

# Homestead West & Cathedral Gorge Targeted Significant Fauna Survey May 2023

Prepared for  
BHP Western Australian Iron Ore



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# Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

*Prepared for*  
BHP Western Australian Iron Ore

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## Abbreviations

| Abbreviation | Definition                                                                   |
|--------------|------------------------------------------------------------------------------|
| ALA          | Atlas of Living Australia                                                    |
| ARU          | Autonomous Recording Unit                                                    |
| Astron       | Astron Environmental Services                                                |
| BC Act       | <i>Biodiversity and Conservation Act 2016</i>                                |
| BHP WAIO     | BHP Western Australia Iron Ore                                               |
| BOM          | Bureau of Meteorology                                                        |
| CD           | Conservation dependent                                                       |
| CR           | Critically Endangered                                                        |
| DBCA         | Department of Biodiversity, Conservation and Attractions                     |
| DEHWA        | Department of Water, Heritage and the Arts                                   |
| DSWEPaC      | Department of Sustainability, Water, Environment, Population and Communities |
| EN           | Endangered                                                                   |
| EPA          | Environmental Protection Authority                                           |
| EPBC Act     | <i>Environment Protection and Biodiversity Conservation Act 1999</i>         |
| ESA          | Environmentally Sensitive Area                                               |
| GPS          | Geographical Positioning System                                              |
| ha           | Hectare                                                                      |
| IBRA         | Interim Biogeographic Regionalisation for Australia                          |
| km           | Kilometre                                                                    |
| m            | Metre                                                                        |
| Mi           | Migratory                                                                    |
| MNES         | Matters of National Environmental Significance                               |
| OS           | Specially Protected                                                          |
| P            | Priority                                                                     |
| PMST         | Protected Matters Search Tool                                                |
| SM           | SongMeter                                                                    |
| T            | Threatened                                                                   |
| VHF          | Very High Frequency                                                          |
| VU           | Vulnerable                                                                   |
| °C           | Degrees Celsius                                                              |

## Executive Summary

Astron Environmental Services was commissioned by BHP Western Australian Iron Ore (BHP WAIIO) to undertake a targeted vertebrate fauna survey, specifically targeting the presence of Matters of National Environmental Significance (MNES) and other significant vertebrate fauna within the Homestead West and Cathedral Gorge survey area. The survey area is located approximately 9 km north-west of Newman and covers an area of approximately 3,266 ha. The fauna assessment did not assess any specific development proposed by BHP WAIIO; however, it will be used to inform future environmental approvals across the area.

Nine broad fauna habitat types, excluding Disturbed areas, were recorded in the survey area: Breakaway/ Cliff, Drainage Area/ Floodplain, Gilgai Plain, Gorge/ Gully, Hillcrest/ Hillslope, Major Drainage Line, Minor Drainage Line, Stony Plain, and Undulating Low Hills. Most of these fauna habitat types within the survey area have the potential to support significant species to varying extents. With regard to MNES species, Gorge/Gully, Breakaway/Cliff and Major Drainage Lines have the potential to provide critical habitat for Pilbara olive python (*Liasis olivaceus barroni*) (VU; VU), northern quoll (*Dasyurus hallucatus*) (EN; EN), ghost bat (*Macroderma gigas*) (VU; VU), and Pilbara leaf-nosed bat (*Rhinonictis aurantia*) (VU; VU). Minor disturbances to fauna habitats included weed invasion, road/access tracks and mining exploration, with Major Drainage Line and Drainage Area/Floodplain habitats the most impacted. None of the habitats within the survey area are restricted at a local or sub-regional scale.

The Gorge/ Gully and Breakaway/ Cliff habitat types are considered critical habitat for the Pilbara olive python and northern quoll, and supporting habitat for several other MNES species, including the ghost bat and Pilbara leaf-nosed bat. Caves in these habitat types can often provide critical roosting habitat for ghost bat and Pilbara leaf-nosed bat; however, the 21 caves recorded in the survey area were of minor significance, consisting of 19 Category 4 (potential feed cave) and two Category 5 (little to no usage) caves. These caves within the survey area were generally open and shallow and, thus, considered unlikely to support diurnal roosting opportunities for either species. One pool was supported within Gorge/Gully habitat along Major Drainage Line habitat, with these habitats representing critical habitat for the Pilbara olive python and grey falcon, and supporting habitat for several other MNES species.

Eighty-one vertebrate fauna species were recorded during the survey, comprising one amphibian, 10 reptiles, 52 birds, and 18 mammals (including three introduced species). The fauna species assemblages recorded during the survey were considered typical for a targeted vertebrate fauna survey within the Hammersley subregion.

One MNES species, Pilbara olive python, was recorded within the survey area via secondary sign. Relict scats were observed in one location within Gorge/Gully habitat in a small cave adjacent to a pool. Previous surveys had also found evidence of Pilbara olive python within the vicinity of the current record; however, eDNA analysis of water samples collected from the pool during the current survey did not detect the presence of Pilbara olive python. No other signs of Pilbara olive python or other MNES fauna species were observed within the survey area.

The post-survey likelihood of occurrence for the MNES species ghost bat, Pilbara leaf-nosed bat and grey falcon (*Falco hypoleucos*) (VU; VU) are considered 'high' despite no observations coming from the current survey. These three species have been recently recorded within or proximate to the survey area on previous surveys, and supporting habitat is present throughout the survey area. The likelihood of occurrence for the northern quoll was assessed as 'moderate' due to the presence of critical and supporting habitat across the survey area but lack of nearby records.

One additional species of significance was recorded during the current survey: western pebble-mound mouse (*Pseudomys chapmani*) (P4). Nine mounds (five active, two recently inactive, and two inactive) were observed across the Stony Plain and Undulating Low Hills habitats across the survey area. These habitats are widespread and well represented outside of the survey area.

Two other significant species, the peregrine falcon (*Falco peregrinus*) (OS) and Gane's blind snake (*Anilius ganei*) (P1), were assessed as having a 'high' post-survey likelihood of occurrence given previous records in the vicinity and the presence of suitable habitat within the survey area.

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## 1 Introduction

### 1.1 Project Background

Astron Environmental Services (Astron) was commissioned by BHP Western Australian Iron Ore (BHP WAIO) to undertake a single season targeted vertebrate fauna survey, specifically targeting the presence of Matters of National Environmental Significance (MNES) and other significant vertebrate fauna, covering the Homestead West and Cathedral Gorge area (hereafter referred to as the survey area). The survey area is located approximately 9 km north-west of Newman and covers an area of approximately 3,266 ha (Figure 1). The fauna assessment is not assessing any specific development proposed by BHP WAIO, though it may be used to inform future environmental approvals across the area.

### 1.2 Scope and Objectives

The objective was to undertake a targeted vertebrate fauna assessment, with a specific focus on MNES and other significant fauna species, through a field survey and desktop assessment. The desktop assessment informed the field survey and included a comprehensive database and literature review for potentially occurring MNES species, including ghost bat (*Macroderma gigas*) (VU; VU), Pilbara leaf-nosed bat (*Rhinonicteris aurantia*) (VU; VU), bilby (*Macrotis lagotis*) (VU; VU), northern quoll (*Dasyurus hallucatus*) (EN; EN), grey falcon (*Falco hypoleucos*) (VU), southern whiteface (*Aphelocephala leucopsis*) (VU), night parrot (*Pezoporus occidentalis*) (EN; CR), great desert skink (*Liopholis kintorei*) (VU; VU), and Pilbara olive python (*Liasis olivaceus barroni*) (VU; VU). The targeted vertebrate fauna assessment also surveyed for other significant fauna species likely to occur in the general locality of the survey area, including peregrine falcon (*Falco peregrinus*) (OS), long-tailed dunnart (*Antechinomys longicaudata*) (P4), brush-tailed mulgara (*Dasycercus blythi*) (P4), and western pebble-mound mouse (*Pseudomys chapmani*) (P4). The scope of work was to undertake:

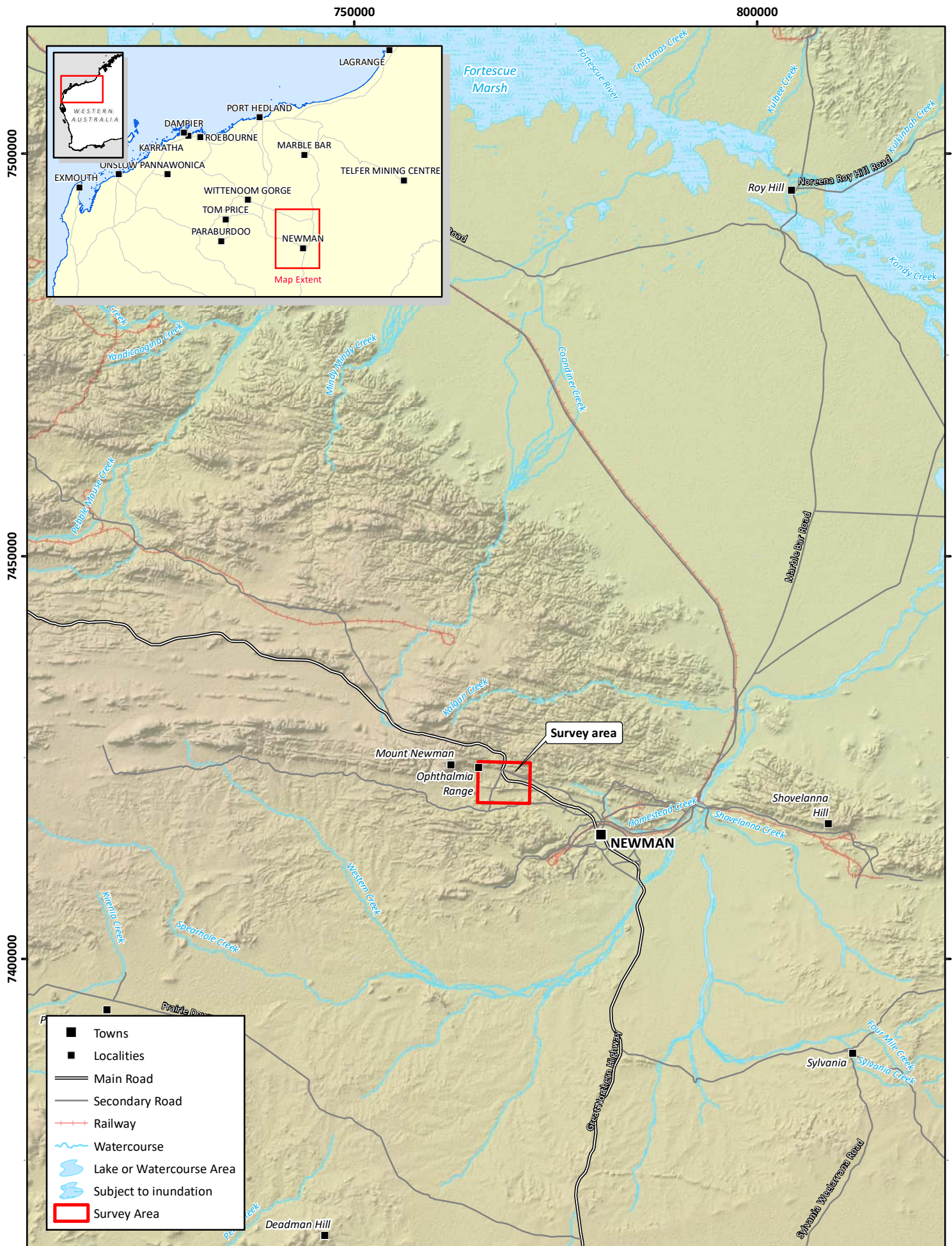
- A desktop assessment, including a comprehensive database and literature review for the presence, or likely presence, of significant vertebrate fauna species and communities.
- A targeted vertebrate fauna field survey, including:
  - targeted MNES species sampling and searches
  - other fauna species sampling and searches, particularly other significant fauna
  - fauna habitat assessments and mapping.

Astron conducted the fauna survey in accordance with the regulatory guidance detailed in Table 1 and BHP WAIO's internal guidance document (BHP 2023a) and Spatial Data Requirements (BHP 2023b).

The scope of the survey is outlined in Table 1. Section 3.4 of this report provides details on the limitations of the survey.

Table 1: Summary of Astron’s targeted vertebrate fauna assessment.

| Level of survey                                                                                                                        | Survey area size | Survey timing    | Relevant regulatory guidance documents                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Targeted vertebrate fauna assessment (specifically Matters of National Environmental Significance and other significant fauna species) | 3,266 ha         | 8 to 15 May 2023 | <ul style="list-style-type: none"> <li>• Environmental Protection Authority (EPA) (2018) Statement of Environmental Principles, Factors and Objectives</li> <li>• EPA (2016) Environmental Factor Guideline – Terrestrial Fauna</li> <li>• EPA (2020) Technical Guidance – Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment</li> <li>• Department of Environment, Water, Heritage and the Arts (DEWHA) (2013) Significant Impact Guidelines 1.1 – Matters of National Environmental Significance</li> <li>• DEWHA (2010a) Survey Guidelines for Australia’s Threatened Bats</li> <li>• DEWHA (2010b) Survey Guidelines for Australia’s Threatened Birds</li> <li>• DEWHA (2010c) Survey Guidelines for Australia’s Threatened Frogs</li> <li>• Department of Sustainability, Environment, Water, Population and Communities (DSWEPaC) (2011a) Survey Guidelines for Australia’s Threatened Mammals</li> <li>• DSWEPaC (2011b) Survey Guidelines for Australia’s Threatened Reptiles</li> <li>• Department of the Environment and Energy (2016) Referral guideline for the endangered northern quoll <i>Dasyurus hallucatus</i></li> <li>• Department of Biodiversity, Conservation and Attractions (DBCA) (2017) Guidelines for surveys to detect the presence of bilbies, and assess the importance of habitat in Western Australia</li> <li>• Department of Parks and Wildlife (2017) Interim Guideline for Preliminary Surveys of Night Parrot (<i>Pezoporus occidentalis</i>) in Western Australia</li> <li>• Bat Call WA (2021a) A review of ghost bat ecology, threats and survey requirements</li> <li>• Bat Call WA (2021b) A review of Pilbara leaf nosed bat ecology, threats and survey requirements</li> <li>• BHP WAIO’s (BHP 2023a) Guidance for Vertebrate Fauna Surveys in the Pilbara (SPR-IEN-EMS-012)</li> <li>• BHP WAIO’s (BHP 2023b) Biological Survey Spatial Data Requirements (SPR-IEN-EMS-015).</li> </ul> |



BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge Targeted Significant Fauna Survey



**Figure 1: Survey area location**

|                     |                                                    |                                                                                        |
|---------------------|----------------------------------------------------|----------------------------------------------------------------------------------------|
| Author: S. Smithies | Date: 17-10-2023                                   | <p>Datum: GDA 1994 - Projection: MGA Zone 50</p> <p>0 5 10 15 20 25 30 Km</p> <p>N</p> |
| Drawn: C. Dyde      | Figure Ref: 2400-08-22-BIDR-1RevB_231017_Fig1_Locn |                                                                                        |

## 2 Environmental Context

### 2.1 Physical Environment

#### 2.1.1 Climate

The climate of the Pilbara region of Western Australia is classified as arid tropical with two distinct seasons: a hot, wet summer (October – April) and a mild, dry winter (May – September) (Bureau of Meteorology 2023).

Based on long-term climatic data from the nearest Bureau of Meteorology (BOM) weather station at Newman Aero (Station 007176) (approximately 9 km south-east of the survey area) the mean annual rainfall since 1971 is 313.5 mm. The mean maximum daily temperatures ranges between 23.1°C and 39.3°C, and ranges above 30°C for much of the year (Bureau of Meteorology 2023).

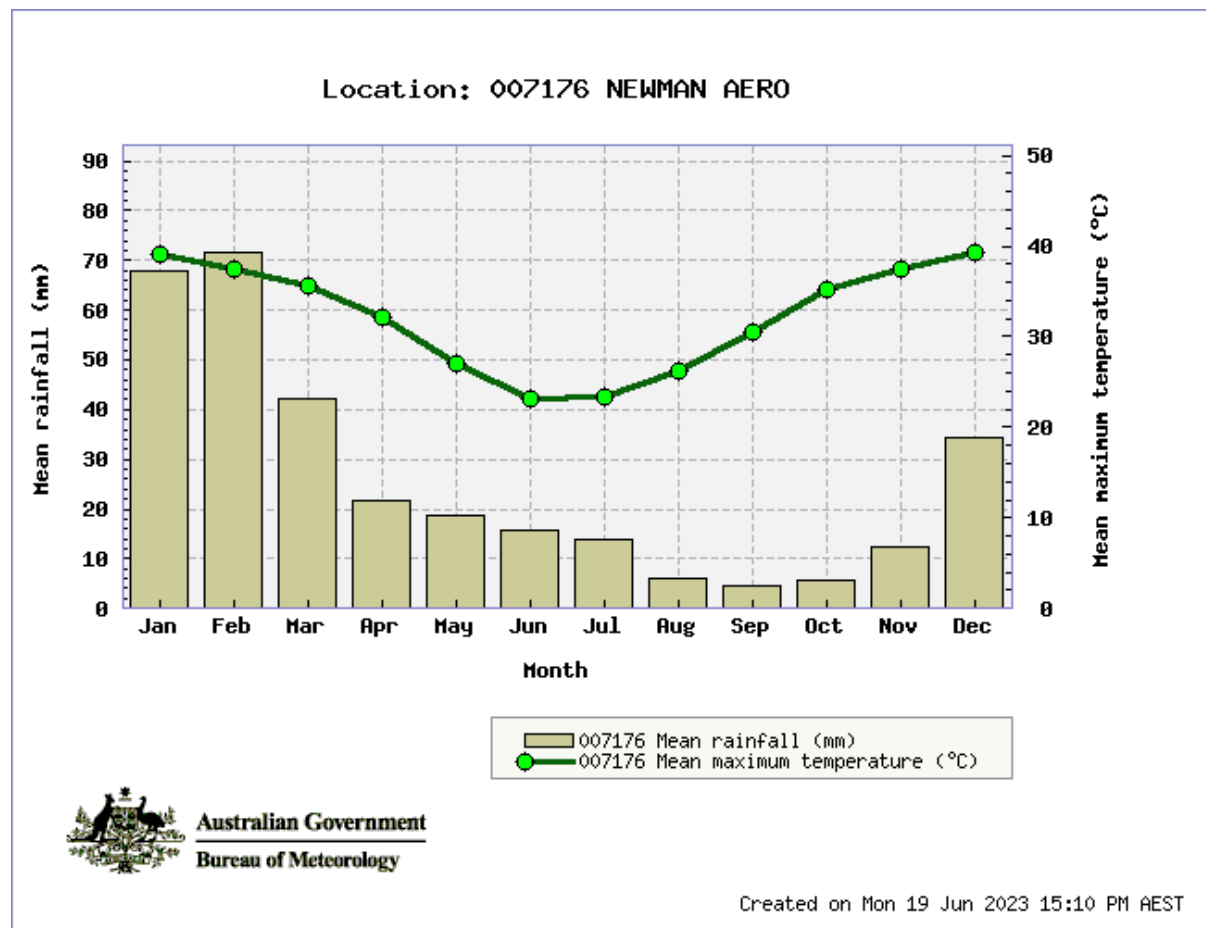


Figure 2: Climate data for Newman Aero Station (007176). Mean annual rainfall data has been calculated from 1971-2023 and mean maximum temperature has been calculated from 1996-2023 (Bureau of Meteorology 2023).

#### 2.1.2 Geology and Soils

The surface geology of the survey area is comprised of eight units (Geoscience Australia 2008, Stewart et al. 2008), with Marra Mamba Iron Formation the most dominant (Table 2). Geological mapping of the survey area is presented in Figure A.1 (Appendix A).

Table 2: Geological units of the survey area (Stewart et al. 2008).

| Geological name                                                                                                                                                                                                                                                                    | Label | Area within survey area (ha) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------------------------------|
| <b>Marra Mamba Iron Formation:</b> Chert, ferruginous chert, jaspilite, banded iron-formation, minor shale, siltstone, mudstone                                                                                                                                                    | Achm  | 1,302.56                     |
| <b>Hamersley Group:</b> Undivided chert, banded iron-formation, jaspilite, dolomite, mudstone, siltstone                                                                                                                                                                           | Lch   | 664.89                       |
| <b>Brockman Iron Formation:</b> Banded iron-formation, chert, mudstone and siltstone                                                                                                                                                                                               | Lchk  | 520.41                       |
| <b>Weeli Wolli Formation:</b> Banded iron-formation (commonly jaspilitic), mudstone, siltstone; common interlayered metadoleritic sills                                                                                                                                            | Lchw  | 465.41                       |
| <b>Colluvium 38491:</b> Colluvium, sheetwash, talus; gravel piedmonts and aprons over and around bedrock; clay-silt-sand with sheet and nodular kankar; alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin; local calcrete, reworked laterite | Qrc   | 242.03                       |
| <b>Fortescue Group - mafic intrusions:</b> Metadolerite, dolerite, gabbro; medium to coarse grained, massive grey-green rock, usually foliated                                                                                                                                     | Adf   | 56.66                        |
| <b>Woongarra Rhyolite:</b> Rhyolite, rhyodacite, rhyolitic volcanoclastic breccia and banded iron formation                                                                                                                                                                        | Lfhw  | 8.17                         |
| <b>Jeerinah Formation:</b> Shale, sandstone, siltstone, mudstone, dolomite, local microbanded chert, jaspilite, conglomerate; fine-grained massive rhyolite; mafic tuff with local accretionary lapilli and agglomerate; thin basalt/dolerite and andesitic basalt flows           | Awfj  | 6.04                         |

### 2.1.3 Surface Water and Hydrology

The survey area occurs within the 'Fortescue River Upper' catchment. No Wetlands of International Importance (i.e. Ramsar wetlands) or Nationally Important Wetlands occur within the survey area (Department of the Environment and Energy 2020a, 2020b). The nearest Nationally Important Wetland is Fortescue Marshes, located approximately 58 km from the survey area. Homestead Creek runs through the survey area.

## 2.2 Biological Environment

### 2.2.1 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation for Australia (IBRA; Version 7) divides the Australian continent into 89 bioregions and 419 subregions (Department of Agriculture, Water and the Environment 2021). The IBRA regions represent a landscape-based approach to classifying the land surface, including attributes of climate, geomorphology, landform, lithology, and characteristic flora and fauna. The survey area is situated in the Pilbara Bioregion, of which 5-10% is represented in the national reserve system (Department of the Environment and Energy 2021).

The biodiversity of the 53 subregions recognised in Western Australia was documented as part of a national audit to provide priorities for conservation action (Department of Conservation and Land Management 2002). The survey area occurs within the Hamersley subregion, described as:

- Hamersley PIL03 – Mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale, and dolerite). Mulga low woodland over bunch

grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges (Kendrick 2001).

### 2.2.2 Land Systems

Land systems of the Western Australian rangelands have been mapped and described by the Department of Agriculture and Food, outlining the distributions and providing comprehensive descriptions of biophysical resources, including soil and vegetation condition. A total of 102 land systems occur in the Pilbara bioregion, covering 181,723 km<sup>2</sup>. Six land systems occur in the survey area (Table 3). The distribution of these land systems within the survey area is shown in Figure A.2 (Appendix A).

Table 3: Distribution of land systems within the survey area.

| Land system                                                                                                                                                                                 | Total area within bioregion (ha) | Total area within survey area (ha) | Proportion within survey area (%) |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|------------------------------------|-----------------------------------|
| <b>Boolgeeda (BGD)</b> - Stony lower slopes and plains below hill systems, supporting hard and soft spinifex grasslands or mulga shrublands.                                                | 961,847.05                       | 628.97                             | 0.07                              |
| <b>Elimunna (ELI)</b> - Stony plains on basalt, supporting sparse acacia and cassia shrublands and patchy tussock grasslands.                                                               | 62,850.65                        | 628.34                             | 1.00                              |
| <b>McKay (MCK)</b> - Hills, ridges, plateaux remnants, and breakaways of meta sedimentary and sedimentary rocks, supporting hard spinifex grasslands with acacias and occasional eucalypts. | 425,967.39                       | 135.85                             | 0.03                              |
| <b>Newman (NEW)</b> - Rugged jaspilite plateaux, ridges, and mountains, supporting hard spinifex grasslands.                                                                                | 1,994,339.47                     | 1,583.69                           | 0.08                              |
| <b>Platform (PLA)</b> - Dissected slopes and raised plains, supporting shrubby hard spinifex grasslands.                                                                                    | 236,389.89                       | 219.29                             | 0.09                              |
| <b>Rocklea (ROC)</b> - Basalt hills, plateaux, lower slopes, and minor stony plains, supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.              | 2,880,288.28                     | 70.04                              | <0.01                             |

### 2.2.3 Pre-European Vegetation

Beard (1975) completed broad-scale (1:1,000,000) pre-European vegetation mapping at an association level. The Beard mapping was later used by the former Department of Agriculture and Food Western Australia (Shepherd et al. 2002) to compile vegetation units that assisted with identifying pre-European and current extents of vegetation throughout Western Australia.

Two pre-European vegetation units, 18 and 82 (Shepherd et al. 2002, Department of Primary Industries and Regional Development 2019), are associated with the survey area (Figure A.3, Appendix A). Table 4 summarises the current and pre-European extent of these two vegetation units in the Pilbara bioregion and the survey area.

Table 4: Extent of pre-European vegetation within the survey area by Interim Biogeographic Regionalisation for Australia (IBRA) sub-region (Government of Western Australia 2018).

| Vegetation unit | Mapping unit (Beard 1975) | Description                                                                                                                                                     | Extent in survey area (ha) | Pre-European extent (ha) | Current extent in bioregion (ha)* | Proportion of pre-European extent remaining (%) | Pre-European extent with formal protection (%) |
|-----------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------|-----------------------------------|-------------------------------------------------|------------------------------------------------|
| 18              | a1 Li                     | Low woodland, open low woodland, or sparse woodland: Mulga <i>Acacia aneura</i> and associated species.                                                         | 1,686.71                   | 581,246.08               | 576,541.70                        | 99.19                                           | 19.51                                          |
| 82              | e16Lr t3Hi                | Low tree-steppe: Hummock grassland with scattered bloodwoods & snappy gum <i>Triodia</i> spp., <i>Corymbia dichromophloia</i> , <i>Eucalyptus leucophloia</i> . | 1,579.46                   | 2,177,573.90             | 2,165,224.21                      | 99.43                                           | 12.04                                          |

\*Data sourced from the '2018 Statewide Vegetation Statistics – Full report'; please note, the statistics now presented may be out of date.

## 2.3 Conservation Categories and Management

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage MNES, including listed flora, fauna, and ecological communities. These listed flora, fauna, and ecological communities are allocated a conservation category, which are outlined in Tables B.1 – B.2 and B.5 (Appendix B).

Ecological communities may be subject to processes that threaten to destroy or significantly modify it across much of its range. These communities are identified as threatened ecological communities that are listed at the Commonwealth level under the EPBC Act (Tables B.1 and B.2, Appendix B).

Under Western Australian legislation, all native fauna is protected, and it is an offence to ‘take’ protected fauna. The *Biodiversity Conservation Act 2016* (BC Act) also provides for native fauna species to be specially protected when they are considered rare, threatened with extinction, or have a high conservation value (Table B.3, Appendix B). In addition, due to the diversity of Western Australia’s fauna, many species are known from only a few collections or locations but have not been adequately surveyed. Such fauna may be rare or threatened but cannot be considered for declaration as ‘Threatened fauna’ until adequate surveys have been undertaken. These fauna species are included on a supplementary conservation list managed by the Department of Biodiversity, Conservation and Attractions (DBCA) called the *Priority Fauna List*. Priority fauna species are categorised according to level of threat and other information; the conservation categories are described in Table B.4 (Appendix B).

## 2.4 Land Use and Tenure

The survey area is located within the Shire of East Pilbara and intersects with land used for transport (airports and roads), water, and other minimal use. The local area is used for mineral exploration, mining activity, and pastoralism.

Karijini National Park is the nearest conservation reserve to the survey area, located approximately 105 km to the west of the survey area.

## 3 Methods

### 3.1 Desktop Assessment

#### 3.1.1 Database Searches

The desktop assessment focused on key habitats for MNES species that occur in the Pilbara bioregion. The database searches conducted are summarised in Table 5.

Table 5: List of databases reviewed for the desktop assessment.

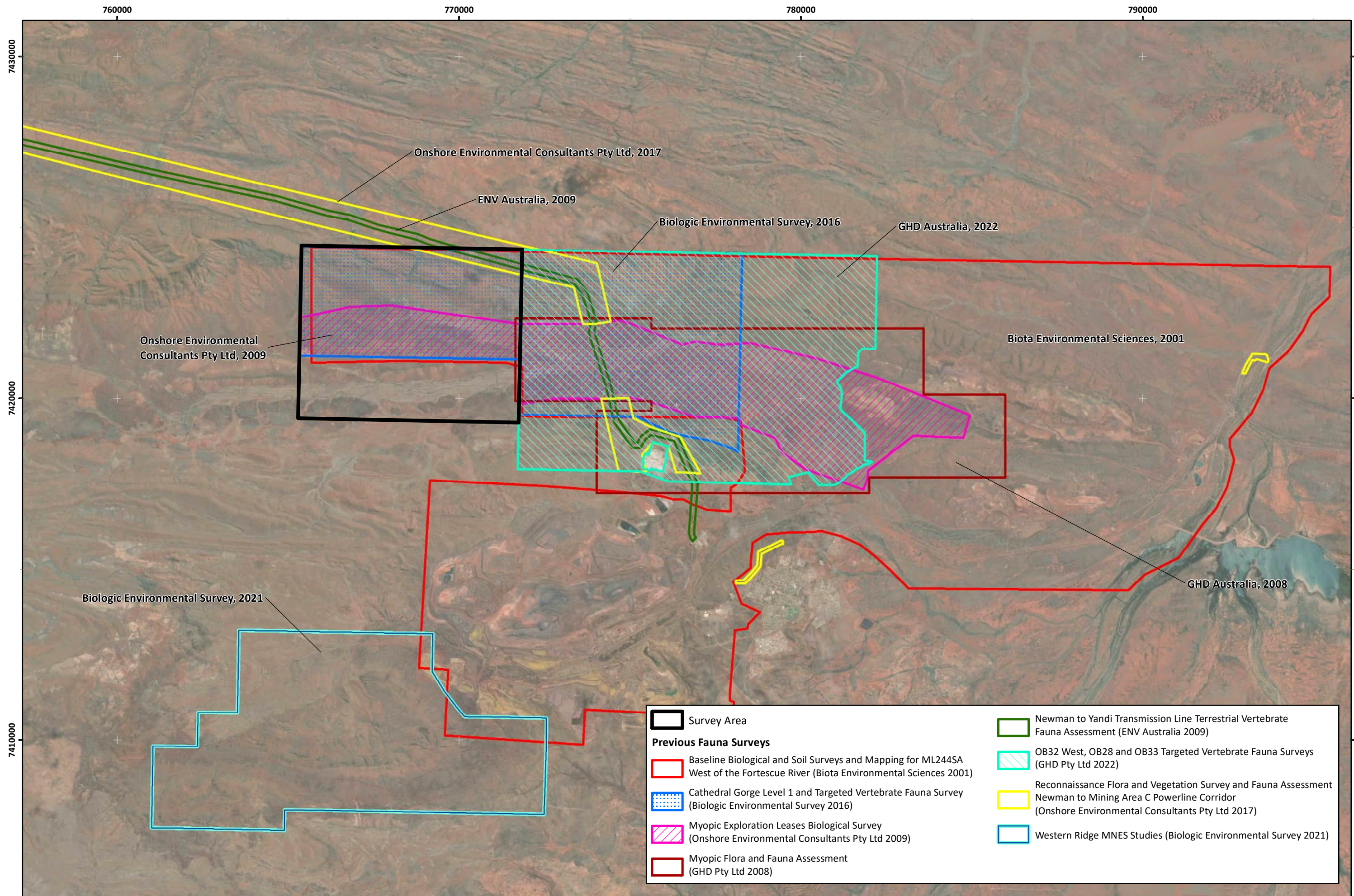
| Database name                                                                                           | Date search results received | Search focus                                                  | Search area                                                                                                   |
|---------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Threatened and Priority Fauna Database (Department of Biodiversity, Conservation and Attractions 2022a) | 22 December 2022             | Threatened and Priority fauna species                         | 80 km buffer from a central point defined by the coordinates: 23°17'25.94"S, 119°37'32.55"E                   |
| NatureMap (Department of Biodiversity, Conservation and Attractions 2022b)                              | 21 December 2022             | Terrestrial vertebrate fauna and fauna of significance        | 80 km buffer from a central point defined by the coordinates: 23°17'25.94"S, 119°37'32.55"E                   |
| Protected Matters Search Tool (Department of Climate Change, Energy, the Environment and Water 2022)    | 20 December 2022             | Matters of National Environmental Significance (MNES) species | 80 km buffer around approximate survey centre point defined by the coordinates: 23°17'25.94"S, 119°37'32.55"E |
| Birdlife Australia Birddata (Birdlife Australia 2022)                                                   | 20 December 2022             | Bird species                                                  | 80 km buffer around approximate survey centre point defined by the coordinates: 23°17'25.94"S, 119°37'32.55"E |
| Atlas of Living Australia (Atlas of Living Australia 2022)                                              | 20 December 2022             | Terrestrial vertebrate fauna and fauna of significance        | 80 km buffer around approximate survey centre point defined by the coordinates: 23°17'25.94"S, 119°37'32.55"E |
| Index of Biodiversity Surveys for Assessment (Department of Water and Environmental Regulation 2021)    | 20 December 2022             | Review of reports relevant to the survey area                 | Surveys overlapping and/or within 15 km of the survey area                                                    |

#### 3.1.2 Literature Review

Fauna surveys have been previously commissioned by BHP WAIO overlapping and/or within 15 km of the survey area and were supplied to Astron for the desktop assessment. The previous survey areas

in relation to the current survey are shown in Figure 3. The reports reviewed as part of this assessment include:

- Baseline Biological and Soil Surveys and Mapping for ML244SA West of the Fortescue River (Biota Environmental Sciences 2001)
- Myopic Flora and Fauna Assessment (GHD Pty Ltd 2008)
- Myopic Exploration Leases Biological Survey (Onshore Environmental Consultants Pty Ltd 2009)
- Newman to Yandi Transmission Line Terrestrial Vertebrate Fauna Assessment (ENV Australia 2009)
- Cathedral Gorge Level 1 and Targeted Vertebrate Fauna Survey (Biologic Environmental Survey 2016)
- Reconnaissance Flora and Vegetation Survey and Fauna Assessment Newman to Mining Area C Powerline Corridor (Onshore Environmental Consultants Pty Ltd 2017)
- Western Ridge Matters of National Environmental Significance Fauna Study (Biologic Environmental Survey 2021)
- OB32 West, OB28 and OB33 Targeted Vertebrate Fauna Surveys (GHD Pty Ltd 2022).



BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

**Figure 3: Previous fauna surveys conducted in the vicinity of the survey area**

Author: S. Smithies

Drawn: C. Dyde

Scale: 1:100,000 at A3  
Coordinate System: GDA 1994 MGA Zone 50  
0 1 2 3 4 5 Kilometres

Date: 17-10-2023



Figure Ref: 2400-08-22-BIDR-1RevB\_231017\_Fig3\_PrevSurveys

### 3.1.3 Conservation Assessment

Significant vertebrate fauna species (inclusive of Threatened and Migratory MNES listed fauna, and DBCA Priority and otherwise Specially Protected fauna species) that were returned from the database searches were categorised for likelihood of occurrence within the survey area according to the criteria listed in Table B.6 (Appendix B). Post survey, the likelihood table was re-assessed utilising the information obtained during the field visit and additional criteria outlined in Table B.8 (Appendix B). The likelihood table was then updated to reflect an improved understanding of the likelihood that a species would actually occur in the survey area.

## 3.2 Field Survey

### 3.2.1 Survey Timing and Personnel

The field survey was undertaken by Principal Zoologist David Keirle and Zoologist Sean Smithies from 8 to 15 May 2023. Principal Zoologist David Keirle has over 10 years of experience conducting vertebrate fauna surveys, specifically within the Pilbara region of Western Australia.

### 3.2.2 Weather

Daily weather observations recorded from Newman Aero (station 007176) were used to describe local rainfall and temperature preceding the survey (Figure 2). The annual rainfall recorded preceding the survey (323.4 mm) was slightly above the long-term mean of 313.5 mm recorded at Newman (Bureau of Meteorology 2023). Rainfall in the three months preceding the field survey was above the long term mean (198.2 mm versus 180.1 mm) (Bureau of Meteorology 2023). The maximum daily temperatures during the field survey period ranged from 22.8°C and 28.9°C (Bureau of Meteorology 2023).

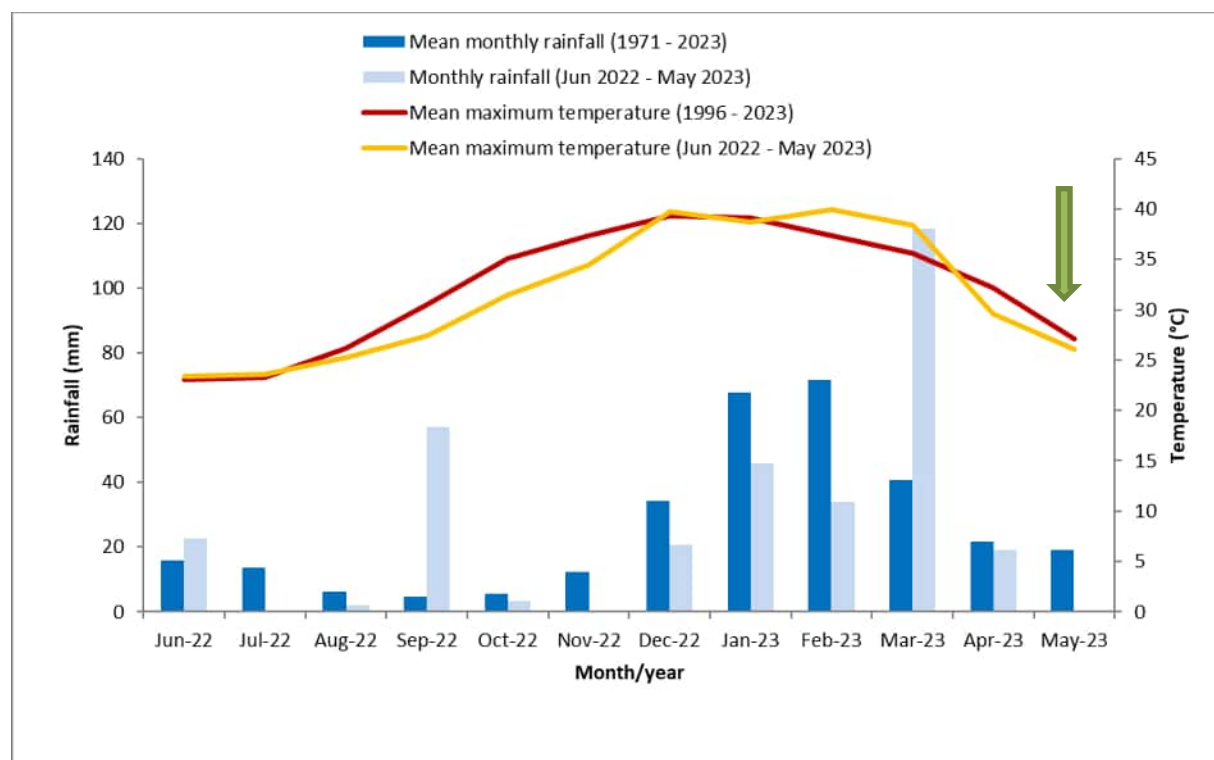


Figure 4 : Newman Aero (station 007176) mean monthly rainfall (1971 - 2023), total recorded rainfall (June 2022 – May 2023), long-term mean monthly maximum temperatures (1996-2023), and mean monthly maximum temperatures (June 2022 – May 2023). The green arrow indicates the field survey timing.

### 3.2.3 Vertebrate Fauna

#### 3.2.3.1 Habitat Assessment and Mapping

Seventy-five fauna habitat assessments were conducted within the survey area. This included 28 habitat-only assessment sites, and 47 habitat assessments completed at targeted fauna sampling sites (Table C.1 and Figure C.1, Appendix C). The following information was collected at each site:

- location – coordinates measured using a handheld GPS (GDA94)
- recorder and date – personnel involved in undertaking the fauna habitat assessment and the survey date
- habitat/landform – position in the landscape – major fauna habitat types were described based on the landform and vegetation
- vegetation type – a broad description of vegetation type and structure
- soils – a brief description of soil type
- microhabitat – presence of specific microhabitat features; for example, leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, permanent, or semi-permanent water
- condition – habitat condition was assessed based on the presence of anthropogenic (human-induced) disturbances, and using the conditions ratings suggested by Thompson and Thompson (2010) (Table B.7, Appendix B)
- disturbance – any disturbances, such as clearing, fire, weeds, flooding, vehicular, machinery, tracks, or grazing
- photographs – a representative photograph was taken of each habitat assessment/sampling site.

The information derived from the fauna habitat assessments was used to delineate fauna habitats throughout the survey area, which were then mapped accordingly.

The potential for the habitats to provide critical or supporting habitat for MNES species: bilby, northern quoll, ghost bat, Pilbara leaf-nosed bat, grey falcon, southern whiteface, night parrot, great desert skink, and Pilbara olive python, were ranked according to the criteria listed in Table B.8 (Appendix B).

#### 3.2.3.2 Motion Sensitive Cameras

Motion sensitive cameras (Browning, Bushnell, Moultrie, and Reconyx) were set at 31 locations for five nights, with a combined trapping effort of 155 camera trap nights. The cameras were placed in prospective/suitable habitat, such as breakaways, drainage lines and water pools, aimed at targeting MNES species, particularly northern quoll and Pilbara olive python. Cameras were baited with a scent lure (fish oil in a plastic jar with holes in the lid), except when placed at water sources. Camera locations are shown in Figure C.1 and detailed in Table C.1 (Appendix C).

A further five motion sensitive cameras were deployed by BHP WAIO personnel prior to the current survey to provide additional contextual information for the survey area. These five cameras were deployed from 21 February to 22 March 2023, totalling 145 camera trap nights. These cameras were unbaited and placed in prospective/suitable habitat aimed at targeting MNES species (BHP pers. comm., 2023).

### 3.2.3.3 Acoustic Bat Surveys

Acoustic ultrahigh frequency recording equipment was used to record the presence of bats, in particular the Pilbara leaf-nosed bat and ghost bat. Recording devices (Song Meter 4 (SM4)) were positioned in a total of eight locations to achieve a broad coverage of the survey area, and were set for between two and three nights, resulting in a total of 23 recording nights. The locations are depicted in Figure C.1 and detailed in Table C.1 (appendix C). The bat echolocation data collected in the field was analysed by Robert Bullen (Bat Call WA) for presence of all bat species.

A further five SM4 recording devices were deployed by BHP WAIO personnel prior to the current survey to assist with understanding the Pilbara leaf-nosed bat within the broader Newman area. These five units were deployed within or along the boundary of the current survey area between 20 February and 21 March 2023, resulting in 150 recording nights (Bat Call WA 2023). Recording devices were placed in prospective habitat and data collected in the field were analysed by Bat Call WA.

### 3.2.3.4 Cave Assessments

Any potential roost caves identified within the survey area were assessed for suitability to provide roosting opportunities for the ghost bat and Pilbara leaf-nosed bat using the following information:

- cave characteristics, including position of the cave in the landscape, angle of cave floor, orientation of cave opening, exposure of cave, and type of cave entrance
- cave dimensions, including overhang depth, cave entrance height and width, cave depth, and number of chambers and their dimension (height and width)
- humidity and temperature inside the cave
- bat species present within the cave, including the presence of scats and feeding debris.

### 3.2.3.5 Night Parrot Surveys

Due to the recent discovery of night parrot populations in Western Australia, the survey area is in the area mapped as 'high priority for survey' for the night parrot (*Pezoporus occidentalis*) according to DBCA's Interim Guidelines for Preliminary Surveys of night parrots in Western Australia (Department of Parks and Wildlife 2017). Therefore, passive acoustic surveys were undertaken, and Autonomous Recording Units (ARUs) used, in the most prospective habitats available (Stony Plain habitat containing mature *Triodia*).

The ARUs, recording 1 hour pre-sunset to 1 hour post-dawn, were set at two locations for six nights, resulting in a total of 12 recording nights. The audio data was recorded at 44.1 k bits and covered the frequency range of 100 kHz to 21,000 kHz, which brackets the night parrot call frequency range of 1,500 kHz to 3,500 kHz. The ARU locations are depicted in Figure C.1 and detailed in Table C.1 (Appendix C). The audio data collected in the field was analysed by Robert Bullen (Bat Call WA) for the presence of the night parrot.

### 3.2.3.6 Targeted Bilby Plot Searches

Targeted searches for signs of bilby were conducted using a combination of the 2 ha plot protocol and linear survey methods as outlined in DBCA's guidelines for survey to detect the presence of bilbies and assess the importance of habitat in Western Australia (Department of Biodiversity Conservation and Attractions 2017). Five 2 ha plots of either 50 m x 400 m or 100 m x 200 m were traversed on foot

for approximately three hours per plot, with track logs recorded on a handheld GPS unit. Any evidence of bilby, including burrows, tracks, foraging signs, and scats were recorded, photographed and GPS located. The bilby plot search locations are depicted in Figure C.1 and detailed in Table C.1 (Appendix C).

#### 3.2.3.7 eDNA Sampling

An assessment of the presence of Pilbara olive python was undertaken using eDNA metabarcoding of water samples collected from one pool within the survey area. Two replicates were collected from this pool and transported to eDNA Frontiers for DNA extraction and sample analysis (eDNA Frontiers 2023). The collection point location is shown in Figure C.1 and detailed in Table C.1 (Appendix C).

#### 3.2.3.8 Targeted Searches for Other Species

The aim of targeted searches was to identify areas of potential suitable habitat for significant fauna, such as caves and water sources, and secondary signs including tracks, scats, diggings, and burrows. Targeted searches were undertaken for other significant species previously found or considered likely to occur in the area, including grey falcon, southern whiteface, great desert skink, brush-tailed mulgara, and western pebble-mound mouse.

For grey falcon and southern whiteface, targeted searches focused on areas of suitable habitat, such as open woodland and shrubland (southern whiteface) and Drainage Lines (grey falcon), in conjunction with opportunistic observations for these and other significant bird species throughout the survey area.

Searches for great desert skink and brush-tailed mulgara were conducted concurrently with bilby searches in suitable Drainage Area/Floodplain and Gilgai Plain habitats and focused on the identification of their similarly distinctive burrows. Observations for western pebble-mound mouse were conducted within Hillcrest/Hillslope, Stony Plain and Undulating Low Hills habitat and focused on the identification of their distinctive pebble mounds.

Visual observations, including nocturnal spotlighting, for significant fauna and opportunistic bird recordings were ongoing whilst moving through the survey area. Track logs were recorded using a handheld GPS and are shown in Figure C.1 (Appendix C). Any opportunistic sightings of fauna species were recorded whilst traversing through the survey area.

### 3.3 Taxonomy and Nomenclature

Nomenclature and sequence for the fauna species listed within this report is as per the Western Australian Museum's *Checklist of the Vertebrates of Western Australia* (Western Australian Museum 2022). For species identified in the desktop assessment, every effort was made to determine the current scientific name for each taxon, including wherever there was doubt as to their true taxonomy (through subsequent name changes). Invertebrate and fish species were not included in the desktop assessment as they are outside the scope of this survey.

### 3.4 Limitations

Following the completion of the desktop review and field survey, a review of any limitations that may affect a complete assessment of the data collected was conducted. The limitations listed in Table 6 are based on those suggested for consideration in the EPA technical guidance (Environmental Protection Authority 2020).

Table 6: Statement of limitations for the targeted vertebrate fauna assessment.

| Potential limitation                                                                                                                                           | Degree of limitation | Statement regarding potential limitation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(i) Competency/experience</b>                                                                                                                               | No limitation        | The zoologists responsible for conducting the survey have extensive experience in conducting vertebrate fauna surveys in the Pilbara region. David Keirle has over 10 years and Sean Smithies has over five years of fauna surveying experience.                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>(ii) Scope</b><br>What faunal groups were sampled and were some sampling methods not able to be employed because of constraints such as weather conditions? | No limitation        | The survey scope was able to be completed and all sampling methods adequately employed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>(iii) Proportion of fauna identified, recorded and/or collected</b>                                                                                         | No limitation        | The survey effort was targeted towards Matters of National Environmental Significance and significant species as defined by the EPA, and was focused on habitats considered suitable for these species within the survey area. The use of motion sensitive cameras and ultrasonic recorders were employed to identify species that are cryptic or nocturnal. Given the nature of the survey (single-phase targeted), the fauna observed and identified are likely to represent a portion of the suite of species that utilise the survey area; however, the substantial level of desktop information available is sufficient to offset this as a limitation. |
| <b>(iv) Sources of information</b><br>Previously available information (whether historic or recent) as distinct from new data.                                 | No limitation        | Adequate information was available from database searches and previous studies in the survey area and region.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>(v) Proportion of task achieved</b><br>Further work which might be needed.                                                                                  | No limitation        | The survey scope was able to be completed and all sampling methods adequately employed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>(vi) Timing/weather/season/cycle</b>                                                                                                                        | No limitation        | Rainfall in the three months preceding the field survey was slightly above the long-term average for the corresponding timeframe. Survey timing was marginally outside the optimal for reptiles and mammals (September – April); although, due to late seasonal rainfall, conditions were considered suitable.                                                                                                                                                                                                                                                                                                                                               |
| <b>(vii) Disturbances</b><br>For example, fire, flood, accidental human intervention which affected results of survey.                                         | No limitation        | No major disturbances were recorded in the survey area that would have affected the survey results.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Potential limitation                                                                                           | Degree of limitation | Statement regarding potential limitation                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>(viii) Intensity</b><br>In retrospect, was the intensity adequate?                                          | No limitation        | The intensity of the survey was considered adequate for a targeted vertebrate fauna assessment.                                                                                   |
| <b>(xi) Completeness</b><br>Was the relevant area fully surveyed?                                              | No limitation        | All target habitats considered suitable for MNES and other significant vertebrate fauna species within the survey area were adequately surveyed.                                  |
| <b>(x) Resources</b><br>Degree of expertise available in animal identification to taxon level.                 | No limitation        | Adequate resources were available to identify fauna species. All technical personnel involved in identification have extensive experience in conducting vertebrate fauna surveys. |
| <b>(xi) Remoteness and/or access problems</b>                                                                  | No limitation        | There were no access problems, with all the survey area able to be accessed by vehicle and on foot.                                                                               |
| <b>(xii) Availability of contextual information</b><br>For example, biogeographical information on the region. | No limitation        | Database searches and previous fauna surveys within and in the vicinity of the survey area provided contextual information.                                                       |

## 4 Results

### 4.1 Desktop Assessment

#### 4.1.1 Environmentally Sensitive Areas

No Environmentally Sensitive Areas (ESAs) intersected the survey area. The nearest ESA likely of interest is the Fortescue Marshes, located approximately 58 km from the survey area (Department of the Environment and Energy 2020a).

#### 4.1.2 Vertebrate Fauna

The database searches indicated that 431 vertebrate fauna occur, or potentially occur, within an 80 km radius from the centre of the survey area (Table D.1 – D.4, Appendix D), including 11 amphibian species, 146 reptile species, 214 bird species, and 60 mammal species (including 11 introduced mammal species) (Birdlife Australia 2022, Department of Biodiversity, Conservation and Attractions 2022b, 2022a, Department of Climate Change, Energy, the Environment and Water 2022). Of these, 35 species are listed as MNES (specifically those listed as Threatened and Migratory species) occurring, or potentially occurring, within the survey area. These 35 species comprise of two reptile species, 27 bird species and six mammal species (Table E.1, Appendix E). A further 13 species, including four reptile species, three bird species and six mammal species, are State listed Priority or Otherwise Specially Protected species (Table E.1, Appendix E). Of the MNES listed species, two species (Pilbara olive python and ghost bat) had previously been recorded within the survey area, ten species were considered to have a 'high' likelihood of occurrence within the survey area, three species were considered to have a 'moderate' likelihood of occurrence, and 20 species were considered to have a 'low' likelihood of occurrence (Table E.1, Appendix E). This is based on their respective ecology, habitats considered likely to be present, and any previous records from historic survey and database records.

Previous surveys undertaken for BHP WAIO in the vicinity of the survey area recorded four MNES species (ghost bat, Pilbara leaf-nosed bat, Pilbara olive python, and grey falcon) and an additional four species of significance (brush-tailed mulgara, western pebble-mound mouse, long-tailed dunnart, and peregrine falcon) (Table 7).

Table 7: Summary of literature review results from surveys conducted within the vicinity of the survey area.

| Author (year)                                                                              | Survey area; size (ha)                        | Survey level               | Survey timing          | Survey effort                                                                                                                                                                                               | Significant vertebrate fauna recorded [distance from current survey area]                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GHD (2022) – OB32 West, OB28 and OB33 Targeted Vertebrate Fauna Surveys                    | OB32 West, OB28 and OB33; 6,536 ha            | Targeted fauna survey      | April 2021             | Habitat assessments (including cave assessments), targeted significant fauna using remote cameras, avifauna census, echolocation and acoustic recorders, nocturnal searches, and targeted search transects. | <p><b><u>MNES Fauna</u></b></p> <p><b>Pilbara leaf-nosed bat (<i>Rhinonictoris aurantia</i>)</b><br/>[4.6 km east]</p> <p><b>Grey falcon (<i>Falco hypoleucos</i>)</b><br/>[4.4 km east]</p> <p><b><u>Other Significant Fauna</u></b></p> <p>Brush-tailed mulgara (<i>Dasycercus blythi</i>)<br/>[0.1 km east]</p> <p>Western pebble-mound mouse (<i>Pseudomys chapmani</i>)<br/>[0.1 km east]</p> <p>Peregrine falcon (<i>Falco peregrinus</i>)<br/>[1.8 km east]</p> |
| Biologic (2021) – Western Ridge Matters of National Environmental Significance Fauna Study | Western Ridge and surrounding area; 33,970 ha | Targeted MNES fauna survey | August – November 2020 | Targeted searches, camera transects, echolocation recorders, ghost bat scat monitoring and analysis, and eDNA water sampling.                                                                               | <p><b><u>MNES Fauna</u></b></p> <p><b>Pilbara leaf-nosed bat (<i>Rhinonictoris aurantia</i>)</b><br/>[0.1 km east]</p> <p><b>Ghost bat (<i>Macroderma gigas</i>)</b><br/>[9.2 km south]</p> <p><b>Pilbara olive python (<i>Liasis olivaceus barroni</i>)</b><br/>[Recorded within the survey area]</p> <p><b><u>Other Significant Fauna</u></b></p> <p>Western pebble-mound mouse (<i>Pseudomys chapmani</i>)<br/>[Recorded within the survey area]</p>                |

| Author (year)                                                                                    | Survey area; size (ha)                     | Survey level                                                       | Survey timing          | Survey effort                                                                                                                                                                     | Significant vertebrate fauna recorded [distance from current survey area]                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------|--------------------------------------------|--------------------------------------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Onshore (2017) – Reconnaissance Flora and Vegetation Survey and Fauna Assessment                 | Mining Area C Powerline Corridor; 4,580 ha | Basic fauna survey in conjunction with flora and vegetation survey | July 2017              | Habitat assessments and targeted transects recording observations (direct and secondary) of significant fauna.                                                                    | <p><b><u>MNES Fauna</u></b><br/><b>None recorded</b></p> <p><b><u>Other Significant Fauna</u></b><br/>Western pebble-mound mouse (<i>Pseudomys chapmani</i>)<br/>[10 km north-west]</p>                                                                                                                                                                                                                                                                                                   |
| Biologic (2016) – Cathedral Gorge Level 1 Vertebrate Fauna Survey                                | Cathedral Gorge; 5,300 ha                  | Basic fauna survey                                                 | September/October 2015 | Habitat assessments and mapping, targeted vertebrate fauna searches, and motion sensitive cameras. Echolocation and acoustic recorders to detect presence of significant species. | <p><b><u>MNES Fauna</u></b><br/><b>Ghost bat (<i>Macroderma gigas</i>)</b><br/><b>[Recorded within the survey area]</b><br/><b>Pilbara leaf-nosed bat (<i>Rhynonictis aurantia</i>)</b><br/><b>[1.7 km east]</b><br/><b>Pilbara olive python (<i>Liasis olivaceus barroni</i>) (scats)</b><br/><b>[Recorded within the survey area]</b></p> <p><b><u>Other Significant Fauna</u></b><br/>Western pebble-mound mouse (<i>Pseudomys chapmani</i>)<br/>[Recorded within the survey area]</p> |
| ENV Australia (2009) – Newman to Yandi Transmission Line Terrestrial Vertebrate Fauna Assessment | Proposed transmission line; 2,300 ha       | Basic fauna survey                                                 | May 2009               | Habitat assessments, avifauna census, active foraging/searching, and echolocation targeted surveys.                                                                               | <p><b><u>MNES Fauna</u></b><br/><b>None recorded</b></p> <p><b><u>Other Significant Fauna</u></b><br/>None recorded</p>                                                                                                                                                                                                                                                                                                                                                                   |

| Author (year)                                                                                           | Survey area; size (ha)                                          | Survey level                                                              | Survey timing  | Survey effort                                                                                                                                                                                                         | Significant vertebrate fauna recorded [distance from current survey area]                                                                                                               |
|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Onshore (2009) – Myopic Exploration Leases Biological Survey                                            | Myopic exploration area on mining lease 70/270; size not stated | Basic fauna survey in conjunction with flora and vegetation survey        | June 2009      | Significant fauna habitat types determined and mapped. Opportunistic records of vertebrate species. Targeted surveys within identified significant habitat using avifauna surveys, echolocation, and active foraging. | <b><u>MNES Fauna</u></b><br><b>None recorded</b><br><br><u>Other Significant Fauna</u><br>Western pebble-mound mouse ( <i>Pseudomys chapmani</i> )<br>[Recorded within the survey area] |
| GHD (2008) – Myopic Flora and Fauna Assessment                                                          | Myopic area; 3,600 ha                                           | Detailed vegetation and flora survey, and basic fauna survey              | May/June 2008  | Active foraging, and searches for secondary evidence (scats, tracks, burrows, and remains) for vertebrates. Opportunistic sightings of species during vegetation/flora surveys.                                       | <b><u>MNES Fauna</u></b><br><b>None recorded</b><br><br><u>Other Significant Fauna</u><br>Western pebble-mound mouse ( <i>Pseudomys chapmani</i> )<br>[4.8 km east]                     |
| Biota (2001) – Baseline Biological and Soil Surveys and Mapping for ML244SA West of the Fortescue River | Mining lease 244SA; 31,804 ha                                   | Basic fauna survey in conjunction with flora, vegetation and soils survey | September 2000 | Habitat assessments and mapping. Database searches, aerial imagery, and ground-truthing to determine significant species likelihood of occurrence.                                                                    | <b><u>MNES Fauna</u></b><br><b>None Recorded</b><br><br><u>Other Significant Fauna</u><br>None Recorded                                                                                 |

Note: MNES = Matters of National Environmental Significance

## 4.2 Field Survey

### 4.2.1 Vertebrate Fauna Habitats

Nine broad fauna habitat types were recorded in the survey area: Breakaway/ Cliff, Drainage Area/ Floodplain, Gilgai Plain, Gorge/ Gully, Hillcrest/ Hillslope, Major Drainage Line, Minor Drainage Line, Stony Plain, and Undulating Low Hills. Fauna habitat types are summarised in Table 8 and mapped in Figure F.1 (Appendix F). Areas of Cleared/ Disturbed habitat totalled 15.5 ha (0.5%) within the survey area, were in Disturbed to Highly Degraded condition, and are not considered further in terms of fauna habitat.

The majority of habitats were considered to be in ‘Excellent’ to ‘High Quality’ condition owing to minimal disturbances from fire, weeds and grazing. Regions within Major Drainage Line and Drainage Area/Floodplain habitats were impacted by buffel grass (*Cenchrus ciliaris*) as well as grazing and erosion from livestock.

**Gorge/ Gully** habitat is one of the more restricted habitats in the survey area. Gorges are a common feature of the Pilbara; however, as they tend to be narrow, linear features, gorges represent only a small proportion of the total land area. They represent important shelter or roosting habitat for several MNES species, including the Pilbara olive python, ghost bat, Pilbara leaf-nosed bat, and northern quoll. They may also support other significant species, such as Gane’s blind snake (*Anilius ganei*) (P1) and peregrine falcon. Caves/overhangs and areas where water could potentially pool following significant rain events are important microhabitat features of Gorge/ Gully habitats. Only category 4 (potential roost) and category 5 (little to no usage) caves were identified within this habitat type, with these caves generally being open and shallow and thus considered unlikely to provide diurnal roosting opportunities for either ghost bat or Pilbara leaf-nosed bat, but may act as shelter/denning sites for northern quoll and Pilbara olive python. This habitat was considered of high value as it contains a complexity of microhabitats and potentially supports significant fauna species but was generally limited within the survey area (32.7 ha, 1%).

**Breakaway/ Cliff** habitat is a common feature of the Pilbara but, because they tend to be narrow, linear features, they represent only a small proportion of the total land area. This habitat type was commonly associated with the drop off areas of the Hillcrest/ Hillslope habitat within the survey area. Breakaway/ Cliff habitat contained microhabitats such as crevices, overhangs and shallow caves that provide sheltering opportunities for MNES species. These caves and crevices have potential to be used as shelter/denning sites for Pilbara olive python and northern quoll but, as the caves present were generally open and shallow, they were considered unlikely to provide diurnal roosting opportunities for either MNES bat species. The Breakaway/ Cliff habitat provides important habitat values to several significant species, including MNES; therefore, it was considered of high importance for fauna but was generally limited within the survey area (81.3 ha, 2.5%).

**Major Drainage Line** habitat consisted of large drainage channels over 10 m in width, typically lined with mature *Eucalyptus/Corymbia* spp., and is considered to be of moderate value to a wide spectrum of fauna species, but of high value to several MNES species, including Pilbara olive python, grey falcon and northern quoll. Within the survey area, buffel grass was present in the ground storey vegetation, potentially reducing floral diversity, increasing fire fuel loading, and indirectly displacing native fauna, particularly herpetofauna (Schlesinger et al. 2020). Major Drainage Line habitat exhibited a high diversity of microhabitats, with some tree hollows, woody debris (logs and leaf litter) and crevices present. One semi-permanent pool was recorded within the Major Drainage Line habitat and, while some smaller pools were present at the time of the survey, they are likely to be temporary remnants following large rainfall events. Major Drainage Line habitat provides potential nesting habitat for the

grey falcon, and potential foraging habitat and dispersal pathways for Pilbara olive python, ghost bat, Pilbara leaf-nosed bat, and northern quoll. Major Drainage Line habitat comprised approximately 2.8% (90.1 ha) of the survey area.

**Minor Drainage Line** habitat is a commonly recorded habitat for the Pilbara region and considered to be of low to moderate value to a wide spectrum of fauna species. Minor Drainage Lines within the survey area typically consisted of small drainage channels less than 10 m wide, with thick *Acacia* sp. growth along banks. A moderate diversity of microhabitats was exhibited, with tree hollows and woody debris (logs and leaf litter) present. Buffel grass was present in the ground storey vegetation. Ground-dwelling fauna, including MNES species such as northern quoll, bilby, and Pilbara olive-python, are likely to utilise the linear nature of the Minor Drainage Lines to traverse between more preferred habitats. Minor Drainage Line habitat comprised approximately 1.2% (39.1 ha) of the survey area.

**Hillcrest/ Hillslope** habitats were characterised by large, open, rocky areas with open grasslands (predominantly *Triodia* hummock grasslands). This habitat tended to be more open and structurally simple than other fauna habitats. It is considered to be of moderate to low value as it provided limited microhabitats for fauna to exploit, and the stony, compact soil reduces potential opportunities for burrowing species. Northern quoll and other MNES species are likely to traverse and forage within these habitats on occasion. Other significant species, such as western pebble-mound mouse and Gane's blind snake, may also utilise this habitat. Hillcrest/ Hillslope habitat comprised approximately 24.7% (807.9 ha) of the survey area.

**Drainage Area/ Floodplain** habitat is of low to moderate value to a wide spectrum of fauna species. There were grasslands and soft soils associated with this habitat type, creating microhabitats for some reptile and marsupial species, and potential habitat for MNES species, such as bilby, night parrot and grey falcon. Drainage Area/ Floodplain habitat within the survey area was often impacted by buffel grass, reducing floral diversity. This habitat type comprised approximately 13.3% (434.6 ha) of the survey area and is well-represented both inside and outside of the survey area.

**Stony Plain** habitat is widespread and common throughout the Pilbara region and, although there are some MNES species that may utilise it, they are not restricted to this habitat type. Significant fauna likely to occur in this habitat include the western pebble-mound mouse. This habitat generally had low vegetation complexity and microhabitat diversity, low availability of large spinifex (*Triodia* sp.) hummocks that may support night parrot presence and is generally considered to be of low value for MNES species. Stony Plain habitat comprised approximately 28.7% (936.9 ha) of the survey area.

**Undulating Low Hills** habitat is widespread and common throughout the Pilbara region and, although there are some significant species that may utilise this habitat, they are unlikely to be restricted to it, with the possible exception of the western pebble-mound mouse. This habitat had low vegetation complexity and low diversity of microhabitats available for fauna species to exploit. The soils were stony and compact, reducing the potential opportunities for burrowing species. This habitat is considered to be of low value to a broad spectrum of fauna species. Undulating Low Hills habitat comprised approximately 24.9% (813.9 ha) of the survey area.

**Gilgai Plain** habitat is an uncommon, typically small, habitat feature within the Pilbara bioregion. These plains are typically characterised by heavy clay-based soils with a cracking surface and are commonly associated with low-lying areas. Hummock/tussock grasses are prolific in the post-wet seasons but will hastily die off during the drier months. The presence of soft soils favours burrowing species and provides potential habitat for MNES species, such as bilby. Grey falcon may also hunt over this habitat. Gilgai Plain habitat comprised approximately 0.4% (14.2 ha) of the survey area.

Table 8: Fauna habitats described within the survey area.

| Fauna habitat   | Extent in survey area (proportion) | Broad habitat description                                           | Microhabitats                                                                                                                                                                                                                                      | Sites                                                                                                                | Habitat condition | Significant fauna habitat suitability for species recorded or considered highly likely to occur                                                                                                                                                                                                                                                                                                                                                                                                                                       | Representative photo                                                                |
|-----------------|------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Gorge/<br>Gully | 32.70 ha<br>(1%)                   | Incised rock features that have moderate to steep sides and slopes. | <ul style="list-style-type: none"> <li>• Caves</li> <li>• Overhangs</li> <li>• Logs</li> <li>• Tree hollows</li> <li>• Crevices</li> <li>• Thick undergrowth</li> <li>• Rock piles</li> <li>• Old <i>Triodia</i></li> <li>• Leaf litter</li> </ul> | <ul style="list-style-type: none"> <li>• HC-BAT-03</li> <li>• HC-NQ1-CAM01, 02, 08</li> <li>• HC-HA01, 03</li> </ul> | Excellent         | <p><b>MNES critical habitat</b><br/>Pilbara olive python (<i>Liasis olivaceus barroni</i>) – within home range of current record</p> <p><b>MNES supporting habitat</b><br/>Ghost bat (<i>Macroderma gigas</i>) – foraging<br/>Pilbara olive python (<i>Liasis olivaceus barroni</i>) – foraging and dispersal<br/>Pilbara leaf-nosed bat (<i>Rhinonictis aurantia</i>) – foraging</p> <p><b>Other significant species</b><br/>Gane’s Blind Snake (<i>Anilius ganei</i>)<br/>Peregrine falcon (<i>Falco peregrinus</i>) – foraging</p> |  |

| Fauna habitat     | Extent in survey area (proportion) | Broad habitat description                                                                  | Microhabitats                                                                                                                                                                                                                                     | Sites                                                                                                                                                                                              | Habitat condition | Significant fauna habitat suitability for species recorded or considered highly likely to occur                                                                                                                                                                                                                                                                                                                                                                                                | Representative photo                                                                |
|-------------------|------------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Breakaway / Cliff | 81.29 ha (2.49%)                   | Single-sided rock face or steep mid - upper slope comprising bare rock outcrops of cliffs. | <ul style="list-style-type: none"> <li>• Caves</li> <li>• Overhangs</li> <li>• Logs</li> <li>• Tree hollows</li> <li>• Crevices</li> <li>• Thick undergrowth</li> <li>• Rock pile</li> <li>• Old <i>Triodia</i></li> <li>• Leaf litter</li> </ul> | <ul style="list-style-type: none"> <li>• HC-BAT-02</li> <li>• HC-NQ1-CAM03, 04, 05, 06, 07, 09, 10</li> <li>• HC-NQ2-CAM01-10</li> <li>• HC-NQ3-CAM01-10</li> <li>• HC-HA06, 07, 18, 25</li> </ul> | Good to Excellent | <p><b>MNES critical habitat</b><br/>Pilbara olive python (<i>Liasis olivaceus barroni</i>) – within home range of current record</p> <p><b>MNES supporting habitat</b><br/>Pilbara olive python (<i>Liasis olivaceus barroni</i>) – foraging and dispersal<br/>Pilbara leaf-nosed bat (<i>Rhinonictis aurantia</i>) – foraging</p> <p><b>Other significant species</b><br/>Gane's Blind Snake (<i>Anilius ganei</i>)<br/>Peregrine falcon (<i>Falco peregrinus</i>) – nesting and foraging</p> |  |

| Fauna habitat       | Extent in survey area (proportion) | Broad habitat description                                                                                                                                                                      | Microhabitats                                                                                                                                                                                                                                                                                                    | Sites                                                                                                                         | Habitat condition | Significant fauna habitat suitability for species recorded or considered highly likely to occur                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Representative photo                                                                |
|---------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Major Drainage Line | 90.11 ha (2.76%)                   | Large drainage channel over 10 m in width. Water generally ephemeral and rocky substrate with soil/organic matter washed away. <i>Eucalyptus</i> and/or <i>Corymbia</i> species often present. | <ul style="list-style-type: none"> <li>• Caves</li> <li>• Overhangs</li> <li>• Logs</li> <li>• Tree hollows</li> <li>• Crevices</li> <li>• Thick undergrowth</li> <li>• Soft soil (burrows)</li> <li>• Semi-permanent water</li> <li>• Rock pile</li> <li>• Old <i>Triodia</i></li> <li>• Leaf litter</li> </ul> | <ul style="list-style-type: none"> <li>• HC-BAT-04, 05, 07, 08</li> <li>• HC-CAM-01</li> <li>• HC-HA04, 19, 20, 24</li> </ul> | Good to Very Good | <p><b>MNES critical habitat</b></p> <p>Pilbara olive python (<i>Liasis olivaceus barroni</i>) – recorded (scats)</p> <p>Grey falcon (<i>Falco hypoleucos</i>) – nesting</p> <p><b>MNES supporting habitat</b></p> <p>Ghost bat (<i>Macroderma gigas</i>) – foraging</p> <p>Grey falcon (<i>Falco hypoleucos</i>) – foraging</p> <p>Pilbara leaf-nosed bat (<i>Rhinonicteris aurantia</i>) – foraging</p> <p>Pilbara olive python (<i>Liasis olivaceus barroni</i>) – dispersal</p> <p><b>Other significant species</b></p> <p>Gane's Blind Snake (<i>Anilius ganei</i>)</p> <p>Peregrine falcon (<i>Falco peregrinus</i>) – foraging</p> |  |

| Fauna habitat        | Extent in survey area (proportion) | Broad habitat description                                                                                                                                                  | Microhabitats                                                                                                                                                                                     | Sites                                                                                       | Habitat condition      | Significant fauna habitat suitability for species recorded or considered highly likely to occur                                                                                                                                                                                                                                                                                                                                                              | Representative photo                                                                 |
|----------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Minor Drainage Line  | 39.10 ha (1.2%)                    | Small drainage channel less than 10 m in width. Often thick with <i>Acacia</i> growth along banks and is less likely to support surface water for long following rainfall. | <ul style="list-style-type: none"> <li>• Logs</li> <li>• Tree hollows</li> <li>• Thick undergrowth</li> <li>• Soft soil (burrows)</li> <li>• Old <i>Triodia</i></li> <li>• Leaf litter</li> </ul> | <ul style="list-style-type: none"> <li>• HC-AU-01, 02</li> <li>• HC-HA12, 13, 14</li> </ul> | Very Good to Excellent | <p><b>MNES supporting habitat</b></p> <p>Ghost bat (<i>Macroderma gigas</i>) – foraging</p> <p>Grey falcon (<i>Falco hypoleucos</i>) – foraging</p> <p>Pilbara leaf-nosed bat (<i>Rhinonicteris aurantia</i>) – foraging</p> <p>Pilbara olive python (<i>Liasis olivaceus barroni</i>) – dispersal</p> <p><b>Other significant species</b></p> <p>Gane’s Blind Snake (<i>Anilius ganei</i>)</p> <p>Peregrine falcon (<i>Falco peregrinus</i>) – foraging</p> |   |
| Hillcrest/ Hillslope | 807.94 ha (24.74%)                 | Characterised by large, open, rocky areas with open grasslands, predominantly <i>Triodia</i> hummock grasslands.                                                           | <ul style="list-style-type: none"> <li>• Crevices</li> <li>• Rock pile</li> <li>• Old <i>Triodia</i></li> </ul>                                                                                   | <ul style="list-style-type: none"> <li>• HC-HA02, 10, 22, 23, 27</li> </ul>                 | Very Good to Excellent | <p><b>MNES supporting habitat</b></p> <p>Ghost bat (<i>Macroderma gigas</i>) – foraging</p> <p>Grey falcon (<i>Falco hypoleucos</i>) – foraging</p> <p>Pilbara leaf-nosed bat (<i>Rhinonicteris aurantia</i>) – foraging</p> <p><b>Other significant species</b></p> <p>Western pebble-mound mouse (<i>Pseudomys chapmani</i>) – denning and foraging</p> <p>Peregrine falcon (<i>Falco peregrinus</i>) – foraging</p>                                       |  |

| Fauna habitat                | Extent in survey area (proportion) | Broad habitat description                                                                             | Microhabitats                                                                                                                                                                                     | Sites                                                                                                                        | Habitat condition      | Significant fauna habitat suitability for species recorded or considered highly likely to occur                                                                                                                                                                                                                                                                | Representative photo                                                                 |
|------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Drainage Area/<br>Floodplain | 434.58 ha<br>(13.31%)              | Generally adjacent to drainage lines, often contains tussock grasses and has a high vegetation cover. | <ul style="list-style-type: none"> <li>• Logs</li> <li>• Tree hollows</li> <li>• Thick undergrowth</li> <li>• Soft soil (burrows)</li> <li>• Old <i>Triodia</i></li> <li>• Leaf litter</li> </ul> | <ul style="list-style-type: none"> <li>• HC-BAT-01, 06</li> <li>• HC-BP-01, 03, 04, 05, 06</li> <li>• HC-HA16, 17</li> </ul> | Good to Very Good      | <p><b>MNES supporting habitat</b></p> <p>Ghost bat (<i>Macroderma gigas</i>) – foraging</p> <p>Grey falcon (<i>Falco hypoleucos</i>) – foraging</p> <p>Pilbara leaf-nosed bat (<i>Rhinonictis aurantia</i>) – foraging</p> <p><b>Other significant species</b></p> <p>Peregrine falcon (<i>Falco peregrinus</i>) – foraging</p>                                |   |
| Stony Plain                  | 936.86 ha<br>(28.68%)              | Broad, flat, low-lying plains to undulating plain over clay or stony substrate.                       | <ul style="list-style-type: none"> <li>• Soft soil (burrows)</li> <li>• Rock piles</li> <li>• Old <i>Triodia</i></li> <li>• Leaf litter</li> </ul>                                                | <ul style="list-style-type: none"> <li>• HC-BP-02</li> <li>• HC-HA05, 08, 09, 11, 26, 28</li> </ul>                          | Very Good to Excellent | <p><b>MNES supporting habitat</b></p> <p>Grey falcon (<i>Falco hypoleucos</i>) – foraging</p> <p>Pilbara leaf-nosed bat (<i>Rhinonictis aurantia</i>) – foraging</p> <p><b>Other significant species</b></p> <p>Western pebble-mound mouse (<i>Pseudomys chapmani</i>) – denning and foraging</p> <p>Peregrine falcon (<i>Falco peregrinus</i>) – foraging</p> |  |

| Fauna habitat        | Extent in survey area (proportion) | Broad habitat description                                                                        | Microhabitats                                                                               | Sites                                                     | Habitat condition | Significant fauna habitat suitability for species recorded or considered highly likely to occur                                                                                                                                                                                                                                                                                                                         | Representative photo                                                                 |
|----------------------|------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Undulating Low Hills | 813.91 ha (24.92%)                 | Low, undulating hills and extensive foot slopes with a gentle gradient.                          | <ul style="list-style-type: none"> <li>Old <i>Triodia</i></li> </ul>                        | <ul style="list-style-type: none"> <li>HC-HA15</li> </ul> | Excellent         | <p><b>MNES supporting habitat</b></p> <p>Ghost bat (<i>Macroderma gigas</i>) – foraging</p> <p>Grey falcon (<i>Falco hypoleucos</i>) – foraging</p> <p>Pilbara leaf-nosed bat (<i>Rhinionicteris aurantia</i>) – foraging</p> <p><b>Other significant species</b></p> <p>Western pebble-mound mouse (<i>Pseudomys chapmani</i>) – denning and foraging</p> <p>Peregrine falcon (<i>Falco peregrinus</i>) – foraging</p> |   |
| Gilgai Plain         | 14.16 ha (0.43%)                   | Heavy clay-based soil with cracking surface. Contains tussock grasses and high vegetation cover. | <ul style="list-style-type: none"> <li>Soft soils (burrows)</li> <li>Leaf litter</li> </ul> | <ul style="list-style-type: none"> <li>HC-HA21</li> </ul> | Very Good         | <p><b>MNES supporting habitat</b></p> <p>Ghost bat (<i>Macroderma gigas</i>) – foraging</p> <p>Grey falcon (<i>Falco hypoleucos</i>) – foraging</p> <p>Pilbara leaf-nosed bat (<i>Rhinionicteris aurantia</i>) – foraging</p> <p><b>Other significant species</b></p> <p>Peregrine falcon (<i>Falco peregrinus</i>) – foraging</p>                                                                                      |  |

| Fauna habitat         | Extent in survey area (proportion) | Broad habitat description                                                 | Microhabitats | Sites    | Habitat condition                 | Significant fauna habitat suitability for species recorded or considered highly likely to occur | Representative photo |
|-----------------------|------------------------------------|---------------------------------------------------------------------------|---------------|----------|-----------------------------------|-------------------------------------------------------------------------------------------------|----------------------|
| Cleared/<br>Disturbed | 15.51 ha<br>(0.47%)                | Areas where the natural vegetation and microhabitats have been disrupted. | None present  | No sites | Degraded<br>to Highly<br>Degraded | None                                                                                            | N/A                  |

Note: MNES = Matters of National Environmental Significance; N/A = not applicable.

## 4.2.2 Vertebrate Fauna Species

Eighty-one vertebrate fauna species were recorded within the survey area during the current survey (Table 9). A complete list of recorded species is provided in Tables D.1 to D.4 (Appendix D). The following sections detail results for each major taxonomic group sampled.

Table 9: Number of vertebrate fauna species recorded during the survey.

| Fauna taxonomic group | Number of species recorded | Number of MNES species recorded | Number of DBCA Priority fauna species recorded | Number of introduced species recorded |
|-----------------------|----------------------------|---------------------------------|------------------------------------------------|---------------------------------------|
| Amphibians            | 1                          | 0                               | 0                                              | 0                                     |
| Reptiles              | 10                         | 1                               | 0                                              | 0                                     |
| Birds                 | 52                         | 0                               | 0                                              | 0                                     |
| Mammals               | 18                         | 0                               | 1                                              | 3                                     |
| <b>Total</b>          | <b>81</b>                  | <b>1</b>                        | <b>1</b>                                       | <b>3</b>                              |

### 4.2.2.1 Herpetofauna

One amphibian species, *Litoria rubella*, was recorded during the survey, persisting in remnant pools within Major Drainage Line habitat.

Ten reptile species were recorded during the survey. The most speciose families were Scincidae (skinks) and Gekkonidae (cosmopolitan geckos) with three species each, followed by Diplodactylidae (diplodactylid geckos) with two species. Agamidae (dragons) and Pythonidae (pythons) were each represented by a singular species (Table D.2, Appendix D). The low number of reptiles is not unexpected given the survey focused on the presence/absence of MNES and other significant species without the use of pitfall trapping implemented in Detailed fauna assessments.

One MNES reptile species, Pilbara olive python, was recorded during the survey through secondary evidence. This species is discussed further in Section 4.2.2.4.

### 4.2.2.2 Birds

Fifty-two bird species were recorded during the survey. The most speciose families were Meliphagidae (honeyeaters) and Artamidae (woodswallows, butcherbirds) with five species each, followed by Accipitridae (hawks, eagles), Columbidae (pigeons), Falconidae (falcons), and Maluridae (Australian wrens) with three species each (Table D.3, Appendix D). The limited surface water within the survey area restricted the bird diversity, with no waterfowl or wading species recorded. No MNES or other significant bird species were recorded during the survey.

### 4.2.2.3 Mammals

Eighteen species of mammal were recorded during the survey, including three introduced species: cat (*\*Felis catus*), dog/dingo (*\*Canis familiaris*), and European cattle (*\*Bos taurus*) (Table D.4, Appendix D). Eight bat species were identified from ultrasonic acoustic recordings within the survey area.

One mammal of significance was recorded during the survey: western pebble-mound mouse (P4). This species is discussed further in Section 4.2.2.4.

### 4.2.3 Significant Species Recorded

Two vertebrate species of significance, including one MNES species, have been recorded within the survey area: Pilbara olive python and western pebble-mound mouse. The locations of these species' records from the current survey, as well as previously recorded species, are shown in Figure H.1 and detailed in Table H.1 (Appendix H).

#### **Pilbara Olive Python (*Liasis olivaceus barroni*) (VU; VU)**

The Pilbara olive python prefers escarpments, deep gorges, water holes, and rock piles associated with permanent pools in rocky areas in the ranges of the Pilbara region (Pearson 1993, Wilson and Swan 2017). Microhabitat preferences of the Pilbara olive python are under rock piles, on top of rock or under spinifex (Tutt et al. 2004). Individuals spend the cooler months within caves and rock crevices away from water sources. In the warmer summer months, the pythons are found to move around widely, usually in close proximity to water and rocky outcrops (Wilson and Swan 2017).

Evidence of Pilbara olive python occurrence via two scats was recorded at one opportunistic location during the survey (Plate 1). The scat was found within a small cave proximate to a pool within Gorge/Gully habitat along Major Drainage Line habitat (Plate 2). A live Pilbara olive python, skin shed, large scat pile, and eDNA samples have previously been identified from the same approximate location on previous surveys (Biologic Environmental Survey 2016, 2021). No individuals were captured on a motion sensitive camera deployed at the nearby pool during the current survey, and no Pilbara olive python DNA was detected in the eDNA analysis of collected water samples (eDNA Frontiers 2023).



Plate 1: Pilbara olive python (*Liasis olivaceus barroni*) scat location.



Plate 2: Pool near scat location.

This species is likely to be found within Gorge/ Gully, Breakaway/ Cliff, and Major Drainage Line habitats, particularly around water sources and rocky outcrops that provide denning sites and ambush locations. The thick vegetation and log piles found in these areas act as refuges and provide shelter and ambush locations, particularly in areas containing permanent/semi-permanent water sources. Approximately 204.1 ha (6.2%) of the survey area, consisting of Gorge/ Gully, Breakaway/ Cliff and Major Drainage Line habitat, was considered critical habitat for the Pilbara olive python (Figure G.4, Appendix G). Minor Drainage Line, covering approximately 39.1 ha (1.2%), was considered as supporting habitat. The remaining approximately 3,023.0 ha (92.6%) of the survey area, consisting of Stony Plain, Undulating Low Hills, Hillcrest/ Hillslope, Drainage Areas/ Floodplain, Gilgai Plain, and Cleared/ Disturbed habitats, was considered to provide limited foraging and dispersal habitat (Figure G.4, Appendix G).

### Western Pebble-mound Mouse (*Pseudomys chapmani*) (P4)

The western pebble-mound mouse is endemic to the Pilbara and confined to the central and eastern Pilbara in Western Australia. They are found on stony hillsides with hummock grasslands, and shelter in complex burrow systems under a mound, which they construct on the surface using pebbles collected in the vicinity (Menkhorst and Knight 2011). Nine mounds were recorded during the current survey, including five active mounds (see Plate 3 for example), two recently inactive mounds (see Plate 4 for example), and two inactive mounds. The Stony Plain, Undulating Low Hills and Hillcrest/ Hillslope habitats support this species and are widespread throughout the Pilbara and the survey area.



Plate 3: Active western pebble-mound mouse (*Pseudomys chapmani*) mound



Plate 4: Recently inactive western pebble-mound mouse (*Pseudomys chapmani*) mound

#### 4.2.4 Significant Species Possibly Occurring in the Survey Area

Table 10 provides additional summary of the home range, habitat availability and likelihood of occurrence for the MNES species identified as occurring, or potentially occurring, within the survey area.

##### 4.2.4.1 High Likelihood of Occurrence

Five species not recorded in the survey area during the current survey are considered to have a high post-survey likelihood of occurrence (Table E.1, Appendix E). Three species are MNES: ghost bat, Pilbara leaf-nosed bat and grey falcon.

#### Ghost Bat (*Macroderma gigas*) (VU; VU)

The ghost bat is found in a wide range of habitats but relies on caves for roosting. Whilst no diurnal roost caves or critical habitat were present, 19 Category 4 caves (potential feed caves) and 2 Category 5 caves (little to no usage) were identified during the survey (Figure F.2, Appendix F). Supporting foraging and dispersal habitat including Major Drainage Lines and Drainage Areas/ Floodplain were present throughout the survey area. Fresh (<1 month old) scats were identified within a cave (CCAT-09) during a previous survey overlapping the current survey area (Biologic Environmental Survey 2016); however, no further scats were identified in the following cave assessments (Biologic

Environmental Survey 2021). Five previous records within 20 km of the survey area were also outlined in DBCA's Threatened and Priority database search (Department of Biodiversity, Conservation and Attractions 2022a). VHF and GPS/satellite tracking studies have shown that ghost bats forage up to 12 km from their diurnal roosts (Augusteyn et al. 2018), with round trips of up to 30 km being recorded (Bat Call WA 2021a). No ghost bat calls have been recorded within the survey area to date; however, due to the recent scat record in cave CCAT-09 and the presence of supporting foraging and dispersal habitat, this species has a 'high' likelihood of occurrence.

No critical habitat was identified for the ghost bat within the survey area. Critical habitat for ghost bat comprises of Gorge/ Gully and Breakaway/ Cliff habitats with the presence of maternity and/or diurnal roost caves, and foraging habitat within 12 km of such caves.

Approximately 1,628.8 ha (49.9%) of the survey area was identified as supporting habitat for the ghost bat, consisting of Gorge/ Gully, Breakaway/ Cliff, Major Drainage Line, Minor Drainage Line, Stony Plain, Drainage Areas/ Floodplain, and Gilgai Plain habitats (Figure G.2, Appendix G). Ghost bats have relatively broad foraging habitat, ranging across tree-lined drainage lines, isolated trees on the outskirts of plains, and productive plains of thin woodland over clumped tussock or *Triodia* hummock grass (Bat Call WA 2021a).

The remaining approximately 1,637.4 ha (50.1%) of the survey area was considered to provide limited foraging and dispersal habitat, consisting of Hillcrest/ Hillslope, Undulating Low Hills, and Cleared/ Disturbed habitats (Figure G.2, Appendix G).

#### **Pilbara Leaf-nosed Bat (*Rhinonicteris aurantia*) (VU; VU)**

The Pilbara leaf-nosed bat roosts in deep, warm, humid caves or rock cracks near water pools, and forages in a range of habitats, including along watercourses and over *Triodia* grasslands. All 21 identified caves within the survey area were considered Category 4 (potential nocturnal refuge) caves for this species. Calls have been recorded on multiple previous surveys from within 1 km of the survey area, including records from as close as 10 m (Biologic Environmental Survey 2016, 2021). Over 100 previous records within 20 km of the survey area were detailed on database search returns. (Department of Biodiversity, Conservation and Attractions 2022a). Due to the proximate records and the presence of supporting foraging and dispersal habitat within the survey area, this species has a 'high' likelihood of occurrence.

No critical habitat was identified for this species within the survey area. The Pilbara leaf-nosed bat requires deep, humid, climatically stable caves for diurnal and maternal roost sites, which are typically associated with Gorge/ Gully and Breakaway/ Cliff habitats. While these habitat types were present within the survey area, no suitable (Category 1-3) caves were identified. Moreover, the absence of Pilbara leaf-nosed bat recordings from long-term echolocation recording units placed by BHP WAIO personnel indicated that there is no Pilbara leaf-nosed bat roost within the Homestead West/Cathedral Gorge area (Bat Call WA 2023). The nearest known permanent diurnal roost is Kalgan Creek, located approximately 18 km north-west of the survey area. Gorge/ Gully and Breakaway/ Cliff habitats within the survey area are thus included as supporting habitat only for this species.

The Pilbara leaf-nosed bat is known to forage across a wide variety of habitat, typically along vegetated gullies and ridgelines, water courses and drainage lines, and across plains and low hills with complex vegetation structure (Bat Call WA 2021b). As such, the entire survey area, excluding Cleared/ Disturbed areas (15.5 ha (0.5%)), was considered as supporting habitat for the Pilbara leaf-nosed bat (Figure G.3, Appendix G).

### **Grey Falcon (*Falco hypoleucos*) (VU)**

The grey falcon is a raptor that usually nests in the tallest trees along watercourses, particularly in River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*E. coolabah*), but also in telecommunication towers (Marchant and Higgins 1993, Schoenjahn 2013, 2018). The species frequents timbered, lowland plains, particularly *Acacia* shrublands that are crossed by tree-lined water courses (Garnett et al. 2011, Watson 2011, Janse et al. 2015, Ley and Tynan 2016, Schoenjahn 2018). A pair of grey falcons was observed on a recent fauna survey within approximately 10 km of the current survey area (GHD Pty Ltd 2022). Due to this species' wide home range (~100 km<sup>2</sup>) and the presence of critical and supporting habitat within the survey area, there is a 'high' likelihood of occurrence for this species.

The Major Drainage Line habitat within the survey area (90.1 ha (2.9%); Figure G.5, Appendix G) was considered critical habitat for the grey falcon, according to the criteria in Table B.8 (Appendix B). This was due to the presence of tall *Eucalyptus* trees within this habitat that may be suitable as nest sites for this species.

Approximately 2,238.0 ha (68.5%) of the survey area was considered supporting habitat, consisting of Minor Drainage Line, Stony Plain, Undulating Low Hills, Drainage Areas/ Floodplain, and Gilgai Plain habitats (Figure G.5, Appendix G).

The remaining approximately 937.4 ha (28.7%) of the survey area was considered to provide limited foraging and dispersal habitat, which consisted of Gorge/ Gully, Breakaway/ Cliff, Hillcrest/ Hillslope, and Cleared/ Disturbed habitats (Figure G.5, Appendix G).

### **Peregrine Falcon (*Falco peregrinus*) (OS)**

The peregrine falcon occurs throughout Australia and in most habitat types, with the exception of treeless and waterless desert and dense forests (Birdlife Australia 2012). The peregrine falcon utilises the ledges, cliff faces and large hollows/broken spouts of trees for nesting. It also occasionally uses the abandoned nests of other birds of prey (Johnstone and Storr 1998). The closest record occurs within 5 km of the survey area (Department of Biodiversity, Conservation and Attractions 2022a) and this species was recorded on three surveys within the vicinity of the current survey area (Biota Environmental Sciences 2001, GHD Pty Ltd 2008, 2022). Potential habitat, including Major Drainage Lines, Gorges/ Gullies and Breakaways/ Cliffs, for this species is present throughout the survey area (Figure F.1, Appendix F).

### **Gane's Blind Snake (*Anilius ganei*) (P1)**

Gane's blind snake is often poorly collected in vertebrate fauna surveys. This species has been associated with moist gorges and gullies (Wilson and Swan 2017) but potentially occurs over a wide range of other stony habitats. Given its cryptic fossorial habit, this species is rarely encountered. There were seven records from within 20 km of the survey area (Department of Biodiversity, Conservation and Attractions 2022a) and potential habitat, including Gorge/ Gully, Breakaway/ Cliff and Hillcrest/ Hillslope, is present throughout the survey area (Figure F.1, Appendix F).

#### **4.2.4.2 Moderate Likelihood of Occurrence**

Four significant fauna species not found in the survey area were considered to have a moderate post-survey likelihood of occurrence: Northern quoll, long-tailed dunnart, brush-tailed mulgara, and Pilbara barking gecko (*Underwoodisaurus serosus*) (P2) (Table E.1, Appendix E).

### **Northern Quoll (*Dasyurus hallucatus*) (EN; EN)**

Northern quoll is common in a range of habitats within its distribution, including rocky habitats and watercourses. There are 13 previous records for this species within 80 km of the survey area, with the closest record being approximately 57 km from the survey area (Department of Biodiversity, Conservation and Attractions 2022a). Approximately 114.0 ha (3.5%) of the survey area, comprising of Gorge/ Gully and Breakaway/ Cliff, was considered critical habitat for northern quoll (Figure G.1, Appendix G). These habitats contain the rocky environments of high relief that are particularly important for northern quoll, as they provide denning sites for breeding and shelter, and diverse microhabitats for foraging, such as caves, crevices, and rock piles.

Approximately 937.2 ha (28.7%) of the survey area, which consisted of Hillcrest/ Hillslope, Major Drainage Line and Minor Drainage Line habitats, was considered supporting habitat (Figure G.1, Appendix G).

The remaining approximately 2,215.0 ha (67.8%) of the survey area, consisting of Stony Plain, Undulating Low Hills, Drainage Areas/ Floodplain, Gilgai Plain, and Cleared/ Disturbed habitats, was considered to provide limited foraging and dispersal habitat (Figure G.1, Appendix G).

#### **Long-tailed Dunnart (*Antechinomys longicaudata*) (P4)**

Long-tailed dunnart is a specialist rock-dwelling species (Freeland et al. 1988) associated with rocky landscapes that support low, open, Mulga woodland or shrubland with a spinifex hummock understory (Pavey 2006). There are two previous records for this species within 5 km of the survey area, and potential supporting habitat is present.

#### **Brush-tailed Mulgara (*Dasymercus blythi*) (P4)**

Brush-tailed mulgara is common in a range of habitats, including tussock/hummock grasslands and low open woodlands. Nine records within 1 km of the current survey area were identified on a recent previous survey (GHD Pty Ltd 2022). Due to the limited supporting habitat within the survey area, this species has a 'moderate' likelihood of occurrence.

#### **Pilbara Barking Gecko (*Underwoodisaurus seorsus*) (P2)**

Pilbara barking gecko is confined to the Hamersley Ranges from Tom Price to Newman and occurs in rocky areas with spinifex and low tree cover. There are 14 previous records, all of which are over 60 km from the survey area. However, due to suitable habitat being present in the form of Stony Plain, Hillcrest/ Hillslope and Undulating Low Hills, there is a 'moderate' likelihood of this species occurring.

**Table 10: Comparison of home range, habitat availability and likelihood of occurrence for Matters of National Environmental Significance (MNES) species identified in the desktop analysis for the survey area.**

| MNES species                                                                    | Home range                                        | Nearest record from survey area (km) | Critical habitat                                                                                                                        |                                  | Supporting habitat                                                                        |                                  | Likelihood of occurrence |                 |
|---------------------------------------------------------------------------------|---------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------|----------------------------------|--------------------------|-----------------|
|                                                                                 |                                                   |                                      | Type                                                                                                                                    | Area within survey area (ha (%)) | Type                                                                                      | Area within survey area (ha (%)) | Pre-survey               | Post-survey     |
| Northern quoll ( <i>Dasyurus hallucatus</i> ) (EN; EN)                          | 35 ha, up to 100 ha during breeding season        | Approximately 50 km                  | Low, rocky hills, major drainage lines, and woodland within home ranges.                                                                | 113.99 ha (3.49%)                | Major drainage line systems facilitating foraging and dispersal.                          | 937.16 ha (28.69%)               | Moderate                 | Moderate        |
| Ghost bat ( <i>Macroderma gigas</i> ) (VU; VU)                                  | >12 to 30 km                                      | Previously recorded                  | Deep, humid caves generally in select geological formations, such as Gorge/ Gully and Breakaway habitats.                               | 0 ha (0%)                        | Productive plains areas, isolated trees on plain outskirts, and tree lined water courses. | 1,628.81 ha (49.87%)             | <b>Recorded</b>          | High            |
| Pilbara leaf-nosed bat ( <i>Rhinonicteris aurantia</i> (Pilbara form)) (VU; VU) | >10 to 30 km from permanent/semi-permanent roosts | Less than 1 km                       | Deep, humid caves generally in select geological formations, such as Gorge/ Gully and Breakaway habitats.                               | 0 ha (0%)                        | Plains and low hills with moderate two-layer non-complex vegetation structure.            | 3,250.65 ha (99.53%)             | High                     | High            |
| Pilbara olive python ( <i>Liasis olivaceus barroni</i> ) (VU; VU)               | 88 to 450 ha                                      | Previously recorded                  | Rocky outcrops in proximity to gorges and water holes. Such features are typically associated with Gorge/ Gully and Breakaway habitats. | 204.10 ha (6.25%)                | Gullies, drainage lines, and water courses                                                | 39.10 ha (1.20%)                 | <b>Recorded</b>          | <b>Recorded</b> |

| MNES species                                 | Home range                                                                                                                           | Nearest record from survey area (km) | Critical habitat                                                                                                                                                                                 |                                  | Supporting habitat                                                                                                                                                                                                       |                                  | Likelihood of occurrence |             |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------|-------------|
|                                              |                                                                                                                                      |                                      | Type                                                                                                                                                                                             | Area within survey area (ha (%)) | Type                                                                                                                                                                                                                     | Area within survey area (ha (%)) | Pre-survey               | Post-survey |
| Grey falcon ( <i>Falco hypoleucos</i> ) (VU) | Undetermined, but likely to be larger than that of the peregrine falcon in the temperate zone (i.e. more than 100 km <sup>2</sup> ). | Approximately 20 km                  | Major drainage habitats with suitably sized Eucalypts ( <i>E. camaldulensis</i> , <i>E. coolabah</i> ) as potential nesting habitat, often in the abandoned nest of a raptor or corvid in trees. | 90.11 ha (2.76%)                 | Timbered, lowland plains, particularly <i>Acacia</i> shrublands that are crossed by tree-lined water courses. Hunting has been observed in treeless areas and the species frequents tussock grassland and open woodland. | 2,238.61 ha (68.54%)             | High                     | High        |

Note: MNES = Matters of National Environmental Significance.

#### 4.2.4.3 Low Likelihood of Occurrence

An additional 37 species, including 29 MNES species, were considered to have a low post-survey likelihood of occurrence due to a lack of suitable habitats (Table E.1, Appendix E). Nine migratory birds were originally considered as having a 'high' likelihood of occurrence, as they had been recorded within 20 km of the survey area. The post-survey assessment downgraded these species' likelihood of occurrence to 'low' due to a lack of suitable habitat observed within the survey area. The bilby, great desert skink, southern whiteface, and night parrot were considered to have a low likelihood of occurrence during the desktop assessment due to the lack of historical records in the vicinity of the survey area and the lack of potential suitable habitat (Table 10).

## 5 Discussion

### 5.1 Fauna Habitats

None of the fauna habitats within the survey area are restricted at the local or sub-regional scale and no uncommon geological units or land systems occur within the survey area. The nine broad habitats observed within the survey area are considered representative examples of each habitat type, which all occur widely within the Pilbara bioregion.

There was one pool recorded as a significant habitat feature, located within Major Drainage Line habitat in the north-western corner of the survey area. Although Major Drainage Line habitat accounted for a small portion of the survey area (2.8%), this habitat type is identified as being of high value to several MNES fauna species. Major Drainage Line habitat within the survey area was considered as 'critical' Pilbara olive python habitat (current and historical records within survey area), and the presence of tall, mature *Eucalyptus* species within this habitat type provides suitable (critical) nesting habitat for the grey falcon (high likelihood). Additionally, foraging and dispersal opportunities within Major Drainage Lines provide supporting habitat for ghost bat and Pilbara leaf-nosed bat (high likelihood), and for northern quoll (moderate likelihood).

Breakaway/ Cliff and Gorge/ Gully habitats are common within the survey area and across the wider Pilbara bioregion; however, due to their linear nature, they only represent a small portion of the total land area (and a combined 3.5% within the survey area). Despite this small representation, these habitats are also of high value to several MNES species. Caves present within these habitats across the survey area may be opportunistically used as nocturnal roosts or feeding caves by ghost bat and Pilbara leaf-nosed bat, although none are considered critical as they do not provide deep, humid environments necessary for diurnal roosting and continuous occupancy. Microhabitats present, such as caves/overhangs, rock piles and rock shelters, provide critical foraging and denning opportunities for northern quoll and, when associated with Major Drainage Line habitat, for Pilbara olive python.

Minor Drainage Line habitat (1.2% of the survey area) is of moderate value to a wide spectrum of vertebrate fauna and provides supporting (foraging and dispersal) habitat for MNES species Pilbara olive python, northern quoll, ghost bat, Pilbara leaf-nosed bat, and grey falcon. Minor Drainage Lines, although not necessarily large in area, are common habitats within the vicinity of the survey area and wider Pilbara bioregion.

Drainage Area/ Floodplain and Gilgai Plain habitats (14.0% of the survey area) are of moderate value to a variety of fauna species, but of generally low value to the target MNES species. However, they may be utilised for foraging by ghost bat, Pilbara leaf-nosed bat and grey falcon on occasion. Soft soils present opportunities for burrowing species, like bilby, although no signs of this species were observed, and likelihood of occurrence is considered low.

The Stony Plain, Hillcrest/ Hillslope and Undulating Low Hills habitats were the three most common habitats across the survey area, collectively accounting for approximately 2,558.7 ha (78.3%). These habitats are of low value generally to the target MNES species but are of high value to the recorded significant species (western pebble-mound mouse). Stony Plain, Hillcrest/ Hillslope and Undulating Low Hill habitats are common within the vicinity of the survey area and the wider Pilbara bioregion.

## 5.2 Vertebrate Fauna Species

Eighty-one vertebrate fauna species, comprising one amphibian, 10 reptiles, 52 birds, and 18 mammals (including three introduced species) were recorded within the survey area during the current survey. The fauna assemblage recorded during the survey is considered typical of the Hamersley subregion and the broader Pilbara bioregion. This is a comparatively similar diversity of species when compared to other fauna assessments of the same surveying intensity in the area (e.g. Biologic Environmental Survey 2016, GHD Pty Ltd 2022).

### 5.2.1 Significant Species

Of the 48 significant species identified in the desktop assessment as occurring or potentially occurring in the survey area, seven species (including two species recorded during the survey) were considered to have a 'high' post-survey likelihood of occurrence within the survey area. These species include the Pilbara olive python, western pebble-mound mouse, ghost bat, Pilbara leaf-nosed bat, grey falcon, peregrine falcon, and Gane's blind snake (Table E.1, Appendix E).

#### 5.2.1.1 Target MNES Species

Extensive survey effort was undertaken to provide an indication of MNES species presence within the survey area, including 155 camera trap nights, 23 echolocation recording nights, 12 acoustic recording nights, five targeted 2 ha bilby plot searches, targeted cave searches, and two targeted nocturnal searches. An additional 145 camera trap nights and 150 echolocation recording nights were conducted prior to the current survey by BHP WAIO personnel (BHP pers. comm., 2023, Bat Call WA 2023). Despite the survey effort, evidence of only one MNES species, the Pilbara olive python, was identified via secondary scat evidence at one location within Gorge/Gully habitat.

The Pilbara olive python is typically associated with gorges and rocky habitats, particularly where water holes and permanent pools are common (Pearson 1993, Wilson and Swan 2017). The scats record identified during the current survey was obtained from within a small cave within 20 m of a pool in Gorge/Gully habitat along a major drainage line. Pilbara olive python records from previous surveys were identified at the location of the current scat record including a large scat pile identified alongside a permanent river pool (Biologic Environmental Survey 2016) and an individual captured in the same Gorge/Gully system on a following survey (Biologic Environmental Survey 2021). Recent eDNA analysis from a water source central to the previous and current records also detected Pilbara olive python on multiple sampling assessments (Biologic Environmental Survey 2021); however, comparable eDNA analysis during the current survey failed to detect the species. The accumulation of records surrounding this pool indicates the significance of this local area to the species. Favourable microhabitats, including water pools, caves/overhangs, rock piles, logs, and thick vegetation, are present within the localised area and provide critical denning and ambushing/foraging locations. Critical Pilbara olive python habitat covers 6.2 % (204.1 ha) of the survey area, consisting of Major Drainage Line and associated Gorge/ Gully and Breakaway/ Cliff habitats, which provide foraging, sheltering and dispersal opportunities.

Extensive survey effort for both ghost bat and Pilbara leaf-nosed bat species has been undertaken across the greater Homestead Creek and Cathedral Gorge region (ENV Australia 2009, Biologic Environmental Survey 2016, GHD Pty Ltd 2022). A ghost bat scat was previously found in a cave within the survey area, while a bat detector placed less than 1 km from the survey area boundary had previously recorded Pilbara leaf-nosed bat (Biologic Environmental Survey 2016); however, no evidence of either species was observed during the current survey. Both MNES bat species utilise deep, humid, climatically stable caves for diurnal and maternal roost sites (Bat Call WA 2021b, 2021a). None of the 21 caves identified within the survey area exhibited features suitable for diurnal or maternal roost sites and, thus, no critical ghost or Pilbara leaf-nosed bat habitat was considered to be present within the survey area. No Pilbara leaf-nosed bat roosts are present in the Homestead Creek/Cathedral Gorge area, with any presence likely to occur in April/May when the species is known to utilise opportunistic roosting sites or are within a nights flying range of the nearest known significant roost at Kalgan Creek (Bat Call WA 2023). The identified caves within the survey area could potentially be used opportunistically by ghost bats as nocturnal roosts or feeding caves (Category 4 or 5), while both species are likely to forage over a wide range of habitats present throughout the survey area. As supporting habitat is present, and both species have recently been identified from within or proximate to the survey area, they are both considered to have a 'high' likelihood of occurrence, but not to be reliant on any of the habitats within.

The grey falcon is one of the least frequently encountered raptor species across Australia, commonly frequenting timbered, lowland plains and *Acacia* shrublands (Garnett et al. 2011, Watson 2011, Schoenjahn 2013, 2018). This species typically nests in the tallest trees along watercourses, generally *Eucalyptus* species, and is thought to have a home range of around 100 km<sup>2</sup> (Marchant and Higgins 1993, Schoenjahn 2013, 2018). The Major Drainage Line habitat across the survey area contained large *Eucalyptus* spp. that could act as suitable (critical) nesting habitat for the grey falcon, while suitable (supporting) foraging and dispersal habitat was common throughout the survey area. Moreover, a recent fauna survey within the vicinity of the Homestead Creek and Cathedral Gorge area observed a pair of grey falcons flying overhead (GHD Pty Ltd 2022). As a result of these combined factors, the likelihood of occurrence of the grey falcon was assessed as 'high', and the species is expected to occur within the survey area and the broader surrounds on occasion, but not to be solely reliant on any of the habitats within.

Extensive survey effort was undertaken to provide an indication of northern quoll presence within the survey area, including 155 camera trap nights at 31 locations, across suitable Major Drainage Line, Gorge/ Gully, and Breakaway/ Cliff habitat. Despite the survey effort, no evidence of northern quoll was identified within the survey area. The survey area is situated towards the southern boundary of the northern quoll distribution (Department of the Environment and Energy 2016), with the nearest species record identified approximately 57 km from the survey area (Department of Biodiversity, Conservation and Attractions 2022a), and no prior surveys having had recorded any signs of northern quoll. Critical habitat in Gorge/ Gully and Breakaway/ Cliffs is present within the survey area, particularly in the northern section, and wide-reaching Hillcrest/ Hillslope and Major Drainage Lines in the surrounding area provides suitable dispersal pathways. The northern quoll was considered to have a 'moderate' likelihood of occurrence due to habitat availability; however, the survey area is considered unlikely to currently support a resident population, reflective of the exceptionally low recorded numbers of this species in the general Newman area.

Five targeted 2 ha plot searches across two habitats, Drainage Area/ Floodplain and Stony Plain, were undertaken to provide an indication of bilby presence within the survey area. No evidence of bilby occupation or critical habitat was identified within the survey area. The nearest record was identified over 20 km from the survey area (Department of Biodiversity, Conservation and Attractions 2022a),

and, although bilby are known to disperse in response to foraging opportunities (Southgate et al. 2007, Southgate and Carthew 2008), it is considered unlikely that bilby occur in the survey area.

None of the habitats within the survey area were considered critical habitat for the night parrot and no calls attributed to the night parrot were recorded from 12 ARU recording nights. The most prospective habitats, Stony Plain, Undulating Low Hills, Drainage Areas/ Floodplains, and Gilgai Plain habitats, did not support old, large and unburnt *Triodia* clumps that are considered primary requirements of roosting and nesting habitat (Department of Parks and Wildlife 2017). It is considered unlikely that this species occurs in the survey area.

Habitats that are considered critical for the great desert skink and southern whiteface were not present within the survey area. The great desert skink requires hummock grass sandplains and adjacent dunefield swales that have been burnt within the previous 3 to 15 years (McAlpin 2001), while the southern whiteface utilises relatively undisturbed open woodlands with a herbaceous understory that provides essential foraging habitat (Department of Climate Change, Energy, the Environment and Water 2023). Two great desert skink records were detailed in database searches from over 70 km from the survey area (Department of Biodiversity, Conservation and Attractions 2022a) and, without the presence of any critical or supporting habitat, it is unlikely that either species occurs in the survey area.

#### 5.2.1.2 Other Significant Species

Five active and four inactive (two recently inactive) western pebble-mound mouse mounds were recorded during the current survey within Stony Plain and Undulating Low Hills habitats. This species generally prefers stony hillsides with hummock grasslands and shelter within complex burrow systems under a mound, which they construct using pebbles collected in the vicinity (Menkhurst and Knight 2011). As such, the Stony Plain, Undulating Low Hills and Hillcrest/ Hillslope habitats of the survey area are likely to support this species. Suitable habitat for the western pebble-mound mouse is widespread throughout the survey area and the wider Pilbara bioregion. This species was previously recorded within, and in the vicinity of, the survey area (Biota Environmental Sciences 2001, GHD Pty Ltd 2008, 2022, Onshore Environmental Consultants Pty Ltd 2009, 2017, Biologic Environmental Survey 2016).

Peregrine falcon occur throughout Australia, with the exception of treeless deserts and dense forest (Birdlife Australia 2012). *Eucalyptus* lined drainage lines provide suitable perching and hunting habitat for this species, where they feed primarily on small to medium sized birds. Pairs of peregrine falcon typically defend home ranges of 20 to 30 km<sup>2</sup> (Birdlife Australia 2012). Previous records of this species were identified in the desktop assessment less than 5 km from the survey boundary area (Department of Biodiversity, Conservation and Attractions 2022a), and this species was recorded on three surveys within the vicinity of the current survey area (Biota Environmental Sciences 2001, GHD Pty Ltd 2008, 2022). Suitable nesting, shelter and foraging habitat is present in Gorge/ Gully, Breakaway/ Cliff, and Major Drainage Line habitats within the survey area. This species was not recorded during the survey; however, the peregrine falcon likelihood of occurrence is considered 'high'.

Gane's blind snake is often poorly collected in vertebrate fauna surveys largely due to this species cryptic fossorial habit. This species has commonly been associated with moist gorges and gullies (Wilson and Swan 2017) but potentially occurs across a suite of other stony habitats, including Breakaway/Cliff and Hillcrest/Hillslope. Several records of this species were identified from within 20 km of the survey area (Department of Biodiversity, Conservation and Attractions 2022a), and suitable habitat is present in Gorge/Gully, Breakaway/Cliff and Hillcrest/Hillslope habitats within the survey area. This species was not recorded during the survey due to methods targeting other species; however, the likelihood of occurrence of Gane's blind snake is considered 'high'.

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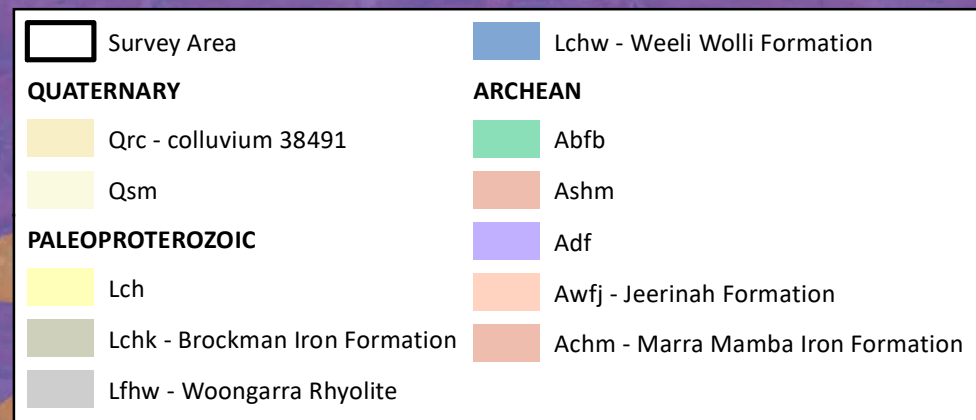
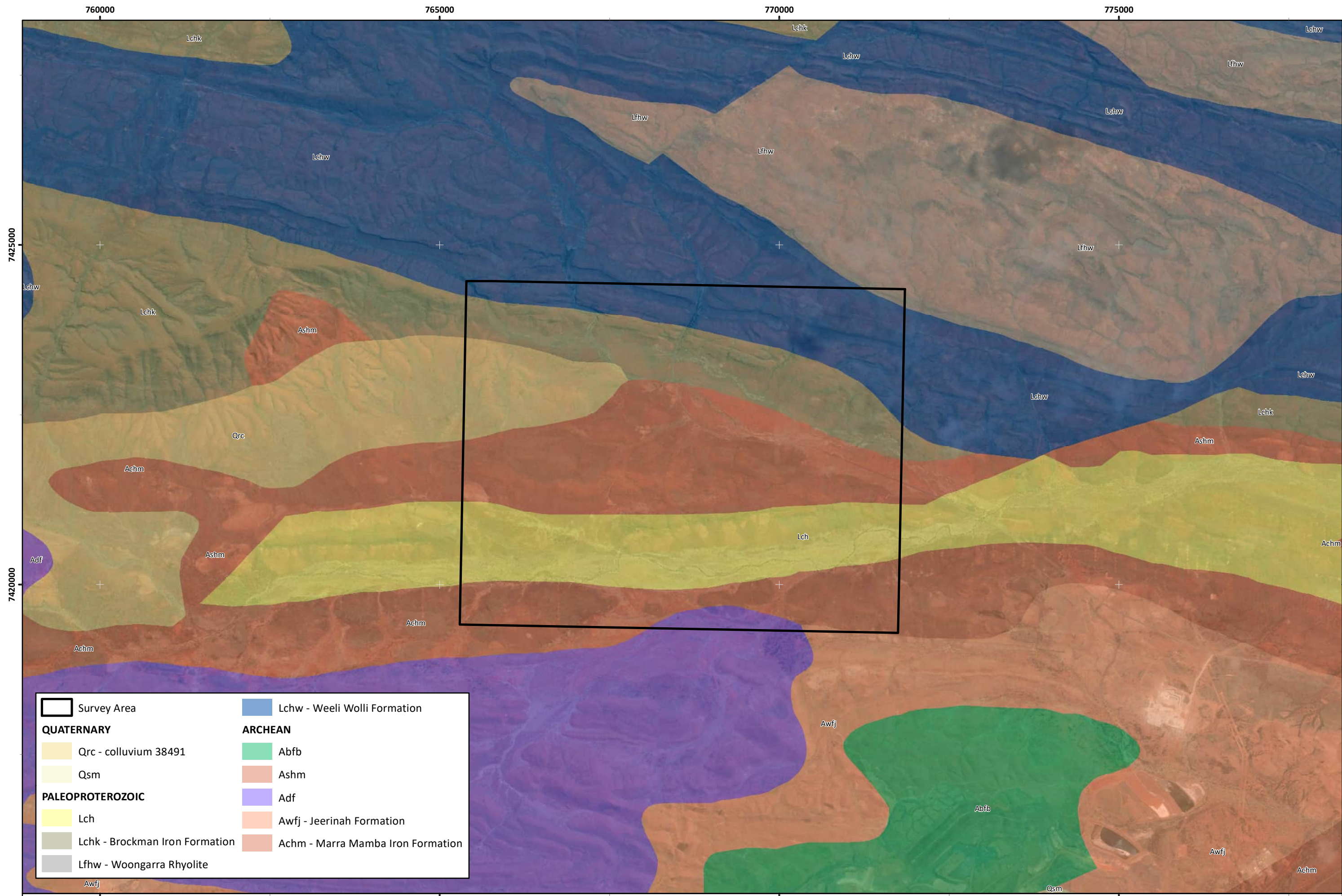
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## **Appendix A: Background Information Figures**

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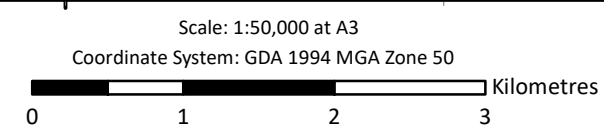


BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

**Figure A.1: Geological units of the survey area**

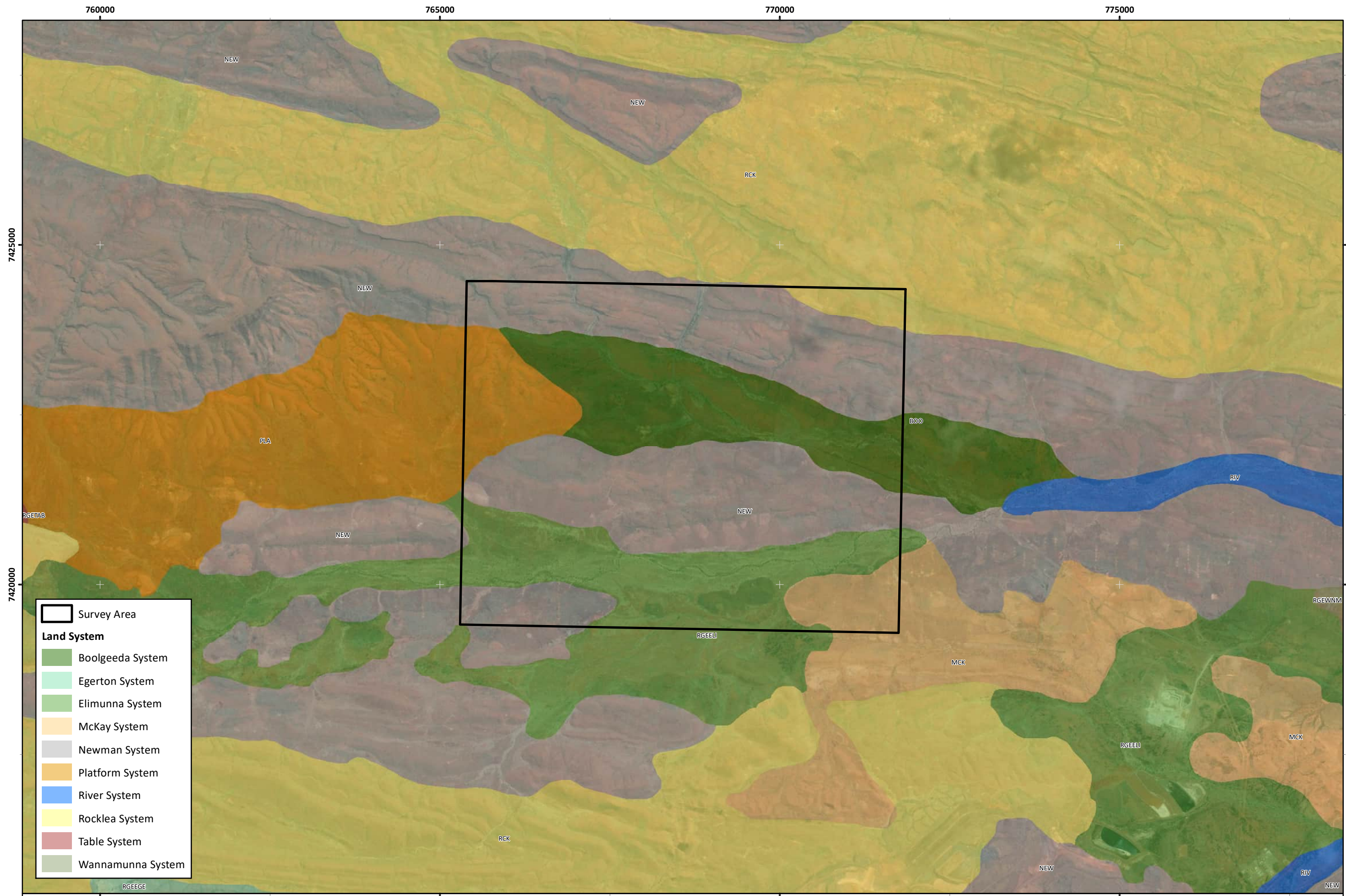
Author: S. Smithies

Drawn: C. Dyde



Date: 17-10-2023

Figure Ref: 2400-08-22-BIDR-1RevB\_231017\_FigA1\_Geo



Survey Area

**Land System**

Boolgeeda System

Egerton System

Elimunna System

McKay System

Newman System

Platform System

River System

Rocklea System

Table System

Wannamunna System

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Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

**Figure A.2: Land systems of the survey area**

Author: S. Smithies

Drawn: C. Dyde

Scale: 1:50,000 at A3  
Coordinate System: GDA 1994 MGA Zone 50

0

1

2

3

Kilometres

Date: 17-10-2023



Figure Ref: 2400-08-22-BIDR-1RevB\_231017\_FigA2\_LS



BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

**Figure A.3: Pre-European vegetation of the survey area**

Author: S. Smithies

Drawn: C. Dyde

Scale: 1:50,000 at A3  
Coordinate System: GDA 1994 MGA Zone 50  
0 1 2 3 Kilometres

Date: 17-10-2023



Figure Ref: 2400-08-22-BIDR-1RevB\_231017\_FigA3\_PEV

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## **Appendix B: Conservation Listed Fauna Categories, Habitat Condition Scales and Likelihood Criteria**

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Table B.1: Categories of Threatened Ecological Communities (Department of Environment and Conservation 2013).

| PD: Presumed Destroyed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.</p> <p>An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant <b>and either</b> of the following applies (A or B):</p> <ul style="list-style-type: none"> <li>A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats <b>or</b></li> <li>B) All occurrences recorded within the last 50 years have since been destroyed.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| CR : Critically Endangered                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p>An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.</p> <p>An ecological community will be listed as <b>Critically Endangered</b> when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting <b>any one or more of</b> the following criteria (A, B or C):</p> <ul style="list-style-type: none"> <li>A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% <b>and either or both of</b> the following apply (i or ii): <ul style="list-style-type: none"> <li>i) geographic range and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);</li> <li>ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.</li> </ul> </li> <li>B) Current distribution is limited, <b>and one or more</b> of the following apply (i, ii or iii): <ul style="list-style-type: none"> <li>i) geographic range and/or number of discrete occurrences and/or area occupied is highly restricted and the community is currently subject to known threatening processes, which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years);</li> <li>ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes;</li> <li>iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.</li> </ul> </li> <li>C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).</li> </ul> |

**En: Endangered**

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

An ecological community will be listed as **Endangered** when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting **any one or more** of the following criteria (A, B, or C):

- A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement **and either or both** of the following apply (i or ii):
  - i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short-term future (within approximately 20 years);
  - ii) modification throughout its range is continuing such that in the short-term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.
- B) Current distribution is limited, **and one or more** of the following apply (i, ii or iii):
  - i) geographic range and/or number of discrete occurrences and/or area occupied is highly restricted and the community is currently subject to known threatening processes, which are likely to result in total destruction throughout its range in the short-term future (within approximately 20 years);
  - ii) there are few occurrences, each of which is small and/or isolated, and all or most occurrences are very vulnerable to known threatening processes;
  - iii) there may be many occurrences, but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.
- C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

**VU: Vulnerable**

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

An ecological community will be listed as **Vulnerable** when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting **any one or more of** the following criteria (A, B or C):

- A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.
- B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.
- C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long-term future because of existing or impending threatening processes.

**Reference:** Department of Environment and Conservation 2013, Definitions, Categories and Criteria for Threatened and Priority Ecological Communities DEC (Parks and Wildlife), <[https://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/definitions\\_categories\\_and\\_criteria\\_for\\_threatened\\_and\\_priority\\_ecological\\_communities.pdf](https://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/definitions_categories_and_criteria_for_threatened_and_priority_ecological_communities.pdf)>

**Table B.2: Definitions and criteria for Threatened Ecological Communities (Department of Environment and Conservation 2013).**

Three categories exist for listing Threatened Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). An ecological community may be categorised as:

| Categories of ecological communities |                                                                                                                                                 |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Critically endangered</b>         | If, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future.                                        |
| <b>Endangered</b>                    | If, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future.                  |
| <b>Vulnerable</b>                    | If, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium-term future. |

**Reference:** Department of Environment and Conservation 2013, Definitions, Categories and Criteria for Threatened and Priority Ecological Communities DEC (Parks and Wildlife), <[https://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/definitions\\_categories\\_and\\_criteria\\_for\\_threatened\\_and\\_priority\\_ecological\\_communities.pdf](https://www.dpaw.wa.gov.au/images/plants-animals/threatened-species/definitions_categories_and_criteria_for_threatened_and_priority_ecological_communities.pdf)>

Table B.3: Conservation codes for Western Australian fauna (Department of Parks and Wildlife 2019).

| Code | Conservation category                                                                                                            | Definition                                                                                                |
|------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| CR   | Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice under the <i>Biodiversity Conservation Act 2016</i> . | Fauna that is rare or likely to become extinct, as critically endangered fauna.                           |
| EN   | Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice under the <i>Biodiversity Conservation Act 2016</i> . | Fauna that is rare or likely to become extinct, as endangered fauna.                                      |
| VU   | Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice under the <i>Biodiversity Conservation Act 2016</i> . | Fauna that is rare or likely to become extinct, as vulnerable fauna.                                      |
| EX   | Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice under the <i>Biodiversity Conservation Act 2016</i> . | Fauna that is presumed to be extinct.                                                                     |
| IA   | Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice under the <i>Biodiversity Conservation Act 2016</i> . | Birds that are subject to international agreements relating to the protection of migratory birds.         |
| CD   | Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice under the <i>Biodiversity Conservation Act 2016</i> . | Fauna that are of special conservation need being species dependent on ongoing conservation intervention. |
| OS   | Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice under the <i>Biodiversity Conservation Act 2016</i> . | Declared to be fauna that is in need of special protection, otherwise than for the reasons mentioned.     |

**Reference:** Department of Parks and Wildlife 2019, *Conservation Codes For Western Australian flora and fauna*, The Government of Western Australia.

**Table B.4: Priority species under Western Australian Biodiversity Conservation Act 2016 (Department of Parks and Wildlife 2019).**

Taxa that have not yet been adequately surveyed to be listed under Schedule 1 or 2 are added to the Priority Flora and Priority Fauna Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna. Taxa that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list for other than taxonomic reasons, are placed in Priority 4. These taxa require regular monitoring. Conservation Dependent species are placed in Priority 5.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>P1: Priority One – Poorly known taxa</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.                                                                                                                                     |
| <b>P2: Priority Two – Poorly known taxa</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.                                                                                                                                                                                                               |
| <b>P3: Priority Three – Poorly known taxa</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.                                                                                                                                                                                                               |
| <b>P4: Priority Four: Rare, near threatened and other taxa in need of monitoring</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>c) Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</li> </ul> |
| <b>P5: Priority Five: Conservation dependent taxa</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxa becoming threatened within five years.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

**Reference:** Department of Parks and Wildlife 2019, *Conservation Codes For Western Australian flora and fauna*, The Government of Western Australia.

Table B.5: Categories and definitions for *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed fauna species.

| Conservation category              | Definition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Extinct</b>                     | Taxa with no reasonable doubt that the last member of the species has died.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Extinct in the wild</b>         | Taxa known to survive only in cultivation, in captivity or as a naturalized population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriated seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Critically endangered (CR)</b>  | Taxa facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Endangered (EN)</b>             | Taxa are not critically endangered and are facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Vulnerable (VU)</b>             | Taxa are not critically endangered or endangered and are facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Conservation dependent (CD)</b> | <p>Taxa are the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered, or critically endangered, or the following subparagraphs are satisfied:</p> <ul style="list-style-type: none"> <li>○ the taxa is a species of fish;</li> <li>○ the taxa is the focus of a management plan that provides management actions necessary to stop the decline of, and support the recovery of, the taxa so that its chances of long term survival in nature are maximized;</li> <li>○ the management plan is in force under a law of the Commonwealth or of a State or Territory;</li> <li>○ cessation of the management plan would adversely affect the conservation status of the taxa.</li> </ul> <p>Fish includes all taxa of bony fish, sharks, rays, crustaceans, molluscs, and other marine organisms, but does not include marine mammals/reptiles.</p> |
| <b>Migratory (Mi)</b>              | <p>Taxa are considered migratory species on International Agreements:</p> <ul style="list-style-type: none"> <li>i) if they 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);</li> <li>ii) all migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA); and</li> <li>iii) are 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).</li> </ul>                                                                                                                                                       |

Note: CD and Mi are only related to conservation significant fauna

Table B.6: Criteria used to define likelihood occurrence of significant fauna species.

| Likelihood of occurrence | Pre-survey (BHP 2023)                                                                                                                                                                                                                                                                      | Post-survey                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recorded                 | Individuals or signs of individuals recorded in the survey area during previous surveys.                                                                                                                                                                                                   | Species or evidence of species recorded during survey.                                                                                                                                                                                                                                                                                                                                                                    |
| High                     | Suitable habitat is or has the potential to be present within the survey area.<br>OR<br>Species is cryptic and suitable habitat is present but may not have been previously recorded.<br>OR<br>Species has been recorded within 20 km of the survey area.                                  | Core or preferred habitats present in the survey area which are abundant and/or high-quality condition.<br>OR<br>Species is known to be cryptic and may not have been detected despite adequate survey effort and suitable habitat present within the survey area.<br>OR<br>Species or evidence of species recorded within the survey area; however, doubt remains over the taxonomic identification, validity of record. |
| Moderate                 | Suitable habitat for the species is, or has the potential to be, present but is in poor condition, limited in extent or isolated and discontinuous.                                                                                                                                        | Core or highly suitable habitats present in the survey area, however non-cryptic species that was not detected despite adequate survey effort.<br>OR<br>Core or preferred habitats present in the survey area are mainly in poor or modified condition.                                                                                                                                                                   |
| Low                      | Suitable habitat is not present within the survey area.<br>OR<br>Species has not been previously recorded within 20 km of survey area despite adequate survey effort.<br>OR<br>Survey area is not within the species' known distribution and/or the species is considered locally extinct. | Species has not been recorded in the survey area despite adequate survey effort.<br>OR<br>Species dependent on specific habitats that do not occur in the survey area.<br>OR<br>Species considered locally extinct.                                                                                                                                                                                                       |

Reference: BHP, 2023, *Vertebrate Fauna Surveys in Western Australia – Technical Process Instruction*.

Table B.7: Fauna habitat condition scale (Thompson and Thompson 2010).

| Habitat condition                              | Condition description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>High Quality Fauna Habitat (1.0)</b>        | These areas closely approximate the vegetation mix and quality that would have been in the area prior to any human induced disturbance. The habitat has connectivity with other habitats and is likely to support the most natural vertebrate fauna assemblage.                                                                                                                                                                                                                                                                                                                                                  |
| <b>Very Good Fauna Habitat (0.8)</b>           | These areas show minimal signs of human induced disturbance (e.g. grazing, clearing, fragmentation, weeds) and retain almost all of the characteristics of the habitat had it not been disturbed. The habitat has connectivity with other habitats, and fauna assemblages in these areas are likely to be minimally affected by disturbance.                                                                                                                                                                                                                                                                     |
| <b>Good Fauna Habitat (0.6)</b>                | These areas show signs of human induced disturbance (e.g. grazing, clearing, fragmentation, weeds) but generally retain many of the characteristics of the habitat had it not been disturbed. The habitat still retains some connectivity with other habitats but fauna assemblages in these areas are likely to be affected by disturbance. Fauna assemblages in these areas are likely to be similar to what might be expected in this habitat.                                                                                                                                                                |
| <b>Disturbed Fauna Habitat (0.4)</b>           | These areas show signs of human induced significant disturbance (e.g. mining, clearing, tracks and roads). Many of the trees, shrubs and undergrowth have died or have been cleared. These areas may be in the early succession and regeneration stages. Areas may show signs of significant grazing, contain an abundance of weeds or have been damaged by vehicles or machinery. Habitats are fragmented or have limited connectivity with other fauna habitats. Fauna assemblages in these areas are likely to differ significantly from what might be expected in the area had the disturbance not occurred. |
| <b>Highly Degraded Fauna Habitat (&lt;0.2)</b> | These areas often have a significant human induced loss of vegetation, and/or a large number of vehicle tracks and/or have been completely cleared and/or areas have been heavily grazed or farmed. There is limited or no fauna habitat connectivity. Fauna assemblages in these areas are likely to differ significantly from what existed prior to the disturbance and are often depleted compared to what existed prior to the disturbance.                                                                                                                                                                  |

**Reference:** Thompson, SA & Thompson, GG 2010, *Terrestrial Vertebrate Fauna Assessments for Ecological Impact Assessment*, Terrestrial Ecosystems, Mt Claremont

Table B.8: Suitability/significance of habitat ranking criteria for the seven target Matters of National Environmental Significance (MNES) species based on BHP (2023).

| Species                                                     | Critical habitat (a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Supporting habitat (b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Limited foraging and dispersal habitat (c)                                                           |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Greater bilby<br>( <i>Macrotis lagotis</i> )                | <ul style="list-style-type: none"> <li>Denning and foraging within the home range (18 ha (female) to 316 ha (male)) of stony sandplain, sandplain and/or recently burnt sandplain.</li> <li>Denning and foraging within the home range of interdune corridors or stony plains dominated by <i>Triodia</i> spp. and <i>Acacias</i>.</li> <li>Denning and foraging within the home range surrounding salt lakes that are dominated with samphire and or <i>Melaleuca</i> habitats.</li> <li>Denning and foraging within the home range of paleo-drainage systems habitat.</li> </ul> | <p>Habitat important for foraging including:</p> <ul style="list-style-type: none"> <li>Open tussock grasslands on uplands and hills.</li> <li>Mulga woodland/shrubland growing on ridges and rises.</li> <li>Hummock grassland growing on sand plains and dunes, drainage systems, saltlake systems, and other alluvial areas.</li> <li>Laterite and rock feature substrates that support <i>Acacia kempeana</i>, <i>Acacia hilliana</i> and <i>Acacia rhodophylla</i> shrub species and spinifex hummocks with open runways between the hummocks for easy movements.</li> </ul> | Habitat that has limited burrowing capacity for the greater bilby.                                   |
| Pilbara olive python<br>( <i>Liasis olivaceus barroni</i> ) | <ul style="list-style-type: none"> <li>Rocky outcrops in proximity to deep gorges, gullies, and water holes within home range (88 – 450 ha).</li> <li>Dense riparian vegetated sites in association with permanent wetlands (spring-fed) within the home range of the individual.</li> </ul>                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Deep gorges, gullies, waterholes, drainage lines, and watercourses.</li> <li>Under rock piles, on top of rocks or under spinifex to ambush prey.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                | Habitat that has limited sheltering and foraging capacity with no permanent or semi-permanent water. |

| Species                                             | Critical habitat (a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Supporting habitat (b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Limited foraging and dispersal habitat (c)                                                                                     |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Great desert skink<br>( <i>Liopholis kintorei</i> ) | <p>Incomplete distribution data makes it currently impossible to define critical habitat; it is possible to describe commonalities in the habitats occupied by known populations.</p> <ul style="list-style-type: none"> <li>• Generally, occur on hummock grass sandplains and some adjacent dunefield swales.</li> <li>• Tanami Desert and parts of the Great Sandy Desert; paleodrainage lines characterised by lateritic soils, giant termite mounds, and tea tree (<i>Melaleuca</i> spp.) shrubs.</li> <li>• Wataru (in northern South Australia) was located in an area of open mulga (<i>Acacia aneura</i>) and minyura (<i>Acacia minyura</i>) woodland over woollybutt grass (<i>Eragrostis eriopoda</i>) and spinifex.</li> <li>• Habitat that has been burnt within the previous 3 to 15 years.</li> </ul> | Habitat that is under 3 years since burnt and over 15 years burnt.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Habitat that has limited sheltering and foraging capacity.                                                                     |
| Northern quoll<br>( <i>Dasyurus hallucatus</i> )    | <ul style="list-style-type: none"> <li>• Denning and foraging habitat within the home range (35 hectares (ha) to &gt;100 ha in breeding season) of low rocky hills, gorges, escarpments, ranges, breakaways, and boulder fields.</li> <li>• Denning and foraging within the home range of major drainage lines and tree-lined creeks.</li> <li>• Denning and foraging within the home range of structurally diverse woodland or forest.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• Variable foraging habitats within the home range and dispersal habitats that include: <ul style="list-style-type: none"> <li>o drainage lines that act as dispersal corridors</li> <li>o basalt hills, mesas, high and low plateaus, and lower slopes</li> <li>o stony plains supporting hard or soft spinifex grasslands</li> <li>o sandstone and dolomite hills and ridges, shrublands, sandy plains, clay pans, and tussock grasslands</li> <li>o coastal fringes, including dunes islands and beaches.</li> </ul> </li> </ul> | Habitat that has limited sheltering and foraging capacity and not connected to potential denning/shelter and foraging habitat. |

| Species                                                    | Critical habitat (a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Supporting habitat (b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Limited foraging and dispersal habitat (c)                                                                                                         |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Ghost bat<br>( <i>Macroderma gigas</i> )                   | <ul style="list-style-type: none"> <li>Category 1 - Maternity/diurnal roost caves with permanent Ghost bat occupancy. These may be abandoned underground mines.</li> <li>Category 2 - Maternity/diurnal roost caves with regular (but not continuous) ghost bat occupancy that is capable of supporting one or more reproducing females and their habitat. These may be abandoned underground mines.</li> <li>Category 3 - Diurnal roost caves with occasional occupancy if adjacent to one or more Category 2 cave(s). These may be abandoned underground mines.</li> <li>Foraging habitat within 12 km radius of these caves or 1,200 ha of habitat surrounding each of these caves.</li> </ul>                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>Category 3 - Diurnal roost caves with occasional occupancy if isolated from Category 1 and 2 caves.</li> <li>Category 4 - shallow caves, shelters and deep overhangs that support opportunistic usage for resting and feeding.</li> <li>Productive plain areas with thin, mature woodland over patchy or clumped tussock or hummock grass (<i>Triodia</i> spp.) on sand or stony ground.</li> <li>Isolated trees and trees on the edge of thin thickets on the plains.</li> <li>Trees along the edges of watercourse woodlands.</li> <li>Prefer gully or gorge system that opens onto a plain or riparian line.</li> </ul>                                                                                                                                                                                                                                  | Habitat that has limited ecological value but may provide capacity for transitory movement across the landscape and/or limited foraging potential. |
| Pilbara leaf-nosed bat<br>( <i>Rhinoicteris aurantia</i> ) | <ul style="list-style-type: none"> <li>Roosting habitat: <ul style="list-style-type: none"> <li>Category 1 cave - Permanent diurnal roost and maternity roost with seasonal presence of young.</li> <li>Category 2 - Permanent/semi-permanent possible breeding roosts that are used during some part of the breeding cycle (but without the proven presence of young).</li> <li>Category 3 - Transitory diurnal roosts, occupied part of the year only, outside the breeding season (i.e. April to June) that facilitate long distance dispersal.</li> </ul> </li> <li>Permanent water sources within 8.7 km of known Priority/Category 1-3 roosts.</li> <li>Foraging habitat within a 10 km (1,000 ha) radius of these caves that include: <ul style="list-style-type: none"> <li>Plain and low hill habitat that includes watercourses and other sites with semi-permanent or permanent surface water (natural or anthropogenic). Three layers in vegetation structure.</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>Priority/Category 4 - Nocturnal refuge that are occupied at night for resting, feeding or other purpose, with perching not a requirement, which can be moderately deep caves and shallow, abandoned mines.</li> <li>Plains and low hills with three-layer, complex vegetation structure. Or moderate two-layer non-complex vegetation structure. Includes ephemeral watercourse.</li> <li>Mesa side or long ridge line with north facing deeply incised gullies with vertical walls. Or Mesa side or long ridge line with deeply incised gullies in weathered strata (45° sloping walls). Caves and overhangs present. Shrubs and thin tree cover in gully base. Ephemeral watercourse in gully or nearby. (Priority 2 foraging habitat).</li> <li>Dry, deeply incised gorge into a ridge or mountain. Complex three-layer vegetation structure.</li> </ul> | Habitat that has limited ecological value but may provide capacity for transitory movement across the landscape and/or limited foraging potential. |

| Species | Critical habitat (a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Supporting habitat (b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Limited foraging and dispersal habitat (c) |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
|         | <ul style="list-style-type: none"> <li>o Mesa side or long ridge line with south, east, or west facing, deeply incised gullies with vertical walls. Semi-permanent or permanent water pools present. Vegetation is complex. Also, north facing gullies with permanent water.</li> <li>o Deep wet 'open' gorge with hills to the side. Wet 'closed' gorge with one or two vertical walls. Complex three-layer, dense vegetation structure. Semi-permanent or permanent water pools present. (Priority 1 foraging habitat type).</li> <li>• Rocky outcrop geological formations such as the following: <ul style="list-style-type: none"> <li>o banded Iron Formations (Hamersley Group ironstone terrain)</li> <li>o dolerite/gabbro formations.</li> </ul> </li> <li>• Granite top rockpiles in the eastern Pilbara.</li> </ul> | <p>Ephemeral water course. (Priority 1 foraging habitat). Large watercourses, around rocky outcrop, gullies, gorges and over pools.</p> <ul style="list-style-type: none"> <li>• Rocky outcrop areas of exposed rock at the top of rocky outcrop and mesa hills that contain caves and overhangs, and boulder piles in the granite terrains. (Priority 3 foraging habitat).</li> <li>• Major watercourses that support riparian vegetation on flat land plus the main gravelly or sandy channel of the riverbed, sometimes containing pools that persist for weeks or months, and generally supporting higher productivity of biomass than the surrounding habitats. (Priority 4 foraging habitat).</li> <li>• Open grassland and woodland dominated by <i>Triodia</i>, on lowland plains, colluvial slopes, and hilltops. (Priority 5 foraging habitat)</li> <li>• Large watercourses, around rocky outcrop, gullies, gorges, and over pools</li> </ul> |                                            |

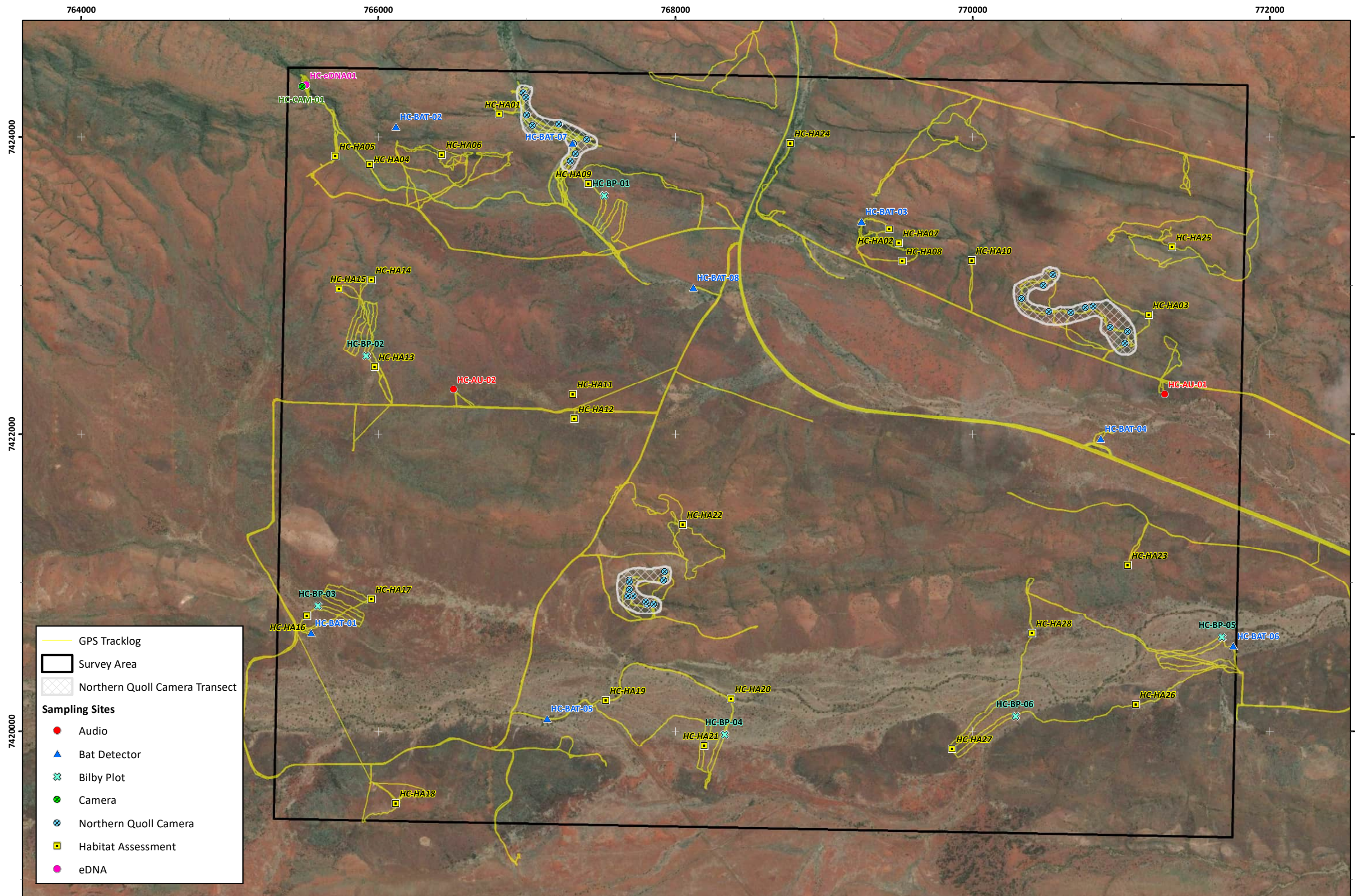
| Species                                        | Critical habitat (a)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Supporting habitat (b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Limited foraging and dispersal habitat (c)                                             |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Night parrot ( <i>Pezoporus occidentalis</i> ) | <ul style="list-style-type: none"> <li>• Nesting and foraging in areas that can support multiple to many occurrences of dense roosting habitat such as old-growth dense hummock-forming spinifex (<i>Triodia</i> spp.), thickets of lignum, or dense shrubby samphire.</li> <li>• Nesting and foraging in old-growth spinifex (<i>Triodia</i> spp.) in close proximity to ephemeral water sources, which may be associated with the following: <ul style="list-style-type: none"> <li>o Hummock grasslands (unburnt) in stony or sandplain environments.</li> <li>o Paleo-drainage features in a landscape mosaic with spinifex (<i>Astrebla</i> spp.) and <i>Acacia aneura</i> (Mulga) woodland.</li> <li>o Treeless areas and bare gibber.</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Areas that are likely to be of relatively high vegetative or seed productivity, such as run-on areas, floodplains, salt or clay pans, and salt-lake margins.</li> <li>• Paleo-drainage systems, salt lakes and pans.</li> <li>• Permanent or ephemeral sources of free water, or areas where high soil moisture ephemerally or permanently support vegetation that offers a source of water.</li> <li>• Flyways varying from river and creek drainage systems, surrounding dune-fields, forb–grasslands on mainly ironstone gravel-covered plains, low ranges, and low dissected tablelands supporting sparse shrublands, undulating stony clay plains supporting Mitchell Grass, and Gidgee.</li> </ul> | Habitat that has limited roosting and foraging potential for the night parrot.         |
| Grey falcon ( <i>Falco hypoleucos</i> )        | <ul style="list-style-type: none"> <li>• Major drainage habitats with suitably sized Eucalypts (<i>Eucalyptus camaldulensis</i>, <i>E. coolabah</i>) as potential nesting habitat, often in the abandoned nest of a raptor or corvid in trees.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>• Timbered lowland plains, particularly <i>Acacia</i> shrublands that are crossed by tree-lined water courses.</li> <li>• Hunting in treeless areas, particularly tussock grassland and open woodland.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Habitat that has limited nesting, roosting and foraging potential for the grey falcon. |

| Species                                                  | Critical habitat (a)                                                                                                                                                                                                                                                                                                                                                                            | Supporting habitat (b)                                                                                                                                                                                                                                                         | Limited foraging and dispersal habitat (c)                                                    |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Southern whiteface<br>( <i>Aphelocephala leucopsis</i> ) | <ul style="list-style-type: none"> <li>Relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both.</li> <li>Habitat with low tree densities and a herbaceous understorey litter cover, which provides essential foraging habitat.</li> <li>Living and dead trees with hollows and crevices, which are essential for roosting and nesting</li> </ul> | <ul style="list-style-type: none"> <li>Wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both.</li> <li>Habitats dominated by <i>Acaia</i> or <i>Eucalyptus</i> spp. on ranges, foothills and lowlands, and plains</li> </ul> | Habitat that has limited nesting, roosting and foraging potential for the southern whiteface. |

**Reference:** BHP, 2023, *Vertebrate Fauna Surveys in Western Australia – Technical Process Instruction*. Department of Climate Change, Energy, the Environment and Water. 2023. Conservation Advice for *Aphelocephala leucopsis* (southern whiteface).

## **Appendix C: Survey Sampling Locations**

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BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

**Figure C.1: Fauna sampling location**

Author: S. Smithies

Drawn: C. Dyde

Date: 17-10-2023

Scale: 1:23,000 at A3  
Coordinate System: GDA 1994 MGA Zone 50  
0 200 400 600 800 1,000 Metres



Figure Ref: 2400-08-22-BIDR-1RevB\_231017\_FigC1\_Sites

Table C.1: Fauna sampling locations.

| Site ID | Latitude | Longitude | Sampling method    | Date       | Habitat             | Condition^ | Disturbance      | Microhabitats                                                                                            | Photo                                                                                 |
|---------|----------|-----------|--------------------|------------|---------------------|------------|------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-HA01 | -23.2703 | 119.6081  | Habitat Assessment | 08/05/2023 | Gorge/Gully         | 1.0        | None discernible | Overhangs, tree hollows, crevices, rock pile, old <i>Triodia</i> , leaf litter                           |    |
| HC-HA02 | -23.2769 | 119.6339  | Habitat Assessment | 08/05/2023 | Hillcrest/Hillslope | 1.0        | None discernible | Crevices, rock pile, old <i>Triodia</i>                                                                  |    |
| HC-HA03 | -23.2818 | 119.6511  | Habitat Assessment | 09/05/2023 | Gorge/Gully         | 1.0        | None discernible | Overhangs, logs, tree hollows, crevices, thick undergrowth, rock piles, old <i>Triodia</i> , leaf litter |   |
| HC-HA04 | -23.2735 | 119.5997  | Habitat Assessment | 10/05/2023 | Major Drainage Line | 0.6        | Weed invasion    | Logs, tree hollows, soft soil (burrows), old <i>Triodia</i> , leaf litter                                |  |
| HC-HA05 | -23.2731 | 119.5974  | Habitat Assessment | 10/05/2023 | Stony Plain         | 1.0        | None discernible | Rock pile, old <i>Triodia</i>                                                                            |  |

| Site ID | Latitude | Longitude | Sampling method    | Date       | Habitat             | Condition^ | Disturbance       | Microhabitats                                                                               | Photo                                                                                 |
|---------|----------|-----------|--------------------|------------|---------------------|------------|-------------------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-HA06 | -23.2729 | 119.6044  | Habitat Assessment | 10/05/2023 | Breakaway/Cliff     | 1.0        | None discernible  | Caves, overhangs, crevices, thick undergrowth, rock pile, old <i>Triodia</i>                |    |
| HC-HA07 | -23.2777 | 119.6346  | Habitat Assessment | 11/05/2023 | Breakaway/Cliff     | 1.0        | Road/access track | Caves, overhangs, logs, tree hollows, crevices, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-HA08 | -23.2788 | 119.6348  | Habitat Assessment | 11/05/2023 | Stony Plain         | 1.0        | Road/access track | Old <i>Triodia</i>                                                                          |   |
| HC-HA09 | -23.2745 | 119.6141  | Habitat Assessment | 11/05/2023 | Stony Plain         | 1.0        | Road/access track | Old <i>Triodia</i>                                                                          |  |
| HC-HA10 | -23.2787 | 119.6394  | Habitat Assessment | 11/05/2023 | Hillcrest/Hillslope | 1.0        | None discernible  | Crevices, rock pile, old <i>Triodia</i>                                                     |  |

| Site ID | Latitude | Longitude | Sampling method    | Date       | Habitat              | Condition^ | Disturbance                      | Microhabitats                                                            | Photo                                                                                 |
|---------|----------|-----------|--------------------|------------|----------------------|------------|----------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-HA11 | -23.2873 | 119.6133  | Habitat Assessment | 12/05/2023 | Stony Plain          | 0.8        | None discernible                 | Soft soil (burrows), leaf litter                                         |    |
| HC-HA12 | -23.2888 | 119.6134  | Habitat Assessment | 12/05/2023 | Minor Drainage Line  | 0.8        | Road/access track, weed invasion | Thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter |    |
| HC-HA13 | -23.2858 | 119.6002  | Habitat Assessment | 12/05/2023 | Minor Drainage Line  | 1.0        | None discernible                 | Thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter |   |
| HC-HA14 | -23.2805 | 119.5999  | Habitat Assessment | 12/05/2023 | Minor Drainage Line  | 0.8        | None discernible                 | Thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter |  |
| HC-HA15 | -23.2811 | 119.5978  | Habitat Assessment | 12/05/2023 | Undulating Low Hills | 1.0        | None discernible                 | Old <i>Triodia</i>                                                       |  |

| Site ID | Latitude | Longitude | Sampling method    | Date       | Habitat                  | Condition^ | Disturbance                      | Microhabitats                                                                          | Photo                                                                                 |
|---------|----------|-----------|--------------------|------------|--------------------------|------------|----------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-HA16 | -23.3010 | 119.5961  | Habitat Assessment | 12/05/2023 | Drainage Area/Floodplain | 0.8        | Road/access track, weed invasion | Tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter |    |
| HC-HA17 | -23.2999 | 119.6003  | Habitat Assessment | 12/05/2023 | Drainage Area/Floodplain | 0.8        | None discernible                 | Soft soil (burrows), old <i>Triodia</i> , leaf litter                                  |    |
| HC-HA18 | -23.3123 | 119.6021  | Habitat Assessment | 12/05/2023 | Breakaway/Cliff          | 0.6        | Weed invasion                    | Caves, overhangs, crevices, rock pile                                                  |   |
| HC-HA19 | -23.3058 | 119.6158  | Habitat Assessment | 12/05/2023 | Major Drainage Line      | 0.6        | Weed invasion                    | Logs, tree hollows, thick undergrowth, soft soil (burrows), leaf litter                |  |
| HC-HA20 | -23.3056 | 119.6241  | Habitat Assessment | 12/05/2023 | Major Drainage Line      | 0.6        | Weed Invasion                    | Logs, tree hollows, thick undergrowth, soft soil (burrows), leaf litter                |  |

| Site ID | Latitude | Longitude | Sampling method    | Date       | Habitat             | Condition^ | Disturbance                                                      | Microhabitats                                                                      | Photo                                                                                 |
|---------|----------|-----------|--------------------|------------|---------------------|------------|------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-HA21 | -23.3085 | 119.6224  | Habitat Assessment | 12/05/2023 | Gilgai Plain        | 0.8        | Cattle grazing                                                   | Soft soil (burrows), leaf litter                                                   |    |
| HC-HA22 | -23.2951 | 119.6207  | Habitat Assessment | 12/05/2023 | Hillcrest/Hillslope | 1.0        | None discernible                                                 | Crevices, rock pile, old <i>Triodia</i>                                            |    |
| HC-HA23 | -23.2970 | 119.6387  | Habitat Assessment | 12/05/2023 | Hillcrest/Hillslope | 1.0        | None discernible                                                 | Crevices, rock pile, old <i>Triodia</i>                                            |   |
| HC-HA24 | -23.2718 | 119.6273  | Habitat Assessment | 13/05/2023 | Major Drainage Line | 0.6        | Cattle grazing, road/access track, rubbish/litter, weed invasion | Logs, tree hollows, thick undergrowth, soft soil (burrows), rock pile, leaf litter |  |
| HC-HA25 | -23.2777 | 119.6525  | Habitat Assessment | 13/05/2023 | Breakaway/Cliff     | 1.0        | None discernible                                                 | Overhangs, logs, crevices, rock pile, old <i>Triodia</i> , leaf litter             |  |

| Site ID  | Latitude | Longitude | Sampling method    | Date       | Habitat                  | Condition^ | Disturbance      | Microhabitats                                         | Photo                                                                                 |
|----------|----------|-----------|--------------------|------------|--------------------------|------------|------------------|-------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-HA26  | -23.3055 | 119.6507  | Habitat Assessment | 14/05/2023 | Stony Plain              | 1.0        | None discernible | Old <i>Triodia</i>                                    |    |
| HC-HA27  | -23.3084 | 119.6387  | Habitat Assessment | 14/05/2023 | Hillcrest/Hillslope      | 0.8        | Cattle grazing   | Crevice, rock pile, old <i>Triodia</i>                |    |
| HC-HA28  | -23.3013 | 119.6438  | Habitat Assessment | 14/05/2023 | Stony Plain              | 0.8        | Cattle grazing   | Old <i>Triodia</i>                                    |   |
| HC-BP-01 | -23.2752 | 119.6151  | Targeted Search    | 11/05/2023 | Drainage Area/Floodplain | 0.8        | Weed invasion    | Soft soil (burrows), old <i>Triodia</i> , leaf litter |  |
| HC-BP-02 | -23.2852 | 119.5997  | Targeted Search    | 12/05/2023 | Stony Plain              | 1.0        | None discernible | Old <i>Triodia</i>                                    |  |

| Site ID   | Latitude | Longitude | Sampling method | Date                    | Habitat                  | Condition^ | Disturbance                                   | Microhabitats                                                                                                                                             | Photo                                                                                 |
|-----------|----------|-----------|-----------------|-------------------------|--------------------------|------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-BP-03  | -23.3004 | 119.5968  | Targeted Search | 12/05/2023              | Drainage Area/Floodplain | 0.8        | Weed invasion                                 | Logs, tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter                                                              |    |
| HC-BP-04  | -23.3078 | 119.6237  | Targeted Search | 12/05/2023              | Drainage Area/Floodplain | 0.8        | Weed Invasion                                 | Logs, tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter                                                              |    |
| HC-BP-05  | -23.3013 | 119.6563  | Targeted Search | 12/05/2023              | Drainage Area/Floodplain | 0.8        | Weed Invasion                                 | Logs, tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter                                                              |   |
| HC-BP-06  | -23.3063 | 119.6428  | Targeted Search | 14/05/2023              | Drainage Area/Floodplain | 0.6        | Cattle grazing, rubbish/litter, weed invasion | Logs, tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter                                                              |  |
| HC-CAM-01 | -23.2689 | 119.5951  | Camera (active) | 10/05/2023 – 15/05/2023 | Major Drainage Line      | 0.8        | Weed invasion                                 | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, soft soil (burrows), semi-permanent water, rock pile, old <i>Triodia</i> , leaf litter |  |

| Site ID      | Latitude | Longitude | Sampling method | Date                    | Habitat         | Condition^ | Disturbance      | Microhabitats                                                                                                  | Photo                                                                                 |
|--------------|----------|-----------|-----------------|-------------------------|-----------------|------------|------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-NQ1-CAM01 | -23.2828 | 119.6497  | Camera (active) | 09/05/2023 – 14/05/2023 | Gorge/Gully     | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ1-CAM02 | -23.2810 | 119.6427  | Camera (active) | 09/05/2023 – 14/05/2023 | Gorge/Gully     | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |   |
| HC-NQ1-CAM03 | -23.2817 | 119.6445  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |
| HC-NQ1-CAM04 | -23.2813 | 119.6474  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |

| Site ID      | Latitude | Longitude | Sampling method | Date                    | Habitat         | Condition^ | Disturbance      | Microhabitats                                                                                                  | Photo                                                                                 |
|--------------|----------|-----------|-----------------|-------------------------|-----------------|------------|------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-NQ1-CAM05 | -23.2818 | 119.6460  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ1-CAM06 | -23.2826 | 119.6486  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |   |
| HC-NQ1-CAM07 | -23.2795 | 119.6447  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |
| HC-NQ1-CAM08 | -23.2836 | 119.6496  | Camera (active) | 09/05/2023 – 14/05/2023 | Gorge/Gully     | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |

| Site ID      | Latitude | Longitude | Sampling method | Date                    | Habitat         | Condition^ | Disturbance      | Microhabitats                                                                                                  | Photo                                                                                 |
|--------------|----------|-----------|-----------------|-------------------------|-----------------|------------|------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-NQ1-CAM09 | -23.2814 | 119.6469  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ1-CAM10 | -23.2801 | 119.6441  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |   |
| HC-NQ2-CAM01 | -23.2704 | 119.6099  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion    | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |
| HC-NQ2-CAM02 | -23.2718 | 119.6139  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion    | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |

| Site ID      | Latitude | Longitude | Sampling method | Date                    | Habitat         | Condition^ | Disturbance   | Microhabitats                                                                                                  | Photo                                                                                 |
|--------------|----------|-----------|-----------------|-------------------------|-----------------|------------|---------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-NQ2-CAM03 | -23.2709 | 119.6121  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ2-CAM04 | -23.2731 | 119.6129  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ2-CAM05 | -23.2727 | 119.6132  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |   |
| HC-NQ2-CAM06 | -23.2710 | 119.6103  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |
| HC-NQ2-CAM07 | -23.2720 | 119.6131  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |

| Site ID      | Latitude | Longitude | Sampling method | Date                    | Habitat         | Condition^ | Disturbance      | Microhabitats                                                                                                  | Photo                                                                                 |
|--------------|----------|-----------|-----------------|-------------------------|-----------------|------------|------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-NQ2-CAM08 | -23.2690 | 119.6097  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion    | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ2-CAM09 | -23.2693 | 119.6099  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion    | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ2-CAM10 | -23.2693 | 119.6099  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 0.8        | Weed invasion    | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |   |
| HC-NQ3-CAM01 | -23.2994 | 119.6175  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |
| HC-NQ3-CAM02 | -23.2999 | 119.6184  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |

| Site ID      | Latitude | Longitude | Sampling method | Date                    | Habitat         | Condition^ | Disturbance      | Microhabitats                                                                                                  | Photo                                                                                 |
|--------------|----------|-----------|-----------------|-------------------------|-----------------|------------|------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-NQ3-CAM03 | -23.2999 | 119.6189  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ3-CAM04 | -23.2998 | 119.6184  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ3-CAM05 | -23.2984 | 119.6195  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |   |
| HC-NQ3-CAM06 | -23.2985 | 119.6172  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |
| HC-NQ3-CAM07 | -23.2986 | 119.6172  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |  |

| Site ID      | Latitude | Longitude | Sampling method | Date                    | Habitat             | Condition^ | Disturbance      | Microhabitats                                                                                                  | Photo                                                                                 |
|--------------|----------|-----------|-----------------|-------------------------|---------------------|------------|------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-NQ3-CAM08 | -23.2979 | 119.6196  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff     | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ3-CAM09 | -23.2995 | 119.6172  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff     | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |    |
| HC-NQ3-CAM10 | -23.2991 | 119.6173  | Camera (active) | 09/05/2023 – 14/05/2023 | Breakaway/Cliff     | 1.0        | None discernible | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |   |
| HC-AU-01     | -23.2866 | 119.6522  | Audio Recorder  | 08/05/2023 – 14/05/2023 | Minor Drainage Line | 1.0        | None discernible | Logs, tree hollows, thick undergrowth, old <i>Triodia</i> , leaf litter                                        |  |
| HC-AU-02     | -23.2871 | 119.6054  | Audio Recorder  | 08/05/2023 – 14/05/2023 | Minor Drainage Line | 0.8        | None discernible | Soft soil (burrows), old <i>Triodia</i>                                                                        |  |

| Site ID   | Latitude | Longitude | Sampling method | Date                    | Habitat                      | Condition^ | Disturbance                          | Microhabitats                                                                                                  | Photo                                                                                 |
|-----------|----------|-----------|-----------------|-------------------------|------------------------------|------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-BAT-01 | -23.3021 | 119.5964  | Bat Detector    | 13/05/2023 – 15/05/2023 | Drainage Area/<br>Floodplain | 0.8        | Mining exploration,<br>weed invasion | Logs, tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter                   |    |
| HC-BAT-02 | -23.2712 | 119.6014  | Bat Detector    | 10/05/2023 – 13/05/2023 | Breakaway/Cliff              | 1.0        | None discernible                     | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile                                   |    |
| HC-BAT-03 | -23.2765 | 119.6321  | Bat Detector    | 08/05/2023 – 11/05/2023 | Gorge/Gully                  | 1.0        | None discernible                     | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, rock pile, old <i>Triodia</i> , leaf litter |   |
| HC-BAT-04 | -23.2894 | 119.6481  | Bat Detector    | 11/05/2023 – 14/05/2023 | Major Drainage<br>Line       | 0.6        | Road/access track, weed<br>invasion  | Logs, tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter                   |  |
| HC-BAT-05 | -23.3070 | 119.6120  | Bat Detector    | 09/05/2023 – 12/05/2023 | Major Drainage<br>Line       | 0.6        | Weed invasion                        | Logs, tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter                   |  |

| Site ID   | Latitude | Longitude | Sampling method    | Date                    | Habitat                      | Condition^ | Disturbance                         | Microhabitats                                                                                                                                             | Photo                                                                                 |
|-----------|----------|-----------|--------------------|-------------------------|------------------------------|------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| HC-BAT-06 | -23.3018 | 119.6570  | Bat Detector       | 12/05/2023 – 15/05/2023 | Drainage Area/<br>Floodplain | 0.8        | Weed invasion                       | Logs, tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter                                                              |    |
| HC-BAT-07 | -23.2720 | 119.6130  | Bat Detector       | 08/05/2023 – 11/05/2023 | Major Drainage<br>Line       | 0.8        | Weed invasion                       | Caves, overhangs, logs, tree hollows, crevices, rock pile, old <i>Triodia</i> , leaf litter                                                               |    |
| HC-BAT-08 | -23.2806 | 119.6211  | Bat Detector       | 11/05/2023 – 14/05/2023 | Major Drainage<br>Line       | 0.6        | Road/access track, weed<br>invasion | Logs, tree hollows, thick undergrowth, soft soil (burrows), old <i>Triodia</i> , leaf litter                                                              |   |
| HC-eDNA01 | -23.2688 | 119.5954  | eDNA Sampling Site | 10/05/2023              | Major Drainage<br>Line       | 0.8        | Weed invasion                       | Caves, overhangs, logs, tree hollows, crevices, thick undergrowth, soft soil (burrows), semi-permanent water, rock pile, old <i>Triodia</i> , leaf litter |  |

^ 1.0 (Excellent); 0.8 (Very Good); 0.6 (Good); 0.4 (Poor); 0.2 (Very Poor); 0.1 (Completely Degraded).

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## **Appendix D: Fauna Species Lists**

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Table D.1: Amphibian species list – results of database searches, literature reviews and Astron survey results.

| Scientific Name                | Common Name                | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|--------------------------------|----------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                |                            |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| Pelodyradidae                  |                            |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Cyclorana maini</i>         | Sheep frog                 |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Cyclorana occidentalis</i>  | Western water-holding Frog |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Litoria rubella</i>         | Little red tree frog       |            |                    |        |                          | X         | X   |           |              | X                | X              |
| Limnodynastidae                |                            |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Neobatrachus aquilonius</i> | Northern burrowing frog    |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Neobatrachus kunapalari</i> | Kunapalari frog            |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Neobatrachus sutor</i>      | Shoemaker frog             |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Notaden nichollsi</i>       | Desert spadefoot           |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Platyplectrum spenceri</i>  | Centralian burrowing frog  |            |                    |        |                          | X         | X   |           |              | X                |                |
| Myobatrachidae                 |                            |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Pseudophryne douglasi</i>   | Gorge toadlet              |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Uperoleia russelli</i>      | Northwest toadlet          |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Uperoleia saxatilis</i>     | Pilbara toadlet            |            |                    |        |                          | X         | X   |           |              |                  |                |

Note: EPBC = Environment Protection and Biodiversity Conservation; BC = Biodiversity and Conservation; DBCA = Department of Biodiversity, Conservation and Attractions; ALA = Atlas of Living Australia; PMST = Protected Matters Search Tool; T = Threatened; P = Priority.

Table D.2: Reptile species list – results of database searches, literature reviews and Astron survey results.

| Scientific Name                       | Common Name                       | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|---------------------------------------|-----------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                       |                                   |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| Chelidae                              |                                   |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Chelodina steindachneri</i>        | Flat-shelled turtle               |            |                    |        |                          | X         | X   |           |              | X                |                |
| Carphodactylidae                      |                                   |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Nephrurus wheeleri</i>             | Southern Banded Knob-tailed Gecko |            |                    |        |                          | X         |     |           |              | X                |                |
| <i>Underwoodisaurus milii</i>         | Southern barking gecko            |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Underwoodisaurus seorsus</i>       | Pilbara barking gecko             |            |                    |        | P2                       | X         |     |           | X            |                  |                |
| Diplodactylidae                       |                                   |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Crenadactylus ocellatus</i>        | South-western Clawless Gecko      |            |                    |        |                          | X         |     |           |              | X                |                |
| <i>Crenadactylus pilbarensis</i>      | Pilbara clawless gecko            |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Diplodactylus bilybara</i>         | Western Fat-tailed Gecko          |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Diplodactylus conspicillatus</i>   | Variable Fat-tailed Gecko         |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Diplodactylus granariensis rex</i> |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Diplodactylus laevis</i>           | Desert fat-tailed gecko           |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Diplodactylus mitchelli</i>        |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Diplodactylus pulcher</i>          |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Diplodactylus savagei</i>          | Southern Pilbara beak-faced gecko |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Lucasium squarrosum</i>            |                                   |            |                    |        |                          |           | X   |           |              |                  | X              |
| <i>Lucasium stenodactylus</i>         |                                   |            |                    |        |                          | X         | X   |           |              | X                |                |

| Scientific Name                | Common Name                       | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|--------------------------------|-----------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                |                                   |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Lucasium wombeyi</i>        |                                   |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Lucasium woodwardi</i>      |                                   |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Oedura fimbria</i>          | Western marbled velvet gecko      |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Rhynchoedura ornata</i>     | Western beaked gecko              |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Strophurus elderi</i>       |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Strophurus jeanae</i>       |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Strophurus wellingtonae</i> |                                   |            |                    |        |                          | X         | X   |           |              | X                |                |
| Gekkonidae                     |                                   |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Christinus marmoratus</i>   | Marbled gecko                     |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Gehyra crypta</i>           | Western cryptic gehyra            |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Gehyra fenestrula</i>       | Hamersley Range spotted gehyra    |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Gehyra micra</i>            | Small Pilbara spotted rock gehyra |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Gehyra montium</i>          |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Gehyra pilbara</i>          |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Gehyra punctata</i>         |                                   |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Gehyra purpurascens</i>     |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Gehyra variegata</i>        |                                   |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Heteronotia binoei</i>      | Bynoe's gecko                     |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Heteronotia planiceps</i>   |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Heteronotia spelea</i>      | Pilbara cave gecko                |            |                    |        |                          | X         | X   |           |              | X                | X              |

| Scientific Name                      | Common Name                | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|--------------------------------------|----------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                      |                            |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| Pygopodidae                          |                            |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Delma borea</i>                   |                            |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Delma butleri</i>                 |                            |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Delma elegans</i>                 |                            |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Delma nasuta</i>                  |                            |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Delma pax</i>                     |                            |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Delma tincta</i>                  |                            |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Lialis burtonis</i>               |                            |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Pygopus lepidopodus</i>           | Common scaly foot          |            |                    |        |                          |           |     |           |              | X                |                |
| <i>Pygopus nigriceps</i>             |                            |            |                    |        |                          | X         | X   |           |              |                  |                |
| Agamidae                             |                            |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Ctenophorus caudicinctus</i>      | Western ring-tailed dragon |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Ctenophorus isolepis citrinus</i> | Yellowy military dragon    |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Ctenophorus isolepis gularis</i>  | Central military dragon    |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Ctenophorus isolepis isolepis</i> | Central military dragon    |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Ctenophorus maculatus badius</i>  |                            |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Ctenophorus nuchalis</i>          | Central netted dragon      |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Ctenophorus reticulatus</i>       | Western netted dragon      |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Diporiphora amphiboluroides</i>   | Mulga dragon               |            |                    |        |                          | X         | X   |           |              |                  |                |

| Scientific Name                        | Common Name                    | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|----------------------------------------|--------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                        |                                |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Diporiphora valens</i>              | Southern Pilbara tree dragon   |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Gowidon longirostris</i>            | Long-nosed dragon              |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Lophognathus gilberti</i>           | Gilbert's dragon               |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Moloch horridus</i>                 | Thorny devil                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Pogona minor minor</i>              | Western bearded dragon         |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Tympanocryptis cephalus</i>         | Coastal pebble-mimic dragon    |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Tympanocryptis diabolicus</i>       | Hamersley pebble-mimic dragon  |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Tympanocryptis pseudopsephos</i>    | Goldfields pebble-mimic dragon |            |                    |        |                          |           | X   |           |              |                  |                |
| Scincidae                              |                                |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Carlia munda</i>                    |                                |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Carlia triacantha</i>               |                                |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Cryptoblepharus buchananii</i>      |                                |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Cryptoblepharus plagioccephalus</i> |                                |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Cryptoblepharus ustulatus</i>       |                                |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Ctenotus ariadnae</i>               |                                |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Ctenotus atlas</i>                  |                                |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Ctenotus duricola</i>               | Eastern Pilbara lined ctenotus |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Ctenotus grandis grandis</i>        |                                |            |                    |        |                          | X         |     |           |              |                  |                |

| Scientific Name                         | Common Name                        | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|-----------------------------------------|------------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                         |                                    |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Ctenotus grandis titan</i>           |                                    |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Ctenotus greeri</i>                  |                                    |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Ctenotus hanloni</i>                 |                                    |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Ctenotus helenae</i>                 |                                    |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Ctenotus inornatus</i>               |                                    |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Ctenotus leonhardii</i>              |                                    |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Ctenotus pallasotus</i>              | Western Pilbara lined ctenotus     |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Ctenotus pantherinus</i>             |                                    |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Ctenotus piankai</i>                 | Coarse sands ctenotus              |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Ctenotus quattuordecimlineatus</i>   |                                    |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Ctenotus rubicundus</i>              |                                    |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Ctenotus rutilans</i>                |                                    |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Ctenotus saxatilis</i>               | Rock ctenotus                      |            |                    |        |                          | X         |     |           |              | X                |                |
| <i>Ctenotus schomburgkii</i>            |                                    |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Ctenotus serventyi</i>               |                                    |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Ctenotus uber johnstonei</i>         |                                    |            |                    |        | P2                       | X         |     |           | X            |                  |                |
| <i>Ctenotus uber uber</i>               |                                    |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Cyclodomorphus melanops melanops</i> |                                    |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Egernia cygnitos</i>                 | Western Pilbara spiny-tailed skink |            |                    |        |                          | X         | X   |           |              |                  |                |

| Scientific Name                         | Common Name                       | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|-----------------------------------------|-----------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                         |                                   |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Egernia depressa</i>                 | Southern pygmy spiny-tailed skink |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Egernia formosa</i>                  |                                   |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Eremiascincus isolepis</i>           |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Eremiascincus pallidus</i>           | Western narrow-banded skink       |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Eremiascincus richardsonii</i>       | Broad-banded sand swimmer         |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Eremiascincus rubiginosus</i>        | Rusty skink                       |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Lerista amicornum</i>                |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Lerista bipes</i>                    |                                   |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Lerista chalybura</i>                |                                   |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Lerista flammicauda</i>              |                                   |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Lerista jacksoni</i>                 |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Lerista labialis</i>                 |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Lerista macropisthopus fusciceps</i> |                                   |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Lerista macropisthopus remota</i>    |                                   |            |                    |        | P2                       | X         | X   |           | X            |                  |                |
| <i>Lerista muelleri</i>                 |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Lerista neander</i>                  |                                   |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Lerista timida</i>                   |                                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Lerista verhmens</i>                 |                                   |            |                    |        |                          | X         |     |           |              |                  |                |

| Scientific Name                     | Common Name                  | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|-------------------------------------|------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                     |                              |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Liopholis kintorei</i>           | Great desert skink           |            | VU                 | VU     |                          |           |     | X         | X            |                  |                |
| <i>Menetia greyii</i>               |                              |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Menetia surda surda</i>          |                              |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Morethia ruficauda exquisita</i> |                              |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Notoscincus ornatus ornatus</i>  |                              |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Proablepharus reginae</i>        |                              |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Tiliqua multifasciata</i>        | Central bluetongue           |            |                    |        |                          | X         | X   |           |              | X                |                |
| Varanidae                           |                              |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Varanus acanthurus</i>           | Spiny-tailed goanna          |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Varanus brevicauda</i>           | Short-tailed pygmy goanna    |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Varanus bushi</i>                | Pilbara mulga goanna         |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Varanus caudolineatus</i>        |                              |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Varanus eremius</i>              | Pygmy desert goanna          |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Varanus giganteus</i>            | Perentie                     |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Varanus gilleni</i>              | Pygmy mulga goanna           |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Varanus gouldii</i>              | Bungarra or sand goanna      |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Varanus hamersleyensis</i>       | Southern Pilbara rock goanna |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Varanus panoptes rubidus</i>     |                              |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Varanus pilbarensis</i>          | Northern Pilbara rock goanna |            |                    |        |                          | X         | X   |           |              | X                |                |

| Scientific Name                       | Common Name                  | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|---------------------------------------|------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                       |                              |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Varanus tristis</i>                | Racehorse goanna             |            |                    |        |                          | X         | X   |           |              | X                |                |
| Typhlopidae                           |                              |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Anilius ammodytes</i>              |                              |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Anilius ganeii</i>                 | Gane's blind snake (Pilbara) |            |                    |        | P1                       | X         | X   |           | X            |                  |                |
| <i>Anilius grypus</i>                 |                              |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Anilius hamatus</i>                |                              |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Anilius pilbarensis</i>            |                              |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Anilius waitii</i>                 |                              |            |                    |        |                          | X         | X   |           |              |                  |                |
| Pythonidae                            |                              |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Antaresia childreni</i>            | Children's python            |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Antaresia perthensis</i>           | Pygmy python                 |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Aspidites melanocephalus</i>       | Black-headed Python          |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Liasis olivaceus barroni</i>       | Pilbara olive python         |            | VU                 | VU     |                          | X         | X   | X         | X            | X                | X              |
| Elapidae                              |                              |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Acanthophis wellsi</i>             | Pilbara death adder          |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Brachyuropsis approximans</i>      |                              |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Demansia psammophis cupreiceps</i> |                              |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Demansia rufescens</i>             | Rufous whipsnake             |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Furina ornata</i>                  | Moon snake                   |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Pseudechis australis</i>           | Mulga snake                  |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Pseudonaja mengdeni</i>            | Western brown snake          |            |                    |        |                          | X         |     |           |              |                  |                |

| Scientific Name             | Common Name                   | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|-----------------------------|-------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                             |                               |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Pseudonaja modesta</i>   | Ringed brown snake            |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Pseudonaja nuchalis</i>  | Gwardar, northern brown snake |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Simoselaps bertholdi</i> | Jan's banded snake            |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Suta fasciata</i>        | Rosen's snake                 |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Suta gaikorstorum</i>    |                               |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Suta punctata</i>        | Spotted snake                 |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Vermicella snelli</i>    |                               |            |                    |        |                          | X         | X   |           |              |                  |                |

Note: EPBC = Environment Protection and Biodiversity Conservation; BC = Biodiversity and Conservation; DBCA = Department of Biodiversity, Conservation and Attractions; ALA = Atlas of Living Australia; PMST = Protected Matters Search Tool; T = Threatened; P = Priority; VU = Vulnerable.

Table D.3: Bird species list – results of database searches, literature reviews and Astron survey results.

| Scientific Name                    | Common Name              | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Birddata | Previous Surveys | Current Survey |
|------------------------------------|--------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|----------|------------------|----------------|
|                                    |                          |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| Casuariiidae                       |                          |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Dromaius novaehollandiae</i>    | Emu                      |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Anseranatidae                      |                          |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Anseranas semipalmata</i>       | Magpie goose             |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Anatidae                           |                          |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Anas gracilis</i>               | Grey teal                |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Anas superciliosa</i>           | Pacific black duck       |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Aythya australis</i>            | Hardhead                 |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Biziura lobata</i>              | Musk duck                |            |                    |        |                          |           | X   |           |              | X        |                  |                |
| <i>Chenonetta jubata</i>           | Australian wood duck     |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Cygnus atratus</i>              | Black swan               |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Dendrocygna arcuata</i>         | Wandering whistling duck |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Dendrocygna eytoni</i>          | Plumed whistling duck    |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Malacorhynchus membranaceus</i> | Pink-eared duck          |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Spatula rhynchotis</i>          | Australasian shoveler    |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Stictonetta naevosa</i>         | Freckled duck            |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Tadorna tadornoides</i>         | Australian shelduck      |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Phasianidae                        |                          |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Coturnix pectoralis</i>         | Stubble quail            |            |                    |        |                          | X         |     |           |              |          |                  |                |

| Scientific Name                     | Common Name                               | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Birddata | Previous Surveys | Current Survey |
|-------------------------------------|-------------------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|----------|------------------|----------------|
|                                     |                                           |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| <i>Synoicus ypsilophora</i>         | Brown quail                               |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Procellariidae                      |                                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Macronectes giganteus</i>        | Southern giant petrel                     |            | EN & MI            | MI     |                          | X         |     |           | X            |          |                  |                |
| Podicipedidae                       |                                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Podiceps cristatus</i>           | Great crested grebe                       |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Poliiocephalus poliocephalus</i> | Hoary-headed grebe                        |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Tachybaptus novaehollandiae</i>  | Australasian grebe (black-throated grebe) |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Ciconiidae                          |                                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Ephippiorhynchus asiaticus</i>   | Black-necked stork                        |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Threskiornithidae                   |                                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Platalea regia</i>               | Royal spoonbill                           |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Platalea flavipes</i>            | Yellow-billed spoonbill                   |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Plegadis falcinellus</i>         | Glossy ibis                               |            | MI                 | MI     |                          | X         | X   |           | X            | X        |                  |                |
| <i>Threskiornis moluccus</i>        | Australian white ibis                     |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Threskiornis spinicollis</i>     | Straw-necked Ibis                         |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Ardeidae                            |                                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Ardea alba</i>                   | Eastern great egret                       |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Ardea intermedia</i>             | Intermediate egret                        |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Ardea pacifica</i>               | White-necked heron                        |            |                    |        |                          | X         | X   |           |              | X        | X                |                |

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|                                   |                                            |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| <i>Bubulcus coromandus</i>        | Cattle egret                               |            |                    |        |                          | X         | X   | X         |              | X        |                  |                |
| <i>Egretta garzetta</i>           | Little egret                               |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Egretta novaehollandiae</i>    | White-faced heron                          |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Ixobrychus flavicollis</i>     | Black bittern                              |            |                    |        |                          |           | X   |           |              | X        |                  |                |
| <i>Nycticorax caledonicus</i>     | Nankeen night-heron                        |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Pelecanidae                       |                                            |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Pelecanus conspicillatus</i>   | Australian pelican                         |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Phalacrocoracidae                 |                                            |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Microcarbo melanoleucos</i>    | Little pied cormorant                      |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Phalacrocorax carbo</i>        | Great cormorant                            |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Phalacrocorax sulcirostris</i> | Little black cormorant                     |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Phalacrocorax varius</i>       | Pied cormorant (Australian pied cormorant) |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Anhingidae                        |                                            |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Anhinga novaehollandiae</i>    | Australasian darter                        |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Accipitridae                      |                                            |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Accipiter cirrocephalus</i>    | Collared sparrowhawk                       |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |

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|                                  |                                  |            | EPBC Act           | BC Act | DBCAs Priority Fauna List |           |     |           |               |          |                  |                |
| <i>Accipiter fasciatus</i>       | Brown goshawk                    |            |                    |        |                           | X         | X   |           |               | X        | X                |                |
| <i>Aquila audax</i>              | Wedge-tailed eagle               |            |                    |        |                           | X         | X   |           |               | X        | X                |                |
| <i>Circus approximans</i>        | Swamp harrier                    |            |                    |        |                           | X         | X   |           |               | X        |                  |                |
| <i>Circus assimilis</i>          | Spotted harrier                  |            |                    |        |                           | X         | X   |           |               | X        | X                |                |
| <i>Elanus axillaris</i>          | Australian black-shouldered kite |            |                    |        |                           | X         | X   |           |               | X        | X                | X              |
| <i>Elanus scriptus</i>           | Letter-winged kite               |            |                    |        | P4                        | X         |     |           | X             |          |                  |                |
| <i>Erythrotriorchis radiatus</i> | Red goshawk                      |            | VU                 | VU     |                           |           |     | X         |               |          |                  |                |
| <i>Haliaeetus leucogaster</i>    | White-bellied sea-eagle          |            |                    |        |                           | X         | X   |           |               | X        |                  |                |
| <i>Haliastur sphenurus</i>       | Whistling kite                   |            |                    |        |                           | X         | X   |           |               | X        | X                | X              |
| <i>Hamirostra melanosternon</i>  | Black-breasted buzzard           |            |                    |        |                           | X         | X   |           |               | X        | X                |                |
| <i>Hieraetus morphnoides</i>     | Little eagle                     |            |                    |        |                           | X         | X   |           |               | X        | X                |                |
| <i>Lophoictinia isura</i>        | Square-tailed kite               |            |                    |        |                           | X         | X   |           |               | X        |                  |                |
| <i>Milvus migrans</i>            | Black kite                       |            |                    |        |                           | X         | X   |           |               | X        | X                |                |
| <i>Pandion haliaetus</i>         | Osprey, eastern osprey           |            | MI                 | MI     |                           | X         |     |           | X             |          |                  |                |
| Otididae                         |                                  |            |                    |        |                           |           |     |           |               |          |                  |                |
| <i>Ardeotis australis</i>        | Australian bustard               |            |                    |        |                           | X         | X   |           |               | X        | X                |                |
| Rallidae                         |                                  |            |                    |        |                           |           |     |           |               |          |                  |                |
| <i>Fulica atra</i>               | Eurasian coot                    |            |                    |        |                           | X         | X   |           |               | X        | X                |                |

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|                                      |                          |            | EPBC Act           | BC Act  | DBCAs Priority Fauna List |           |     |           |               |          |                  |                |
| <i>Gallinula tenebrosa</i>           | Dusky moorhen            |            |                    |         |                           |           | X   |           |               |          |                  |                |
| <i>Hypotaenidia philippensis</i>     | Buff-banded rail         |            |                    |         |                           | X         |     |           |               | X        |                  |                |
| <i>Porphyrio melanotus</i>           | Purple swamphen          |            |                    |         |                           | X         | X   |           |               | X        |                  |                |
| <i>Porzana fluminea</i>              | Australian spotted crane |            |                    |         |                           |           | X   |           |               |          |                  |                |
| <i>Tribonyx ventralis</i>            | Black-tailed native-hen  |            |                    |         |                           | X         | X   |           |               | X        | X                |                |
| <i>Zapornia pusilla</i>              | Baillon's crane          |            |                    |         |                           | X         | X   |           |               | X        |                  |                |
| <i>Zapornia tabuensis</i>            | Spotless crane           |            |                    |         |                           | X         | X   |           |               | X        |                  |                |
| Turnicidae                           |                          |            |                    |         |                           |           |     |           |               |          |                  |                |
| <i>Turnix velox</i>                  | Little button-quail      |            |                    |         |                           | X         | X   |           |               | X        | X                | X              |
| Burhinidae                           |                          |            |                    |         |                           |           |     |           |               |          |                  |                |
| <i>Burhinus grallarius</i>           | Bush stone-curlew        |            |                    |         |                           |           | X   |           |               | X        |                  |                |
| Recurvirostridae                     |                          |            |                    |         |                           |           |     |           |               |          |                  |                |
| <i>Cladorhynchus leucocephalus</i>   | Banded stilt             |            |                    |         |                           | X         | X   |           |               | X        |                  |                |
| <i>Himantopus himantopus</i>         | Black-winged stilt       |            |                    |         |                           |           | X   |           |               | X        | X                |                |
| <i>Recurvirostra novaehollandiae</i> | Red-necked avocet        |            |                    |         |                           | X         | X   |           |               | X        | X                |                |
| Charadriidae                         |                          |            |                    |         |                           |           |     |           |               |          |                  |                |
| <i>Charadrius leschenaultii</i>      | Greater sand plover      |            | VU & MI            | VU & MI |                           |           | X   |           |               |          |                  |                |
| <i>Charadrius ruficapillus</i>       | Red-capped Plover        |            |                    |         |                           | X         | X   |           |               | X        |                  |                |

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| <i>Charadrius veredus</i>   | Oriental plover          |            | MI                 | MI      |                          |           | X   | X         | X            |          |                  |                |
| <i>Euseyornis melanops</i>  | Black-fronted dotterel   |            |                    |         |                          | X         | X   |           |              | X        | X                |                |
| <i>Erythronyx cinctus</i>   | Red-kneed dotterel       |            |                    |         |                          | X         | X   |           |              | X        |                  |                |
| <i>Vanellus tricolor</i>    | Banded lapwing           |            |                    |         |                          | X         | X   |           |              |          |                  |                |
| <i>Vanellus miles</i>       | Masked lapwing           |            |                    |         |                          |           | X   |           |              |          |                  |                |
| Rostratulidae               |                          |            |                    |         |                          |           |     |           |              |          |                  |                |
| <i>Rostratula australis</i> | Australian painted snipe |            | EN                 | EN      |                          | X         | X   | X         | X            | X        |                  |                |
| Scolopacidae                |                          |            |                    |         |                          |           |     |           |              |          |                  |                |
| <i>Actitis hypoleucos</i>   | Common sandpiper         |            | MI                 | MI      |                          | X         | X   | X         | X            | X        |                  |                |
| <i>Calidris acuminata</i>   | Sharp-tailed sandpiper   |            | MI                 | MI      |                          | X         | X   | X         | X            | X        |                  |                |
| <i>Calidris ferruginea</i>  | Curlew sandpiper         |            | CR & MI            | CR & MI |                          | X         | X   | X         | X            | X        |                  |                |
| <i>Calidris melanotos</i>   | Pectoral sandpiper       |            | MI                 | MI      |                          | X         | X   | X         | X            |          |                  |                |
| <i>Calidris ruficollis</i>  | Red-necked stint         |            |                    | MI      |                          | X         | X   |           | X            | X        |                  |                |
| <i>Calidris subminuta</i>   | Long-toed stint          |            | MI                 | MI      |                          | X         | X   |           | X            | X        |                  |                |
| <i>Tringa glareola</i>      | Wood sandpiper           |            | MI                 | MI      |                          | X         | X   |           | X            | X        | X                |                |
| <i>Tringa nebularia</i>     | Common greenshank        |            | MI                 | MI      |                          | X         | X   |           | X            | X        | X                |                |
| <i>Tringa stagnatilis</i>   | Marsh sandpiper          |            | MI                 | MI      |                          | X         | X   |           | X            | X        |                  |                |
| <i>Tringa totanus</i>       | Common redshank          |            | MI                 | MI      |                          | X         |     |           | X            |          |                  |                |
| Glareolidae                 |                          |            |                    |         |                          |           |     |           |              |          |                  |                |
| <i>Glareola maldivarum</i>  | Oriental pratincole      |            | MI                 | MI      |                          |           | X   |           |              |          |                  |                |
| <i>Stiltia isabellae</i>    | Australian pratincole    |            |                    |         |                          | X         | X   |           |              | X        |                  |                |

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|                                        |                           |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| Laridae                                |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Chlidonias hybrida</i>              | Whiskered tern            |            |                    |        |                          |           | X   |           |              | X        |                  |                |
| <i>Chroicocephalus novaehollandiae</i> | Silver gull               |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Gelochelidon nilotica</i>           | Gull-billed tern          |            | MI                 | MI     |                          | X         | X   |           | X            | X        |                  |                |
| <i>Hydroprogne caspia</i>              | Caspian tern              |            | MI                 | MI     |                          | X         | X   |           | X            | X        |                  |                |
| Columbidae                             |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Geopelia cuneata</i>                | Diamond dove              |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Geopelia humeralis</i>              | Bar-shouldered dove       |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Geopelia striata placida</i>        | Peaceful dove             |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Geophaps plumifera</i>              | Spinifex pigeon           |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Ocyphaps lophotes</i>               | Crested pigeon            |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Phaps chalcoptera</i>               | Common bronzewing         |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Cuculidae                              |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Centropus phasianinus</i>           | Pheasant coucal           |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Chalcites basalis</i>               | Horsfield's bronze cuckoo |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Chalcites osculans</i>              | Black-eared cuckoo        |            |                    |        |                          | X         | X   | X         |              | X        | X                |                |
| <i>Heteroscenes pallidus</i>           | Pallid cuckoo             |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Tytonidae                              |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Tyto javanica</i>                   | Eastern barn owl          |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Strigidae                              |                           |            |                    |        |                          |           |     |           |              |          |                  |                |

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|                                  |                                   |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| <i>Ninox connivens</i>           | Barking owl                       |            |                    |        |                          | X         | X   |           |              |          |                  | X              |
| <i>Ninox connivens connivens</i> |                                   |            |                    |        | P3                       | X         | X   |           | X            |          |                  |                |
| <i>Ninox boobook</i>             | Southern boobook                  |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Podargidae                       |                                   |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Podargus strigoides</i>       | Tawny frogmouth                   |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Caprimulgidae                    |                                   |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Eurostopodus argus</i>        | Spotted nightjar                  |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Aegotheidae                      |                                   |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Aegotheles cristatus</i>      | Australian owlet-nightjar         |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Apodidae                         |                                   |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Apus pacificus</i>            | Fork-tailed swift (Pacific swift) |            | MI                 | MI     |                          | X         | X   | X         | X            | X        |                  |                |
| Coraciidae                       |                                   |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Eurystomus orientalis</i>     | Dollarbird                        |            |                    |        |                          |           | X   |           |              |          |                  |                |
| Alcedinidae                      |                                   |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Dacelo leachii</i>            | Blue-winged kookaburra            |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Todiramphus pyrrhopygius</i>  | Red-backed kingfisher             |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Todiramphus sanctus</i>       | Sacred kingfisher                 |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Meropidae                        |                                   |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Merops ornatus</i>            | Rainbow bee-eater                 |            |                    |        |                          | X         | X   | X         |              | X        | X                | X              |
| Falconidae                       |                                   |            |                    |        |                          |           |     |           |              |          |                  |                |

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| <i>Falco berigora</i>           | Brown falcon                         |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Falco cenchroides</i>        | Australian kestrel (nankeen kestrel) |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Falco hypoleucos</i>         | Grey falcon                          |            |                    | VU     |                          | X         | X   | X         | X            |          | X                |                |
| <i>Falco longipennis</i>        | Australian hobby                     |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Falco peregrinus</i>         | Peregrine falcon                     |            |                    | OS     |                          | X         | X   |           | X            | X        | X                |                |
| <i>Falco subniger</i>           | Black falcon                         |            |                    |        |                          |           | X   |           |              |          |                  |                |
| Cacatuidae                      |                                      |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Cacatua sanguinea</i>        | Little corella                       |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Calyptrorhynchus banksii</i> | Red-tailed black cockatoo            |            |                    |        |                          |           | X   |           |              |          |                  |                |
| <i>Eolophus roseicapilla</i>    | Galah                                |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Lophochroa leadbeateri</i>   | Major Mitchell's cockatoo            |            |                    |        |                          |           | X   |           |              |          |                  |                |
| <i>Nymphicus hollandicus</i>    | Cockatiel                            |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Psittacidae                     |                                      |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Barnardius zonarius</i>      | Australian ringneck                  |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Melopsittacus undulatus</i>  | Budgerigar                           |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Neopsephotus bourkii</i>     | Bourke's parrot                      |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Pezoporus occidentalis</i>   | Night parrot                         |            | EN                 | CR     |                          |           |     | X         |              |          |                  |                |
| <i>Polytelis alexandrae</i>     | Princess parrot                      |            | VU                 |        | P4                       | X         | X   | X         | X            |          |                  |                |

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|                                 |                          |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| <i>Psephotus varius</i>         | Mulga parrot             |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Ptilonorhynchidae               |                          |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Chlamydera guttatus</i>      | Western bowerbird        |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Climacteridae                   |                          |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Climacteris melanura</i>     | Black-tailed Treecreeper |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Maluridae                       |                          |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Amytornis whitei</i>         | Rufous grasswren         |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Malurus assimilis</i>        | Purple-backed fairy-wren |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Malurus leucopterus</i>      | White-winged fairy-wren  |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Malurus splendens</i>        | Splendid fairy-wren      |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Stipiturus ruficeps</i>      | Rufous-crowned emu-wren  |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Meliphagidae                    |                          |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Acanthagenys rufogularis</i> | Spiny-cheeked honeyeater |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Certhionyx variegatus</i>    | Pied honeyeater          |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Epthianura aurifrons</i>     | Orange chat              |            |                    |        |                          | X         | X   |           |              |          |                  |                |
| <i>Epthianura tricolor</i>      | Crimson chat             |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Gavicalis virescens</i>      | Singing honeyeater       |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Lacustroica whitei</i>       | Grey honeyeater          |            |                    |        |                          |           | X   |           |              | X        | X                |                |
| <i>Lichmera indistincta</i>     | Brown honeyeater         |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Manorina flavigula</i>       | Yellow-throated miner    |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Melithreptus gularis</i>     | Black-chinned honeyeater |            |                    |        |                          |           | X   |           |              | X        | X                |                |

| Scientific Name                  | Common Name                               | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Birddata | Previous Surveys | Current Survey |
|----------------------------------|-------------------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|----------|------------------|----------------|
|                                  |                                           |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| <i>Ptilotula keartlandi</i>      | Grey-headed honeyeater                    |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Ptilotula penicillata</i>     | White-plumed honeyeater                   |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Ptilotula plumula</i>         | Grey-fronted honeyeater                   |            |                    |        |                          | X         | X   |           |              |          | X                |                |
| <i>Purnella albifrons</i>        | White-fronted honeyeater                  |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Stomiopera unicolor</i>       | White-gaped honeyeater                    |            |                    |        |                          |           |     |           |              | X        |                  |                |
| <i>Sugomel niger</i>             | Black honeyeater                          |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Pardalotidae                     |                                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Pardalotus rubricatus</i>     | Red-browed pardalote                      |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Pardalotus striatus</i>       | Striated pardalote                        |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Acanthizidae                     |                                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Acanthiza apicalis</i>        | Broad-tailed thornbill (inland thornbill) |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Acanthiza chrysorrhoa</i>     | Yellow-rumped thornbill                   |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Acanthiza robustirostris</i>  | Slaty-backed thornbill                    |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Acanthiza uropygialis</i>     | Chestnut-rumped thornbill                 |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Aphelocephala leucopsis</i>   | Southern whiteface                        |            | VU                 |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Aphelocephala nigricincta</i> | Banded whiteface                          |            |                    |        |                          | X         |     |           |              | X        |                  |                |
| <i>Calamanthus campestris</i>    | Rufous fieldwren                          |            |                    |        |                          |           |     |           |              | X        |                  |                |
| <i>Gerygone fusca</i>            | Western gerygone                          |            |                    |        |                          | X         | X   |           |              | X        | X                |                |

| Scientific Name                   | Common Name                           | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Birddata | Previous Surveys | Current Survey |
|-----------------------------------|---------------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|----------|------------------|----------------|
|                                   |                                       |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| <i>Pyrholaemus brunneus</i>       | Redthroat                             |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Smicrornis brevirostris</i>    | Weebill                               |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Pomatostomidae                    |                                       |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Pomatostomus superciliosus</i> | White-browed babbler                  |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Pomatostomus temporalis</i>    | Grey-crowned babbler                  |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Psophodidae                       |                                       |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Psophodes occidentalis</i>     | Western wedgebill (chiming wedgebill) |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Cinclosomatidae                   |                                       |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Cinclosoma marginatum</i>      | Chestnut-breasted quail-thrush        |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Artamidae                         |                                       |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Artamus cinereus</i>           | Black-faced woodswallow               |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Artamus cyanopterus</i>        | Dusky woodswallow                     |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Artamus minor</i>              | Little woodswallow                    |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Artamus personatus</i>         | Masked woodswallow                    |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Artamus superciliosus</i>      | White-browed Woodswallow              |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Cracticus nigrogularis</i>     | Pied butcherbird                      |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Cracticus torquatus</i>        | Grey butcherbird                      |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Gymnorhina tibicen</i>         | Australian magpie                     |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |

| Scientific Name                  | Common Name               | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Birddata | Previous Surveys | Current Survey |
|----------------------------------|---------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|----------|------------------|----------------|
|                                  |                           |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| Campephagidae                    |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Coracina maxima</i>           | Ground cuckoo-shrike      |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Coracina novaehollandiae</i>  | Black-faced cuckoo-shrike |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Lalage tricolor</i>           | White-winged triller      |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Neosittidae                      |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Daphoenositta chrysoptera</i> | Varied sittella           |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Oreoidae                         |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Oreoica gutturalis</i>        | Crested bellbird          |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Pachycephalidae                  |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Colluricincla harmonica</i>   | Grey shrike-thrush        |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Pachycephala fuliginosa</i>   | Western whistler          |            |                    |        |                          |           |     |           |              | X        |                  |                |
| <i>Pachycephala rufiventris</i>  | Rufous whistler           |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Rhipiduridae                     |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Rhipidura albiscapa</i>       | Grey fantail              |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Rhipidura leucophrys</i>      | Willie wagtail            |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Monarchidae                      |                           |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Grallina cyanoleuca</i>       | Magpie-lark               |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Corvidae                         |                           |            |                    |        |                          |           |     |           |              |          |                  |                |

| Scientific Name                | Common Name             | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Birddata | Previous Surveys | Current Survey |
|--------------------------------|-------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|----------|------------------|----------------|
|                                |                         |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| <i>Corvus bennetti</i>         | Little crow             |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Corvus coronoides</i>       | Australian raven        |            |                    |        |                          | X         |     |           |              |          |                  |                |
| <i>Corvus orru</i>             | Torresian crow          |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Petroicidae                    |                         |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Melanodryas cucullata</i>   | Hooded robin            |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Microeca fascians</i>       | Jacky winter            |            |                    |        |                          | X         |     |           |              |          |                  |                |
| <i>Petroica goodenovii</i>     | Red-capped robin        |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Alaudidae                      |                         |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Mirafra javanica</i>        | Horsfield's bushlark    |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Hirundinidae                   |                         |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Cheramoeca leucosterna</i>  | White-backed swallow    |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Hirundo neoxena</i>         | Welcome swallow         |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Hirundo rustica</i>         | Barn swallow            |            | MI                 | MI     |                          |           |     | X         |              |          |                  |                |
| <i>Petrochelidon ariel</i>     | Fairy martin            |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Petrochelidon nigricans</i> | Tree martin             |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Acrocephalidae                 |                         |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Acrocephalus australis</i>  | Australian reed warbler |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Locustellidae                  |                         |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Cincloramphus cruralis</i>  | Brown songlark          |            |                    |        |                          | X         | X   |           |              | X        | X                |                |

| Scientific Name                 | Common Name      | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Birddata | Previous Surveys | Current Survey |
|---------------------------------|------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|----------|------------------|----------------|
|                                 |                  |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |          |                  |                |
| <i>Cincloramphus mathewsi</i>   | Rufous songlark  |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Poodytes carteri</i>         | Spinifexbird     |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| <i>Poodytes gramineus</i>       | Little grassbird |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| Dicaeidae                       |                  |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Dicaeum hirundinaceum</i>    | Mistletoebird    |            |                    |        |                          | X         | X   |           |              | X        | X                |                |
| Estrildidae                     |                  |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Emblema pictum</i>           | Painted finch    |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| <i>Neochmia ruficauda</i>       | Star finch       |            |                    |        |                          | X         | X   |           |              | X        |                  |                |
| <i>Taeniopygia castanotis</i>   | Zebra finch      |            |                    |        |                          | X         | X   |           |              | X        | X                | X              |
| Motacillidae                    |                  |            |                    |        |                          |           |     |           |              |          |                  |                |
| <i>Motacilla tschutschensis</i> | Yellow wagtail   |            | MI                 | MI     |                          |           |     | X         |              |          |                  |                |
| <i>Motacilla cinerea</i>        | Grey wagtail     |            | MI                 | MI     |                          |           |     | X         |              |          |                  |                |
| <i>Anthus australis</i>         | Australian pipit |            |                    |        |                          | X         | X   |           |              | X        | X                |                |

Note: EPBC = Environment Protection and Biodiversity Conservation; BC = Biodiversity and Conservation; DBCA = Department of Biodiversity, Conservation and Attractions; ALA = Atlas of Living Australia; PMST = Protected Matters Search Tool; T = Threatened; P = Priority; EN = Endangered; MI = Migratory; VU = Vulnerable; CR = Critically Endangered; OS = Specially Protected.

Table D.4: Mammal species list – results of database searches, literature reviews and Astron survey results.

| Scientific Name                         | Common Name                   | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|-----------------------------------------|-------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                         |                               |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| Tachyglossidae                          |                               |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Tachyglossus aculeatus acanthion</i> | Short-beaked echidna          |            |                    |        |                          | X         |     |           |              | X                | X              |
| Dasyuridae                              |                               |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Antechinomys longicaudata</i>        | Long-tailed dunnart           |            |                    |        | P4                       | X         | X   |           | X            | X                |                |
| <i>Dasyercus blythi</i>                 | Brush-tailed mulgara, ampurta |            |                    |        | P4                       | X         |     |           | X            | X                |                |
| <i>Dasykaluta rosamondae</i>            | Kaluta                        |            |                    |        |                          |           | X   |           |              | X                |                |
| <i>Dasyurus hallucatus</i>              | Northern quoll                |            | EN                 | EN     |                          | X         |     | X         | X            |                  |                |
| <i>Ningai ridei</i>                     | Wongai ningai                 |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Ningai timealeyi</i>                 | Pilbara ningai                |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Planigale ingrami</i>                | Long-tailed planigale         |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Planigale maculata</i>               | Common planigale              |            |                    |        |                          | X         |     |           |              | X                |                |
| <i>Planigale species 1'</i>             | Pilbara planigale             |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Pseudantechinus woolleyae</i>        | Woolley's pseudantechinus     |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Sminthopsis crassicaudata</i>        | Fat-tailed dunnart            |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Sminthopsis dolichura</i>            | Little Long-tailed dunnart    |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Sminthopsis hirtipes</i>             | Hairy-footed dunnart          |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Sminthopsis macroura</i>             | Stripe-faced dunnart          |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Sminthopsis ooldea</i>               | Ooldea dunnart                |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Sminthopsis youngsoni</i>            | Lesser hairy-footed dunnart   |            |                    |        |                          | X         | X   |           |              |                  |                |

| Scientific Name                               | Common Name                        | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|-----------------------------------------------|------------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                               |                                    |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| Thylacomyidae                                 |                                    |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Macrotis lagotis</i>                       | Greater bilby, dalgyte             |            | VU                 | VU     |                          | X         |     | X         | X            |                  |                |
| Notoryctidae                                  |                                    |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Notoryctes spp</i>                         | Marsupial mole spp.                |            |                    |        | P4                       |           |     |           | X            |                  |                |
| Phalangeridae                                 |                                    |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Trichosurus vulpecula arnhemensis</i>      | Northern brushtail possum          |            |                    | VU     |                          | X         |     |           |              |                  |                |
| Macropodidae                                  |                                    |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Lagorchestes conspicillatus leichardti</i> | Spectacled hare-wallaby (Mainland) |            |                    |        | P4                       | X         | X   |           | X            |                  |                |
| <i>Osphranter robustus erubescens</i>         | Euro, biggada                      |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Osphranter rufus</i>                       | Red kangaroo, marlu                |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Petrogale lateralis lateralis</i>          | Black-footed rock-wallaby          |            | EN                 | EN     |                          | X         | X   |           | X            |                  |                |
| <i>Petrogale rothschildi</i>                  | Rothschild's rock-wallaby          |            |                    |        |                          | X         | X   |           |              | X                | X              |
| Muridae                                       |                                    |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Leggadina lakedownensis</i>                | Short-tailed mouse, kerakenga      |            |                    |        | P4                       |           |     |           | X            |                  |                |
| <i>Mus musculus</i>                           | House mouse                        | *          |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Notomys alexis alexis</i>                  | Spinifex hopping-mouse             |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Pseudomys chapmani</i>                     | Western pebble-mound mouse, ngadji |            |                    |        | P4                       | X         | X   |           | X            | X                | X              |
| <i>Pseudomys delicatulus</i>                  | Delicate mouse                     |            |                    |        |                          | X         |     |           |              |                  |                |

| Scientific Name                              | Common Name                      | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|----------------------------------------------|----------------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                              |                                  |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Pseudomys desertor</i>                    | Desert mouse                     |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Pseudomys hermannsburgensis</i>           | Sandy inland mouse               |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Pseudomys nanus nanus</i>                 | Western chestnut mouse           |            |                    |        |                          | X         |     |           |              |                  |                |
| <i>Zyomys argurus</i>                        | Common rock-rat                  |            |                    |        |                          | X         | X   |           |              | X                | X              |
| Leporidae                                    |                                  |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Oryctolagus cuniculus</i>                 | Rabbit                           | *          |                    |        |                          | X         | X   |           |              | X                |                |
| Rhinonycteridae                              |                                  |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Rhinonicteris aurantia</i> (Pilbara form) | Pilbara leaf-nosed bat           |            | VU                 | VU     |                          | X         |     | X         | X            | X                |                |
| Megadermatidae                               |                                  |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Macroderma gigas</i>                      | Ghost bat                        |            | VU                 | VU     |                          | X         | X   | X         | X            | X                |                |
| Emballonuridae                               |                                  |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Saccolaimus flaviventris</i>              | Yellow-bellied sheath-tailed bat |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Taphozous georgianus</i>                  | Common sheath-tailed bat         |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Taphozous hilli</i>                       | Hill's sheath-tailed bat         |            |                    |        |                          | X         | X   |           |              | X                | X              |
| Molossidae                                   |                                  |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Austronomus australis</i>                 | White-striped free-tailed bat    |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Chaerephon jobensis</i>                   | Northern free-tailed bat         |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Ozimops lumsdenae</i>                     | Northern free-tailed bat         |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Setirostris eleryi</i>                    | Bristle-faced Free-tailed Bat    |            |                    |        |                          |           | X   |           |              |                  |                |
| Vespertilionidae                             |                                  |            |                    |        |                          |           |     |           |              |                  |                |

| Scientific Name                          | Common Name                 | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|------------------------------------------|-----------------------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                                          |                             |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Chalinolobus gouldii</i>              | Gould's wattled bat         |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Chalinolobus morio</i>                | Chocolate wattled bat       |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Chalinolobus nigrogriseus rogersi</i> | Hoary wattled bat           |            |                    |        |                          |           | X   |           |              |                  |                |
| <i>Nyctophilus daedalus</i>              | Northwestern long-eared bat |            |                    |        |                          | X         | X   |           |              |                  |                |
| <i>Nyctophilus geoffroyi geoffroyi</i>   | Lesser long-eared bat       |            |                    |        |                          | X         | X   |           |              | X                |                |
| <i>Scotorepens balstoni</i>              | Inland broad-nosed bat      |            |                    |        |                          | X         |     |           |              | X                |                |
| <i>Scotorepens greyii</i>                | Little broad-nosed bat      |            |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Vespadelus finlaysoni</i>             | Finlayson's cave bat        |            |                    |        |                          | X         | X   |           |              | X                | X              |
| Canidae                                  |                             |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Canis familiaris familiaris</i>       | Dog                         | *          |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Vulpes vulpes</i>                     | Red fox                     | *          |                    |        |                          |           | X   |           |              |                  |                |
| Felidae                                  |                             |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Felis catus</i>                       | Cat                         | *          |                    |        |                          | X         | X   |           |              | X                | X              |
| Equidae                                  |                             |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Equus asinus</i>                      | Donkey                      | *          |                    |        |                          | X         |     |           |              |                  |                |
| <i>Equus caballus</i>                    | Horse                       | *          |                    |        |                          | X         |     |           |              |                  |                |
| Suidae                                   |                             |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Sus scrofa</i>                        | Pig                         | *          |                    |        |                          |           | X   |           |              |                  |                |
| Camelidae                                |                             |            |                    |        |                          |           |     |           |              |                  |                |
| <i>Camelus dromedarius</i>               | Dromedary, camel            | *          |                    |        |                          | X         | X   |           |              |                  |                |
| Bovidae                                  |                             |            |                    |        |                          |           |     |           |              |                  |                |

| Scientific Name     | Common Name     | Introduced | Conservation Codes |        |                          | NatureMap | ALA | EPBC PMST | DBCA T and P | Previous Surveys | Current Survey |
|---------------------|-----------------|------------|--------------------|--------|--------------------------|-----------|-----|-----------|--------------|------------------|----------------|
|                     |                 |            | EPBC Act           | BC Act | DBCA Priority Fauna List |           |     |           |              |                  |                |
| <i>Bos taurus</i>   | European cattle | *          |                    |        |                          | X         | X   |           |              | X                | X              |
| <i>Capra hircus</i> | Goat            | *          |                    |        |                          |           |     |           |              | X                |                |

Note: EPBC = Environment Protection and Biodiversity Conservation; BC = Biodiversity and Conservation; DBCA = Department of Biodiversity, Conservation and Attractions; ALA = Atlas of Living Australia; PMST = Protected Matters Search Tool; T = Threatened; P = Priority; EN = Endangered; VU = Vulnerable.

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## **Appendix E: Threatened and Priority Fauna Species Likelihood of Occurrence within the Survey Area**

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Table E.1: Likelihood of occurrence of significant vertebrate fauna species listed as potentially occurring in the vicinity of the survey area.

| Common name (scientific name)                                                           | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                                                               | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|-----------------------------------------------------------------------------------------|--------------------|--------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                                                         | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                                                      |                                     |                                      |
| Reptiles                                                                                |                    |        |      |                                                                                                                                                                                                                                                                                                                                                                                                      |                                     |                                      |
| Pilbara barking gecko<br>( <i>Underwoodisaurus seorsus</i> )                            |                    |        | P2   | Confined in the Pilbara to the Hammersley Ranges from Tom Price to Newman. Occurs in rocky areas with spinifex and low tree cover. Fourteen previous records were detailed on the DBCA threatened and priority fauna database search, over 60 km from the survey area.                                                                                                                               | Moderate                            | Moderate                             |
| Spotted ctenotus (northeast)<br>( <i>Ctenotus uber johnstonei</i> )                     |                    |        | P2   | This subspecies is only known from chenopod shrubland at the base of a sandstone hill, near Balgoo. One recent (2018) fauna record was detailed on the DBCA threatened and priority fauna database search result, over 30 km from the survey area.                                                                                                                                                   | Low                                 | Low                                  |
| Unpatterned robust slider<br>(Robertson Range) ( <i>Lerista macropisthopus remota</i> ) |                    |        | P2   | <i>Acacia</i> shrublands and woodlands in the central interior. Shelters in loose soil under leaf litter at the base of shrubs. Four historic fauna records were detailed on the DBCA threatened and priority fauna database search result, over 50 km from the survey area.                                                                                                                         | Low                                 | Low                                  |
| Great desert skink ( <i>Liopholis kintorei</i> )                                        | VU                 | VU     |      | Red sandplains and sand ridges. Prefers a mosaic landscape of different aged vegetation and inhabits sites that have been burnt (3 to 15 years). Sparsely distributed across arid sand flats and clay-based or loamy soils vegetated with spinifex. Two recent (2010) fauna records were detailed on the DBCE threatened and priority fauna database search result, over 70 km from the survey area. | Low                                 | Low                                  |
| Gane’s bind snake ( <i>Anilius ganei</i> )                                              |                    |        | P1   | Little information is available on this species, but it is believed to be associated with moist gorges and gullies. Fifteen previous records were detailed on the DBCA threatened and priority fauna database search result, including two historical records within 5 km of the survey area.                                                                                                        | High                                | High                                 |

| Common name (scientific name)                            | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                                                                                                                                               | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|----------------------------------------------------------|--------------------|--------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                          | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                     |                                      |
| Pilbara olive python ( <i>Liasis olivaceus barroni</i> ) | VU                 | VU     |      | Generally rocky habitats in close association to permanent and semi-permanent water sources. This includes gorges, rock pools and riparian zones. Five previous records were detailed on BHP WAIO's database from within the survey area, including four records from 2020. Twenty-four previous records were also detailed on the DBCA threatened and priority fauna database search result, including one recent (2012) and one historical record within 10 km of the survey area. | Recorded                            | Recorded                             |
| <b>Birds</b>                                             |                    |        |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                     |                                      |
| Southern giant-petrel ( <i>Macronectes giganteus</i> )   | EN, MI             | MI     |      | Predominantly pelagic species that is independent of terrestrial habitats. One previous record was detailed on the DBCA threatened and priority fauna database search, over 50 km from the survey area.                                                                                                                                                                                                                                                                              | Low                                 | Low                                  |
| Glossy ibis ( <i>Plegadis falcinellus</i> )              | MI                 | MI     |      | Wetland habitats, such as freshwater marshes at the edges of lakes, rivers and wet swamp areas. This species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes, and coastal lagoons. Twelve previous records were detailed on the DBCA threatened and priority fauna database result, over 20 km from the survey area.                                                                                                                               | Low                                 | Low                                  |
| Letter-winged Kite ( <i>Elanus scriptus</i> )            |                    |        | P4   | The letter-winged kite is a bird of open country and grasslands in arid and semi-arid Australia, where there are tree-lined streams or water courses. One recent (2018) record was detailed on the DBCA threatened and priority fauna database search, over 70 km from the survey area.                                                                                                                                                                                              | Low                                 | Low                                  |

| Common name (scientific name)                            | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                                                                                                                                            | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|----------------------------------------------------------|--------------------|--------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                          | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                     |                                      |
| Red goshawk ( <i>Erythroriorchis radiatus</i> )          | VU                 | VU     |      | The red goshawk occurs in coastal and sub-coastal areas in wooded and forested lands of tropical and warm-temperate Australia. Riparian vegetation also provided significant nesting and foraging opportunities. The EPBC Act protected matters report assessed that this species or species habitat may occur within the survey area.                                                                                                                                            | Low                                 | Low                                  |
| Eastern osprey ( <i>Pandion haliaetus</i> )              | MI                 | MI     |      | Occurs in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. Also, coastal areas, and occasionally travels inland along major rivers. One recent (2011) record was detailed on the DBCA threatened and priority fauna database search, over 60 km from the survey area.                                                                                                                                             | Low                                 | Low                                  |
| Greater sand plover ( <i>Charadrius leschenaultia</i> )  | VU, MI             | VU, MI |      | Mainly sandy beaches and tidal mud, reef, and sand flats. Vagrant to Australia. The species was identified on the ALA database search only.                                                                                                                                                                                                                                                                                                                                       | Low                                 | Low                                  |
| Oriental plover ( <i>Charadrius veredus</i> )            | MI                 | MI     |      | This species inhabits sparsely vegetated plains, beaches, and tidal flats, and saltworks and sewage ponds. Three records were detailed on the DBCA threatened and priority fauna database result, including one historic record within 15 km of the survey area.                                                                                                                                                                                                                  | High                                | Low                                  |
| Australian painted snipe ( <i>Rostratula australis</i> ) | EN                 | EN     |      | Inhabits shallow terrestrial freshwater wetlands, lakes, swamps and claypans. Also found in waterlogged grassland and saltmarsh. Typical sites include areas with emergent tussocks of grass, sedges, or samphire; often scattered with clumps of lignum <i>Muehlenbeckia</i> , or canegrass or sometimes with tea-tree ( <i>Melaleuca</i> ). Two recent (2012) records were detailed on the DBCA threatened and priority fauna database result, over 60 km from the survey area. | Low                                 | Low                                  |

| Common name (scientific name)                        | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                            | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|------------------------------------------------------|--------------------|--------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                      | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                   |                                     |                                      |
| Common sandpiper ( <i>Actitis hypoleucos</i> )       | MI                 | MI     |      | Non-breeding migrant to a wide variety of habitats, such as riverbanks, estuaries, freshwater seeps on coastal shores, tidal creeks, mangrove swamps, and saltmarshes. Nineteen previous records were detailed on the DBCA threatened and priority fauna database result, including one recent (2012) and two historical records within 10 km of the survey area. | High                                | Low                                  |
| Sharp-tailed sandpiper ( <i>Calidris acuminata</i> ) | MI                 | MI     |      | Muddy edges of shallow fresh/brackish wetlands with emergent sedges, saltmarsh, grass, and low vegetation. Eight previous records were detailed on the DBCA threatened and priority fauna database result, over 10 km from the survey area.                                                                                                                       | High                                | Low                                  |
| Curlew sandpiper ( <i>Calidris ferruginea</i> )      | CR, MI             | CR, MI |      | Mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast. One previous record was detailed on the DBCA threatened and priority fauna database result, over 20 km from the survey area.                                                     | Low                                 | Low                                  |
| Pectoral sandpiper ( <i>Calidris melanotos</i> )     | MI                 | MI     |      | Mainly swamps, lagoons, river pools, irrigation channels, and sewerage ponds. Also, in samphire flats around estuaries and salt lakes. One previous record was detailed on the DBCA threatened and priority fauna database result, over 10 km from the survey area.                                                                                               | High                                | Low                                  |
| Red-necked stint ( <i>Calidris ruficollis</i> )      |                    | MI     |      | The edge of sheltered waters, including estuaries, beaches, near-coastal salt lakes, swamps, lakes, sewerage ponds, and bore overflows. Four previous records were detailed on the DBCA threatened and priority fauna database result, over 20 km from the survey area.                                                                                           | Low                                 | Low                                  |
| Long-toed stint ( <i>Calidris subminuta</i> )        | MI                 | MI     |      | Generally found in coastal environments such as coastal margins, lagoons, beaches, and tidal flats. Three historic records were detailed on the DBCA threatened and priority fauna database result, over 10 km from the survey area.                                                                                                                              | High                                | Low                                  |

| Common name (scientific name)                       | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                                                                                     | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|-----------------------------------------------------|--------------------|--------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                     | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                                                                            |                                     |                                      |
| Wood sandpiper ( <i>Tringa glareola</i> )           | MI                 | MI     |      | Generally open areas, such as the margins of inland freshwater lakes and reservoirs. This species rarely occurs in coastal habitats but may be found along the creeks of saltmarshes and mangrove swamps. Seven previous records were detailed on the DBCA threatened and priority fauna database result, over 10 km from the survey area.                                                                                 | High                                | Low                                  |
| Common greenshank ( <i>Tringa nebularia</i> )       | MI                 | MI     |      | A variety of freshwater, marine and artificial wetlands, including swamps, open muddy or rocky shores of lakes and large rivers, sewage farms, saltworks, muddy coastal flats, mangroves, and estuaries. Ten previous records were detailed on the DBCA threatened and priority fauna database result, including one recent (2012) record within 10 km of the survey area.                                                 | High                                | Low                                  |
| Marsh sandpiper ( <i>Tringa stagnatilis</i> )       | MI                 | MI     |      | Found at the margins of inland freshwater and brackish wetlands, such as rice paddy-fields, swamps, salt pans, salt marshes, sewage works, and marshy lake edges and, although it is rare on open coastlines, it can occasionally be found on estuaries, lagoons and intertidal mudflats. Three previous records were detailed on the DBCA threatened and priority fauna database result, over 20 km from the survey area. | Low                                 | Low                                  |
| Common redshank, redshank ( <i>Tringa tetanus</i> ) | MI                 | MI     |      | Found at sheltered coastal wetlands such as bays, river estuaries, lagoons, inlets, and saltmarsh (with bare open flats and banks of mud or sand). They are also found around salt lakes, freshwater lagoons, artificial wetlands and saltworks and sewage farms. One recent (2012) record was detailed on the DBCA threatened and priority fauna database search, within 10 km of the survey area.                        | High                                | Low                                  |
| Oriental pratincole ( <i>Glareola maldivarum</i> )  | MI                 | MI     |      | Open plains, bare ground on swamp-margins, mudflats and claypans. Feeds in the air and roosts on bare ground besides water. The species was identified on the ALA database search only.                                                                                                                                                                                                                                    | Low                                 | Low                                  |

| Common name (scientific name)                                        | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                                                                              | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|----------------------------------------------------------------------|--------------------|--------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                                      | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     |                                      |
| Gull-billed tern ( <i>Gelochelidon (Sterna) nilotica</i> )           | MI                 | MI     |      | Shallow sheltered seas close to land, estuaries, tidal creeks, near-coastal salt lakes, samphire flats, swamps, lagoons, river pools, claypans, dams, and over grain crops. Fourteen previous records were detailed on the DBCA threatened and priority fauna database result, over 10 km from the survey area.                                                                                                     | High                                | Low                                  |
| Caspian tern ( <i>Hydroprogne (Sterna) caspia</i> )                  | MI                 | MI     |      | Mainly sheltered seas, estuaries, and tidal creeks. Four previous records were detailed on the DBCA threatened and priority fauna database result, over 20 km from the survey area.                                                                                                                                                                                                                                 | Low                                 | Low                                  |
| Barking owl (southwest subpop.) ( <i>Ninox connivens connivens</i> ) |                    |        | P3   | Forest and woodland; however, mostly absent from arid regions. Mostly rests in the outer, dense foliage of trees during the days, occasionally coming out late afternoon. They form permanent mating pairs, often returning year after year to the same hollow to nest. One historical fauna record was detailed on the DBCA threatened and priority fauna database search result, over 50 km from the survey area. | Low                                 | Low                                  |
| Fork-tailed Swift ( <i>Apus pacificus</i> )                          | MI                 | MI     |      | Summer migrant to Australia and occurs in low to very high airspace, largely independent of terrestrial habitats and landforms. Several recent (2011 - 2014) records were detailed on the DBCA threatened and priority fauna database search, over 40 km from the survey area.                                                                                                                                      | Moderate                            | Low                                  |
| Grey falcon ( <i>Falco hypoleucos</i> )                              |                    | VU     |      | Open habitats: semi-deserts, grassy inland plains, timbered watercourses, and pastoral lands. One record of two individuals was identified in a fauna survey within 20 km of the current survey area. Six previous records were detailed on the DBCA threatened and priority fauna database result, over 80 km from the survey area.                                                                                | High                                | High                                 |

| Common name (scientific name)                         | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|-------------------------------------------------------|--------------------|--------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                       | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                     |                                      |
| Peregrine falcon ( <i>Falco peregrinus</i> )          |                    | OS     |      | Cosmopolitan, will hunt in any habitat, soaring at height or from a perch, often near cliffs. Nests on rocky ledges in tall, vertical cliff faces and tall trees associated with drainage lines. Twenty-three previous records were detailed on the DBCA threatened and priority fauna database result, including one recent (2011) record less than 5 km from the survey area.                                                                                                        | High                                | High                                 |
| Night parrot ( <i>Pezoporus occidentalis</i> )        | EN                 | CR     |      | Arid and semi-arid areas characterised by dense, low vegetation. Based on accepted records, the habitat consists of <i>Triodia</i> grasslands in stony or sandy environments, of samphire and chenopod shrublands, on floodplains and claypans and margins of salt lakes, creeks, and other water sources. The EPBC Act protected matters report assessed that this species or species habitat is likely occur within the survey area.                                                 | Low                                 | Low                                  |
| Princess parrot ( <i>Polytelis alexandrae</i> )       | VU                 |        | P4   | Inhabits sand dunes and sand flats in the arid zone. Occurs in savanna woodlands and shrublands that usually consist of scattered stands of <i>Eucalyptus</i> spp, <i>Casuarina/Allocasuarina</i> trees, an understorey of shrubs, and a ground cover dominated by <i>Triodia</i> ssp. Two recent (2012) records were detailed on the DBCA threatened and priority fauna database result, over 30 km from the survey area.                                                             | Low                                 | Low                                  |
| Southern whiteface ( <i>Aphelocephala leucopsis</i> ) | VU                 |        |      | Critical habitat includes relatively undisturbed open woodlands and shrublands with an understorey of grasses or shrubs, or both, habitat with low tree densities, and a herbaceous understorey litter cover, which provides essential foraging habitat, and living and dead trees with hollows and crevices, which are essential for roosting and nesting. This species was identified on NatureMap, ALA and Birddata database searches as occurring within 80 km of the survey area. | Low                                 | Low                                  |

| Common name (scientific name)                            | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                                                                         | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|----------------------------------------------------------|--------------------|--------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                          | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                                                                |                                     |                                      |
| Barn swallow ( <i>Hirundo rustica</i> )                  | MI                 | MI     |      | Generally coastal open country, especially near surface water and man-made structures, such as bridges and power wires. The EPBC Act protected matters report assessed that this species or species habitat may occur within the survey area.                                                                                                                                                                  | Low                                 | Low                                  |
| Yellow wagtail ( <i>Motacilla tschutschensis</i> )       | MI                 | MI     |      | Damp short-grass flats, edges of swamps, sewerage ponds, grazed or mowed grass and irrigated areas. Vagrant to Australia. The EPBC Act protected matters report assessed that this species or species habitat may occur within the survey area.                                                                                                                                                                | Low                                 | Low                                  |
| Grey wagtail ( <i>Motacilla cinerea</i> )                | MI                 | MI     |      | Mainly banks and rocks in fast flowing fresh water. Vagrant to Australia. The EPBC Act protected matters report assessed that this species or species habitat may occur within the survey area.                                                                                                                                                                                                                | Low                                 | Low                                  |
| <b>Mammals</b>                                           |                    |        |      |                                                                                                                                                                                                                                                                                                                                                                                                                |                                     |                                      |
| Long-tailed dunnart ( <i>Antechinomys longicaudata</i> ) |                    |        | P4   | Found in rocky scree and plateau areas, generally with little vegetation or in areas of spinifex hummock grassland, shrubs, and open woodland. Four previous records were detailed on the DBCA threatened and priority fauna database result, including two historical records within 5 km of the survey area                                                                                                  | High                                | Moderate                             |
| Brush-tailed mulgara ( <i>Dasycercus blythi</i> )        |                    |        | P4   | Common in a range of habitats – tussock/hummock grasslands and sparse shrubs and low open woodlands on ridge tops, cliffs, scree slopes, hills, and valley floors. Nine recent records from 2021 were detailed on BHP WAIO's database result from within 1 km of the survey area. Eighteen previous records were detailed on the DBCA threatened and priority fauna database, over 30 km from the survey area. | High                                | Moderate                             |
| Northern quoll ( <i>Dasyurus hallucatus</i> )            | EN                 | EN     |      | Occurs in a variety of habitats, but commonly found in rocky escarpments and open lowland savanna forest. Also, in areas associated with rocky areas, but also along watercourses. Thirteen previous records were detailed on the DBCA threatened and priority fauna database, over 50 km from the survey area.                                                                                                | Moderate                            | Moderate                             |

| Common name (scientific name)                                                       | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                         | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|-------------------------------------------------------------------------------------|--------------------|--------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                                                     | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                |                                     |                                      |
| Greater bilby, dalgyte ( <i>Macrotis lagotis</i> )                                  | VU                 | VU     |      | The major habitats they now occupy in Western Australia include mulga scrub and hummock grasslands on sandplains or along drainage or salt lake systems. They require sandy or loamy soils in which to burrow. Seventy-nine previous records were detailed on the DBCA threatened and priority fauna database result, over 20 km from the survey area.         | Low                                 | Low                                  |
| Marsupial mole ( <i>Notoryctes</i> spp.)                                            |                    |        | P4   | Northern spp.: Lives primarily underground of sand dunes and sandy soils along river flats.<br>Southern spp.: Lives primarily underground of sand dunes (the crest and slope), sandy plains and sandy soils along river flats.<br>One previous record was detailed on the DBCA threatened and priority fauna database result, over 70 km from the survey area. | Low                                 | Low                                  |
| Northern brushtail possum ( <i>Trichosurus vulpecula arnhemensis</i> )              |                    | VU     |      | Restricted to the top end and the Kimberly region. The northern brushtail possum is well adapted to rural and urban areas and is sometimes considered a pest in high numbers. The species was identified on the Naturemap database search only.                                                                                                                | Low                                 | Low                                  |
| Spectacled hare-wallaby (mainland) ( <i>Lagorchetes conspicillatus leichardti</i> ) |                    |        | P4   | Tussock or hummock grassland with mid-dense/sparse tree and shrub cover. One previous record was detailed on the DBCA threatened and priority fauna database result, over 50 km from the survey area.                                                                                                                                                          | Low                                 | Low                                  |
| Black-footed rock-wallaby ( <i>Petrogale lateralis lateralis</i> )                  | EN                 | EN     |      | Occurs in cliffs, rock-piles, talus or escarpment refuge and other steep substrates with grassland feeding habitat nearby. Also occurs on limestone outcrops, coastal cliffs, and granite outcrops. Four historic records were detailed on the DBCA threatened and priority fauna database result, over 10 km from the survey area.                            | Low                                 | Low                                  |
| Short-tailed mouse ( <i>Leggadina lakedownensis</i> )                               |                    |        | P4   | Open tussock and hummock grassland, Acacia shrubland and savanna woodland on alluvial clay/sandy soils. Cracking clays. Eleven previous records were detailed on the DBCA threatened and priority fauna database result, over 80 km from the survey area.                                                                                                      | Low                                 | Low                                  |

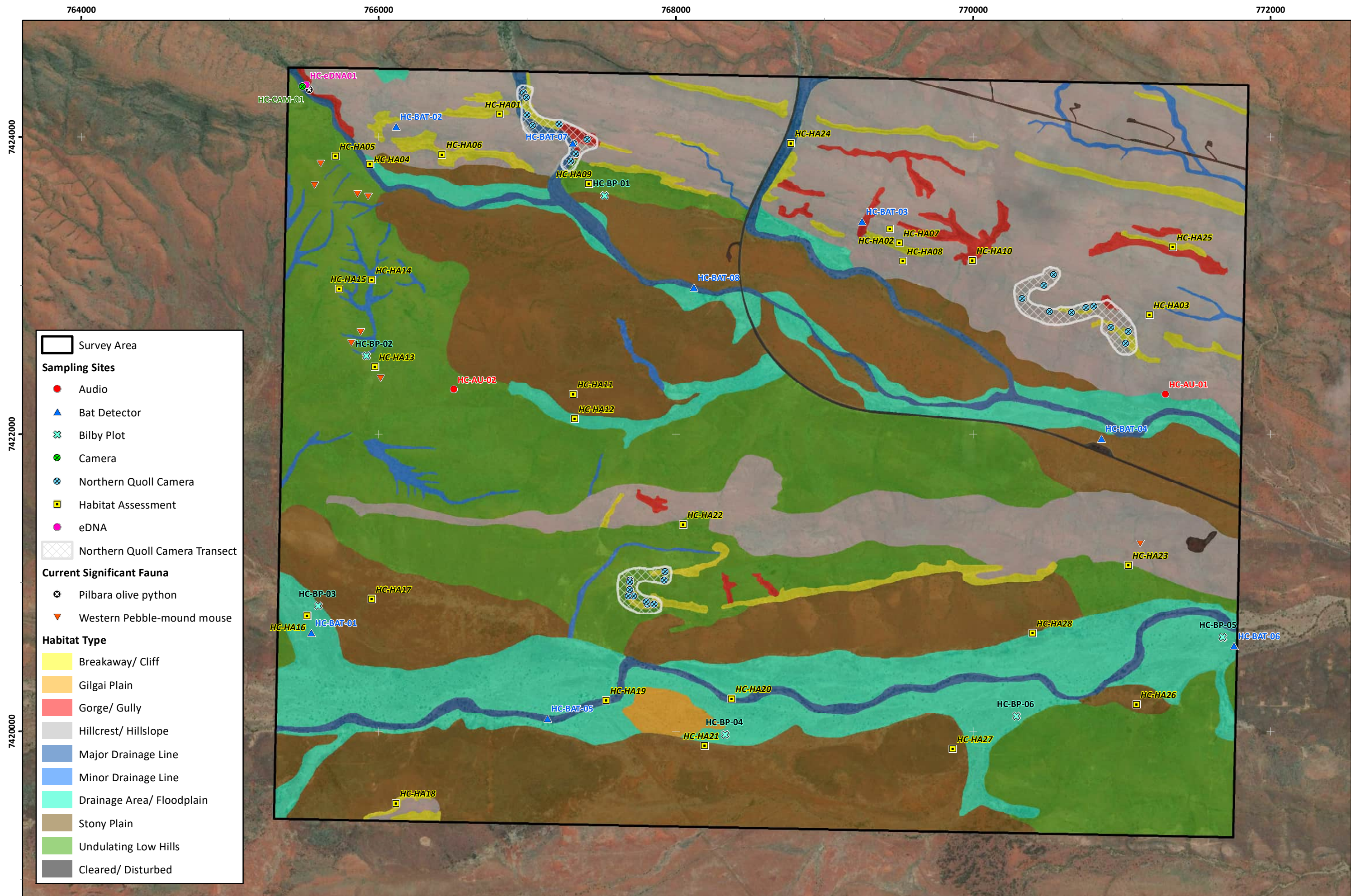
| Common name (scientific name)                                           | Conservation codes |        |      | Preferred habitat and previous records                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Pre-survey likelihood of occurrence | Post-survey likelihood of occurrence |
|-------------------------------------------------------------------------|--------------------|--------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------------------|
|                                                                         | EPBC Act           | BC Act | DBCA |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                     |                                      |
| Western pebble-mound mouse<br>( <i>Pseudomys chapmani</i> )             |                    |        | P4   | Gentle rocky slopes, hills and spurs with small pebble surface cover and sparse vegetation. This species distribution has contracted to the inland Pilbara away from the coastal Pilbara, Murchison, and Gascoyne. Fifty-four previous records were detailed on BHP WAIO's database search result from within the survey area. Three-hundred and eight previous records were detailed on the DBCA threatened and priority fauna database result, with three historical records from within 5 km of the survey area. | Recorded                            | Recorded                             |
| Pilbara leaf-nosed bat<br>( <i>Rhinonictis aurantia</i> (Pilbara form)) | VU                 | VU     |      | Roosts in deep warm, humid caves or rock cracks, especially in proximity to water pools. Forages while flying low along watercourses and gorges and over <i>Triodia</i> grassland. One record from 2020 was detailed on BHP WAIO's database result from within 1 km of the survey area. One-hundred and sixty-three previous records were also detailed on the DBCA threatened and priority fauna database result, with eight recent (2014 - 2017) records within 10 km of the survey area.                         | High                                | High                                 |
| Ghost bat ( <i>Macroderma gigas</i> )                                   | VU                 | VU     |      | A wide range from rainforest, monsoon, and vine scrub in the tropics to open woodlands and arid areas. One scat record, from 2015, was detailed on BHP WAIO's database result from within the survey area. One-hundred and twenty-five previous records were detailed on the DBCA threatened and priority fauna database result, including one historical record within 5 km and two recent records (2014 - 2015) within 10 km of the survey area.                                                                  | Recorded                            | High                                 |

Note: EPBC = Environment Protection and Biodiversity Conservation; BC = Biodiversity and Conservation; DBCA = Department of Biodiversity, Conservation and Attractions; VU = Vulnerable; BHP WAIO = BHP Western Australian Iron Ore; EN = Endangered; MI = Migratory; ALA = Atlas of Living Australia; CR = Critically Endangered; OS = Specially Protected.

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## **Appendix F: Fauna Habitat Mapping and Significant Areas**

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BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

**Figure F.1: Fauna habitat mapping**

Author: S. Smithies

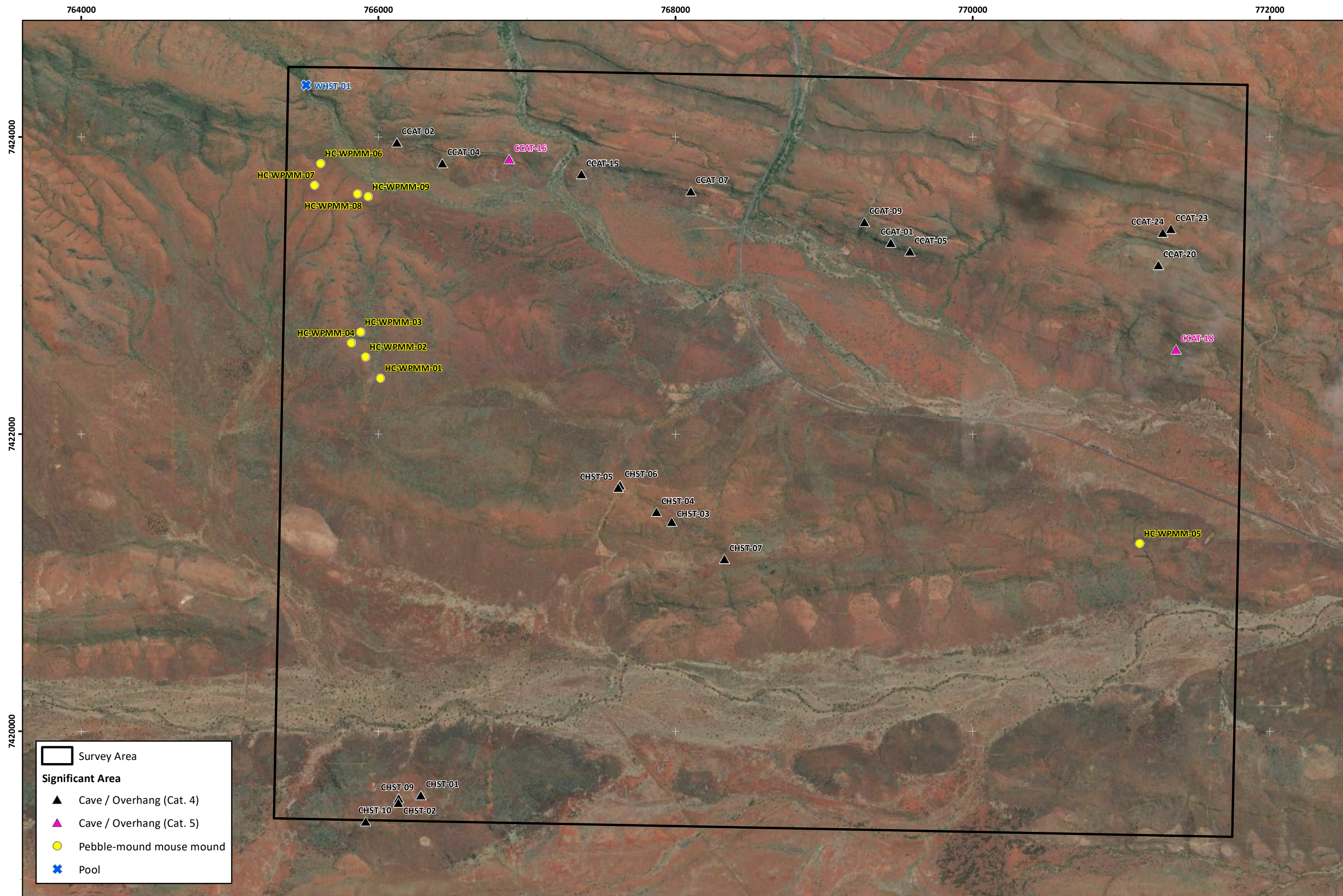
Drawn: C. Dyde

Scale: 1:23,000 at A3  
Coordinate System: GDA 1994 MGA Zone 50  
0 200 400 600 800 1,000 Metres



Date: 17-10-2023

Figure Ref: 2400-08-22-BIDR-1RevB\_231017\_FigF1\_Habitat



BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

**Figure F.2: Significant area locations within the study area**

Author: S. Smithies

Drawn: C. Dyde

Date: 18-10-2023

Scale: 1:23,000 at A3  
Coordinate System: GDA 1994 MGA Zone 50  
0 200 400 600 800 1,000 Metres



Figure Ref: 2400-08-22-BIDR-1RevB\_231017\_FigF2\_SigArea

Table F.1: Locations of significant areas within the study area

| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                                                               | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CCAT-09 | Cave/Overhang | -23.2765 | 119.6323  | 4                                   | <p><b>Entrance:</b> Wide opening (2 m high x 5 m wide)</p> <p><b>Orientation:</b> West</p> <p><b>Internal:</b> One chamber (2.5 m high x 6 m wide x 25 m deep)</p> <p><b>Conditions:</b> Microbats present, bat smell</p> |   |
| CCAT-02 | Cave/Overhang | -23.2722 | 119.6014  | 4                                   | <p><b>Entrance:</b> Wide opening (2 m high x 25 m wide)</p> <p><b>Orientation:</b> South</p> <p><b>Internal:</b> One chamber (2 m high x 15 m wide x 6 m deep)</p> <p><b>Conditions:</b> Microbats present, bat smell</p> |  |

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| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                                                                  | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CCAT-04 | Cave/Overhang | -23.2734 | 119.6044  | 4                                   | <p><b>Entrance:</b> Wide opening (1 m high x 10 m wide)</p> <p><b>Orientation:</b> South</p> <p><b>Internal:</b> One chamber (0.5 m high x 10 m wide x 15 m deep)</p> <p><b>Conditions:</b> Microbats present, bat smell</p> |   |
| CCAT-01 | Cave/Overhang | -23.2777 | 119.6340  | 4                                   | <p><b>Entrance:</b> Wide opening (2 m high x 10 m wide)</p> <p><b>Orientation:</b> South</p> <p><b>Internal:</b> One chamber (20 m high x 7 m wide x 5 m deep)</p> <p><b>Conditions:</b> Bat smell</p>                       |  |

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| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                                                                                                                                                 | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CCAT-05 | Cave/Overhang | -23.2782 | 119.6353  | 4                                   | <p><b>Entrance:</b> Two openings - constricted (1 m high x 5 m wide, 0.5 m high x 0.5 m wide)</p> <p><b>Orientation:</b> South</p> <p><b>Internal:</b> Three chambers (2 m high x 3 m wide x 3 m deep, 1 m wide x 3 m deep, 1 m wide x 3 m deep)</p> <p><b>Conditions:</b> Microbats present, bat smell</p> |   |
| CCAT-07 | Cave/Overhang | -23.2748 | 119.6208  | 4                                   | <p><b>Entrance:</b> Overhang (2 m high x 3 m wide)</p> <p><b>Orientation:</b> South</p> <p><b>Internal:</b> One chambers (0.5 m high x 3 m wide x 15 m deep)</p> <p><b>Conditions:</b> Bat scat</p>                                                                                                         |  |

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| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                 | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CCAT-15 | Cave/Overhang | -23.2739 | 119.6136  | 4                                   | <b>Entrance:</b> Large overhang<br><b>Orientation:</b> East<br><b>Internal:</b> Small opening at rear<br><b>Conditions:</b> Bat scat                                        |   |
| CHST-01 | Cave/Overhang | -23.3118 | 119.6038  | 4                                   | <b>Entrance:</b> Small Opening<br><b>Orientation:</b> North<br><b>Internal:</b> Large dome (4 m high x 6 m wide x 10 m deep)<br><b>Conditions:</b> Bat scat, feeding debris |  |

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| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                                                                        | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CHST-09 | Cave/Overhang | -23.3120 | 119.6023  | 4                                   | <b>Entrance:</b> Large overhang<br><b>Orientation:</b> North<br><b>Internal:</b> Small dome<br><b>Conditions:</b> Bat scat, feeding debris                                                                                         |   |
| CHST-10 | Cave/Overhang | -23.3134 | 119.6002  | 4                                   | <b>Entrance:</b> Large opening (4 m high x 5 m wide)<br><b>Orientation:</b> West<br><b>Internal:</b> Main chamber (2 m high x 4 m wide x 20 m deep) with narrow rear tunnel (0.3 high x ~20 m deep)<br><b>Conditions:</b> Bat scat |  |

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| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                                                    | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CHST-02 | Cave/Overhang | -23.3123 | 119.6023  | 4                                   | <b>Entrance:</b> Large overhang<br><b>Orientation:</b> West<br><b>Internal:</b> High overhang<br><b>Conditions:</b> Bat scat, microbats present                                                                |   |
| CHST-03 | Cave/Overhang | -23.2949 | 119.6200  | 4                                   | <b>Entrance:</b> Restricted opening (1 m high x 10 m wide)<br><b>Orientation:</b> South<br><b>Internal:</b> One chamber (0.5 m high x 25 m wide x 15 m deep)<br><b>Conditions:</b> Bat scat, microbats present |  |

BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge – Targeted Significant Fauna Survey, May 2023

| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                                             | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CHST-04 | Cave/Overhang | -23.2943 | 119.6189  | 4                                   | <p><b>Entrance:</b> Wide opening (2.5 m high x 15 m wide)</p> <p><b>Orientation:</b> West</p> <p><b>Internal:</b> One chamber (3 m high x 10 m wide x 15 m deep)</p> <p><b>Conditions:</b> Bat scat</p> |   |
| CHST-06 | Cave/Overhang | -23.2927 | 119.6165  | 4                                   | <p><b>Entrance:</b> Narrow opening (0.5 m high x 3 m wide)</p> <p><b>Orientation:</b> East</p> <p><b>Internal:</b> One chamber (1 m high x 6 m wide x 10 m deep)</p> <p><b>Conditions:</b> Bat scat</p> |  |

BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge – Targeted Significant Fauna Survey, May 2023

| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                                                                                          | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CHST-05 | Cave/Overhang | -23.2929 | 119.6164  | 4                                   | <p><b>Entrance:</b> Wide opening (2.5 m high x 10 m wide)</p> <p><b>Orientation:</b> East</p> <p><b>Internal:</b> Main chamber (2 m high x 10 m wide x 10 m deep) with rear chamber (0.5 m wide and 2 m deep)</p> <p><b>Conditions:</b> Bat scat</p> |   |
| CCAT-16 | Cave/Overhang | -23.2731 | 119.6088  | 5                                   | <p><b>Entrance:</b> Narrow opening (0.2 m high x 4 m wide)</p> <p><b>Orientation:</b> South-west</p> <p><b>Internal:</b> Unknown (Approx. 0.2 m high x 10 m wide x ? m deep)</p> <p><b>Conditions:</b> Bat smell</p>                                 |  |

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Homestead West & Cathedral Gorge – Targeted Significant Fauna Survey, May 2023

| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                                                                 | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CCAT-18 | Cave/Overhang | -23.2839 | 119.6529  | 5                                   | <p><b>Entrance:</b> Small opening (1.5 m high x 2 m wide)</p> <p><b>Orientation:</b> West</p> <p><b>Internal:</b> One chamber (1.5 m high x 2 m wide x 15 m deep)</p> <p><b>Conditions:</b> Bat scat, microbats present</p> |   |
| CCAT-20 | Cave/Overhang | -23.2788 | 119.6517  | 4                                   | <p><b>Entrance:</b> Large, tall opening</p> <p><b>Orientation:</b> East</p> <p><b>Internal:</b> High opening</p> <p><b>Conditions:</b> Bat scat, microbats present</p>                                                      |  |

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Homestead West & Cathedral Gorge – Targeted Significant Fauna Survey, May 2023

| Site ID | Feature       | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                                                                                    | Photograph                                                                           |
|---------|---------------|----------|-----------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CCAT-23 | Cave/Overhang | -23.2766 | 119.6524  | 4                                   | <b>Entrance:</b> Wide opening (3 m high x 5 m wide)<br><b>Orientation:</b> East<br><b>Internal:</b> One chamber (1 m high x 5 m wide x 10 m deep)<br><b>Conditions:</b> Bat scat                               |   |
| CCAT-24 | Cave/Overhang | -23.2768 | 119.6519  | 4                                   | <b>Entrance:</b> Wide opening (2 m high x 10 m wide)<br><b>Orientation:</b> East<br><b>Internal:</b> Narrow rear passage runs unknown distance (2 m high x 7 m wide x ? m deep)<br><b>Conditions:</b> Bat scat |  |

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Homestead West & Cathedral Gorge – Targeted Significant Fauna Survey, May 2023

| Site ID | Feature             | Latitude | Longitude | Category rating for ghost bat usage | Description                                                                                                                                 | Photograph                                                                           |
|---------|---------------------|----------|-----------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CHST-07 | Cave/Overhang       | -23.2971 | 119.6235  | 4                                   | <b>Entrance:</b> Large high overhang<br><b>Orientation:</b> South<br><b>Internal:</b> High overhang<br><b>Conditions:</b> Microbats present |   |
| WHST-01 | Semi-permanent pool | -23.2688 | 119.5954  | N/A                                 | Semi-permanent spring, 5 m x 3 m wide and approximately 0.5 m deep. Nearby Pilbara olive python scats in cave.                              |  |

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| Site ID    | Feature      | Latitude | Longitude | Category rating for ghost bat usage | Description               | Photograph                                                                           |
|------------|--------------|----------|-----------|-------------------------------------|---------------------------|--------------------------------------------------------------------------------------|
| HC-WPMM-01 | Pebble mound | -23.2865 | 119.6006  | N/A                                 | Mound (recently inactive) |   |
| HC-WPMM-02 | Pebble mound | -23.2852 | 119.5996  | N/A                                 | Mound (Inactive)          |  |

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Homestead West & Cathedral Gorge – Targeted Significant Fauna Survey, May 2023

| Site ID    | Feature      | Latitude | Longitude | Category rating for ghost bat usage | Description      | Photograph                                                                           |
|------------|--------------|----------|-----------|-------------------------------------|------------------|--------------------------------------------------------------------------------------|
| HC-WPMM-03 | Pebble mound | -23.2837 | 119.5993  | N/A                                 | Mound (inactive) |   |
| HC-WPMM-04 | Pebble mound | -23.2844 | 119.5987  | N/A                                 | Mound (active)   |  |

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Homestead West & Cathedral Gorge – Targeted Significant Fauna Survey, May 2023

| Site ID    | Feature      | Latitude | Longitude | Category rating for ghost bat usage | Description               | Photograph                                                                           |
|------------|--------------|----------|-----------|-------------------------------------|---------------------------|--------------------------------------------------------------------------------------|
| HC-WPMM-05 | Pebble mound | -23.2957 | 119.6507  | N/A                                 | Mound (active)            |   |
| HC-WPMM-06 | Pebble mound | -23.2735 | 119.5965  | N/A                                 | Mound (recently inactive) |  |

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Homestead West & Cathedral Gorge – Targeted Significant Fauna Survey, May 2023

| Site ID    | Feature      | Latitude | Longitude | Category rating for ghost bat usage | Description    | Photograph                                                                           |
|------------|--------------|----------|-----------|-------------------------------------|----------------|--------------------------------------------------------------------------------------|
| HC-WPMM-07 | Pebble mound | -23.2749 | 119.5961  | N/A                                 | Mound (active) |   |
| HC-WPMM-08 | Pebble mound | -23.2753 | 119.5989  | N/A                                 | Mound (active) |  |

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Homestead West & Cathedral Gorge – Targeted Significant Fauna Survey, May 2023

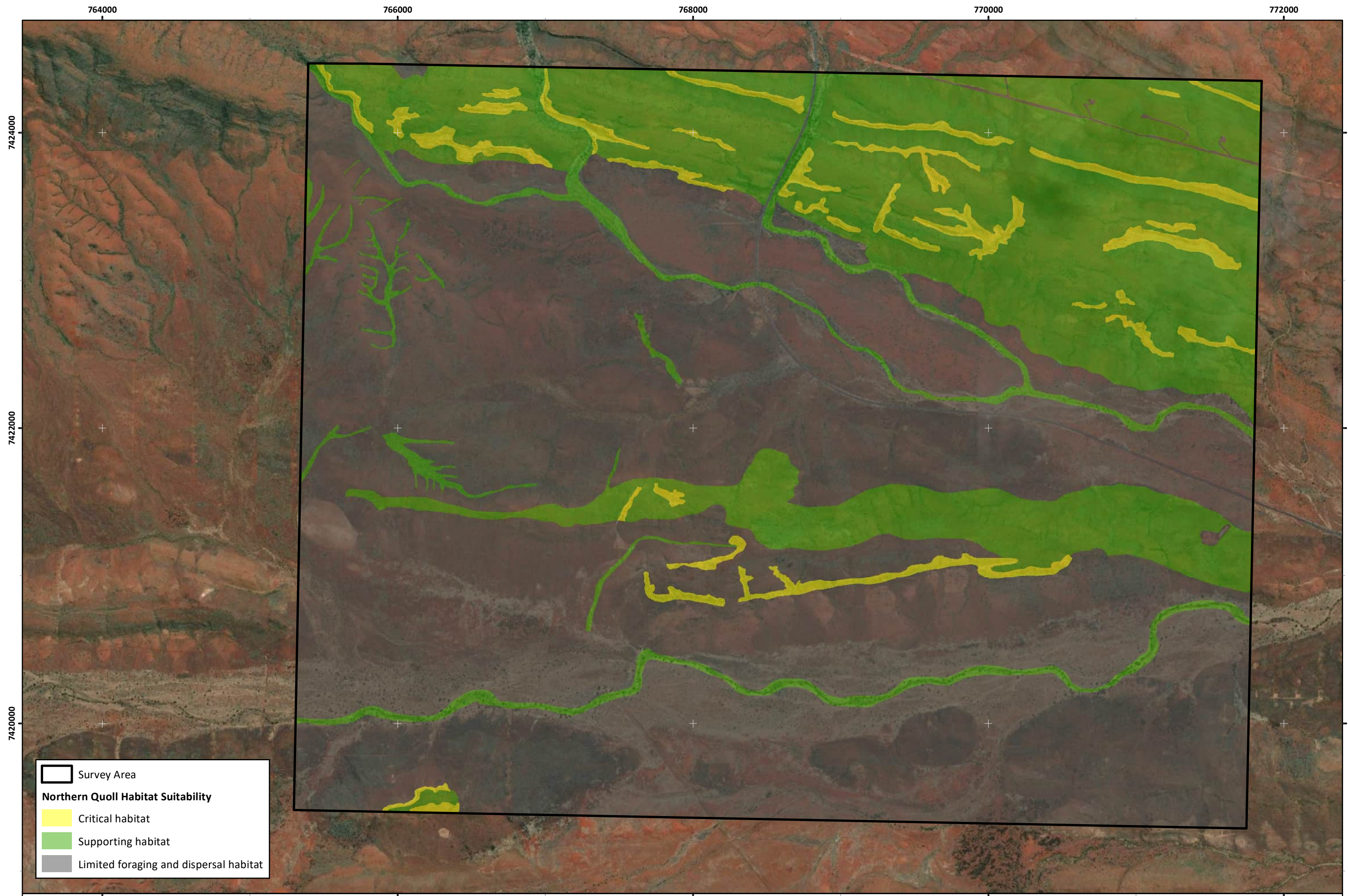
| Site ID    | Feature      | Latitude | Longitude | Category rating for ghost bat usage | Description    | Photograph                                                                          |
|------------|--------------|----------|-----------|-------------------------------------|----------------|-------------------------------------------------------------------------------------|
| HC-WPMM-09 | Pebble mound | -23.2755 | 119.5996  | N/A                                 | Mound (active) |  |

Note: N/A = not applicable.

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## **Appendix G: MNES Fauna Habitat Suitability Mapping**

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BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

**Figure G.1: Northern Quoll**

Author: S. Smithies

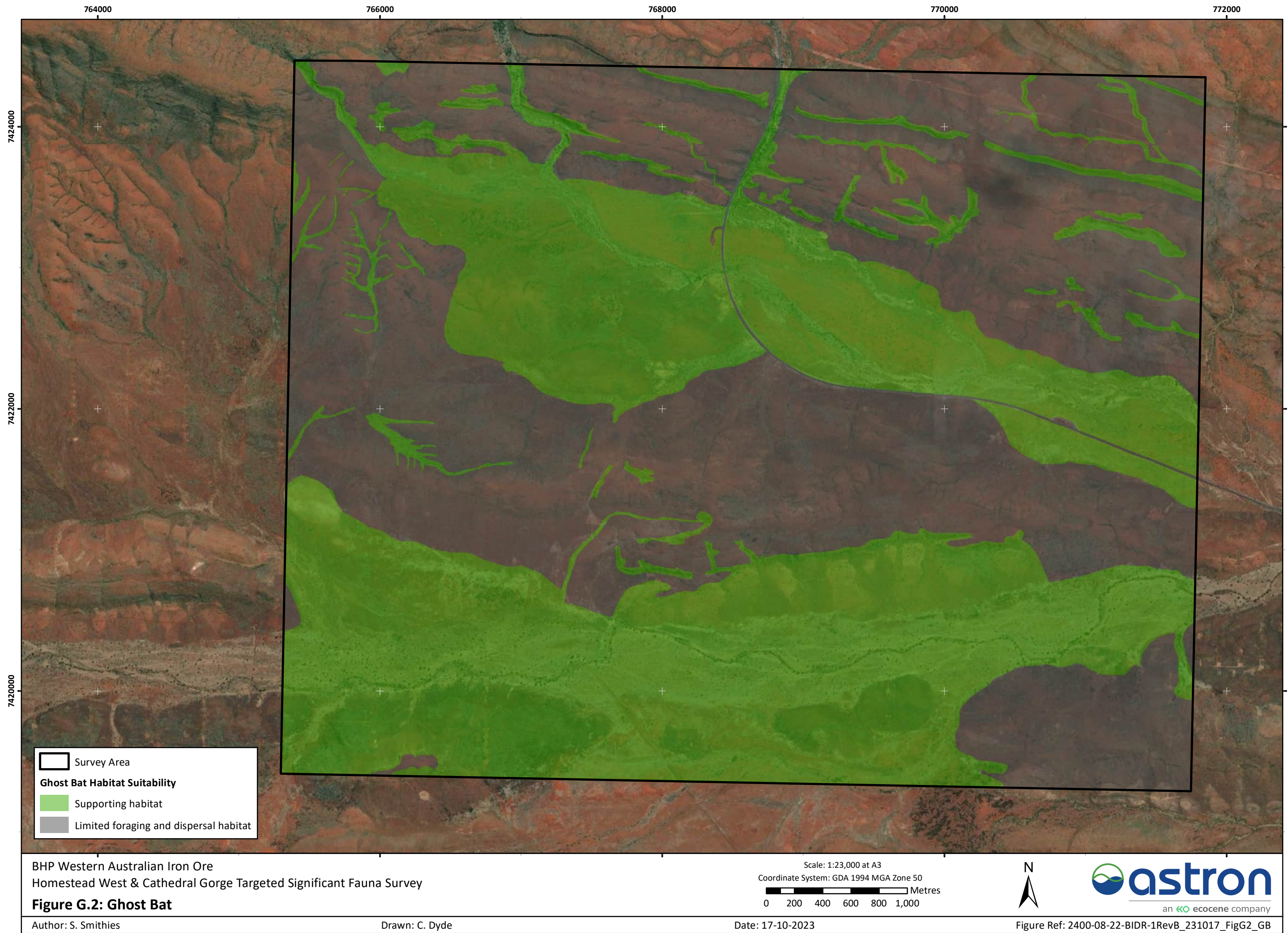
Drawn: C. Dyde

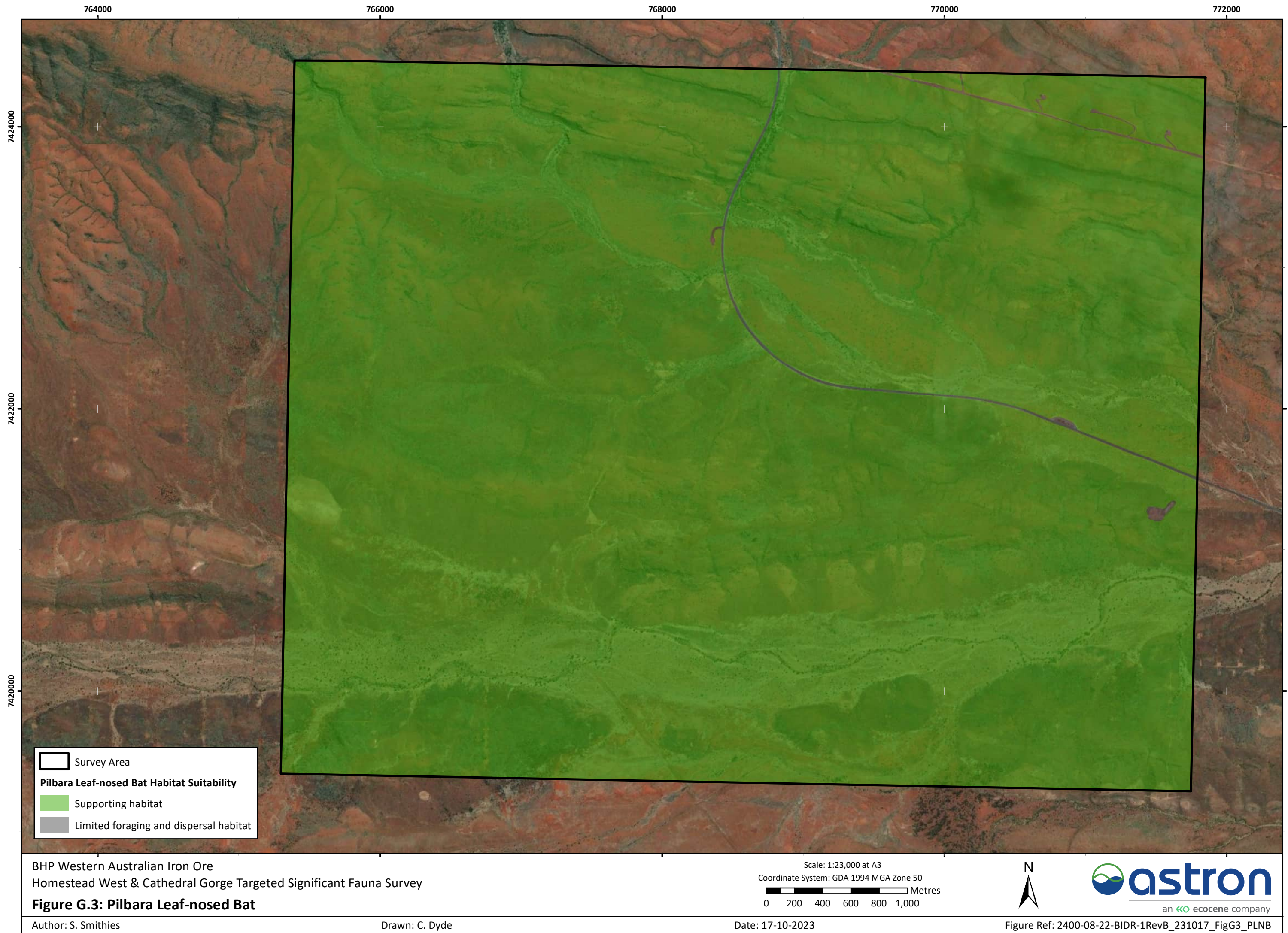
Date: 17-10-2023

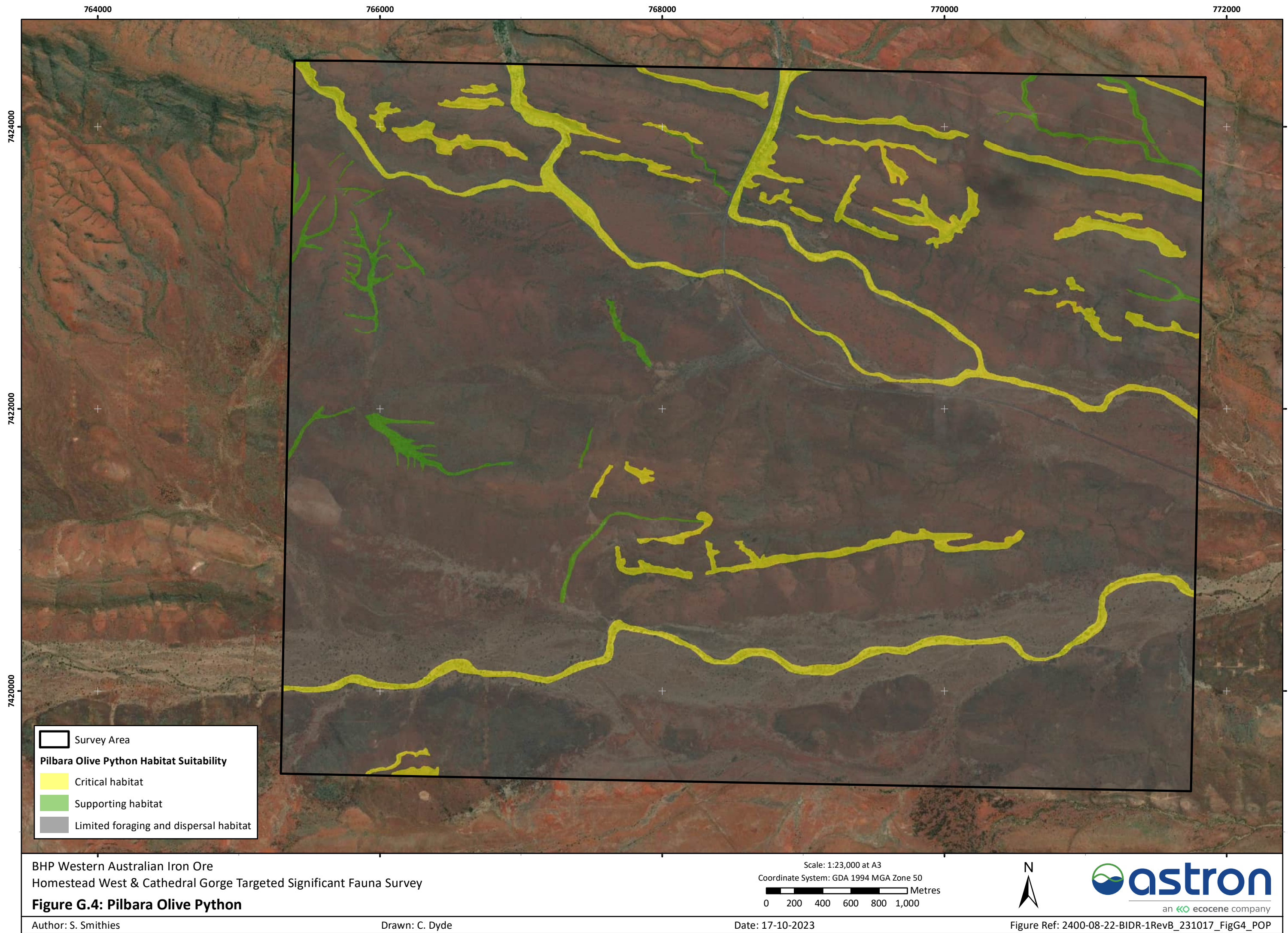
Scale: 1:23,000 at A3  
Coordinate System: GDA 1994 MGA Zone 50  
0 200 400 600 800 1,000 Metres

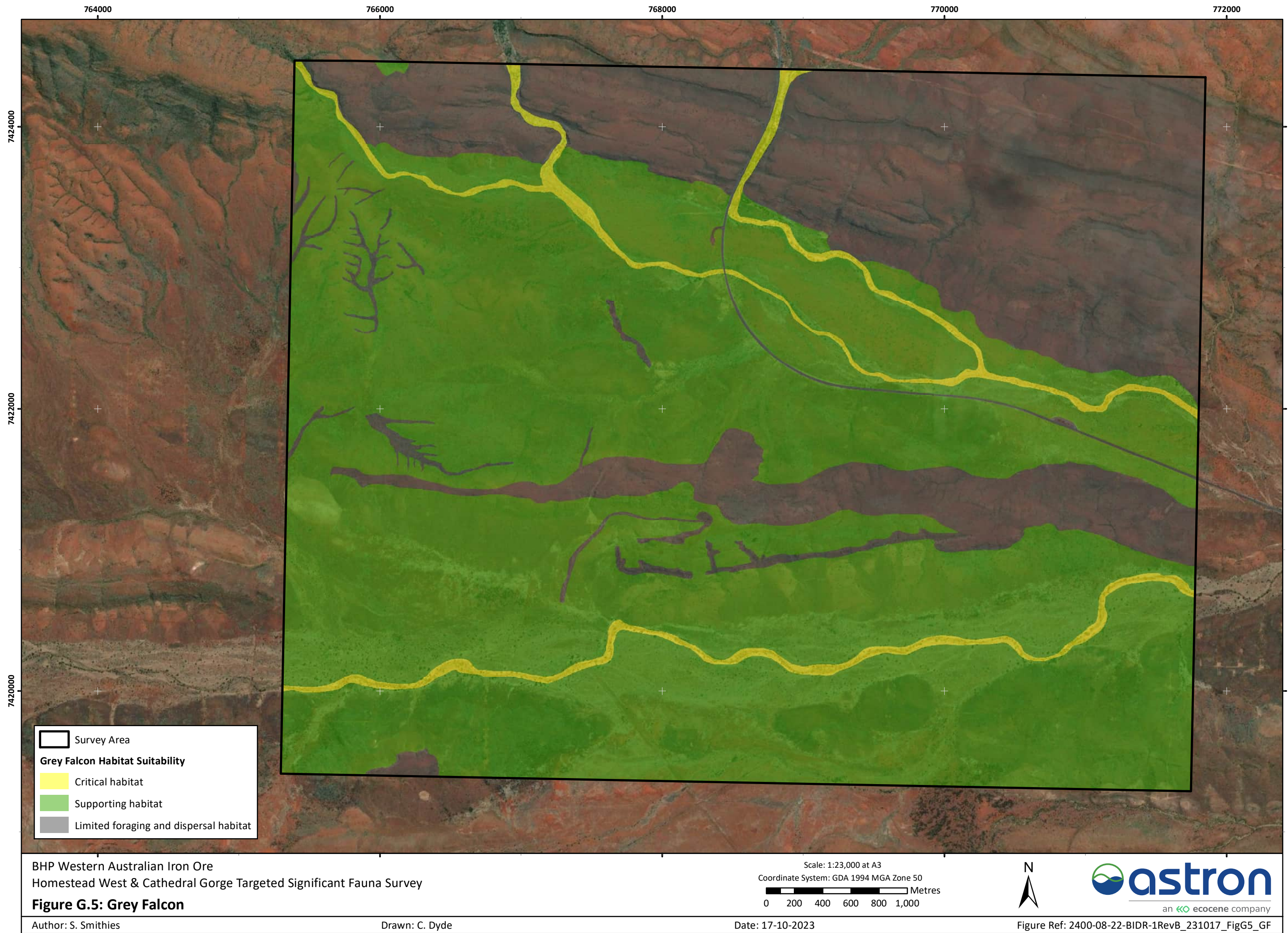


Figure Ref: 2400-08-22-BIDR-1RevB\_231017\_FigG1\_NQ





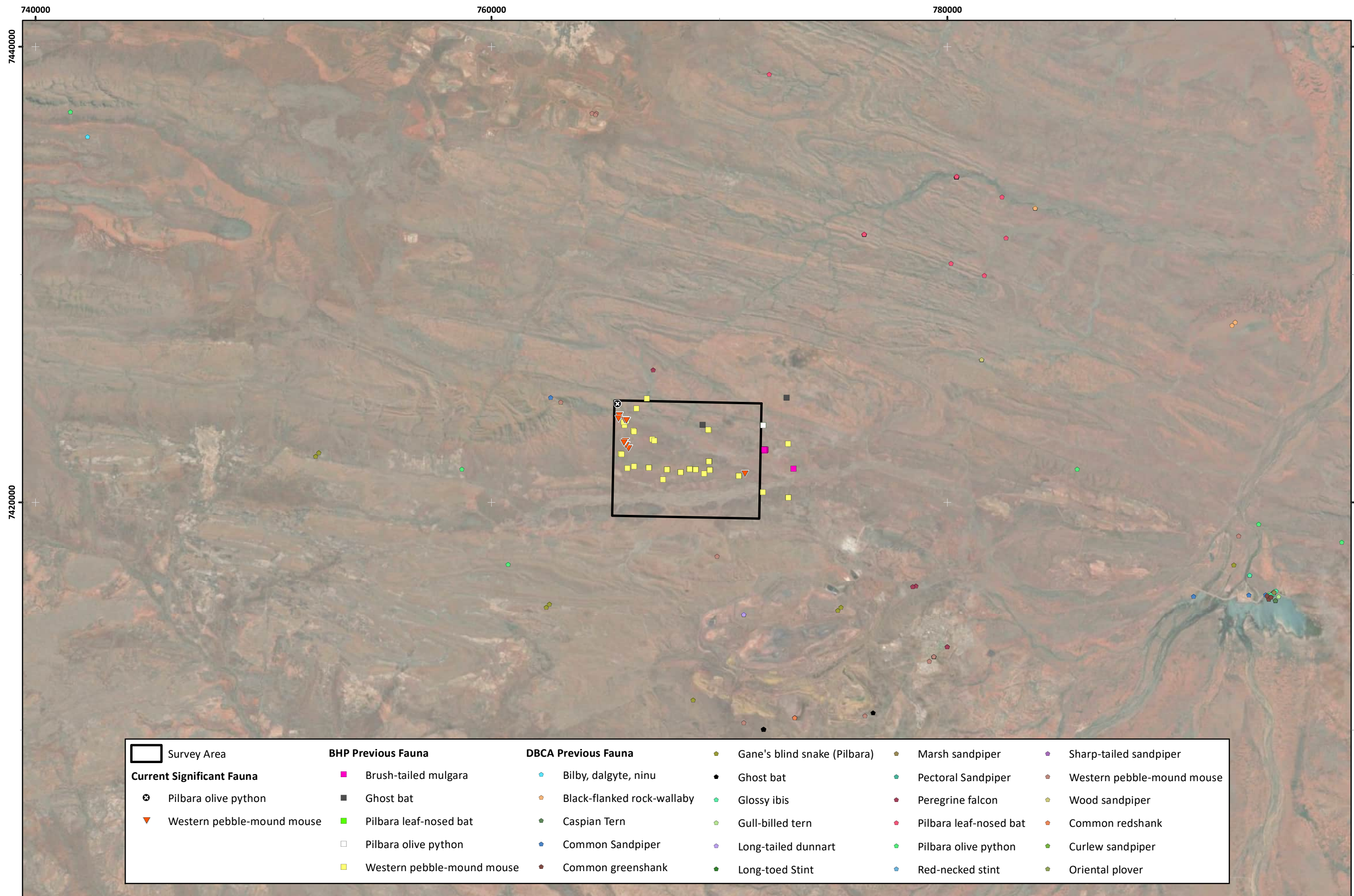




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## **Appendix H: Significant Fauna Locations**

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BHP Western Australian Iron Ore  
Homestead West & Cathedral Gorge Targeted Significant Fauna Survey

**Figure H.1: Previous and current significant vertebrate fauna locations**

Author: S. Smithies

Drawn: C. Dyde

Scale: 1:150,000 at A3  
Coordinate System: GDA 1994 MGA Zone 50



0 2 4 6 8 10 Kilometres



Figure Ref: 2400-08-22-BIDR-1RevB\_231017\_FigH1\_PrevFauna

Table H.1: Locations of significant vertebrate fauna species recorded during the current survey.

| Species name<br>(common name)                             | Status | Site ID    | Latitude | Longitude | Observation type<br>(number of records) | Habitat             | Photograph                                                                           |
|-----------------------------------------------------------|--------|------------|----------|-----------|-----------------------------------------|---------------------|--------------------------------------------------------------------------------------|
| Reptiles                                                  |        |            |          |           |                                         |                     |                                                                                      |
| <i>Liasis olivaceus barroni</i><br>(Pilbara olive python) | VU; VU | OPP        | -23.2691 | 119.5956  | Scat                                    | Major Drainage Line |   |
| Mammals                                                   |        |            |          |           |                                         |                     |                                                                                      |
| <i>Pseudomys chapmani</i><br>(Western pebble-mound mouse) | P4     | HC-WPMM-01 | -23.2865 | 119.6006  | Mound (recently inactive)               | Stony Plain         |  |

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| Species name<br>(common name) | Status | Site ID    | Latitude | Longitude | Observation type<br>(number of records) | Habitat     | Photograph                                                                            |
|-------------------------------|--------|------------|----------|-----------|-----------------------------------------|-------------|---------------------------------------------------------------------------------------|
|                               |        | HC-WPMM-02 | -23.2852 | 119.5996  | Mound (inactive)                        | Stony Plain |    |
|                               |        | HC-WPMM-03 | -23.2837 | 119.5993  | Mound (inactive)                        | Stony Plain |   |
|                               |        | HC-WPMM-04 | -23.2844 | 119.5987  | Mound (active)                          | Stony Plain |  |

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| Species name<br>(common name) | Status | Site ID    | Latitude | Longitude | Observation type<br>(number of records) | Habitat              | Photograph                                                                            |
|-------------------------------|--------|------------|----------|-----------|-----------------------------------------|----------------------|---------------------------------------------------------------------------------------|
|                               |        | HC-WPMM-05 | -23.2957 | 119.6507  | Mound (active)                          | Stony Plain          |    |
|                               |        | HC-WPMM-06 | -23.2735 | 119.5965  | Mound (recently inactive)               | Undulating Low Hills |   |
|                               |        | HC-WPMM-07 | -23.2749 | 119.5961  | Mound (active)                          | Undulating Low Hills |  |

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| Species name<br>(common name) | Status | Site ID    | Latitude | Longitude | Observation type<br>(number of records) | Habitat              | Photograph                                                                           |
|-------------------------------|--------|------------|----------|-----------|-----------------------------------------|----------------------|--------------------------------------------------------------------------------------|
|                               |        | HC-WPMM-08 | -23.2753 | 119.5989  | Mound (active)                          | Undulating Low Hills |   |
|                               |        | HC-WPMM-09 | -23.2755 | 119.5996  | Mound (active)                          | Undulating Low Hills |  |

Note: VU = Vulnerable; P = Priority.

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