



BHP Western Australian Iron Ore
Ministers North Fauna Survey
Level 2 Survey

February 2021

Executive summary

Introduction

BHP West Australian Iron Ore (BHP WAIO) commissioned GHD Pty Ltd (GHD) to undertake vertebrate fauna surveys at two survey areas within the Minister North area. Study Area 1 comprised eight areas requiring a Level 1 (targeted) vertebrate fauna survey. Study Area 2 is the subject of this report and comprised a potential groundwater dependent ecosystem (GDE) in Yandicoogina Creek, which required a detailed two season Level 2 vertebrate fauna survey.

This report details the results from both seasons of the Level 2 vertebrate fauna survey in Study Area 2 (hereafter referred to as the survey area) undertaken during pre-wet season conditions in September 2019 and post-wet season conditions in March 2020. The purpose of the survey was to identify ecological values, further add to the biodiversity knowledge within the survey area and support future approvals.

Survey effort

Phase one of the survey consisted of a 12 day pre-wet season Level 2 assessment from 9 September to 20 September 2019. The phase two survey consisted of a nine day post-wet season Level 2 assessment from 19 March to 27 March 2020. A habitat assessment was conducted in accordance with the BHP fauna survey guidelines over the survey area.

Access to the survey area was limited due to the terrain, with a majority of the area only accessible by foot. As a result, two trap lines (comprising 10 transects each) were deployed within the western portion of the survey area. Trap Line 1 was located within Drainage Area/Floodplain habitat, while Trap Line 2 was positioned in Gorge/Gully habitat. Conservation significant species targeted throughout the Level 2 survey included the Western Pebble-mound Mouse, Rufous Grasswren, Peregrine Falcon, Grey Falcon, Ghost Bat, Northern Quoll, Pilbara Leaf-nosed Bat, Pilbara Flat-headed Blind Snake, Pilbara Olive Python and Pilbara Barking Gecko. The Chocolate Wattle bat was also reported on via call analysis, although this species is not conservation-listed.

The total trapping effort for both phases of survey consisted of 1275 trap-nights (total trap effort associated with the two trap lines), 240 minutes of bird assessments, 540 minutes of active searches, 600 minutes of night searches, 16 nights of Night Parrot assessment and 25 nights of Bat detection. Remote cameras were deployed during phase one of the survey and collected during phase two of the survey after being deployed for a total of 3,063 nights.

Key results

- Four habitat types were identified within the survey area. These comprised Hilltop/Hillcrest (149.72 ha), Gorge/Gully (95.90 ha), Drainage Area/Floodplain (12.69 ha) and Minor Drainage Line (1.91 ha)
- There is a high degree of fauna habitat continuity throughout and adjacent to the survey area while extensive mining operations at Yandi approximately 3 km north and northeast of the survey area reduce connectivity regionally
- Whilst the vegetation is mostly intact, evidence of grazing was observed within the Drainage Area/Floodplain and Minor Drainage Line habitat, which otherwise is generally in good condition. The overall quality of the remainder higher elevation rocky areas of the survey area is in very good to excellent condition
- The field survey identified 122 species of vertebrate fauna within the survey area. This number comprises 55 birds, 44 reptiles, 19 mammals and four amphibians

- Four conservation significant fauna species were recorded within the survey area during the field survey:
 - Ghost Bat (*Macroderma gigas*) – listed as Vulnerable (Vulnerable) under the *Biodiversity Conservation Act 2016* (BC Act) and Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
 - Western Pebble-mound Mouse (*Pseudomys chapmani*) – Listed as Priority 4 under the Department of Biodiversity Conservation and Attractions fauna listings
 - Pilbara Olive Python (*Liasis olivaceus*) – Listed as Vulnerable under both the BC Act and EPBC Act
 - Pilbara Flat-headed Blind Snake (*Anilius ganei*) – Listed as Priority 2 under the BC Act
- Four caves were identified along the cliffs and breakaway of the Gorge/Gully system which appear to be previously or currently used by Ghost Bat (three diurnal roosts and one foraging cave). There were caves, including two cultural heritage caves, not accessed during the survey that may provide additional diurnal roosting habitat for the Ghost Bat and Pilbara Leaf-nosed Bat
- Two active and one recently inactive Western Pebble-mound Mouse mounds were recorded in the Hillcrest/Hillslope habitat
- Pilbara Olive Python scat was found on a rock ledge at one of the permanent water holes within the Gorge/ Gully habitat during the first phase survey
- One Pilbara Flat-headed Blind Snake was captured in a pitfall trap at Trap Line 2 during the phase two survey
- During the phase one survey, definite recordings of the Chocolate Wattle Bat were detected at two locations within the survey area (Site 2 (Gorge/Gully) and Site 4 (Gorge/ Gully)). Probable detections were recorded at four other sites within the survey area (Trap Line 1 (Drainage Area/Floodplain), Trap Line 2 (Gorge/Gully), Site 1 (water hole within Gorge/Gully system) and Site 3 (Gorge/ Gully). The Chocolate Wattle Bat was not recorded during the second phase survey
- Seven additional conservation significant species are considered likely to utilise the survey area on the basis of suitable habitat and nearby records including:
 - Rufous Grasswren (*Amytornis striatus* subsp. *whitei*) - listed as Priority 4 under the BC Act (nesting and foraging habitat available in Hillcrest/Hillslope habitat)
 - Peregrine Falcon (*Falco peregrinus*) - listed as Other Special under the BC Act (all habitats are suitable for foraging)
 - Grey Falcon (*Falco hypoleucos*) - listed as Vulnerable under the BC Act (all habitats are suitable for foraging)
 - Northern Quoll (*Dasyurus hallucatus*) - listed as Endangered under the BC Act and Endangered under the EPBC Act (foraging and denning habitat available in Gorge/Gully and Breakaway/Cliff habitat)
 - Pilbara leaf-nosed Bat (*Rhinonictoris aurantia*) - listed as Vulnerable under the BC Act and Vulnerable under the EPBC Act (foraging habitat available in Gorge/Gully, Minor Drainage Lines, and Hillcrest/ Hillslope habitat particularly those associated with the permanent pools along Yandicoogina Creek)
 - Pilbara Barking Gecko (*Underwoodisaurus seorsus*) - listed as Priority 2 under the DBCA fauna listings (suitable habitat available within Gorge/Gully and Hillcrest/Hillslope habitat).

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Appendices

- Appendix A – Relevant legislation, background information and conservation codes
- Appendix B – Desktop Searches
- Appendix C – Fauna species data

1. Introduction

1.1 Project background

BHP Western Australian Iron Ore (BHP WAIO) commissioned GHD Pty Ltd (GHD) to undertake vertebrate fauna surveys at two survey areas in the Minister North area. Study Area 1 comprised eight areas requiring a Level 1 (targeted) vertebrate fauna survey. Study Area 2 is the subject of this report and comprised a potential groundwater dependent ecosystem (GDE) in Yandicoogina Creek which requires a detailed two season Level 2 vertebrate fauna survey.

1.2 Purpose of this report

This report details the results from both seasons of the Level 2 vertebrate fauna survey undertaken during pre-wet season conditions in September 2019 and post-wet season conditions in March 2020. The purpose of the survey was to identify ecological values, further add to the biodiversity knowledge within the survey area and support future approvals documentation.

1.2.1 Limitations and assumptions

This report has been prepared by GHD for BHP WAIO and may only be used and relied on by BHP for the purpose agreed between GHD and the BHP WAIO as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than BHP WAIO arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. Site conditions may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. The opinions, conclusions and recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by BHP WAIO and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

1.3 Scope of works

The scope of works was to:

- Provide a comprehensive desktop assessment comprising vertebrate fauna database search for the database search area as detailed in BHP guidance document SPR-IEN-EMS-012 v6, to determine the presence, or likely presence, of conservation significant vertebrate fauna species
- Undertake a two-season Level 2 vertebrate fauna survey within the survey area as detailed in guidance document SPR-IEN-EMS-012 v6
- Provide a technical report (this document) detailing the desktop assessment and the fauna survey, prepared in accordance with guidance document SPR-IEN-EMS-012 v6
- Submit fauna survey data in accordance with BHP guidance document SPR-IEN-EMS-015 v11.

1.4 Survey Location

1.4.1 Survey area

The survey area is located directly southeast of the BHP Yandi mining operation and approximately 81 kilometres (km) northwest of Newman. The survey area covers approximately 255.55 hectares (ha) and comprises a section of the Yandicoogina Creek thought to be a potential (GDE) (see Figure 1).

For this report, the term database search area includes the survey area and an additional 40 km radius buffer around the survey area. The database search area defines the limits of the desktop assessment as described in Section 2.3.

1.5 Environment

1.5.1 Regional biogeography

The survey area is situated in the Eremaean Botanical Province, within the Pilbara bioregion and the Hamersley sub-region as described by the Interim Biogeographic Regionalisation of Australia.

Bastin and the ACRIS Management Committee (2008) have characterised the Pilbara bioregion as vast coastal plains and inland mountain ranges with cliffs and deep gorges. Vegetation is predominantly mulga low woodlands or snappy gum over bunch and hummock grasses. Tenure comprises Aboriginal land, leasehold (for grazing cattle) and conservation reserves. The bioregion provides the majority of Western Australia (WA)'s exports in petroleum, natural gas and iron ore. Major population centres are Karratha, Port Hedland, Newman and Tom Price (Bastin and the ACRIS Management Committee 2008).

1.5.2 Geology and soils

Geology

The Australian continent is made up of four continental blocks: the Yilgarn, Pilbara and Gawler Cratons and the Wilyama Block. The survey area is located within the Fortescue Large Igneous Provinces of the Pilbara Craton. The Pilbara Craton is a geological formation formed from Archaean crust (3.6-2.7 billion years ago). The Fortescue Large Igneous Province comprises mafic to intermediate and ultramafic volcanic rocks, mafic sills, mafic-ultramafic-layered intrusions and dykes, such as the Black Range Suite. The tectonic setting of the Fortescue Group has been variably interpreted as a rift-to-passive margin, to a more complex rift- and breakup-shelf subsidence model (Thorne & Trendall 2001, Pirajno & Morris 2005).

Land systems, landforms and soil

Soils within the survey area comprise the Fa13 soil type (BRS 2009). This unit is described as: *Ranges of banded jaspilite and chert along with shales, dolomites, and iron ore formations; some areas of ferruginous duricrust as well as occasional narrow winding valley plains and steeply dissected pediments. This unit is largely associated with the Hamersley and Ophthalmia Ranges. The soils are frequently stony and shallow and there are extensive areas without soil cover: chief soils are shallow stony earthy loams (Um5.51) along with some (Uc5. 11) soils on the steeper slopes. Associated are (Dr2.33 and Dr2.32) soils on the limited areas of dissected pediments, while (Um5.52) and (Uf6.71) soils occur on the valley plains* (BRS 2009).

The Pilbara region has been surveyed by the Department of Agriculture and Food, Western Australia and others for the purposes of land classification, mapping and resource evaluation. One hundred and two land systems have been described for the region, which are distinguished on the basis of topography, geology, soils and vegetation (van Vreeswyk et al. 2004). The survey area intersects two mapped land systems; details of these land systems are presented in Table 1.

Table 1 Land systems within the survey area

| Land system | Description | Land type |
|-------------|--|---|
| Newman | Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands | Hills and ranges with spinifex grasslands |
| River | Active flood plains, major rivers and banks supporting grassy eucalypt woodlands, tussock grasslands and soft spinifex | River plains with grassy woodlands and tussock grasslands |

1.5.3 Hydrology

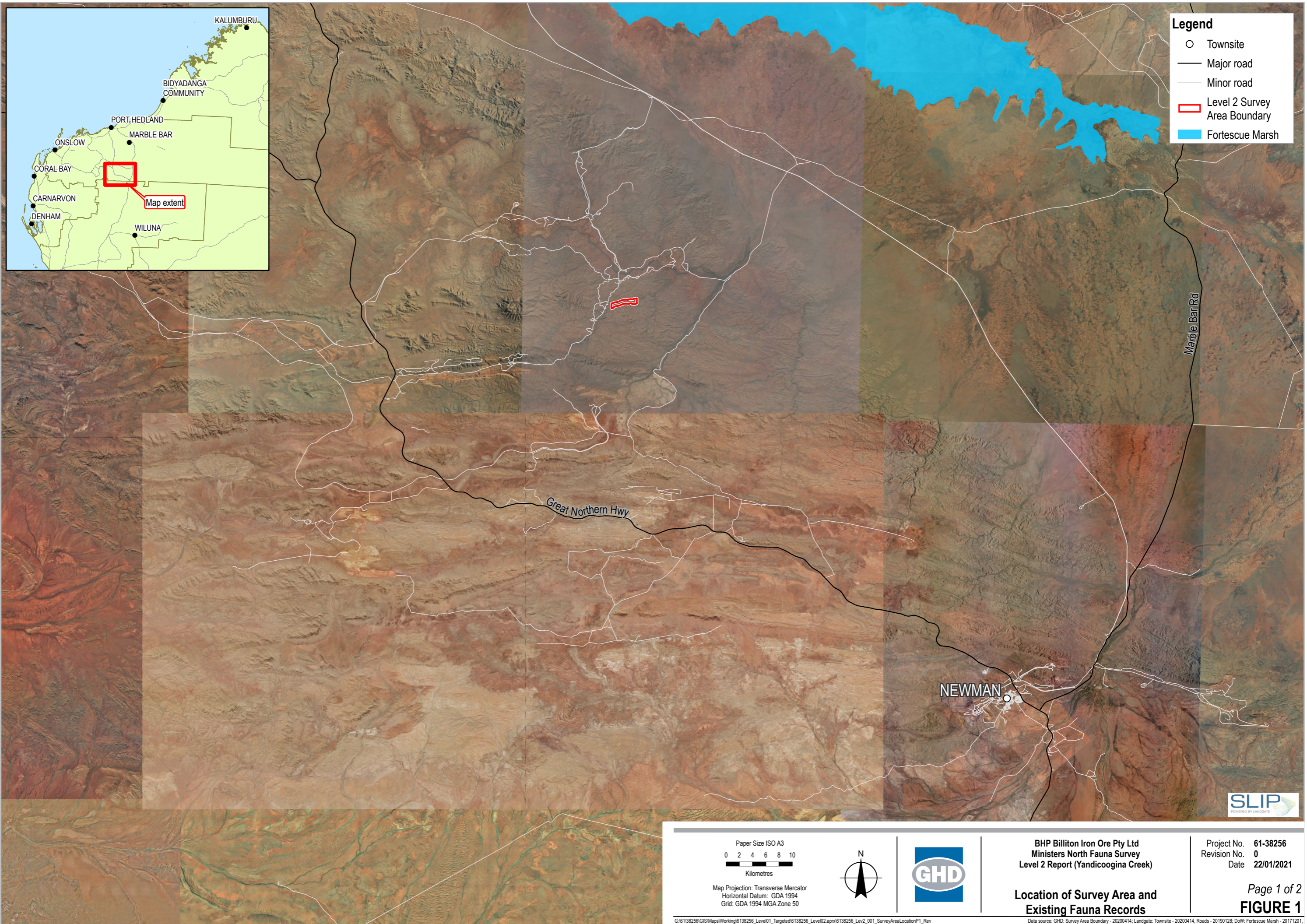
The survey area is intersected by Yandicoogina Creek which supports a potential GDE and is dominated by old growth Paperbark (*Melaleuca argentea*) and River Gums (*Eucalyptus camaldulensis*) over dense reeds and rushes. Yandicoogina Creek, which runs the length of the survey area is classified as a Minor River and flows seasonally depending on the severity of cyclonic and monsoonal weather events. Yandicoogina Creek flows approximately northeast and connects with Marillana Creek and Weeli Wollie Creek which feed into the Fortescue Marsh approximately 50 kilometres northeast of the survey area. During the survey, seven surface water bodies were identified (Figure 3). These areas, and others associated with dense reed beds are considered to be permanent water bodies.

1.5.4 Land use

The survey area lies within BHP Iron Ore (Jimblebar) Pty Ltd, FMG Pilbara Pty Ltd and Process Minerals International Pty Ltd mining tenements (DMIRS 2019). The survey area does not appear to be within a pastoral lease.

1.5.5 Vegetation

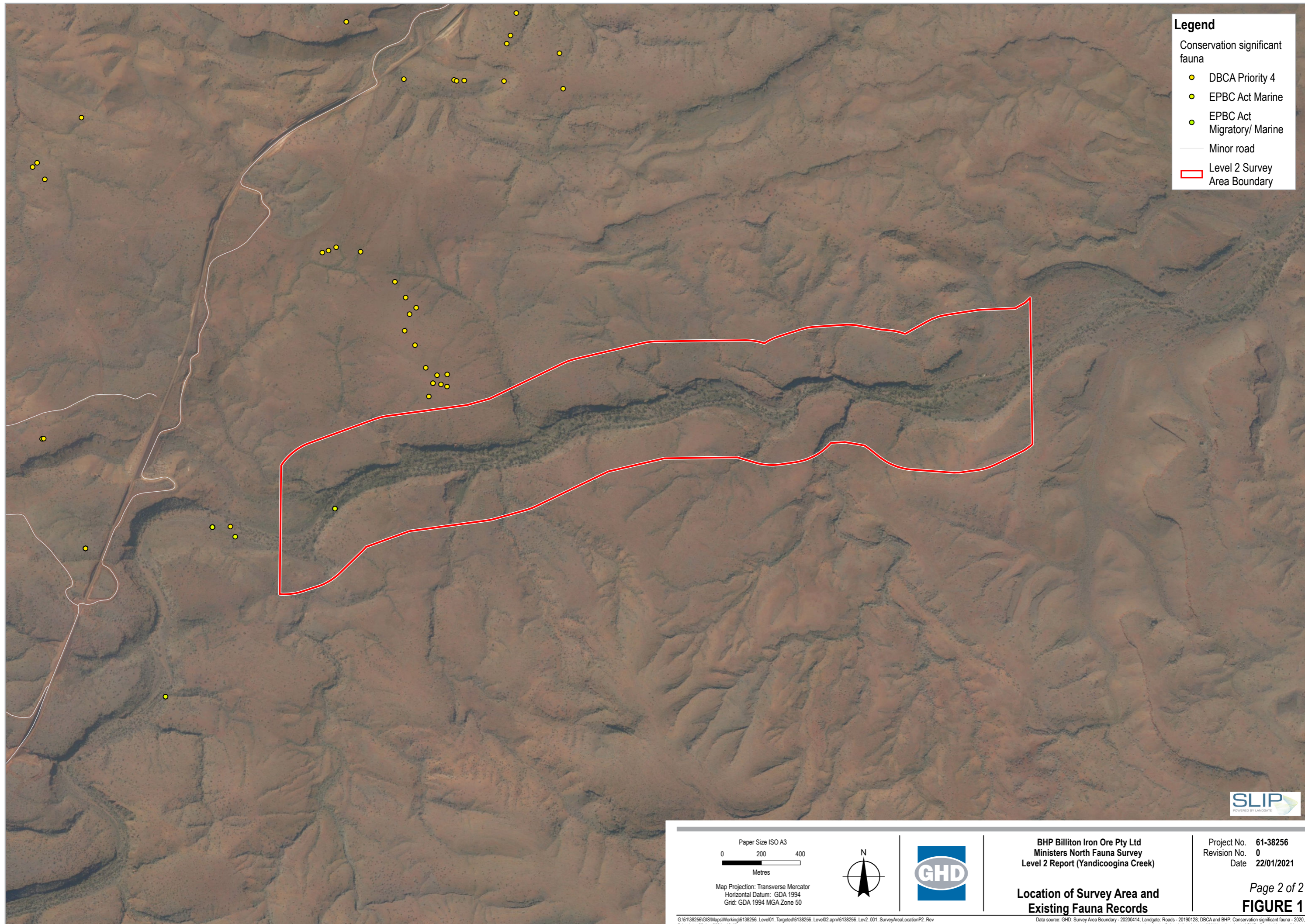
Broad scale (1:1,000,000) pre-European vegetation mapping of the Pilbara region was completed by Beard (1976) at an association level. The mapping indicates there is one vegetation association present within the survey area, Low tree-steppe, which is described as 'Hummock grassland with scattered bloodwoods & snappy gum, *Triodia* spp., *Corymbia dichromophloia*, *Eucalyptus leucophloia*'.



Legend

- Townsite
- Major road
- Minor road
- ▭ Level 2 Survey Area Boundary
- Fortescue Marsh

| | | | | |
|---|--|--|---|---|
| <p>Paper Size ISO A3 0 2 4 6 8 10 Kilometres</p> <p>Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 50</p> | | | <p>BHP Billiton Iron Ore Pty Ltd Ministers North Fauna Survey Level 2 Report (Yandicoogina Creek)</p> | <p>Project No. 61-38256 Revision No. 0 Date 22/01/2021</p> |
| | | | <p>Location of Survey Area and Existing Fauna Records</p> | <p>Page 1 of 2 FIGURE 1</p> |
| <p><small>G:\6138256\GIS\Maps\Working\6138256_Level01_Targeted\6138256_Level02.aprx\6138256_Level2_001_SurveyAreaLocationP1_Rev</small></p> | | | <p><small>Data source: GHD: Survey Area Boundary - 20200414; Landgate: Townsite - 20200414; Roads - 20190128; DoW: Fortescue Marsh - 20171201; Landgate_Subscription_Imagery\WAnow: Landgate / SLIP. Created by: mmikonen</small></p> | |



- Legend**
- Conservation significant fauna
- DBCA Priority 4
 - EPBC Act Marine
 - EPBC Act Migratory/ Marine
 - Minor road
 - Level 2 Survey Area Boundary



Paper Size ISO A3
 0 200 400
 Metres

Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 50



BHP Billiton Iron Ore Pty Ltd
Ministers North Fauna Survey
Level 2 Report (Yandicoogina Creek)

Project No. **61-38256**
 Revision No. **0**
 Date **22/01/2021**

Location of Survey Area and Existing Fauna Records

Page 2 of 2
FIGURE 1

G:\6138256\GIS\Maps\Working\6138256_Level01_Targeted\6138256_Level02.aprx\6138256_Lev2_001_SurveyAreaLocationP2_Rev
 Print date: 22 Jan 2021 - 10:17

Data source: GHD: Survey Area Boundary - 20200414; Landgate: Roads - 20190128; DBCA and BHP: Conservation significant fauna - 2020; Landgate_Subscription_Imagery\WANow; Landgate / SLIP. Created by: mmikonen

2. Methodology

2.1 BHP requirements

BHP requirements applied to this survey are set out in Guidance for Vertebrate Fauna Surveys in the Pilbara (SPR-IEN-EMS-012 v6). This document outlines BHP's expectations for survey components including the level of survey, desktop assessment, survey design and intensity, timing, habitat assessment and reporting requirements. Biological survey spatial data requirements (SPR-IEN-EMS-015 v11) set out all biodiversity data requirements to standard and consistent format. These standards enable analysis of survey data and comparison between surveys spatially and temporally.

2.2 Relevant legislation and background documents

In WA all native species and communities are protected under the *Biodiversity Conservation Act 2016* (BC Act). Species of high conservation status (conservation significant species) are further protected under Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). An overview of these key legislation and guidelines, conservation codes and background information relevant to this fauna survey is provided in Appendix B. In addition, regulatory authorities also provide a range of guidance and information on expected standards and protocols for environmental surveys.

2.3 Desktop assessment

Prior to the field survey a desktop assessment was undertaken to collect relevant environmental and ecological information pertaining to the survey area and wider database search area and to assist survey design. This included a review of:

- The Department of the Environment and Energy (DEE) (now Department of Agriculture, Water and the Environment) Protected Matters Search Tool (PMST) to identify communities and species listed under the EPBC Act potentially occurring within the database search area (DEE 2019) (Appendix C)
- Literature review of five previous fauna survey reports provided by BHP that cover portions of the survey area and wider database search area
- The Department of Biodiversity Conservation and Attractions (DBCA) Threatened and Priority Fauna database for the database search area
- The DBCA NatureMap database for fauna species previously recorded within the database search area (DBCA 2007–) (Appendix C) comprising the following databases:
 - Atlas of Australian birds
 - Pilbara Threatened Fauna
 - Bird data - Birdlife Australia
 - Fauna Survey Returns Database
 - Pilbara Biological Survey - Birds or Pilbara
 - Biological Survey - Pilbara Biological Survey (mammals, birds, reptiles)
 - Waterbirds or Pilbara Threatened Fauna
 - WA Threatened Fauna Database
 - WA Museum (WAM) databases (mammals, birds, reptiles)

- Aerial photography, geology/soils, land systems and hydrology information to provide background information on the variability of the environment and likely vegetation and habitat types present.

2.4 Field survey

2.4.1 Field survey details and timing

Phase one of the survey consisted of a 12 day pre-wet season Level 2 assessment from 9 to 20 September 2019. The field survey was led by Principal Zoologist Glen Gaikhorst and assisted by Senior Zoologist Robert Browne-Cooper and Ecologists Madison Roberts and Sarah Flemington. The phase two survey consisted of a nine day post-wet season Level 2 assessment from 19– 27 March 2020. The experience of these staff members are presented in Table 2.

Table 2 Personnel experience

| Name | Years of experience | Role | Field survey phase |
|----------------------|---------------------|------------------------------------|--------------------|
| Glen Gaikhorst | 20 | Principle Zoologist and field lead | Phase one |
| Robert Browne-Cooper | 20+ | Senior Zoologist | Phase one and two |
| Madison Roberts | 3 | Ecologist | Phase one and two |
| Sarah Flemington | 2 | Ecologist | Phase one |

2.4.2 Guiding documents

In addition to the BHP requirements listed in Section 2.1, the survey methodology and data collection that GHD employed was consistent with:

- EPA Technical Guidance –Terrestrial Fauna Surveys, Perth, Environmental Protection Authority (EPA 2016a)
- EPA Technical Guidance – Sampling methods for terrestrial vertebrate fauna, Perth, Environmental Protection Authority (EPA 2016b)
- Interim guideline for preliminary surveys of Night Parrot (*Pezoporus occidentalis*) in Western Australia. (Department of Parks and Wildlife, 2017)
- Survey Guidelines for Australia's Threatened Bats (Department of the Environment, Water, Heritage and the Arts 2010a)
- Survey Guidelines for Australia's Threatened Mammals (Department of the Environment, Water, Heritage and the Arts 2010b)
- Survey Guidelines for Australia's Threatened Reptiles (Department of the Environment, Water, Heritage and the Arts 2010c)
- EPBC Act referral guideline for the endangered northern quoll *Dasyurus hallucatus* (Department of Environment 2016b).

2.4.3 Permits and ethics

A Regulation 17 Licence to Take Fauna for Scientific Purposes was obtained from DBCA prior to undertaking the fauna survey (Licence Number: BA27000036). This permit also allows vouchering a limited number of non-conservation significant specimens for lodgement with the Western Australian Museum (WAM). However in general, only specimens of particular scientific interest or taxonomic significance are collected for the WAM. The fauna survey (specifically trapping and animal handling) was undertaken in accordance with Standard Operating Procedures (SOPs) which were required to be followed under the conditions of GHD's fauna

trapping permit. At the time of survey, compliance with these SOPs was accepted by DBCA as evidence of ethical treatment of animals.

2.4.4 Habitat assessment

Habitat assessment was conducted in accordance with the BHP fauna survey guidelines as outlined in Section 2.1. Field data was collected via the ArcGis Online platform for all systematic fauna sampling sites (Section 2.4.7), at significant species record sites and other locations as required to enable delineation and mapping of major fauna habitat types throughout the survey area.

Habitat value is assessed based on the landform habitat characteristics and the known habitat preferences and requirements for a given species. The terms High, Moderate, or Low are used to assign a broad value to a habitat feature or landform being assessed. Low habitat value is assigned to habitat that lack a species' preferred foraging, sheltering, denning and or breeding opportunities. Moderate habitat value is assigned to habitat that has limited or marginal foraging, sheltering, denning and or breeding opportunities. High habitat value is assigned to habitat that has a species' preferred foraging, sheltering, denning and or breeding opportunities.

Broad habitat types within the survey area were identified, mapped and described based on the following:

- Location within survey area
- Landscape position
- Geomorphology, topography and substrate
- Photos of representative habitat types
- Values to associated fauna including significant species (e.g. refuge, foraging, shelter)
- Disturbances (weeds, fire, ground disturbance)
- Comparison between broad habitat types
- Evaluation of the likelihood of occurrence of conservation significant fauna within the environments present (based on presence of suitable habitats and species recorded).

2.4.5 Fauna Habitat Mapping

The survey area was mapped utilising the habitat assessment and referencing BHP WAIO Vertebrate fauna survey and data guidelines for the correct habitat terminology. In addition to habitat mapping, various fauna habitat assessment points were included in areas where habitat either supported significant fauna, or warranted further descriptive information as it differed slightly from surrounding habitats. Additionally, habitat features of significance were recorded and targeted searches for Pilbara Olive Python and/or frogs were undertaken where significant water features were identified. All data was recorded on the tablet devices, using the BHP database. Habitat points are displayed in Table 3.

Table 3 Location of habitat points

| Site ID | Date | Easting | Northing |
|---------|------------|-----------|------------|
| HAB-01 | 12/09/2019 | 720988.36 | 7474111.61 |
| HAB-02 | 15/09/2019 | 722380.72 | 7474032.18 |
| HAB-03 | 15/09/2019 | 723125.08 | 7474336.66 |
| HAB-04 | 15/09/2019 | 722664.18 | 7474127.61 |
| HAB-05 | 18/09/2019 | 719546.11 | 7473863.11 |
| HAB-06 | 18/09/2019 | 719892.09 | 7474008.48 |

| Site ID | Date | Easting | Northing |
|---------|------------|-----------|------------|
| HAB-07 | 12/09/2019 | 721483.54 | 7474291.82 |
| HAB-08 | 12/09/2019 | 721504.53 | 7474276.21 |
| HAB-09 | 12/09/2019 | 721974.58 | 7474118.26 |
| HAB-10 | 12/09/2019 | 721970.25 | 7474122.30 |
| HAB-11 | 12/09/2019 | 720439.50 | 7473914.39 |
| HAB-12 | 12/09/2019 | 721721.90 | 7473998.61 |
| HAB-13 | 12/09/2019 | 720489.93 | 7473812.29 |
| HAB-14 | 15/09/2019 | 721726.20 | 7474223.94 |
| HAB-15 | 18/09/2019 | 720608.92 | 7474122.36 |
| HAB-16 | 18/09/2019 | 720242.61 | 7473615.35 |
| HAB-17 | 18/09/2019 | 720226.47 | 7473616.17 |
| HAB-18 | 18/09/2019 | 720220.61 | 7473594.89 |

2.4.6 Fauna identification and nomenclature

Species Identification

Fauna were identified in the field or office (remote camera, bat call and bird acoustic analysis) using reference books and field guides and electronic guides (Table 4). Where identification was not possible, photographs of specimens were collected to be later identified (field) or species were identified to genus level (bat call and bird acoustic analysis).

Table 4 Fauna references

| Fauna group | Field guide |
|-------------|---|
| Mammals | Menkhorst & Knight (2004), Van Dyck & Strahan (2008), Pizzey & Knight (2012) |
| Bats | Churchill (2008), Menkhorst & Knight (2011), Pizzey & Knight (2012), Van Dyck et al. (2013), Armstrong (2011), Armstrong & Coles (2007), Bullen & McKenzie (2011), Duffy et al. (2000), Hourigan (2011), McKenzie & Bullen (2009; 2012), Mills et al. (1996), Reardon et al. (2014) |
| Birds | Morcombe (2004), Jackett et al. (2017); Murphy et al. (2017); Leseberg et al. (2019) |
| Reptiles | Wilson & Swan (2017), Storr et al. (1999), Storr et al. (2002) |
| Amphibians | Tyler & Doughty (2009) |

Nomenclature

Nomenclature used in this report follows that used by WAM as reported on *NatureMap*. This nomenclature is deemed the most up-to-date species information for WA fauna.

2.4.7 Systematic trapping program

Systematic trapping programs are designed for recording an inventory of general species and significant species in a standardised approach where trapping and other survey effort is equal and quantifiable across all trapping quadrats. This allows comparison of species abundance and richness between sampling sites and habitat types, and provides a robust and reproducible approach for analysing species accumulation data.

Trapping for terrestrial vertebrate fauna was duplicated for both phases and undertaken using a series of standardised systematic trapping quadrat sites (trap lines) comprising pit-fall traps, Elliott box traps, cage traps and funnel traps. Traps were checked and cleared as per licence condition within a specified time each morning, with fauna identified and released in situ. For each quadrat timed bird survey and active searching was also carried out.

Access into the survey area was limited with the majority of the area only accessible by foot. As a result, two trap lines (comprising 10 transects each) were deployed within the western portion of the survey area which was within 500 m of a vehicle track. This allowed the trap lines to be within a safe distance of the survey vehicle for manual handling and when conducting nocturnal surveys. The two trap lines were positioned in different habitat types: Trap Line 1 was located within the Drainage Area/Floodplain habitat type, while Trap Line 2 was positioned in the Gorge/Gully habitat type. Each trap line was surveyed (trapped) for eight consecutive nights during the first season survey and seven consecutive nights during the second season survey. Checking of traps was carried out in accordance with the DBCA fauna trapping licence stipulating daily requirements for clearing traps.

Active searching and avifauna surveys were also undertaken systematically within the survey area Table 5 presents the systematic trapping methods and survey effort; and trapping locations (Trap Sites) are shown in Figure 2. The trap methods used are described below.

Pit-trap with drift fence

Pit-fall traps consisting of alternating buckets and pipes were installed in a linear formation at approximately 20 m intervals within each of the two trap lines. Due to the rocky nature of Trap Line 2, only three pit traps could be installed and so extra funnel traps were used in their place. This gave a total of 10 pit-fall traps across Trap Line 1 and three pit-fall traps across Trap Line 2. Buckets were 20 litre plastic buckets (25 cm diameter by 40 cm deep), and pipe traps consisted of 8-9 litre (15 cm diameter by 50 cm length) sections of PVC pipe. Each pit-fall trap was set with a 6-8 m long flywire drift fence (30 cm high) bisecting the pits (or additional funnels) to direct fauna into them. Soil, leaf litter and/or egg crate were placed within each pit to provide shade and protection to trapped fauna.

Funnel traps

Funnel traps were set on each drift fence and positioned with one funnel at each end, giving a total of 20 funnels at Trap Line 1 and 28 funnels at Trap Line 2 (the additional eight funnels were in place of pit-traps). Funnel traps were placed such that animals were directed into them from the drift fence. Funnel traps were covered with insulating and highly reflective materials to maximise shade, and minimise heat and cold exposure to animals.

Elliott box traps

Elliott box traps (medium size) were used at each trapping site. These traps target a range of small rodents and Dasyurid mammals such as *Sminthopsis* and *Pseudomys* species. Traps were placed approximately 20 m apart and approximately 10 m from each respective pit-fall trap, and baited with universal bait (a mixture of peanut butter, rolled oats and sardines). Elliott traps were located within shady areas or covered with vegetation to minimise heat exposure to captured animals. Ten box traps were set at each trap line giving a total of 20 Elliott box traps set over both trap lines.

Cage traps

Two cage traps were located at each trap line to target medium-sized mammals. These traps were placed at each end of the line of Elliott traps. Cage traps were baited with universal bait and each was covered with a hessian sack and placed below vegetation canopy for shade and to reduce exposure to animals.

Avifauna

Avifauna surveys were undertaken within each of the trapping sites. Each survey comprised of a 20 minute census of birds within an unbounded 2 ha area. This approach is the standard method

used by Birds Australia for the Bird Atlas project. Birds detected visually (using binoculars) and/or aurally over a 20 minute period were recorded. Numbers of each species observed were also recorded. All systematic bird surveys were undertaken within four hours of dawn or two hours of dusk, as these are the times of day when birds are most active. In addition to systematic surveys, observations of birds were also made opportunistically.

Active searches

Each trapping quadrat site was actively searched by hand for amphibians, reptiles, and mammals. Searches comprised looking under or overturning logs, bark, rocks and leaf litter and low vegetation, and other ground debris to search for inactive fauna. All fauna, both inactive and active including abundance was recorded. Species presence was also determined via secondary evidence, in the form of scats, tracks, feathers, skeletal remains and burrows. A minimum of one hour was spent at each trap line and the general area around it. Additional active searches were undertaken independently of the trapping location searches. The independent active searches were undertaken in areas of difficult access or in those habitats that may support conservation significant species. Additional active searches can be seen in Table 9.

2.4.8 Remote Fauna recording devices

Remote Cameras

Remote sensor cameras (Reconyx-Hyperfire ® and Scoutguard ®) were deployed during phase one of the survey and subsequently collected during phase two after the wet season approximately six months later. Cameras were used to target significant fauna species, primarily Northern Quoll and also add to the general species inventory. Cameras can also opportunistically detect Pilbara Olive Python (POP) however the preferred method for detecting POP is via searching water bodies and rocky habitat for individuals or signs of use (e.g. scat, sluffs). Cameras generally target medium to large mammals, birds and reptiles. Cameras were set in areas where significant species are more likely to be recorded e.g. rocky potential forage or den sites, or along potential fauna movement corridors. Cameras were baited with sardines and/or universal animal bait to attract fauna species. A total of 16 remote cameras were set across the survey area giving a total of 3063 camera trap nights. For each camera location the time and date deployed and recovered, and the GPS coordinates were recorded (Table 6).

Data from the cameras were downloaded to a computer and analysed for the presence of animals following the field survey.

Bat acoustic recorders

Bat Detectors (SM4 and SM2 SongMeters ®) were deployed targeting a range of micro bats, but focussing on Ghost Bat and Pilbara Leaf-nosed Bat. Detectors were set for up to three night before being shifted to new locations. Bat detectors were set at both trap transects and at other locations positioned in areas where bats were likely to be present i.e. water bodies, fly-ways such as rocky gullies and clearings and set at potential roost caves. Bat detectors were programmed to record from 25 minutes pre-dusk to 25 minutes post-dawn. For each detector the time and date deployed and recovered, and the GPS coordinates were recorded (Table 7).

Data from the bat detectors were downloaded to a computer and analysed for the presence of animals following the field survey. Data from the detectors was analysed by GHD Zoologist Craig Grabham to determine species, using Kaleidoscope ® bat analysis software and a series of graphical reference comparison calls.

Bird acoustic recorders

Bird acoustic recorders were set primarily for detecting the Night Parrot in line with DPaW (2017). Acoustic detectors (SM4 SongMeter ® Acoustic recorders) were deployed in areas where Night Parrot might be recorded such as potential roosting or feeding habitat i.e. utilising water bodies or Triodia and grassland plain. The detectors were set for a maximum of three nights and programmed to record from 25 minutes pre-dusk to 25 minutes post-dawn. Following three nights of deployment, the detectors were moved to a different area to increase coverage. For each detector the time and date deployed and recovered, and the GPS coordinates were recorded (Table 8). Data from the recorders was downloaded onto a computer and analysed by Nigel Jackett, an Ecologist with three years experience in analysis and identification of Night Parrot acoustic data.

2.4.9 Non-systematic fauna survey

Non-systematic survey methods aim to detect conservation significant species and boost inventory species records by augmenting systematic trapping methods. These methods detect fauna by opportunistic observation and by selectively searching particular habitat types and landform features in consideration of target species' habitat preferences, optimal seasonal and diurnal timing to record active fauna or opportunistic secondary evidence. Non-systematic methods described below, particularly opportunistic observations, generally account for a high proportion of the total fauna inventory including significant fauna recorded during surveys. Non-systematic survey method locations are shown in Figure 2.

Nocturnal searching

Spotlighting was undertaken to locate nocturnal species such as nocturnal reptiles, mammals and birds that may otherwise remain undetected using other survey techniques. Hand held or head mounted spotlights were used for a minimum of one hour by two personnel in selected areas based on habitat suitability and site access in consideration of HSE requirements. Two nocturnal searching assessments were undertaken during each survey phase within the survey area.

Opportunistic observations

Opportunistic observations involve the recording of fauna taxa (physical presence and/or signs of presence) spatially throughout the survey area. Opportunistic observations include physical observations (sighting or hearing fauna), and indirect evidence (scats, tracks, diggings, nests, feathers, skeletal remains, pellets) which indicate the current or recent activity of a species. Wherever possible, numbers of individuals, microhabitat use and other relevant information was recorded. Opportunistic observations were recorded outside of the diurnal, nocturnal or general trap site surveys (for example when driving, traversing the survey area, and during habitat assessment).

Cave searches

Caves identified as potentially suitable for Pilbara Leaf-Nosed Bat or Ghost Bat were first observed opportunistically while driving or traversing through the survey area, and then further investigated by foot where accessible. Outcrops not accessible by vehicle but considered to potentially contain caves were accessed by foot and searched thereafter. Assessment of suitability for Pilbara Leaf-Nosed Bat and Ghost Bat included cave dimensions, the presence of guano and evidence of feeding. If possible, SongMeters ® and/or cameras were set at the mouths of caves to collect further evidence of cave use.

eDNA

Environmental DNA (eDNA) enables the detection of species from environmental samples through the analysis of DNA released by organisms into their environment. The practice is relatively new and currently not all conservation significant species can be detected in this way as their DNA is yet to be 'mapped'. eDNA sampling was undertaken in the survey area where significant water bodies were located to detect POP, for which reference DNA has been mapped. In theory, if POP are utilising these water bodies they are likely to leave trace DNA in the water, which can then be detected through the eDNA technique. A total of six water samples and one faecal sample were taken over four different sites. Following collection, water filtrate samples are sent to a third party, EnviroDNA, for laboratory analysis.

Short-range Endemic Invertebrate collection

GHD was requested by Biologic, who were conducting an SRE survey in the area, to collect candidate specimens of short-range endemic invertebrates opportunistically. These were collected as bi-catch during systematic trapping, and collected incidentally during active searching. Live specimens of scorpion and isopod were given to Biologic staff onsite.

2.5 Survey effort and sampling locations

Survey effort is described as the amount and type of survey that is undertaken during an assessment.

The effort and location of sampling can be found in the following tables; Table 5, Table 6, Table 7, Table 8 and Table 9. Figure 2 shows the survey effort undertaken for both phases of this project.

Each of the two trapping sites was sampled for eight eight consecutive trap-nights during the first season survey and seven consecutive nights during the second season survey including bucket, cage, funnel and Elliott traps. Additionally, bat acoustic detectors were set for two nights covering both trap lines during the first season survey and set for three nights at each trap line (Trap Line 1 and Trap Line 2) during the second season survey. The first and second season surveys also consisted of 300 minutes of night searches, 120 minutes of active searches and 120 minutes of bird census undertaken at each trap line.

In the process of setting traps and remote sampling the approximate 4 km length of the survey area was traversed by foot on four separate occasions. During this time active searches were performed as well as opportunistic fauna observations.

The total trapping effort for both phases consisted of 1275 trap-nights (total trap effort associated with the two trap lines), in addition to 240 minutes of bird assessments, 540 minutes of active searches, 600 minutes of night searches, 16 nights of Night Parrot assessment and 25 nights of Bat detection. Remote cameras were deployed for a total of 3,063 nights.

Table 5 Survey effort both phases

| Fauna Trapping | | | | | Pit-fall traps (pipes / buckets) | | Elliot traps | | Cage Traps | | Funnel traps | | Night search | Birds search | Active search |
|----------------------------|-----------|------------|---------------------------|-------------|----------------------------------|-------------|--------------|-------------|------------|-------------|--------------|-------------|--------------|--------------|---------------|
| Sites (Site_ID) | Easting | Northing | Habitats | Nights Open | Per site | Trap nights | Per site | Trap nights | Per site | Trap nights | Per site | Trap nights | (minutes) | | |
| Phase one (September 2019) | | | | | | | | | | | | | | | |
| Trap Line 1 (TL-01) | 719468.57 | 7473619.44 | Drainage area/Flood Plain | 8 | 10 | 80 | 10 | 80 | 2 | 16 | 20 | 160 | 240 | 60 | 60 |
| Trap Line 2 (TL-02) | 719664.01 | 7473633.34 | Gorge/ Gully | 8 | 3 | 24 | 10 | 80 | 2 | 16 | 28 | 224 | 240 | 60 | 60 |
| Phase two (March 2020) | | | | | | | | | | | | | | | |
| Trap Line 1 (TL-01) | 719468.57 | 7473619.44 | Drainage area/Flood Plain | 7 | 10 | 70 | 10 | 70 | 2 | 14 | 20 | 140 | 60 | 60 | 60 |
| Trap Line 2 (TL-02) | 719664.01 | 7473633.34 | Gorge/ Gully | 7 | 3 | 21 | 10 | 70 | 2 | 14 | 28 | 196 | 60 | 60 | 60 |
| Total | - | - | - | 30 | 26 | 128 | 40 | 300 | 8 | 60 | 96 | 720 | 600 | 240 | 240 |

Table 6 Camera trap locations

| Camera number (Site_ID) | Habitat type | Micro Habitat | Location | | Date deployed | Date recovered | Total nights deployed |
|----------------------------|--------------------|--------------------|-----------|------------|------------------|-------------------|--------------------------|
| | | | Easting | Northing | | | |
| Cam 23 (CAM-01) | Ironstone Outcrops | Ironstone Outcrops | 719756.39 | 7473697.94 | 11/09/2019 | 21/03/2020 | 192 |
| Cam 8 (CAM-02) | Ironstone Outcrops | Breakaway | 719906.27 | 7473850.03 | 11/09/2019 | 21/03/2020 | 192 |
| MC115 (CAM-03) | Ironstone Outcrops | Breakaway | 719700.09 | 7473798.03 | 11/09/2019 | 21/03/2020 | 192 |
| Cam 20 (CAM-04) | Gorge/ Gully | Gorge | 722518.24 | 7474149.60 | 12/09/2019 | 22/03/2020 | 192 |
| Cam 44 (CAM-05) | Gorge/ Gully | Breakaway | 722351.99 | 7474167.50 | 12/09/2019 | 22/03/2020 | 192 |
| Cam 29 (CAM-06) | Gorge/ Gully | Gorge | 722260.60 | 7474176.38 | 12/09/2019 | 22/03/2020 | 192 |
| Cam 43 (CAM-07) | Gorge/ Gully | Gorge | 722213.02 | 7474221.17 | 12/09/2019 | 22/03/2020 | 192 |
| Cam 5 (CAM-08) | Gorge/ Gully | Gorge | 722103.49 | 7474193.01 | 12/09/2019 | 22/03/2020 | 192 |
| MC21 (CAM-09) | Gorge/ Gully | Gorge | 721991.74 | 7474133.76 | 12/09/2019 | 22/03/2020 | 192 |
| Cam 7SG (CAM-10) | Gorge/ Gully | Gorge | 721861.84 | 7474144.95 | 12/09/2019 | 22/03/2020 | 192 |
| Cam 31 (CAM-11) | Gorge/ Gully | Gorge | 721742.90 | 7474195.28 | 12/09/2019 | 22/03/2020 | 192 |
| Cam 11 (CAM-12) | Gorge/ Gully | Gorge | 721539.31 | 7474157.74 | 12/09/2019 | 22/03/2020 | 192 |
| Cam C42 (CAM-13) | Gorge/ Gully | Gorge | 721413.90 | 7474117.20 | 12/09/2019 | 22/03/2020 | 192 |
| MC6 (CAM-14) | Gorge/ Gully | Gorge | 720586.59 | 7473978.53 | 15/09/2019 | 22/03/2020 | 189 |
| SG6 (CAM-15) | Gorge/ Gully | Gorge | 721306.74 | 7474249.56 | 15/09/2019 | 22/03/2020 | 189 |
| Cam 1 (CAM-16) | Gorge/ Gully | Gorge | 722674.66 | 7474242.67 | 15/09/2019 | 22/03/2020 | 189 |
| Total nights | | | | | | | 3063 |

Table 7 Bat Detector locations

| Bat detector sites (Site_ID) | Detector | Habitat type | Location | | Nights deployed |
|--------------------------------|----------|-------------------------------------|-----------|------------|-----------------|
| | | | Easting | Northing | |
| Site 1 (BAT-02) | SM4-2 | Gorge/ Gully, near a waterhole | 721602.77 | 7474177.58 | 3 |
| Site 2 (BAT-03) | SM4-5 | Gorge/ Gully, near large water hole | 722267.13 | 7474263.19 | 3 |
| Site 3 (BAT-04) | SM4-5 | Gorge/ Gully | 722956.56 | 7474314.67 | 3 |
| Site 4 (BAT-05) | SM4-2 | Gorge/ Gully | 720986.13 | 7474108.10 | 3 |
| Trap Line 1 phase one (BAT-01) | SM4-6 | Drainage area/Floodplain | 719468.49 | 7473619.50 | 3 |
| Trap Line 2 phase one (BAT-06) | SM4-2 | Gorge/ Gully | 719351.47 | 7473473.09 | 2 |
| Trap Line 1 phase two (BAT-01) | SM4-4 | Drainage area/Floodplain | 719468.49 | 7473619.50 | 3 |
| Trap Line 2 phase two (BAT-06) | SM4-4 | Gorge/ Gully | 719351.47 | 7473473.09 | 3 |
| Total | | | | | 25 |













Table 8 Night Parrot Detector locations

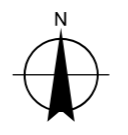
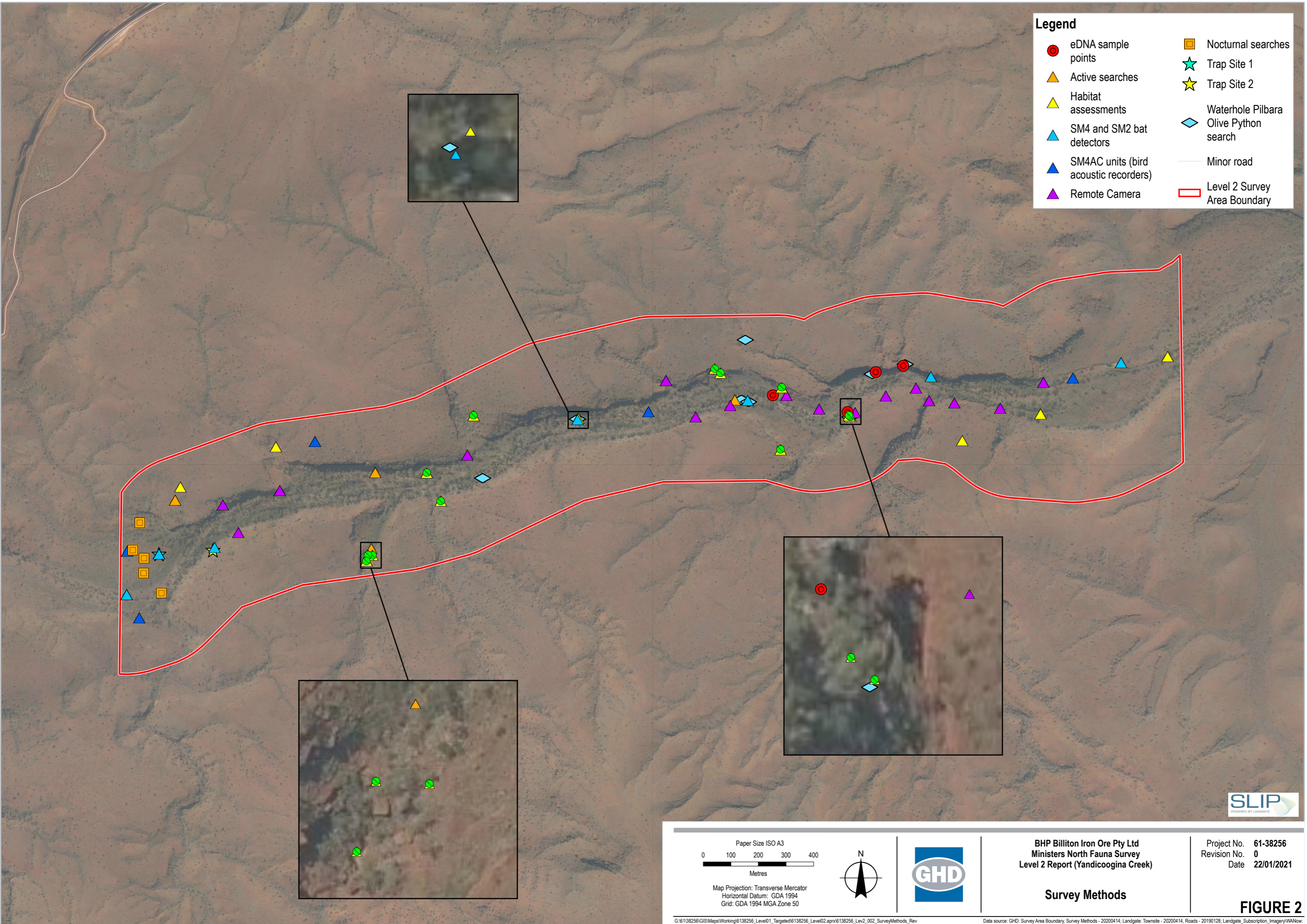
| Night Parrot detector number (Site_ID) | Habitat type | Location | | Nights deployed |
|--|---------------------------|-----------|------------|-----------------|
| | | Easting | Northing | |
| Site 1 (BAR-01) | Drainage Area/ Floodplain | 719353.23 | 7473629.61 | 3 |
| Site 2 (BAR-02) | Hillcrest/ Hillslope | 720033.83 | 7474027.71 | 2 |
| Site 3 (BAR-03) | Gorge/ Gully | 721242.99 | 7474136.05 | 3 |
| Site 4 (BAR-4) | Gorge/ Gully | 722781.72 | 7474258.73 | 3 |
| Site 5 phase two (BAR-05) | Drainage Area/ Floodplain | 719396.75 | 7473388.02 | 5 |
| Total | | | | 16 |

Table 9 Additional active search locations (not on trap lines)

| Active Search number (Site_ID) | Habitat type | Micro-habitat | Location | | Active Search (minutes) |
|--------------------------------|----------------------|----------------------------|-----------|------------|-------------------------|
| | | | Easting | Northing | |
| 1 (AS-01) | Gorge/ Gully | Ironstone Outcrops | 720252.78 | 7473914.87 | 120 |
| 2 (AS-02) | Gorge/ Gully | Gully | 721556.07 | 7474178.64 | 60 |
| 3 (AS-03) | Hillcrest/ Hillslope | Hillcrest/ Upper Hillslope | 719526.90 | 7473815.63 | 60 |
| 4 (AS-04) | Gorge/ Gully | Cave | 720238.40 | 7473639.51 | 60 |
| Total | | | | | 300 |

Legend

| | |
|---|---|
|  eDNA sample points |  Nocturnal searches |
|  Active searches |  Trap Site 1 |
|  Habitat assessments |  Trap Site 2 |
|  SM4 and SM2 bat detectors |  Waterhole Pilbara Olive Python search |
|  SM4AC units (bird acoustic recorders) |  Minor road |
|  Remote Camera |  Level 2 Survey Area Boundary |



**BHP Billiton Iron Ore Pty Ltd
Ministers North Fauna Survey
Level 2 Report (Yandicoogina Creek)**

Project No. **61-38256**
Revision No. **0**
Date **22/01/2021**

Survey Methods

FIGURE 2

G:\6138256\GIS\Maps\Working\6138256_Level01_Targeted\6138256_Level02.aprx\6138256_Level2_002_SurveyMethods_Rev
Print date: 22 Jan 2021 - 10:24

Data source: GHD: Survey Area Boundary, Survey Methods - 20200414; Landgate: Townsite - 20200414, Roads - 20190128; Landgate_Subscription_Imagery\WAnow; Landgate / SLIP. Created by: mmikkonen

2.6 Seasonal conditions

The survey area is located within the Pilbara region of WA. The climate of this region is arid to tropical with very hot summers and mild winters. Rainfall in the Pilbara is spatially and temporally variable. Rainfall in the eastern Pilbara (containing the site) is most influenced by tropical and monsoonal drivers which are predominantly active in the summer and autumn months (December – May) while rainfall in the western Pilbara is also influenced by southern mid-latitude drivers such as frontal systems during autumn and winter (March – August) (Sudmeyer 2016).

During summer and early autumn (December – March), average daily temperatures exceed 30°C across the region, with average daily maxima exceeding 35°C from October - March. During the winter months (June – August), average temperatures are around 20°C across the region.

The closest current weather station to the site is in Newman (Station ID: 007176) located approximately 81 km southeast of the southern survey area boundary. Climate data from this station indicate:

- Mean maximum temperature ranges from 23.0 °C in June and July to 39.2 °C in December
- Mean minimum temperature ranges from 6.4 °C in July to 25.1 °C in January
- Mean annual rainfall is 329.5 mm with an average of 29.9 rain days per year (BoM 2019).

Phase one survey (September 2019)

Rainfall for the six months prior to the survey is presented in Table 10 (based on Newman data), with the total rainfall for this period being 83.6 mm. This is approximately a quarter of the year's total for this region, however, is well below the long term average for these months (190.4 mm).

The weather over the phase one survey period is presented below in

Table 11.

Table 10 Rainfall six months prior to the survey month.

| Date | Rainfall (mm) |
|---------------|---------------|
| February 2019 | 46.2 |
| March 2019 | 12.2 |
| April 2019 | 3.8 |
| May 2019 | 0 |
| June 2019 | 17.8 |
| July 2019 | 0 |
| August 2019 | 3.6 |
| Total | 83.6 |

Table 11 Weather during survey period (sourced BoM 2019)

| Date | Temperature (°C) | | Rainfall (mm) |
|------------|------------------|---------|---------------|
| | Minimum | Maximum | |
| 09/09/2019 | 13.6 | 34.7 | 0 |
| 10/09/2019 | 18.6 | 35.5 | 0 |
| 11/09/2019 | 14.6 | 33.6 | 0 |
| 12/09/2019 | 11.8 | 33.7 | 0 |
| 13/09/2019 | 8.6 | 33.4 | 0 |

| Date | Temperature (°C) | | Rainfall (mm) |
|------------|------------------|-------------|---------------|
| | Minimum | Maximum | |
| 14/09/2019 | 7.4 | 33.2 | 0 |
| 15/09/2019 | 9.8 | 34.5 | 0 |
| 16/09/2019 | 10.5 | 34.7 | 0 |
| 17/09/2019 | 13.7 | 36.1 | 0 |
| 18/09/2019 | 14.3 | 35.3 | 0 |
| 19/09/2019 | 14.9 | 30.4 | 0 |
| 20/09/2019 | 12.0 | 23.2 | 0 |

Phase two survey (March 2020)

Rainfall for the six months leading up to the phase two survey is presented Table 12 (based on Newman data). The rainfall total for the six months prior to the survey was 268.4 mm, which is well above the average for these months (196.9 mm). The month of March including the phase two survey received 0.4 mm of rainfall recorded over two days during the survey period. The weather over the phase two survey period is presented below in

Table 13.

Table 12 Rainfall six months prior to the survey month.

| Date | Rainfall (mm) |
|----------------|-----------------|
| September 2019 | 0 |
| October 2019 | 0.4 |
| November 2019 | 1.4 |
| December 2019 | 6.6 |
| January 2020 | 198.2 |
| February 2020 | 61.8 |
| Total | 268.4 mm |

Table 13 Weather during survey period (sourced BoM 2020)

| Date | Temperature (°C) | | Rainfall (mm) |
|------------|------------------|-------------|---------------|
| | Minimum | Maximum | |
| 19/03/2020 | 25.0 | 39.0 | 0.2 |
| 20/03/2020 | 25.4 | 40.3 | 0 |
| 21/03/2020 | 23.1 | 37.6 | 0.2 |
| 22/03/2020 | 23.3 | 37.8 | 0 |
| 23/03/2020 | 23.1 | 38.6 | 0 |
| 24/03/2020 | 24.6 | 37.1 | 0 |
| 25/03/2020 | 24.7 | 36.0 | 0 |
| 26/03/2020 | 22.5 | 39.0 | 0 |
| 27/03/2020 | 22.4 | 38.8 | 0 |

3. Desktop assessment

3.1 Fauna diversity

The *NatureMap* database identified 392 vertebrate fauna taxa previously recorded within the database search area (DBCA 2007–). This total includes seven amphibians, 185 birds, 55 mammals, four fish and 141 reptiles. The EPBC Act PMST indicated the potential presence of 13 additional fauna taxa within the database search area (DEE 2018). The DBCA Threatened and Priority database and BHP's fauna record database did not detect any additional species. The full database search can be seen in Appendix B.

3.2 Conservation significant fauna

From the above species diversity, 26 conservation significant fauna were identified to be present/potentially present within the database search area. Available database point records are presented in Figure 1. The desktop search recorded:

- Three Critically Endangered taxa (one also listed as Endangered)
- Two Endangered taxa (one also listed as Critically Endangered)
- Seven Vulnerable taxa
- One Other Specially protected taxa
- One Priority 1 (DBCA) taxa
- Two Priority 2 (DBCA) taxa
- One Priority 3 (DBCA) taxa
- Four Priority 4 (DBCA) taxa
- Six Migratory taxa (one also Listed as Critically Endangered).

These species are listed in Appendix C. A likelihood of occurrence assessment was then performed on the 26 conservation significant fauna and of those, 10 were considered known or likely to occur within the survey area following desktop assessment and field survey results. The final likelihood of occurrence assessment is presented in Section 4.3.

Likelihood of occurrence

Prior to undertaking the fieldwork a likelihood of occurrence (LOO) assessment was performed on the conservation significant fauna species detected in the desktop assessment. The LOO assigns a likelihood of the species occurring within the survey area based on the known preferences and requirements of each conservation significant species and the landscape characteristics (i.e. geographic location, vegetation type, land systems, landscape features etc.) detected during the desktop assessment. The LOO assessment is updated following the completion of the survey depending on observations made in the field. The LOO outcomes used for assessment are:

- **Present** – species recorded during the field survey or from recent, reliable records from within or close proximity to the survey area.
- **Likely** – species are likely to occur in the survey area where there is suitable habitat within the survey area and there are recent records of occurrence of the species in close proximity to the survey area OR the species known distribution overlaps with the survey area and there is suitable habitat within the survey area.

- **Unlikely** – species assessed as unlikely include those species previously recorded within 40 km of the survey area however:
 - There is limited (i.e. the type, quality and quantity of the habitat is generally poor or restricted) habitat in the survey area.
 - The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area.
 OR
- Those species that have a known distribution overlapping with the survey area however:
 - There is limited habitat in the survey area (i.e. the type, quality and quantity of the habitat is generally poor or restricted).
 - The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area.
- **Highly Unlikely** – species that are considered highly unlikely to occur in the survey area include:
 - Those species that have no suitable habitat within the survey area.
 - Those species that have become locally extinct, or are not known to have ever been present in the region of the survey area.

3.3 Literature review

As part of the desktop assessment fauna survey reports of spatial relevance to the survey area were provided by BHP. Following a review of the reports the findings were collated and are summarised in Table 14.

Table 14 Literature review

| Name of survey | Ministers North Biological Survey 2006 | Munjina and Ministers North (Yandi Hub) Fauna Assessment 2009 | Ministers North Level 2 Vertebrate Fauna Survey 2017 (Biologic 2017a) | Ministers North to Yandi Single Phase Level 2 Fauna and Detailed Flora/Vegetation Survey Corridor 2017 (Biologic 2017b) | East Packsaddle Level 1 Vertebrate Fauna Study 2010 |
|---|---|---|--|---|---|
| Consultant | Ecologia Environmental | ENV Australia | Biologic | Biologic | Biologic |
| Level of experience of consultant | All members of the survey team have had appropriate training, experience and mentoring in fauna identification and fauna assemblage surveys. Positions unknown. | One Senior Zoologist/Ornithologist, four Zoologists and one Taxonomist | One Principle Zoologist and three Senior Zoologists | One experienced zoologist. | One Principal Zoologist, two Senior Zoologist and one Herpetologist |
| Location of survey in relation to this survey | Appers to intersects GHD 2020 survey area | Appears to intersects GHD 2020 survey area | Appears to intersect GHD 2020 survey area | Appears to intersect GHD 2020 survey area | Located approximately 30 km west of the GHD 2020 survey area. |
| Dates of survey | 10-14 May 2006 | 21 Nov-2 Dec 2007 | 15-26 October 2016 and 3-13 April 2017 | 9-13 October 2017 | 5-18 October 2009 and 20-1 April 2010 |
| Seasonal conditions during and in the six months prior to the survey | The report indicates that 'rainfall has been high in the previous four months'. During survey moderate day temperatures and cool night temperatures were experienced. | The area received 2.8 mm of rain in the three months preceding the survey. The day temperatures were in the low 40s, with night temperatures in the high 20s. | The weather conditions during the first season dry survey were typical of that time of year, averaging around the long-term average for October of 35.2°C. No rainfall recorded in the month before or during the first season survey. However, heavy rainfall was experienced in the summer months between the two surveys which | Not specified | Not presented. |

| Name of survey | Ministers North Biological Survey 2006 | Munjina and Ministers North (Yandi Hub) Fauna Assessment 2009 | Ministers North Level 2 Vertebrate Fauna Survey 2017 (Biologic 2017a) | Ministers North to Yandi Single Phase Level 2 Fauna and Detailed Flora/Vegetation Survey Corridor 2017 (Biologic 2017b) | East Packsaddle Level 1 Vertebrate Fauna Study 2010 |
|---|---|---|---|---|--|
| | | | was well above average for Newman (152.4 mm of rain falling during March 2017, compared to the long-term average of 41.5 mm). | | |
| Summary of survey techniques and survey effort | Level 1 survey: 17.16 hrs diurnal search, 2 hrs nocturnal search, 16.6 hrs bird survey, four nights of bat recordings (Anabat II) | Single phase Level 2 survey: Five trapping sites, between five and eight trap nights per site. Total trapping effort is equal to 2170 trap nights including 310 cage trap, Eliot trap and Bucket trap nights, and 620 Funnel and Pot trap nights. Non-systematic survey effort included 14.75 hours diurnal searches, 13.5 hours of nocturnal searches, 30 hours of bird census, 10 nights of bat recordings (52 hours) (Anabat II). | Level 2 survey: A total of 10 trapping sites with seven monitored per season. Each trapping site comprised 10 pit traps, 20 funnel traps, 20 medium Elliot traps, and two cage traps. Targeted and nocturnal searches were conducted along eight transects; SM2BAT+ recorders were placed at 28 locations, motion cameras at 26 locations, and opportunistic sightings throughout survey area. Habitat assessments were conducted at every trapping site/ motion camera/ bat recorder/ nocturnal transect location, as well at standalone habitat assessment locations (for | Single phase Level 2 survey: Survey included; 23 motion cameras, SongMeter2 (SM2) for bat call detection at five locations, SongMeter4 (SM4) acoustic recorders for bird call detection at two locations, 37 habitat assessments, three targeted search locations, and opportunistic recordings throughout the survey. | Level 1 fauna survey: four trap sites were established and open for six nights per phase, only two sites were open during the second phase. Birds were recorded throughout the day during transects of the project area. Bat echolocation calls were recorded using an ANABAT™ receiver coupled with a ZCAIM unit. Overnight bat recordings using ANABAT™ systems were performed at seven locations. Motion sensitive cameras were set up at six locations. Opportunistic surveys were conducted at |

| Name of survey | Ministers North Biological Survey 2006 | Munjina and Ministers North (Yandi Hub) Fauna Assessment 2009 | Ministers North Level 2 Vertebrate Fauna Survey 2017 (Biologic 2017a) | Ministers North to Yandi Single Phase Level 2 Fauna and Detailed Flora/Vegetation Survey Corridor 2017 (Biologic 2017b) | East Packsaddle Level 1 Vertebrate Fauna Study 2010 |
|---|--|--|---|---|--|
| | | | a total of 73 habitat assessments) | | trapping sites and at 20 opportunistic survey sites. Targeted searches for conservation significant fauna were undertaken via transects. Habitat types were assessed throughout the survey area. |
| Species richness within survey area (species recorded) | 71 vertebrate fauna species comprising 18 reptiles, 42 birds, 10 mammals and one amphibian. | 134 vertebrate fauna species comprising 22 mammals, 45 reptiles, 66 birds and one amphibian. | 116 vertebrate fauna comprising 17 mammal species, 54 bird species, 43 reptile species, and two amphibians | 59 vertebrate fauna comprising; 35 birds, 14 mammals and 10 reptiles. | 110 vertebrate fauna comprising 19 mammals, 48 birds, 39 reptiles and four amphibians. |
| Conservation significant species recorded | <i>Pseudomys chapmani</i> Western Pebble-mound Mouse (P4) | <i>Pseudomys chapmani</i> Western Pebble-mound Mouse (P4) | <i>Pseudomys chapmani</i> Western Pebble Mouse-(P4) (One locally significant species was recorded during the survey, the Chocolate Wattled Bat (<i>Chalinolobus morio</i>)) | <i>Pseudomys chapmani</i> Western Pebble-mound Mouse (P4) | <i>Pseudomys chapmani</i> Western Pebble-mound Mouse (P4) <i>Macroderma gigas</i> Ghost Bat (Vu) |
| Taxonomic changes for conservation significant species | None | None | None | None | None |
| Survey limitations | Unlikely for all vertebrate fauna species to have been detected as a result of the single survey using | Hot, dry weather conditions experienced during the survey may have limited activity of | Heavy rainfall during March 2017 delayed the second season survey and caused access | The survey was conducted during a single season only (dry season) | Not specified. |

| Name of survey | Ministers North Biological Survey 2006 | Munjina and Ministers North (Yandi Hub) Fauna Assessment 2009 | Ministers North Level 2 Vertebrate Fauna Survey 2017 (Biologic 2017a) | Ministers North to Yandi Single Phase Level 2 Fauna and Detailed Flora/Vegetation Survey Corridor 2017 (Biologic 2017b) | East Packsaddle Level 1 Vertebrate Fauna Study 2010 |
|----------------|---|---|---|---|---|
| | <p>non-systematic sampling methodology; ecologia also indicated that seasonal conditions (cool nights, moderate day temps) may have reduced herpetofauna detection.</p> | <p>certain fauna groups such as amphibians. The survey area was recently burnt.</p> | <p>restrictions to three of the trapping sites, resulting in three new trapping sites being established. Due to identical characteristics in the calls of some bat species within a genus, it was not possible to differentiate all species using calls. The survey area was recently burnt. Site placement was restricted in some cases due to the presence of heritage sites.</p> | <p>that reduced the ability to detect some fauna.</p> | |

Table 14 Literature review continued

| Name of survey | Marillana Creek (Yandi) Iron Ore Mine Modification Level 2 Fauna Survey 2008 | RGP5 Fauna Survey, Kurrajura Siding to Yandi Wye , including Yandi Repeater 1 2008 | Yandi Vertebrate Fauna Review 2011 | Packsaddle West, Vegetation and Flora Survey and Fauna Assessment 2010 | Packsaddle Range Biological Survey |
|--|---|--|---|--|--|
| Consultant | Ecologia Environmental | Ecologia Environmental | Biologic | Astron Environmental Services | Biologic |
| Level of experience of consultant | Four Senior Zoologists | Two Senior Zoologists (one specializing in ornithology) | Two Senior Ecologists | One Principal Zoologist | Two Senior Zoologists, One Herpetologist, One Research assistant |
| Location of survey in relation to this survey | Located approximately 4.4 km northwest of survey GHD 2020 survey area. | Located approximately 33 km southwest of GHD 2020 survey area. | Located approximately 3.7 km north of GHD 2020 survey area. | Located approximately 30 km southwest of GHD 2020 survey area. | Located approximately 30 km west of the GHD 2020 survey area. |
| Dates of survey | 19-30 March 2008 | 9-13 May 2008 | 10-17 December 2010 | 10-19 April 2010 | 5-10 May 2004 |
| Seasonal conditions during and in the six months prior to the survey | In months preceding the study, Newman received most rain in February with 124.6 mm in contrast, anecdotal evidence suggests that little rainfall was received during February at Yandi, with most rain prior to the survey haven fallen in January and no rain falling in February. | Climatic conditions experienced during the survey were generally warm during the day and cool at night with no rainfall recorded | Not specified | Approximately 170 mm of rain was recorded in the 12 months preceding the survey at Wittenoom weather station and at the Area C weather station, which is below the long-term average of 460 mm. Four months prior to the survey a rain bearing depression brought 69 mm to Wittenoom, and 31 mm to Area C. | Biologic indicate that the timing of the survey was optimal, following several months of heavy rainfall. Not discussed specifically for the lead up to survey. |

| Name of survey | Marillana Creek (Yandi) Iron Ore Mine Modification Level 2 Fauna Survey 2008 | RGP5 Fauna Survey, Kurrajura Siding to Yandi Wye , including Yandi Repeater 1 2008 | Yandi Vertebrate Fauna Review 2011 | Packsaddle West, Vegetation and Flora Survey and Fauna Assessment 2010 | Packsaddle Range Biological Survey |
|--|--|--|--|--|--|
| Summary of survey techniques and survey effort | Level 2 fauna survey: Terrestrial mammals and herpetofauna; Pit trap 960 nights) and drift fence, Elliot traps (960 nights), funnel traps (960 nights) and cage traps (96). Avifauna; six x 20 minute Post dawn and pre-dusk surveys. Bats; Anabat 11. Opportunistic data; Spotlighting, hand searching, secondary evidence, sightings and transects. | Level 1 Fauna survey: The survey comprised a total of 51.7 man hours of opportunistic searching (both diurnal and nocturnal) across a total of 32 localities between the Kurrajura siding and Yandi. Repeater 1 was surveyed for a total of 5 hrs, including a walked transect of both sides of the access road. | Level 1 Fauna survey: Bat echolocation calls were recorded using ANABAT II Traversing of survey area. Camera trap were used in addition to diurnal searches and ANABAT. | Level 1 fauna survey: Opportunistic survey sites were established in all fauna habitats present within the survey area. At each opportunistic survey site, a bird census, and targeted searches for mammals, reptiles, frogs and conservation significant species was undertaken. Motion-sensitive cameras were established at two locations. Habitat mapping was performed over the area. | Level 1 fauna Opportunistic searches, nocturnal searches and targeted fauna survey techniques were used in combination with Anabat system for bat call analysis. A total of 8 hrs and 30 minutes of bird census, 35 hours and 5 minutes of reptile searching and 5 hrs and 15 minutes of bat recordings were undertaken. |
| Species richness within survey area (species recorded) | 16 native mammals and three introduced mammals were recorded, along with 60 bird, 37 reptile and three amphibian species. | 77 vertebrate species comprising, 14 mammals, 52 birds, nine reptiles and two amphibians. | 75 fauna species, comprising eight mammals, 53 birds, 12 reptiles and two amphibians. | 87 vertebrate species comprising 60 birds, 14 reptiles and 13 mammals. | 88 vertebrate species 11 mammals, 56 birds, and 22 reptiles. |
| Conservation significant species recorded | <i>Pseudomys chapmani</i> Western Pebble-mound Mouse (P4) | <i>Rhinonicteris aurantia</i> Pilbara leaf nosed bat (VU) <i>Macroderma gigas</i> Ghost Bat (VU) | <i>Pseudomys chapmani</i> Western Pebble-mound Mouse (P4) (mounds), <i>Liasis olivaceus barroni</i> Pilbara Olive Python, (VU) | <i>Macroderma gigas</i> Ghost Bat (VU) <i>Pseudomys chapmani</i> Western Pebble-mound Mouse (P4); | <i>Pseudomys chapmani</i> Western Pebble-mound Mouse (P4) <i>Macroderma gigas</i> Ghost Bat (VU) |

| Name of survey | Marillana Creek (Yandi) Iron Ore Mine Modification Level 2 Fauna Survey 2008 | RGP5 Fauna Survey, Kurrajura Siding to Yandi Wye , including Yandi Repeater 1 2008 | Yandi Vertebrate Fauna Review 2011 | Packsaddle West, Vegetation and Flora Survey and Fauna Assessment 2010 | Packsaddle Range Biological Survey |
|--|--|---|---|---|--|
| | | <i>Pseudomys chapmani</i> Western Pebble-mound Mouse (P4) | | | |
| Taxonomic changes for conservation significant species | None | Merops ornatus Rainbow Bee-eater detected during survey and has since been delisted | None | None | None |
| Survey limitations | The survey area was recently burnt. Site placement was restricted in some cases due to the presence of heritage sites. | In a number of locations along the corridor, access was limited to only one side of the railway. Where possible searches for animals using binoculars was conducted. A number of Aboriginal Heritage areas occur within the project area, these areas were not available for survey. Mammals tend to be poorly represented in any opportunistic survey. | Some areas inaccessible due to Heritage issues. | Cryptic species were unlikely to be recorded due to the survey methodology. Not all areas were searched for conservation significant species. Cool temperatures during the day potentially reduced activity levels for many species making them less likely to be recorded. Not all significant areas were visited. This includes caves which are likely to be numerous within the survey area. | Some areas within the survey area were inaccessible by road. However, the habitats that needed to be sampled to adequately represent the project area were accessible. |

4. Results

4.1 Fauna habitats

4.1.1 Habitat type

Four habitat types were identified within the survey area. These comprised Hillcrest/Hillslope, Gorge/Gully, Drainage Area/Floodplain and Minor Drainage Line. A description of each habitat type along with the representative area (ha) located within the survey area is presented in Table 15 and mapped in Figure 3.

The majority of the survey area consists of the Hillcrest/Hillslope habitat (149.72 ha). This habitat lies on high ground to the north and south of the survey area framing a gorge system that runs from east to west through the centre. The Gorge/Gully system is the next largest habitat type (95.90 ha) comprising mainly Banded Iron Formation (BIF) and contains rocky ledges, steep slopes, caves and breakaway and has a major drainage line at its centre. The east and west most portions of the survey area are mapped as Drainage Area/ Floodplain (12.69 ha). These areas are where the gorge systems flatten into the greater landscape and the BIF ceases. Minor Drainage Lines (1.91 ha) connect and provide habitat corridors between the Hillcrest/Hillslope and the Gorge/Gully and Drainage Area/Floodplain habitats.

Significant habitats recorded within the survey area include 14 caves (three of which were recorded as potential Ghost Bat diurnal roost caves, one as a potential Ghost Bat feeding cave and two not accessed due to heritage markers) and seven water holes which may be suitable drinking, hunting or foraging locations for fauna (Figure 3).

Disturbed areas such as old drill lines and drill pads that are in use and not rehabilitated have not been separately mapped.

4.1.2 Habitat linkages

There is a high degree of fauna habitat continuity throughout and adjacent to the survey area. Extensive mining operations at Yandi approximately 3 km north and northeast of the survey area reduce connectivity regionally. Land to the east and south retain high connectivity to habitats directly adjacent and extensive areas beyond. Iron ore rail infrastructure to the west reduces local habitat connectivity. Riparian habitat associated with Yandcoogina Creek is continuous downstream for 6 km where it intersects with mine infrastructure, with seasonal stream flow maintained via culverts. Current disturbances to the survey area are limited to low level cattle disturbance and weed infestation within Drainage Area/Floodplain and Minor Drainage Line habitats associated with Yandicoogina Creek. Adjacent Gorge/Gully and Hillcrest/Hillslope have minor disturbance evident from mine exploration activity in the western portion of the survey area.

4.1.3 Quality of habitat

The quality of the fauna habitats are currently affected by the impacts described above in Section 4.1.2. Whilst the vegetation is mostly intact, the impact from grazing was evident within the Drainage Area/Floodplain and Minor Drainage line, which otherwise were generally in good condition. The overall quality of the remainder higher elevation rocky areas of the survey areas are in very good to excellent condition.


The survey results (i.e. species recorded) identified micro habitats within Drainage Area/Floodplain and Minor Drainage Line play a significant part in the species present. The majority of the Gorge/Gully and Hillcrest/Hillslope have areas of rock outcropping, breakaway or exfoliation and there are caves suitable for bat presence. The surrounding areas are covered in


pebbles and small scattered rocks on very hard substrates. This environmental structure reduces the opportunity for species to hide or create refuge and therefore reduces the species present.


Where small areas of micro-habitat (outcropping, breakaway or exposed rock) were present they provided high quality resources for a diverse suite of fauna, particularly reptiles and small mammals. This micro-habitat supports numerous saxicoline (rock inhabiting) species such as Wooley's False Antechinus, Pilbara Rock Monitor, Hamersley Range Dtella, Rock Ctenotus. Several reptiles endemic to the region are rock habitat specialists (thigmotactic). These environments provide refuge, breeding, feeding and dispersal for species.


The survey area had not been burnt recently and vegetation appeared to be greater than six years old based on fire scarring on trees and burnt stumps. Old growth Melaleuca and River Gum trees and lower dense riparian vegetation provide habitat and refuge areas for a wide range of vertebrate species.

Table 15 Major habitat types within the survey area

| Description | Extent in the Survey area | Representative Images |
|---|------------------------------|---|
| <p>Hillcrest/Hillslope Low sparse shrubland of <i>Acacia sp.</i>, <i>Senna sp.</i> and <i>Solanum lasiophyllum</i> over tussock grassland of <i>Triodia sp.</i></p> <p>The northern and southern portion of the survey area comprise Hillcrest/Hillslopes. This habitat contains varying small to gravel-sized ironstone rocks with limited soil availability. This habitat supports limited vegetation (likely due to limited soil availability). Vegetation within this habitat includes scattered mixed shrubs of <i>Acacia</i>, <i>Senna sp.</i>, <i>Eremophila sp.</i>, <i>Solanum</i> and <i>Grevillea sp.</i> over <i>Triodia</i>. Few microhabitats were observed in this habitat (i.e. limited litter, logs or debris). There was no evidence of fire in this habitat.</p> <p>The Hillcrest/ Hillslopes in the survey area are predominantly flat or have a low slope and there was minor BIF outcropping present. Due to the lack of cover and limited soil (difficulty for species to dig and hide) relatively few species were observed in this environment. This is a locally and regionally extensive habitat type occurring throughout the Hamersley subregion.</p> <p>Conservation significant fauna</p> <p>Two active and one inactive (recent) Pebble-mound Mouse (<i>Pseudomys chapmani</i>) mounds were recorded in the north-western extent of the survey area. Other mounds are expected to be scattered through the habitat as conditions are well suited to support the Pebble-mound Mouse (i.e. denning). Ghost Bat (<i>Macroderma gigas</i>), Peregrine Falcon (<i>Falco peregrinus</i>) and Grey Falcon (<i>Falco hypoleucos</i>) may also utilise these areas for foraging. Northern Quoll may use this habitat opportunistically and for dispersing purposes however it is not considered core foraging or denning habitat. Pilbara Barking Gecko may also utilise this habitat for shelter and foraging.</p> <p>Moderate value</p> | <p>149.72 ha (57.5%)</p> |  |

| Description | Extent in the Survey area | Representative Images |
|---|-----------------------------|--|
| <p>Gorge/Gully Eucalyptus woodland over mixed shrubland of <i>Acacia sp.</i>, <i>Senna sp.</i>, <i>Hakea sp.</i>, <i>Eremophila</i>, <i>Ptilotus obovatus</i>, <i>Paspalidium clementii</i> and <i>Solanum lasiophyllum</i> over tussock grassland of <i>Triodia sp.</i> and reeds.</p> <p>Gorge/Gully habitat comprises a large portion of the survey area running east-west associated with Yandicoogina Creek and the potential GDE area. This habitat is characterised by deep gorges with cliffs, breakaways, rocky outcropping, scree slopes, caves and overhangs. The habitat has a major drainage line running through its centre which contained moderate to high litter, logs and debris and many small to medium rocks and was densely vegetated with reeds. Six pools of water and a small lightly flowing stream were identified during the phase one survey and larger more connected water bodies were present during the phase two survey. Most of this habitat showed no signs of fire however some small areas presented signs of fire within the past three to five years.</p> <p>The Gorge/Gully habitat contains a variety of microhabitats suitable to support an array of species. One trap line (Trap Line 2) was established in this habitat and accessible caves and water features were actively searched for signs of conservation significant species. A Northern Quoll remote camera trap line was also deployed in this habitat. Evidence of cattle, dog/dingo and domestic cat were observed in the area in the form of scat, remains or remote camera footage.</p> <p>Conservation significant fauna</p> <p>This habitat is known to be used by Pilbara Olive Python, Ghost Bat and Pilbara Flat-headed Blind Snake. Pilbara Olive Python scat was found at one of the water holes and the presence of permanent and semi-permanent water and general terrain is considered excellent Pilbara Olive Python habitat. The Ghost Bat is known to persist with feeding evidence and scat present in a number of caves within the Gorge/Gully system. The caves located with few old scats are likely to be used by Ghost Bats for feeding and as potential diurnal roost locations. Pilbara Flat-headed Blind Snake was recorded in a trap within Trap Line 2 which is located in this habitat type.</p> | <p>95.90 ha (36.8%)</p> |  |

| Description | Extent in the Survey area | Representative Images |
|--|----------------------------|---|
| <p>Peregrine Falcon and Grey Falcon may also utilise these areas for foraging. Northern Quoll is also likely to utilise this habitat on at least an occasional basis for foraging and denning however the camera line did not detect this species at the time of survey. The Pilbara Leaf-nosed Bat is likely to utilise the area opportunistically particularly in the areas around the permanent water body's of Yandicoogina Creek.</p> <p>High value</p> | | |
| <p>Drainage Area/Floodplain Shrublands of Mixed <i>Acacia</i> over <i>Triodia</i> and native grasses on silty/clay/loam soils</p> <p>The Drainage Area/Floodplain habitat is found in the western and eastern most portions of the survey area where the gorge system converges with the rest of the landscape. The vegetation present in this habitat primarily comprises of <i>Acacia</i> shrubs over native and introduced grasses. Indirect observations of cattle, i.e. dung piles, were observed in this habitat. The habitat appears to be mostly long unburnt and undisturbed, retaining good structural diversity. Litter is evenly spread and very light. Soils comprise of silty clay loam and heavy clay and are littered with pebbles to large rocks. This substrate is suitable for fossorial and burrowing species such as skinks including <i>Lerista</i> species and Dragons (<i>Ctenophorus</i>), but the substrate is limited in extent and isolated to patches at the western and eastern end of Yandicoogina Creek.</p> <p>The <i>Triodia</i> in this habitat type is relatively small and does not have good habitat linkage to surrounding <i>Triodia</i> sandplains so probably would not support the breeding of various fauna species which require large, thick <i>Triodia</i> for shelter. However, it may provide some foraging and breeding habitat for small mammals and reptiles with fewer habitat requirements. One trap line (Trap Line 1) was deployed in this habitat type.</p> <p>Conservation significant fauna</p> | <p>12.69 ha (4.9%)</p> |  |

| Description | Extent in the Survey area | Representative Images |
|---|---------------------------|--|
| <p>Opportunistic migratory species may utilise this habitat particularly if water is maintained for prolonged periods, however this would be very rarely. The Peregrine and Grey Falcon may utilise the well vegetated corridors for hunting/foraging. Night Parrot are known to be nomadic and resource dependent therefore when environmental conditions become favourable, they could potentially use this habitat opportunistically or sporadically for nesting. However the spinifex in this habitat is generally small and thin lacking oldgrown structure, and is not optimal for the Night Parrot. Night Parrot audio recorders were deployed in this habitat during both phases of the survey and returned no hits for this species during either phase. This habitat is considered unlikely to support the Greater Bilby as sandplain habitat is very limited and isolated, habitat connectivity is low and the species has not been recorded within 32 km of the survey area. No evidence of Greater Bilby: burrows, tracks, scats, foraging digs was recorded during the survey.</p> <p>Moderate Value</p> | | |
| <p>Minor Drainage Line Scattered Eucalypts over shrublands of Mixed <i>Acacia</i> over <i>Triodia</i> and native grassland on heavy loam/clay soils</p> <p>Numerous minor drainage lines run through the survey area. The vegetation along these drainage lines is dominated by <i>Acacia</i> species with scattered mixed shrubs including <i>Cymbopogon</i>, <i>Grevillea</i>, <i>Hakea</i> with <i>Triodia</i> and <i>Poaceae sp.</i> grassland. The minor drainage lines represent the transition from Hillcrest/Hillslope into the Gorge/Gully habitat types.</p> <p>The drainage lines have a mosaic of substrates with a complex and variable mix of rocky, stony and sandy profiles. Leaf litter is light to moderate depending on the area. The substrates would vary and erode in response to rainfall and flooding. No fire events were recorded in this habitat type.</p> <p>These linear patches of habitat provide a corridor for the movement of fauna through the local landscape. Small birds (such as the Variegated Fairywren (<i>Malurus lamberti</i>) and White-winged Fairy-wren (<i>Malurus leucopterus</i>) that</p> | <p>1.91 ha (0.7%)</p> |  |

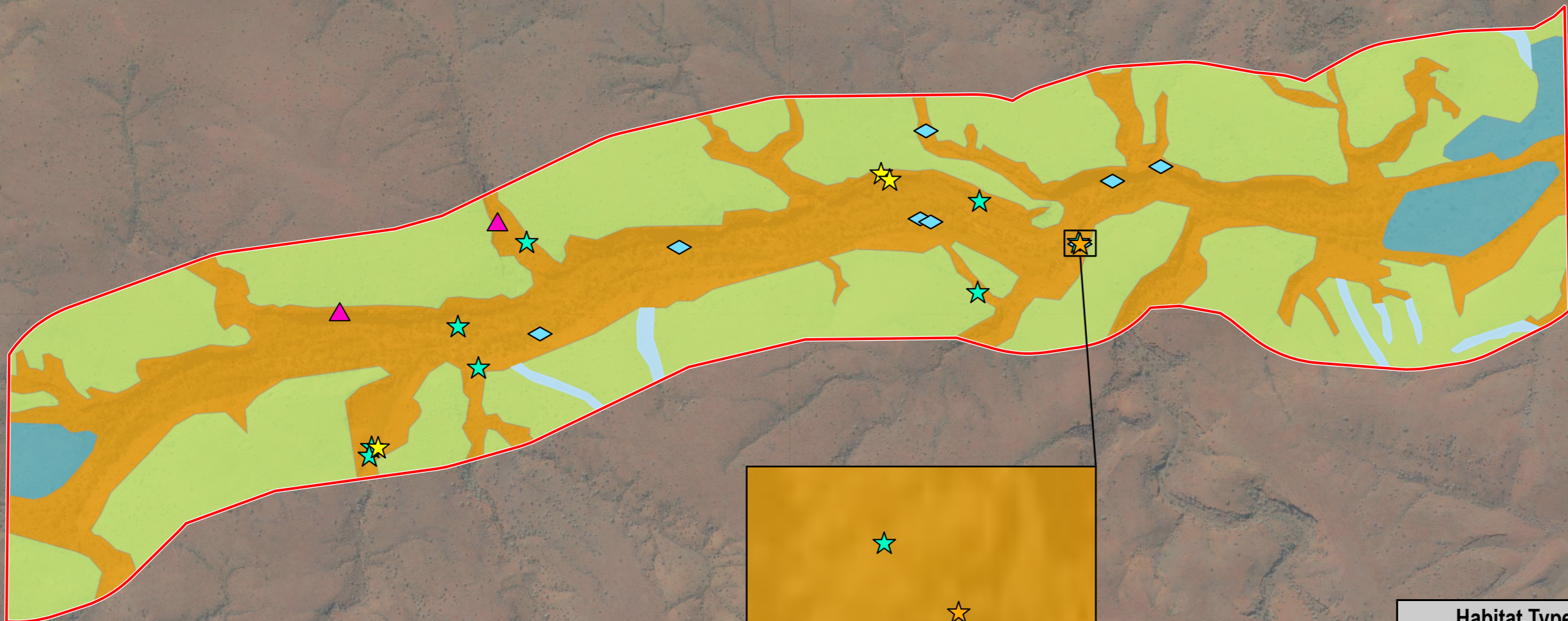
| Description | Extent in the Survey area | Representative Images |
|--|---------------------------|-----------------------|
| <p>rarely move though open habitats would utilise this denser vegetation for foraging, movement and nesting.</p> <p>Conservation significant fauna</p> <p>Pilbara Leaf-nosed Bat, Ghost Bat, Peregrine and Grey Falcon are likely to utilise these well vegetated corridors for hunting/foraging. Northern Quoll may utilise the habitat for opportunistic foraging and for dispersal. Pilbara Olive Python may utilise this habitat for hunting/foraging.</p> <p>High Value</p> | | |

Legend

- ★ Caves
- ★ Ghost Bat potential feeding cave
- ★ Ghost Bat potential day roost
- ▲ BHP listed Heritage Caves (not assessed)
- ◊ Waterhole/pool of water
- Minor road
- ▭ Level 2 Survey Area Boundary

Habitat Type

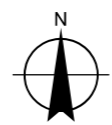
- Minor Drainage Line
- Drainage Area/ Floodplain
- Hillcrest/ Hillslope
- Gorge/ Gully



| Habitat Type | Area (ha) |
|---------------------------|-----------|
| Drainage Area/ Floodplain | 12.75 |
| Gorge/ Gully | 94.12 |
| Hillcrest/ Hillslope | 146.11 |
| Minor Drainage Line | 2.68 |



Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50



BHP Billiton Iron Ore Pty Ltd
Ministers North Fauna Survey
Level 2 Report (Yandicoogina Creek)

Fauna Habitat

Project No. 61-38256
Revision No. 0
Date 22/01/2021

FIGURE 3

4.2 Fauna diversity

The fauna survey identified 122 species of vertebrate fauna within the survey area. This number comprises 55 birds, 44 reptiles, 19 mammals and four amphibians. A breakdown of the fauna assemblages is provided below. Individual species trapping data is recorded in Appendix C.

4.2.1 Mammals

The survey recorded 19 mammal species within the survey area, including two introduced and 17 native mammals. Ten individual mammals were recorded in traps over the trapping program. A breakdown of mammal families recorded during the surveys is provided in Table 16. The composition of species includes 10 bats, three native rodents, two macropod, Echidna, Dingo and two introduced mammals. The most specious family was the Vespertilionidae (four species), Molossidae (three species) and the Muridae (three species).

Only presence or absence information was collected for mammals recorded during the survey, with species abundance not assessed. Bats were only recorded via echolocation, feeding evidence and scat, therefore only presence or absence information could be collected. Some species overlap in call identification and therefore may represent multiple species (such as in the *Nyctophilus* group).

Table 16 Mammal families recorded during the field surveys

| Mammal Family | No. of species |
|-------------------------------------|----------------|
| Bovidae (Ruminants) | 1 |
| Canidae (Dingo) | 1 |
| Emballonuridae (Sheath tailed Bats) | 2 |
| Felidae (Cat) | 1 |
| Megadermatidae (Ghost Bat) | 1 |
| Macropodidae (Kangaroos) | 2 |
| Molossidae (Free-tailed bat) | 3 |
| Muridae (Rodents) | 3 |
| Tachyglossidae (Echidna) | 1 |
| Vespertilionidae (Bats) | 4 |
| Total | 19 |

Chocolate Wattle Bat

During the phase one survey, definite recordings of the common Chocolate Wattle Bat were detected on SM4 SongMeters® at two locations within the survey area (Site 2 (Gorge/Gully) and Site 4 (Gorge/ Gully), Table 7). Positively identified calls were recorded on 12 – 15 and 17 September 2019. Probable detections (defined as a call most likely to represent a particular species, with a low probability of confusion with species of similar call type or call lacks sufficient detail) of Chocolate Wattle Bat were recorded at four other sites within the survey area. These include Trap Line 1 (Drainage Area/Floodplain), Trap Line 2 (Gorge/Gully), Site 1 (water hole within Gorge/Gully system) and Site 3 (Gorge/ Gully). Table 7 displays the locations of the SM4 Song Meter sites. No Chocolate Wattle Bat calls were detected during the second phase survey.

4.2.2 Birds

The survey identified 55 bird species from 31 families. The most specious families were the Meliphagidae (eight species) and Columbidae (five species).

Four hundred and eighty-eight individual birds were recorded over the trapping program. The most abundant species were the Budgerigar (*Melopsittacus undulatus*) with 47 records (9.6% of total bird recordings), Yellow-throated Miner (*Manorina flavigula*) with 36 records (7.4% of total

bird recordings) and Zebra Finch (*Taeniopygia guttata*) with 30 records (6.1% of total bird records). A breakdown of bird families recorded during the survey is provided in Table 17.

The Night Parrot (*Pezoporus occidentalis*) was specifically targeted for assessment in potential habitat areas (*Triodia* clumps on the Drainage Line/Floodplain, Hillcrest/Hillslope and Gorge/Gully habitat types). These areas were targeted due to good coverage of Spinifex present and/or water present representing potential foraging or roosting habitat (Department of Parks and Wildlife 2017).

The results of the targeted Night Parrot survey are based on four Bird Acoustic Recorder SM4 units deployed in five locations during the survey period for a combined total of 16 nights of bioacoustic recordings. A total of 68,523 acoustic detections were manually analysed for Night Parrot. No calls of Night Parrots were detected. Twenty-six non-target bird species were detected during the analysis. The call frequency range of these non-target species overlaps with Night Parrot calls, therefore it is highly likely that the detectors would have recorded Night Parrot calls if vocalisation had occurred.

Table 17 Bird families recorded during the field surveys

| Bird Family | No. of species |
|-------------------|----------------|
| Acanthizidae | 1 |
| Accipitridae | 3 |
| Aegothelidae | 1 |
| Alcedinidae | 2 |
| Ardeidae | 1 |
| Artamidae | 2 |
| Burhinidae | 1 |
| Cacatuidae | 3 |
| Campephagidae | 1 |
| Centropodidae | 1 |
| Columbidae | 5 |
| Corvidae | 1 |
| Cracticidae | 2 |
| Cuculidae | 1 |
| Dicruridae | 2 |
| Estrildidae | 2 |
| Falconidae | 1 |
| Maluridae | 2 |
| Meliphagidae | 8 |
| Meropidae | 1 |
| Monarchidae | 1 |
| Otididae | 1 |
| Pachycephalidae | 2 |
| Pardalotidae | 1 |
| Phasianidae | 1 |
| Podargidae | 1 |
| Pomatostomidae | 1 |
| Psittaculidae | 3 |
| Ptilonorhynchidae | 1 |
| Strigidae | 1 |
| Sylviidae | 1 |
| Total | 55 |

4.2.3 Reptiles

A total of 44 reptile species were recorded during the field surveys from nine families. The most specious families were Scincidae (13 species), Gekkonidae (7 species), Varanidae (5 species), and Elapidae (5 species).

Sixty-eight individual reptiles were recorded in traps over the trapping program. The most abundant species was Skink (*Ctenotus inornatus*) with eight records (11.8% of total reptile recordings), Ring-tailed Dragon (*Ctenophorus caudicinctus*) and Spotted Dtella (*Ghyra punctata*) both with seven species (10.3% of total reptile records each). A breakdown of reptile families recorded during the survey is provided in Table 18.

Table 18 Reptile families recorded during the field surveys

| Reptile Family | No. of species |
|-------------------------------|----------------|
| Agamidae (Dragons) | 3 |
| Diplodactylidae (Geckos) | 4 |
| Elapidae (Snakes) | 5 |
| Gekkonidae (Geckos) | 7 |
| Pygopodidae (Legless Lizards) | 1 |
| Pythonidae (Pythons) | 3 |
| Scincidae (Skinks) | 13 |
| Typhlopidae (Blind Snakes) | 3 |
| Varanidae (Monitors) | 5 |
| Total | 44 |

4.2.4 Amphibians

A total of four amphibian species were recorded during the survey. Two of these are from the Myobatrachidae family and two from the Hylidae family. These species were recorded by call and physically during trapping and nocturnal surveys. All recorded frogs were associated with the Yandicoogina Creek system.

Twenty-nine individual amphibians were recorded in traps over the trapping program. The most abundant species was the Gorge Toadlet (*Pseudophryne douglasi*) with 15 recordings (51.7% of total amphibian recordings), followed by the Sheep Frog (*Cyclorana maini*) with 12 recordings (41.4% of total amphibian recordings).

4.2.5 Introduced species

Two introduced mammals were recorded:

- Cattle (*Bos taurus*)
- Cat (*Felis catus*).

Other introduced species likely to occur include Donkey (*Equus asinus*) and Dog (*Canis familiaris*).

4.3 Conservation significant fauna

Four conservation significant fauna species were recorded within the survey area during the field survey, these being:

- Ghost Bat (*Macroderma gigas*) – listed as Vulnerable under the BC Act and Vulnerable under the EPBC Act

- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Listed as Priority 4 under the DBCA fauna listings
- Pilbara Olive Python (*Liasis olivaceus*) – Listed as Vulnerable under the EPBC Act and the BC Act
- Pilbara Flat-headed Blind Snake (*Anilius ganei*) – Listed as Priority 2 under the BC Act.

The locations of all conservation significant fauna recorded during the survey are presented in Figure 4.

Likelihood of occurrence assessment

A likelihood assessment of conservation significant species occurring in the survey area was undertaken in addition to the field survey. The assessment takes into consideration the species' biology, habitat requirements, and the quality and availability of suitable habitat as determined during the field survey as well as previous records of the species in the survey area and region

In addition to the four known conservation significant species recorded, a further six species are considered likely to occur in the survey area. Table 19 summarises the species of conservation significance that are either known or considered likely to occur in the survey area. The parameters of determination and the full likelihood of occurrence assessment for the species identified through the desktop assessment are provided in Appendix C. A brief description of known species and their associated habitat types within the survey area are described below.

Table 19 Summary of likelihood of occurrence assessment

| Species | EPBC Act | BC Act/ DBCA | Assessment outcome |
|--|----------|--------------|--|
| Birds | | | |
| Rufous Grasswren (<i>Amytornis striatus subsp. whitei</i>) | | P4 | Likely. The Hillcrest/ Hillslope habitat comprises <i>Triodia</i> hummocks which may be large enough for this species to nest in although the surrounding areas have larger patches of spinifex which may be more favourable for this species. The closest record of this species is located approximately 9.3 km southeast of the survey area. |
| Peregrine Falcon (<i>Falco peregrinus</i>) | - | OS | Likely. This species is known from the region and may use the steep cliffs within the Gorge/Gully system for breeding and may forage in all habitats. The closest record of this species is located approximately 5.6 km northwest of the survey area. |
| Grey Falcon (<i>Falco hypoleucos</i>) | | Vu | Likely. Suitable habitat is present for the Grey Falcon within the survey area and surrounds (all habitats) and the species is known from the region. The closest record of this species is located approximately 30 km north of the survey area. |
| Mammals | | | |

| Species | EPBC Act | BC Act/ DBCA | Assessment outcome |
|--|----------|--------------|--|
| Ghost Bat (<i>Macroderma gigas</i>) | Vu | Vu | Known. This species was recorded via feeding evidence and possible fresh and old scats within four caves in the Gorge/Gully habitat but no evidence of a long-term roosting cave was found. Three potential diurnal roost caves and one potential foraging cave was identified during the survey with a number of other caves not assessed due to access issues (positioned in cliffs). The closest recording of this species is located approximately 8 km south of the survey area. The presence of recent and historic scats, foraging evidence and diurnal roost opportunities at four locations over the course of the survey period suggest regular usage of these roost sites within the survey area. It is likely that with additional effort further evidence to support diurnal and nocturnal (e.g. feeding site) usage of these roost sites would be recorded. The lack of calls recorded by the detectors is not a definitive indication of Ghost Bat activity for these sites as the detectors were located in different habitats at some distance (e.g. base of gorge approx 300 m away) from the potential diurnal roosting sites. |
| Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>) | | P4 | Known. Indirect evidence of the Western Pebble-mound Mouse was recorded in the Hillcrest/Hillslope habitat via their characteristic pebble mound structures. Three mounds were assessed as both active (two) and recently non-active (one). Pebble mounds are found spread throughout Hillcrest/Hillslope habitat surrounding the survey area and this species is largely restricted to this habitat. |
| Northern Quoll (<i>Dasyurus hallucatus</i>) | En | En | Likely. The Gorge/Gully habitat type presents suitable denning and foraging habitat to support this species while Minor Drainage Lines provide opportunistic foraging and dispersal habitat. The closest record of this species is located approximately 6 km north of the survey area. Deployed remote cameras did not detect Northern Quoll and no signs of scat or direct sightings were recorded during the survey. However, this does not suggest Northern Quoll absence from the area as they may persist in low density. |

| Species | EPBC Act | BC Act/ DBCA | Assessment outcome |
|---|----------|--------------|---|
| Pilbara leaf-nosed Bat (<i>Rhinoicteris aurantia</i>) | Vu | Vu | Likely. Foraging habitat is present for the species (Gorge/Gully, Minor Drainage Lines, and Hillcrest/Hillslope). A number of caves within the survey area could not be accessed and may provide diurnal roosting for Pilbara leaf-nosed Bat. Although no calls were recorded for this species recent evidence demonstrates (Bullen and Reiffer 2019) that the Pilbara leaf-nosed Bat is capable of inter roost movements of 170 km over the course of 13 months. The lack of calls recorded by the detectors is not a definitive indication of Pilbara Leaf-nosed Bat activity for these sites as the detectors were located in different habitats at some distance (e.g. base of gorge approx 300 m away) from the potential roosting sites. Furthermore recent radio-tracking of Pilbara leaf-nosed Bat by GHD has also demonstrated linear movements greater than 8 km over the course of one hour during the same night (pers comm C. Grabham unpublished data 2018 and 2020). The nearest confirmed records are approximately 29 km north west of the survey area. However given there is likely potential roost caves and permanent pools along Yandicoogina Creek within the survey area, and the regional extent of the species distribution within the Hamersley Range, the species is considered likely to opportunistically forage within the survey area. |
| Reptiles | | | |
| Pilbara Flat-headed Blind Snake (<i>Anilius ganei</i>) | | P1 | Known. This species was recorded in a trap within the Gorge/ Gully system. |
| Pilbara Olive Python (<i>Liasis olivaceus barroni</i>) | Vu | Vu | Known. This species was recorded in the Gorge/Gully habitat with scats being found on a rock ledge next to a pool of water. Suitable denning and foraging habitat exists throughout the gorge system. Minor Drainage Line habitat may also be used for foraging. Seven pools of water were recorded in the Gorge/Gully during the dry season survey and the gorge had a flowing stream through it during the wet season survey providing excellent conditions to support Pilbara Olive Python. |
| Pilbara Barking Gecko (<i>Underwoodisaurus seorsus</i>) | | P2 | Likely. The survey area contains suitable habitat to support this species, particularly in the Gorge/Gully and Minor Drainage Line habitats. The closest known record is located approximately 9.3 km south of the survey area. |

Key – (SP) = Other Special Protection under BC Act, (Vu) = Vulnerable under the EPBC Act and/ or BC Act, P1 = Priority 1 under DBCA, P4 = Priority 4 under DBCA. For breakdown of code meaning see Appendix B.

Significant fauna species recorded in the survey area

Ghost Bat (*Macroderma gigas*)

The Ghost Bat (*Macroderma gigas*) is listed as Vulnerable under the EPBC Act and under the BC Act.

The Ghost Bat occurs in a wide range of habitats (foraging), and requires an undisturbed cave, deep fissure or disused mine shaft to roost (roosting and breeding). It is patchily distributed across Australia with an isolated population persisting in the Pilbara region, and is sensitive to disturbance (Van Dyck and Strahan 2008).

The Gorge/Gully habitat type comprises breakaways with cave systems which may support the Ghost Bat for foraging and/or as a potential diurnal roosts although no long-term roosting caves were recorded. Potential foraging habitat for the Ghost Bat in the survey area includes the drainage line associated with Yandicoogina Creek, the Gorge/Gully and Minor Drainage Line habitat which supports trees that may be used as ambush structures.

Four caves were identified along the cliffs and breakaway of the Gorge/Gully system which appear to be previously or currently used by Ghost Bat. Three of these contained old Ghost Bat scats and two comprised fresh Ghost Bat scats (one cave contained both). One cave (Cave 3) containing fresh potential Ghost Bat scats also contained potential feeding evidence in the form of moth wings. Moths are a known prey species of Ghost Bat (Biologic 2016). However this cave did not have the appropriate structure (single chamber with no roosting space available) to support Ghost Bat roosting and is considered to be a foraging location only. Another cave (Cave 10) contained extensive foraging evidence with both diamond dove and wood swallow feathers scattered through the entrance. This cave contained fresh and old Ghost Bat scat and is considered to be a potential diurnal roost. This cave was part of an extensive cave system with multiple large chambers with multiple entrances and was very humid inside. Cave 1 and Cave 2 were also considered to be potential diurnal roosts due to cave structure and presence of old scat. It is likely that with additional effort further evidence to support diurnal and nocturnal (e.g. feeding site) usage of these roost sites would be recorded.

Further details of Ghost Bat evidence and potential habitat locations is presented in Table 20. All caves assessed are presented in Appendix C.

Bat detectors deployed during both phases of the survey did not detect Ghost Bat presence. The lack of calls recorded by the detectors is not a definitive indication of Ghost Bat activity for these caves as the detectors were located in different habitats at some distance (e.g. base of gorge approximately 300 m away) from the potential diurnal roosting sites.

Studies undertaken on Ghost Bat foraging found the species will travel on average 1.9 km from a diurnal roost utilising large trees as vantage points to hunt (Tidemann et al. 1985). The survey area contains a number of large Eucalypts along the drainage lines and within the Gorge/Gully habitat which may be used as ambush structures. Based on the current evidence it is likely Ghost Bats will move into this environment to forage and utilise the located caves for feeding. This is most likely to occur during warm wet conditions which are seasonally suitable for wide dispersal. During these favourable dispersal conditions, and based on home range (Churchill 1998), it is likely a more permanent diurnal roost or maternal cave is present within 2 km of the feeding locations. An additional targeted Ghost Bat cave assessment would be required to potentially identify this area.

Western Pebble-mound Mouse (*Pseudomys chapmani*)



The Western Pebble-mound Mouse is listed as Priority 4 under DBCA Priority fauna listing.


The Western Pebble-mound Mouse is restricted to the Pilbara region where it is recognised as an endemic species. Habitat for the species can be found on stony hills or hillsides with hummock grasslands. It constructs large mounds of pebbles on stony hills which cover an area of 0.5 – 9 m². 'Active' mounds are characterized by volcano-like cones capped by 'craters' that mark occluded entrances to subterranean burrow systems where the mice live, often gregariously (Van Dyck and Strahan, 2008). An active mound also has pebbles that do not or are not settled, meaning the mound is being worked and pebbles continuously manipulated.

Evidence of this species was recorded in three locations within the survey area (as shown below in Table 21 and in Figure 4). In total, two active and one recently inactive mounds were recorded on the Hillcrest/Hillslope habitat.

NatureMap records (DPaW 2007) indicate this species is widespread in the eastern Pilbara region. However, this species is known to be sensitive to external impacts and populations are known to decline in areas where disturbance has occurred.

Table 20 Ministers North Level 2 Ghost Bat evidence

| Cave ID | Lat. | Long. | Ghost Bats present/ other evidence | Cave Type and comments | Image |
|---------|------------|-------------|---|---|--|
| Cav-01 | 721483.539 | 7474291.816 | Approx. 10 old Ghost Bat scat recorded, <i>T. georgianus</i> scat and one individual <i>T. georgianus</i> recorded | Potential diurnal roost (occasional usage) for Ghost Bat with multiple medium sized chambers. Comments: May provide potential diurnal roost habitat for small number of Ghost Bat. Unlikely to provide breeding habitat. Appears to receive water during the wet season. |  |
| Cav-02 | 721504.529 | 7474276.215 | Approx. five old Ghost Bat scat recorded. Recent other microbat scats. 1 x <i>V. finlaysoni</i> recorded in flight. | Potential diurnal roost (occasional usage) for Ghost Bat with multiple chambers. Comments: May provide potential diurnal roost habitat for small number of Ghost Bat. Unlikely to provide breeding habitat. |  |

| Cave ID | Lat. | Long. | Ghost Bats present/ other evidence | Cave Type and comments | Image |
|---------|------------|-------------|--|---|---|
| Cav-03 | 721974.581 | 7474118.264 | Approx. 10 possible fresh Ghost Bat scat recorded, some foraging evidence in the form of large moth remains. | Potential foraging cave with one main opening Comments: No roosting space available, lots of <i>T. georgianus</i> scat and one individual roosting. Pilbara Olive Python scat also found at this cave. |  |





| Cave ID | Lat. | Long. | Ghost Bats present/ other evidence | Cave Type and comments | Image |
|---------|------------|-------------|---|--|--|
| Cav-10 | 720242.608 | 7473615.347 | Foraging signs including extensive diamond dove and wood swallow feathers, old and fresh scat present | Potential day and feeding roost. Comments: Extensive cave system with multiple large chambers, very humid, multiple entrances, appears to be seasonally wet, three <i>T. georgianus</i> seen in flight. Considered to be potential diurnal roost. |  |

Table 21 Western Pebble-mound Mouse mounds recorded in the survey area

| Mound | Easting | Northing | Habitat | Active/ in active | Image |
|-------|-----------|------------|----------------------|-------------------|--|
| 1 | 720246.78 | 7474122.42 | Hillcrest/ Hillslope | Active |  |
| 2 | 720372.35 | 7474085.51 | Hillcrest/ Hillslope | Active |  |
| 3 | 719666.71 | 7473982.21 | Hillcrest/ Hillslope | Recently inactive |  |

Pilbara Olive Python (*Liasis olivaceus barroni*)

The Pilbara Olive Python (*Liasis olivaceus barroni*) is listed as Vulnerable under the EPBC Act and under the BC Act.

The Pilbara Olive Python utilises escarpments, gorges and waterholes within the Pilbara region. Individuals usually occur within close proximity to water and rocky outcrops that attract sizeable prey species (Pearson 2003). Individuals will often submerge themselves in water and ambush their prey when they come to drink.

The Gorge/Gully and Minor Drainage Line habitats are suitable habitats for the Pilbara Olive Python. Some of the cave systems of the Gorge/Gully habitat may be used by Pilbara Olive Pythons for breeding. The water holes within the Gorge/Gully and Minor Drainage Line habitats provide feeding habitat for this species.

During the phase one survey, a Pilbara Olive Python scat was found on a rock ledge between a cave and a permanent water hole. The scat was collected, processed and filtered and sent for eDNA sampling along with a water sample from the associated waterhole. Water samples from another two waterholes within the Gorge/Gully were also collected and sent to the laboratory for eDNA analysis. All water samples and the scat sample returned negative results for Olive Python DNA. A noted limitation of this form of analysis is that DNA only persists for a short duration, potentially only several days in water before its concentration becomes too diluted to be detected. The negative result for DNA in the samples collected does not rule out the presence of the target species, rather it indicates a lack of recently deposited Olive Python DNA. Several factors can affect the persistence of trace DNA such as temperature, time, sunlight, and environmental DNA concentration. Therefore, the scat itself may have been too old, and water pools not recently

visited by the target species to contain active DNA traceable in the analysis. A picture of the Pilbara Olive Python scat and associated water hole is displayed below.

Plate 1 Pilbara Olive Python scat and associated waterhole (recorded at 721973.66 E, 7474116.88 N)



Pilbara Flat-headed Blind Snake (*Anilius ganei*)

The Pilbara Flat-headed Blind Snake (*Anilius ganei*) (Plate 2) is listed as Priority 1 under the DBCA priority fauna listing. It is an endemic species to the Pilbara found only between Newman and Pannawonica. The species is moderately robust with greyish/ brown above and cream below. An irregular junction is present between the darker lateral and paler underside areas (Wilson & Swan 2017). This species has a cryptic fossorial habit and is rarely encountered during surveys. Little is known of the species' ecology but like most other blind snakes, it is insectivorous, feeding on termites and their eggs, and larvae and pupae of ants (Wilson & Swan 2017). This species of blind snake is known from widely separated areas and considered to be possibly associated with moist gorges and gullies (Wilson & Swan 2017) as well as other rocky and stony environments.

One Pilbara Flat-headed Blind Snake was recorded during the survey from Trap Line 2 within the Yandicoogina Creek. Numerous records of this species have been recorded within the region with the closest record being approximately 12 km north-west of the survey area. Suitable habitat for the Pilbara Flat-headed Blind Snake within the survey area includes Minor Drainage Lines, Gorges, Gullies and Hillcrest/ Hillslope, however this species is recognised as being highly cryptic with relatively few records, and the habitat preferences have not been quantified.

**Plate 2 Pilbara Flat-headed Blind Snake recorded within survey area
(recorded at 719642.39E, 7473615.59 N)**



4.4 Fauna survey limitations

EPA Technical Guidance –Terrestrial Fauna Surveys (EPA 2016a) states fauna and faunal assemblage survey reports for environmental impact assessment in Western Australia should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with the fauna component of this field survey are discussed in Table 22.

Table 22 Fauna survey limitations

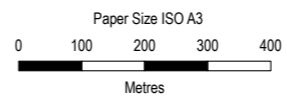
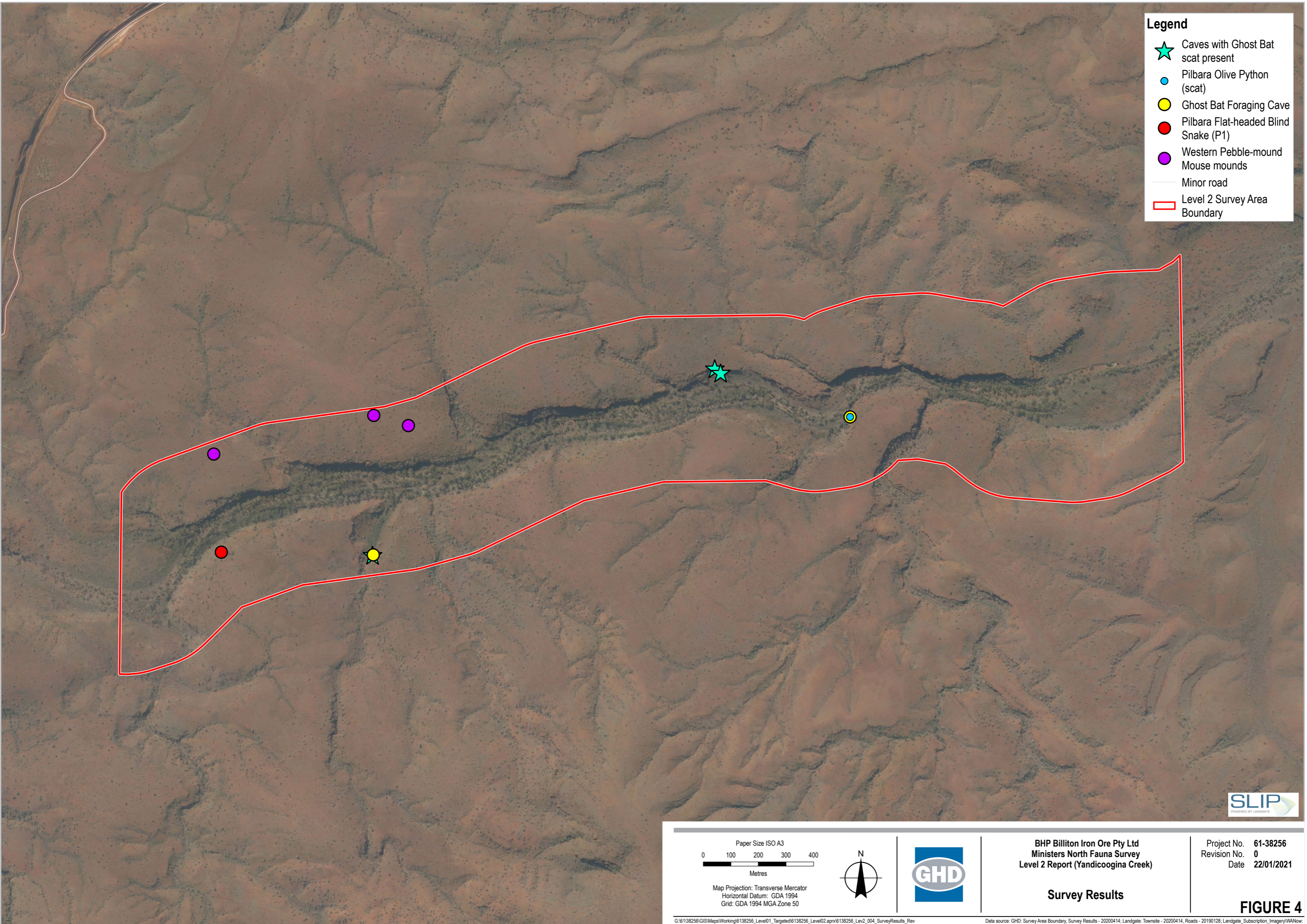
| Limitations | Constraints | Impact on Survey outcomes |
|---|-------------|--|
| Scope (what faunal groups were sampled? Were some sampling methods not able to be employed because of constraints such as weather conditions?, e.g. pitfall trapping in waterlogged soils or inability to use pitfall traps because of rocky terrain) | Minimal | All fauna groups were able to be sampled however in rocky areas that were unable to be dug, pit traps were substituted with funnel traps. This was done for seven lines at Trap Line 2 with the remaining three pitfall traps comprising buckets as the pipes were deeper than the buckets and the substrate was difficult to dig. Due to accessibility issues, only two trap lines were able to be deployed over the western end of the survey area. To substitute for trap lines, 15 cameras and six locations of bat and bird acoustic recorders were deployed throughout the length of the survey area which was also traversed and actively searched on three separate days by four ecologists. |
| Seasonal environmental conditions | Minimal | The Pilbara and this survey area in the summer period leading up to the survey had below average rainfall. The Newman longterm average rainfall is 190.4 mm over the six month period prior to the first season survey. In 2019, Newman only received 82.6 mm over this period. Although the area received below average rainfall, pools of water were still present in the Gorge/Gully habitat and fauna were present. Nevertheless, additional active |

| Limitations | Constraints | Impact on Survey outcomes |
|---|-------------|---|
| | | <p>searches and remote camera deployment were undertaken to compensate for any potential reductions in expected trapping outcome from reduced rainfall.</p> <p>In comparison, the Newman area received 268.4 mm of rainfall in the six month lead up to the second season survey which is well above the average for these months (196.9 mm). This provided optimal trapping conditions for fauna with abundant freshwater and new foliage present. A greater number of juveniles were observed during the second season survey (anecdotal) however in general a higher number of species were recorded in the first season survey (n=100 compared to n=73).</p> |
| Proportion of fauna identified, recorded and/or collected | Nil | All fauna were identified and released on site. |
| Proportion of the task achieved and further work which might be needed. | Minimal | <p>The Level 2 survey was successful and most areas were able to be assessed. Potential Ghost Bat caves could not be individually assessed at dusk using night vision goggles due to access issues and safety concerns. Therefore each cave was not set with internal and external bat acoustic recorders. The entrances of each accessible cave were searched for scat and foraging evidence. Some caves located on steep upper slopes or cliffs within the gorge were not physically assessed for Ghost Bat evidence due to safety reasons. These caves were assessed with binoculars instead and noted as potentially suitable caves based on their dimensions (displayed in Appendix C). Where appropriate, bat acoustic recorders were placed in the major drainage line near these caves to capture acoustics from any bats that may come out to forage or drink.</p> |
| Remoteness and/or access problems | Moderate | <p>Only the western end of the survey area was accessible by vehicle. As a result, only two trap lines were installed in the western survey area and only this portion of the survey area was able to be nocturnally searched. To adequately survey the remaining survey area, active searches and cave assessments were undertaken by traversing the gorge on four separate occasions. A Northern Quoll remote camera trap line was set in the eastern-most end of the gorge and 16 cameras in total were set along the length of the gorge to substitute the lack of pitfall trap lines and increase survey effort and coverage. Twice when the gorge was traversed, two bat acoustic recorders and two bird acoustic recorders were moved to new locations to increase coverage. Bird censuses were performed throughout the duration of the active searching. Approximately 10 caves could not be surveyed due to positioning high in cliff faces or unstable looking entrances. Most of these cliff caves were located as clusters in honeycombing rock. In total, eight bat detector locations were used throughout the gorge system to increase the chance of recording bats that may have been within these inaccessible caves. Bat detectors were placed in foraging habitat between</p> |

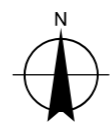
| Limitations | Constraints | Impact on Survey outcomes |
|------------------------------|-------------|---|
| | | caves to increase survey coverage or at water bodies to capture bats coming to drink or those foraging around waterholes. |
| Accordance to EPA guidelines | Minor | The commissioning of this study, dual season surveys and revisions A and B of this report were performed during the implementation of the <i>Technical Guidance: Sampling methods for terrestrial vertebrate fauna</i> (EPA 216a) and <i>Technical Guidands: Terrestrial Fauna Surveys</i> (EPA 2016b) and prior to the implementation of the newer <i>Technical Guidances – Terrestrial vertebrate fauna surveys for environmental impact assessment</i> (EPA 2020) guideline which supercedes the 2016 versions. This document has not been updated to comply with 2020 guidelines. |

Legend

-  Caves with Ghost Bat scat present
-  Pilbara Olive Python (scat)
-  Ghost Bat Foraging Cave
-  Pilbara Flat-headed Blind Snake (P1)
-  Western Pebble-mound Mouse mounds
-  Minor road
-  Level 2 Survey Area Boundary



Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 MGA Zone 50



BHP Billiton Iron Ore Pty Ltd
Ministers North Fauna Survey
Level 2 Report (Yandicoogina Creek)

Project No. **61-38256**
 Revision No. **0**
 Date **22/01/2021**

Survey Results

FIGURE 4

5. Conclusion

In total four broad fauna habitat types were recorded in the survey area during the field survey. These different habitat types are closely aligned with the different vegetation types and landforms within the survey area. The habitat types include Gorge/ Gully, Hillcrest/Hillslope, Drainage Area/ Floodplain and Minor Drainage Line.

The Hillcrest/Hillslope habitat is found widely in the broader region while the potential GDE area which comprises the Gorge/Gully and Minor Drainage Lines, is unique in the greater landscape. A number of permanent water holes were observed in the Gorge/Gully habitat during the summer survey which provide a vital water supply to local fauna during the hotter months, including the conservation significant Pilbara Olive Python and Ghost Bat. During the phase 2 survey, parts of the Yandicoogina creek were flowing and some of the permanent pools were connected. Noticeably more juvenile species were observed during this phase due to the abundance of resources following wet conditions (anecdotal). Due to the available resources (permanent water, dense vegetation, caves etc.) and diverse microhabitats available the species richness is greater in this potential GDE area when compared to the surrounding landscape which is predominantly Hillcrest/Hillslope which has few microhabitats and few resources (GHD 2020).

The suitability of caves for bats (size/shape/humidity etc) within the Gorge/Gully system was greater than that of caves the surrounding landscape. In addition to the phase 1 Level 2 survey, GHD also performed a Level 1 survey covering 2,507.69 ha of land to the north and west of the survey area (GHD 2020). The quality of caves within the Level 1 survey areas did not match those within the Gorge/Gully habitat of the survey area in terms of structure, and proximity to resources (mainly water).

The fauna survey recorded 122 vertebrate fauna species utilising the survey area, including 19 mammals, 55 birds, 44 reptiles and four amphibians. Of these, two species were introduced including the Feral Cat and Cattle. The Cattle are managed under pastoral lease. The use of remote cameras detected four additional fauna species that were not otherwise detected during the survey (Perentie, Southern Pilbara Rock Monitor, Yellow-spotted Monitor and Common Rock Rat). This reflects strongly on the survey effort applied, particularly active searching and bird census.

Four species of conservation significance were recorded during the survey and included the Ghost Bat, Western Pebble-mound Mouse, Pilbara Olive Python and Pilbara Flat-headed Blind Snake. In addition to the four known species recorded, six conservation significant species are considered likely to occur in the survey area.

Three potential Ghost Bat diurnal roosts and one foraging cave were identified within the survey area. All caves contained either fresh or old Ghost Bat scat and two of these caves also contained Ghost Bat feeding evidence in the form of large moths and Diamond Dove, both of which are known prey species of Ghost Bat (Biologic 2016). All caves were located along the cliffs and breakaways of the Gorge/Gully system. The survey area provides foraging habitat (entire area) and potential diurnal roost habitat within the cliffs and breakaways. Based on the foraging evidence, it is expected that a larger diurnal roost or potential maternity roost may be present within 2 km of the feeding locations. An additional survey would be required to potentially identify this area. Two potentially suitable caves on the northern side of the gorge were not searched for Ghost Bat evidence due to cultural markers pertaining the caves as culturally significant sites (Figure 3). These caves should be considered potential diurnal roost unless evidence to the contrary is provided.

The Western Pebble-mound Mouse was recorded via active and recently inactive pebble mounds on Hillcrest/Hillslope habitat in the survey area. This species is known from the area and is patchily

distributed through the rocky substrate habitats (often on the hill crest or slope areas) within the broader landscape. The Western Pebble-mound Mouse is highly susceptible to disturbance and is known to disappear from areas impacted.

The Pilbara Olive Python was recorded via scat found at a permanent water hole during the first phase survey. The survey area contains good habitat to support this species including foraging habitat (various permanent water holes, dense vegetation, rocky substrate) and denning habitat (rocky gorge/breakaway habitat). The survey area is considered to contain highly important habitat for this species within the local area.

Pilbara Flat-headed Blind Snake was captured at Trap Line 2 within the Gorge/Gully system. It is an endemic species to the Pilbara found only between Newman and Pannawonica. The Pilbara Flat-headed Blind Snake is a highly cryptic species and is rarely captured. The closest record is 12 km north-west of the survey area. The habitat preferences have not yet been confirmed however Minor Drainage Lines, Gorges/Gullies and Hillcrest/Hillslope are expected to be suitable habitats.

Rufous Grasswren, Peregrine Falcon, Grey Falcon, Northern Quoll, Pilbara Leaf-nosed Bat, and Pilbara Barking Gecko were all identified as likely to be present within the habitat of the survey area. All species identified have previously been recorded in the region and suitable habitat is present within the survey area. However, some species like the Northern Quoll and Pilbara Leaf-nosed Bat appear to be in very low densities in the Yandi region compared to other locations in the Pilbara. The Pilbara Barking Gecko is a small reptile typically associated with gorges and gullies or ridgelines restricted to the Pilbara. This species has a patchy distribution and is cryptic in the environment. While the dual season survey did not detect this species, trapping and nocturnal search effort focused primarily on the western portion of the survey area due to access restrictions. It is still considered likely this species is present within the survey area. The remaining birds, Rufous Grasswren, Peregrine Falcon and Grey Falcon are all known from the region and are opportunistic utilising areas as resources become available. Breeding habitat is present for the Peregrine Falcon along some of the high cliffs and breakaways in the survey area.

The Northern Quoll was not detected within the survey area but is considered likely to occur in the survey area. The closest known record is approximately 6 km north of the survey area and the Gorge/Gully habitat types present suitable foraging and denning habitat for this species, while Minor Drainage Line and Hillcrest/Hillslope habitats within the survey area may assist dispersal and provide opportunistic foraging habitat. Although the remote cameras did not detect this species, this does not suggest Northern Quoll absence from the survey area as the species may persist at very low densities.

Pilbara Leaf-nosed Bat was also not detected through cave assessment or via bat detectors within the survey area. Foraging habitat is present for the species within Gorge/Gully, Minor Drainage Lines, and Hillcrest/Hillslope habitat however no suitable roosting habitat was detected during the survey and the closest known records of the species are approximately 29 km west of the survey area. Recent evidence demonstrates (Bullen and Reiffer 2019) that the Pilbara Leaf-nosed Bat is capable of inter roost movements of 170 km over the course of 13 months. Approximately 10 possible caves were located in honeycombing cliffs in the Gorge/Gully and were not able to be accessed at the time of survey due to safety concerns. The bat detectors returned no hits for the species however they may be persisting in low numbers or opportunistically using the survey area as resource availability fluctuates (particularly the water source (permanent pools) along Yandcoogina Creek).

There were a number of caves not accessed during the survey that may provide additional diurnal roosting for both the Pilbara Leaf-nosed Bat and Ghost Bat including the two cultural heritage caves.

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Appendices

Appendix A – Relevant legislation, background information and conservation codes

Relevant legislation to Fauna

Federal *Environment Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Federal Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (MNES).

The biological aspects listed as MNES include:

- Nationally threatened flora and fauna species and ecological communities
- Migratory species

A person must not undertake an action that has, will have, or is likely to have a significant impact (direct or indirect) on MNES, without approval from the Federal Minister for the Environment.

The EPBC Act is administered by the Department of the Environment and Energy (DEE).

State *Environmental Protection Act 1986*

The *Environmental Protection Act 1986* (EP Act) is the primary legislative Act dealing with the protection of the environment in Western Australia. The Act allows the Environmental Protection Authority (EPA), to prevent, control and abate pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing. Part IV of the EP Act is administered by the EPA and makes provisions for the EPA to undertake environmental impact assessment of significant proposals, strategic proposals and land use planning schemes.

The Department of Water and Environment Regulation (DWER) is responsible for administering the clearing provisions of the EP Act (Part V). Clearing of native vegetation in Western Australia requires a permit from the DWER, unless exemptions apply. Applications for clearing permits are assessed by the Department and decisions are made to grant or refuse the application in accordance with the Act. When making a decision the assessment considers clearing against the ten clearing principles as specified in Schedule 5 of the EP Act:

- a) Native vegetation should not be cleared if it comprises a high level of biodiversity.
- b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significance habitat for fauna indigenous to Western Australia.
- c) Native vegetation should not be cleared if it includes, or is necessary, for the continued existence of rare flora.
- d) Native vegetation should not be cleared if it comprises the whole or part of native vegetation in an area that has been extensively cleared.
- e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
- f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- g) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.
- h) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

- i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.
- j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

Exemptions for clearing include clearing that is a requirement of a written law or authorised under certain statutory processes (listed in Schedule 6 of the EP Act) and exemptions for prescribed low impact day-to-day activities (prescribed in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004); these exemptions do not apply in environmentally sensitive areas (ESAs).

State Biodiversity and Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides for the conservation and protection of biodiversity and biodiversity components, as well as the promotion of the ecologically sustainable use of biodiversity components in Western Australia. The BC Act replaces both the repealed *Wildlife Conservation Act 1950* (WC Act) and the *Sandalwood Act 1929* (Sandalwood Act), as well as their associated regulations. To attain the objectives of the BC Act, principles of ecological sustainable development have been established:

- Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations
- If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations
- The conservation of biodiversity and ecological integrity should be a fundamental consideration in decision-making
- Improved valuation, pricing and incentive mechanisms should be promoted.

The BC Act is administered by the Department of Biodiversity Conservation and Attractions (DBCA).

State Biosecurity and Agriculture Management Act 2007

The *Biosecurity and Agriculture Management Act 2007* (BAM Act) and associated regulations are administered by the Department of Primary Industries and Regional Development (DPIRD) and replace the repealed *Agriculture and Related Resources Protection Act 1976*. The main purposes of the BAM Act and its regulations are to:

- Prevent new animal and plant pests (vermin and weeds) and diseases from entering WA
- Manage the impact and spread of those pests already present in the state
- Safely manage the use of agricultural and veterinary chemicals
- Increased control over the sale of agricultural products that contain violative chemical residues.

The Western Australian Organism List (WAOL) provides the status of organisms which have been categorised under the BAM Act. A Declared Pest is a prohibited organism or an organism for which a declaration under Section 22(2) of the Act is in force. Declared Pests may be assigned a control category including: C1 (exclusion), C2 (eradication) and C3 (management). The category may apply to the whole of the State, LGAs, districts, individual properties or even paddocks, and all landholders are obliged to comply with the specific category of control. Categories of control are defined below.

DPIRD Categories for Declared Pests under the BAM Act

| Control class code | Description |
|--------------------|---|
| C1 (Exclusion) | Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State. |
| C2 (Eradication) | Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility. |
| C3 (Management) | Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest. |

Fauna Conservation codes

Conservation significant fauna

The Federal conservation level of fauna species and their significance status is assessed under the EPBC Act. The significance levels for fauna used in the EPBC Act align with the International Union for Conservation of Nature (IUCN) Red List criteria, which are internationally recognised as providing best practice for assigning the conservation status of species. The EPBC Act also protects land and migratory species that are listed under International Agreements. The list of migratory species established under section 209 of the EPBC Act comprises:

- Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II)
- Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China–Australia Migratory Bird Agreement (CAMBA)
- Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the republic of Korea–Australia Migratory Bird Agreement (ROKAMBA)

The State conservation level of fauna species and their significance status also follows the IUCN Red List criteria. Under the BC Act fauna can be listed as Threatened, Extinct and as Specially Protected species.

Threatened species are those are species which have been adequately searched for and are deemed to be, in the wild, either rare, under identifiable threat of extinction, or otherwise in need of special protection, and have been gazetted as such. The assessment of the conservation status of Threatened species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria. Specially protected species meet one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as Threatened or Extinct species under the BC Act cannot also be listed as Specially Protected species.

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna List under Priorities 1, 2 or 3. These three categories are ranked in order

of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna.

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

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

For the purposes of this assessment, all species listed under the EPBC Act, BC Act and DBCA Priority species are considered conservation significant.

Conservation categories and definitions for EPBC Act and BC Act listed fauna species

| Conservation category | Definition |
|-----------------------------|--|
| Threatened species | |
| Critically Endangered (CR) | Threatened species considered to be “facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. |
| Endangered (EN) | Threatened species considered to be “facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines |
| Vulnerable (VU) | Threatened species considered to be “facing a high risk of extinction in the wild in the medium term future, as determined in accordance with criteria set out in the ministerial guidelines”. Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. |
| Extinct species | |
| Extinct (EX) | Species where “there is no reasonable doubt that the last member of the species has died”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). |
| Extinct in the Wild (EW) | Species that “is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). |
| Specially protected species | |

| Conservation category | Definition |
|--|---|
| Migratory (MI) | <p>Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).</p> <p>Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species</p> |
| Species of special conservation interest (conservation dependent fauna) (CD) | Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. |
| Other specially protected fauna (OS) | Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). |

Conservation codes for DBCA listed Priority fauna

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

| Priority category | Definition |
|-------------------|--|
| Priority 4 | <p>Rare, Near Threatened and other taxa in need of monitoring</p> <p>A. Rare: Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.</p> <p>B. Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.</p> <p>C. Taxa that have been removed from the list of threatened taxa during the past five years for reasons other than taxonomy.</p> |

Other significant fauna

Fauna species may be significant for a range of reasons other than those protected by international agreement or treaty, Specially Protected or Priority Fauna. Significant fauna may include short-range endemic species, species that have declining populations or declining distributions, species at the extremes of their range, or isolated outlying populations, or species which may be undescribed (EPA 2010).

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Appendix B – Desktop Searches

NatureMap Species Report

Created By Guest user on 03/04/2020

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 119° 09' 53" E, 22° 49' 35" S
Buffer 40km
Group By Species Group

| Species Group | Species | Records |
|---------------|------------|--------------|
| Amphibian | 7 | 705 |
| Bird | 185 | 15986 |
| Fish | 4 | 391 |
| Invertebrate | 365 | 2438 |
| Mammal | 55 | 6054 |
| Reptile | 141 | 8719 |
| TOTAL | 757 | 34293 |

| Name ID | Species Name | Naturalised | Conservation Code | Endemic To Query Area |
|------------------|---|-------------|-------------------|-----------------------|
| Amphibian | | | | |
| 1. | 25375 <i>Cyclorana maini</i> (Sheep Frog) | | | |
| 2. | 25376 <i>Cyclorana platycephala</i> (Water-holding Frog) | | | |
| 3. | 25392 <i>Litoria rubella</i> (Little Red Tree Frog) | | | |
| 4. | 25427 <i>Neobatrachus sutor</i> (Shoemaker Frog) | | | |
| 5. | 25432 <i>Pseudophryne douglasi</i> (Gorge Toadlet) | | | |
| 6. | 25445 <i>Uperoleia russelli</i> (Northwest Toadlet) | | | |
| 7. | 41428 <i>Uperoleia saxatilis</i> (Pilbara Toadlet) | | | |
| Bird | | | | |
| 8. | 24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater) | | | |
| 9. | 24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill) | | | |
| 10. | 24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill) | | | |
| 11. | 24264 <i>Acanthiza robustirostris</i> (Slaty-backed Thornbill) | | | |
| 12. | <i>Acanthiza</i> sp. | | | |
| 13. | 24265 <i>Acanthiza uropygialis</i> (Chestnut-rumped Thornbill) | | | |
| 14. | 25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk) | | | |
| 15. | 24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk) | | | |
| 16. | 25536 <i>Accipiter fasciatus</i> (Brown Goshawk) | | | |
| 17. | 24283 <i>Accipiter fasciatus</i> subsp. <i>didimus</i> (Brown Goshawk) | | | |
| 18. | 25755 <i>Acrocephalus australis</i> (Australian Reed Warbler) | | | |
| 19. | 25544 <i>Aegotheles cristatus</i> (Australian Owllet-nightjar) | | | |
| 20. | 25647 <i>Amytornis striatus</i> (Striated Grasswren) | | | |
| 21. | 24540 <i>Amytornis striatus</i> subsp. <i>whitei</i> (Rufous Grasswren) | | | |
| 22. | 24316 <i>Anas superciliosa</i> (Pacific Black Duck) | | | |
| 23. | 47414 <i>Anhinga novaehollandiae</i> (Australasian Darter) | | | |
| 24. | 25670 <i>Anthus australis</i> (Australian Pipit) | | | |
| 25. | 24599 <i>Anthus australis</i> subsp. <i>australis</i> (Australian Pipit) | | | |
| 26. | 25528 <i>Aphelocephala leucopsis</i> (Southern Whiteface) | | | |
| 27. | 25554 <i>Apus pacificus</i> (Fork-tailed Swift, Pacific Swift) | | IA | |
| 28. | 24285 <i>Aquila audax</i> (Wedge-tailed Eagle) | | | |
| 29. | 41324 <i>Ardea modesta</i> (great egret, white egret) | | | |
| 30. | 24340 <i>Ardea novaehollandiae</i> (White-faced Heron) | | | |
| 31. | 24341 <i>Ardea pacifica</i> (White-necked Heron) | | | |
| 32. | 24610 <i>Ardeotis australis</i> (Australian Bustard) | | | |
| 33. | 25566 <i>Artamus cinereus</i> (Black-faced Woodswallow) | | | |
| 34. | 24352 <i>Artamus cinereus</i> subsp. <i>melanops</i> (Black-faced Woodswallow) | | | |
| 35. | 24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow) | | | |
| 36. | 24355 <i>Artamus minor</i> (Little Woodswallow) | | | |
| 37. | 24356 <i>Artamus personatus</i> (Masked Woodswallow) | | | |
| 38. | <i>Barnardius zonarius</i> | | | |
| 39. | 24359 <i>Burhinus grallarius</i> (Bush Stone-curlew) | | | |

| Name ID | Species Name | Naturalised | Conservation Code | ¹ Endemic To Query Area |
|---------|--|-------------|-------------------|------------------------------------|
| 40. | 25715 <i>Cacatua roseicapilla</i> (Galah) | | | |
| 41. | 24725 <i>Cacatua roseicapilla</i> subsp. <i>assimilis</i> (Galah) | | | |
| 42. | 24726 <i>Cacatua roseicapilla</i> subsp. <i>roseicapilla</i> (Galah) | | | |
| 43. | 25716 <i>Cacatua sanguinea</i> (Little Corella) | | | |
| 44. | 24728 <i>Cacatua sanguinea</i> subsp. <i>sanguinea</i> (Little Corella) | | | |
| 45. | 24727 <i>Cacatua sanguinea</i> subsp. <i>westralensis</i> (Little Corella) | | | |
| 46. | 42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo) | | | |
| 47. | 25600 <i>Centropus phasianinus</i> (Pheasant Coucal) | | | |
| 48. | 24564 <i>Certhionyx variegatus</i> (Pied Honeyeater) | | | |
| 49. | 24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo) | | | |
| 50. | 24434 <i>Chrysococcyx osculans</i> (Black-eared Cuckoo) | | | |
| 51. | 25580 <i>Cinlosoma castaneothorax</i> (Chestnut-breasted Quail-thrush) | | | |
| 52. | 24288 <i>Circus approximans</i> (Swamp Harrier) | | | |
| 53. | 24289 <i>Circus assimilis</i> (Spotted Harrier) | | | |
| 54. | 25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush) | | | |
| 55. | 24613 <i>Colluricincla harmonica</i> subsp. <i>rufiventris</i> (Grey Shrike-thrush) | | | |
| 56. | 24361 <i>Coracina maxima</i> (Ground Cuckoo-shrike) | | | |
| 57. | 25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike) | | | |
| 58. | 24362 <i>Coracina novaehollandiae</i> subsp. <i>novaehollandiae</i> (Black-faced Cuckoo-shrike) | | | |
| 59. | 24363 <i>Coracina novaehollandiae</i> subsp. <i>subpallida</i> (Black-faced Cuckoo-shrike) | | | |
| 60. | 24416 <i>Corvus bennetti</i> (Little Crow) | | | |
| 61. | 25592 <i>Corvus coronoides</i> (Australian Raven) | | | |
| 62. | 25593 <i>Corvus orru</i> (Torresian Crow) | | | |
| 63. | 24418 <i>Corvus orru</i> subsp. <i>ceciliae</i> (Western Crow) | | | |
| 64. | 24419 <i>Corvus splendens</i> (House Crow) | | | |
| 65. | 25701 <i>Coturnix ypsilophora</i> (Brown Quail) | | | |
| 66. | 24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird) | | | |
| 67. | 25595 <i>Cracticus tibicen</i> (Australian Magpie) | | | |
| 68. | 24422 <i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed Magpie) | | | |
| 69. | 24423 <i>Cracticus tibicen</i> subsp. <i>tibicen</i> (Black-backed Magpie) | | | |
| 70. | 25596 <i>Cracticus torquatus</i> (Grey Butcherbird) | | | |
| 71. | 25547 <i>Dacelo leachii</i> (Blue-winged Kookaburra) | | | |
| 72. | 24304 <i>Dacelo leachii</i> subsp. <i>leachii</i> (Blue-winged Kookaburra) | | | |
| 73. | 24325 <i>Dendrocygna eytoni</i> (Plumed Whistling Duck) | | | |
| 74. | 25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird) | | | |
| 75. | 24470 <i>Dromaius novaehollandiae</i> (Emu) | | | |
| 76. | <i>Egretta novaehollandiae</i> | | | |
| 77. | <i>Elanus axillaris</i> | | | |
| 78. | 25540 <i>Elanus caeruleus</i> (Black-shouldered Kite) | | | |
| 79. | 24290 <i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite) | | | |
| 80. | 24291 <i>Elanus scriptus</i> (Letter-winged Kite) | | P4 | |
| 81. | 47937 <i>Elseyornis melanops</i> (Black-fronted Dotterel) | | | |
| 82. | 24631 <i>Emblema pictum</i> (Painted Finch) | | | |
| 83. | <i>Eolophus roseicapillus</i> | | | |
| 84. | 24570 <i>Epthianura tricolor</i> (Crimson Chat) | | | |
| 85. | 24837 <i>Eremiornis carteri</i> (Spinifex-bird) | | | |
| 86. | 24379 <i>Erythronys cinctus</i> (Red-kneed Dotterel) | | | |
| 87. | 24368 <i>Eurostopodus argus</i> (Spotted Nightjar) | | | |
| 88. | 25621 <i>Falco berigora</i> (Brown Falcon) | | | |
| 89. | 24471 <i>Falco berigora</i> subsp. <i>berigora</i> (Brown Falcon) | | | |
| 90. | 25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel) | | | |
| 91. | 24472 <i>Falco cenchroides</i> subsp. <i>cenchrionides</i> (Australian Kestrel, Nankeen Kestrel) | | | |
| 92. | 24473 <i>Falco hypoleucos</i> (Grey Falcon) | | T | |
| 93. | 25623 <i>Falco longipennis</i> (Australian Hobby) | | | |
| 94. | 24474 <i>Falco longipennis</i> subsp. <i>longipennis</i> (Australian Hobby) | | | |
| 95. | 25624 <i>Falco peregrinus</i> (Peregrine Falcon) | | S | |
| 96. | 25730 <i>Gallirallus philippensis</i> (Buff-banded Rail) | | | |
| 97. | 42314 <i>Gavicalis virescens</i> (Singing Honeyeater) | | | |
| 98. | 24401 <i>Geopelia cuneata</i> (Diamond Dove) | | | |
| 99. | 25585 <i>Geopelia striata</i> (Zebra Dove) | | | |
| 100. | 24403 <i>Geopelia striata</i> subsp. <i>placida</i> (Peaceful Dove) | | | |
| 101. | 24404 <i>Geophaps plumifera</i> (Spinifex Pigeon) | | | |
| 102. | 25530 <i>Gerygone fusca</i> (Western Gerygone) | | | |
| 103. | 24271 <i>Gerygone fusca</i> subsp. <i>fusca</i> (Western Gerygone) | | | |
| 104. | 47959 <i>Gerygone fusca</i> subsp. <i>mungi</i> (Desert Gerygone) | | | |
| 105. | 24443 <i>Grallina cyanoleuca</i> (Magpie-lark) | | | |
| 106. | 24571 <i>Grantiella picta</i> (Painted Honeyeater) | | | |
| 107. | 24295 <i>Haliastur sphenurus</i> (Whistling Kite) | | | |
| 108. | 24296 <i>Hamirostra isura</i> (Square-tailed Kite) | | | |
| 109. | 24297 <i>Hamirostra melanosternon</i> (Black-breasted Buzzard) | | | |

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|---------|---|-------------|-------------------|------------------------------------|
| 110. | 47965 <i>Hieraaetus morphnoides</i> (Little Eagle) | | | |
| 111. | 25734 <i>Himantopus himantopus</i> (Black-winged Stilt) | | | |
| 112. | 24572 <i>Lacustroica whitei</i> (Grey Honeyeater) | | | |
| 113. | 24367 <i>Lalage tricolor</i> (White-winged Triller) | | | |
| 114. | 25661 <i>Lichmera indistincta</i> (Brown Honeyeater) | | | |
| 115. | 24582 <i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater) | | | |
| 116. | 24690 <i>Macronectes giganteus</i> (Southern Giant Petrel) | | IA | |
| 117. | 25651 <i>Malurus lamberti</i> (Variegated Fairy-wren) | | | |
| 118. | 24544 <i>Malurus lamberti</i> subsp. <i>assimilis</i> (Variegated Fairy-wren) | | | |
| 119. | 25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren) | | | |
| 120. | 24549 <i>Malurus leucopterus</i> subsp. <i>leuconotus</i> (White-winged Fairy-wren) | | | |
| 121. | 24548 <i>Malurus leucopterus</i> subsp. <i>leucopterus</i> (Dirk Hartog black and white fairy-wren) | | T | |
| 122. | 25654 <i>Malurus splendens</i> (Splendid Fairy-wren) | | | |
| 123. | 24583 <i>Manorina flavigula</i> (Yellow-throated Miner) | | | |
| 124. | 47997 <i>Melanodryas cucullata</i> (Hooded Robin) | | | |
| 125. | 25665 <i>Melithreptus gularis</i> (Black-chinned Honeyeater) | | | |
| 126. | 24589 <i>Melithreptus gularis</i> subsp. <i>laetior</i> (Black-chinned Honeyeater) | | | |
| 127. | 24736 <i>Melopsittacus undulatus</i> (Budgerigar) | | | |
| 128. | 24598 <i>Merops ornatus</i> (Rainbow Bee-eater) | | | |
| 129. | 25542 <i>Milvus migrans</i> (Black Kite) | | | |
| 130. | 24298 <i>Milvus migrans</i> subsp. <i>affinis</i> (Black Kite) | | | |
| 131. | 25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark) | | | |
| 132. | 24302 <i>Mirafra javanica</i> subsp. <i>horsfieldii</i> (Horsfield's Bushlark, Singing Bushlark) | | | |
| 133. | 25685 <i>Neochmia ruficauda</i> (Star Finch) | | | |
| 134. | 24639 <i>Neochmia ruficauda</i> subsp. <i>clarescens</i> (Star Finch) | | | |
| 135. | 24737 <i>Neophema bourkii</i> (Bourke's Parrot) | | | |
| 136. | <i>Neopsephotus bourkii</i> | | | |
| 137. | 25747 <i>Ninox connivens</i> (Barking Owl) | | | |
| 138. | 24819 <i>Ninox connivens</i> subsp. <i>connivens</i> (Barking owl (southwest subpop.)) | | P3 | |
| 139. | 25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron) | | | |
| 140. | 24742 <i>Nymphicus hollandicus</i> (Cockatiel) | | | |
| 141. | 24407 <i>Ocyphaps lophotes</i> (Crested Pigeon) | | | |
| 142. | 24618 <i>Oreoica gutturalis</i> (Crested Bellbird) | | | |
| 143. | 34012 <i>Oreoica gutturalis</i> subsp. <i>pallescens</i> (Crested Bellbird, central) | | | |
| 144. | 25680 <i>Pachycephala rufiventris</i> (Rufous Whistler) | | | |
| 145. | 24624 <i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler) | | | |
| 146. | 24627 <i>Pardalotus rubricatus</i> (Red-browed Pardalote) | | | |
| 147. | 25682 <i>Pardalotus striatus</i> (Striated Pardalote) | | | |
| 148. | 24628 <i>Pardalotus striatus</i> subsp. <i>murchisoni</i> (Striated Pardalote) | | | |
| 149. | 24629 <i>Pardalotus striatus</i> subsp. <i>uropygialis</i> (Striated Pardalote) | | | |
| 150. | 24630 <i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote) | | | |
| 151. | 24648 <i>Pelecanus conspicillatus</i> (Australian Pelican) | | | |
| 152. | 48060 <i>Petrochelidon ariel</i> (Fairy Martin) | | | |
| 153. | 48061 <i>Petrochelidon nigricans</i> (Tree Martin) | | | |
| 154. | 24659 <i>Petroica goodenovii</i> (Red-capped Robin) | | | |
| 155. | 24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant) | | | |
| 156. | 25699 <i>Phalacrocorax varius</i> (Pied Cormorant) | | | |
| 157. | 24409 <i>Phaps chalcoptera</i> (Common Bronzewing) | | | |
| 158. | 24748 <i>Platycercus varius</i> (Mulga Parrot) | | | |
| 159. | 25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot) | | | |
| 160. | 24751 <i>Platycercus zonarius</i> subsp. <i>zonarius</i> (Port Lincoln Parrot) | | | |
| 161. | 25703 <i>Podargus strigoides</i> (Tawny Frogmouth) | | | |
| 162. | 24683 <i>Pomatostomus superciliosus</i> (White-browed Babbler) | | | |
| 163. | 25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler) | | | |
| 164. | 24684 <i>Pomatostomus temporalis</i> subsp. <i>rubeculus</i> (Grey-crowned Babbler) | | | |
| 165. | 25731 <i>Porphyrio porphyrio</i> (Purple Swamphen) | | | |
| 166. | 24771 <i>Porzana tabuensis</i> (Spotless Crane) | | | |
| 167. | 24390 <i>Psophodes occidentalis</i> (Western Wedgebill, Chiming Wedgebill) | | | |
| 168. | <i>Ptilonorhynchus guttatus</i> | | | |
| 169. | 25724 <i>Ptilonorhynchus maculatus</i> (Spotted Bowerbird) | | | |
| 170. | 24757 <i>Ptilonorhynchus maculatus</i> subsp. <i>guttatus</i> (Western Bowerbird) | | | |
| 171. | 24758 <i>Ptilonorhynchus nuchalis</i> subsp. <i>nuchalis</i> (Great Bowerbird) | | | |
| 172. | 42323 <i>Ptilotula keartlandi</i> (Grey-headed Honeyeater) | | | |
| 173. | 48088 <i>Ptilotula penicillata</i> (White-plumed Honeyeater) | | | |
| 174. | 42344 <i>Purnella albifrons</i> (White-fronted Honeyeater) | | | |
| 175. | 24278 <i>Pyrrholaemus brunneus</i> (Redthroat) | | | |
| 176. | <i>Rhipidura albicauda</i> | | | |
| 177. | 48096 <i>Rhipidura albiscapa</i> (Grey Fantail) | | | |
| 178. | 25614 <i>Rhipidura leucophrys</i> (Willie Wagtail) | | | |
| 179. | 24454 <i>Rhipidura leucophrys</i> subsp. <i>leucophrys</i> (Willie Wagtail) | | | |

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|---------|---|-------------|-------------------|------------------------------------|
| 180. | 30948 <i>Smicromis brevirostris</i> (Weebill) | | | |
| 181. | 25656 <i>Stipiturus ruficeps</i> (Rufous-crowned Emu-wren) | | | |
| 182. | 24556 <i>Stipiturus ruficeps</i> subsp. <i>ruficeps</i> (Rufous-crowned Emu-wren) | | | |
| 183. | 30870 <i>Taeniopygia guttata</i> (Zebra Finch) | | | |
| 184. | 30871 <i>Taeniopygia guttata</i> subsp. <i>castanotis</i> (Zebra Finch) | | | |
| 185. | 24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis) | | | |
| 186. | 42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher) | | | |
| 187. | 25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher) | | | |
| 188. | 24309 <i>Todiramphus sanctus</i> subsp. <i>sanctus</i> (Sacred Kingfisher) | | | |
| 189. | 24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank) | | IA | |
| 190. | 24851 <i>Turnix velox</i> (Little Button-quail) | | | |
| 191. | 25762 <i>Tyto alba</i> (Barn Owl) | | | |
| 192. | 24852 <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl) | | | |

Fish

| | | | | |
|------|--------------------------------|--|--|--|
| 193. | <i>Amniataba percoides</i> | | | |
| 194. | <i>Leiopotherapon unicolor</i> | | | |
| 195. | <i>Melanotaenia australis</i> | | | |
| 196. | <i>Neosilurus hyrtlil</i> | | | |

Invertebrate

| | | | | |
|------|--|--|--|---|
| 197. | 'Bryocyclops' sp. 1 (PSS) | | | |
| 198. | <i>Acariformes</i> sp. | | | |
| 199. | <i>Aeolosoma</i> sp. 1 (PSS) | | | |
| 200. | <i>Aeolosoma</i> sp. 3 (PSS) | | | |
| 201. | <i>Aeshnidae</i> sp. | | | |
| 202. | <i>Ainudrilus</i> sp. WA26 (PSS) | | | Y |
| 203. | <i>Allonais paraguayensis</i> | | | |
| 204. | <i>Allonais pectinata</i> | | | |
| 205. | <i>Alluaudomyia</i> sp. | | | |
| 206. | <i>Alona</i> cf. <i>verrucosa</i> | | | |
| 207. | <i>Ameiridae</i> sp. | | | |
| 208. | <i>Amphipoda</i> sp. | | | |
| 209. | <i>Amphora coffeaeformis</i> (Ag.) Kütz. | | | |
| 210. | <i>Aname mellosa</i> | | | |
| 211. | <i>Anomoeoneis styriaca</i> (Grun.) Hust. | | | |
| 212. | <i>Anopheles annulipes</i> s.l. | | | |
| 213. | <i>Antichiropus</i> sp. | | | |
| 214. | <i>Arcella</i> sp. | | | |
| 215. | <i>Argiocnemis rubescens</i> | | | |
| 216. | <i>Argiope protensa</i> | | | |
| 217. | <i>Armatalona macrocopa</i> | | | |
| 218. | <i>Arrenurus</i> sp. nov. 1 (PSS) | | | Y |
| 219. | <i>Arthrorhabdus paucispinus</i> | | | |
| 220. | <i>Asadipus yundamindra</i> | | | |
| 221. | <i>Aspidiobates pilbara</i> | | | |
| 222. | <i>Atopobathynella</i> sp. | | | |
| 223. | <i>Australiobates</i> n. sp. (PSS) | | | |
| 224. | <i>Australiobates queenslandensis</i> | | | |
| 225. | <i>Australoencyclops karaytugi</i> (ex <i>Paracyclops</i> sp. 7) | | | |
| 226. | <i>Austraturus</i> sp. P1 (PSW) | | | |
| 227. | <i>Austroagrion pindrina</i> /Ischnura heterosticta | | | |
| 228. | <i>Austrodytes insularis</i> | | | |
| 229. | <i>Austroepigomphus (Xerogomphus) gordonii</i> | | | |
| 230. | <i>Austrolimnius</i> WA sp. 2 (= adult sp WA 2) (PSW) | | | |
| 231. | <i>Austropeplea lessoni</i> | | | |
| 232. | <i>Austrostrophus stictopygus</i> | | | |
| 233. | <i>Axonopsella nr truzza</i> (PSW) | | | |
| 234. | <i>Baetidae</i> sp. | | | |
| 235. | <i>Bathynella</i> sp. | | | |
| 236. | <i>Bdelloidea</i> sp. 2:2 | | | |
| 237. | <i>Belostomatidae</i> sp. | | | |
| 238. | <i>Berosus pulchellus</i> | | | |
| 239. | <i>Berosus</i> sp. | | | |
| 240. | <i>Bezzia</i> sp. 1 (SAP) | | | |
| 241. | <i>Bezzia</i> sp. 2 (SAP) | | | |
| 242. | <i>Bigenditia zuytdorp</i> | | | |
| 243. | <i>Bolboleas truncatus</i> | | | |
| 244. | <i>Boongurrus occidentalis</i> | | | |
| 245. | <i>Boongurrus</i> sp. | | | Y |
| 246. | <i>Buddelundia</i> sp. | | | |

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|---------|--|-------------|-------------------|------------------------------------|
| 247. | <i>Caenidae</i> sp. | | | |
| 248. | <i>Candoninae</i> ' (pss) | | | |
| 249. | <i>Candonocypris fitzroyi</i> | | | |
| 250. | <i>Candonopsis cf. tenuis</i> (PSS) | | | |
| 251. | <i>Candonopsis williami</i> (PSS) | | | Y |
| 252. | <i>Carenum pulchrum</i> | | | |
| 253. | <i>Carenum subplanatum</i> | | | |
| 254. | <i>Carenum venustum</i> | | | |
| 255. | <i>Cavisternum clavatum</i> | | | |
| 256. | <i>Cephalodella gibba</i> | | | |
| 257. | <i>Ceratopogonidae</i> sp. | | | |
| 258. | <i>Cheumatopsyche wellsae</i> | | | |
| 259. | <i>Chimarra</i> sp AV17 (PSW) | | | |
| 260. | <i>Chironominae</i> sp. | | | |
| 261. | <i>Chironomus aff. alternans</i> (V24) (CB) | | | |
| 262. | <i>Chydaekata</i> sp. | | | |
| 263. | <i>Clinohalea</i> sp. | | | |
| 264. | <i>Cloeon</i> sp. | | | |
| 265. | <i>Cnephia nr aurantiacum</i> | | | |
| 266. | <i>Cocconeis placentula</i> var. <i>euglypta</i> ehr. | | | |
| 267. | <i>Coenagrionidae</i> sp. | | | |
| 268. | <i>Conopterum leai</i> | | | |
| 269. | <i>Conopterum pyripenne</i> | | | |
| 270. | <i>Corduliidae</i> sp. | | | |
| 271. | <i>Corixidae</i> sp. | | | |
| 272. | <i>Cormocephalus strigosus</i> | | | |
| 273. | <i>Cormocephalus turneri</i> | | | |
| 274. | <i>Corynoneura</i> sp. P2 (PSW) | | | |
| 275. | <i>Cryptochironomus griseidorsum</i> | | | |
| 276. | <i>Culex crinicauda</i> | | | |
| 277. | <i>Culicidae</i> sp. | | | |
| 278. | <i>Culicoides?</i> sp P4 (PSW) | | | |
| 279. | <i>Cymbella affinis</i> Kütz. | | | |
| 280. | <i>Cymbella cymbiformis</i> Ag. | | | |
| 281. | <i>Cymbella delicatula</i> Kütz. | | | |
| 282. | <i>Cymbella falaisensis</i> (Grun.) Krammer & Lange-Bertalot | | | |
| 283. | <i>Cymbella pusilla</i> Grun. | | | |
| 284. | <i>Cypretta baylyi</i> | | | |
| 285. | <i>Cypretta seurati</i> | | | |
| 286. | <i>Cypretta</i> sp. BOS080 | | | |
| 287. | <i>Dasyheleinae</i> sp. P1 (PSW) | | | |
| 288. | <i>Dasyheleinae</i> sp. P2 (PSW) | | | |
| 289. | <i>Deminutiocandona 'stomachosa'</i> (PSS) | | | |
| 290. | <i>Deminutiocandona mica</i> | | | Y |
| 291. | <i>Deminutiocandona</i> sp. 1' (PSS) | | | |
| 292. | <i>Diacyclops cockingi</i> | | | |
| 293. | <i>Diacyclops humphreysi humphreysi</i> | | | |
| 294. | <i>Diacyclops scanloni</i> | | | |
| 295. | <i>Diacyclops sobeprolatus</i> | | | |
| 296. | <i>Diacyclops</i> sp. | | | |
| 297. | <i>Dicrotendipes</i> sp P4 (PSW) | | | |
| 298. | <i>Diffugia</i> sp. P1 | | | |
| 299. | <i>Diplacodes haematodes</i> | | | |
| 300. | <i>Diplonychus eques</i> | | | |
| 301. | <i>Diplopoda</i> sp. | | | |
| 302. | <i>Dissotrocha n. sp.</i> (Pilbara stygo) | | | |
| 303. | <i>Djalmabatista</i> sp. | | | |
| 304. | <i>Dolichopodidae</i> sp. | | | |
| 305. | <i>Dytiscidae</i> sp. | | | |
| 306. | <i>Ecnomidae</i> sp. | | | |
| 307. | <i>Ecnomus pilbarensis</i> | | | |
| 308. | <i>Ecnomus</i> sp. | | | |
| 309. | <i>Ectocyclops phaleratus</i> | | | |
| 310. | <i>Elaphoidella</i> sp. 2 (PSS) | | | |
| 311. | <i>Elaphoidella</i> sp. 3 (PSS) | | | |
| 312. | <i>Empididae</i> sp. | | | |
| 313. | <i>Enchytraeidae</i> sp. | | | |
| 314. | <i>Enchytraeus Pilbara</i> sp. 2 (PSS) | | | |
| 315. | <i>Eolimna minima</i> (Grun.) Lange-Bertalot | | | |
| 316. | <i>Ephemeropterus barroisi</i> s.l. | | | |

| Name ID | Species Name | Naturalised | Conservation Code | ¹ Endemic To Query Area |
|---------|---|-------------|-------------------|------------------------------------|
| 317. | <i>Ethmostigmus curtipes</i> | | | |
| 318. | <i>Euchlanis dilatata</i> | | | |
| 319. | <i>Euchlanis oropha</i> | | | |
| 320. | <i>Eucyclops australiensis</i> | | | |
| 321. | <i>Euglypha</i> sp. | | | |
| 322. | <i>Eurysticta coolawanyah</i> | | | |
| 323. | <i>Fissarena castanea</i> | | | |
| 324. | <i>Fragilaria ulna</i> (Nitz.) Lange Bertalot | | | |
| 325. | <i>Geoscaptus laevisimus</i> | | | |
| 326. | Gerridae sp. | | | |
| 327. | Glossiphoniidae sp. | | | |
| 328. | <i>Gnathaphanus melbournensis</i> | | | |
| 329. | Gomphidae sp. | | | |
| 330. | <i>Gomphodella</i> sp. 4 (PSS) | | | |
| 331. | <i>Gondwanabates nr bodivus</i> (PSW) | | | |
| 332. | <i>Guineaxonopsis</i> sp. P1 (PSW) | | | |
| 333. | <i>Gyraulus hesperus</i> | | | |
| 334. | Gyrinidae sp. | | | |
| 335. | <i>Harpacticoida</i> sp | | | |
| 336. | Hebridae sp. | | | |
| 337. | <i>Hellyethira litua</i> | | | |
| 338. | <i>Hellyethira</i> sp. | | | |
| 339. | <i>Helochares/E mastersi</i> larvae | | | |
| 340. | <i>Hemicordulia intermedia</i> | | | |
| 341. | <i>Hesperomomonis humphreysi</i> | | | |
| 342. | <i>Heteronyx tepperi</i> | | | |
| 343. | <i>Heteropoda marillana</i> | | | Y |
| 344. | <i>Hoggicosa bicolor</i> | | | |
| 345. | <i>Humphreyscandona woutersi</i> | | | |
| 346. | <i>Hydra</i> sp. | | | |
| 347. | <i>Hydraena barbipes</i> | | | |
| 348. | Hydraenidae sp. | | | |
| 349. | <i>Hydrochus eurypleuron</i> | | | |
| 350. | <i>Hydrochus lateviridus</i> | | | |
| 351. | <i>Hydrochus obscuroaeus</i> | | | |
| 352. | <i>Hydrochus</i> sp. | | | |
| 353. | <i>Hydrodroma</i> sp. | | | |
| 354. | <i>Hydroglyphus leai</i> | | | |
| 355. | <i>Hydroglyphus orthogrammus</i> | | | |
| 356. | Hydrophilidae sp. | | | |
| 357. | Hydropsychidae sp. | | | |
| 358. | Hydroptilidae sp. | | | |
| 359. | <i>Ictinogomphus dobsoni</i> | | | |
| 360. | <i>Ilydromus</i> sp BOS25 | | | |
| 361. | <i>Indolpium</i> sp. | | | |
| 362. | <i>Inermipes</i> sp. 1 (PSS) | | | |
| 363. | <i>Ischnura aurora aurora</i> | | | |
| 364. | Isostictidae sp. | | | |
| 365. | <i>Laccobius</i> sp. | | | |
| 366. | <i>Lamponata daviesae</i> | | | |
| 367. | <i>Lamponina scutata</i> | | | |
| 368. | <i>Larsia albiceps</i> | | | |
| 369. | <i>Latrodectus hasseltii</i> | | | |
| 370. | <i>Lecane aculeata</i> | | | |
| 371. | <i>Lecane bulla</i> | | | |
| 372. | <i>Lecane hornemanni</i> | | | |
| 373. | <i>Lecane lunaris</i> | | | |
| 374. | <i>Lecane obtusa</i> | | | |
| 375. | <i>Lecane papuana</i> | | | |
| 376. | <i>Lecane thalera</i> | | | |
| 377. | <i>Lepadella</i> (H.) <i>heterostyla</i> | | | |
| 378. | <i>Lepadella acuminata</i> | | | |
| 379. | <i>Lepadella latusinus</i> | | | |
| 380. | <i>Lepadella ovalis</i> | | | |
| 381. | <i>Lepadella patella</i> | | | |
| 382. | <i>Lepidota squamulata</i> | | | |
| 383. | <i>Leptasteron platyconductor</i> | | | |
| 384. | Leptoceridae sp. | | | |
| 385. | <i>Lesquereusia spiralis</i> | | | |
| 386. | Libellulidae sp. | | | |

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|---------|--|-------------|-------------------|------------------------------------|
| 387. | <i>Limnebius</i> sp. | | | |
| 388. | <i>Limnesia</i> sp. | | | |
| 389. | <i>Limnesia</i> sp. 1 (PSW) | | | |
| 390. | <i>Limnesia</i> sp. 4 (PSW) | | | |
| 391. | <i>Limnochares australica</i> | | | |
| 392. | <i>Limnocythere dorsosicula</i> | | | |
| 393. | <i>Limnogonus luctuosus</i> | | | |
| 394. | <i>Loxandrus laevigatus</i> | | | |
| 395. | <i>Loxandrus micantior</i> | | | |
| 396. | <i>Lychas</i> sp. 1 | | | |
| 397. | <i>Lychas</i> sp. 2 | | | |
| 398. | <i>Lycidas</i> sp. 1 | | | |
| 399. | <i>Lymnaeidae</i> sp. | | | |
| 400. | <i>Maarka weeliwollii</i> | | | Y |
| 401. | <i>Macrochaetus altamirai</i> | | | |
| 402. | <i>Macrogyrus darlingtoni</i> | | | |
| 403. | <i>Macrothrix indistincta</i> | | | |
| 404. | <i>Masasteron sampeyae</i> | | | |
| 405. | <i>Masasteron tealei</i> | | | |
| 406. | <i>Mastogloia elliptica</i> (Ag.) Cl. | | | |
| 407. | <i>Mastogloia elliptica</i> var. <i>danseii</i> (thwaites) grun. | | | |
| 408. | <i>Mastogloia smithii</i> Thwaites | | | |
| 409. | <i>Meedo houstoni</i> | | | |
| 410. | <i>Melitidae</i> sp. | | | |
| 411. | <i>Meridiescandona 'marillaneae'</i> (PSS) | | | Y |
| 412. | <i>Meridiescandona cf. facies</i> (PSS) | | | |
| 413. | <i>Meridiescandona facies</i> (PSS) | | | Y |
| 414. | <i>Meridiescandona</i> sp. 1" (PSS) | | | Y |
| 415. | <i>Meridiescandona</i> sp. 3' (PSS) | | | |
| 416. | <i>Mesocyclops darwini</i> | | | |
| 417. | <i>Mesostigmata</i> sp. | | | |
| 418. | <i>Mesovelgia vittigera</i> | | | |
| 419. | <i>Mesoveliidae</i> sp. | | | |
| 420. | <i>Microchironomus 'K1'</i> (PSW) | | | |
| 421. | <i>Microcyclops varicans</i> | | | |
| 422. | <i>Microvelia (Austromicrovelia) peramoena</i> | | | |
| 423. | <i>Minasteron minusculum</i> | | | |
| 424. | <i>Missulena faulderi</i> | | | Y |
| 425. | <i>Missulena langlandsi</i> | | | Y |
| 426. | <i>Mitulliodon tarantulinus</i> | | | |
| 427. | <i>Mytilina ventralis macracantha</i> | | | |
| 428. | <i>Naididae (ex Tubificidae)</i> | | | |
| 429. | <i>Navicula cryptonella</i> Lange-Bertalot | | | |
| 430. | <i>Navicula leptostriata</i> Jørgensen | | | |
| 431. | <i>Navicula radiosa</i> Kütz. | | | |
| 432. | <i>Navicula variostrata</i> Krasske | | | |
| 433. | <i>Nebela</i> sp. | | | |
| 434. | <i>Necterosoma regulare</i> | | | |
| 435. | <i>Nematoda</i> sp. | | | |
| 436. | <i>Nematoda</i> sp. 12 (PSS) | | | |
| 437. | <i>Nematoda</i> sp. 4 (PSS) | | | |
| 438. | <i>Nematoda</i> sp. P2/P4 (PSW) | | | |
| 439. | <i>Nematoda</i> sp. P3 (PSW) | | | |
| 440. | <i>Nematoda</i> sp. P8 (PSW) | | | |
| 441. | <i>Neocandona</i> sp. 1 (PSS) | | | Y |
| 442. | <i>Nephila edulis</i> | | | |
| 443. | <i>Nerthra luteovaria</i> | | | |
| 444. | <i>Nilobezzia</i> sp. | | | |
| 445. | <i>Nilotanypus</i> sp. P1 (PSW) | | | |
| 446. | <i>Nitzschia angustata</i> Grun. | | | |
| 447. | <i>Nitzschia palea</i> (Kütz.) W. Sm. | | | |
| 448. | <i>No invertebrates</i> | | | |
| 449. | <i>Nososticta</i> sp. | | | |
| 450. | <i>Notacandona boultoni</i> | | | Y |
| 451. | <i>Notacandona cf. modesta</i> (PSS) | | | Y |
| 452. | <i>Notacandona modesta</i> | | | Y |
| 453. | <i>Notobathynella</i> sp. | | | |
| 454. | <i>Notonectidae</i> sp. | | | |
| 455. | <i>Oecetis</i> sp. <i>Pilbara 4</i> (PSW) | | | |
| 456. | <i>Offadens soror (ex genus 1 WA sp. 1)</i> | | | |

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|---------|---|-------------|-------------------|------------------------------------|
| 457. | <i>Oligochaeta</i> sp. | | | |
| 458. | <i>Onthophagus consentaneus</i> | | | |
| 459. | <i>Opisthopora</i> sp. | | | |
| 460. | <i>Oribatida</i> group 1 (PSS) | | | |
| 461. | <i>Oribatida</i> group 5 (PSS) | | | |
| 462. | <i>Orphnaeus brevilabiatus</i> | | | |
| 463. | <i>Orthetrum caledonicum</i> | | | |
| 464. | <i>Orthetrum pruinosum migratum</i> | | | |
| 465. | <i>Orthoclaadiinae</i> sp. | | | |
| 466. | <i>Ostracoda</i> (unident.) | | | |
| 467. | <i>Paracyclops chiltoni</i> | | | |
| 468. | <i>Paramelitidae</i> cf. sp. 9 (PSS) | | | Y |
| 469. | <i>Paramelitidae</i> sp. | | | |
| 470. | <i>Paramelitidae</i> sp. 2 (PSS) | | | |
| 471. | <i>Parametricnemus</i> sp P1 (PSW) | | | |
| 472. | <i>Pediana horni</i> | | | |
| 473. | <i>Pellenes bitaeniata</i> | | | |
| 474. | <i>Pentaneurini</i> sp. P6 (PSW) | | | |
| 475. | <i>Philopotamidae</i> sp. | | | |
| 476. | <i>Phorticosomus gularis</i> | | | |
| 477. | <i>Phreodrilid</i> with dissimilar ventral chaetae | | | |
| 478. | <i>Phreodrilid</i> with similar ventral chaetae | | | |
| 479. | <i>Phreodrilidae</i> sp. | | | |
| 480. | <i>Phreodrilus</i> sp. | | | Y |
| 481. | <i>Phryssonotus novaehollandiae</i> | | | |
| 482. | <i>Pilbaracandona 'rosa'</i> (PSS) | | | |
| 483. | <i>Pilbaracandona eberhardi</i> | | | |
| 484. | <i>Pilbarascutigera incola</i> | | | |
| 485. | <i>Pilbarus millsii</i> | | | |
| 486. | <i>Planorbidae</i> sp. | | | |
| 487. | <i>Platygaster quadricornis</i> | | | |
| 488. | <i>Platynectes decempunctatus</i> var <i>decempunctatus</i> | | | |
| 489. | <i>Pleidae</i> sp. | | | |
| 490. | <i>Polypedilum nubifer</i> | | | |
| 491. | <i>Polypedilum watsoni</i> | | | |
| 492. | <i>Prethopalpus julianneae</i> | | | Y |
| 493. | <i>Prethopalpus maini</i> | | | |
| 494. | <i>Prethopalpus pearsoni</i> | | | Y |
| 495. | <i>Pristina longiseta</i> | | | |
| 496. | <i>Pristina</i> sp. | | | |
| 497. | <i>Procladius paludicola</i> | | | |
| 498. | <i>Procorticacarus</i> P1 (PSW) | | | |
| 499. | <i>Prodidomus woodleigh</i> | | | |
| 500. | <i>Pseudagrion microcephalum</i> | | | |
| 501. | <i>Psychodidae</i> sp. | | | |
| 502. | <i>Pygolabis weeliwoili</i> | | | |
| 503. | <i>Pyralidae</i> nr sp. 37 of JHH (now sp. 53) (ex. <i>Pilbara</i> sp. 3) (PSW) | | | |
| 504. | <i>Pyralidae</i> sp. | | | |
| 505. | <i>Pyralidae</i> sp. 3 of JHH (PSW) (= <i>Margarosticha ?repetitalis</i>) | | | |
| 506. | <i>Ranatra diminuta</i> | | | |
| 507. | <i>Recifella</i> sp. | | | |
| 508. | <i>Regimbartia attenuata</i> | | | |
| 509. | <i>Rheocricotopus</i> sp. P1 (PSW) | | | |
| 510. | <i>Rheotanytarsus trivittatus</i> | | | |
| 511. | <i>Rhodothemis lieftincki</i> | | | |
| 512. | <i>Sciomyzidae</i> sp. | | | |
| 513. | <i>Scirtidae</i> sp. | | | |
| 514. | <i>Scirtidae</i> sp. 1 (PSW) | | | |
| 515. | <i>Scolopendra laeta</i> | | | |
| 516. | <i>Scolopendra morsitans</i> | | | |
| 517. | <i>Sellephora pupula</i> (Kütz) Mereschkowsky | | | |
| 518. | <i>Simuliidae</i> sp. | | | |
| 519. | <i>Simulium clathrinum</i> | | | |
| 520. | <i>Spinasteron barlee</i> | | | |
| 521. | <i>Spinasteron cavasteroides</i> | | | |
| 522. | <i>Spinasteron waldockae</i> | | | |
| 523. | <i>Sternolophus marginicollis</i> | | | |
| 524. | <i>Stilobezzia</i> sp P1 (PSW) | | | |
| 525. | <i>Stratiomyidae</i> sp. | | | |
| 526. | <i>Stygonitocrella bispinosa</i> | | | |

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|---------|---|-------------|-------------------|------------------------------------|
| 527. | <i>Stygorigedwayia trispinosa</i> | | | |
| 528. | <i>Supunna funerea</i> | | | |
| 529. | <i>Synsphyronus gracilis</i> | | | |
| 530. | <i>Synsphyronus heptatrichus</i> | | | |
| 531. | <i>Tabanidae sp.</i> | | | |
| 532. | <i>Tamopsis fickerti</i> | | | |
| 533. | <i>Tanypodinae sp.</i> | | | |
| 534. | <i>Tanytarsus sp. D (SAP)</i> | | | |
| 535. | <i>Tanytarsus sp. P2 (PSW)</i> | | | |
| 536. | <i>Tasmanocoenis arcuata</i> | | | |
| 537. | <i>Testudinella amphora</i> | | | |
| 538. | <i>Thienemanniella sp. P1 (PSW)</i> | | | |
| 539. | <i>Tiporus sp.</i> | | | |
| 540. | <i>Tiporus tambreyi</i> | | | |
| 541. | <i>Tipulidae sp.</i> | | | |
| 542. | <i>Tipulidae type P1 (PSW)</i> | | | |
| 543. | <i>Trachyspina mundaring</i> | | | |
| 544. | <i>Triaenodes sp. P1=P2 (PSW)</i> | | | |
| 545. | <i>Trichocerca pusilla</i> | | | |
| 546. | <i>Trichocycclus aranda</i> | | | |
| 547. | <i>Tropocyclops confinis (ex Paracyclops sp. 6)</i> | | | |
| 548. | <i>Tubificidae WA28 (SAP)</i> | | | |
| 549. | <i>Tubificidae stygo type 1 (imm Ainudrilus WA25/26?) (PSS)</i> | | | |
| 550. | <i>Turbellaria sp.</i> | | | |
| 551. | <i>Tyrannochthonius aridus</i> | | | |
| 552. | <i>Unixenus attemsi</i> | | | |
| 553. | <i>Urodacus butleri</i> | | | |
| 554. | <i>Veliidae sp.</i> | | | |
| 555. | <i>Vestalenula marmonieri</i> | | | |
| 556. | <i>Wandesia sp. P1(nr glareosa)(PSW)</i> | | | |
| 557. | <i>Wyndundra barrow</i> | | | |
| 558. | <i>Wyndundra kennedy</i> | | | |
| 559. | <i>Zenodorus orbiculatus</i> | | | |
| 560. | <i>Zyomma elgneri</i> | | | |
| 561. | <i>nr Encoptarthria sp. B01</i> | | | Y |

Mammal

| | | | | | |
|------|-------|--|---|----|--|
| 562. | 47713 | <i>Austronomus australis (White-striped Free-tailed Bat)</i> | | | |
| 563. | 24251 | <i>Bos taurus (European Cattle)</i> | Y | | |
| 564. | 24252 | <i>Bubalus bubalis (Water Buffalo)</i> | Y | | |
| 565. | 24254 | <i>Camelus dromedarius (Dromedary, Camel)</i> | Y | | |
| 566. | 24181 | <i>Chaerephon jobensis (Greater Northern Freetail-bat, Northern Mastiff Bat)</i> | | | |
| 567. | 24186 | <i>Chalinolobus gouldii (Gould's Wattled Bat)</i> | | | |
| 568. | 24187 | <i>Chalinolobus morio (Chocolate Wattled Bat)</i> | | | |
| 569. | 30903 | <i>Dasyercus blythi (Brush-tailed Mulgara, Ampurta)</i> | | P4 | |
| 570. | 48395 | <i>Dasyercus sp. (mulgara)</i> | | P4 | |
| 571. | 24091 | <i>Dasykaluta rosamondae (Little Red Kaluta)</i> | | | |
| 572. | 24092 | <i>Dasyurus geoffroyi (Chuditch, Western Quoll)</i> | | T | |
| 573. | 24093 | <i>Dasyurus hallucatus (Northern Quoll)</i> | | T | |
| 574. | 24257 | <i>Equus asinus (Donkey)</i> | Y | | |
| 575. | 24258 | <i>Equus caballus (Horse)</i> | Y | | |
| 576. | 24041 | <i>Felis catus (Cat)</i> | Y | | |
| 577. | 24180 | <i>Macroderma gigas (Ghost Bat)</i> | | T | |
| 578. | 25489 | <i>Macropus robustus (Euro, Biggada)</i> | | | |
| 579. | 24135 | <i>Macropus robustus subsp. erubescens (Euro, Biggada)</i> | | | |
| 580. | 24136 | <i>Macropus rufus (Red Kangaroo, Marlu)</i> | | | |
| 581. | 24168 | <i>Macrotis lagotis (Bilby, Dalgyte, Ninu)</i> | | T | |
| 582. | 24183 | <i>Mormopterus loriae (Little Northern Freetail-bat)</i> | | | |
| 583. | 24223 | <i>Mus musculus (House Mouse)</i> | Y | | |
| 584. | 24094 | <i>Ningai ridei (Wongai Ningai)</i> | | | |
| 585. | 24095 | <i>Ningai timealeyi (Pilbara Ningai)</i> | | | |
| 586. | 24224 | <i>Notomys alexis (Spinifex Hopping-mouse)</i> | | | |
| 587. | 42365 | <i>Nyctophilus daedalus (Northwestern Long-eared Bat, Pallid Long-eared Bat)</i> | | | |
| 588. | 24194 | <i>Nyctophilus geoffroyi (Lesser Long-eared Bat)</i> | | | |
| 589. | 24085 | <i>Oryctolagus cuniculus (Rabbit)</i> | Y | | |
| 590. | 48034 | <i>Osphranter robustus (Euro, Biggada)</i> | | | |
| 591. | 24144 | <i>Petrogale rothschildi (Rothschild's Rock-wallaby)</i> | | | |
| 592. | 48401 | <i>Petrogale sp. (rock wallaby)</i> | | T | |
| 593. | 24101 | <i>Planigale ingrami (Long-tailed Planigale)</i> | | | |
| 594. | 24102 | <i>Planigale maculata (Common Planigale)</i> | | | |
| 595. | 24106 | <i>Pseudantechinus woolleyae (Woolley's Pseudantechinus)</i> | | | |

| Name ID | Species Name | Naturalised | Conservation Code | ¹ Endemic To Query Area |
|---------|--|-------------|-------------------|------------------------------------|
| 596. | 24233 <i>Pseudomys chapmani</i> (Western Pebble-mound Mouse, Ngadji) | | P4 | |
| 597. | 24235 <i>Pseudomys desertor</i> (Desert Mouse) | | | |
| 598. | 24237 <i>Pseudomys hermannsburgensis</i> (Sandy Inland Mouse) | | | |
| 599. | 24239 <i>Pseudomys nanus</i> (Western Chestnut Mouse) | | | |
| 600. | 43368 <i>Rhinonictes aurantia</i> (Orange Leaf-nosed bat) | | P4 | |
| 601. | 48095 <i>Rhinonictes aurantia</i> (Pilbara) (Pilbara leaf-nosed bat) | | T | |
| 602. | 24174 <i>Saccolaimus flaviventris</i> (Yellow-bellied Sheath-tailed Bat) | | | |
| 603. | 24200 <i>Scotorepens greyii</i> (Little Broad-nosed Bat) | | | |
| 604. | 24109 <i>Sminthopsis dolichura</i> (Little long-tailed Dunnart) | | | |
| 605. | 24114 <i>Sminthopsis hirtipes</i> (Hairy-footed Dunnart) | | | |
| 606. | 24116 <i>Sminthopsis macroura</i> (Stripe-faced Dunnart) | | | |
| 607. | 24117 <i>Sminthopsis ooldea</i> (Ooldea Dunnart) | | | |
| 608. | 24120 <i>Sminthopsis youngsoni</i> (Lesser Hairy-footed Dunnart) | | | |
| 609. | 24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna) | | | |
| 610. | 24175 <i>Taphozous georgianus</i> (Common Sheath-tailed Bat) | | | |
| 611. | 24176 <i>Taphozous hillii</i> (Hill's Sheath-tail-bat) | | | |
| 612. | 24205 <i>Vespadelus finlaysoni</i> (Finlayson's Cave Bat) | | | |
| 613. | 24248 <i>Zyomys argurus</i> (Common Rock-rat) | | | |
| 614. | 24249 <i>Zyomys pedunculatus</i> (Central Rock-rat, Antina) | | T | |
| 615. | <i>Zyomys</i> sp. | | | Y |
| 616. | 24250 <i>Zyomys woodwardi</i> (Kimberley Rock-rat) | | | |

Reptile

| | | | | |
|------|--|--|----|--|
| 617. | 25332 <i>Acanthopis wellsi</i> (Pilbara Death Adder) | | | |
| 618. | 30833 <i>Amphibolurus longirostris</i> (Long-nosed Dragon) | | | |
| 619. | 44634 <i>Anilius ganei</i> (Gane's blind snake (Pilbara)) | | P1 | |
| 620. | 44635 <i>Anilius grypus</i> | | | |
| 621. | 25318 <i>Antaresia perthensis</i> (Pygmy Python) | | | |
| 622. | 25448 <i>Antaresia stimsoni</i> (Stimson's Python) | | | |
| 623. | 25319 <i>Antaresia stimsoni</i> subsp. <i>orientalis</i> (Stimson's Python) | | | |
| 624. | 25241 <i>Antaresia stimsoni</i> subsp. <i>stimsoni</i> (Stimson's Python) | | | |
| 625. | 25320 <i>Aspidites melanocephalus</i> (Black-headed Python) | | | |
| 626. | 25331 <i>Brachyurophis approximans</i> (North-western Shovel-nosed Snake) | | | |
| 627. | 25015 <i>Carlia munda</i> (Shaded-litter Rainbow Skink) | | | |
| 628. | 25017 <i>Carlia triacantha</i> (Desert Rainbow Skink) | | | |
| 629. | 25456 <i>Crenadactylus ocellatus</i> (Clawless Gecko) | | | |
| 630. | 24919 <i>Crenadactylus ocellatus</i> subsp. <i>horni</i> (Clawless Gecko) | | | |
| 631. | 24921 <i>Crenadactylus ocellatus</i> subsp. <i>rostralis</i> (Clawless Gecko) | | | |
| 632. | 30893 <i>Cryptoblepharus buchananii</i> | | | |
| 633. | 25020 <i>Cryptoblepharus plagiocephalus</i> | | | |
| 634. | 30892 <i>Cryptoblepharus ustulatus</i> | | | |
| 635. | 25458 <i>Ctenophorus caudicinctus</i> (Ring-tailed Dragon) | | | |
| 636. | 24865 <i>Ctenophorus caudicinctus</i> subsp. <i>caudicinctus</i> (Ring-tailed Dragon) | | | |
| 637. | 25459 <i>Ctenophorus isolepis</i> (Crested Dragon, Military Dragon) | | | |
| 638. | 24874 <i>Ctenophorus isolepis</i> subsp. <i>citrinus</i> (Yellow Military Dragon) | | | |
| 639. | 24875 <i>Ctenophorus isolepis</i> subsp. <i>gularis</i> (Central Military Dragon) | | | |
| 640. | 24876 <i>Ctenophorus isolepis</i> subsp. <i>isolepis</i> (Crested Dragon, Military Dragon) | | | |
| 641. | 24882 <i>Ctenophorus nuchalis</i> (Central Netted Dragon) | | | |
| 642. | 24886 <i>Ctenophorus reticulatus</i> (Western Netted Dragon) | | | |
| 643. | 25025 <i>Ctenotus ariadnae</i> | | | |
| 644. | 25036 <i>Ctenotus duricola</i> | | | |
| 645. | 25462 <i>Ctenotus grandis</i> | | | |
| 646. | 25041 <i>Ctenotus grandis</i> subsp. <i>grandis</i> | | | |
| 647. | 25043 <i>Ctenotus grandis</i> subsp. <i>titan</i> | | | |
| 648. | 25044 <i>Ctenotus hanloni</i> | | | |
| 649. | 25045 <i>Ctenotus helenae</i> | | | |
| 650. | 25048 <i>Ctenotus inornatus</i> | | | |
| 651. | 25052 <i>Ctenotus leonhardii</i> | | | |
| 652. | 25463 <i>Ctenotus pantherinus</i> (Leopard Ctenotus) | | | |
| 653. | 25060 <i>Ctenotus pantherinus</i> subsp. <i>acripes</i> (Leopard Ctenotus) | | | |
| 654. | 25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus) | | | |
| 655. | 25065 <i>Ctenotus pantherinus</i> subsp. <i>pantherinus</i> (Leopard Ctenotus) | | | |
| 656. | 25066 <i>Ctenotus quattuordecimlineatus</i> | | | |
| 657. | 25072 <i>Ctenotus rubicundus</i> | | | |
| 658. | 25071 <i>Ctenotus rutilans</i> | | | |
| 659. | 25073 <i>Ctenotus saxatilis</i> (Rock Ctenotus) | | | |
| 660. | 25074 <i>Ctenotus schomburgkii</i> | | | |
| 661. | 25077 <i>Ctenotus serventyi</i> | | | |
| 662. | 25465 <i>Ctenotus uber</i> (Spotted Ctenotus) | | | |
| 663. | 25081 <i>Ctenotus uber</i> subsp. <i>johnstonei</i> (Spotted Ctenotus (northeast), Spotted Skink (Balgo, NE WA)) | | P2 | |

| Name ID | Species Name | Naturalised | Conservation Code | ¹ Endemic To Query Area |
|---------|---|-------------|-------------------|------------------------------------|
| 664. | 25466 <i>Cyclodomorphus melanops</i> (Slender Blue-tongue) | | | |
| 665. | 25089 <i>Cyclodomorphus melanops</i> subsp. <i>elongatus</i> (Slender Blue-tongue) | | | |
| 666. | 25090 <i>Cyclodomorphus melanops</i> subsp. <i>melanops</i> (Slender Blue-tongue) | | | |
| 667. | 24997 <i>Delma butleri</i> | | | |
| 668. | 24998 <i>Delma elegans</i> | | | |
| 669. | 25000 <i>Delma haroldi</i> | | | |
| 670. | 25001 <i>Delma nasuta</i> | | | |
| 671. | 25002 <i>Delma pax</i> | | | |
| 672. | 25004 <i>Delma tincta</i> | | | |
| 673. | 25468 <i>Demansia psammophis</i> (Yellow-faced Whipsnake) | | | |
| 674. | 25295 <i>Demansia psammophis</i> subsp. <i>cupreiceps</i> (Yellow-faced Whipsnake) | | | |
| 675. | 25296 <i>Demansia psammophis</i> subsp. <i>reticulata</i> (Yellow-faced Whipsnake) | | | |
| 676. | 25297 <i>Demansia rufescens</i> (Rufous Whipsnake) | | | |
| 677. | 24926 <i>Diplodactylus conspicillatus</i> (Fat-tailed Gecko) | | | |
| 678. | 24940 <i>Diplodactylus pulcher</i> | | | |
| 679. | 24944 <i>Diplodactylus savagei</i> (Southern Pilbara Beak-faced Gecko) | | | |
| 680. | 24899 <i>Diporiphora valens</i> (Southern Pilbara Tree Dragon) | | | |
| 681. | 41406 <i>Egernia cygnitis</i> (Western Pilbara Spiny-tailed Skink) | | | |
| 682. | 25092 <i>Egernia depressa</i> (Southern Pygmy Spiny-tailed Skink) | | | |
| 683. | 25094 <i>Egernia formosa</i> | | | |
| 684. | 42404 <i>Eremiascincus isolepis</i> | | | |
| 685. | 43381 <i>Eremiascincus pallidus</i> (Western Narrow-banded Skink, Narrow-banded Sand Swimmer) | | | |
| 686. | 25109 <i>Eremiascincus richardsonii</i> (Broad-banded Sand Swimmer) | | | |
| 687. | 25301 <i>Furina ornata</i> (Moon Snake) | | | |
| 688. | 24953 <i>Gehyra montium</i> | | | |
| 689. | 24956 <i>Gehyra pilbara</i> | | | |
| 690. | 24958 <i>Gehyra punctata</i> | | | |
| 691. | 24957 <i>Gehyra purpurascens</i> | | | |
| 692. | 24959 <i>Gehyra variegata</i> | | | |
| 693. | 24961 <i>Heteronotia binoei</i> (Bynoe's Gecko) | | | |
| 694. | <i>Heteronotia</i> sp. | | | |
| 695. | 24962 <i>Heteronotia spelea</i> (Desert Cave Gecko, Pilbara Cave Gecko) | | | |
| 696. | 30926 <i>Lerista amicornum</i> | | | |
| 697. | 25125 <i>Lerista bipes</i> | | | |
| 698. | 30929 <i>Lerista jacksoni</i> | | | |
| 699. | 25146 <i>Lerista labialis</i> | | | |
| 700. | 25482 <i>Lerista macropisthopus</i> | | | |
| 701. | 25151 <i>Lerista macropisthopus</i> subsp. <i>fusciceps</i> | | | |
| 702. | 25155 <i>Lerista muelleri</i> | | | |
| 703. | 25156 <i>Lerista neander</i> | | | |
| 704. | 42411 <i>Lerista timida</i> | | | |
| 705. | 30925 <i>Lerista verhmens</i> | | | |
| 706. | 25183 <i>Lerista zietzi</i> | | | |
| 707. | 25005 <i>Lialis burtonis</i> | | | |
| 708. | 25238 <i>Liasis olivaceus</i> subsp. <i>barroni</i> (Pilbara Olive Python) | | T | |
| 709. | 30933 <i>Lucasium stenodactylum</i> | | | |
| 710. | 30934 <i>Lucasium wombeyi</i> | | | |
| 711. | 25184 <i>Menetia greyii</i> | | | |
| 712. | 25491 <i>Menetia surda</i> | | | |
| 713. | 25187 <i>Menetia surda</i> subsp. <i>surda</i> | | | |
| 714. | 25495 <i>Morethia ruficauda</i> | | | |
| 715. | 25193 <i>Morethia ruficauda</i> subsp. <i>exquisita</i> | | | |
| 716. | 25498 <i>Nephruerus wheeleri</i> | | | |
| 717. | 24972 <i>Nephruerus wheeleri</i> subsp. <i>cinctus</i> | | | |
| 718. | 24973 <i>Nephruerus wheeleri</i> subsp. <i>wheeleri</i> | | | |
| 719. | 25499 <i>Notoscincus ornatus</i> | | | |
| 720. | 25197 <i>Notoscincus ornatus</i> subsp. <i>ornatus</i> | | | |
| 721. | <i>Oedura fimbria</i> | | | |
| 722. | 24976 <i>Oedura marmorata</i> (Marbled Velvet Gecko) | | | |
| 723. | 25254 <i>Parasuta monachus</i> | | | |
| 724. | 25510 <i>Pogona minor</i> (Dwarf Bearded Dragon) | | | |
| 725. | 24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon) | | | |
| 726. | 24908 <i>Pogona minor</i> subsp. <i>mittelli</i> (Dwarf Bearded Dragon) | | | |
| 727. | 25199 <i>Proablepharus reginae</i> | | | |
| 728. | 25261 <i>Pseudechis australis</i> (Mulga Snake) | | | |
| 729. | 42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake) | | | |
| 730. | 25263 <i>Pseudonaja modesta</i> (Ringed Brown Snake) | | | |
| 731. | 25264 <i>Pseudonaja nuchalis</i> (Gwardar, Northern Brown Snake) | | | |
| 732. | 25009 <i>Pygopus nigriceps</i> | | | |

| Name ID | Species Name | Naturalised | Conservation Code | ¹ Endemic To Query Area |
|---------|---|-------------|-------------------|------------------------------------|
| 733. | 24982 <i>Rhynchoedura ornata</i> (Western Beaked Gecko) | | | |
| 734. | 24927 <i>Strophurus elderi</i> | | | |
| 735. | 24932 <i>Strophurus jeanae</i> | | | |
| 736. | 24949 <i>Strophurus wellingtonae</i> | | | |
| 737. | 25269 <i>Suta fasciata</i> (Rosen's Snake) | | | |
| 738. | 25307 <i>Suta punctata</i> (Spotted Snake) | | | |
| 739. | 25202 <i>Tiliqua multifasciata</i> (Central Blue-tongue) | | | |
| 740. | 30814 <i>Tympanocryptis cephalus</i> (Pebble Dragon) | | | |
| 741. | 41426 <i>Underwoodisaurus seorsus</i> (Pilbara Barking Gecko) | | P2 | |
| 742. | 25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor) | | | |
| 743. | 25210 <i>Varanus brevicauda</i> (Short-tailed Pygmy Monitor) | | | |
| 744. | 30825 <i>Varanus bushi</i> (Pilbara Mulga Monitor) | | | |
| 745. | 25211 <i>Varanus caudolineatus</i> | | | |
| 746. | 25212 <i>Varanus eremius</i> (Pygmy Desert Monitor) | | | |
| 747. | 25216 <i>Varanus giganteus</i> (Perentie) | | | |
| 748. | 25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor) | | | |
| 749. | 48154 <i>Varanus hamersleyensis</i> (Southern Pilbara Rock Goanna) | | | |
| 750. | 25524 <i>Varanus panoptes</i> (Yellow-spotted Monitor) | | | |
| 751. | 25222 <i>Varanus panoptes</i> subsp. <i>panoptes</i> | | | |
| 752. | 25223 <i>Varanus panoptes</i> subsp. <i>rubidus</i> | | | |
| 753. | 25224 <i>Varanus pilbarensis</i> (Pilbara Rock Monitor, Northern Pilbara Rock Goanna) | | | |
| 754. | <i>Varanus</i> sp. | | | |
| 755. | 25526 <i>Varanus tristis</i> (Racehorse Monitor) | | | |
| 756. | 25227 <i>Varanus tristis</i> subsp. <i>tristis</i> (Racehorse Monitor) | | | |
| 757. | 25311 <i>Vermicella snelli</i> | | | |

Conservation Codes

T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 20/04/20 15:26:38

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

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[Coordinates](#)

[Buffer: 40.0Km](#)

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Available

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

| | |
|---|------|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Wetlands of International Importance: | None |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Listed Threatened Ecological Communities: | None |
| Listed Threatened Species: | 8 |
| Listed Migratory Species: | 9 |

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

| | |
|--|------|
| Commonwealth Land: | None |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 14 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

| | |
|--|------|
| State and Territory Reserves: | None |
| Regional Forest Agreements: | None |
| Invasive Species: | 9 |
| Nationally Important Wetlands: | None |
| Key Ecological Features (Marine) | None |

Details

Matters of National Environmental Significance

Listed Threatened Species [\[Resource Information \]](#)

| Name | Status | Type of Presence |
|------|--------|------------------|
|------|--------|------------------|

Birds

| | | |
|---|-----------------------|--|
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
|---|-----------------------|--|

| | | |
|--|------------|--|
| Pezoporus occidentalis Night Parrot [59350] | Endangered | Species or species habitat likely to occur within area |
|--|------------|--|

| | | |
|--|------------|--|
| Rostratula australis Australian Painted Snipe [77037] | Endangered | Species or species habitat may occur within area |
|--|------------|--|

Mammals

| | | |
|---|------------|---|
| Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331] | Endangered | Species or species habitat known to occur within area |
|---|------------|---|

| | | |
|---|------------|--|
| Macroderma gigas Ghost Bat [174] | Vulnerable | Species or species habitat likely to occur within area |
|---|------------|--|

| | | |
|---|------------|--|
| Macrotis lagotis Greater Bilby [282] | Vulnerable | Species or species habitat likely to occur within area |
|---|------------|--|

| | | |
|---|------------|-------------------------------------|
| Rhinonictes aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790] | Vulnerable | Roosting known to occur within area |
|---|------------|-------------------------------------|

Reptiles

| | | |
|---|------------|---|
| Liasis olivaceus barroni Olive Python (Pilbara subspecies) [66699] | Vulnerable | Species or species habitat known to occur within area |
|---|------------|---|

Listed Migratory Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

| Name | Threatened | Type of Presence |
|------|------------|------------------|
|------|------------|------------------|

Migratory Marine Birds

| | | |
|---|--|--|
| Apus pacificus Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
|---|--|--|

Migratory Terrestrial Species

| | | |
|---|--|--|
| Hirundo rustica Barn Swallow [662] | | Species or species habitat may occur within area |
|---|--|--|

| | | |
|---|--|--------------------|
| Motacilla cinerea Grey Wagtail [642] | | Species or species |
|---|--|--------------------|

| Name | Threatened | Type of Presence |
|--|-----------------------|---|
| Motacilla flava Yellow Wagtail [644] | | habitat may occur within area Species or species habitat may occur within area |
| Migratory Wetlands Species | | |
| Actitis hypoleucos Common Sandpiper [59309] | | Species or species habitat may occur within area |
| Calidris acuminata Sharp-tailed Sandpiper [874] | | Species or species habitat may occur within area |
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calidris melanotos Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| Charadrius veredus Oriental Plover, Oriental Dotterel [882] | | Species or species habitat may occur within area |

Other Matters Protected by the EPBC Act

| Listed Marine Species | [Resource Information] | |
|--|--|--|
| * Species is listed under a different scientific name on the EPBC Act - Threatened Species list. | | |
| Name | Threatened | Type of Presence |
| Birds | | |
| Actitis hypoleucos Common Sandpiper [59309] | | Species or species habitat may occur within area |
| Apus pacificus Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |
| Ardea alba Great Egret, White Egret [59541] | | Species or species habitat likely to occur within area |
| Ardea ibis Cattle Egret [59542] | | Species or species habitat may occur within area |
| Calidris acuminata Sharp-tailed Sandpiper [874] | | Species or species habitat may occur within area |
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calidris melanotos Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| Charadrius veredus Oriental Plover, Oriental Dotterel [882] | | Species or species habitat may occur within area |
| Chrysococcyx osculans Black-eared Cuckoo [705] | | Species or species |

| Name | Threatened | Type of Presence |
|---|-------------|--|
| Hirundo rustica Barn Swallow [662] | | habitat known to occur within area Species or species habitat may occur within area |
| Merops ornatus Rainbow Bee-eater [670] | | Species or species habitat may occur within area |
| Motacilla cinerea Grey Wagtail [642] | | Species or species habitat may occur within area |
| Motacilla flava Yellow Wagtail [644] | | Species or species habitat may occur within area |
| Rostratula benghalensis (sensu lato) Painted Snipe [889] | Endangered* | Species or species habitat may occur within area |

Extra Information

Invasive Species

[\[Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

| Name | Status | Type of Presence |
|---|--------|--|
| Mammals | | |
| Camelus dromedarius Dromedary, Camel [7] | | Species or species habitat likely to occur within area |
| Canis lupus familiaris Domestic Dog [82654] | | Species or species habitat likely to occur within area |
| Equus asinus Donkey, Ass [4] | | Species or species habitat likely to occur within area |
| Equus caballus Horse [5] | | Species or species habitat likely to occur within area |
| Felis catus Cat, House Cat, Domestic Cat [19] | | Species or species habitat likely to occur within area |
| Mus musculus House Mouse [120] | | Species or species habitat likely to occur within area |
| Oryctolagus cuniculus Rabbit, European Rabbit [128] | | Species or species habitat likely to occur within area |
| Vulpes vulpes Red Fox, Fox [18] | | Species or species habitat likely to occur within area |
| Plants | | |
| Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213] | | Species or species |

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-22.82663 119.16437

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

Appendix C – Fauna species data

[Fauna species list](#)

[Fauna likelihood of occurrence assessment guideline and definitions](#)

[Fauna likelihood of occurrence assessment](#)

[Species identified from remote camera](#)

[Trapping Data](#)

[Caves assessed](#)

Species recorded from studies and database searches

The table presents all vertebrate fauna species recorded in previous studies within or in proximity to the survey area, and database searches within a 40 kilometre radius of the survey area.

| Genus | Species | Common Name | Conservation status | | Database searches | | | | | Phase one survey (September 2019) | Phase two survey (March 2020) | Remote cameras (Sept 19 to March 20) |
|---------------------|---------------------------|---------------------------|---------------------|----------|-------------------|--------------|-----------------------------|------------------------------------|---|--------------------------------------|----------------------------------|---|
| | | | BC Act | EPBC Act | NatureMap | DOEE PMST | DBCA threatened fauna | BHP previous fauna record | | | | |
| Birds | | | | | | | | | | | | |
| ACANTHIZIDAE | | | | | | | | | | | | |
| <i>Acanthiza</i> | <i>apicalis</i> | Inland Thornbill | | | X | | | | X | | | |
| <i>Acanthiza</i> | <i>chrysorrhoa</i> | Yellow-rumped Thornbill | | | X | | | | X | | | |
| <i>Acanthiza</i> | <i>uropygialis</i> | Chestnut-rumped Thornbill | | | X | | | | X | | | |
| <i>Gerygone</i> | <i>fusca subsp. fusca</i> | Western Gerygone | | | X | | | | X | | | |
| <i>Gerygone</i> | <i>fusca subsp. mungi</i> | Desert Gerygone | | | X | | | | X | | | |
| <i>Pyrrholaemus</i> | <i>brunneus</i> | Redthroat | | | X | | | | X | | | |
| <i>Smicromis</i> | <i>brevirostris</i> | Weebill | | | X | | | | X | X | X | |
| ACCIPITRIDAE | | | | | | | | | | | | |
| <i>Accipiter</i> | <i>cirrocephalus</i> | Collared Sparrowhawk | | | X | | | | X | | | |
| <i>Accipiter</i> | <i>fasciatus</i> | Brown Goshawk | | | X | | | | X | X | X | |
| <i>Aquila</i> | <i>audax</i> | Wedge-tailed Eagle | | | X | | | | X | | | |
| <i>Circus</i> | <i>assimilis</i> | Spotted Harrier | | | X | | | | X | | | |
| <i>Elanus</i> | <i>caeruleus</i> | Black-shouldered Kite | | | X | | | | X | | | |
| <i>Haliastur</i> | <i>sphenurus</i> | Whistling Kite | | | X | | | | X | | | |
| <i>Lophoictinia</i> | <i>insura</i> | Square-tailed Kite | | | X | | | | X | | | |
| <i>Hamirostra</i> | <i>melanosternon</i> | Black-breasted Buzzard | | | X | | | | X | X | | |
| <i>Hieraaetus</i> | <i>morphnoides</i> | Little Eagle | | | X | | | | | | | |
| <i>Milvus</i> | <i>migrans</i> | Black Kite | | | X | | | | X | X | X | |
| AEGOTHELIDAE | | | | | | | | | | | | |
| <i>Aegotheles</i> | <i>cristatus</i> | Owlet-nightjar | | | X | | | | X | X | X | |
| ALAUDIDAE | | | | | | | | | | | | |
| <i>Mirafra</i> | <i>cantillans</i> | Singing Bushlark | | | X | | | | X | | | |

| Genus | Species | Common Name | Conservation status | | Database searches | | | | Phase one survey (September 2019) | Phase two survey (March 2020) | Remote cameras (Sept 19 to March 20) |
|----------------------|--|---------------------------|---------------------|----------|-------------------|-----------|------------------------|---------------------------|--------------------------------------|----------------------------------|---|
| | | | BC Act | EPBC Act | NatureMap | DOEE PMST | DBCAs threatened fauna | BHP previous fauna record | | | |
| ALCEDINIDAE | | | | | | | | | | | |
| <i>Dacelo</i> | <i>leachii subsp. leachii</i> | Blue-winged Kookaburra | | | | | | X | X | X | |
| <i>Todiramphus</i> | <i>pyrrhopygius</i> | Red-backed Kingfisher | | | | | | X | | | |
| <i>Todiramphus</i> | <i>sanctus</i> | Sacred Kingfisher | | | | | | X | X | X | X |
| ANATIDAE | | | | | | | | | | | |
| <i>Anus</i> | <i>superciliosa</i> | Pacific Black Duck | | | | | | X | | | |
| APODIDAE | | | | | | | | | | | |
| <i>Apus</i> | <i>pacificus</i> | Fork-tailed Swift | IA | Mi | X | X | X | X | | | |
| ARDEIDAE | | | | | | | | | | | |
| <i>Ardea</i> | <i>pacifica</i> | White-necked Heron | | | | | | X | X | | |
| <i>Areeda</i> | <i>alba</i> | Great Egret | | | | | | X | | | |
| <i>Egretta</i> | <i>novaehollandiae</i> | White-faced Heron | | | | | | X | | | |
| ARTAMIDAE | | | | | | | | | | | |
| <i>Artamus</i> | <i>cinereus</i> | Black-faced Woodswallow | | | | | | X | X | | |
| <i>Artamus</i> | <i>cyanopterus</i> | Dusty Woodswallow | | | | | | X | | | |
| <i>Artamus</i> | <i>minor</i> | Little Woodswallow | | | | | | X | X | | |
| <i>Artamus</i> | <i>personatus</i> | Masked Woodswallow | | | | | | X | | | |
| BURHINIDAE | | | | | | | | | | | |
| <i>Burhinus</i> | <i>grallarius</i> | Bush Stone Curlew | | | | | | | X | | |
| CACATUIDAE | | | | | | | | | | | |
| <i>Cacatua</i> | <i>roseicapilla</i> | Galah | | | | | | X | X | | |
| <i>Cacatua</i> | <i>sanguinea</i> | Little Corella | | | | | | X | X | | |
| <i>Nymphicus</i> | <i>hollandicus</i> | Cockatiel | | | | | | X | | X | |
| CAMPEPHAGIDAE | | | | | | | | | | | |
| <i>Lalage</i> | <i>tricolor</i> | White-winged Triller | | | | | | X | | | |
| <i>Coracina</i> | <i>maxima</i> | Ground Cuckoo-shrike | | | | | | X | | | |
| <i>Coracina</i> | <i>novaehollandiae subsp. subpallida</i> | Black-faced Cuckoo-shrike | | | | | | X | X | X | |
| CAPRIMULGIDAE | | | | | | | | | | | |

| Genus | Species | Common Name | Conservation status | | Database searches | | | | Phase one survey (September 2019) | Phase two survey (March 2020) | Remote cameras (Sept 19 to March 20) |
|----------------------|------------------------------------|------------------------|---------------------|----------|-------------------|--------------|------------------------------|------------------------------------|--------------------------------------|----------------------------------|---|
| | | | BC Act | EPBC Act | NatureMap | DOEE PMST | DBCAs threatened fauna | BHP previous fauna record | | | |
| <i>Eurostopodus</i> | <i>argus</i> | Spotted Nightjar | | | X | | | X | | | |
| CASUARIIDAE | | | | | | | | | | | |
| <i>Dromaius</i> | <i>novaehollandiae</i> | Emu | | | X | | | X | | | |
| CENTROPODIDAE | | | | | | | | | | | |
| <i>Centropus</i> | <i>phasianinus</i> | Pheasant Coucal | | | X | | | X | | X | |
| CHARADRIIDAE | | | | | | | | | | | |
| <i>Elsyornis</i> | <i>melanops</i> | Black-fronted Dotterel | | | X | | | X | | | |
| <i>Charadrius</i> | <i>cinctus</i> | Red-kneed Dotterel | | | X | | | | | | |
| CISOMATIDAE | | | | | | | | | | | |
| <i>Psophodes</i> | <i>occidentalis</i> | Western Wedgebill | | | | | | | | | |
| COLUMBIDAE | | | | | | | | | | | |
| <i>Geopelia</i> | <i>cuneatus</i> | Diamond Dove | | | X | | | X | X | | X |
| <i>Geopelia</i> | <i>placida</i> | Zebra Dove | | | X | | | | | | |
| <i>Geopelia</i> | <i>striata subsp. placida</i> | Peaceful Dove | | | X | | | X | X | X | |
| <i>Geophaps</i> | <i>plumifera subsp. ferruginea</i> | Spinifex Pigeon | | | X | | | X | X | X | |
| <i>Ocyphaps</i> | <i>lophotes</i> | Crested Pigeon | | | X | | | X | X | X | |
| <i>Phaps</i> | <i>chalcoptera</i> | Common Bronzewing | | | X | | | X | X | | |
| CORVIDAE | | | | | | | | | | | |
| <i>Corvus</i> | <i>bennetti</i> | Little Crow | | | X | | | X | | | |
| <i>Corvus</i> | <i>orru</i> | Torresian Crow | | | X | | | X | X | X | X |
| <i>Corvus</i> | <i>coronoides</i> | Australian Raven | | | X | | | | | | |
| <i>Corvus</i> | <i>orru subsp. ceciliae</i> | Western Crow | | | X | | | | | | |
| CRACTICIDAE | | | | | | | | | | | |
| <i>Cracticus</i> | <i>nigrogularis</i> | Pied Butcherbird | | | X | | | X | X | X | |
| <i>Cracticus</i> | <i>tibicen</i> | Australian Magpie | | | X | | | X | X | | |
| <i>Cracticus</i> | <i>tibicen subsp. dorsalis</i> | White-backed Magpie | | | X | | | | | | |
| <i>Cracticus</i> | <i>torquatus</i> | Grey Butcherbird | | | X | | | X | | | |
| CUCULIDAE | | | | | | | | | | | |

| Genus | Species | Common Name | Conservation status | | Database searches | | | | Phase one survey (September 2019) | Phase two survey (March 2020) | Remote cameras (Sept 19 to March 20) |
|----------------------|---------------------------------------|----------------------------|---------------------|----------|-------------------|--------------|------------------------------|------------------------------------|--------------------------------------|----------------------------------|---|
| | | | BC Act | EPBC Act | NatureMap | DOEE PMST | DBCAs threatened fauna | BHP previous fauna record | | | |
| <i>Cacomantis</i> | <i>pallidus</i> | Pallid Cuckoo | | | X | | | X | X | | |
| <i>Chrysococcyx</i> | <i>basalis</i> | Horsefield's Bronze Cuckoo | | | X | | | | | | |
| DICAEIDAE | | | | | | | | | | | |
| <i>Dicaeum</i> | <i>hirundinaceum</i> | Mistletoebird | | | X | | | X | | | |
| DICRURIDAE | | | | | | | | | | | |
| <i>Rhipidura</i> | <i>albiscapa</i> | Grey Fantail | | | X | | | X | X | | |
| <i>Rhipidura</i> | <i>leucophrys subsp. leucophrys</i> | Willie Wagtail | | | X | | | X | X | X | X |
| ESTRILDIDAE | | | | | | | | | | | |
| <i>Emblema</i> | <i>pictum</i> | Painted Finch | | | X | | | X | X | X | |
| <i>Taeniopygia</i> | <i>guttata subsp. castanotis</i> | Zebra Finch | | | X | | | X | X | X | |
| <i>Neochmia</i> | <i>ruficauda subsp. subclarescens</i> | Star Finch | | | | | | X | | | |
| FALCONIDAE | | | | | | | | | | | |
| <i>Falco</i> | <i>berigora</i> | Brown Falcon | | | X | | | X | X | X | |
| <i>Falco</i> | <i>hypoleucos</i> | Grey Falcon | Vu | | | | X | | | | |
| <i>Falco</i> | <i>cenchroides</i> | Nankeen Kestrel | | | X | | | X | | | |
| <i>Falco</i> | <i>longipennis</i> | Australian Hobby | | | X | | | X | | | |
| <i>Falco</i> | <i>peregrinus</i> | Peregrine Falcon | OS | | X | | X | X | | | |
| HIRUNDINIDAE | | | | | | | | | | | |
| <i>Petrochelidon</i> | <i>nigricans</i> | Tree Martin | | | X | | | X | | | |
| <i>Hirundo</i> | <i>rustica</i> | Barn Swallow | IA | MI | | | X | | | | |
| LARIDAE | | | | | | | | | | | |
| <i>Gelochelidon</i> | <i>nilotica</i> | Gull-billed tern | | | | | X | | | | |
| MALURIDAE | | | | | | | | | | | |
| <i>Malurus</i> | <i>lamberti subsp. assimilis</i> | Variiegated Fairywren | | | X | | | X | X | | X |
| <i>Malurus</i> | <i>leucopterus</i> | White-winged Fairywren | | | X | | | X | | | |
| <i>Stipiturus</i> | <i>ruficeps</i> | Rufous-crowned Emu-wren | | | X | | | X | X | | |
| <i>Amytornis</i> | <i>striatus</i> | Striated Grasswren | | | X | | | X | | | |
| <i>Amytornis</i> | <i>striatus subsp. whitei</i> | Rufous Grasswren | P4 | | X | | | | | | |

| Genus | Species | Common Name | Conservation status | | Database searches | | | | Phase one survey (September 2019) | Phase two survey (March 2020) | Remote cameras (Sept 19 to March 20) |
|------------------------|------------------------|--------------------------|---------------------|----------|-------------------|--------------|------------------------------|------------------------------------|--------------------------------------|----------------------------------|---|
| | | | BC Act | EPBC Act | NatureMap | DOEE PMST | DBCAs threatened fauna | BHP previous fauna record | | | |
| MELIPHAGIDAE | | | | | | | | | | | |
| <i>Acanthagenys</i> | <i>rufogularis</i> | Spiny-cheeked Honeyeater | | | X | | | X | | X | |
| <i>Epthianura</i> | <i>tricolor</i> | Crimson Chat | | | X | | | X | X | | |
| <i>Eremiornis</i> | <i>carteri</i> | Spinifex-bird | | | X | | | X | X | | |
| <i>Gavicalis</i> | <i>virescens</i> | Singing Honeyeater | | | X | | | X | | X | |
| <i>Lacustroica</i> | <i>whitei</i> | Grey Honeyeater | | | X | | | X | | | |
| <i>Lichmera</i> | <i>indistincta</i> | Brown Honeyeater | | | X | | | X | X | | |
| <i>Manorina</i> | <i>flavigula</i> | Yellow-throated Miner | | | X | | | X | X | X | |
| <i>Melithreptus</i> | <i>gularis</i> | Black-chinned Honeyeater | | | X | | | X | | | |
| <i>Ptilotula</i> | <i>keartlandi</i> | Grey-headed Honeyeater | | | X | | | X | X | | |
| <i>Ptilotula</i> | <i>penicillata</i> | White-plumed Honey Eater | | | | | | X | X | X | |
| <i>Purnella</i> | <i>albifrons</i> | White-fronted Honeyeater | | | X | | | X | | | |
| MEROPIDAE | | | | | | | | | | | |
| <i>Merops</i> | <i>ornatus</i> | Rainbow Bee-eater | | | X | | | X | X | X | |
| MONARCHIDAE | | | | | | | | | | | |
| <i>Grallina</i> | <i>cyanoleuca</i> | Magpie-lark | | | X | | | X | X | X | X |
| MOTACILLIDAE | | | | | | | | | | | |
| <i>Anthus</i> | <i>novaeseelandiae</i> | Australian Pipit | | | X | | | X | | | |
| <i>Motacillidae</i> | <i>cinerea</i> | Grey Wagtail | MI | IA | | | X | | | | |
| OTIDIDAE | | | | | | | | | | | |
| <i>Ardeotis</i> | <i>australis</i> | Australian Bustard | | | X | | | | X | | |
| PACHYCEPHALIDAE | | | | | | | | | | | |
| <i>Oreoica</i> | <i>gutturalis</i> | Crested Bellbird | | | X | | | X | | | |
| <i>Pachycephala</i> | <i>rufiventris</i> | Rufous Whistler | | | X | | | X | X | X | |
| <i>Colluricincla</i> | <i>harmonica</i> | Grey Shrike-thrush | | | X | | | X | X | X | X |
| PANDIONIDAE | | | | | | | | | | | |
| <i>Pandion</i> | <i>cristatus</i> | Eastern osprey | MI | MI | | | | X | X | | |
| PARDALOTIDAE | | | | | | | | | | | |

| Genus | Species | Common Name | Conservation status | | Database searches | | | | Phase one survey (September 2019) | Phase two survey (March 2020) | Remote cameras (Sept 19 to March 20) |
|--------------------------|----------------------------------|------------------------|---------------------|----------|-------------------|--------------|------------------------------|------------------------------------|--------------------------------------|----------------------------------|---|
| | | | BC Act | EPBC Act | NatureMap | DOEE PMST | DBCAs threatened fauna | BHP previous fauna record | | | |
| <i>Pardalotus</i> | <i>striatus</i> | Striated Pardalote | | | X | | | X | X | | |
| <i>Pardalotus</i> | <i>rubicatus</i> | Red-browed Pardalote | | | X | | | X | | | |
| PELECANIDAE | | | | | | | | | | | |
| <i>Pelecanus</i> | <i>conspicillatus</i> | Australian Pelican | | | X | | | X | | | |
| PETROICIDAE | | | | | | | | | | | |
| <i>Melanodryas</i> | <i>cucullata</i> | Hooded Robin | | | X | | | | | | |
| <i>Petroica</i> | <i>goodenovii</i> | Red-capped Robin | | | X | | | X | | | |
| PHAETHONTIDAE | | | | | | | | | | | |
| <i>Phalacrocorax</i> | <i>sulcirostris</i> | Little Black Cormorant | | | X | | | X | | | |
| PHASIANIDAE | | | | | | | | | | | |
| <i>Coturnix</i> | <i>ypsilophora</i> | Brown Quail | | | X | | | X | | X | |
| PODARGIDAE | | | | | | | | | | | |
| <i>Podargus</i> | <i>strigoides</i> | Tawny Frogmouth | | | X | | | X | X | | |
| POMATOSTOMIDAE | | | | | | | | | | | |
| <i>Pomatostomus</i> | <i>temporalis</i> | Grey-crowned Babbler | | | X | | | X | X | X | X |
| <i>Pomatostomus</i> | <i>superciliosus</i> | White-browed Babbler | | | X | | | X | | | |
| PROCELLARIIDAE | | | | | | | | | | | |
| <i>Macronectes</i> | <i>giganteus</i> | Southern Giant Petrel | | | X | | X | | | | |
| PSITTACIDAE | | | | | | | | | | | |
| <i>Platycercus</i> | <i>zonarius</i> | Port Lincoln Parrot | | | X | | | X | X | X | |
| <i>Pezoporus</i> | <i>occidentalis</i> | Night Parrot | Cr | En | | X | | | | | |
| <i>Platycercus</i> | <i>varius</i> | Mulga Parrot | | | X | | | X | | | |
| <i>Melopsittacus</i> | <i>undulatus</i> | Budgerigar | | | X | | | X | X | X | |
| PTILINORHYNCHIDAE | | | | | | | | | | | |
| <i>Ptilonorhynchus</i> | <i>maculatus subsp. guttatus</i> | Western Bowerbird | | | X | | | | X | X | X |
| <i>Ptilonorhynchus</i> | <i>maculatus</i> | Spotted Bowerbird | | | X | | | X | | | |
| RALLIDAE | | | | | | | | | | | |
| <i>Gallirallus</i> | <i>philippensis</i> | Buff-banded Rail | | | X | | | X | | | |

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| <i>Porphyrio</i> | <i>porphyrio</i> | Purple Swamphen | | | X | | | | | | |
| <i>Porzana</i> | <i>tabuensis</i> | Spotless Crake | | | X | | | | | | |
| ROSTRATULIDAE | | | | | | | | | | | |
| <i>Rostratula</i> | <i>australis</i> | Australian Painted-snipe | EN | EN | | X | | | | | |
| SCOLOPACIDAE | | | | | | | | | | | |
| <i>Calidris</i> | <i>ferruginea</i> | Curlew Sandpiper | Cr | Cr, Mi | | X | | | | | |
| <i>Tringa</i> | <i>nebularia</i> | Common Greenshank | MI | IA | | | X | X | | | |
| STRIGIDAE | | | | | | | | | | | |
| <i>Ninox</i> | <i>boobook</i> | Boobook Owl | | | | | | X | | X | |
| <i>Ninox</i> | <i>connivens</i> | Barking Owl | | | X | | X | X | | | |
| SYLVIIDAE | | | | | | | | | | | |
| <i>Acrocephalus</i> | <i>australis</i> | Australian Reed Warbler | | | X | | | X | X | | |
| THRESKIORNITHIDAE | | | | | | | | | | | |
| <i>Threskiornis</i> | <i>spinipectus</i> | Straw-necked Ibis | | | X | | | | | | |
| TURNICIDAE | | | | | | | | | | | |
| <i>Turnix</i> | <i>velox</i> | Little Button-quail | | | X | | | X | | | |
| TYTONIDAE | | | | | | | | | | | |
| <i>Tyto</i> | <i>alba</i> | Barn Owl | | | X | | | | | | |
| Reptiles | | | | | | | | | | | |
| AGAMIDAE | | | | | | | | | | | |
| <i>Ctenophorus</i> | <i>caudicinctus</i> | Ring-tailed Dragon | | | X | | | X | X | X | X |
| <i>Ctenophorus</i> | <i>isolepis subsp. gularis</i> | Central Military Dragon | | | X | | | | | | |
| <i>Ctenophorus</i> | <i>isolepis subsp. isolepis</i> | Northern Military Dragon | | | X | | | X | X | | |
| <i>Ctenophorus</i> | <i>isolepis subsp. citrinus</i> | Yellowy Military Dragon | | | X | | | | | | |
| <i>Ctenophorus</i> | <i>nuchalis</i> | Central Netted Dragon | | | X | | | X | | | |
| <i>Ctenophorus</i> | <i>reticulatus</i> | Western Netted Dragon | | | X | | | | | | |
| <i>Diporiphora</i> | <i>valens</i> | Pilbara Tree Dragon | | | X | | | X | | | |
| <i>Gowidon</i> | <i>longirostris</i> | Long-nosed Dragon | | | X | | | X | X | X | X |

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| <i>Pogona</i> | <i>Minor subsp. minor</i> | Dwarf Bearded Dragon | | | X | | | | | | |
| <i>Pogona</i> | <i>minor subsp. mitchelli</i> | Dwarf Bearded Dragon | | | X | | | | | | |
| <i>Tympanocryptis</i> | <i>cephalus</i> | Pebble Dragon | | | X | | | | | | |
| CARPHODACTYLIDAE | | | | | | | | | | | |
| <i>Nephrurus</i> | <i>wheeleri cinctus</i> | Banded Knob-tailed Gecko | | | X | | | X | | | |
| <i>Nephrurus</i> | <i>wheeleri subsp. wheeler</i> | Banded Knob-tailed Gecko | | | X | | | | | | |
| DIPLODACTYLIDAE | | | | | | | | | | | |
| <i>Crenadactylus</i> | <i>ocellatus subsp. horni</i> | Clawless Gecko | | | X | | | | | | |
| <i>Crenadactylus</i> | <i>ocellatus subsp. rostralis</i> | Clawless Gecko | | | X | | | | | | |
| <i>Diplodactylus</i> | <i>laevis</i> | Fat-tailed Gecko | | | X | | | X | | | |
| <i>Diplodactylus</i> | <i>pulcher</i> | Pretty Gecko | | | X | | | | | | |
| <i>Diplodactylus</i> | <i>savagei</i> | Pilbara Beak-faced Gecko | | | X | | | X | | | |
| <i>Lucasium</i> | <i>stenodactylum</i> | Box-patterned Ground Gecko | | | X | | | X | X | X | |
| <i>Lucasium</i> | <i>wombeyi</i> | Pilbara Ground Gecko | | | X | | | X | X | | |
| <i>Oedura</i> | <i>fimbria (marmorata)</i> | Marbled Velvet Gecko | | | X | | | X | X | | |
| <i>Rhynchoedura</i> | <i>ornata</i> | Western Beaked Gecko | | | X | | | X | X | X | |
| <i>Strophurus</i> | <i>elderi</i> | Jewelled Gecko | | | X | | | X | | | |
| <i>Strophurus</i> | <i>jeanae</i> | Phasmid Gecko | | | X | | | X | | | |
| <i>Strophurus</i> | <i>wellingtonae</i> | Betty's Gecko | | | X | | | X | | | |
| ELAPIDAE | | | | | | | | | | | |
| <i>Acanthophis</i> | <i>wellsi</i> | Pilbara Death Adder | | | X | | | X | | | |
| <i>Brachyurops</i> | <i>approximans</i> | Shovel-nosed Snake | | | X | | | X | | X | |
| <i>Demansia</i> | <i>psammophis cupriceps</i> | Yellow-faced Whip Snake | | | X | | | X | | | X |
| <i>Demansia</i> | <i>psammophis subsp. reticulata</i> | Yellow-faced Whip Snake | | | X | | | X | | | |
| <i>Demansia</i> | <i>rufescens</i> | Rufous Whipsnake | | | X | | | X | X | | |
| <i>Furina</i> | <i>ornatus</i> | Orange-napped Snake | | | X | | | X | | | |
| <i>Parasuta</i> | <i>monachus</i> | Monk Snake | | | X | | | X | | | |
| <i>Pseudechis</i> | <i>australis</i> | Mulga Snake | | | X | | | X | | X | X |

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| <i>Pseudonaja</i> | <i>modesta</i> | Ringed Brown Snake | | | X | | | | | | |
| <i>Pseudonaja</i> | <i>mengdeni</i> | Western brown Snake, Gwardar | | | X | | | X | | X | |
| <i>Pseudonaja</i> | <i>nuchalis</i> | Northern Brown Snake, Gwardar | | | X | | | X | | | |
| <i>Suta</i> | <i>fasciata</i> | Rosen's Snake | | | X | | | X | | | |
| <i>Suta</i> | <i>punctata</i> | Little Spotted Snake | | | X | | | X | | | |
| <i>Vermicella</i> | <i>snelli</i> | Pilbara Bandy Bandy | | | X | | | X | | | |
| GEKKONIDAE | | | | | | | | | | | |
| <i>Gehyra</i> | <i>micra</i> | Small Pilbara Spotted Rock Gehyra | | | | | | | X | | |
| <i>Gehyra</i> | <i>montium</i> | Centralian Dtella | | | X | | | X | | | |
| <i>Gehyra</i> | <i>punctata</i> | Spotted Rock Dtella | | | X | | | X | X | X | |
| <i>Gehyra</i> | <i>pilbara</i> | Pilbara Dtella | | | X | | | X | | | |
| <i>Gehyra</i> | <i>purpurascens</i> | Purple Arid Dtella | | | | | | X | X | | |
| <i>Gehyra</i> | <i>undulata</i> | Crescent-marked Pilbara Gehya | | | | | | | X | | |
| <i>Gehyra</i> | <i>variegata</i> | Tree Dtella | | | X | | | X | X | X | |
| <i>Heteronotia</i> | <i>binoei</i> | Bynoe's Gecko | | | X | | | X | X | X | |
| <i>Heteronotia</i> | <i>spelea</i> | Desert Cave Gecko | | | X | | | X | X | X | |
| <i>Underwoodisaurus</i> | <i>seorsus</i> | Pilbara Barking Gecko | | P2 | X | | X | X | | | |
| PYGOPODIDAE | | | | | | | | | | | |
| <i>Delma</i> | <i>butleri</i> | Butler's Delma | | | X | | | X | | | |
| <i>Delma</i> | <i>elegans</i> | Elegant Delma | | | X | | | X | | | |
| <i>Delma</i> | <i>haroldi</i> | Neck-barred Delma | | | X | | | X | | | |
| <i>Delma</i> | <i>nasuta</i> | Sharp-snout Delma | | | X | | | X | | | |
| <i>Delma</i> | <i>pax</i> | Peace Delma | | | X | | | X | X | X | |
| <i>Delma</i> | <i>tincta</i> | Black-necked Delma | | | X | | | X | | | |
| <i>Lialis</i> | <i>burtonis</i> | Burton's Legless Lizard | | | X | | | X | | | |
| <i>Pygopus</i> | <i>nigriceps</i> | Hooded Scaly-foot | | | X | | | X | | | |
| PYTHONIDAE | | | | | | | | | | | |
| <i>Antaresia</i> | <i>perthensis</i> | Pygmy Python | | | X | | | X | | X | X |

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| <i>Antaresia</i> | <i>stimsoni subsp. stimsoni</i> | Stimson's Python | | | X | | | X | X | | |
| <i>Aspidites</i> | <i>melanocephalus</i> | Black-headed Python | | | X | | | X | | | |
| <i>Liasis</i> | <i>olivaceus subsp. barroni</i> | Pilbara Olive Python | Vu | Vu | X | X | X | X | X | | |
| SCINCIDAE | | | | | | | | | | | |
| <i>Carlia</i> | <i>munda</i> | Shaded-litter Rainbow Skink | | | X | | | X | X | X | |
| <i>Carlia</i> | <i>triacantha</i> | Desert Rainbow Skink | | | X | | | X | | | |
| <i>Cryptoblepharus</i> | <i>buchananii</i> | Buchanan's Skink | | | X | | | X | | | |
| <i>Cryptoblepharus</i> | <i>plagiocephalus</i> | Peron's Snake-eyed Skink | | | X | | | X | | | |
| <i>Cryptoblepharus</i> | <i>ustulatus</i> | Russet Snake-eyed Skink | | | X | | | X | X | | |
| <i>Ctenotus</i> | <i>ariadnae</i> | Arid Ctenotus | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>duricola</i> | Pilbara Striped Ctenotus | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>grandis subsp. grandis</i> | Grand Ctenotus | | | X | | | | | | |
| <i>Ctenotus</i> | <i>grandis titan</i> | Giant Desert Ctenotus | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>hanloni</i> | Hanlon's Skink | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>helenae</i> | Helen's Skink | | | X | | | X | | X | |
| <i>Ctenotus</i> | <i>inornatus</i> | Bar-shouldered Ctenotus | | | X | | | X | | X | |
| <i>Ctenotus</i> | <i>leonhardii</i> | Leonhard's Ctenotus | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>pantherinus subsp. acripes</i> | Leopard Skink | | | X | | | | | | |
| <i>Ctenotus</i> | <i>pantherinus subsp. ocellifer</i> | Leopard Skink | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>pantherinus subsp. pantherinus</i> | Leopard Skink | | | X | | | | | | |
| <i>Ctenotus</i> | <i>quattuordecimlineatus</i> | Fourteen-lined Skink | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>rubicundus</i> | Ruddy Ctenotus | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>rutilans</i> | Rusty-shouldered Ctenotus | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>saxatilis</i> | Rock Ctenotus | | | X | | | X | X | | |
| <i>Ctenotus</i> | <i>schomburgkii</i> | Wedge-snout Ctenotus | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>serventyi</i> | North-western Sandy-loam Ctenotus | | | X | | | X | | | |
| <i>Ctenotus</i> | <i>uber johnstonei</i> | Spotted Ctenotus | P2 | | X | | | X | | | |
| <i>Cyclodomorphus</i> | <i>melanops subsp. elongatus</i> | Slender Blue-tongue | | | X | | | | | | |

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| <i>Cyclodomorphus</i> | <i>melanops subsp. melanops</i> | Slender Blue-tongue | | | | | | X | | | |
| <i>Egernia</i> | <i>cygnitos</i> | Western Pilbara Spiny-tail | | | X | | | X | | | |
| <i>Egernia</i> | <i>depressa</i> | Southern Pygmy Spiny-tail | | | X | | | X | | | |
| <i>Egernia</i> | <i>formosa</i> | Goldfields Crevice Skink | | | X | | | X | | X | X |
| <i>Eremiascincus</i> | <i>isolepis</i> | Northern Bar-lipped Skink | | | X | | | X | | X | |
| <i>Eremiascincus</i> | <i>pallidus</i> | Western Narrow-banded Skink | | | X | | | X | | | |
| <i>Eremiascincus</i> | <i>richardsonii</i> | Broad-banded Sand-swimmer | | | X | | | X | | | |
| <i>Lerista</i> | <i>amicorum</i> | Friendly Slider | | | X | | | | | | |
| <i>Lerista</i> | <i>bipes</i> | Western Two-toed Slider | | | X | | | X | X | | |
| <i>Lerista</i> | <i>jacksoni</i> | Jackson's Slider | | | X | | | X | | | |
| <i>Lerista</i> | <i>labialis</i> | Southern Sandslider | | | X | | | X | | | |
| <i>Lerista</i> | <i>macropisthopus subsp. fuscescens</i> | Unpatterned Robust Slider | | | X | | | | | | |
| <i>Lerista</i> | <i>muelleri</i> | Mueller's Three-toed Slider | | | X | | | X | X | | |
| <i>Lerista</i> | <i>neander</i> | Robust Pilbara Slider | | | X | | | X | | | |
| <i>Lerista</i> | <i>timida</i> | Dwarf Three-toed Slider | | | X | | | X | | X | |
| <i>Lerista</i> | <i>verhmens</i> | Powerful Three-toed Slider | | | X | | | | | | |
| <i>Lerista</i> | <i>zietzi</i> | Pilbara Blue-tailed Slider | | | X | | | X | X | X | |
| <i>Menetia</i> | <i>greyii</i> | Common Dwarf Skink | | | X | | | X | X | | |
| <i>Menetia</i> | <i>surda subsp. surda</i> | Western Dwarf Skink | | | X | | | X | | | |
| <i>Morethia</i> | <i>ruficauda exquisita</i> | Fire-tail Skink | | | X | | | X | X | X | |
| <i>Proablepharus</i> | <i>reginae</i> | Western Soil-crevice Skink | | | X | | | X | | | |
| <i>Tiliqua</i> | <i>multifasciata</i> | Central Blue-tongue | | | X | | | X | | | |
| TYPHLOPIDAE | | | | | | | | | | | |
| <i>Anilius</i> | <i>ammodytes</i> | Sand-diving blind snake | | | | | | X | X | | |
| <i>Anilius</i> | <i>ganei</i> | Pilbara Flat-headed Blind Snake | P2 | | X | | X | X | X | X | |
| <i>Anilius</i> | <i>grypus</i> | Northern Beaked Blind Snake | | | X | | | X | | X | |
| VARANIDAE | | | | | | | | | | | |
| <i>Varanus</i> | <i>acanthurus</i> | Spiny-tailed Monitor | | | | | | X | X | | |

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| <i>Varanus</i> | <i>brevicauda</i> | Short-tailed Pygmy Monitor | | | X | | | X | | | |
| <i>Varanus</i> | <i>bushi</i> | Pilbara Monitor | | | X | | | X | | | |
| <i>Varanus</i> | <i>caudolineatus</i> | Striped-tailed Monitor | | | X | | | X | | | |
| <i>Varanus</i> | <i>eremius</i> | Pygmy Desert Monitor | | | X | | | X | | | |
| <i>Varanus</i> | <i>giganteus</i> | Perentie | | | X | | | X | | | X |
| <i>Varanus</i> | <i>gouldii</i> | Gould's Monitor | | | X | | | X | | | |
| <i>Varanus</i> | <i>hamersleyensis</i> | Southern Pilbara Rock Monitor | | | X | | | X | | | X |
| <i>Varanus</i> | <i>panoptes</i> | Yellow-spotted Monitor | | | X | | | X | | | X |
| <i>Varanus</i> | <i>pilbarensis</i> | Pilbara Rock Monitor | | | X | | | X | | | |
| <i>Varanus</i> | <i>Tristis subsp. tristis</i> | Black-headed Monitor | | | X | | | X | X | | X |
| Amphibians | | | | | | | | | | | |
| HYLIDAE | | | | | | | | | | | |
| <i>Cyclorana</i> | <i>platycephala</i> | Water-holding Frog | | | X | | | | | | |
| <i>Cyclorana</i> | <i>maini</i> | Sheep Frog | | | X | | | X | | X | |
| <i>Litoria</i> | <i>rubella</i> | Little Red Tree Frog | | | X | | | X | | X | |
| LIMNODYNASTIDAE | | | | | | | | | | | |
| <i>Neobatrachus</i> | <i>sutor</i> | Shoemaker Frog | | | X | | | | | | |
| MYOBATRACHIDAE | | | | | | | | | | | |
| <i>Pseudophryne</i> | <i>douglasi</i> | Gorge Toadlet | | | X | | | | X | X | |
| <i>Uperoleia</i> | <i>russelli</i> | Russell's Toadlet | | | X | | | | | | |
| <i>Uperoleia</i> | <i>saxatilis</i> | Pilbara Toadlet | | | X | | | X | X | | |
| Mammals | | | | | | | | | | | |
| BOVIDAEIDAE | | | | | | | | | | | |
| <i>Bos</i> | <i>taurus</i> | Domestic Cattle | int | | X | | | X | X | | |
| <i>Bubalus</i> | <i>bubalis</i> | Water Buffalo | int | | X | | | | | | |
| CAMELIDAE | | | | | | | | | | | |
| <i>Camelus</i> | <i>dromedarius</i> | Camel | int | | X | | | X | | | |
| CANIDAE | | | | | | | | | | | |

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| <i>Canus</i> | <i>lupis dingo</i> | Dingo | | | | | | | X | X | |
| <i>Canus</i> | <i>familiaris</i> | Dog | int | | | | | | X | X | |
| DASYURIDAE | | | | | | | | | | | |
| <i>Dasyurus</i> | <i>hallucatus</i> | Northern Quoll | En | En | X | X | X | | | | |
| <i>Dasyercus</i> | <i>blythi</i> | Brush-tailed Mulgara | P4 | | X | | X | X | | | |
| <i>Dasykaluta</i> | <i>rosamondae</i> | Little Red Kaluta | | | X | | | | | | |
| <i>Ningau</i> | <i>ridei</i> | Wongai Ningau | | | X | | | X | | | |
| <i>Ningau</i> | <i>timealeyi</i> | Pilbara Ningau | | | X | | | X | | | |
| <i>Planigale</i> | <i>ingrami</i> | Long-tailed Planigale | | | X | | | X | | | |
| <i>Planigale</i> | <i>maculata</i> | Common Planigale | | | X | | | X | | | |
| <i>Pseudantechinus</i> | <i>woolleyae</i> | Woolley's Pseudantechinus | | | X | | | X | | | |
| <i>Sminthopsis</i> | <i>dolichura</i> | Little long-tailed Dunnart | | | X | | | | | | |
| <i>Sminthopsis</i> | <i>hirtipes</i> | Hairy-footed Dunnart | | | X | | | X | | | |
| <i>Sminthopsis</i> | <i>macroura</i> | Stripe-faced Dunnart | | | X | | | | | | |
| <i>Sminthopsis</i> | <i>ooldea</i> | Ooldea Dunnart | | | X | | | | | | |
| <i>Sminthopsis</i> | <i>youngsoni</i> | Lesser Hairy-footed Dunnart | | | X | | | X | | | |
| EMBALLONURIDAE | | | | | | | | | | | |
| <i>Saccolaimus</i> | <i>flaviventris</i> | Yellow-belly Sheath-tail Bat | | | X | | | X | D | D | |
| <i>Taphozous</i> | <i>hilli</i> | Hill's Sheath-tail Bat | | | X | | | | SG | | |
| <i>Taphozous</i> | <i>georgianus</i> | Common Sheath-tail Bat | | | X | | | X | D | D | |
| EQUIDAE | | | | | | | | | | | |
| <i>Equus</i> | <i>asinus</i> | Donkey | int | | X | | | X | | | |
| <i>Equus</i> | <i>caballus</i> | Horse | int | | X | | | | | | |
| FELIDAE | | | | | | | | | | | |
| <i>Felis</i> | <i>catus</i> | Domestic Cat | int | | X | | | X | X | | X |
| HIPPOSIDARIDAE | | | | | | | | | | | |
| <i>Rhinonictis</i> | <i>aurantia (Pilbara pop'n)</i> | Pilbara Leaf-nosed Bat | Vu | Vu | X | X | X | X | | | |
| LEPORIDAE | | | | | | | | | | | |

| Genus | Species | Common Name | Conservation status | | Database searches | | | | Phase one survey (September 2019) | Phase two survey (March 2020) | Remote cameras (Sept 19 to March 20) |
|------------------------|--------------------------|---------------------------------|---------------------|----------|-------------------|-----------|------------------------|---------------------------|--------------------------------------|----------------------------------|---|
| | | | BC Act | EPBC Act | NatureMap | DOEE PMST | DBCAs threatened fauna | BHP previous fauna record | | | |
| <i>Oryctolagus</i> | <i>cuniculus</i> | European Rabbit | int | | X | | | X | | | |
| MACROPODIDAE | | | | | | | | | | | |
| <i>Osphranter</i> | <i>robustus</i> | Euro | | | X | | | X | X | X | X |
| <i>Macropus</i> | <i>rufus</i> | Red Kangaroo | | | X | | | | | | |
| <i>Petrogale</i> | <i>rothschildi</i> | Rothschild's Rock Wallaby | | | X | | | X | X | | X |
| MEGADERMATIDAE | | | | | | | | | | | |
| <i>Macroderma</i> | <i>gigas</i> | Ghost Bat | Vu | Vu | X | X | X | X | X | | |
| MOLOSSIDAE | | | | | | | | | | | |
| <i>Austronomus</i> | <i>australis</i> | White-striped free-tail Bat | | | X | | | X | D | D | |
| <i>Chaerephon</i> | <i>jobensis</i> | Northern Mastiff Bat | | | X | | | | D | | |
| <i>Mormopterus</i> | <i>loriae</i> | Little Northern Free-tailed Bat | | | X | | | X | | | |
| <i>Ozimops</i> | <i>lumsdenae</i> | Northern Free-tailed bat | | | | | | X | D | PR | |
| MURIDAE | | | | | | | | | | | |
| <i>Mus</i> | <i>musculus</i> | House Mouse | int | | X | | | | | | |
| <i>Notomys</i> | <i>alexis</i> | Spinifex Hopping Mouse | | | X | | | | | | |
| <i>Pseudomys</i> | <i>chapmani</i> | Pebble-mound Mouse | P4 | | X | | X | X | X | | |
| <i>Pseudomys</i> | <i>desertor</i> | Desert Mouse | | | X | | | X | | | |
| <i>Pseudomys</i> | <i>hermannsburgensis</i> | Sandy Inland Mouse | | | X | | | X | X | X | |
| <i>Pseudomys</i> | <i>nanus</i> | Western Chestnut Mouse | | | X | | | X | | | |
| <i>Zyomys</i> | <i>argurus</i> | Rock Rat | | | X | | | X | | | X |
| <i>Zyomys</i> | <i>pedunculatus</i> | Central Rock Rat | | | X | | | | | | |
| <i>Zyomys</i> | <i>woodwardi</i> | Kimberly Rock-rat | | | X | | | X | | | |
| TACHYGLOSSIDAE | | | | | | | | | | | |
| <i>Tachyglossus</i> | <i>aculeatus</i> | Short-beaked Echidna | | | X | | | | X | | X |
| THYLACOMYIDAE | | | | | | | | | | | |
| <i>Macrotis</i> | <i>lagotis</i> | Greater Bilby | Vu | Vu | X | X | X | X | | | |
| VESPERTILIOIDAE | | | | | | | | | | | |
| <i>Chalinobus</i> | <i>gouldii</i> | Gould's Wattle Bat | | | X | | | X | D | D | |

| Genus | Species | Common Name | Conservation status | | Database searches | | | | Phase one survey (September 2019) | Phase two survey (March 2020) | Remote cameras (Sept 19 to March 20) |
|---------------------|--------------------|-----------------------------|---------------------|----------|-------------------|--------------|-----------------------------|------------------------------------|--------------------------------------|----------------------------------|---|
| | | | BC Act | EPBC Act | NatureMap | DOEE PMST | DBCA threatened fauna | BHP previous fauna record | | | |
| <i>Chalinolobus</i> | <i>morio</i> | Chocolate Wattle Bat | | | X | | | | D | D | |
| <i>Nyctophilus</i> | <i>daedalus</i> | Northwestern Long-eared Bat | | | | | | X | | SG | |
| <i>Nyctophilus</i> | <i>geoffroyi?</i> | Lesser Long-eared Bat | | | X | | | X | | SG | |
| <i>Nyctophilus</i> | <i>arnhemensis</i> | Arnhem Long-eared Bat | | | | | | X | | SG | |
| <i>Scotorepens</i> | <i>greyii</i> | Little Broad-nosed Bat | | | X | | | X | D | D | |
| <i>Vespadelus</i> | <i>finlaysoni</i> | Inland Cave Bat | | | X | | | X | D | D | |

Key; X- recorded species, SG – species group = bat detection or calls overlap with another species and could be either or both species, int- Introduced species, Vu- Vulnerable listed under either/or both EPBC or BC Acts, En- Endangered listed under either/or both EPBC or BC Acts, Cr- Critically Endangered listed under either/or both EPBC or BC Acts, Mi/Ma Migratory / Ma Migratory listed under EPBC Act, OS- Special Protection listed under BC Act, P1-4-Priority species listed by DBCA.

Fauna likelihood of occurrence assessment guidelines

| Assessment outcome | Description |
|--------------------|--|
| Present | Species recorded during the field survey or from recent, reliable records from within or close proximity to the survey area. |
| Likely | Species are likely to occur in the survey area where there is suitable habitat within the survey area and there are recent records of occurrence of the species in close proximity to the survey area. OR Species known distribution overlaps with the survey area and there is suitable habitat within the survey area. |
| Unlikely | Species assessed as unlikely include those species previously recorded within 40 km of the survey area however: <ul style="list-style-type: none"> • There is limited (i.e. the type, quality and quantity of the habitat is generally poor or restricted) habitat in the survey area. • The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area. OR Those species that have a known distribution overlapping with the survey area however: <ul style="list-style-type: none"> • There is limited habitat in the survey area (i.e. the type, quality and quantity of the habitat is generally poor or restricted). • The suitable habitat within the survey area is isolated from other areas of suitable habitat and the species has no capacity to migrate into the survey area. |
| Highly unlikely | Species that are considered highly unlikely to occur in the survey area include: <ul style="list-style-type: none"> • Those species that have no suitable habitat within the survey area. • Those species that have become locally extinct, or are not known to have ever been present in the region of the survey area. |

Source information - desktop searches

NM – DBCA *NatureMap* (accessed September 2019)

PMST – DEE Protected Matters Search Tool (PMST) to identify fauna listed under the EPBC Act potentially occurring within the survey area (accessed September 2019)

Definitions

| Term | Description |
|----------------------|---|
| database search area | a 40 km buffer around the survey area |
| survey area | the area subject to the current survey |
| region | the area within an approximate 40 km radius of the survey area |
| Cr | Critically endangered under the EPBC Act or BC Act |
| En | Endangered under the EPBC Act or BC Act |
| Vu | Vulnerable under the EPBC Act or BC Act |
| IA | Migratory birds protected under an international agreement |
| Mi, Ma | Migratory, Marine |
| CD | Conservation dependent fauna |
| OS | Other specially protected fauna under the BC Act |
| P1 | Priority 1: Poorly known fauna. Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey. |
| P2 | Priority 2: Poorly known species. Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey. |
| P3 | Priority 3: Poorly known species. Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey. |
| P4 | Priority 4: Rare, Near Threatened and other species in need of monitoring. (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy. |

Fauna likelihood of occurrence assessment of conservation significant species identified in the desktop assessment as potentially occurring within the survey area.

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|---|----------|--------|--------|----|-----------------------|----------------------------|---|---|
| | EPBC Act | BC Act | PMST | NM | DBCA threatened fauna | BHP previous fauna records | | |
| Birds | | | | | | | | |
| <i>Amytornis striatus</i> <i>subsp. whitei</i> Rufous Grasswren | | P4 | X | | | X | The Rufous Grasswren occurs in spinifex, with mallee, acacias, and other inland and coastal shrubs. The species seeks big old clumps of spinifex for breeding (Pizzey & Knight 2012). | Likely , the Hillcrest/ Hillslope habitat comprises <i>Triodia</i> which may be large enough to nest in although the surrounding areas have larger patches of spinifex which may be favoured by this species. The closest record is 9.3 km southeast of the survey area. |
| <i>Elanus scriptus</i> Letter Winged Kite | | P4 | | X | | | This species is irruptive, nomadic and generally rare in Western Australia but has been reported in all states. The species roosts during the day in well-foliaged trees and along tree lined watercourses and hunts at night over grasslands and fields. It is a specialist hunter of rodents and presence of the species within an area is linked to rodent density. Birds breed almost repeatedly in colonies when rodent populations are high. Following a decline in rodent density, the Kites disperse and may be found almost anywhere in Australia except the driest of deserts (Pizzey & Knight 2012). | Unlikely , suitable habitat may be present within the survey area and surrounds however it is will only be a vagrant to the area and is not considered resident. One record of the species has been documented approximately 40 km west of the survey area. |
| <i>Falco hypoleucos</i> Grey Falcon | | Vu | | | X | | The Grey Falcon inhabits lightly timbered country, especially stony plains and lightly timbered acacia scrub. This species is considered scarce to rare and is usually found singularly or sometimes in pairs. (Morcombe 2004). | Likely , suitable habitat is present for the species within the survey area and surrounds (all habitat types) and the species is known from the region. Closest record is |

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|---|----------|--------|--------|----|-----------------------|----------------------------|--|--|
| | EPBC Act | BC Act | PMST | NM | DBCA threatened fauna | BHP previous fauna records | | |
| | | | | | | | | approximately 30 km north of the survey area. |
| <i>Falco peregrinus</i> Peregrine Falcon | | OS | | X | X | X | The Peregrine Falcon is uncommon but wide-ranging across Australia. Habitat is extremely diverse, from rainforest to arid scrub, from coastal heath to alpine, and also occurs in urban environments and city scapes. The Peregrine Falcon nests primarily on ledges of cliffs, shallow tree hollows, and ledges of building in cities (Morcombe 2004). | Likely , suitable habitat is present for the species within the survey area and surrounds (all habitat types) and the species is known from the region. Closest record is approximately 10 km east of the survey area. |
| <i>Malurus leucopterus subsp. leucopterus</i> Dirk Hartog black and white fairy-wren | Vu | Vu | | X | | | The White-winged Fairy-wren (Dirk Hartog Island) is confined to Dirk Hartog Island, off the coast of Peron Peninsula, in Western Australia (Schodde & Mason 1999). It is possible that birds may occasionally disperse to the adjacent mainland: black-plumaged birds, presumably originating from Dirk Hartog Island, have occasionally been reported on the Peron Peninsula (Driskell et al. 2002; Pizzey 1980; Schodde & Mason 1999). However, due to a lack of corroborative material, these reports cannot be confirmed (Schodde & Mason 1999). | Unlikely , suitable habitat may be available to support this species however the survey area is not within their confirmed range and any species possibly visiting would be vagrant only. There are 5 records of the species occurring within the buffered database search area, all of which are approximately 25 km north of the survey area. |
| <i>Pezoporus occidentalis</i> Night Parrot | En | Cr | X | | | | The Night Parrot inhabits arid and semi-arid areas that are characterised by having dense, low vegetation. Based on accepted records, the habitat of the Night Parrot consists of Triodia grasslands in stony or sandy environments and of samphire and chenopod shrublands, including genera such as Atriplex, Bassia and Maireana, on floodplains and claypans, and on the margins of saltlakes, creeks or other | Unlikely , some habitat is available for this species on the sand plain, however due to the paucity of sand plain there is limited habitat for this species. Sampling methods did not identify the |

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|--|-----------|--------|--------|----|-----------------------|----------------------------|---|--|
| | EPBC Act | BC Act | PMST | NM | DBCA threatened fauna | BHP previous fauna records | | |
| | | | | | | | sources of water (Parker 1980). It has also been observed to enter dense Muehlenbecki growth when flushed from a more typical habitat (Boles et al. 1994). | species during the survey. Use maybe irregular and opportunistic. |
| Migratory Birds | | | | | | | | |
| <i>Apus pacificus</i> Fork-tailed Swift | Mi | Mi | X | X | X | X | A highly nomadic and very wide ranging but sparsely scattered species occurring in a wide variety of habitats throughout Australia. They are widespread in coastal and sub-coastal areas between Augusta and Carnarvon, including some on nearshore and offshore islands, venturing into inland areas following storms and cyclonic events. This species is almost exclusively aerial, flying less than 1 m to at least 300 m above ground. (DSEWPaC 2013). | Unlikely , an almost exclusively aerial species that may opportunistically utilise the area during storm or cyclone events. |
| <i>Hirundo rustica</i> Barn Swallow | Mi | Mi | X | | | | In Australia, the Barn Swallow is recorded in open country in coastal lowlands, often near water, towns and cities. Birds are often sighted perched on overhead wires, and also in or over freshwater wetlands, paperbark Melaleuca woodland, mesophyll shrub thickets and tussock grassland. | Unlikely , an almost exclusively aerial species that may opportunistically utilise the area during storm or cyclone events. |
| <i>Motacilla cinerea</i> Grey Wagtail | Mi | Mi | X | | | | The Grey Wagtail is an opportunistic migrant to Australia. The species typically migrates to Indonesia occasionally landing in Australia. Most records for the species are from Northern Australia and South Australia (Morcombe 2004). The non-breeding habitat only of the Grey Wagtail has a strong association with water, particularly rocky substrates along water courses but also lakes and marshes (DotE 2019a). It can be found mainly in banks and rocks in fast-running freshwater habitats: rivers, creeks, streams, and around waterfalls, both in forest and open country; but occurs almost anywhere during migration (Johnstone & Storr 2004). | Unlikely , some habitat is available along major drainage line habitat during times of residual pools of standing water and it may opportunistically but irregularly occur, however this species is nomadic and resource dependant. |
| <i>Calidris ferruginea</i> | Cr, Mi | Cr | X | | | | Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and | Unlikely , some habitat is available along major |

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|--|----------|--------|--------|----|------------------------|----------------------------|---|---|
| | EPBC Act | BC Act | PMST | NM | DBCAs threatened fauna | BHP previous fauna records | | |
| Curlew Sandpiper | | | | | | | lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters (Higgins & Davies 1996). Curlew Sandpipers forage on mudflats and nearby shallow water. In non-tidal wetlands, they usually wade, mostly in water 15–30 mm, but up to 60 mm, deep. They forage at the edges of shallow pools and drains of intertidal mudflats and sandy shores. At high tide, they forage among low sparse emergent vegetation, such as saltmarsh, and sometimes forage in flooded paddocks or inundated saltflats. Occasionally they forage on wet mats of algae or waterweed, or on banks of beach cast seagrass or seaweed. | drainage line habitat during times of residual pools of standing water and it may opportunistically but irregularly occur, however this species is nomadic and resource dependant. |
| <i>Pandion cristatus</i> Eastern Osprey | MI | MI | | | X | X | Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging (Marchant & Higgins 1993). They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. They exhibit a preference for coastal cliffs and elevated islands in some parts of their range, but may also occur on low sandy, muddy or rocky shores and over coral cays. | Unlikely , the species may infrequently visit the area when it contains water however the habitat is not primary to support this species. The closest known record is located 21 km northwest of the survey area. Only one record is available within a 40 km buffer of the survey area. This may have been a misidentification. |
| <i>Rostratula australis</i> | EN | EN | X | | | | The Australian Painted Snipe is rarely seen as it is extremely secretive, keeping to dense vegetation of swamps, emerging | Unlikely , some habitat is available within the |

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|---|----------|--------|--------|----|------------------------|----------------------------|---|--|
| | EPBC Act | BC Act | PMST | NM | DBCAs threatened fauna | BHP previous fauna records | | |
| Australian Painted-snipe | | | | | | | only in subdued light of dawn and dusk. The preferred habitat of this species includes surrounds and shallows of wetlands that are well vegetated with dense low cover (Morcombe 2004). | floodplain habitat during times of residual pools of standing water and it may opportunistically but irregularly occur, however this species is nomadic and resource dependant. |
| <i>Tringa nebularia</i> Common Greenshank | Mi | Mi | | | X | X | The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms (Morcombe 2004). The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores (Morcombe 2004). The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees. | Unlikely , some habitat is available along major drainage line habitat during times of residual pools of standing water and it may opportunistically but irregularly occur, however this species is nomadic and resource dependant. |
| Mammals | | | | | | | | |
| <i>Dasyercus blythi</i> Brush-tail Mulgara | | P4 | | X | X | X | The Brush-tailed Mulgara is primarily nocturnal, shelters in burrows and feeds on insects, other arthropods and small vertebrates. This species inhabits spinifex grasslands and, in central Australia, lives in burrows that it digs on the flats between low sand dunes (Van Dyck & Strahan 2008). The Mulgara is a solitary species exhibiting high site fidelity and a low propensity for dispersal once a home range has been | Unlikely , despite some habitat being present no expansive sand plains are present. Therefore the survey area is considered unsuitable or sub-optimal at best. The closest record |

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|--|----------|--------|--------|----|------------------------|----------------------------|--|--|
| | EPBC Act | BC Act | PMST | NM | DBCAs threatened fauna | BHP previous fauna records | | |
| | | | | | | | established (Masters et al. 2003). Males and females maintain home ranges of 1.4 to 14 hectares (Masters et al. 2003) which on average, overlap by less than 20% (Masters et al. 2003). | is 14 km northeast of the survey area. |
| <i>Dasyurus hallucatus</i> Northern Quoll | En | En | X | X | X | X | The Northern Quoll once occurred across the majority of northern Australia but its range has significantly contracted. It occurs in the Pilbara region but in disjunct populations. The Northern Quoll inhabits a range of vegetation associations but is especially abundant on dissected rocky escarpment and eucalypt woodland within 200 km of the coast. It is known to den in rock crevices and rock piles and favours rocky areas. They are predominantly nocturnal but are occasionally active during the day, particularly during the mating season and are known to have a large home range (Van Dyck & Strahan 2008). | Likely , the Gorge/ Gully habitat type presents suitable habitat to support this species. The closest record of this species is approximately 6 km north of the survey area. |
| <i>Dasyurus geofroii</i> Western Quoll, Chuditch | VU | VU | | X | | | The Chuditch inhabits eucalypt forest (especially Jarrah, <i>E. marginata</i>), dry woodland, mallee shrublands, heaths, and desert, particularly in the south coast of WA. They also occur at lower densities in drier woodland and mallee shrubland in the goldfields and wheatbelt, as well as in Kalbarri National Park (translocated). Chuditch require adequate numbers of suitable den and refuge sites (horizontal hollow logs or earth burrows) to survive (DEC 2012). In Jarrah forest, Chuditch populations occur in both moist, densely vegetated, steeply sloping forest and drier, open, gently sloping forest (Van Dyck and Strahan 2008). The species can travel large distances, and for this reason requires habitats that are of a suitable size and not excessively fragmented. | Highly unlikely , the survey area is outside the known range for this species. <i>NatureMap</i> records within the buffered survey area are considered to be misidentification. |
| <i>Macrotis lagotis</i> Greater Bilby | Vu | Vu | X | X | X | X | The Greater Bilby distribution in Western Australia is restricted to the north, including the Pilbara, Sandy and Gibson Deserts. The Greater Bilby usually spends the daytime in burrows, often built against termite mounds, | Unlikely , despite some habitat being present no expansive sand plain are present and those patches |

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|--------------------------------------|----------|--------|--------|----|------------------------|----------------------------|---|---|
| | EPBC Act | BC Act | PMST | NM | DBCAs threatened fauna | BHP previous fauna records | | |
| | | | | | | | spinifex hummock or shrubs (Van Dyck & Strahan 2008). Extant population of the Greater Bilby occur in a variety of habitats, usually on landforms with level to low slope topography and light to medium soils. It occupies 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. Laterite and rock feature substrates are an important part of Greater Bilby habitat. These habitat support shrub species, such as <i>Acacia kempeana</i> , <i>A. hilliana</i> and <i>A. rhodophylla</i> , which have root-dwelling larvae that provide a constant food source for the Greater Bilby. After dark they leave their burrows to feed and populations are known to move long distances when current habitat ranges become unsuitable. Bilbies are largely solitary, widely dispersed and found in low numbers. The current occurrence of the Greater Bilby is strongly associated with higher rainfall and temperatures, which promote areas of higher plant and food production. The Greater Bilby may also prefer these conditions as higher rainfall and temperatures are not well tolerated by foxes (Pavey 2006; Southgate et al. 2007). | present lack connectivity. Therefore the survey area is considered unsuitable or sub-optimal at best. The closest record of this species is approximately 32 km northeast of the survey area. |
| <i>Macroderma gigas</i> Ghost Bat | Vu | Vu | X | X | X | X | The Ghost Bat occurs in a wide range of habitats, and requires an undisturbed cave, deep fissure or disused mine shaft in which to roost. It is patchily distributed across Australia, and is sensitive to disturbance (Van Dyck & Strahan 2008). | Known , the species was recorded via feeding evidence and old scats within numerous caves in the survey area but no evidence of long-term roost caves was found. Roost caves may be located within close proximity of the survey area. The closest recording of the species is |

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|---|----------|--------|--------|----|------------------------|----------------------------|---|--|
| | EPBC Act | BC Act | PMST | NM | DBCAs threatened fauna | BHP previous fauna records | | |
| | | | | | | | | approximately 8 km south of the survey area. |
| <i>Rhinonicteris aurantia</i> Pilbara leaf-nosed Bat | Vu | Vu | X | X | X | X | The Pilbara Leaf-nosed Bat roosts in deep caves or mines in the wet season and forages nearby. This species occurs in the Pilbara region where its populations are scattered and localised. There are a few known populations of this species in the western Pilbara, roosting in caves formed in gorges that dissect massive siliceous sedimentary geology. It is most often observed in flight over waterholes in gorges (Van Dyck & Strahan 2008). Optimal roosts are thought to occur in caves that form between ascending rock layers, where humidity is maintained from seeping groundwater (Van Dyck & Strahan 2008). Roosts are commonly located over pools of water, or areas deep within the mine or cave structure which provides elevated temperature and humidity. Foraging habitat includes: Triodia hummock grasslands covering low rolling hills and shallow gullies, with <i>Eucalyptus camaldulensis</i> along the creeks; over small watercourses throughout granite boulder terrain; over pools and low shrubs in ironstone gorges; and in and around watercourses with <i>Melaleuca leucodendron</i> . | Likely , foraging habitat is present for the species (major and Minor Drainage Lines, and Hillcrest/Hillslope) with multiple potentially suitable foraging and roosting caves. No calls were identified during the survey. The nearest confirmed records are approximately 29 km north west of the survey area. |
| <i>Pseudomys chapmani</i> Western Pebble-mound Mouse | | P4 | | X | X | X | The Western Pebble-mound Mouse is restricted to the Pilbara region where it is recognised as an endemic species. Habitat for the Western Pebble-mound Mouse can be found on stony hillsides with hummocky grasslands and little or no soil. It constructs large mounds of pebbles on stony slopes which cover an area of 0.5-9.0 square metres. "Active" mounds are characterized by volcano-like cones capped by 'craters' that mark occluded entrances to subterranean burrow systems in which the mice live, often gregariously (Van Dyck & Strahan 2008). | Known , the species was recorded in the survey area via both active and non-active mounds. Hillcrest/Hillslope is suitable habitat. |

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|--|----------|--------|--------|----|------------------------|----------------------------|--|--|
| | EPBC Act | BC Act | PMST | NM | DBCAs threatened fauna | BHP previous fauna records | | |
| <i>Zyzomys pedunculatus</i> Central Rock-rat, Antina | Cr | Cr | | X | | X | The central rock-rat is restricted to the West MacDonnell Ranges of central Australia. The species has irruptive demography and is recorded in high densities following rainfall events. It occurs in a variety of rocky habitat (DotE 2019b). | Highly Unlikely , the survey area is not within the known range of this species. NatureMap shows one record within the 40 km database search area however this is considered to be misidentification. |
| Reptiles | | | | | | | | |
| <i>Anilius ganei</i> Pilbara Flat-headed Blind Snake | | | | X | X | X | <i>Ramphotyphlops ganei</i> is a moderately robust blind snake known from widely separated areas between Newman and Pannawonica. A very cryptic species. Most often recorded in rocky or stony areas, and considered to be possibly associated with moist gorges and gullies (Wilson & Swan 2017). | Known , this species was recorded in a trap within the Gorge/ Gully system. |
| <i>Ctenotus uber johnstonei</i> Spotted Ctenotus | | P2 | | X | | X | This subspecies of the Spotted Ctenotus is known from an area of chenopod shrubland at the base of a sandstone hill near Balgo in the northern interior of Western Australia. It is possible that the species also extends further west into the Pilbara region (Wilson & Swan 2010). | Unlikely , the species has not been recorded within a 40 km buffer of the survey area |
| <i>Liasis olivaceus barroni</i> Pilbara Olive Python | Vu | Vu | X | X | X | X | The Olive Python (Pilbara subspecies) is a dull olive-brown to pale fawn or rich-brown python with a white underside and pale finely dotted lips. This species reaches an average size of 2.5 m but can grow up to 4 m long. The Olive Python's range is restricted to the Pilbara region, north Western Australia, and the Dampier Archipelago. Habitat consists of rocky escarpments, gorges and waterholes within the Pilbara region. The preferred microhabitats for this species are under rock piles, on top of rocks, and under spinifex as well as in man-made features such as overburden heaps, railway embankments and sewerage treatment ponds. The species' | Known , Pilbara Olive Python scat was found at one of the pools within the Gorge/ Gully. Suitable habitat is present throughout the habitat type particularly within the rocky ledges and pools. |

| Species name | Status | | Source | | | | Habitat requirements | Likelihood of occurrence within the survey area |
|--|----------|--------|--------|----|------------------------|----------------------------|--|---|
| | EPBC Act | BC Act | PMST | NM | DBCAs threatened fauna | BHP previous fauna records | | |
| | | | | | | | breeding season occurs from June to August, with males moving long distances in search of breeding females (Wilson & Swan 2017). | |
| <i>Underwoodisaurus seorsus</i> Pilbara Barking Gecko | | P2 | | X | | X | This species is found in the Hamersley Range within the Pilbara from north of Tom Price and then southeast to near Newman. It occurs in rocky areas with spinifex and low tree cover (Wilson & Swan 2017). | Likely , the survey area contains suitable habitat to support this species. The closest known record is approximately 9.3 km south of the survey area. |

Phase one (September 2019): Species recorded during the trapping program including bat detection, active searches and opportunistic

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song meter) | Totals | |
|---------------------------------|-------------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|-----------------|------|---------------------|---------------------------|--------|--------------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | | | | | | Noct. Search |
| Birds | | | | | | | | | | | | | | | | |
| ACANTHIZIDAE | | | | | | | | | | | | | | | | |
| <i>Smicromnis brevirostris</i> | Weebill | | | | | | | | | | | | 12 | ✓ | | 13 |
| ACCIPITRIDAE | | | | | | | | | | | | | | | | |
| <i>Accipiter fasciatus</i> | Brown Goshawk | | | | | | | | | | | | 1 | | | 1 |
| <i>Hamirostra melanosternon</i> | Black-breasted Buzzard | | | | | | | | | | | 2 | | | | 2 |
| <i>Milvus migrans</i> | Black Kite | | | | 2 | | | | | | | | 2 | | | 4 |
| AEGOTHELIDAE | | | | | | | | | | | | | | | | |
| <i>Aegotheles cristatus</i> | Owlet-nightjar | | | | | | | | | | | 2 | 1 | ✓ | | 3 |
| ALCEDINIDAE | | | | | | | | | | | | | | | | |
| <i>Dacelo leachii</i> | Blue-winged Kookaburra | | | | 1 | | | | | | | | 2 | ✓ | | 4 |
| <i>Todiramphus sanctus</i> | Sacred Kingfisher | | | | | | | | | | | | 1 | | | 2 |
| ARDEIDAE | | | | | | | | | | | | | | | | |
| <i>Ardea pacifica</i> | White-necked Heron | | | | | | | | | | | | 1 | | | 1 |
| ARTAMIDAE | | | | | | | | | | | | | | | | |
| <i>Artamus cinereus</i> | Black-faced Woodswallow | | | | 2 | | | | | | | | 15 | | | 17 |
| <i>Artamus minor</i> | Little Woodswallow | | | | | | | | | | | | 6 | | | 7 |
| BURHINIDAE | | | | | | | | | | | | | | | | |
| <i>Burhinus grallarius</i> | Bush Stone Curlew | | | | | | | | | | | | 1 | | | 1 |
| CACATUIDAE | | | | | | | | | | | | | | | | |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song meter) | Totals |
|---|---------------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|-----------------|------|---------------------|---------------------------|--------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | | | | | |
| <i>Eolophus roseicapilla</i> | Galah | | | | | | | | | | 1 | | | | 1 |
| <i>Cacatua sanguinea</i> | Little Corella | | | | 1 | | | | | | | 4 | | | 5 |
| CAMPEPHAGIDAE | | | | | | | | | | | | | | | |
| <i>Coracina novaehollandiae</i> | Black-faced Cuckoo-shrike | | | | 2 | | | | 1 | | | 10 | | | 13 |
| CAPRIMULGIDAE | | | | | | | | | | | | | | | |
| <i>Eurostopodus argus</i> | Spotted Nightjar | | | | | | | | | | | 1 | ✓ | | 1 |
| COLUMBIDAE | | | | | | | | | | | | | | | |
| <i>Geopelia cuneatus</i> | Diamond Dove | | | | | | | | | | | 5 | | | 5 |
| <i>Geopelia striata</i> subsp. <i>placida</i> | Peaceful Dove | | | | | | | | 1 | | | 9 | ✓ | | 9 |
| <i>Geophaps plumifera</i> | Spinifex Pigeon | | | | | | | | 1 | | | 24 | | | 25 |
| <i>Ocyphaps lophotes</i> | Crested Pigeon | | | | 12 | | | | 1 | | | 12 | | | 25 |
| <i>Phaps chalcoptera</i> | Common Bronzewing | | | | 1 | | | | 1 | | | 4 | | | 6 |
| CORVIDAE | | | | | | | | | | | | | | | |
| <i>Corvus orru</i> | Torresian Crow | | | | 2 | | | | 2 | | | 8 | ✓ | | 12 |
| CRACTICIDAE | | | | | | | | | | | | | | | |
| <i>Cracticus nigrogularis</i> | Pied Butcherbird | | | | | | | | | | 1 | | ✓ | | 1 |
| <i>Cracticus tibicen</i> | Australian Magpie | | | | | | | | | | | 2 | | | 2 |
| CUCULIDAE | | | | | | | | | | | | | | | |
| <i>Cacomantis pallidus</i> | Pallid Cuckoo | | | | | | | | | | | 1 | | | 2 |
| DICRURIDAE | | | | | | | | | | | | | | | |
| <i>Grallina cyanoleuca</i> | Magpie-lark | | | | 1 | | | | 1 | | | 2 | | | 4 |
| <i>Rhipidura albiscapa</i> | Grey Fantail | | | | | | | | | | 1 | | | | 1 |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song meter) | Totals | |
|---|--------------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|-----------------|------|---------------------|---------------------------|--------|--------------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | | | | | | Noct. Search |
| <i>Rhipidura leucophrys</i> | Willie Wagtail | | | | | | | | | | 4 | | ✓ | | 4 | |
| ESTRILDIDAE | | | | | | | | | | | | | | | | |
| <i>Emblema pictum</i> | Painted Finch | | | | | | | | | | 6 | 12 | | | 18 | |
| <i>Taeniopygia guttata</i> subsp. <i>castanotis</i> | Zebra Finch | | | | | | | | | | | 30 | | | 30 | |
| <i>Neochmia ruficauda</i> | Star Finch | | | | | | | | | | | 6 | | | 6 | |
| FALCONIDAE | | | | | | | | | | | | | | | | |
| <i>Falco berigora</i> | Brown Falcon | | | | | | | | | | | 1 | | | 1 | |
| MALURIDAE | | | | | | | | | | | | | | | | |
| <i>Malurus assimilis</i> | Purple-backed Fairy-wren | | | | | | | | | | | | ✓ | | | |
| <i>Malurus lamberti</i> | Variegated Fairy-wren | | | | | | | | | | 1 | | | | 7 | |
| <i>Stipiturus ruficeps</i> | Rufous-crowned Emu-wren | | | | | | | | | | | 1 | | | 1 | |
| MELIPHAGIDAE | | | | | | | | | | | | | | | | |
| <i>Epthianura tricolor</i> | Crimson Chat | | | | | | | | | | 1 | | | | 1 | |
| <i>Lacustroica whitei</i> | Grey Honeyeater | | | | | | | | | | | 2 | | | 2 | |
| <i>Lichmera indistincta</i> | Brown Honeyeater | | | | | | | | | | | | 6 | | 6 | |
| <i>Manorina flavigula</i> | Yellow-throated Miner | | | | | | | | | | | | 15 | | 17 | |
| <i>Ptilotula keartlandi</i> | Grey-headed Honeyeater | | | | | | | | | | | | 2 | | 4 | |
| <i>Ptilotula penicillata</i> | White-plumed Honeyeater | | | | | | | | | | | | 20 | ✓ | 21 | |
| MEROPIIDAE | | | | | | | | | | | | | | | | |
| <i>Merops ornatus</i> | Rainbow Bee-eater | | | | 2 | | | | | | | | | | 6 | 10 |
| OTIDIDAE | | | | | | | | | | | | | | | | |
| <i>Ardeotis australis</i> | Australian Bustard | | | | 1 | | | | | | | | | | 1 | 2 |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song meter) | Totals |
|--|----------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|-----------------|------|---------------------|---------------------------|--------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | | | | | |
| PACHYCEPHALIDAE | | | | | | | | | | | | | | | |
| <i>Pachycephala rufiventris</i> | Rufous Whistler | | | | | | | 1 | | | | 2 | | | 3 |
| <i>Colluricincla harmonica</i> | Grey Shrike-thrush | | | | 1 | | | 2 | | | | 6 | ✓ | | 9 |
| PARDALOTIDAE | | | | | | | | | | | | | | | |
| <i>Pardalotus striatus subsp. murchisoni</i> | Striated Pardalote | | | | | | | 1 | | | 2 | | | | 3 |
| PETROICIDAE | | | | | | | | | | | | | | | |
| <i>Melanodryas cucullata</i> | Hooded Robin | | | | | | | | | | | | ✓ | | |
| PHASIANIDAE | | | | | | | | | | | | | | | |
| <i>Coturnix ypsilophora</i> | Brown Quail | | | | | | | 2 | | | | | | | 2 |
| PODARGIDAE | | | | | | | | | | | | | | | |
| <i>Podargus strigoides</i> | Tawny Frogmouth | | | | | | | | | | | 1 | | | 1 |
| POMATOSTOMIDAE | | | | | | | | | | | | | | | |
| <i>Pomatostomus temporalis</i> | Grey-crowned Babbler | | | | | | | 1 | | | | 8 | | | 9 |
| PSITTACIDAE | | | | | | | | | | | | | | | |
| <i>Platycercus varius</i> | Mulga Parrot | | | | | | | | | | | | | | |
| <i>Melopsittacus undulatus</i> | Budgerigar | | | | 8 | | | | | | | 13 | | | 21 |
| <i>Platycercus zonarius subsp. zonarius</i> | Port Lincoln Parrot | | | | 1 | | | | | | | 2 | ✓ | | 3 |
| PTILINORHYNCHIDAE | | | | | | | | | | | | | | | |
| <i>Ptilonorhynchus guttatus</i> | Western Bowerbird | | | | 1 | | | 2 | | | 1 | | ✓ | | 4 |
| STRIGIDAE | | | | | | | | | | | | | | | |
| <i>Ninox connivens</i> | Barking Owl | | | | | | | | | | | | ✓ | | |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song meter) | Totals |
|---------------------------------|------------------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|-----------------|------|---------------------|---------------------------|--------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | | | | | |
| <i>Ninox boobook</i> | Australian Boobook | | | | | | | | | | | | ✓ | | |
| SYLVIIDAE | | | | | | | | | | | | | | | |
| <i>Acrocephalus australis</i> | Australian Reed Warbler | | | | | | | | | | | 1 | | | 1 |
| <i>Eremiornis carteri</i> | Spinifex bird | | | | | | | | | | | 2 | | | 2 |
| <i>Tyto javanica</i> | Eastern Barn Owl | | | | | | | | | | | | ✓ | | |
| Amphibians | | | | | | | | | | | | | | | |
| MYOBATRACHIDAE | | | | | | | | | | | | | | | |
| <i>Pseudophryne douglasi</i> | Gorge Toadlet | | | | | | | | | | | 4 | | | 4 |
| <i>Uperoleia saxatilis</i> | Pilbara Toadlet | | | | | | | | | | | 1 | | | 1 |
| Mammals | | | | | | | | | | | | | | | |
| BOVIDAEIDAE | | | | | | | | | | | | | | | |
| <i>Bos taurus</i> | Domestic Cattle | int | | 6 | | | | | | | | | 1 | | 1 |
| CANIDAE | | | | | | | | | | | | | | | |
| <i>Canus lupis dingo</i> | Dingo | | | | | | | | | | | | 1 | | 1 |
| EMBALLONURIDAE | | | | | | | | | | | | | | | |
| <i>Saccolaimus flaviventris</i> | Yellow-belly Sheath-tail Bat | | | | | | | | | | | | | | D |
| <i>Taphozous georgianus</i> | Common Sheath-tail Bat | | | | | | | | | | | | | | D |
| <i>Taphozous hilli</i> | Hill's Sheathtail-bat | | | | | | | | | | | | | | SG |
| FELIDAE | | | | | | | | | | | | | | | |
| <i>Felis catus</i> | Cat | | | | | | | | | | | | 2 | | 2 |
| MACROPODIDAE | | | | | | | | | | | | | | | |
| <i>Osphranter robustus</i> | Euro | | | | | | | | | | | | 6 | | 6 |
| <i>Petrogale rothschildi</i> | Rothschild's Rock Wallaby | | | | | | | | | | | | 1 | | 1 |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song meter) | Totals |
|---|-----------------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|-----------------|------|---------------------|---------------------------|--------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | | | | | |
| MEGADERMATIDAE | | | | | | | | | | | | | | | |
| <i>Macroderma gigas</i> | Ghost Bat | | | | | | | | | | | S | | | |
| MOLOSSIDAE | | | | | | | | | | | | | | | |
| <i>Austronomus australis</i> | White-striped free-tail Bat | | | | | | | D | | | | | D | | |
| <i>Chaerephon jobensis</i> | Northern Mastiff Bat | | | | | | | PR | | | | | PR | | D |
| <i>Mormopetrus Ozimops lumsdenae</i> | Northern Free-tailed Bat | | | | | | | D | | | | | PR | | D |
| MURIDAE | | | | | | | | | | | | | | | |
| <i>Pseudomys chapmani</i> | Pebble-mound Mouse | P4 | | | | | | | | | | | 3 M | | |
| <i>Pseudomys hermannsburgensis</i> | Sandy Inland Mouse | | 9 | | | | | | | | | | | | 9 |
| TACHYGLOSSIDAE | | | | | | | | | | | | | | | |
| <i>Tachyglossus aculeatus</i> | Short-beaked Echidna | | | | | | | | | | | | S | | |
| VESPERTILIOIDAE | | | | | | | | | | | | | | | |
| <i>Chalinolobus morio</i> | Chocolate Wattle Bat | | | | | | | PR | | | | | PR | | D |
| <i>Chalinolobus gouldii</i> | Gould's Wattle Bat | | | | | | | D | | | | | D | | D |
| <i>Scotorepens greyii</i> | Little Broad-nosed Bat | | | | | | | D | | | | | D | | D |
| <i>Vespadelus finlaysoni</i> | Inland Cave Bat | | | | | | | D | | | | | D | | D |
| Reptiles | | | | | | | | | | | | | | | |
| AGAMIDAE | | | | | | | | | | | | | | | |
| <i>Ctenophorus caudicinctus subsp. caudicinctus</i> | Ring-tailed dragon | | 1 | 1 | | | | | | | | | | | 2 |
| <i>Ctenophorus isolepis</i> | Military dragon | | | | | | | | | | | | 3 | | 3 |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | | Opp. | Bird acoustic (SM4) | Bat acoustic (song meter) | Totals | |
|----------------------------------|-----------------------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|--------------|------|---------------------|---------------------------|--------|------------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | Noct. Search | | | | | Bat Census |
| <i>Gowidon longirostris</i> | Long-nosed dragon | | | | | | 1 | | | | | 1 | | | | 2 |
| DIPLODACTYLIDAE | | | | | | | | | | | | | | | | |
| <i>Lucasium stenodactylum</i> | Crowned gecko | | 8 | | | | | | | 3 | | | | | | 11 |
| <i>Oedura fimbria</i> | Western Marbled Velvet Gecko | | | | | | 1 | | | | | | 1 | | | 2 |
| <i>Rhynchoedura ornata</i> | Western Beaked Gecko | | 2 | | | | | | | | | | | | | 2 |
| ELAPIDAE | | | | | | | | | | | | | | | | |
| <i>Demansia rufescens</i> | Rufous Whipsnake | | 1 | | | | | | | | | | | | | 1 |
| GEKKONIDAE | | | | | | | | | | | | | | | | |
| <i>Gehyra punctata</i> | Spotted Dtella | | | | | | 3 | | | | | | | | | 3 |
| <i>Gehyra unguiculata</i> | Crested-marked Pilbara Gehyra | | 3 | | | | 1 | | | | | | | | | 4 |
| <i>Gehyra micra</i> | Small Pilbara Spotted Rock Gehyra | | | | | | 1 | | | 6 | | | | | | 7 |
| <i>Gehyra purpurascens</i> | Purplish Dtella | | | | | | | 1 | | | | | 1 | | | 2 |
| PYGOPODIDAE | | | | | | | | | | | | | | | | |
| <i>Delma pax</i> | Peace Delma | | 2 | | | | | | | | | | | | | 2 |
| PYTHONIDAE | | | | | | | | | | | | | | | | |
| <i>Antaresia stimsoni</i> | Stimson's Python | | | | | | | | | | | | 1 | | | 1 |
| <i>Liasis olivaceus</i> | Pilbara Olive Python | | | | | | | | | | | | 1 | | | 1 |
| SCINCIDAE | | | | | | | | | | | | | | | | |
| <i>Carlia munda</i> | Shaded-litter Rainbow Skink | | | | | | 1 | | | | | | | | | 1 |
| <i>Cryptoblepharus ustulatus</i> | Russet Snake-eyed Skink | | | | | | | | 1 | | | | 6 | | | 7 |
| <i>Ctenotus inornatus</i> | Skink | | 2 | 1 | | | 4 | 1 | | | | | | | | 8 |
| <i>Lerista zeitzi</i> | Pilbara Blue-tailed Slider | | 1 | | | | 5 | | | | | | | | | 6 |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song meter) | Totals | |
|--|--------------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|--------------|-----------------|------|---------------------|---------------------------|--------|------------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | Noct. Search | | | | | | Bat Census |
| <i>Lerista muelleri</i> | Wood-mulch Slider | | 2 | 2 | | | | | | 6 | | | | | | | 10 |
| <i>Lerista bipes</i> | North-western Sandslider | | 1 | | | | | | | | | | | | | | 1 |
| <i>Menetia greyii</i> | Common Dwarf Skink | | 1 | | | | | | | | | | | | | | 1 |
| <i>Morethia ruficauda subsp. exquisita</i> | Fire-tailed Skink | | | | | | | | | 17 | 1 | | 1 | | | | 19 |
| TYPHLOPIDAE | | | | | | | | | | | | | | | | | |
| <i>Anilius ammodytes</i> | Sand-diving Blind Snake | | | | | | | | | 2 | | | | | | | 2 |
| <i>Anilius grypupus</i> | Beaked Blind Snake | | 2 | | | | | | | | | | | | | | 2 |
| <i>Heteronotia spelea</i> | Desert Cave Gecko | | | | | | | | | 3 | | | | | | | 3 |
| <i>Heteronotia binoei</i> | Bynoe's Gecko | | | | | | | | | 1 | | | | | | | 1 |
| VARANIDAE | | | | | | | | | | | | | | | | | |
| <i>Varanus tristis subsp. tristis</i> | Racehorse Goanna | | | | | | | | | | | | | 1 | | | 1 |
| <i>Varanus acanthurus</i> | Spiny-tailed Monitor | | | | | | | | | 1 | | | | | | | 1 |

Key; 6 – number of species recorded, ✓ – species recorded Pr- Probable recorded of species via bat detection or calls overlap with another species, D- Detected species via bat detector, SG 0 Species Group detected, iS – scat detected, F – Foraging evidence, nt- Introduced species, Vu- Vulnerable listed under either/or both EPBC or BC Acts, OS- Special Protection listed under BC Act, P1-4-Priority species listed by DBCA.

Phase two (March 2020): Species recorded during the trapping program including bat detection, active searches and opportunistic

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | Active Searches | Opp. | Bird acoustic (S/M4) | Bat acoustic (song) | Totals | |
|---|---------------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|-----------------|------|----------------------|---------------------|--------|--------------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | | | | | | Noct. Search |
| Birds | | | | | | | | | | | | | | | | |
| ACANTHIZIDAE | | | | | | | | | | | | | | | | |
| <i>Smicronis brevirostris</i> | Weebill | | | | | | | | | 1 | | | | | X | 1 |
| ACCIPITRIDAE | | | | | | | | | | | | | | | | |
| <i>Accipiter fasciatus</i> | Brown Goshawk | | | | 1 | | | | | | | | | | | 1 |
| <i>Milvus migrans</i> | Black Kite | | | | 1 | | | | | | | | | | | 1 |
| AEGOTHELIDAE | | | | | | | | | | | | | | | | |
| <i>Aegotheles cristatus</i> | Owlet-nightjar | | | | | | | | | | 1 | | | | X | 1 |
| ALCEDINIDAE | | | | | | | | | | | | | | | | |
| <i>Dacelo leachii</i> | Blue-winged Kookaburra | | | 1 | 1 | 1 | | | | | | | | | X | 3 |
| <i>Todiramphus sanctus</i> | Sacred Kingfisher | | | | 1 | | | | | 3 | | | | | X | 4 |
| CACATUIDAE | | | | | | | | | | | | | | | | |
| <i>Nymphicus hollandicus</i> | Cockatiel | | | | 6 | | | | | | | | | | X | 6 |
| CAMPEPHAGIDAE | | | | | | | | | | | | | | | | |
| <i>Coracina novaehollandiae</i> | Black-faced Cuckoo-shrike | | | | 2 | | | | | | | | | | X | 2 |
| CENTROPIDAE | | | | | | | | | | | | | | | | |
| <i>Centropus phasianinus</i> | Pheasant Coucal | | | | 1 | | | | | | | | | | | 1 |
| COLUMBIDAE | | | | | | | | | | | | | | | | |
| <i>Geopelia cuneatus</i> | Diamond Dove | | | | | | | | | | | | | | X | |
| <i>Geopelia striata</i> subsp. <i>placida</i> | Peaceful Dove | | | | 2 | | | | | | 1 | | | | X | 3 |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | | Trap Site 2 | | | | | Opp. | Bird acoustic (SM4) | Bat acoustic (song) | Totals | |
|---|--------------------------|--------|-------------|---------------|-------------|--------------|------------|-------------|---------------|-------------|--------------|------------|------|---------------------|---------------------|--------|----|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | Noct. Search | Bat Census | | | | | |
| <i>Geophaps plumifera</i> | Spinifex Pigeon | | | 1 | | | | | | | | | | | | | 1 |
| <i>Ocyphaps lophotes</i> | Crested Pigeon | | | | | | | | 1 | 1 | | | | | X | | 2 |
| CORVIDAE | | | | | | | | | | | | | | | | | |
| <i>Corvus orru</i> | Torresian Crow | | | 1 | 1 | | | | 7 | | | | | | X | | 9 |
| CRACTICIDAE | | | | | | | | | | | | | | | | | |
| <i>Cracticus nigrogularis</i> | Pied Butcherbird | | | | 2 | | | | 1 | | | | | | X | | 3 |
| <i>Cracticus tibicen</i> | Australian Magpie | | | | | | | | | | | | | | X | | |
| DICRURIDAE | | | | | | | | | | | | | | | | | |
| <i>Grallina cyanoleuca</i> | Magpie-lark | | | | 3 | | | | | | | | | | X | | 3 |
| <i>Rhipidura leucophrys</i> | Willie Wagtail | | | | 2 | | | | | | | | | | X | | 2 |
| ESTRILDIDAE | | | | | | | | | | | | | | | | | |
| <i>Emblema pictum</i> | Painted Finch | | | | 2 | | | | | | | | | | X | | 2 |
| <i>Taeniopygia guttata</i> subsp. <i>castanotis</i> | Zebra Finch | | | | | | | | | | | | | | X | | |
| FALCONIDAE | | | | | | | | | | | | | | | | | |
| <i>Falco berigora</i> | Brown Falcon | | | | 1 | | | | | | | | | | | | 1 |
| MELIPHAGIDAE | | | | | | | | | | | | | | | | | |
| <i>Acanthagenys rufogularis</i> | Spiny-cheeked Honeyeater | | | | 1 | | | | | | | | | | | | 1 |
| <i>Manorina flavigula</i> | Yellow-throated Miner | | | | | | | | 8 | | | | | | | | 8 |
| <i>Ptilotula penicillata</i> | White-plumed Honeyeater | | | | 2 | | | | 3 | | | | | | X | | 5 |
| <i>Gavicalis virescens</i> | Singing Honeyeater | | | 1 | 1 | | | | 1 | | | | | | | | 3 |
| MEROPIDAE | | | | | | | | | | | | | | | | | |
| <i>Merops ornatus</i> | Rainbow Bee-eater | | | | 2 | | | | 8 | | | | | | X | | 10 |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song) | Totals |
|--|----------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|-----------------|------|---------------------|---------------------|--------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | | | | | |
| PACHYCEPHALIDAE | | | | | | | | | | | | | | | |
| <i>Pachycephala rufiventris</i> | Rufous Whistler | | | | | | | 1 | | | | | | X | 1 |
| <i>Colluricincla harmonica</i> | Grey Shrike-thrush | | | | 1 | | | 4 | | | | | | | 5 |
| PHASIANIDAE | | | | | | | | | | | | | | | |
| <i>Coturnix ypsilophora</i> | Brown Quail | | | | | | | 3 | | | | | | X | 3 |
| POMATOSTOMIDAE | | | | | | | | | | | | | | | |
| <i>Pomatostomus temporalis</i> | Grey-crowned Babbler | | | | 7 | | | 3 | 7 | | | | | X | 17 |
| PSITTACIDAE | | | | | | | | | | | | | | | |
| <i>Melopsittacus undulatus</i> | Budgerigar | | | | 11 | | | | 15 | | | | | X | 26 |
| <i>Platycercus zonarius</i> subsp. <i>zonarius</i> | Port Lincoln Parrot | | | | 3 | | | | 2 | | | | | X | 5 |
| PTILINORHYNCHIDAE | | | | | | | | | | | | | | | |
| <i>Ptilonorhynchus guttatus</i> | Western Bowerbird | | | | | | | | 2 | | | | | X | 2 |
| STRIGIDAE | | | | | | | | | | | | | | | |
| <i>Ninox connivens</i> | Barking Owl | | | | | | | | | | | | | X | |
| <i>Ninox boobook</i> | Australian Boobook | | | | | | | | | 1 | | | | X | 1 |
| Amphibians | | | | | | | | | | | | | | | |
| MYOBATRACHIDAE | | | | | | | | | | | | | | | |
| <i>Cyclorana maini</i> | Sheep Frog | | | | 7 | | | 2 | | 2 | | | | | 1 1 |
| <i>Pseudophryne douglas</i> | Gorge Toadlet | | | | 12 | | | 3 | | | | | | | 15 |
| PELODRYADDIDAE | | | | | | | | | | | | | | | |
| <i>Litoria rubella</i> | Little Red Tree Frog | | | | | | | | | 2 | | | | | 2 |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | Trap Site 2 | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song) | Totals | |
|--------------------------------------|------------------------------|--------|-------------|---------------|-------------|--------------|-------------|-------|---------------|-------------|-----------------|------|---------------------|---------------------|--------|--------------|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | | | | | | Noct. Search |
| Mammals | | | | | | | | | | | | | | | | |
| BOVIDAEIDAE | | | | | | | | | | | | | | | | |
| <i>Bos taurus</i> | Domestic Cattle | int | | | | | | | | | | | | 1 | | 1 |
| CANIDAE | | | | | | | | | | | | | | | | |
| <i>Canus dingo</i> | Dingo | | | | | | | 1 | | | | | | | | 1 |
| EMBALLONURIDAE | | | | | | | | | | | | | | | | |
| <i>Saccolaimus flaviventris</i> | Yellow-belly Sheath-tail Bat | | | | | | | | | | | | | | D | |
| <i>Taphozous georgianus</i> | Common Sheath-tail Bat | | | | | | | | | | | | | | D | |
| MACROPODIDAE | | | | | | | | | | | | | | | | |
| <i>Osphranter robustus</i> | Euro | | | 1 | | | | 1 | | | | | | | | 2 |
| MOLOSSIDAE | | | | | | | | | | | | | | | | |
| <i>Austronomus australis</i> | White-striped free-tail Bat | | | | | | | | | | | | | | | D |
| <i>Mormopetrus Ozimops lumsdenae</i> | Northern Free-tailed Bat | | | | | | | | | | | | | | P R | P R |
| MURIDAE | | | | | | | | | | | | | | | | |
| <i>Pseudomys hermannsburgensis</i> | Sandy Inland Mouse | | | 1 | | | | | | | | | | | | 1 |
| VESPERTILIOIDAE | | | | | | | | | | | | | | | | |
| <i>Chalinolobus morio</i> | Chocolate Wattle Bat | | | | | | | | | | | | | | P R | D D |
| <i>Chalinolobus gouldii</i> | Gould's Wattle Bat | | | | | | | | | | | | | | D | D |
| <i>Nyctophilus sp.</i> | | | | | | | | | | | | | | | P R | P R |
| <i>Scotorepens greyii</i> | Little Broad-nosed Bat | | | | | | | | | | | | | | D | D |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | | Trap Site 2 | | | | | Active Searches | Opp. | Bird acoustic (SM4) | Bat acoustic (song) | Totals | |
|---------------------------------|----------------------------------|--------|-------------|---------------|-------------|--------------|------------|-------------|---------------|-------------|--------------|------------|-----------------|------|---------------------|---------------------|--------|----|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | Noct. Search | Bat Census | | | | | | |
| <i>Vespadelus finlaysoni</i> | Inland Cave Bat | | | | | | | | | | | | | | | | | D |
| Reptiles | | | | | | | | | | | | | | | | | | |
| AGAMIDAE | | | | | | | | | | | | | | | | | | |
| <i>Ctenophorus caudicinctus</i> | Ring-tailed Dragon | | 2 | 2 | | | | | | | | | | | | | | 4 |
| <i>Gowidon longirostris</i> | Long-nosed Dragon | | | | | | | 2 | | | | | | | | | | 2 |
| DIPLODACTYLIDAE | | | | | | | | | | | | | | | | | | |
| <i>Lucasium stenodactylum</i> | Crowned Gecko | | 4 | | | | | | | | | | | | | | | 4 |
| <i>Oedura fimbria</i> | Western Marbled Velvet Gecko | | | | | | | | | 4 | | | | | | | | 4 |
| ELAPIDAE | | | | | | | | | | | | | | | | | | |
| <i>Pseudechis australis</i> | Mulga Snake | | | | | | | 2 | | | | | | | | | | 2 |
| <i>Pseudonaja mengdeni</i> | Gwardar | | | | | | | 1 | | | | | | | | | | 1 |
| <i>Brachyuropis approximans</i> | North-western Shovel-nosed Snake | | 2 | | | | | | | | | | | | | | | 2 |
| GEKKONIDAE | | | | | | | | | | | | | | | | | | |
| <i>Gehyra punctata</i> | Spotted Dtella | | | | | | | 7 | 1 | 3 | | | | | | | | 11 |
| <i>Gehyra variegata</i> | Tree Gecko | | 2 | | | | | | | | | | | | | | | 2 |
| <i>Heteronotia spelea</i> | Desert Cave Gecko | | | | | | | 6 | | 2 | | | | | | | | 8 |
| <i>Heteronotia binoei</i> | Bynoe's Gecko | | | | | | | 2 | | 1 | | | | | | | | 3 |
| PYGOPODIDAE | | | | | | | | | | | | | | | | | | |
| <i>Delma pax</i> | Peace Delma | | 1 | | | | | | 3 | | | | | | | | | 4 |
| PYTHONIDAE | | | | | | | | | | | | | | | | | | |
| <i>Antaresia perthensis</i> | Pygmy Python | | | | | | | 3 | | | | | | | | | | 3 |
| SCINCIDAE | | | | | | | | | | | | | | | | | | |
| <i>Carlia munda</i> | Shaded-litter Rainbow Skink | | 1 | | | | | 1 | 1 | | | | | | | | | 3 |
| <i>Ctenotus helenae</i> | Skink | | 3 | | | | | | | | | | | | | | | 3 |
| <i>Ctenotus inornatus</i> | Rock Ctenotus | | 8 | | | | | 7 | 1 | | | | | | | | | 16 |

| Family, Genus, Species | Common name | Status | Trap Site 1 | | | | | Trap Site 2 | | | | | Opp. | Bird acoustic (SM4) | Bat acoustic (song) | Totals | |
|--|---------------------------------|--------|-------------|---------------|-------------|--------------|------------|-------------|---------------|-------------|--------------|------------|------|---------------------|---------------------|--------|---|
| | | | Traps | Active search | Bird Census | Noct. Search | Bat Census | Traps | Active search | Bird Census | Noct. Search | Bat Census | | | | | |
| <i>Egernia formosa</i> | Goldfields Crevice-skink | | | | | | | | | | 2 | | | | | | 2 |
| <i>Eremiascincus isolepis</i> | Skink | | | | | | | | | | 2 | | | | | | 2 |
| <i>Lerista zeitzi</i> | Pilbara Blue-tailed Slider | | | | | | | | | | 1 | | | | | | 1 |
| <i>Lerista muelleri</i> | Mueller's Three-toed Slider | | 3 | | | | | | | | | | | | | | 3 |
| <i>Morethia ruficauda subsp. exquisita</i> | Fire-tailed Skink | | | | | | | | | | 5 | | | | | | 5 |
| TYPHLOPIDAE | | | | | | | | | | | | | | | | | |
| <i>Anilius grypupus</i> | Beaked Blind Snake | | | | | | | | | | 1 | | | | | | 1 |
| <i>Anilius ganei</i> | Pilbara Flat-headed Blind-snake | | | | | | | | | | 1 | | | | | | 1 |

Key; 6-numbers of recorded species, Pr- Probable recorded of species via bat detection or calls overlap with another species, D- Detected species via bat detector, SG - Species Group: call made by one of two or more species. Call characteristics overlap, particularly poor quality calls or mixed species calls making it difficult to distinguish between species, S- Scats of the species recorded, int- Introduced species, Vu- Vulnerable listed under either/or both EPBC or BC Acts, OS- Special Protection listed under BC Act, P1-4-Priority species listed by DBCA.

Caves assessed

| Cave ID | Date | Easting | Northing | Cave type | Entrance dimensions | Internal dimensions | Bats observed | Cave Type and comments |
|---------|------------|------------|-------------|-----------|------------------------|--|---|--|
| Cav-01 | 12/09/2019 | 721483.539 | 7474291.816 | Overhang | 6 m wide by 1.2 m high | Approximately 15 m deep, two chambers, 4 m height of highest chamber | Approx. 10 old Ghost Bat scat recorded, <i>T. georgianus</i> scat and one individual recorded | Potential diurnal roost (occasional usage) for Ghost Bat with multiple medium sized chambers. May provide potential diurnal roost habitat for small number of Ghost Bat. Unlikely to provide breeding habitat. Appears to receive water during the wet season. Considered to be a potential diurnal roost. |
| Cav-02 | 12/09/2019 | 721504.529 | 7474276.215 | Overhang | 8 m wide by 2 m high | Approximately 10 m deep, three chambers, 2.5 m height of highest chamber | Approx. five old Ghost Bat scat recorded. Recent other microbat scats. One <i>V. finlaysoni</i> was recorded in flight. | Potential diurnal roost (occasional usage) for Ghost Bat with multiple chambers. May provide potential diurnal roost habitat for small number of Ghost Bat. Unlikely to provide breeding habitat. |
| Cav-03 | 12/09/2019 | 721974.581 | 7474118.264 | Overhang | 10 m wide by 2 m high | Approximately 6 m deep, single chamber, 2 m high | Approx. 10 possible fresh Ghost Bat scat recorded, some | Potential foraging cave with one main opening. No roosting space available, lots of <i>T. georgianus</i> scat and one individual |

| Cave ID | Date | Easting | Northing | Cave type | Entrance dimensions | Internal dimensions | Bats observed | Cave Type and comments |
|---------|------------|------------|-------------|-----------|--------------------------|--|-------------------|---|
| | | | | | | | foraging evidence | roosting. Pilbara Olive Python scat also found at this cave. |
| Cav-04 | 12/09/2019 | 721970.252 | 7474122.304 | Cavity | 0.5 m wide by 25 m high | Approximately 10 m deep, single chamber, 25 m high | None | Vertical slit running from ground to 2/3 up gorge face. Next to permanent water hole surrounded by riparian vegetation. |
| Cav-05 | 12/09/2019 | 720439.501 | 7473914.389 | Overhang | 5 m wide by 2 m high | Approximately 8 m deep, two chambers | None | Inaccessible due to position in cliffs. Appears to be deep. Requires further assessment. |
| Cav-06 | 12/09/2019 | 721721.900 | 7473998.610 | Overhang | 2.5 m wide by 0.6 m high | Approximately 15 m deep by 1 m high | None. | Required further assessment. |
| Cav-07 | 12/09/2019 | 720489.932 | 7473812.292 | Overhang | 2 m wide by 0.5 m high | Approximately 15 m deep by 1 m high | None. | Required further assessmen. Did not crawl to back. |

| Cave ID | Date | Easting | Northing | Cave type | Entrance dimensions | Internal dimensions | Bats observed | Cave Type and comments |
|---------|------------|------------|-------------|-----------|-------------------------|--|---|---|
| Cav-08 | 15/09/2019 | 721726.199 | 7474223.940 | Overhang | 2 m wide by 1.5 m high | Approximately 5 m deep, two chambers, 3 m height of highest chamber | <i>T. georgianus</i> scat was present in accessible caves. | Group of caves. Only those accessible were assessed (due to steep position in landscape). |
| Cav-09 | 18/09/2019 | 720608.919 | 7474122.359 | Cavity | - | - | - | Unable to access due to position in landscape. |
| Cav-10 | 18/09/2019 | 720242.608 | 7473615.347 | Overhang | 10 m wide by 3.5 m high | Approximately 20 m deep, six chambers, 10 m height of highest chamber | Foraging signs including extensive diamond dove and wood swallow feathers, old and fresh scat present | Potential day and feeding roost. Extensive cave system with multiple large chambers, very humid, multiple entrances, appears to be seasonally wet, three <i>T. georgianus</i> seen in flight. Considered to be potential diurnal roost for Ghost Bat. |
| Cav-11 | 18/09/2019 | 720226.467 | 7473616.166 | Overhang | 3 m wide by 2 m high | Approximately 10 m deep, two chambers, 1.5 m height of highest chamber | No evidence of Ghost Bat use. | Many tube shoots in honeycomb cliff face. Requires further assessment. |

| Cave ID | Date | Easting | Northing | Cave type | Entrance dimensions | Internal dimensions | Bats observed | Cave Type and comments |
|---------|------------|------------|-------------|-----------|----------------------|--|------------------------------------|---|
| Cav-12 | 18/09/2019 | 720220.609 | 7473594.891 | Overhang | 3 m wide by 2 m high | Approximately 20 m deep, two chambers, 1.5 m height of highest chamber | One <i>V. finlaysoni</i> observed. | Cave in at entrance so did not enter cave to assess evidence of use. <i>V. finlaysoni</i> observed flying inside. |

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Document Status

| Revision | Author | Reviewer | | Approved for Issue | | |
|----------|-----------------------------|----------|---|--------------------|---|------------|
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