Goat*																					●																								
CAMELIDAE																																														
**Camelus dromedarius*	*Camel*							●						●	●	●								●			●	●											●	●						
CANIDAE																																														
**Canis familiaris*	*Dog*					●		●		●	●	●	●	●	●		●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●
**Vulpes vulpes*	*Fox*																															●									●					
DASYURIDAE																																														
Dasycercus blythi	*Brush-tailed mulgara*			*P4*		●	●							●																																
Dasykaluta rosamondae	*Little-red kaluta*							●			●			●	●		●	●	●	●		●	●	●	●	●	●	●	●		●				●	●			●	●			●			
Dasyurus hallucatus	*Northern quoll*	*EN*	*EN*		*EN*									●			●										●				●		●						●							
Ningaui ridei	*Wongai ningaui*													●																																
Ningaui timealeyi	*Pilbara ningaui*							●			●	●		●	●		●	●	●	●		●	●	●	●		●	●	●	●	●				●	●	●		●	●		●				
Planigale ingrami	*Long-tailed planigale*																●						●								●						●									
Planigale sp. indet	*Undescribed pilbara planigale*							●	●		●	●		●	●			●		●		●				●	●		●	●	●					●			●	●			●			
Pseudantechinus macdonnellensis	*Fat-tailed antechinus*																																													
Pseudantechinus roryi	*Rory's pseudantechinus*																																													
Pseudantechinus woolleyae	*Woolley's pseudantechinus*										●											●					●				●			●	●											
Sminthopsis crassicaudata	*Fat-tailed dunnart*							●																																						
Sminthopsis hirtipes	*Hairy-footed dunnart*																																													
Sminthopsis longicaudata	*Long-tailed dunnart*			*P4*																																										
Sminthopsis macroura	*Stripe-faced dunnart*							●			●			●	●		●					●	●				●		●	●	●					●	●			●						
Sminthopsis ooldea	*Ooldea dunnart*																			●																						●				
Sminthopsis youngsoni	*Lesser hairy-footed dunnart*													●	●								●	●				●			●				●				●							
EMBALLONURIDAE																																														
Saccolaimus flaviventris	*Yellow bellied sheath-tail bat*					●		●	●		●	●	●		●		●			●	●		●	●		●	●	●	●	●	●	●			●	●		●	●	●						●
Taphozous georgianus	*Common sheath-tailed bat*					●		●	●		●	●	●				●			●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●		●	●
Taphozous hilli	*Hill's sheathtail-bat*										●	●										●		●			●	●					●						●				●			
EQUIDAE																																														
**Equus asinus*	*Donkey*							●						●													●										●			●						
**Equus caballus*	*Horse*																														●				●	●	●			●	●					
FELIDAE																																														
**Felis catus*	*Domestic cat*					●		●				●		●					●					●		●	●	●	●	●	●	●	●		●		●	●	●	●	●					●
LEPORIDAE																																														
**Oryctolagus cuniculus*	*European rabbit*							●										●									●																			
MACROPODIDAE																																														
Osphranter robustus subsp. erubescens	*Euro*					●		●	●		●		●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Osphranter rufus	*Red kangaroo*					●		●	●	●					●	●			●	●	●	●		●			●	●		●	●	●	●		●	●		●	●	●	●	●	●			
Petrogale lateralis subsp. lateralis	*Black-flanked rock-wallaby*	*EN*	*EN*		*VU*																																									
Petrogale rothschildi	*Rothschild's rock-wallaby*										●	●		●	●		●	●	●		●		●				●				●	●	●	●	●		●	●	●		●		●			●
MEGADERMATIDAE																																														

Species		Conservation Status				Reports																																							
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**current**
Macroderma gigas	*Ghost bat*	*VU*	*VU*		*VU*			•			•	•					•				•		•	•			•	•		•	•		•	•	•		•		•							•
MOLOSSIDAE																																														
Austronomus australis	*White-striped free-tailed bat*							•							•							•	•	•		•	•	•	•		•	•	•		•	•			•	•						•
Chaerephon jobensis subsp. colonicus	*Greater northern free-tailed bat*					•		•	•		•	•			•		•	•		•		•	•	•	•	•	•	•		•	•	•			•	•	•		•	•			•		•	•
Ozimops lumsdenae	*Northern free-tailed bat*								•		•	•	•					•			•	•	•	•	•	•	•	•	•	•	•	•			•	•	•						•			
MURIDAE																																														
Leggadina lakedownensis	*Northern short-tailed mouse*			*P4*										•	•																•				•											
**Mus musculus*	*House mouse*								•		•			•	•		•	•				•	•	•			•	•			•				•		•		•	•		•	•			
Notomys alexis	*Spinifex hopping-mouse*							•		•						•								•				•											•							
Pseudomys chapmani	*Western pebble-mound mouse*			*P4*		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•			•	•
Pseudomys delicatulus	*Delicate mouse*													•																																
Pseudomys desertor	*Desert mouse*										•	•		•	•		•			•			•		•		•			•	•				•	•	•		•	•		•	•			
Pseudomys hermannsburgensis	*Sandy inland mouse*							•			•	•		•	•		•	•	•	•		•	•	•			•	•	•	•	•				•	•	•		•			•	•			
Pseudomys nanus	*Western chestnut mouse*																																													
Zyzomys argurus	*Common rock rat*							•	•		•	•		•			•	•	•	•		•	•	•	•		•	•	•		•	•		•	•	•	•		•	•			•			•
PHALANGERIDAE																																														
Trichosurus vulpecula subsp. arnhemensis	*Northern brushtail possum*																																	•												
PTEROPODIDAE																																														
Pteropus alecto subsp. gouldii	*Black flying-fox*																	•																												
RHINONYCTERIDAE																																														
Rhinonicteris aurantia	*Pilbara leaf-nosed bat*	*VU*	*VU*																					•	•		•	•					•													
TACHYGLOSSIDAE																																														
Tachyglossus aculeatus subsp. acanthion	*Short-beaked Echidna*					•					•			•			•				•	•					•				•		•		•				•	•						•
THYLACOMYIDAE																																														
Macrotis lagotis	*Greater bilby*	*VU*	*VU*		*VU*																																			•						
VESPERTILIONIDAE																																														
Chalinolobus gouldii	*Gould's wattled bat*					•		•	•		•	•	•		•		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•			•		•	•
Chalinolobus morio	*Chocolate wattled bat*																			•			•														•									
Nyctophilus daedalus	*Northern long-eared bat*								•														•							•						•									•	
Nyctophilus geoffroyi	*Lesser long-eared bat*										•	•	•		•			•			•	•	•	•	•		•	•		•	•						•		•	•			•		•	
Scotorepens balstoni	*Inland broad-nosed bat*														•							•																								
Scotorepens greyii	*Little broad-nosed bat*					•		•	•		•	•	•		•		•			•	•		•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•			•		•	•
Vespadelus finlaysoni	*Finlayson's cave bat*					•		•	•	•	•	•	•				•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•		•	•
ACANTHIZIDAE																																														
Acanthiza apicalis	*Broad-tailed thornbill or inland thornbill*							•			•	•			•		•	•	•	•	•	•	•	•			•	•	•	•	•		•	•	•	•	•	•	•			•	•			
Acanthiza chrysorrhoa	*Yellow-rumped thornbill*							•														•	•			•	•				•		•	•		•							•			
Acanthiza robustirostris	*Slaty-backed thornbill*													•	•												•		•	•	•	•	•	•		•	•			•		•	•			
Acanthiza uropygialis	*Chestnut-rumped thornbill*							•	•					•	•					•	•	•	•	•			•	•		•	•		•	•	•	•		•	•	•		•	•			
Aphelocephala leucopsis	*Southern whiteface*														•																									•						
Gerygone fusca	*Western gerygone*							•	•		•				•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•		•	
Pyrrholaemus brunneus	*Redthroat*														•					•														•								•	•			
Smicrornis brevirostris	*Weebill*					•		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

Species		Conservation Status				Reports																																								current
Scientific Name	Common Name	EPBC Act	BC Act	DBCA	IUCN	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	
ACCIPITRIDAE																																														
Accipiter cirrocephalus	*Collared sparrowhawk*								●		●			●	●		●	●				●	●	●			●	●			●		●						●	●						
Accipiter fasciatus	*Brown goshawk*							●	●	●	●			●	●		●	●			●			●			●	●		●	●				●	●		●	●		●		●			●
Aquila audax	*Wedged-tailed eagle*					●		●	●	●	●		●	●	●		●	●		●		●			●		●		●	●	●	●	●	●	●	●	●		●	●	●		●			
Circus approximans	*Swamp harrier*													●																																
Circus assimilis	*Spotted harrier*							●	●		●	●		●	●		●	●				●	●		●	●				●	●				●				●	●						
Elanus caeruleus subsp. axillaris	*Black-shouldered kite*								●	●				●	●		●							●	●			●																		
Elanus scriptus	*Letter-winged kite*			*P4*	*NT*																																									
Haliaeetus leucogaster	*White-bellied sea-eagle*																																													
Haliastur sphenurus	*Whistling kite*					●		●	●	●	●	●	●	●	●	●	●		●	●		●	●		●	●	●				●	●	●	●		●		●	●	●	●		●			
Lophoictinia isura	*Square-tailed kite*							●						●																●																
Hamirostra melanosternon	*Black-breasted buzzard*					●		●		●	●			●	●		●			●		●		●				●		●	●		●													
Hieraaetus morphnoides	*Little eagle*					●		●			●			●	●		●	●	●	●	●			●	●			●			●	●	●		●		●		●	●						
Milvus migrans	*Black kite*							●						●			●		●				●			●											●		●	●						
Pandion haliaetus	*Eastern osprey*	*MI*	*MI*					●																																						
ACROCEPHALIDAE																																														
Acrocephalus australis	*Australian reed warbler*								●																																					
AEGOTHELIDAE																																														
Aegotheles cristatus	*Australian owlet-nightjar*					●		●		●	●		●	●	●		●	●	●	●	●	●	●		●		●		●	●	●	●		●	●		●	●	●	●	●		●			
ALAUDIDAE																																														
Mirafra javanica	*Horsfield's bushlark*					●				●			●	●	●															●	●	●		●						●				●		
ALCEDINIDAE																																														
Dacelo leachii subsp. leachii	*Blue-winged kookaburra*							●			●	●		●	●			●	●	●				●		●		●			●						●	●	●	●						
Todiramphus pyrrhopygius	*Red-backed kingfisher*					●		●		●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Todiramphus sanctus	*Sacred kingfisher*							●		●				●	●			●		●			●	●				●			●	●					●		●							
ANATIDAE																																														
Anas gracilis	*Grey teal*																	●													●									●						
Anas superciliosa	*Pacific black duck*													●																	●									●						
Aythya australis	*Hardhead*																																													
Chenonetta jubata	*Australian wood duck*																														●															
Cygnus atratus	*Black swan*																																							●						
Dendrocygna eytoni	*Plumed whistling duck*																														●															
Malacorhynchus membranaceus	*Pink-eared duck*																																							●						
Tadorna tadornoides	*Australian shell duck*														●																									●						
ANHINGIDAE																																														
Anhinga novaehollandiae	*Australasian darter*													●									●								●															
APODIDAE																																														
Apus pacificus	*Fork-tailed swift*	*MI*	*MI*				●				●			●	●		●		●		●									●									●							
ARDEIDAE																																														
Ardea modesta	*Eastern great egret*							●							●																															
Ardea novaehollandiae	*White-faced heron*							●						●			●	●		●																				●						
Ardea pacifica	*White-necked heron*					●												●		●		●																		●						

Species		Conservation Status				Reports																																							current
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	
Ixobrychus flavicollis	*Black bittern*																																													
Nycticorax caledonicus subsp. australasiae	*Nankeen night heron*																																													
Artamus cinereus	*Black-faced woodswallow*					●		●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Artamus cyanopterus	*Dusky woodswallow*																																													
Artamus minor	*Little woodswallow*					●		●	●	●	●	●	●				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●	●	●		●		●	●	●	●
Artamus personatus	*Masked woodswallow*					●		●						●			●	●		●		●	●		●	●				●	●			●			●		●							
Cracticus nigrogularis	*Pied butcherbird*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cracticus tibicen	*Australian magpie*					●		●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
Cracticus torquatus	*Grey butcherbird*							●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●		●	
BURHINIDAE																																														
Burhinus grallarius	*Bush stone-curlew*													●																	●				●								●			
CACATUIDAE																																														
Cacatua roseicapilla	*Galah*					●		●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Cacatua sanguinea	*Little corella*					●		●	●	●				●	●			●		●		●	●		●	●					●				●		●		●	●		●	●			
Nymphicus hollandicus	*Cockatiel*					●		●	●	●	●			●	●		●	●				●	●	●			●	●		●	●				●		●	●	●	●	●		●			
CAMPEPHAGIDAE																																														
Coracina maxima	*Ground cuckoo-shrike*								●		●	●			●		●			●	●		●	●	●		●	●		●	●		●		●		●			●	●		●	●		
Coracina novaehollandiae subsp. subpallida	*Black-faced cuckoo-shrike*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
Lalage tricolor	*White-winged triller*					●		●	●	●	●		●	●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●		●	●	●	●	●	●		●	●			●
CAPRIMULGIDAE																																														
Eurostopodus argus	*Spotted nightjar*					●		●		●	●		●	●			●	●	●	●		●	●	●	●	●	●	●	●	●	●				●	●	●	●		●		●	●			
CASUARIIDAE																																														
Dromaius novaehollandiae	*Emu*					●		●		●				●	●	●		●				●	●								●		●	●	●	●			●	●	●		●			
CHARADRIIDAE																																														
Charadrius ruficapillus	*Red-capped plover*																																													
Charadrius veredus	*Oriental plover*	*MI*	*MI*																																											
Elseyornis melanops	*Black-fronted dotterel*							●						●				●													●									●						
Erythrogonys cinctus	*Red-kneed dotterel*																																							●						
CICONIIDAE																																														
Ephippiorhynchus asiaticus	*Black-necked stork*													●																																
CINCLOSOMATIDAE																																														
Cinclosoma castaneothorax	*Chestnut-breasted quail-thrush*													●	●												●									●										
CLIMACTERIDAE																																														
Climacteris melanurus	*Black-tailed treecreeper*												●					●				●													●											
COLUMBIDAE																																														
Geopelia cuneata	*Diamond dove*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Geopelia striata subsp. placida	*Peaceful dove*							●	●		●				●	●		●					●		●										●	●		●			●					
Geophaps plumifera subsp. ferruginea	*Spinifex pigeon*					●		●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●			●	●	●	●	●		●		●			●
Ocyphaps lophotes	*Crested pigeon*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	
Phaps chalcoptera	*Common bronzewing*					●		●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●		●	●		●	●	●	●	●	●	●	●		●	●		●	●			●
Phaps histrionica	*Flock bronzewing*																																													
CORVIDAE																																														

Species		**Conservation Status**				**Reports**																																								**current**
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	
Corvus bennetti	*Little crow*														●		●	●		●			●							●										●			●			
Corvus orru subsp. cecilae	*Torresian crow*					●		●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●
CUCULIDAE																																														
Cacomantis pallidus	*Pallid cuckoo*					●		●			●		●	●	●		●	●	●	●	●	●	●	●	●			●	●	●	●	●		●		●	●	●	●	●		●				
Centropus phasianinus subsp. highami	*Pheasant coucal*							●							●																															●
Chrysococcyx basalis	*Horsfield's bronze cuckoo*					●		●	●	●	●		●	●	●		●	●	●	●	●	●	●	●			●	●	●	●	●	●			●		●		●	●		●			●	●
Chrysococcyx osculans	*Black-eared cuckoo*							●							●																				●							●			●	
DICAEIDAE																																														
Dicaeum hirundinaceum	*Mistletoebird*							●		●	●	●	●		●		●	●			●	●	●	●	●		●	●	●		●			●	●	●	●			●			●	●		
ESTRILDIDAE																																														
Emblema pictum	*Painted finch*					●		●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●			
Neochmia ruficauda subsp. subclarescens	*Star finch (western)*						●		●				●																●								●			●						
Taeniopygia guttata	*Zebra finch*					●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●
FALCONIDAE																																														
Falco berigora	*Brown falcon*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Falco cenchroides	*Nankeen kestrel*					●		●	●	●	●	●		●	●		●	●		●	●	●	●		●		●		●	●	●	●		●	●	●		●	●	●	●	●	●		●	●
Falco hypoleucos	*Grey falcon*	*VU*	*VU*		*VU*								●	●																		●								●						
Falco longipennis	*Australian hobby*							●	●		●			●	●		●	●				●	●							●	●	●				●	●		●	●						
Falco peregrinus	*Peregrine falcon*		*OS*								●			●	●			●		●							●				●					●			●	●						
Falco subniger	*Black falcon*														●																															
HIRUNDINIDAE																																														
Cheramoeca leucosterna	*White-backed swallow*							●										●																												
Hirundo neoxena	*Welcome swallow*																								●							●														
Petrochelidon ariel	*Fairy martin*								●					●					●			●	●		●						●			●						●				●		
Petrochelidon nigricans	*Tree martin*								●						●			●		●		●	●	●	●			●			●			●		●	●		●							
LARIDAE																																														
Gelochelidon nilotica	*Gull-billed tern*	*MI*	*MI*																																											
Sterna caspia	*Caspian tern*	*MI*	*MI*																																											
Sterna hybrida	*Whiskered tern*																																													
Sternula albifrons	*Little tern*	*MI*	*MI*																																											
LOCUSTELLIDAE																																														
Cincloramphus cruralis	*Brown songlark*					●								●	●		●				●		●								●				●		●		●	●						
Cincloramphus mathewsi	*Rufous songlark*					●		●			●		●	●	●		●	●	●		●	●	●	●	●	●		●				●			●		●		●		●	●				●
Eremiornis carteri	*Spinifex bird*					●		●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●		●		●		●
Cincloramphus gramineus	*Little grassbird*																																													
MALURIDAE																																														
Amytornis striatus subsp. whitei	*Striated grasswren*							●			●	●	●	●	●				●	●	●	●		●		●	●	●	●	●	●		●	●		●	●		●		●	●	●	●		
Malurus assimilis subsp. assimilis	*Variegated fairywren*					●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
Malurus leucopterus subsp. leuconotus	*White-winged fairywren*					●		●			●	●	●	●	●			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Malurus splendens	*Splendid fairywren*																			●											●	●	●	●		●						●	●			
Stipiturus ruficeps	*Rufous-crowned emu-wren*					●		●			●		●	●	●					●	●	●		●			●	●	●	●	●				●	●	●			●			●			
MELIPHAGIDAE																																														

Species		Conservation Status				Reports																																								current
Scientific Name	Common Name	EPBC Act	BC Act	DBCA	IUCN	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	
Acanthagenys rufogularis	*Spiny-cheeked honeyeater*							●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	
Certhionyx variegatus	*Pied honeyeater*							●		●					●		●				●				●						●															
Epthianura aurifrons	*Orange chat*																																							●						
Epthianura tricolor	*Crimson chat*					●		●	●	●	●			●	●	●	●	●			●	●	●		●	●				●	●	●			●		●		●				●	●		
Gavicalis virescens subsp. virescens	*Inland Singing Honeyeater*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Conopophila whitei	*Grey honeyeater*										●						●		●				●				●				●		●	●		●										
Lichmera indistincta	*Brown honeyeater*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●				●
Manorina flavigula	*Yellow-throated miner*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Melithreptus gularis subsp. laetior	*Black-chinned honeyeater*							●	●	●	●	●	●		●		●	●		●	●	●	●	●	●		●	●	●		●			●					●	●			●			●
Ptilotula keartlandi	*Grey-headed Honeyeater*					●		●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●
Ptilotula penicillata	*White-plumed honeyeater*					●		●	●	●	●	●		●	●	●		●	●	●		●	●	●			●	●			●		●	●	●	●	●	●	●	●	●		●	●		●
Ptilotula plumula	*Grey-fronted honeyeater*																			●											●									●						
Purnella albifrons	*White-fronted honeyeater*							●		●	●	●					●																													
Sugomel niger	*Black honeyeater*					●		●		●				●	●		●	●			●	●	●			●					●					●			●							
MEROPIDAE																																														
Merops ornatus	*Rainbow bee-eater*					●	●	●		●	●	●		●	●	●	●	●	●	●	●		●	●	●	●	●	●		●	●	●	●		●	●	●		●	●	●		●	●		●
MONARCHIDAE																																														
Grallina cyanoleuca	*Magpie-lark*					●		●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●		●
MOTACILLIDAE																																														
Anthus australis subsp. australis	*Australasian pipit*							●			●	●			●	●		●	●	●	●	●			●		●			●			●	●	●	●		●	●	●			●	●		
Motacilla cinerea	*Grey wagtail*	*MI*	*MI*																																											
NEOSITTIDAE																																														
Daphoenositta chrysoptera	*Varied sittella*													●	●			●				●			●									●		●				●		●	●			
OREOICIDAE																																														
Oreoica gutturalis	*Crested bellbird*							●			●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
OTIDIDAE																																														
Ardeotis australis	*Australian bustard*					●	●	●	●	●	●			●	●		●	●	●	●		●	●	●		●	●	●		●	●	●			●	●		●	●	●	●	●				
PACHYCEPHALIDAE																																														
Colluricincla harmonica subsp. rufiventris	*Grey shrike thrush*					●		●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Pachycephala rufiventris subsp. rufiventris	*Rufous whistler*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
PARDALOTIDAE																																														
Pardalotus punctatus	*Spotted pardalote*																									●																				
Pardalotus rubricatus	*Red-browed pardalote*					●		●	●		●			●	●	●	●	●	●		●	●	●	●	●		●	●		●	●		●	●	●		●	●	●				●	●		●
Pardalotus striatus subsp. murchisoni	*Striated pardalote*							●	●		●	●	●		●			●	●	●	●	●	●	●	●		●	●	●	●	●		●	●			●	●	●	●		●	●		●	
PELECANIDAE																																														
Pelecanus conspicillatus	*Australian pelican*																																													
PETROICIDAE																																														
Melanodryas cucullata	*Hooded robin*					●		●	●		●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
Petroica goodenovii	*Red-capped robin*							●	●					●	●			●		●		●	●		●		●				●		●	●	●	●	●		●	●		●	●	●		
PHAETHONTIDAE																																														
Phalacrocorax melanoleucos	*Little pied cormorant*							●	●																																					
Phalacrocorax sulcirostris	*Little black cormorant*																	●																												

Species		**Conservation Status**				**Reports**																																								**current**
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	
Phalacrocorax varius subsp. hypoleucos	*Pied cormorant*																																														
PHASIANIDAE																																															
Coturnix pectoralis	*Stubble quail*													•	•				•																											
Synoicus ypsilophora	*Brown quail*								•	•					•																•	•						•		•	•			•		
PODARGIDAE																																															
Podargus strigoides	*Tawny frogmouth*								•		•	•		•	•			•				•	•	•	•	•		•	•	•	•	•	•	•		•		•			•					
PODICIPEDIDAE																																															
Poliocephalus poliocephalus	*Hoary-headed grebe*																																														
Tachybaptus novaehollandiae	*Australasian grebe*																																														
POMATOSTOMIDAE																																															
Pomatostomus superciliosus	*White-browed babbler*								•						•	•					•		•	•	•			•	•		•	•					•				•		•	•		•	
Pomatostomus temporalis subsp. rubeculus	*Grey-crowned babbler*								•	•	•	•	•			•	•	•	•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•			•
PROCELLARIIDAE																																															
Macronectes giganteus	*Southern giant petrel*	*EN/MI*	*MI*																																												
PSITTACIDAE																																															
Barnardius zonarius	Australian ringneck						•		•	•	•	•	•	•		•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
Melopsittacus undulatus	*Budgerigar*						•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•				•	•	•	•	•	•	•	•	•			
Neophema elegans	*Elegant parrot*														•																			•													
Neopsephotus bourkii	*Bourke's parrot*													•		•				•							•				•					•				•			•			
Pezoporus occidentalis	*Night parrot*	*EN*	*CR*		*EN*																																			•					
Psephotus varius	*Mulga parrot*								•										•						•					•										•		•		•	
PSOPHODIDAE																																															
Psophodes occidentalis	*Chiming wedgebill*																													•														
PTILINORHYNCHIDAE																																															
Ptilonorhynchus maculatus subsp. guttatus	*Western bowerbird*								•	•	•	•	•	•					•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•				•	•		•
RALLIDAE																																															
Fulica atra	*Eurasian coot*																																														
Gallirallus philippensis	*Buff-banded rail*								•	•																													•						
Porzana tabuensis	*Spotless crake*								•	•																																						
Tribonyx ventralis	*Black-tailed nativehen*																																							•					
RECURVIROSTRIDAE																																															
Himantopus himantopus	*Black-winged stilt*													•											•						•														
Recurvirostra novaehollandiae	*Red-necked avocet*																																														
RHIPIDURIDAE																																															
Rhipidura albiscapa	*Grey fantail*						•		•			•	•			•			•		•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•			•		•	•		•	
Rhipidura leucophrys subsp. leucophrys	*Willie wagtail*						•		•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•
ROSTRATULIDAE																																															
Rostratula australis	*Australian painted snipe*	*EN*	*EN*		*EN*																																										
SCOLOPACIDAE																																															
Calidris acuminata	*Sharp-tailed sandpiper*	*MI*	*MI*																																												
Calidris ferruginea	*Curlew sandpiper*	*CR/MI*	*CR/MI*		*NT*																																										
Calidris melanotos	*Pectoral sandpiper*	*MI*	*MI*																																												

Species		**Conservation Status**				**Reports**																																								
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**current**
Calidris ruficollis	*Red-necked stint*	*MI*	*MI*		*NT*																																									
Calidris subminuta	*Long-toed stint*	*MI*	*MI*																																											
Tringa glareola	*Wood sandpiper*	*MI*	*MI*																												●															
Actitis hypoleucos	*Common sandpiper*	*MI*	*MI*																																											
Tringa nebularia	*Common greenshank*	*MI*	*MI*																																											
Tringa stagnatilis	*Marsh sandpiper*	*MI*	*MI*																																											
Tringa totanus	*Common redshank*	*MI*	*MI*																																											
STRIGIDAE																																														
Ninox boobook	*Boobook owl*					●		●			●			●	●		●	●		●		●	●		●		●		●		●		●		●		●			●		●	●			●
Ninox connivens	*Barking owl*							●										●		●																										
THRESKIORNITHIDAE																																														
Plegadis falcinellus	*Glossy ibis*	*MI*	*MI*																																											
Threskiornis spinicollis	*Straw-necked ibis*														●			●				●														●				●						
TURNICIDAE																																														
Turnix velox	*Little button quail*					●		●	●	●	●		●	●	●		●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●		●		●		●	●		●	●			●
TYTONIDAE																																														
Tyto javanica	*Eastern barn owl*							●		●	●		●																●	●			●		●					●						
AGAMIDAE																																														
Ctenophorus caudicinctus	*Ring-tailed dragon*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●
Ctenophorus isolepis subsp. isolepis	*Crested dragon*							●	●	●	●			●	●	●	●					●	●				●	●			●	●			●	●	●		●		●		●	●		
Ctenophorus nuchalis	*Central netted dragon*							●		●																													●	●						
Ctenophorus reticulatus	*Western netted dragon*														●					●							●				●				●				●							
Diporiphora amphiboluroides	*Mulga dragon*								●					●			●			●			●				●			●	●					●						●				
Diporiphora valens	*Southern pilbara tree dragon*																●										●				●			●		●										
Gowidon longirostris	*Long-nosed dragon*					●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●					
Pogona minor subsp. minor	*Dwarf bearded dragon*										●		●		●	●				●	●	●		●			●	●		●						●							●		●	
Pogona minor subsp. mitchelli	*Dwarf bearded dragon*																																													
Tympanocryptis cephalus	*Earless pebble dragon*													●																				●												
Tympanocryptis diabolicus	*Pebble dragon*																														●															
CARPHODACTYLIDAE																																														
Nephrurus levis subsp. pilbarensis	*Knob-tailed gecko*													●																																
Nephrurus wheeleri	*Southern banded knob-tailed gecko*					●		●	●		●						●	●		●			●	●			●	●		●	●								●							
Underwoodisaurus seorsus	*Pilbara barking gecko*			*P2*							●	●	●										●				●				●															
CHELIDAE																																														
Chelodina steindachneri	*Flat-shelled turtle*													●									●								●									●						
DIPLODACTYLIDAE																																														
Crenadactylus ocellatus subsp. horni	*Clawless gecko*																						●														●									
Crenadactylus pilbarensis	*Pilbara clawless gecko*							●										●						●							●															
Diplodactylus conspicillatus	*Fat-tailed gecko*					●		●	●					●	●		●							●					●										●	●						
Diplodactylus pulcher	*Fine-faced gecko*							●									●			●			●				●				●															
Diplodactylus savagei	*Southern pilbara beak-faced gecko*							●	●		●	●					●		●	●		●	●	●						●	●	●					●		●			●	●			
Lucasium stenodactylus	*Gecko*					●		●	●		●	●		●	●		●	●		●			●	●		●	●		●	●	●						●		●							

Species		**Conservation Status**				**Reports**																																								
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**current**
Lucasium wombeyi	*Gecko*					●			●		●			●	●		●						●	●	●		●		●	●	●					●	●		●				●			
Oedura fimbria	*Western marbled velvet gecko*					●		●	●		●	●	●				●	●	●		●	●		●	●	●	●		●	●	●	●	●	●	●		●	●	●		●					●
Rhynchoedura ornata	*Western beaked gecko*					●		●		●	●						●		●	●			●				●				●				●		●		●							
Strophurus ciliaris subsp. aberrans	*Northern spiny-tailed gecko*																							●																						
Strophurus elderi	*Jewelled gecko*							●			●			●	●								●	●		●				●	●						●		●							
Strophurus jeanae	*Gecko*							●						●																●	●						●		●							
Strophurus strophurus	*Gecko*																																			●										
Strophurus wellingtonae	*Gecko*							●	●		●	●	●	●	●		●			●			●	●	●		●			●	●	●	●		●	●			●			●	●			
ELAPIDAE																																														
Acanthophis wellsi	*Pilbara death adder*																			●		●		●	●		●				●															
Brachyurophis approximans	*North-western shovel-nosed snake*							●	●		●			●									●	●			●			●	●						●		●							
Demansia psammophis subsp. cupreiceps	*Yellow-faced whipsnake*							●	●		●	●		●	●		●	●		●				●	●		●			●	●				●	●	●		●				●			
Demansia rufescens	*Rufous whipsnake*							●			●	●	●	●					●				●	●			●				●						●		●				●			
Furina ornata	*Moon snake*							●	●		●	●		●					●				●	●	●	●	●				●												●			
Pseudechis australis	*Mulga snake*					●		●						●			●			●			●	●	●	●	●	●		●	●				●				●							
Pseudonaja modesta	*Ringed brown snake*							●			●						●						●				●				●				●	●						●				
Pseudonaja nuchalis	*Gwardar*																																													
Simoselaps anomalus	*Desert banded snake*			*P4*																																										
Suta fasciata	*Rosen's snake*					●		●			●	●		●			●						●				●				●								●							
Suta monachus	*Snake*							●			●	●					●	●		●							●				●								●			●				
Suta punctata	*Little spotted snake*													●	●																															
Vermicella snelli	*Pilbara bandy bandy*							●									●										●																			
GEKKONIDAE																																														
Christinus marmoratus	*Marbled gecko*																																													
Gehyra montium	*Gecko*																																													
Gehyra pilbara	*Pilbara dtella*										●													●				●																		
Gehyra punctata	*Spotted dtella*					●		●	●	●	●	●	●	●	●		●			●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			●	●		●	
Gehyra purpurascens	*Gecko*					●		●																●																						
Gehyra variegata	*Tree gecko*					●		●	●	●	●	●			●		●	●		●	●	●	●		●	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●			●	
Heteronotia binoei	*Binoe's gecko*					●		●	●	●	●	●		●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	●				●	●	●		●	●			●	●		
Heteronotia spelea	*Desert cave gecko*					●		●	●		●	●						●				●	●	●	●		●		●	●	●	●				●			●	●			●			
PYGOPODIDAE																																														
Delma butleri	*Legless lizard*							●	●						●									●							●					●										
Delma elegans	*Legless lizard*										●	●		●			●					●		●						●					●				●							
Delma nasuta	*Long-nosed delma*							●			●			●	●		●			●		●	●			●	●			●	●					●	●					●			●	
Delma pax	*Legless lizard*							●	●		●	●		●	●				●	●		●	●	●					●		●						●		●				●		●	
Delma tincta	*Legless lizard*							●			●	●		●	●		●	●	●	●		●	●	●			●			●	●					●										
Delma sp.																															●				●											
Lialis burtonis	*Burton's legless lizard*					●		●	●		●	●		●	●		●			●	●	●	●		●		●	●		●	●					●	●		●	●		●	●			
Pygopus nigriceps	*Legless lizard*									●					●		●			●			●	●								●				●	●		●							
Delma haroldi	*Neck-barred delma*							●												●									●																	
PYTHONIDAE																																														

Species		Conservation Status				Reports																																								
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**current**
Antaresia childreni	*Children's python*							●		●			●	●									●								●					●	●		●				●			●
Antaresia perthensis	*Pygmy python*							●	●		●			●			●						●		●		●		●	●	●		●						●		●				●	
Aspidites melanocephalus	*Black-headed python*					●								●						●				●						●	●								●	●					●	
Aspidites ramsayi	*Woma*																														●															
Liasis olivaceus subsp. barroni	*Pilbara olive python*	*VU*	*VU*				●										●		●		●										●				●			●	●							
SCINCIDAE																																														
Carlia munda	*Shaded-litter rainbow skink*							●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	●	●	●			●	●				●	●	●		●	●	●	●	●		●	
Carlia triacantha	*Desert rainbow skink*							●			●	●		●						●			●				●				●								●							
Cryptoblepharus buchananii	*Buchanan's snake-eyed skink*							●												●		?					●		●		●										●					
Cryptoblepharus plagiocephalus	*Skink*																																							●						
Cryptoblepharus sp.								●	●									●	●					●	●																		●		●	
Cryptoblepharus ustulatus	*Russet snake-eyed skink*					●					●	●					●			●	●	?	●			●	●			●	●		●	●	●				●							●
Ctenotus ariadnae	*Ariadna's ctenotus*							●						●	●														●										●							
Ctenotus duricola	*Skink*							●			●		●	●	●		●			●		●	●						●		●				●		●		●							
Ctenotus grandis subsp. titan	*Grand ctenotus*							●						●									●						●								●		●							
Ctenotus hanloni	*Skink*														●									●						●																
Ctenotus helenae	*Skink*							●	●		●	●		●	●		●					●	●	●	●	●	●	●	●	●	●	●				●	●		●						●	
Ctenotus inornatus	*Skink*																																													●
Ctenotus leonhardii	*Skink*																	●													●					●										
Ctenotus nigrilineatus	*Pin-striped fine-snout skink*			*P1*																																										
Ctenotus pantherinus	*Leopard skink*					●		●			●	●	●	●	●		●	●	●	●		●	●	●	●	●	●			●	●		●	●	●	●	●	●	●	●		●	●		●	
Ctenotus piankai	*Coarse sand ctenotus*														●									●		●																				
Ctenotus quattuordecimlineatus	*Fourteen-lined ctenotus*																																													
Ctenotus robustus	*Robust ctenotus*																																													
Ctenotus rubicundus	*Ruddy ctenotus*										●		●	●			●				●		●	●							●								●	●			●		●	
Ctenotus rutilans	*Skink*																●			●		●	●	●		●	●		●	●		●						●				●				
Ctenotus saxatilis	*Rock ctenotus*					●		●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●		●	●	●	●		●	●	●	●		●	●	●		●			
Ctenotus schomburgkii	*Skink*													●			●			●		●	●				●				●				●	●						●	●			
Ctenotus serventyi	*North-western sandy-loam ctenotus*								●	●	●				●			●						●		●					●															
Ctenotus uber	*Spotted ctenotus*																●														●															
Ctenotus uber subsp. johnstonei	*Spotted ctenotus*			*P2*										●																						●										
Cyclodomorphus melanops subsp. melanops	*Slender blue-tongue*					●		●			●	●		●	●		●	●	●	●		●	●	●	●	●	●	●	●	●	●			●	●	●	●		●	●		●	●		●	
Egernia cygnitos	*Western Pilbara spiny-tailed skink*																●					●					●				●				●						●					
Egernia depressa	*Pygmy spiny-tailed skink*									●	●	●	●								●			●					●	●									●							
Egernia formosa	*Goldfields crevice-skink*							●			●	●					●	●	●		●		●	●	●		●			●	●	●		●	●		●		●		●					
Egernia pilbarensis	*Pilbara skink*																																													
Eremiascincus isolepis	*Skink*											●																																		
Eremiascincus pallidus	*Western narrow-banded skink*											●																																		
Eremiascincus richardsonii	*Broad-banded sand swimmer*							●	●		●							●	●				●						●		●	●							●							
Lerista amicorum	*Skink*																																								●					
Lerista bipes	*Two-toed skink*							●	●	●				●																																
Lerista chalybura	*Pilbara blue-tailed slider*					●		●	●		●	●	●	●			●	●		●		●		●			●		●	●	●						●		●						●	●

Species		Conservation Status				Reports																																								
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**	**45**	**46**	**47**	**48**	**49**	**50**	**51**	**52**	**53**	**54**	**55**	**56**	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	**71**	**current**
Lerista flammicauda	*Pilbara flame-tailed slider*									●																																				
Lerista jacksoni	*Jackson's three-toed slider*																																													
Lerista labialis	*Southern sand-slider skink*																																													
Lerista macropisthopus	*Skink*																																													
Lerista muelleri	*Skink*							●	●	●	●	●		●	●		●	●		●		●	●	●			●	●		●	●	●				●	●		●	●		●	●			
Lerista neander	*Skink*							●										●				●	●	●	●	●											●					●			●	
Lerista timida	*Timid slider*																																													
Lerista verhmens	*Powerful lerista*																																													
Liopholis kintorei	*Great desert skink*	*VU*	*VU*		*VU*																																									
Menetia greyii	*Common dwarf skink*							●			●	●		●	●		●	●		●		●	●	●		●	●		●	●	●	●			●	●			●	●		●	●		●	
Menetia surda subsp. surda	*Skink*																			●		●	●								●															
Morethia ruficauda subsp. exquisita	*Fire-tailed skink*					●		●	●		●	●	●		●		●	●	●	●	●	●	●	●		●	●		●	●	●		●				●		●	●	●		●		●	●
Notoscincus butleri	*Lined soil-crevice skink*			*P4*																																										
Notoscincus ornatus	*Ornate soil-crevice skink*													●																																
Proablepharus reginae	*Skink*							●						●																	●				●											
Tiliqua multifasciata	*Central blue-tongue lizard*					●		●	●		●		●	●			●			●		●	●	●	●	●	●			●	●	●			●	●			●	●			●			
TYPHLOPIDAE																																														
Anilios ammodytes	*Blind-snake*							●	●		●	●		●	●				●					●													●		●	●						●
Anilios ganei	*Blind-snake*			*P1*				●			●							●						●	●		●												●							
Anilios grypus	*Blind-snake*							●	●		●			●									●	●			●		●	●	●								●	●						
Anilios hamatus	*Blind-snake*							●			●									●			●	●						●							●									
Ramphotyphlops waitii	*A blind-snake*																																													
Anilios sp.	*Blind snake*																																													
Varanus acanthurus	*Spiny-tailed monitor*							●	●		●	●	●	●	●		●		●	●		●	●	●			●		●	●	●					●	●		●	●	●		●			
Varanus brevicauda	*Short-tailed pygmy monitor*							●						●			●	●	●				●	●		●					●								●	●						
Varanus bushi	*Pilbara mulga monitor*							●			●						●			●	●	●	●	●	●	●	●			●	●			●			●						●			
Varanus caudolineatus	*Stripe-tailed pygmy monitor*							●	●															●							●					●				●	●		●			
Varanus eremius	*Pygmy desert monitor*							●						●																									●							
Varanus giganteus	*Perentie*							●	●	●	●	●			●	●	●		●		●			●		●	●	●		●	●	●			●		●		●		●		●			
Varanus gilleni	*Pygmy mulga monitor*																																													
Varanus gouldii	*Bungarra*							●						●										●					●	●	●	●			●	●	●	●	●							
Varanus panoptes	*Yellow spotted monitor*							●		●	●		●	●			●	●				●	●	●			●				●	●	●	●			●		●	●	●					●
Varanus pilbarensis	*Pilbara rock monitor*							●			●	●					●		●		●		●				●				●								●							
Varanus tristis subsp. tristis	*Racehorse goanna*							●	●		●						●	●	●	●		●	●			●	●		●	●	●	●	●			●	●	●	●	●			●			
LIMNODYNASTIDAE																																														
Neobatrachus aquilonius	*Northern burrowing frog*																																													
Neobatrachus sutor	*Shoemaker frog*																						●								●	●														
Notaden nichollsi	*Desert spadefoot*													●	●																															
Platyplectrum spenceri	*Centralian burrowing frog*													●																																
MYOBATRACHIDAE																																														
Pseudophryne douglasi	*Gorge toadlet*							●			●	●																																		
Uperoleia russelli	*Russell's toadlet*							●			●	●		●				●								●																				

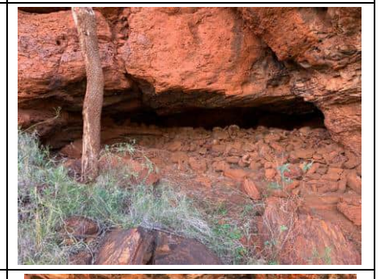
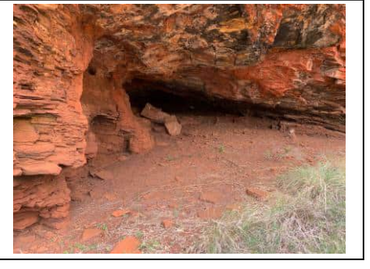
Species		Conservation Status				Reports																																								current
Scientific Name	**Common Name**	**EPBC Act**	**BC Act**	**DBCA**	**IUCN**	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	
Uperoleia saxatilis	*Pilbara toadlet*																						●														●									
PELODRYADIDAE																																														
Cyclorana australis	*Giant frog*													●																																
Cyclorana maini	*Sheep frog*							●			●	●		●	●		●	●	●	●	●	●	●				●			●	●	●					●		●				●			
Cyclorana platycephala	*Water-holding frog*																						●									●					●									
Litoria rubella	*Little red tree frog*					●		●	●		●	●		●			●	●	●		●		●	●	●	●	●	●		●	●	●					●	●	●	●						

Appendix C – Vertebrate Fauna Habitat Assessment

Site ID	Lat.	Long.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcropping	Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances	Last Fire
VBKA-01	-22.6583	119.0874	28/7/22	Breakaway/ Cliff	Major Drainage Line	East	Cliff	Clay Loam	Scarce	Moderate Outcropping	BIF	Small Rocks (11-20cm)	Scarce	Spinifex Hummock Grassland, *Acacia* Shrubland	Mod.	Low	1	Prone to Flooding	Weed Invasion	Old (6+ yr)
VBKA-02	-22.6641	119.0895	28/7/22	Breakaway/ Cliff	Major Drainage Line	East	Very Steep	Clay Loam	Scarce	Major Outcropping	BIF	Small Rocks (11-20cm)	Scarce	Spinifex Hummock Grassland, *Acacia* Shrubland	High	Nil	3	None	Road/ Access Track	Old (6+ yr)
VBKA-03	-22.6680	119.0908	28/7/22	Breakaway/ Cliff	Major Drainage Line	East	Steep	Clay Loam	Scarce	Major Outcropping	BIF	Boulders (>61cm)	None Discernible	Tussock Grassland, Spinifex Hummock Grassland, Scattered Eucalypts, *Acacia* Shrubland	High	Low	5	None	Weed Invasion	Old (6+ yr)
VBKA-04	-22.6739	119.0918	28/7/22	Gorge/ Gully	Breakaway	East	Steep	Clay Loam	Scarce	Major Outcropping	BIF	Small Rocks (11-20cm)	Few Small Patches	*Acacia* Shrubland, Tussock Grassland	Mod.	Nil	3	None	None Discernible	Old (6+ yr)
VBKA-05	-22.6781	119.0947	28/7/22	Breakaway/ Cliff	Major Drainage Line	West	Cliff	Clay Loam	Scarce	Major Outcropping	BIF	Large Rocks (21-60cm)	Scarce	Tussock Grassland, Spinifex Hummock Grassland, Scattered Eucalypts, *Acacia* Shrubland	High	Nil	8	Prone to Flooding	None Discernible	Old (6+ yr)
VBKA-06	-22.6822	119.0928	28/7/22	Gorge/ Gully	Gully	East	Low	Clay Loam	Scarce	Major Outcropping	BIF	Boulders (>61cm)	Few Small Patches	Spinifex Hummock Grassland, Tussock Grassland, Scattered Eucalypts, *Acacia* Shrubland	High	Nil	15	Prone to Flooding	None Discernible	Old (6+ yr)
VBKA-07	-22.6864	119.0995	28/7/22	Breakaway/ Cliff	Major Drainage Line	East	Steep	Clay Loam	Scarce	Major Outcropping	BIF	Boulders (>61cm)	Few Small Patches	Tussock Grassland, Scattered Eucalypts, *Acacia* Shrubland	High	Nil	8	None	Weed Invasion	Old (6+ yr)
VBKA-08	-22.6918	119.1000	28/7/22	Major Drainage Line	Major Drainage Line	South	Flat	Clay Loam	Scarce	Negligible	None Discernible	Gravel (1-4cm)	Few Large Patches	Tussock Grassland, Eucalypt Woodland	Nil	Low	15	Prone to Flooding	Road/ Access Track	Old (6+ yr)
VBKA-09	-22.6994	119.0991	28/7/22	Major Drainage Line	Major Drainage Line	South	Flat	Clay Loam	Scarce	Negligible	None Discernible	Gravel (1-4cm)	Many Small Patches	Eucalypt Woodland, *Acacia* Shrubland, Tussock Grassland	Nil	Low	10	Prone to Flooding	Weed Invasion	Old (6+ yr)
VBKA-10	-22.6508	119.0916	28/7/22	Gorge/ Gully	Gorge	West	Low	Clay Loam	Scarce	Extensive Outcropping	BIF	Boulders (>61cm)	Few Small Patches	Scattered Eucalypts, *Acacia* Shrubland, Tussock Grassland	High	Nil	10	Prone to Pooling	None Discernible	Old (6+ yr)
VBKA-11	-22.6911	119.1072	28/7/22	Gorge/ Gully	Gully	West	Flat	Clay Loam	Scarce	Major Outcropping	BIF	Boulders (>61cm)	Few Small Patches	Scattered Eucalypts, Tussock Grassland	High	Nil	8	Prone to Pooling	None Discernible	Old (6+ yr)
VBKA-12	-22.6498	119.1837	28/7/22	Gorge/ Gully	Cliff	North/ West	Cliff	Clay Loam	Scarce	Major Outcropping	BIF	Pebbles (5-10cm)	Scarce	Spinifex Hummock Grassland	High	Nil	1	None	None Discernible	Mod. (3 to 5 yr)
VBKA-13	-22.6700	119.1494	28/7/22	Minor Drainage Line	Minor Drainage Line	South/ East	Low	Clay Loam	Scarce	Minor Outcropping	BIF	Large Rocks (21-60cm)	Scarce	Scattered Eucalypts, *Acacia* Shrubland, Spinifex Hummock Grassland	Low	Low	3	Prone to Flooding	None Discernible	Old (6+ yr)
VBKA-14	-22.6688	119.1301	29/7/22	Gorge/ Gully	Gully	West	Moderate	Clay Loam	Scarce	Major Outcropping	BIF	Boulders (>61cm)	Many Small Patches	*Acacia* Shrubland, Scattered Eucalypts	High	Nil	5	Prone to Pooling	None Discernible	Old (6+ yr)
VBKA-15	-22.6703	119.1394	29/7/22	Hillcrest/ Hillslope	Undulating Low Hills	West	Low	Clay Loam	Scarce	Limited Outcropping	BIF	Gravel (1-4cm)	Scarce	Scattered Eucalypts, Spinifex Hummock Grassland	Nil	Low	4	None	None Discernible	Old (6+ yr)
VBKA-16	-22.6691	119.1331	29/7/22	Minor Drainage Line	Undulating Low Hills	West	Low	Clay Loam	Scarce	Limited Outcropping	BIF	Gravel (1-4cm)	Few Small Patches	*Acacia* Shrubland, Scattered Eucalypts	Nil	Low	3	Prone to Flooding	None Discernible	Old (6+ yr)
VBKA-17	-22.6745	119.1314	29/7/22	Gorge/ Gully	Gully	West	Low	Clay Loam	Scarce	Major Outcropping	BIF	Pebbles (5-10cm)	Few Small Patches	Scattered Eucalypts, Spinifex Hummock Grassland, Tussock Grassland	Very High	Nil	5	Prone to Pooling	None Discernible	Old (6+ yr)
VBKA-18	-22.6738	119.1349	29/7/22	Hillcrest/ Hillslope	Undulating Low Hills	North	Low	Clay Loam	Scarce	Negligible	None Discernible	Gravel (1-4cm)	Scarce	Spinifex Hummock Grassland	Nil	Low	2	None	None Discernible	Old (6+ yr)
VBKA-19	-22.6641	119.1029	29/7/22	Gorge/ Gully	Gully	West	Flat	Clay Loam	Scarce	Major Outcropping	BIF	Gravel (1-4cm)	Few Small Patches	Scattered Eucalypts, *Acacia* Shrubland, Spinifex Hummock Grassland	Mod.	Low	6	Prone to Flooding	None Discernible	Old (6+ yr)
VBKA-20	-22.6884	119.1003	29/7/22	Breakaway/ Cliff	Breakaway	East	Cliff	Clay Loam	Scarce	Major Outcropping	BIF	Large Rocks (21-60cm)	Few Small Patches	Scattered Eucalypts, Tussock Grassland	High	Nil	0	None	None Discernible	Old (6+ yr)
VBKA-21	-22.6753	119.0882	30/7/22	Drainage Area/ Floodplain	Major Drainage Line	Flat	Flat	Clay Loam	Evenly Spread	Moderate Outcropping	BIF	Boulders (>61cm)	Many Large Patches	Scattered Eucalypts, Tussock Grassland, *Acacia* Shrubland	Mod.	High	4	Prone to Flooding	Cattle Grazing	Old (6+ yr)
VBKA-22	-22.6499	119.1907	30/7/22	Hillcrest/ Hillslope	Hillcrest/ Upper Hillslope	West	Steep	Clay Loam	Scarce	Moderate Outcropping	BIF	Gravel (1-4cm)	Scarce	Scattered Eucalypts, Spinifex Hummock Grassland	Low	Nil	6	None	None Discernible	Mod. (3 to 5 yr)
VBKA-23	-22.6481	119.1856	30/7/22	Hillcrest/ Hillslope	Hillslope	South	Low	Clay Loam	Scarce	Minor Outcropping	BIF	Gravel (1-4cm)	Scarce	Spinifex Hummock Grassland	Low	Nil	0	None	None Discernible	Mod. (3 to 5 yr)
VBKA-24	-22.6498	119.1893	30/7/22	Gorge/ Gully	Gully	North	Very Steep	Clay Loam	Scarce	Extensive Outcropping	BIF	Large Rocks (21-60cm)	Scarce	Spinifex Hummock Grassland, Scattered Eucalypts	High	Nil	4	Prone to Flooding	None Discernible	Mod. (3 to 5 yr)
VBKA-25	-22.6735	119.1446	30/7/22	Hillcrest/ Hillslope	Undulating Low Hills	South/ East	Low	Clay Loam	Scarce	Negligible	None Discernible	Gravel (1-4cm)	Scarce	Scattered Eucalypts, Spinifex Hummock Grassland	Nil	Low	2	None	None Discernible	Mod. (3 to 5 yr)
VBKA-26	-22.6932	119.1328	30/7/22	Basalt Outcrops	Hillcrest/ Upper Hillslope	West	Steep	Clay Loam	Scarce	Major Outcropping	Dolerite	Boulders (>61cm)	Scarce	Spinifex Hummock Grassland	Very High	Nil	0	None	None Discernible	Old (6+ yr)
VBKA-27	-22.6872	119.1270	30/7/22	Hillcrest/ Hillslope	Undulating Low Hills	West	Low	Clay Loam	Scarce	Limited Outcropping	BIF	Gravel (1-4cm)	Scarce	Spinifex Hummock Grassland	Nil	Low	3	None	None Discernible	Old (6+ yr)
VBKA-28	-22.6988	119.1224	30/7/22	Minor Drainage Line	Undulating Low Hills	South	Low	Clay Loam	Scarce	Negligible	None Discernible	Gravel (1-4cm)	Few Small Patches	*Acacia* Shrubland, Scattered Eucalypts	Nil	Mod.	10	Prone to Flooding	None Discernible	Old (6+ yr)
VBKA-29	-22.6964	119.0955	1/8/22	Minor Drainage Line	Hillcrest/ Upper Hillslope	East	Low	Clay Loam	Scarce	Limited Outcropping	BIF	Pebbles (5-10cm)	Scarce	*Acacia* Shrubland	Low	Low	1	Prone to Flooding	None Discernible	Old (6+ yr)
VBKA-30	-22.6955	119.0873	1/8/22	Hillcrest/ Hillslope	Hillcrest/ Upper Hillslope	East	Moderate	Clay Loam	Scarce	Minor Outcropping	BIF	Gravel (1-4cm)	Scarce	Spinifex Hummock Grassland, Scattered Eucalypts	Low	Low	2	None	None Discernible	Old (6+ yr)
VBKA-31	-22.6493	119.1875	30/7/22	Breakaway/ Cliff	Cliff	West	Cliff	Clay Loam	Scarce	Extensive Outcropping	BIF	Large Rocks (21-60cm)	Scarce	Spinifex Hummock Grassland	High	Nil	1	None	None Discernible	Old (6+ yr)

Site ID	Lat.	Long.	Date	Habitat Type	Landform	Aspect	Slope	Soil Type	Soil Avail.	Outcropping	Rock Type	Rock Size	Veg. Litter	Dominant Veg. Type	Rocky Cracks / Crevices	Burrowing Suitability	Hollows	Water present	Disturbances	Last Fire
VBKA-32	-22.6826	119.1363	30/7/22	Hillcrest/ Hillslope	Undulating Low Hills	South	Moderate	Clay Loam	Scarce	Limited Outcropping	BIF	Pebbles (5-10cm)	Scarce	Spinifex Hummock Grassland, Scattered Eucalypts	Nil	Nil	5	None	None Discernible	Old (6+ yr)
VBKA-33	-22.6801	119.1244	30/7/22	Gorge/ Gully	Undulating Low Hills	West	Low	Clay Loam	Scarce	Moderate Outcropping	BIF	Large Rocks (21-60cm)	Scarce	Spinifex Hummock Grassland, Scattered Eucalypts	Mod.	Nil	5	Prone to Flooding	None Discernible	Old (6+ yr)
VBKA-34	-22.6787	119.0868	31/7/22	Hillcrest/ Hillslope	Hillcrest/ Upper Hillslope	East	Low	Clay Loam	Scarce	Limited Outcropping	BIF	Gravel (1-4cm)	Scarce	Scattered Eucalypts, Spinifex Hummock Grassland	Low	Low	2	None	Cattle Grazing	Old (6+ yr)
VBKA-35	-22.6865	119.0951	31/7/22	Gorge/ Gully	Undulating Low Hills	East	Low	Clay Loam	Scarce	Major Outcropping	BIF	Boulders (>61cm)	Few Small Patches	Spinifex Hummock Grassland, Scattered Eucalypts	High	Nil	3	Prone to Pooling	None Discernible	Old (6+ yr)
VBKA-36	-22.7131	119.1103	1/8/22	Minor Drainage Line	Undulating Low Hills	South/ West	Low	Clay Loam	Scarce	Negligible	None Discernible	Pebbles (5-10cm)	Few Small Patches	Scattered Eucalypts, Tussock Grassland	Nil	Mod.	11	Prone to Flooding	None Discernible	Old (6+ yr)

Appendix D – Caves Recorded During the Field Survey

Cave ID	Lat.	Long.	Date Assessed	Cave Position	Floor Slope	Aspect	Cave Exposure	Entrance Type	Entrance Shape	Entrance Width (m)	Entrance Height (m)	Cave Depth (m)	No Cham	Cham Height (m)	Water Present	Number of Ghost Bat Scats	Scat Age	Bats in cave	Photo
CBKA-01	-22.6921	119.1064	29/7/22	Lower Slope	Flat	North/ West	Sheltered	Cavity	Horizontal	4.3	1.7	15.2	1	1	None	0		*Vespadelus finlaysoni*	
CBKA-02	-22.6561	119.0864	30/7/22	Upper Slope	Flat	East	Exposed	Cavern	Horizontal	9.6	2.4	19	1	2.84	None	1	Fresh (<1month)		
CBKA-03	-22.6883	119.1003	29/7/22	Mid Slope	Incline	East	Sheltered	Cavity	Horizontal	3.5	0.75	14.6	1	6.9	None	0			
CBKA-04	-22.6901	119.1015	1/7/22	Lower Slope	Flat	West	Sheltered	Cavity	Horizontal	8.9	2.5	11.8	1	1.1	None	0			

Appendix E – Water Features Recorded During the Field Survey

Water feature ID	Coords.	Date Assessed	Length (m)	Width (m)	Water present above surface	Depth (m)	Water present in intermediate zone	Groundwater veg. present	Emergent macrophyte present	Aquatic veg.	Fauna present	Photo
WBKA-01	-22.6508, 119.0916	28/7/22	10	5	Yes	3	No	No	No	No	No	
WBKA-02	-22.6911, 119.1072	28/7/22	3	2	Yes	0.7	No	No	No	No	No	
WBKA-03	-22.6683, 119.1312	28/7/22	0	0	No	-	No	No	No	No	No	
WBKA-04	-22.6740, 119.1305	28/7/22	0	0	No	-	No	No	No	No	No