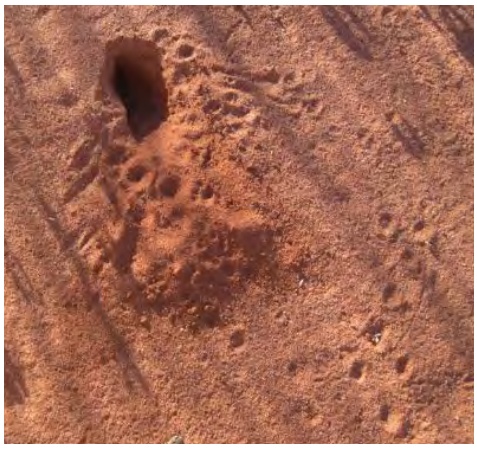
West Musgrave Project:

Level 2 Vertebrate Fauna Survey June 2018 – Interim report



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September 2018

Executive Summary

Introduction

OZ Minerals Limited and their joint venture partner Cassini Resources (the JV) are undertaking prefeasibility studies to assess the viability of developing the Nebo and Babel nickel and copper deposit at their West Musgrave Project (the 'Project Area'). The West Musgrave Project is located 115 km east of Warburton and 29 km south of Jameson Aboriginal community in the Shire of Ngaanyatjarraku, Western Australia. The Project Area was divided into several areas for survey; the Nebo-Babel Area, Western Access Road, Northern Access Road, Southern Borefields and Eastern Borefields.

OZ Minerals Limited commissioned Western Wildlife to carry out a vertebrate fauna survey of the Project Area. The key objectives of the fauna survey were to:

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

Methods

Two levels of fauna survey were undertaken across the Project Area. A Level 2 fauna survey was undertaken across the Nebo-Babel Area and Western Access Road. The remaining areas (Northern Access Road, Southern Borefields and Eastern Borefields) were subject to a Level 1 fauna survey. Tin addition, targeted surveys for conservation significant fauna were undertaken across the whole Project Area. All field surveys were supported by a review of the relevant literature and records on databases.

The fauna survey was undertaken in accordance with the *Statement of environmental principles, factors and objectives* (Environmental Protection Authority (EPA) 2016a), *Environmental factor guideline – terrestrial fauna* (EPA 2016b), *Technical guidance – terrestrial fauna surveys* (EPA 2016c), the *Technical Guide: terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA and DEC 2010) and relevant State and Federal Guidelines on surveying conservation significant fauna.

The field survey was carried out by six zoologists between the 20th June and 4th July 2018, and included:

- Identification of fauna habitats.
- Trapping at ten sites for seven nights, each with ten pitfall traps, ten Elliott traps and two cage traps to give a total of 700 pitfall trap-nights, 700 Elliott trap-nights and 140 cage trap-nights.
- Bird Survey.
- Bat survey with acoustic detectors.
- Camera trap survey, targeting conservation significant fauna.

- Hand-searching for reptiles.
- Spot-lighting.
- Targeted searches for evidence of conservation significant species, such as burrows, tracks and scats.
- Keeping opportunistic records of fauna.

Species of conservation significance were classified as: Conservation Significance 1 (CS1) if listed under *The Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or *The Western Australian Wildlife Conservation Act 1950* (WC Act); Conservation Significance 2 (CS2) if listed as a Priority species by the Department of Biodiversity, Conservation and Attractions (DBCA); or Conservation Significance 3 (CS3) if a locally significant species.

Results and Discussion

Nine fauna habitats were identified:

- Sand dunes
- Spinifex sandplains
- Mallee sandplains
- Mulga sandplains
- Calcrete plains
- Mulga woodlands
- Stony hills and plains
- Chenopod shrublands
- Claypans

The predicted faunal assemblage includes up to seven frogs, 95 reptiles, 120 birds and 42 mammals (34 native mammals). The observed assemblage thus far includes no frogs, 48 reptiles, 67 birds and 19 mammals (11 native mammals). Twenty-one conservation significant fauna have been recorded or potentially occur in the Project Area, 15 of CS1, five of CS2 and one of CS3.

The 15 species of CS1 that were recorded or potentially occur are:

- Night Parrot (*Pezoporus occidentalis*) - EPBC Act (Endangered), WC Act (Schedule 1)
- Sandhill Dunnart (*Sminthopsis psammophila*) - EPBC Act (Endangered), WC Act (Schedule 2)
- Great Desert Skink (*Liopholis kintorei*) – EPBC Act (Vulnerable), WC Act (Schedule 3)
- Malleefowl (*Leipoa ocellata*) – EPBC Act (Vulnerable), WC Act (Schedule 3)
- Bilby (*Macrotis lagotis*) – EPBC Act (Vulnerable), WC Act (Schedule 3)
- MacDonnell Ranges Black-footed Rock Wallaby (*Petrogale lateralis, MacDonnell Range subspecies*) – EPBC Act (Vulnerable), WC Act (Schedule 3)
- Princess Parrot (*Polytelis alexandrae*) – EPBC Act (Vulnerable), Priority 4
- Crest-tailed Mulgara (*Dasycercus cristicauda*) – EPBC Act (Vulnerable), Priority 4
- Oriental Plover (*Charadrius veredus*) – EPBC Act (Migratory), WC Act (Schedule 5)
- Common Sandpiper (*Tringa hypoleucos*) – EPBC Act (Migratory), WC Act (Schedule 5)

- Sharp-tailed Sandpiper (*Calidris acuminata*) – EPBC Act (Migratory), WC Act (Schedule 5)
- Pectoral Sandpiper (*Calidris melanotos*) – EPBC Act (Migratory), WC Act (Schedule 5)
- Fork-tailed Swift (*Apus pacificus*) – EPBC Act (Migratory), WC Act (Schedule 5)
- Grey Falcon (*Falco hypoleucos*) - WC Act (Schedule 3)
- Peregrine Falcon (*Falco peregrinus*) – WC Act (Schedule 7)

Of these, only the Great Desert Skink was recorded during the fauna survey, and this species is likely to be a breeding resident. All records of the Great Desert Skink were on the Southern Borefields on Spinifex sandplain, and the extent of the population remains undefined. As the Great Desert Skink has a small population size and is only known from a few localities, it is a highly significant species in the Project Area.

The Bilby and Night Parrot are potentially scarce residents or visitors to the Project Area. The paucity of records for these species makes it difficult to determine their status in the Project Area. If present, the Bilby may forage across sandplains and the Night Parrot may inhabit areas of long-unburnt Spinifex.

The Peregrine Falcon, Grey Falcon, Fork-tailed Swift, Oriental Plover, Common Sandpiper, Sharp-tailed Sandpiper, Pectoral Sandpiper and Princess Parrot are likely to be non-breeding visitors to the Project Area. These species may make regular or occasional forays into the Project Area to forage, but breeding habitat is absent. The MacDonnell Ranges Black-footed Rock Wallaby favours rocky habitats, so may be a dispersing visitor through the Project Area. The Malleefowl, Sandhill Dunnart and Crest-tailed Mulgara appear to be locally extinct and the habitats they favour, according to recent research, are absent from the Project Area.

The five species of CS2 that were recorded or potentially occur are:

- Striated Grasswren (*Amytornis striatus striatus*) – Priority 4
- Brush-tailed Mulgara (*Dasycercus blythi*) – Priority 4
- Long-tailed Dunnart (*Sminthopsis longicaudata*) – Priority 4
- Southern Marsupial Mole (*Notoryctes typhlops*) – Priority 4
- Central Long-eared Bat (*Nyctophilus major tor*) – Priority 3

Of these, the Striated Grasswren, Brush-tailed Mulgara and Southern Marsupial Mole were recorded during the fauna survey, and all are likely to be breeding residents of the Project Area. The Striated Grasswren and Brush-tailed Mulgara favour Spinifex sandplains and the Southern Marsupial Mole occurs in sand dunes. Although not recorded, the Central Long-eared Bat is also likely to be a breeding resident, favouring mulga woodlands. The Long-tailed Dunnart favours rocky habitats, so although it may occur in the stony hills and plains, it is more likely to be a dispersing visitor through the Project Area.

The one species of conservation significance 3 is the Woma (*Aspidites ramsayi*). This species was recorded on the Western Access Road and is likely to occur on sandplains throughout the Project Area.

Table of Contents

Tables, Figures and Plates

1. Introduction

OZ Minerals Limited and their joint venture partner Cassini Resources (the JV) are undertaking prefeasibility studies to assess the viability of the Nebo and Babel nickel and copper deposit at their West Musgrave Project (the 'Project Area'). OZ Minerals Limited commissioned Western Wildlife to carry out a vertebrate fauna survey of the Project Area.

The key objectives of the fauna survey were to:

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

This report details the findings of the fauna survey conducted in June/July 2018.

1.1 Regional Location

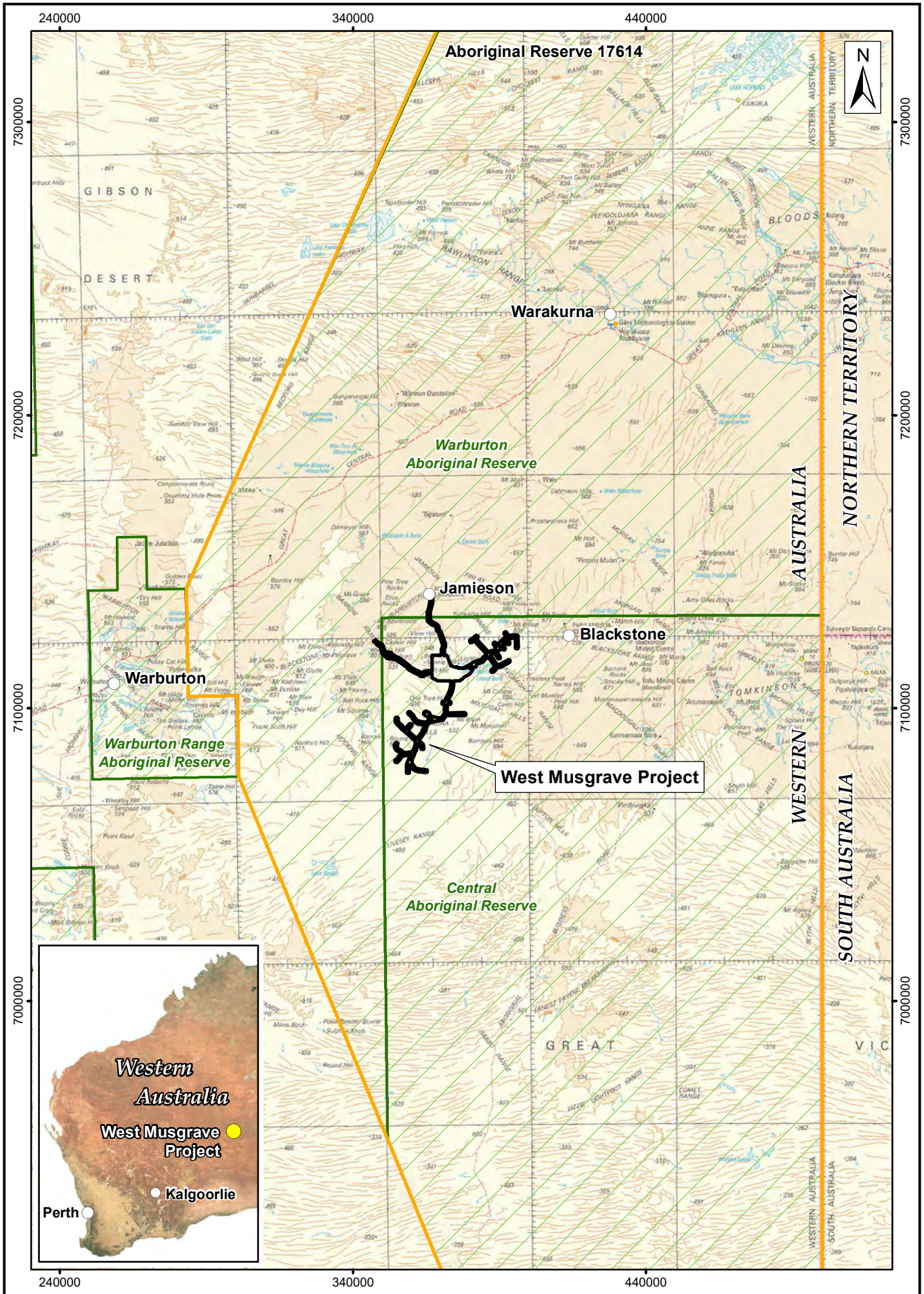
The West Musgrave Project is located 115 km east of Warburton and 29 km south of Jameson Aboriginal community in the Shire of Ngaanyatjarraku, Western Australia (Figure 1). The Project Area is entirely within the Ngaanyatjarra Native Title Area.

The Interim Biogeographic Regionalisation for Australia (IBRA) classifies Australia's landscapes into 89 Bioregions based on common climate, geology, landform, native vegetation and species information. These Bioregions are further subdivided into 419 subregions.

The Project Area spans two Bioregions; the Central Ranges and the Great Victoria Desert (Figure 2). The majority of the Project Area is in the Mann-Musgrave Block subregion of the Central Ranges Bioregion. This subregion is dominated by ranges interspersed with sandplains. The ranges support a mixed *Acacia* scrub over tussock grass or Spinifex. The ranges are often fringed by low open woodlands of Ironwood (*Acacia estrophiolata*) and Corkwood (*Hakea spp.*). The sandplains support low open woodlands of Desert Oak (*Allocasuarina decaisneana*) or Mulga over Spinifex (Graham and Cowan 2001). Significant features in the Mann-Musgrave Block subregion are the permanent freshwater pools in the Walter James Ranges, located 190 km north of the Project Area.

The southern part of the Project Area is within the Great Victoria Desert Central subregion of the Great Victoria Desert Bioregion. This subregion comprises extensive sandplains and dunefields vegetated with a tree steppe of Marble Gum (*Eucalyptus gongylocarpa*), Mulga and Large-fruited Mallee (*Eucalyptus youngiana*) over Spinifex grassland. Salt lakes are fringed with halophytes and the colluvial dunes vegetated with *Acacia*, *Eremophila* and *Santalum* (Barton and Cowan 2001). There are also minor hills and breakaways.

The climate of both subregions is arid with a mean annual rainfall of 150mm (Great Victoria Desert Central) to 200mm (Mann-Musgrave Block), which may fall in summer or winter (Barton and Cowan 2001, Graham and Cowan 2001).



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Western Wildlife

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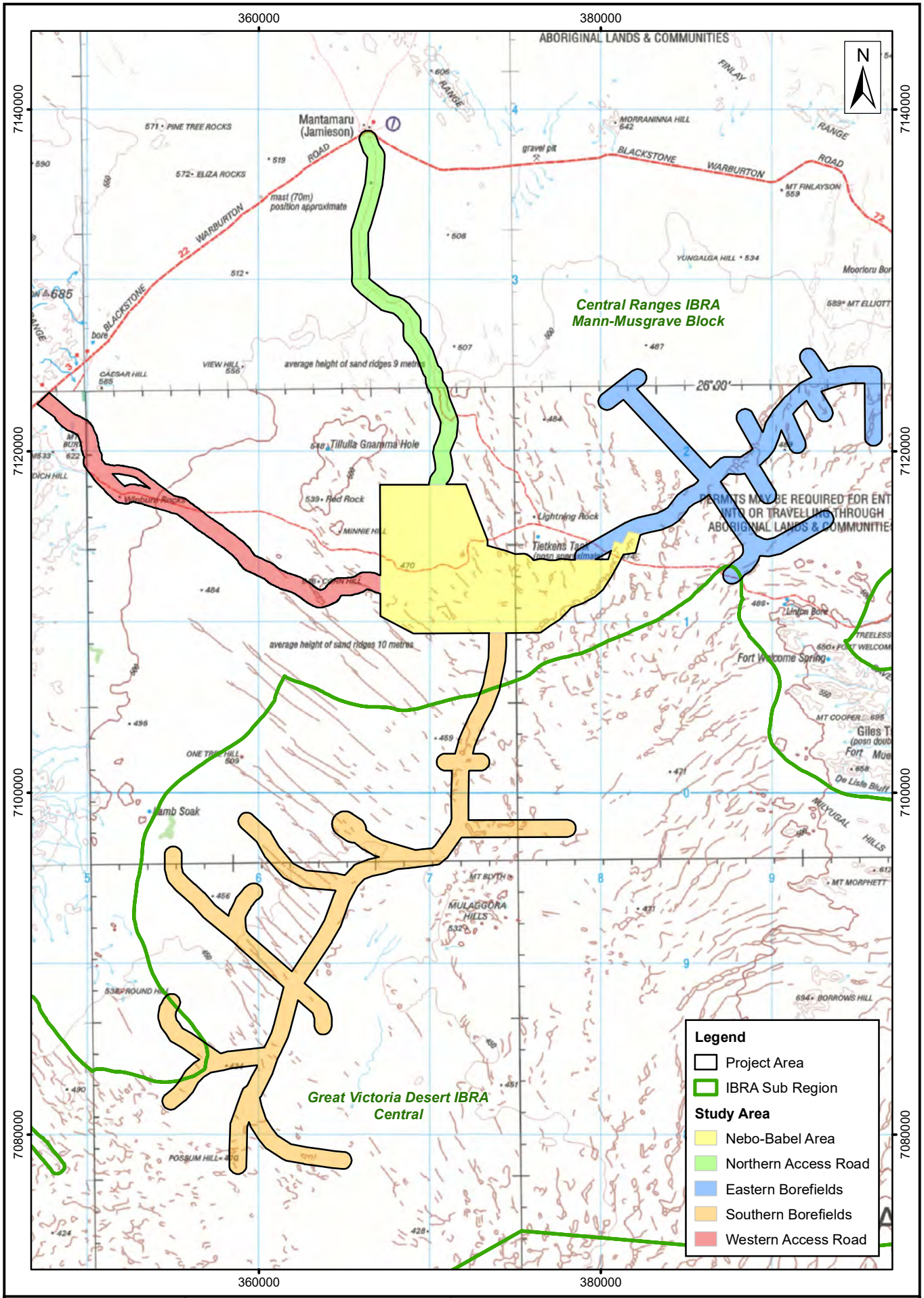
Figure 1

West Musgrave Project

Regional Location



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Date: August 2018 | Rev: A | A4

Western Wildlife

Author: J. Wilcox | WW Ref:

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Figure 2

West Musgrave Project

Study Areas

1.2 Survey Area

The Project Area was divided into five areas for survey (Table 1, Figure 2). Small areas within these were not accessible due to the presence of heritage sites. A Level 2 survey was undertaken for the Nebo-Babel Area and Western Access Road, and a Level 1 survey was undertaken for the remainder. Targeted searches for fauna of conservation significance were undertaken across the entire Project Area.

Table 1. Survey Areas

Survey Area	Description	Area (ha)	Level of fauna Survey
Nebo-Babel Area	Location of ore deposits (Nebo and Babel) and proposed Integrated Waste Landform, stockpiles, process plant, power station, airstrip, camp, windfarm and windfarm access.	8,014	Level 2 + targeted surveys.
Western Access Road	Main access road between Project Area and Warburton.	2,696	Level 2 + targeted surveys.
Northern Access Road	Main access road between Project Area and Jameson.	2,326	Level 1 + targeted surveys.
Southern Borefields	Borefields and associated access roads.	9,308	Level 1 + targeted surveys.
Eastern Borefields	Borefields and associated access roads.	5,493	Level 1 + targeted surveys.

1.3 Climate and Weather

The two nearest weather stations are at Giles Meteorological Office (site number 013017, about 140 km northeast of the Project Area) and Warburton Airfield (site number 013011, about 116 km west of the Project Area). The mean monthly maximum and minimum temperatures and rainfall for these weather stations are presented in Figure 3. Both weather stations indicate that the highest rainfall and temperatures occur in the summer months, though some rain falls throughout the year.

The average annual rainfall for Giles is 293.0mm, higher than Warburton at 247.6mm (Bureau of Meteorology 2018). Annual rainfall at Giles was higher than average in 2016 (517.8mm) and 2017 (375.4mm). At Warburton, the difference was not as marked, but still higher than average in 2016 (328.8mm) and 2017 (333.4mm).

Weather during the June 2018 field survey was characterised by cold clear nights and warm clear days. No rainfall occurred during the field survey. The daily maximum and minimum temperatures at Giles Meteorological Office and Warburton Airfield are presented in Table 2.

Table 2. Daily temperature at Giles Meteorological Station and Warburton Airfield during the June 2018 field survey (Bureau of Meteorology 2018).

	Daily Temperature (ºC)														
Month	June											July			
Day	20	21	22	23	24	25	26	27	28	29	30	1	2	3	4
Warburton															
Maximum	18.1	18.9	18.6	19.1	18.7	18.8	19.9	21.0	21.7	19.3	20.3	23.3	26.1	28.6	29.4
Minimum	4.3	2.4	6.1	5.5	6.9	4.8	3.4	3.7	-1.5	1.1	4.3	4.5	5.4	13.3	11.7
Giles															
Maximum	18.5	18.9	18.2	18.2	17.9	18.4	18.6	19.3	20.3	20.7	19.7	21.9	24.4	25.9	27.3
Minimum	5.2	3.6	3.2	1.4	0.7	1.5	2.1	1.8	2.2	2.8	4.5	3.3	6.3	9.5	15.8

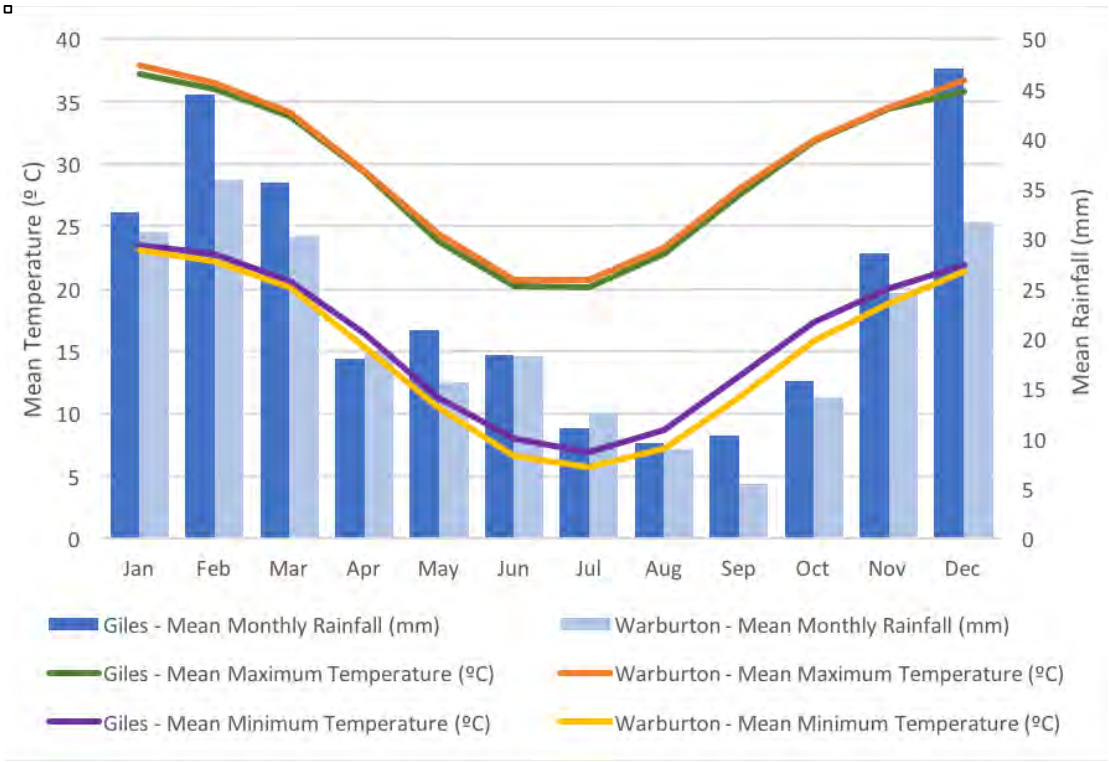


Figure 3. Monthly Climate Statistics for Giles Meteorological Office and Warburton Airfield (Bureau of Meteorology 2018).

2. Methods

In June 2018, two levels of fauna survey were undertaken across the Project Area. A Level 2 fauna survey was undertaken across the Nebo-Babel Area and Western Access Rd. The remaining areas (Northern Access Rd, Southern Borefields and Eastern Borefields) were subject to a Level 1 fauna survey. Targeted searches were undertaken across the entire Project Area, where there was habitat that potentially supported conservation significant fauna. These methods are further described in the sections below.

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

- Statement of environmental principles, factors and objectives (Environmental Protection Authority (EPA) 2016a)
- Environmental factor guideline – terrestrial fauna (EPA 2016b)
- Technical guidance – terrestrial fauna surveys (EPA 2016c)
- Technical Guide: terrestrial vertebrate fauna surveys for environmental impact assessment (EPA and DEC 2010)
- Guidelines for surveys to detect the presence of bilbies, and assess the importance of habitat in Western Australia (DBCA 2017)
- Interim guideline for preliminary surveys of night parrot (*Pezoporus occidentalis*) in Western Australia (DPAW 2017)
- Survey and monitoring guidelines for the Sandhill Dunnart in Western Australia (DPAW 2016)
- Survey Guidelines for Australia's Threatened Mammals (DSEWPaC 2011a)
- Survey Guidelines for Australia's Threatened Birds (DEWHA 2010)
- Survey Guidelines for Australia's Threatened Reptiles (DSEWPaC 2011b)

The vertebrate fauna surveys were undertaken concurrently with surveys for short range endemic (SRE) invertebrate taxa (Alacran Environmental 2018). Although the results of the SRE invertebrate survey are not included in this report, some of the survey design was influenced by the requirement to sample for invertebrates.

2.1 Personnel

A combination of six zoologists undertook the fieldwork, with bat call analysis provided by Dr Kyle Armstrong of Specialised Zoological. Detailes of the survey team and their experience is shown in Table 3. This report was prepared by Ms Jenny Wilcox.

Table 3. Fauna Survey Personnel.

Name	Role	Qualification	Experience	Survey
Jenny Wilcox	Supervising Vertebrate Zoologist (plan and lead fieldwork, analyse data, prepare report)	BSc.Biol/Env.Sci., Hons.Biol.	18 years	20th June – 4th July 2018
Mike Brown	Vertebrate zoologist (fieldwork)	BSc.Biol/Env.Sci.,	12 years	20th June – 4th July 2018
Amy Griffiths	Vertebrate zoologist (fieldwork)	BSc.Biol., Hons.Biol.	8 years	20th June – 4th July 2018
Erich Volschenk	Invertebrate zoologist (fieldwork)	PhD. Zool.	10 years	20th June – 4th July 2018
Ray Lloyd	Vertebrate zoologist (fieldwork)	BSc.Env.Sci.	11 years	27th June – 4th July 2018
Joanna Riley	Vertebrate zoologist (fieldwork, assessment of potential Sandhill Dunnart habitat)	BSc.Biol., Hons.Biol., Current PhD. candidate.	7 years	27th June – 4th July 2018
Kyle Armstrong	Bat call analysis	PhD. Zool.	21 years	N/A

2.2 Taxonomy and Nomenclature

Taxonomy and nomenclature for fauna species used in this report follow the Western Australian Museum checklists, last updated April 2018. In the text, common names are used where appropriate, and all scientific names are given in species lists. Where a species lacks a common name, they are referred to by their scientific name.

2.3 Literature Review

Lists of fauna expected to occur in the study area were produced using information from a number of sources. These included publications that provide information on general patterns of distribution of frogs (Tyler *et al*. 2000), reptiles (Wilson and Swan 2010, Storr *et al*. 1983, 1990, 1999 and 2002), birds (Barrett *et al*. 2003; Johnstone and Storr 1998 and 2004) and mammals (Churchill 1998, Menkhorst and Knight 2011; Van Dyck and Strahan 2008).

The databases listed in Table 4 were searched for fauna records in and around the Project Area. In all cases the extent of the database search was larger than the extent of the Project Area, in order to pick up records of species in the wider area that may also occur in the Project Area. Note that the maximum radius of a database search on NatureMap (DBCA 2007-) is 40 km.

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

Table 4. Databases used in the preparation of Appendices 4 - 7.

Database	Type of records held	Area searched
WA Museum Specimen Databases for reptiles (includes frogs, birds and mammals (DBCA 2007-)	Records of specimens held in the Western Australian Museum. Includes historical records.	Three overlapping search areas each comprising 40km radius around a point for the center of the Project Area (26º 07' 01"S, 127º 45' 29"E), southern extent (26º 25' 30"S, 127º 30' 04"E) and northeastern extent (25º 59' 35"S, 127º 30' 04"E)
Fauna Survey Returns Database (DBCA 2007-)	Records collected from fauna surveys carried out in Western Australia. Includes observational and trapping data.	Three overlapping search areas each comprising 40km radius around a point for the center of the Project Area (26º 07' 01"S, 127º 45' 29"E), southern extent (26º 25' 30"S, 127º 30' 04"E) and northeastern extent (25º 59' 35"S, 127º 30' 04"E)
DBCA's Threatened and Priority Fauna Database (DBCA 2018)	Information and records on Threatened and Priority species in Western Australia.	100km radius around a point in the center of the Project Area (26º 07' 01"S, 127º 45' 29"E).
Birds Australia Atlas Database (DBCA 2007-)	Records of bird observations in Australia, 1998-2009.	Three overlapping search areas each comprising 40km radius around a point for the center of the Project Area (26º 07' 01"S, 127º 45' 29"E), southern extent (26º 25' 30"S, 127º 30' 04"E) and northeastern extent (25º 59' 35"S, 127º 30' 04"E)
Birdata (DBCA 2007-)	Records of bird observations in Australia, 2010-2018.	Three overlapping search areas each comprising 40km radius around a point for the center of the Project Area (26º 07' 01"S, 127º 45' 29"E), southern extent (26º 25' 30"S, 127º 30' 04"E) and northeastern extent (25º 59' 35"S, 127º 30' 04"E)
Atlas of Living Australia (ALA)	ALA collections of fauna, including records from the WA Museum, the Museum and Art Gallery of the Northern Territory and the South Australian Museum. This database also includes unverified records from the general public.	100km radius around a point in the center of the Project Area (26º 07' 01"S, 127º 45' 29"E).
EPBC Act Protected Matters Search Tool	Information and modelled distributions for matters protected under the EPBC Act, including threatened species and ecological communities, migratory species and marine species.	100km radius around a point in the center of the Project Area (26º 07' 01"S, 127º 45' 29"E).

Few fauna studies have been undertaken in the region. Several fauna surveys were carried out at Wingellina (115 km east of the Project Area) between 2002 and 2012 (HGM Maunsell 2002, Outback Ecology 2008, 2009 and 2012). These surveys included level 1, level 2 and targeted components. The fauna recorded at Wingellina have been indicated in the lists of expected fauna for the Project Area.

In the Project Area, fauna clearance surveys were undertaken by Biota (2012a, 2012b) in the Babel West and Gerar Prospects, recording secondary signs of Brush-tailed Mulgara (*Dasycercus blythi*). More recently, fauna clearance surveys were undertaken in the Southern Borefields, with searches for several conservation significant species including the Bilby (*Macrotis lagotis*), Great Desert Skink (*Liopholis kintorei*), Malleefowl (*Leipoa ocellata*) and mulgara (*Dasycercus spp*.) (Everard and Bamford 2018a). A Level 1 fauna survey, including a three-day site visit, was undertaken for the Nebo-Babel Area (Everard and Bamford 2018b).

These sources of information were used to create lists of species that potentially occur in the Project Area. As far as possible, expected species are those that are likely to utilise the Project Area. The lists exclude species that have been recorded in the general region as vagrants, or for which suitable habitat is absent within the study area.

2.4 Field Survey

The field survey was completed between 20th June and - 4th July 2018.

2.4.1 Licensing

All fauna works were carried out under Regulation 17 Licence 08-002396-1 issued by the Department of Biodiversity, Conservation and Attractions (DBCA).

2.4.2 Trapping for Terrestrial Fauna

Trapping for terrestrial fauna (frogs, reptiles and small mammals) was undertaken in a single season survey in winter 2018, (20 June - 4 July). The trapping was focused on the Nebo-Babel Area and the Western Access Road. Ten trapping sites were installed (Figure 4, Table 5, Plates 1 - 10). The placement of trapping sites in the Project Area aimed to sample the habitats present and provide geographic spread. Consideration was also given to situating sites to maximize captures of SRE invertebrate taxa, the results of which are reported separately (Alacran Environmental 2018).

In June 2018, each trapping site consisted of ten pitfall traps, ten Elliott traps and two cage traps open for seven nights, and two camera traps deployed for four nights. Funnel traps were not used as the winter weather was considered too cold to successfully trap reptiles and hand-searching was relied on for this group. The number and types of traps were chosen to sample the likely faunal assemblage while allowing for timely checking of traps to preserve animal welfare.

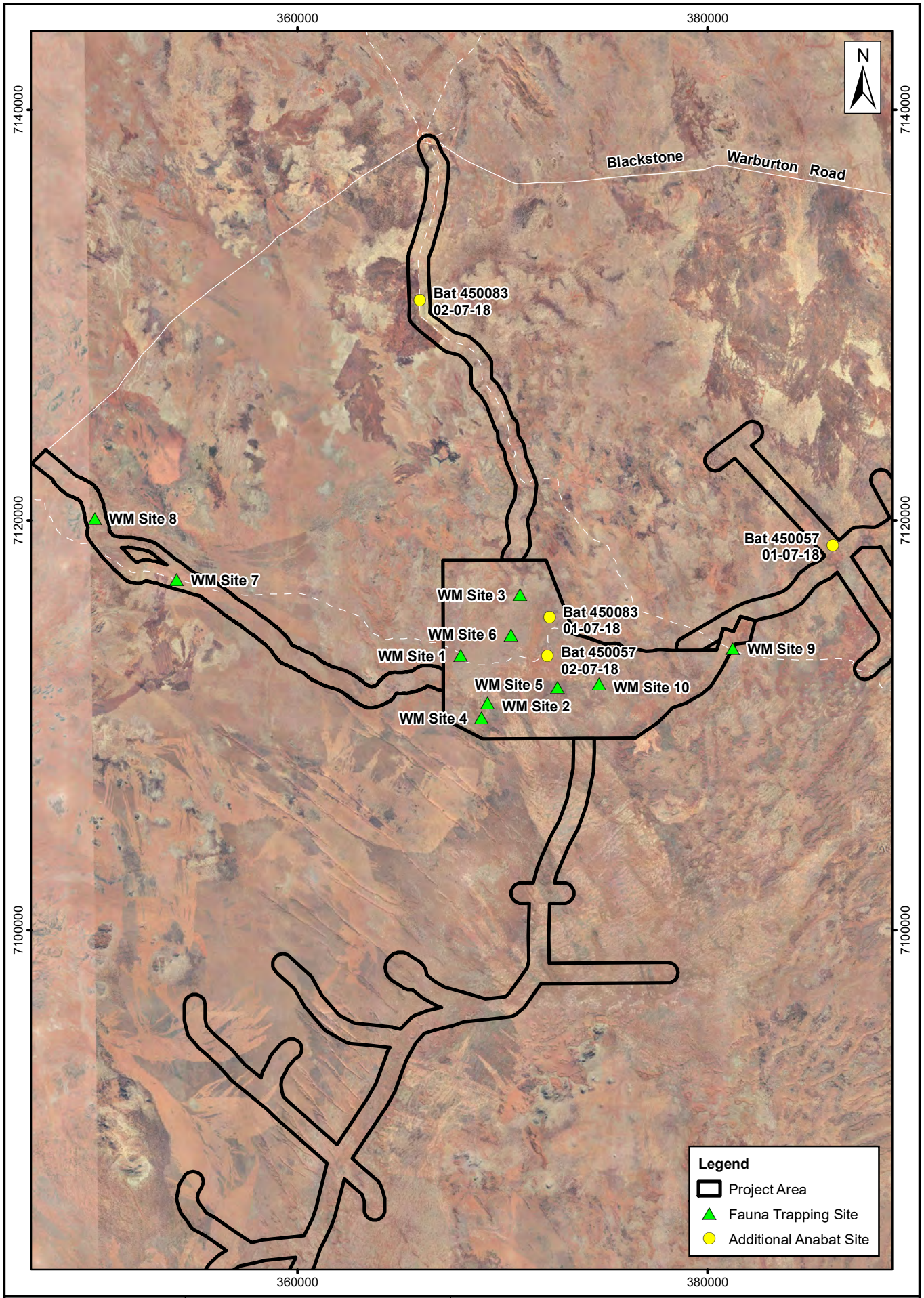
The pitfall traps were placed in two transects with 25 m between each pitfall trap and 50 m between the two transects. Each pitfall trap was a 40 cm deep, white 20 L bucket with a 25 cm high flywire drift-fence extending 3m to either side of the pitfall. A piece of egg carton was used as shelter for any fauna in the trap. Elliott traps were placed near each pitfall and the cage traps were placed at pitfalls 1 and 6. All cage and Elliott traps were placed under vegetation to shade any captured animals and cage traps were covered with a hessian sack. Elliott traps were supplied with a 'blanket' of polar fleece to insulate trapped mammal from the cold metal. All Elliott and cage traps were baited with a mixture of rolled oats, sardines, peanut butter and vanilla essence.

A total of 70 pitfall trap-nights, 70 Elliott trap-nights and 14 cage trap-nights were achieved per site. Across the 10 sites sampled in the Project Area, this resulted in a total of 700 trap-nights each for pitfall and Elliott traps, and 140 trap-nights for cages for the June 2018 survey. All animals caught were identified and recorded, and generally released immediately at the site of capture.

Table 5. Trapping site locations.

Site	Dates open	Location (WGS84)	Habitat
WM Site 1	21 – 28 June 2018	52 J 367954 7113419	Sand dune, grading into small Mulga woodland grove.
WM Site 2	21 – 28 June 2018	52 J 369272 7111101	Calcrete outcropping with shallow red sands supporting spinifex grassland with occasional mallee eucalypts.
WM Site 3	22 – 29 June 2018	52 J 370861 7116372	Mulga woodland over tussock grass on sandy-loam plains with a small claypan.
WM Site 4	22 – 29 June 2018	52 J 368982 7110367	Sand dune (crest and slope) supporting shrubland of *Acacia*, *Grevillea* and *Aluta maisoneuvei* over spinifex grassland.
WM Site 5	22 – 29 June 2018	52 J 372677 7111866	Sandplain with Mallee over Spinifex between calcrete outcroppings.
WM Site 6	23 – 30 June 2018	52 J 370407 7114402	Mulga woodland over tussock grass on sandy-loam plains.
WM Site 7	23 – 30 June 2018	52 J 354100 7117099	Spinifex sandplain.
WM Site 8	24 June – 1 July 2018	52 J 350117 7120091	Mulga woodland over tussock grass on sand-loam plain with minor outcropping of granitic rocks.
WM Site 9	24 June – 1 July 2018	52 J 381225 7113751	Sand dune (crest and swale) supporting shrubland of *Acacia*, *Grevillea* and *Aluta maisoneuvei* over spinifex grassland.
WM Site 10	25 June – 2 July 2018	52 J 374710 7112025	Calcrete outcropping with shallow red sands supporting spinifex grassland with occasional mallee eucalypts.

Plate 1. Site 1 – sand dune grading into mulga woodland grove.



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MGA94 (Zone 52)

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Date: August 2018 | Rev: A | A4

Western Wildlife

Author: J. Wilcox | WW Ref:

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Figure 4

West Musgrave Project

Fauna Trapping Sites

Plate 2. Site 2 - calcrete outcrop with shallow red sands.

Plate 3. Site 3 - mulga woodland over tussock grass.

Plate 4. Site 4 - sand dune.

Plate 5. Site 5 – Mallee sandplain between calcrete outcrops.

Plate 6. Site 6 - mulga woodland over tussock grass.

Plate 7. Site 7 - spinifex sandplain.

Plate 8. Site 8 - Mulga woodland over tussock grass with minor granite outcropping.

Plate 9. Site 9 - sand dune and swale.

Plate 10. Site 10 - calcrete outcrop with shallow red sands.

2.4.3 Bird Surveys

Bird surveys were undertaken at each trapping site to give a total of seven 20 minute surveys at each site, (over 23 hours in total across all sites). Surveys were unbounded, but generally within 200m of the trapping site. Surveys at trapping sites were undertaken concurrently with morning trap checks, between sunrise and approximately 10am. Birds were recorded if seen or heard. Birds were recorded as present only, and a frequency of occurrence calculated for each site.

Birds were also recorded opportunistically during targeted searches and transects, with some targeted searches aiming to survey habitats that may attract birds, such as dense stands of mulga.

2.4.4 Bat Survey

Bat calls were recorded using two Anabat Swift call detectors set to record between dusk and dawn. Detectors were deployed overnight at each trap site and then at selected sites around the Project Area, to give a total of 16 nights of recordings (Table 6, Figure 4). The calls were then analysed by Kyle Armstrong of Specialised Zoological, and the bat calls identified to species level where possible.

Table 6. Anabat locations.

Site	Start Date	Stop Date	GPS Co-ordinate	Location
Bat 450083 23-06-18	23/06/2018	25/06/2018	52 J 370862 7116369	Project Area, Site 3
Bat 450057 23-06-18	23/06/2018	25/06/2018	52 J 372672 7111859	Project Area, Site 5
Bat 450083 25-06-18	25/06/2018	26/06/2018	52 J 370406 7114403	Project Area, Site 6
Bat 450057 25-06-18	25/06/2018	26/06/2018	52 J 367974 7113520	Project Area, Site 1
Bat 450083 26-06-18	26/06/2018	27/06/2018	52 J 374710 7112027	Project Area, Site 10
Bat 450057 26-06-18	26/06/2018	27/06/2018	52 J 354097 7117102	Western Access Rd, Site 7
Bat 450057 27-06-18	27/06/2018	28/06/2018	52 J 350152 7120138	Western Access Rd, Site 8
Bat 450083 27-06-18	27/06/2018	28/06/2018	52 J 381222 7113751	Project Area, Site 9
Bat 450083 29-06-18	29/06/2018	30/06/2018	52 J 369272 7111102	Project Area, Site 2
Bat 450057 30-06-18	30/06/2018	1/07/2018	52 J 368982 7110367	Project Area, Site 4
Bat 450083 01-07-18	1/07/2018	2/07/2018	52 J 372294 7115258	Exploration Camp
Bat 450057 01-07-18	1/07/2018	2/07/2018	52 J 386112 7118774	Eastern Borefields
Bat 450057 02-07-18	2/07/2018	3/07/2018	52 J 372200 7113390	Project Area
Bat 450083 02-07-18	2/07/2018	3/07/2018	52 J 365962 7130731	Northern Access Road

2.4.5 Targeted Searches and Transects

Targeted transects and searches were undertaken throughout the Project Area. The purpose of these was to search for species or evidence of species that are not readily trapped, and to search for signs of conservation significant fauna where potential habitat was found. A GPS location was recorded for small search areas, and a tracklog recorded when walking transects (Figure 5, Appendices 1 and 2).

A total of 234.2km of transect were walked on the June 2018 survey (Appendix 1). Transects generally focused on sandplain habitats that potentially support the Great Desert Skink (*Liopholis kintorei*), Brush-tailed Mulgara (*Dasycercus blythi*) and Bilby (*Macrotis lagotis*), or mulga sandplain habitats that may support Malleefowl (*Leipoa ocellata*). Secondary signs were searched for, and recorded with a GPS co-ordinate and representative photographs if found. Secondary signs include (but are not limited to):

- scat latrines and burrows of the Great Desert Skink
- burrows, tracks, scats or diggings of the Brush-tailed Mulgara
- burrows, tracks, scats or diggings of the Bilby
- mounds, tracks or feathers of the Malleefowl

Species such as the Princess Parrot (*Polytelis alexandrae*), Grey Falcon (*Falco hypoleucos*) and Peregrine Falcon (*Falco peregrinus*) were also targeted on both transects and search sites. As these species are distinctive diurnal birds, no specific methodology, other than vigilance, was required.

Reptiles were targeted by hand-searching in suitable habitat. Hand-searching involved raking through leaf litter, peeling bark from dead trees and raking through windrows of dead Spinifex. Hand-searching can be particularly effective in the cooler months. Any reptiles found were identified and released in situ. Birds were also targeted in search sites. All other fauna and secondary signs of fauna encountered while undertaking targeted searches and transects were also recorded.

2.4.6 Spotlighting

Spotlighting was carried out on the 3rd July 2018 from sundown (5pm) until 9pm. Three teams of two personnel undertook either road-spotting using vehicle headlights, hand-searching using head-torches or a combination of the two. The routes followed are shown in Figure 5. Only a single night of spot-lighting was undertaken due to the cold winter conditions, targeting the warmest night during the survey period.

2.4.7 Camera Trap Survey

Camera traps were deployed at 53 sites during the June 2018 field survey (Appendix 3, Figure 6). Twenty cameras were deployed at trapping sites, three at locations to target mulgara burrows and 30 were deployed for more than two months to target species such as the Bilby (*Macrotis lagotis*), that may be present in low numbers. Short-term deployments at trap sites were baited with a mixture of rolled oats, peanut butter and sardines. Cameras at mulgara burrows were left unbaited. Long-term deployments were baited with a non-reward lure of a tuna oil soaked sponge inside a PVC pipe, securely staked to the ground.

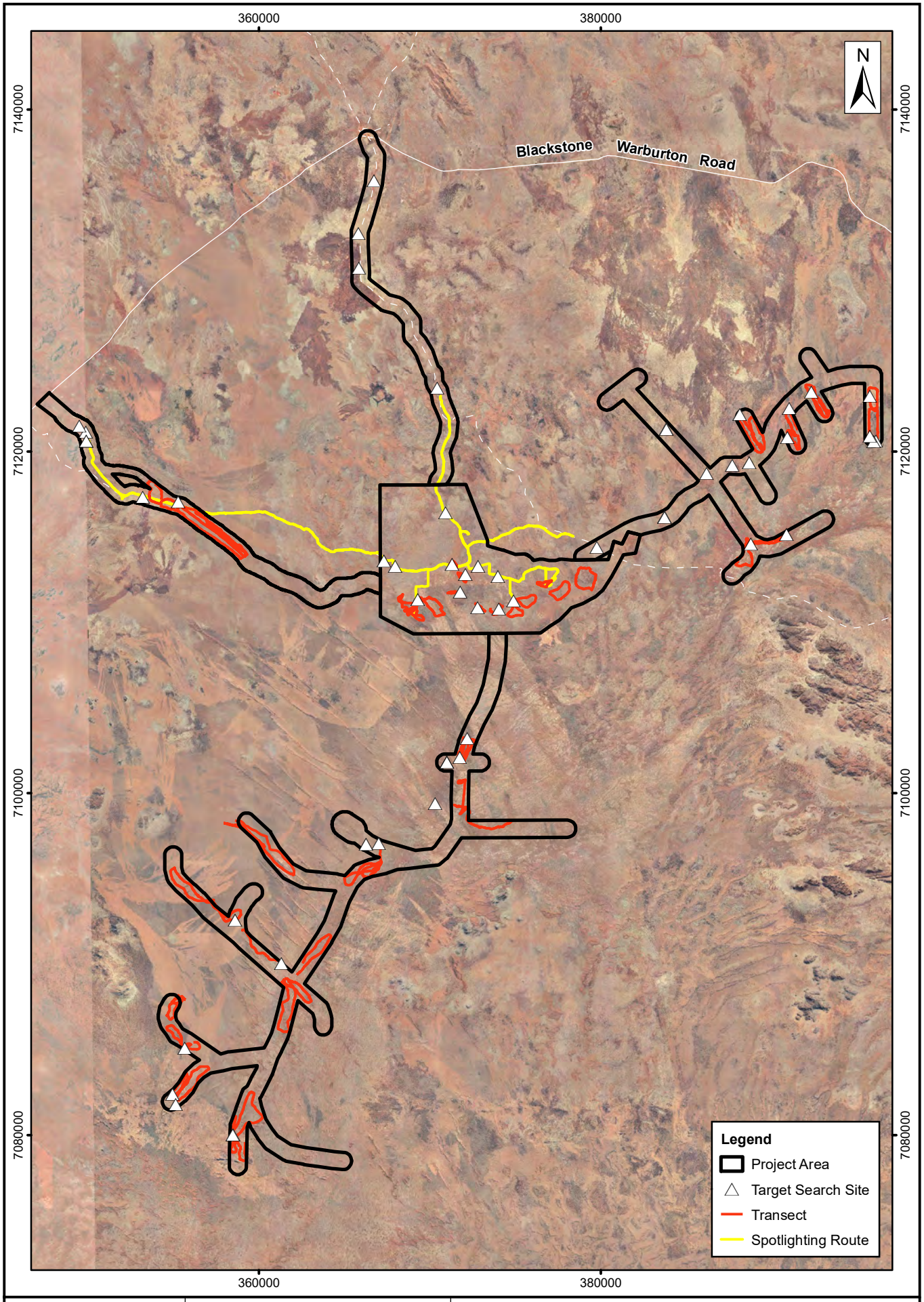

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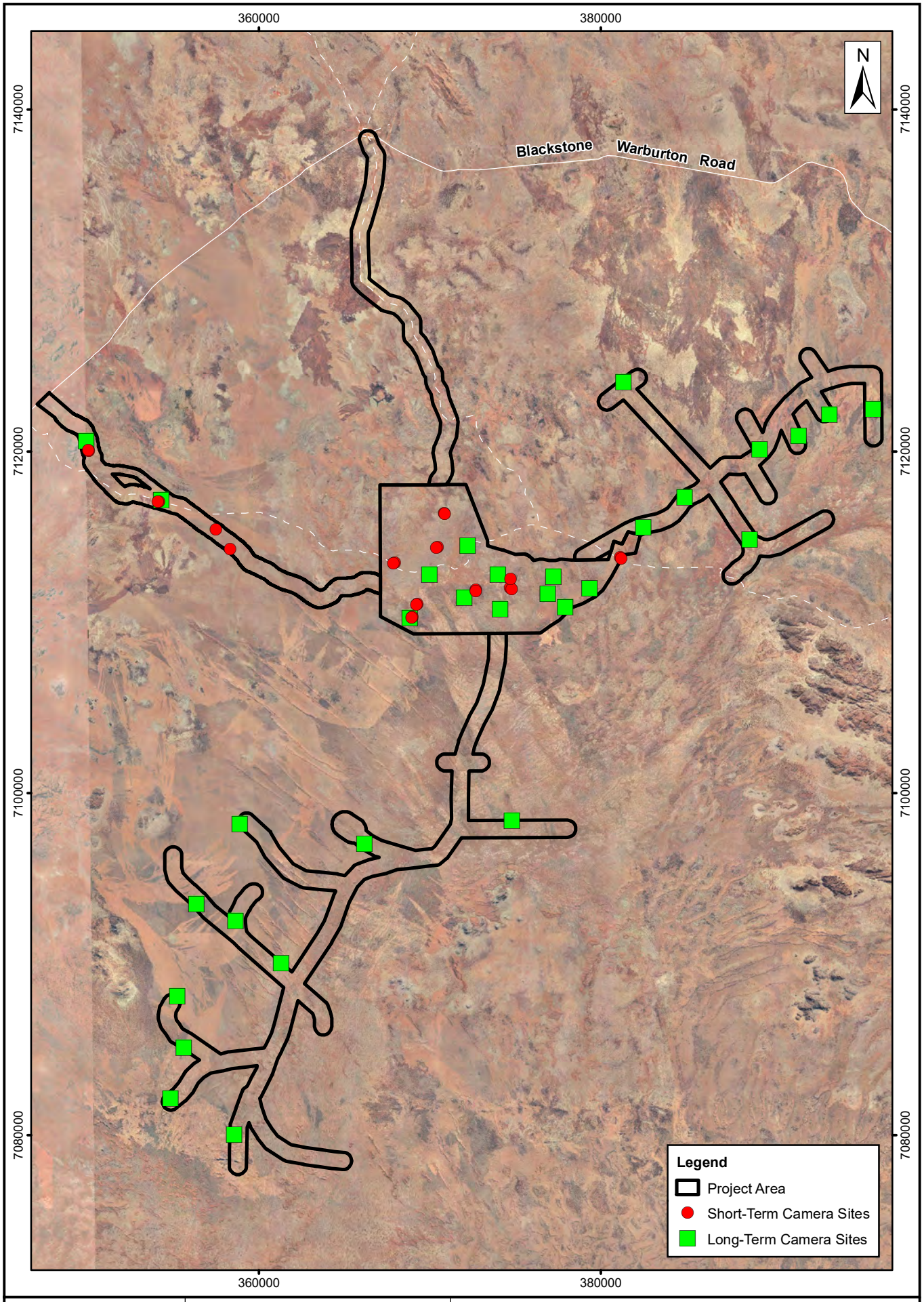
Figure 5

West Musgrave Project

Targeted searches, transects and spot-lighting routes



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MGA94 (Zone 52)

CAD Ref: a2231_Mus_Fauna01_05

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Figure 6

West Musgrave Project

Camera Trap Locations

2.4.8 Opportunistic Records

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

2.5 Habitat Assessment and Mapping

Habitat mapping was undertaken using landform descriptions and vegetation mapping by Western Botanical (2018), observations made by fauna personnel in the field and interpretation of aerial photography. CAD Resources produced the maps from information provided by Western Botanical and Western Wildlife. Elements of each habitat likely to be important for fauna were identified. Habitat elements may include, but are not limited to, rocky crevices, caves, tree hollows, tree crevices, leaf litter or sands suitable for burrowing.

2.6 Assessment of Conservation Significance

Three levels of conservation significance are used within this report to indicate the level of significance of fauna species. These are described in the following sub-sections.

2.6.1 Conservation Significance 1

Conservation Significance 1 (CS1) is the highest level of conservation significance, describing species that are protected under State or Commonwealth legislation. These species are considered to be of state and/or national conservation significance, and some species (e.g. some migratory species) may be considered of international significance.

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

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

The migratory species listed under the EPBC Act are those recognised under international agreements. These agreements are the China-Australia Migratory Bird Agreement (CAMBA), the Japan-Australia Migratory Bird Agreement (JAMBA), the Republic of Korea-Australia

Migratory Bird Agreement (ROKAMBA), or species listed under the Bonn Convention for which Australia is a range state.

Reports on the conservation status of most vertebrate fauna species have been produced by the Department of Environment and Energy (DEE) in the form of Action Plans. An Action Plan is a review of the conservation status of a taxonomic group against IUCN categories. Action Plans have been prepared for amphibians (Tyler 1998), reptiles (Cogger *et al*. 1993), birds (Garnett *et al*. 2011) and mammals (Woinarski *et al*. 2014). These publications also use categories similar to those used by the EPBC Act. The information presented in some of the earlier Action Plans may be out of date due to changes since publication.

The *Western Australian Wildlife Conservation Act 1950* (WC Act) is State legislation for fauna protection administered by the Department of Biodiversity, Conservation and Attractions (DBCA). The WC Act lists species under a set of Schedules, as listed below:

- **Schedule 1:** Fauna that is rare or likely to become extinct (critically endangered fauna)
- **Schedule 2:** Fauna that is rare or likely to become extinct (endangered fauna)
- **Schedule 3:** Fauna that is rare or likely to become extinct (vulnerable fauna)
- **Schedule 4:** Fauna presumed to be extinct
- **Schedule 5:** Migratory birds protected under an international agreement
- **Schedule 6:** Conservation dependent fauna
- **Schedule 7**: Other specially protected fauna

2.6.2 Conservation Significance 2

Species of Conservation Significance 2 (CS2) are not listed under State or Commonwealth Acts, but are listed as Priority species by DBCA. These species may be considered to be regionally significant. In Western Australia, DBCA maintains a list of Priority Fauna made up of species that are not considered Threatened under the WC Act, but for which DBCA feels there is cause for concern. There are four levels of Priority as defined by DBCA, as listed below.

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

2.6.3 Conservation Significance 3

Conservation Significance 3 (CS3) species are not listed under State or Commonwealth Acts or in publications on threatened fauna or as Priority species by DBCA, but are considered by the author to potentially be of local significance because they are at the limit of their distribution in the area, they have a very restricted range or they occur in breeding colonies (e.g. some waterbirds). This level of significance has no legislative recognition and is based on interpretation of information on the species patterns of distribution. For example, the Government of Western Australia (2000) used this sort of interpretation to identify significant bird species in the Perth metropolitan area as part of Bush Forever. Recognition of such species is consistent with the aim of preserving regional biodiversity.

3. Survey Limitations

Various factors can limit the effectiveness of a fauna survey. Pursuant to EPA Technical Guidance (EPA 2016c), these factors have been identified and their potential to impact on the effectiveness of the surveys has been assessed in Table 7 below. All fauna surveys have limitations, and not all fauna species present on the site are likely to be sampled during a survey. Fauna may not be recorded because they are rare, they are difficult to trap or observe, or because they are only present on the site for part of the year.

Table 7. Fauna survey limitations.

Potential Limitation	Extent of limitation for the fauna survey	
Competency /experience of the team carrying out the survey	Not limiting	Supervising zoologist has 18 years' experience with fauna surveys in Western Australia. Field zoologists have 6 – 12 years' experience. Field team included personnel experienced in desert environments and fauna.
Proportion of fauna identified, recorded and/or collected.	Minor limitation	Frogs are unable to be reliably sampled in this Bioregion, except after rains, and no frogs were recorded during the survey. Cool conditions in winter limit the number of reptile captures, though this was ameliorated by intensive hand-searching.
Sources of information e.g. previously available information (whether historic or recent) as distinct from new data	Minor limitation	Few dedicated studies have been undertaken in the region, leading to a paucity of nearby recent records of fauna, making it difficult to place records in the Project Area into a regional context. This is somewhat ameliorated for many species as arid zone fauna typically have wide distributions.
Timing/weather/season/cycle	Minor limitation	Cool winter conditions limited the number of reptile species trapped, though this was ameliorated by intensive hand-searching. Conditions were fine for recording mammals and birds.
Disturbances (e.g. fire, flood, accidental human intervention etc.), which affected results of survey	Not limiting	Parts of the Project Area were recently burnt in 2017, but representative unburnt habitats were also present.
Intensity (in retrospect, was the intensity adequate)	Not limiting	Sufficient time was allowed to survey all accessible habitats.
Completeness (e.g. was relevant area fully surveyed)	Not limiting	A representative proportion of all habitats were able to be accessed and surveyed.
Resources (e.g. degree of expertise available in animal identification to taxon level)	Minor limitation for some species	Almost all vertebrate fauna could be identified to species. Minor exceptions include species of *Nyctophilus* and *Chalinolobus* bats that cannot be positively identified on call. Also, some secondary signs, such as mulgara burrows or bilby diggings, that cannot be reliably attributed when fresh tracks/scats are absent.
Remoteness and/or access problems	Not limiting	Entire Study Area accessible by vehicle or on foot.
Availability of contextual (e.g. biogeographic) information on the region	Minor limitation	There is little contextual information available for this region, however, much of the fauna that occur have widespread distributions across the arid zone.

4. Fauna Habitats of the Project Area

The nine fauna habitats in the Project Area were identified on the basis of observations made in the field by the fauna team, vegetation mapping provided by Western Botanical (2018) and interpretation of aerial photography (Table 8). There is some disturbance to all habitats, from drilling access tracks, roads and off-track driving. Feral Camels (*Camelus dromedarius*) were very common and evidence of vegetation trampling was noted throughout the Project Area. Feral predators, such as the Cat (*Felis catus*), were also commonly recorded. Extensive parts of the Southern Borefields were impacted by fire in 2017.

Table 8. Extent of each fauna habitat in the Project Area.

Habitat	Area (ha) in each Study Area					Total (ha)
	Nebo-Babel Area	Western Access Rd	Northern Access Rd	Southern Borefields	Eastern Borefields	
Sand dunes	981.6	76.1	272.1	550.1	649.4	2,529.3
Spinifex sandplains	1,648.3	1,239.9	14.6	2,114.3	925.3	5,942.4
Mallee sandplains	878.5	62.7	-	1,579.9	1,496.9	4,018.1
Mulga sandplains	308.9	-	26.1	237.2	242.9	815.1
Calcrete /sandplain complex	129.9	-	-	1,664.5	776.1	2,570.4
Calcrete plains	969.8	17.9	16.3	1,381.9	321.2	2,707.2
Mulga woodlands	3,036.0	856.1	1,746.0	99.8	1,055.8	6,793.6
Stony hills and plains	11.7	94.1	26.1	0.7	-	132.5
Chenopod shrublands	-	-	74.9	-	-	74.9
Claypans	13.6	-	126.0	0.5	-	140.2
Cleared/disturbed areas	-	-	13.1	-	-	13.1
Not surveyed (heritage area)	-	337.0	-	1637.2	-	1,974.2
Total:	**7,978.9**	**2,683.9**	**2,315.2**	**9,266.1**	**5,467.7**	**27,711.0**

All of the habitats present in the Project Area are widely represented in the Central Ranges and/or Great Victoria Desert Bioregions. Cleared and disturbed areas are only likely to support a small number of fauna species.

The habitats are described in the sections below, with vegetation descriptions summarised from Western Botanical (2018).

4.1 Sand Dunes

Aeolian sand dunes from 2 to 20 m high occur throughout the Project Area (Plate 11). They are composed of a fine red sand and support a shrubland of *Grevillea* and *Acacia* spp. on the dune crests, over *Aluta maisonneuvei* and Spinifex (*Triodia schinzii* and *Triodia basedowii*). Shrublands on the mid to lower slopes are often dominated by *Aluta maisonneuvei* over sparse Spinifex. Sand dunes are known to support the CS2 Southern Marsupial Mole (*Notoryctes typhlops*).

Plate 11. Sand dune habitat.

4.2 Spinifex Sandplains

Spinifex sandplains occur across much of the Project Area (Plate 12). Deep red sands support a grassland of Spinifex (*Triodia schinzii* and/or *Triodia basedowii*). Much of this habitat includes a shrub layer of *Acacia* spp. Spinifex sandplains are likely to support a diverse reptile assemblage. The deep sands provide habitat for burrowing fauna, including reptiles such as the CS1 Great Desert Skink (*Liopholis kintorei*) and mammals such as the CS2 Brush-tailed Mulgara (*Dasycercus blythi*). There is likely to be substantial overlap between the faunal assemblage of the Mulga Sandplains, Mallee Sandplains and Spinifex Sandplains. However, the Spinifex Sandplains were mapped separately as this habitat appears to be favoured by the Great Desert Skink and Mulgara. Some of this habitat was recently burnt in 2017 (Plate 13).

Plate 12. Spinifex sandplain habitat.

Plate 13. Recently burnt Spinifex sandplain habitat.

4.3 Mallee Sandplains

Mallee sandplains occur throughout the southern parts of the Project Area, often in close association with calcrete plains (Plate 14). Red sands of varying depth support a low mallee woodland of *Eucalyptus oxymitra* and *Eucalyptus gamophylla* over Spinifex (*Triodia basedowii* and *Triodia scariosa*) grassland. There is likely to be substantial overlap between the faunal assemblage of the Mulga Sandplains, Mallee Sandplains and Spinifex Sandplains. However, the Mallee Sandplains are likely to support birds and reptiles that favour Mallee eucalypts, providing leaf litter for small fossorial reptiles and nesting sites for birds.

Plate 14. Mallee sandplain habitat.

4.4 Mulga Sandplains

Mulga sandplains occur in small patches throughout the Project Area (Plate 15). The vegetation is characterised by Mulga woodland over Spinifex (*Triodia basedowii*) grassland, often with a shrub layer of *Eremophila longifolia*, *Hakea lorea* and *Acacia* spp. There is likely to be substantial overlap between the faunal assemblage of the Mulga Sandplains, Mallee Sandplains and Spinifex Sandplains. However, the Mulga Sandplains are likely to support birds and reptiles that favour Mulga and provide nesting sites for birds.

Plate 15. Mulga sandplain habitat.

4.5 Calcrete Plains

Calcrete plains occur throughout the southern part of Project Area, including the Southern and Eastern Borefields (Plate 16). The flat or undulating plains of calcrete occur as small or large patches, often in a complex with sandplain habitats. The calcrete plains support Spinifex (*Triodia scariosa*) grasslands, often with an open woodland of *Hakea lorea* and sometimes with an open shrubland of Mulga, *Melaleuca eleuterostachya, Allocasuarina helmsii* or *Acacia eremophila*. On the southern part of the Southern Borefields, the calcrete plains also support an open woodland of Desert Bloodwood (*Corymbia opaca*). Calcrete plains are likely to support a small suite of reptiles that favour rocky substrates and small mammals that shelter in Spinifex but do not require deep sands in which to burrow. While some sand-dwelling species, particularly reptiles, are also likely to occur where there is shallow sand overlaying the calcrete, the areas of outcropping calcrete are not suitable for burrowing species such as the CS2 Brush-tailed Mulgara (*Dasycercus blythi*). Where red sands overlay the calcrete the soil depth may be too shallow to support burrowing by some species.

Plate 16. Calcrete plains habitat.

4.6 Mulga Woodlands

Mulga woodland is a widespread habitat, occurring on sandy-loam plains (Plate 17). The open woodland canopy is dominated by Mulga species with *Hakea lorea*. The mid-storey is a sparse shrubland and the understorey is a sparse chenopod shrubland of *Sclerolaena* spp. or tussock grassland. In drainage areas the understorey is a forbland that includes *Eremophila foliosissima*, chenopods (*Maireana* and *Sclerolaena* sp.) and grasses. Mulga groves occur where internally drained sites support a greater density of vegetation. In the interzone between Mulga woodlands and sandplains, the Mulga woodland occurs over perennial Wanderrie grasses. Trees in Mulga woodlands provide cracks, crevices and peeling bark to shelter arboreal fauna such as bats and some reptiles. The CS2 Central Long-eared Bat (*Nyctophilus major tor*) potentially occurs in this habitat, though it has not been recorded in the Project Area. Mulga trees and taller shrubs provide nesting habitat for birds, particularly where the Mulga occurs in groves or dense stands. Leaf litter under stands of Mulga provides shelter and foraging habitat for some reptiles.

Plate 17. Mulga woodland habitat.

4.7 Stony Hills and Plains

Small areas of low stony hills and stony plains occur on the Northern and Western Access Roads (Plate 18). Larger rocky hills such as Winburn Rocks, Mount Burt, Cohn Hill, Lightning Rock and Possum Hill have been excluded from the Project Area, though they occur nearby. On the Western Access Road, the lower stony slopes of granitic hills support shrublands of Mulga, *Acacia kempeana*, *Acacia cuthbertsonii* and/or *Senna* spp. On the Northern Access Road, near Jameson, low ironstone hills support Mulga shrublands, some over chenopod shrubland (*Maireana triptera*). Although stony and rocky hills in the region are likely to support a distinct faunal assemblage, the low stony hills and plains that extend into the Project Area are unlikely to support fauna that favour very rugged terrain. Except for a few very small outcrops, this habitat lacks crevices and exfoliating rock. Caves are absent thought they may occur in the surrounding hills.

Plate 18. Stony hills and plains habitat (Mt Burt in background).

4.8 Chenopod Shrublands

Small areas of chenopod shrublands occur on the Northern Access Road, in association with the gravelly lower slopes and plains below ironstone hills. The shrubland is a low open mix of *Atriplex vesicaria* and *Maireana* spp. with *Eremophila clarkei* and occasional grasses.

4.9 Claypans

Small claypans are found within the Mulga woodland and larger claypans of cracking red clays occur on the Northern Access Road near Jameson. These areas are likely to hold water after significant rainfall events. The small claypans have a sparse grassland in the center and are fringed by a shrubland of *Eremophila longifolia* and *Acacia* spp. The larger claypans have a perennial grassland with occasional *Eremophila longifolia* and *Acacia* spp.

Claypans are the only natural wetland habitats in the Project Area. Though soaks and springs occur in the surrounding areas none are known from within the Project Area. Artificial water sources such as tanks and bores are also absent from the Project Area. Claypans are likely to support breeding frogs and may attract waterbirds when inundated, including CS1 migratory shorebirds.

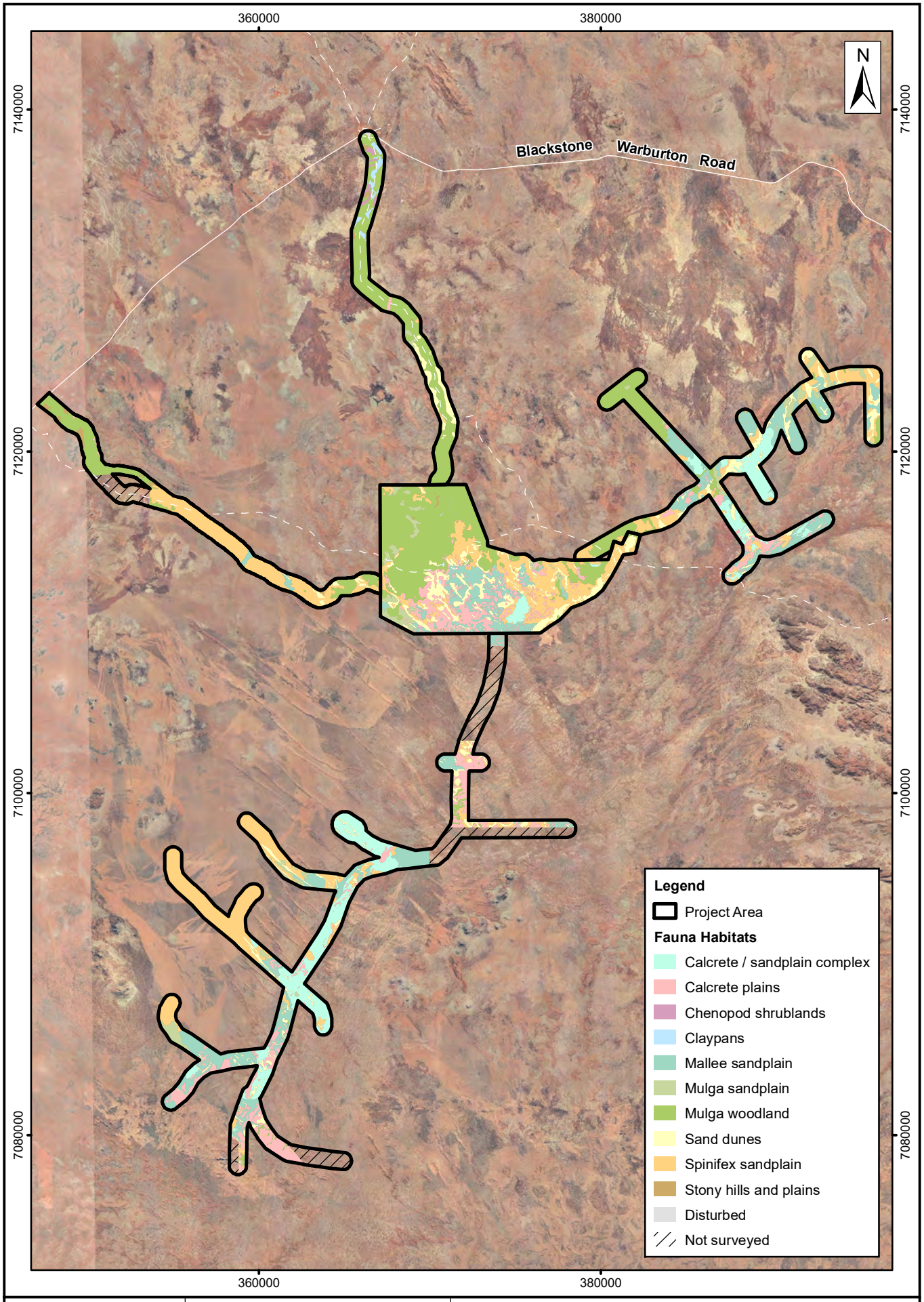

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Figure 7

West Musgrave Project

Fauna Habitats

5. Faunal Assemblage of the Project Area

The results of the literature review and field survey were combined to create a list of all the vertebrate fauna potentially occurring at in the Project Area (Appendices 4 - 7). Indicated in the fauna lists are all the species observed during the fauna surveys, those recorded previously in the Project Area and those recorded in the region as part of the literature review (see Table 4 for search areas). As the Bioregions have not been well surveyed, several species are not represented by records in the surrounding area, and their presence has been inferred from their patterns of distribution as presented in the literature.

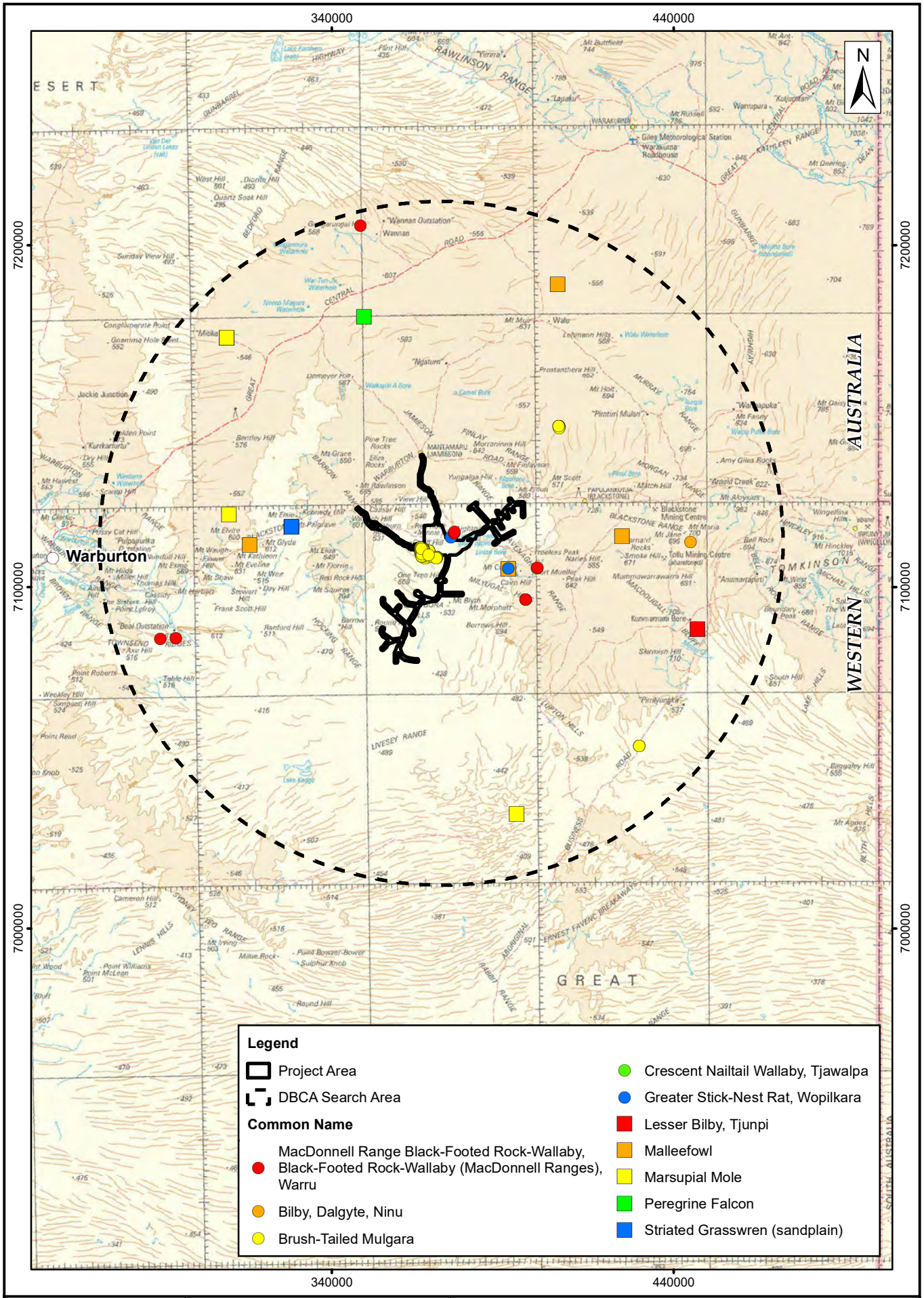
The potentially occurring faunal assemblage is summarised in Table 9. The overall vertebrate faunal assemblage is likely to be largely intact, with the exception of species that are extinct or greatly reduced in their distribution in the Bioregions. The faunal assemblage and conservation significant species likely to occur are further discussed in the sections below.

Table 9. Summary of vertebrate fauna potentially occurring in the Project Area.

Taxon	Total species	Introduced species	Conservation significant species		
			CS1	CS2	CS3
Amphibians	7	0	-	-	-
Reptiles	95	0	1	-	1
Birds	120	0	10	1	-
Mammals	42	8	4	4	-
Totals:	**264**	**8**	**15**	**5**	**1**

The conservation significant fauna recorded within 100 km of the Project Area on DBCA's Threatened and Priority Fauna Database (omitting erroneous records, vagrants, waterbirds and migratory shorebirds) are shown in Figure 8. The significant fauna potentially occurring in the Project Area are discussed in the following sections and summarised in Table 13. The results of the EPBC Act Protected Matters search are given in Appendix 8.

All of the fauna records for June 2018 are presented in Appendix 9 and the individual records of conservation significant species are given in Appendix 10. The analysis of the bat call data collected on the field survey is given in Appendix 11.



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Scale: 1:1,500,000
MGA94 (Zone 52)

CAD Ref: a2231_Mus_Fauna01_07

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Figure 8

West Musgrave Project

DBCA Threatened and Priority Fauna Database Records

5.1 Amphibians

There are seven species of frog that have the potential to occur in the Project Area (Appendix 4). No frogs were recorded during the 2018 survey, as expected with a dry season survey. The frog species that potentially occur in the Project Area are common and widely distributed in the semi-arid zone.

Burrowing species aestivate underground when conditions are dry, so are difficult to sample except immediately after significant rainfall events. These species breed opportunistically after rain and may occur in drainage lines associated with ranges in the region, though they can also forage in terrestrial habitats when conditions are suitable. Frogs may occur throughout the Project Area, potentially breeding anywhere that holds relatively fresh water after rainfall, including small claypans in the mulga woodlands, larger claypans near Jameson and man-made depressions. Many species develop from tadpoles into frogs very quickly, and can make use of ephemeral pools. Regionally important habitat for frogs, such as permanent rock waterholes, were not recorded.

5.1.1 Amphibians of Conservation Significance

No frogs of conservation significance are likely to be present in the Project Area.

5.2. Reptiles

There are 95 species of reptile that have the potential to occur, of which 48 were recorded in the Project Area thus far (Table 10, Appendix 5). A total of 32 species were recorded during the June 2018 fauna survey, the remainder recorded during surveys in April and May (Bamford and Everard 2018) or identified from photographs taken by site personnel. Only 13 individuals of seven species were trapped in June 2018. This was not unexpected given the cool temperatures during the survey. The trapping was supplemented with hand-searching, resulting in a further 19 species recorded opportunistically (Table 10).

Range extensions were recorded for two reptiles that were not previously known to occur in the area. The Spiny-tailed Goanna (*Varanus acanthurus*) was recorded on the Western Access Road. This represents a range extension of about 220 km south from the nearest record near the Clutterbuck Hills, north of Patjarr. The skink *Lerista taeniata* was recorded in the Nebo-Babel Area, representing a range extension of about 270 km west of the nearest record near Sangsters Bore in the Northern Territory and about 290 km northwest of the next nearest record from Manmungari Conservation Park in South Australia. The incidence of range extensions is a reflection of the understudied nature of the region, rather than rarity of these species.

The reptile assemblage is likely to be largely intact and dominated by species that favour sandplain and sand dune habitats. A small number of species, such as *Gehyra montium*, and the Red Rock Dragon (*Ctenophorus rufescens*) favour rocky habitats. These species possibly occur on calcrte plains in the Project Area, but are more likely to occur in the nearby rocky hills. The majority of species have a widespread distribution across arid central Australia.

Table 10. Reptiles recorded in the Project Area, June 2018.

Species	Status	Site										Opportunistic
		1	2	3	4	5	6	7	8	9	10	
Geckoes												
Gehyra purpurescens												+
Gehyra variegata							+					
Heteronotia binoei												+
Strophurus ciliaris												+
Strophurus elderi												+
Strophurus strophurus												+
Legless lizards												
Delma butleri												+
Delma desmosa						1						
Lialis burtonis								+				
Dragons												
Ctenophorus isolepis												+
Ctenophorus nuchalis												+
Gowidon longirostris												+
Moloch horridus												+
Skink Lizards												
Ctenotus brooksi					2					+		
Ctenotus saxatilis									+			
Ctenotus leonhardii		1										
Ctenotus pantherinus						1		+			1	
Ctenotus quattuordecimlineatus		1			1					1		
Cyclodomorphus melanops												+
Lerista bipes												+
Lerista desertorum												+
Lerista labialis			+									
Lerista taeniata												+
Liopholis inornata			+									
Liopholis kintorei	Vu, S3											+
Liopholis striata												+
Menetia greyii				1		+		1				
Morethia ruficauda											2	
Goannas												
Varanus acanthurus												+
Varanus gilleni												+
Snakes												
Parasuta monarchus												+
Pseudechis australis								+				
Total species:		**2**	**2**	**1**	**2**	**3**	**1**	**4**	**1**	**2**	**2**	

Note that numbers may represent the same individuals recorded over successive days. + = Opportunistic.

5.2.1 Reptiles of Conservation Significance

There are two reptiles of conservation significance that were recorded in the Project Area, as listed and discussed below.

Conservation Significance 1

Great Desert Skink *Liopholis kintorei*
This species is listed under Schedule 3 (Vulnerable) of the WC Act and as Vulnerable under the EPBC Act.

The **Great Desert Skink** is a large burrowing lizard that occurs patchily across the western deserts region of central Australia (McAplin 2001). Formerly widespread, it has disappeared from much of its range in Western Australia, including the Gibson Desert north of Warburton and the Great Victoria Desert (TSSC 2016a). Great Desert Skinks in the Ngaanyatjarra Indigenous Protected Area and in the Karlamilyi National Park (Gibson Desert) are recognised as key populations in Western Australia (TSSC 2016a).

The Great Desert Skink usually occurs on spinifex sandplains, but is also known to inhabit adjacent dune swales. In the Tanami and parts of the Great Sandy Desert it also occurs in the lateritic soils of paleodrainage lines (McAplin 2001). The Great Desert Skink lives in burrow systems that can be 1m deep and over 10m in diameter. The burrow systems can have multiple entrances and are characterised by the presence of a scat latrine. Up to three generations live in the burrow system. Burrows may remain active for several years, and males move between burrow systems, mating with females across several burrows. Great Desert Skinks hibernate in the cooler months, usually between May/June and September/October.

Threats to the Great Desert Skink include predation after loss of vegetation cover from fire and possibly habitat degradation from feral Camels and Rabbits (TSSC 2016a). With the cessation of traditional land management practices across much of the western deserts region, frequent patch-burning has been replaced by extensive hot fires (McAplin 2001). Fire management to protect the species should focus on prevention of frequent, widespread hot fires, though the needs of other fauna should also be considered (Cadenhead *et al*. 2016). Great Desert Skinks prefer a mosaic of fire ages, favouring area that have been burnt in the past three to 15 years (McAplin 2001). Both Cats and Foxes are known to prey on the Great Desert Skink. The conservation objective identified in the conservation advice for the species is to "increase the extent of suitable habitat for the species and retain its evolutionary potential across its range" (TSSC 2016a). This is to be achieved through targeted feral predator control at key Great Desert Skink populations and by undertaking prescribed burning with the aim of maximizing ground cover within Great Desert Skink habitat, by reducing the frequency, intensity and size of fires (TSSC 2016a).

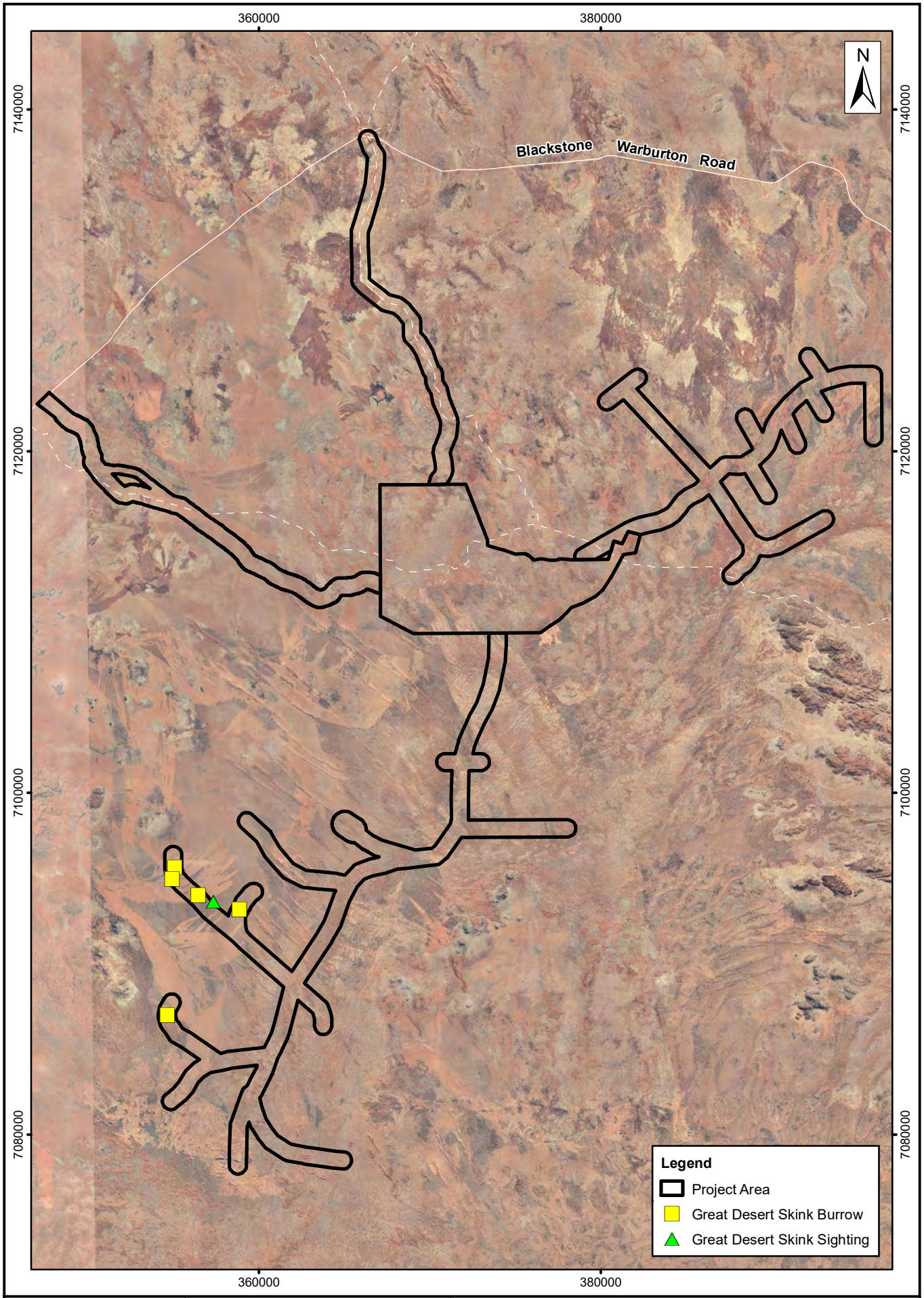
The Great Desert Skink was recorded in the Southern Borefields between April and July 2018 (Plate 19, Figure 9, Appendix 9). This species potentially occurs anywhere on Spinifex sandplains and adjacent dune swale habitats, but it is likely to be patchily distributed. It may also be temporarily absent or in reduced numbers in recently burnt areas.

Plate 19. Great Desert Skink latrine (left) and habitat (right) in the Southern Borefields.

Conservation Significance 3

Woma *Aspidites ramsayi*

The **Woma** is a large python that generally occurs in sandy areas. It is secretive, sheltering in burrows that it digs itself or modifies from the burrows of other fauna (Bruton *et al*. 2017). The population in southwest Western Australia is listed as Priority 1 by DBCA as is thought to be declining. However, the population in the study area is part of the population that extends through the arid interior of Australia and this population has no formal conservation listing. Threats to the species are thought to include destruction of burrows (though intensive cropping or trampling by livestock) and possibly the historical loss of burrowing mammals (Bruton *et al*. 2017). Predation by cats and foxes appears to be less of a threat due to the Woma's large size, rapid maturation and use of burrows (Bruton *et al*. 2017). The Woma is listed as locally significant in the Project Area. The Woma was not recorded during the fauna survey, but was sighted and photographed on the Western Access Road during heritage surveys in 2018 (Appendix 9).



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MGA94 (Zone 52)

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Figure 9

West Musgrave Project

Great Desert Skink (*Liopholis kintorei*) records

5.3 Birds

There are 120 species of bird that potentially occur in the Project Area, of which 67 species have been recorded across the Project Area thus far (Appendix 6). A total of 45 species were recorded in April and May 2018 (Everard and Bamford 2018b) and 57 were recorded in the June 2018 fauna survey (Table 11). As birds are highly mobile, species may occur as vagrants almost anywhere. Vagrants have been excluded from the list in Appendix 6 unless recorded in the Project Area, as the Project Area is unlikely to be ecologically significant for these species.

Between five and 15 species were recorded at each trapping site in June 2018. A further 16 species were observed opportunistically across the Project Area (Table 11). Particularly common were the Crested Pigeon (*Ocyphaps lophotes*), Singing Honeyeater (*Gavicallis virescens*) and Zebra Finch (*Taeniopygia gutatta*). However, several species were only represented by one or two records.

The bird assemblage is likely to include a core suite of species that is resident in the Project Area, a second group that makes regular or nomadic movements into and through the Project Area and a third group of vagrants, that may occur in the Project Area on occasion. Resident species include many of the small insectivores such as fairywrens, thornbills, whistlers and robins. Resident species are present all year, though their populations may fluctuate in response to rainfall and fire.

Birds that make regular seasonal movements include the Rainbow Bee-eater (*Merops ornatus*), cuckoos and some birds of prey. Honeyeaters are also likely to make seasonal or nomadic movements to take advantage of flowering events. Although not present all year, these species are likely to use the Project Area for foraging, breeding or shelter on a seasonal basis or when conditions are suitable.

Wetland dependent bird species may occur as occasional visitors in small numbers. However, as the Project Area lacks significant wetland habitats, the only wetland birds listed in Appendix 5 are those that have been recorded in the Project Area during fauna surveys or conservation significant species known to occur in the region. The only surface water in the Project Area is likely to be in the small claypans that are within the Mulga woodland and the larger claypans near Jameson. Artificial water sources, such as sumps on drill pads, are small and temporary.

Many birds are likely to use a range of habitats across the Project Area, and though the bird assemblage is likely to vary between Mulga Woodlands and Spinifex sandplains, these habitats are widespread. Tree hollows in the isolated patches of Desert Bloodwood (*Corymbia opaca)* may have local significance as they are likely to be used for nesting by a range of species, including parrots, pardalotes and kingfishers.

Table 11. Birds recorded in the Project Area, June 2018.

Names in alphabetical order, see Appendix 6 for scientific names.

Species	Status	Frequency of Occurrence (n=7) at each Site										Opportunistic
		1	2	3	4	5	6	7	8	9	10	
Australian Bustard								2			1	
Australian Hobby											1	
Australian Kestrel							1					
Australian Magpie		1	1				2	1	1	3		
Australian Pipit				2								
Australian Ringneck												+
Banded Whiteface			1									
Black-faced Cuckoo-shrike			1			1						
Black-faced Woodswallow		3		2		1	2			5		
Bourkes Parrot												+
Brown Falcon		2		1		1						
Brown Songlark				1								
Budgerigar						1				2	1	
Bush Stone-curlew												+
Chestnut-rumped Thornbill						1	1					
Cockatiel												+
Common Bronzewing												+
Crested Bellbird		4		1			2	1		1	2	
Crested Pigeon		4	4	2	1	1	4	1		1	2	
Crimson Chat												+
Emu												+
Galah			1		1		1					
Grey-fronted Honeyeater						7	1					
Ground Cuckoo-shrike				1								
Hooded Robin							1					
Inland Thornbill					1							
Little Button-quail					1							
Magpie-lark			1									
Mulga Parrot												+
Pallid Cuckoo		1										
Pied Butcherbird		2	2	1	1		2	1	3	1	1	
Pied Honeyeater											1	
Rainbow Bee-eater										1		
Red-backed Kingfisher												+
Red-browed Pardalote										1		
Red-capped Robin												+
Redthroat					1							
Rufous Whistler		1										
Rufous-crowned Emu-wren												+
Singing Honeyeater		6	4	5	5	3	7	2	1	6	3	

Table 11. (cont.)

Species	Status	Frequency of Occurrence (N=7) at each Site										Opportunistic
		1	2	3	4	5	6	7	8	9	10	
Slaty-backed Thornbill												+
Southern Whiteface		1										
Spiny-cheeked Honeyeater										1		
Striated Grasswren	P4					4		1				
Torresian Crow		1	2	1		1	1	3	1			
Variegated Fairy-wren					1			2		3		
Wedge-tailed Eagle			1					1				
Weebill												+
Western Bowerbird												+
Whistling Kite												+
White-backed Swallow										1		
White-browed Babbler		2										
White-fronted Honeyeater												+
White-winged Fairy-wren			3		2	1		2			3	
Willie Wagtail					3	2				2		
Yellow-throated Miner		1		1		3	2	1	5	4		
Zebra Finch		7	1	6	4	7	5	3		7	3	
Total Species:		**14**	**12**	**12**	**11**	**14**	**14**	**13**	**5**	**15**	**10**	**16**

5.3.1 Birds of Conservation Significance

Two terrestrial birds listed as Migratory under the EPBC Act were listed on databases for the area; the Grey Wagtail (*Motacilla cinera*) and Yellow Wagtail (*Motacilla flava*). These species are considered unlikely to occur except as occasional vagrants. Both occur around wetlands and are generally recorded in the north of the State (Johnstone and Storr 2004, DoE 2015). They are not included in the list in Appendix 6 and are not discussed further.

There are eleven birds of conservation significance that have been recorded or potentially occur in the Project Area. Each species is listed in the boxes below, and discussed.

Conservation Significance 1

Malleefowl *Leipoa ocellata*
This species is listed as Vulnerable under the EPBC Act and under Schedule 3 (Vulnerable) of the WC Act.

Oriental Plover *Charadrius veredus*
This species is listed as migratory under the EPBC Act and under Schedule 5 (migratory birds under international agreement) of the WC Act.

Common Sandpiper *Tringa hypoleucos*
This species is listed as migratory under the EPBC Act and under Schedule 5 (migratory birds under international agreement) of the WC Act.

Sharp-tailed Sandpiper *Calidris acuminata*
This species is listed as migratory under the EPBC Act and under Schedule 5 (migratory birds under international agreement) of the WC Act.

Pectoral Sandpiper *Calidris melanotos*
This species is listed as migratory under the EPBC Act and under Schedule 5 (migratory birds under international agreement) of the WC Act.

Fork-tailed Swift *Apus pacificus*
This species is listed as migratory under the EPBC Act and under Schedule 5 (migratory birds under international agreement) of the WC Act.

Grey Falcon *Falco hypoleucos*
This species is listed under Schedule 3 (Vulnerable) of the WC Act.

Peregrine Falcon *Falco peregrinus*
This falcon is listed under Schedule 7 (other specially protected fauna) of the WC Act.

Princess Parrot *Polytelis alexandrae*
This species is listed as Vulnerable under the EPBC Act and as Priority 4 by DBCA.

Night Parrot *Pezoporus occidentalis*
This species is listed as Endangered under the EPBC Act and under Schedule 1 (critically endangered fauna) of the WC Act.

The **Malleefowl** occurs in semi-arid shrublands and low woodlands across southern Australia, favouring habitats dominated by mallee eucalypts and/or *Acacia* (Garnett *et al*. 2011). They nest in large mounds that they construct in areas with a sandy substrate and abundant leaf litter (Benshemesh 2007). Key threats to this species include habitat degradation by feral herbivores, altered fire regimes and predation by feral Cats (Benshemesh 2007). The Project Area represents the northernmost extent of the range of this species in Western Australia. There are four records on DBCAs Threatened and Priority Fauna Database, all prior to 1972 (Table 10, Figure 8). It is probable that the Malleefowl is locally extinct in the Project Area, however, as a large, mobile bird species, it may potentially move into the region in times of high productivity.

The **Oriental Plover** is a migratory shorebird that is a non-breeding visitor to Australia. It favours dry grasslands and open plains, including recently burnt areas (Geering *et al*. 2007). Although there are no records of this species nearby, it may occur on occasion, using either recently burnt areas, claypans, chenopod shrublands or sparsely vegetated areas of open Mulga Woodland. However, most of the records of this species are from the northern parts of the State (Johnstone and Storr 2000, Birdlife Australia 2018). A site is only considered significant for this species if it supports at least 1% of the population, or 700 birds (Geering *et al*. 2007). It is unlikely that the Project Area would support such large numbers of Oriental Plover.

The **Common Sandpiper**, **Sharp-tailed Sandpiper** and **Pectoral Sandpiper** are migratory shorebirds that occur on inland waterbodies, as well as in coastal habitats. These species have not been recorded in the area but may occur on the claypans after significant summer rainfall events. However, the Project Area is only likely to be a significant site for these species if it supports 1% or more of the flyway population, which equates to 250 Common Sandpipers, 1,600 Sharp-tailed Sandpipers and/or 250 Pectoral Sandpipers (Geering *et al*. 2007). The claypans in the Project Area are unlikely to support significant numbers of these shorebirds, though small numbers may occur after summer rainfall.

The **Fork-tailed Swift** is a non-breeding visitor to Australia between September and April (Boehm 1962, Johnstone and Storr 1998). The bird is primarily observed foraging for insects in proximity to cyclonic weather (Boehm 1962). Although a migratory species, the Fork-tailed Swift has a large range and a large population that appears to be stable (BirdLife International 2018). The Fork-tailed Swift is largely an aerial species and is unlikely to be affected by changes to the Project Area.

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

The **Peregrine Falcon** is a widespread bird of prey that globally has a very large range and a very large population that appears to be secure (BirdLife International 2018). In Western Australia the population is secure, though this species may experience reductions at a local level due to human disturbance at nesting sites (Debus 1998). The Peregrine Falcon nests mainly on ledges on cliffs or rocky outcrops, and it may also use tall trees (Johnstone and Storr 1998). This species often takes advantage of man-made structures such as abandoned open pits or quarries. The Project Area lacks suitable breeding habitat for this species, though it may breed nearby in rocky hills. The Peregrine Falcon may forage over the Project Area if breeding nearby, or during the non-breeding season.

The **Princess Parrot** occurs across inland arid Australia where it inhabits shrublands and open woodlands over Spinifex in the swales between dunes (Garnett *et al*. 2011). There is limited information on population trends, as this species generally occurs in unpopulated areas and can be irruptive (TSSC 2018). The Princess Parrot can congregate in large flocks to breed in response to rainfall events (TSSC 2018). It nests in hollows and has been recorded nesting in River Red Gum (*Eucalyptus camaldulensis*), Marble Gum (*Eucalyptus gongylocarpa*) and Desert Oak (*Allocasuarina decaisneana*) (Garnett *et al*. 2011). Though no threats are known for the species, it may be adversely affected by altered fire regimes and completion with introduced grazing herbivores (Garnett *et al*. 2011). The conservation priority for the species is to undertake active fire management to protect breeding habitat (TSSC 2018). This species potentially occurs as a foraging visitor to the Project Area. It is unlikely that the Project Area provides significant breeding habitat, as the favoured tree species are not present.

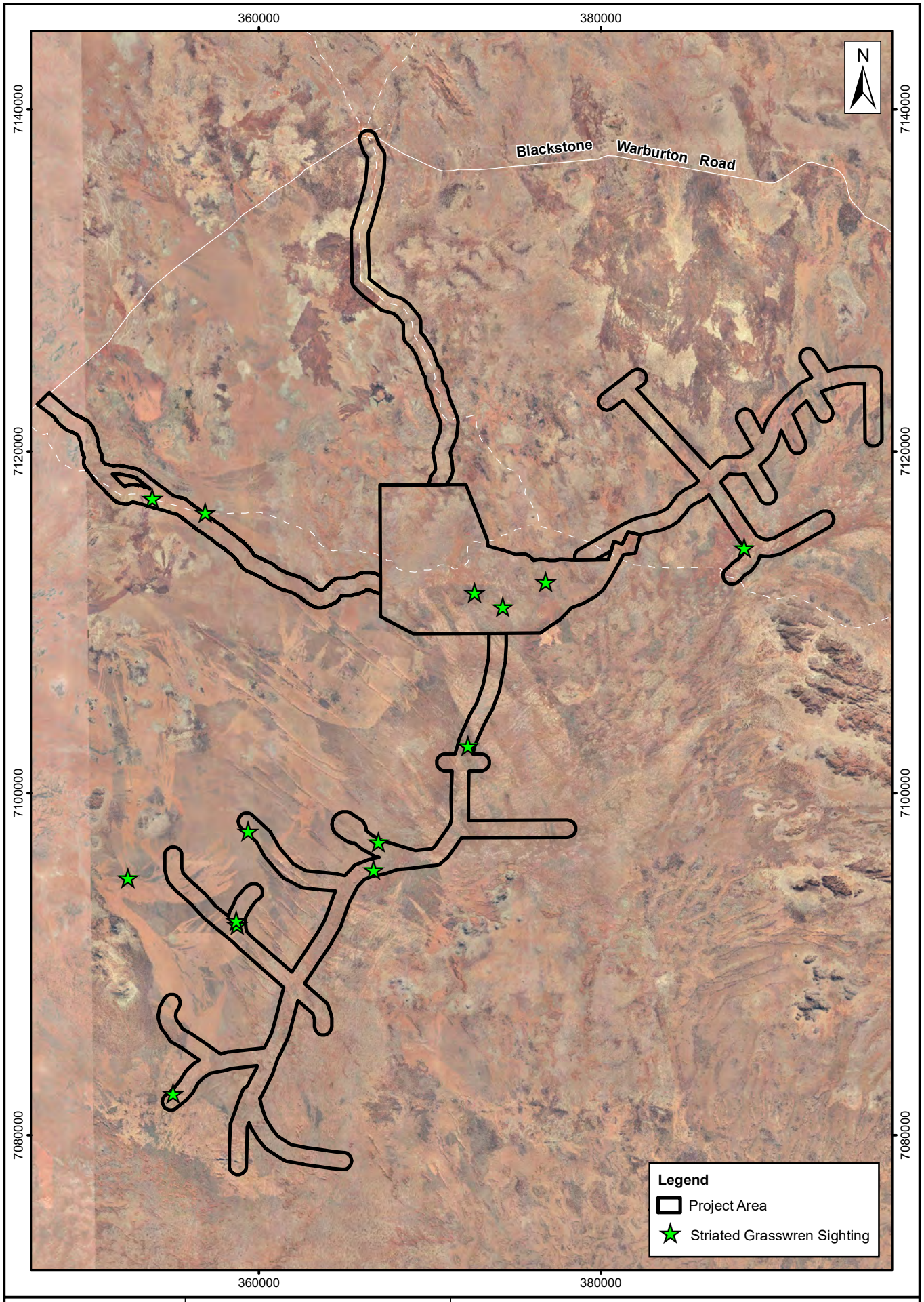
Historically, the **Night Parrot** was recorded across a large range in the arid and semi-arid interior of Australia (Garnett *et al*. 2011). In recent times however, there are very few verified records of the species. Reliable records in recent times are from two main areas, one in western Queensland and one in the Pilbara region of Western Australia (TSSC 2016b). The key habitats for the Night Parrot are thought to be chenopod shrublands and Spinifex grasslands, with the chenopod shrublands a refuge during dry conditions (Garnett *et al*. 2011). With the reasons for its decline unknown, potential threats to the species remain unconfirmed (TSSC 2016b). Possible threats include predation by feral cats or foxes, human-induced fire and degradation of soil around watering points (TSSC 2016b).

There are no recent records of the Night Parrot in this Bioregion. There is an 1896 record from a site that is presumed to be north of Lake Carnegie (about 500 km west of the Project Area) of a Night Parrot on a stony rise with Spinifex and Mulga (Storr 1985). Knowledge about the current distribution and habitat requirements of the Night Parrot in Western Australia is based on very few records. Therefore, there is considerable uncertainty when assessing the likelihood of occurrence of this species. The Project Area does not appear to have habitats similar to those where Night Parrots have been recorded in Queensland (*Triodia pungens* on alluvial gravels) or Western Australia, (old-growth spinifex in the vicinity of a saltlake). However, Spinifex grasslands are present across much of the Project Area and may support this species and the Project Area is within a 'high priority survey area' for the Night Parrot, according to recent guidelines (DPAW 2017).

Conservation Significance 2

Striated Grasswren (sandplain) *Amytornis striatus striatus*
This species is listed as Priority 4 by DBCA.

The sandplain subspecies of the **Striated Grasswren** occurs across much of arid Australia, inhabiting Spinifex sandplains, usually with an overstorey of shrubs or mallee eucalypts (Garnett *et al*. 2011, Johnstone and Storr 2004). It is listed as 'Near Threatened' in the Action Plan for Australian Birds due to its decline in the central and south-eastern parts of its range (Garnett *et al*. 2011). The key threat to the Striated Grasswren is extensive fires that burn mature Spinifex grasslands. The Striated Grasswren was recorded on the Western Access Road, Eastern Borefields, Southern Borefields and main Project Area (Figure 10). It is likely to occur in suitable habitats throughout the region, but may be absent from areas that have been subject to extensive fires.



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MGA94 (Zone 52)

CAD Ref: a2231_Mus_Fauna01_09

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Figure 10

West Musgrave Project

Striated Grasswren (*Amytornis striatus striatus*) records

5.4 Mammals

There are 42 species of mammal that have the potential to occur in the Project Area, of which 34 are native and eight introduced (Appendix 7). A total of 19 species were recorded on the June 2018 fauna survey, of which eleven were native (Table 12). In addition, scats of a kangaroo species, either the Red Kangaroo (*Osphranter robustus*) or Euro (*Osphranter robustus*), were recorded on the Southern Borefields, though no kangaroos were sighted on the survey.

Between zero and five native mammals were recorded at each trapping site (Table 12, Plate 20). Most of the species recorded favour sandy habitats such as Spinifex sandplain, sand dunes or patches of sand in amongst calcrete outcroppings. No ground-dwelling native mammals were recorded at trapping sites in mulga woodlands (Sites 3, 6 and 8), with the White-striped Freetail Bat at Site 8 the only native species recorded. Bats may forage over much of the Project Area at night, by day roosting in either tree hollows or in caves. Although there are no caves in the Project Area, some cave-roosting species may roost in crevices in the low rocky hills nearby. However, the bats recorded on the survey were all tree-roosting species.

Plate 20. Lesser Hairy-footed Dunnart (left) and Wongai Ningaui (right).

The mammal assemblage is dominated by species that favour sandy desert habitats. Most species are likely to be widespread across the central arid regions of Australia. There is also a small suite of species that favour rocky habitats, including the Fat-tailed Pseudantechinus (*Pseudantechinus macdonnellensis*), Long-tailed Dunnart (*Sminthopsis longicaudata*) and MacDonnell Ranges Black-footed Rock-Wallaby (*Petrogale lateralis*). Though they are known to occur in the region, these species are unlikely to occur on sandy or calcrete habitats, unless dispersing between rocky habitats. The dunnart and rock wallaby are of conservation significance and are further discussed in the next section.

The mammal assemblage is likely to be relatively intact, with the exception of species that are extinct in the Bioregion. Australia has a history of mammal extinctions since European settlement, most likely due to changed fire regimes and the impacts of feral Cats and Foxes (Woinarski *et al*. 2015). Several species would once have occurred in the Project Area, including the Boodie (*Bettongia lesueur*), extinct mounds of which were recorded on the Southern Borefield. Extinct mammals are not included in the list of those expected to occur in the Project Area.

Table 12. Mammals recorded in the Project Area, June 2018.

Species		Status	Site										Opportunistic
			1	2	3	4	5	6	7	8	9	10	
Dasyurid Marsupials													
Dasycercus blythi	Brush-tailed Mulgara	P4							1				
Ningaui ridei	Wongai Ningaui		1	2			2		2		2	3	
Sminthopsis ooldea	Ooldea Dunnart		1										
Sminthopsis youngsoni	Lesser Hairy-footed Dunnart											1	
Marsupial Moles													
Notoryctes typhlops	Southern Marsupial Mole	P4											+
Rodents (mice and rats)													
Notomys alexis	Spinifex Hopping Mouse		2			1	2				C		
Pseudomys desertor	Desert Mouse			1							1	2	
Pseudomys hermannsburgensis	Sandy Inland Mouse			1			7				2	1	
Bats													
Austronomus australis	White-striped Freetail Bat									A			
Ozimops petersi	Inland Freetail Bat			A									
Chalinolobus morio	Chocolate Wattled Bat								A			A	
Introduced fauna													
Mus musculus	House Mouse	Int.	2	1			4			1	4	1	
Bos taurus	Cow	Int.	+		+								
Camelus dromedarius	Camel	Int.	+			+		+	+	+	+		
Canis familiaris	Dingo/Dog	Int.	+						+	+	+		
Felis catus	Cat	Int.	+	+			+	+	+	+			
Equus caballus	Horse	Int.											+
Oryctolagus cuniculus	Rabbit	Int.											+
Vulpes vulpes	Fox	Int.				C							
Total native species:			**3**	**4**	**0**	**1**	**3**	**0**	**3**	**1**	**4**	**5**	
Total introduced species:			**5**	**2**	**1**	**2**	**2**	**2**	**3**	**4**	**3**	**1**	

Note that numbers may represent the same individuals recorded over successive days. + = Opportunistic, A = Anabat recording, C = camera record.

5.4.1 Mammals of Conservation Significance

There are eight mammals of conservation significance that may occur in the Project Area. Each species is listed and discussed below. Three mammals that are extinct or locally extinct were represented by historical records on databases; the Greater Stick-nest Rat (*Leporillus conditor*), Lesser Bilby (*Macrotis leucura*) and Crescent Nail-tail Wallaby (*Onychogalea lunata*). These have been omitted from the list of expected fauna and the discussion below.

Conservation Significance 1

Crest-tailed Mulgara *Dacycercus cristicauda*
This species is listed as Vulnerable under the EPBC Act and as Priority 4 by DBCA.

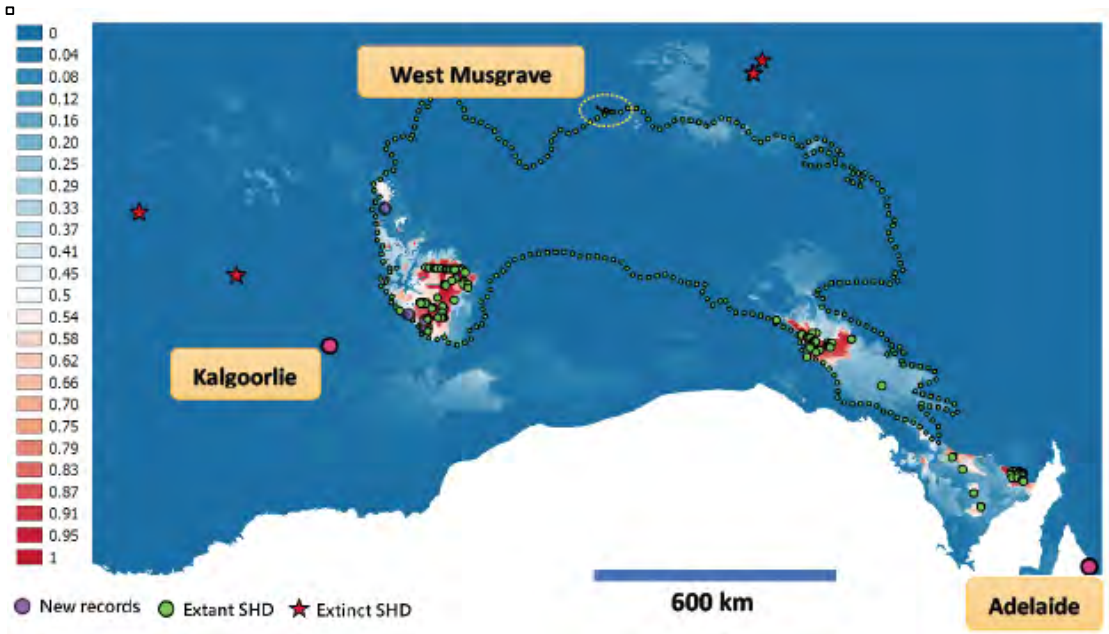
Sandhill Dunnart *Sminthopsis psammophila*
This species is listed as Endangered under the EPBC Act and under Schedule 2 (Endangered) of the WC Act.

Bilby *Macrotis lagotis*
This species is listed as Vulnerable under the EPBC Act and under Schedule 3 (Vulnerable) of the WC Act.

MacDonnell Ranges Black-footed Rock Wallaby *Petrogale lateralis (MacDonnell Range form)*
This species is listed as Vulnerable under the EPBC Act and under Schedule 3 (Vulnerable) of the WC Act.

The **Crest-tailed Mulgara** is not currently known to occur in Western Australia. Due to past taxonomic confusion, records of this species without specimens are ambiguous and may be of either Crest-tailed or Brush-tailed Mulgara. Though the former range is difficult to ascertain, it is known to have occurred in Western Australia in the past, including along the Canning Stock Route in the 1930s (Woinarski *et al*. 2014). It has been included here as the Project Area is in a region that is likely to have been within the former range of the species (Woolley *et al*. 2013), and little survey work has been undertaken in the region. Database records of this species (Appendix 7) are of anecdotal records collected from discussions with Traditional Owners, and may equally pertain to the Brush-tailed Mulgara. The Crest-tailed Mulgara digs a complex burrow system, inhabiting either dune crests with sparse vegetation or the herblands and sparse grasslands around salt lakes (Van Dyck and Strahan 2008, Woinarski *et al*. 2014). It can be distinguished from the Brush-tailed Mulgara on the basis of morphology, and Pavey *et al*. (2013) used tail morphology to distinguish between the two species in a study where they both occurred. Based on the current known distribution of the species and the habitat present, it is unlikely that the Crest-tailed Mulgara occurs in the Project Area.

The **Sandhill Dunnart** has declined significantly in both range and abundance. It is currently known only from the Great Victoria Desert in both Western Australia and South Australia, and the Eyre Peninsula in South Australia (Woinarski *et al*. 2014). The Sandhill Dunnart occurs in Spinifex grasslands on sand dunes, nesting in large Spinifex hummocks (Woinarski *et al*. 2014, Van Dyck and Strahan 2008). However, recent unpublished work modelling the probable distribution of the Sandhill Dunnart indicates that this species is unlikely to occur in the vicinity of the Project Area (Figure 11, J. Riley *pers.comm.* 2018). During the June survey it was observed that the sand dunes present were the wrong soil colour (Sandhill Dunnarts preferring yellow or pale orange), too recently burnt and with a low biodiversity of flora (J. Riley *pers.comm.* 2018). Current threats to the species are thought to include predation by feral Cats and Foxes and inappropriate fire regimes (Woinarski *et al*. 2014). On the basis on the current known distribution of the species and the habitats available in the Project Area, it is considered unlikely that the Sandhill Dunnart occurs in the Project Area.



Probability heatmap of Sandhill Dunnart (SHD) presence, where 1 = species present, 0 = no possibility of occurring.

Figure 11. Sandhill Dunnart probability distribution model (after Riley 2008, with permission).

The **Bilby** currently occurs patchily across the Pilbara and inland northern Australia with the total population estimated at less than 10,000 individuals and in decline (Woinarski *et al*. 2014). The Bilby inhabits spinifex on plains and alluvial areas, mulga on ridges and rises and tussock grasslands on uplands and hills (Pavey 2006). Current threats to the Bilby in the northern part of its range include too-frequent fires and introduced herbivores and water-points (TSSC 2016c). Potential threats include predation by Cats and Foxes, land clearing and mining developments (TSSC 2016c). There is a single historical record of this species within 100km (Table 10, Figure 8). As the Bilby can move its home range in response to the changing availability of food (Van Dyck and Strahan 2008), they may not always be present despite suitable habitat being available. The Bilby may occur on spinifex plains or in mulga over spinifex in the Project Area, though no definitive evidence of their presence (e.g. burrows or diggings) was noted.

The **MacDonnell Ranges Black-footed Rock-Wallaby** has undergone a substantial decline with numbers estimated at less than 10,000 individuals (Woinarski *et al*. 2014). In Western Australia it is extinct across much of its former range and most of the extant subpopulations are small. It occurs in the Townsend Ridges, Cavenagh, Morgan, Bell Rock, Rawlinson and Walter James Ranges, and is only reported to be locally abundant in the Pungkulpirri Rockhole in the Walter James Range (Pearson 2013). In South Australia, a monitored population occurs at the Tomkinson Range, on the border with Western Australia. All populations in Western Australia are considered important to the survival of this taxon (Pearson 2013). Key threats to the MacDonnell Ranges Black-footed Rock-Wallaby are predation by Foxes and Cats, invasive weeds and inappropriate fire regimes (Woinarski *et al*. 2014).

The MacDonnell Ranges Black-footed Rock-Wallaby lives in rocky habitats with critical habitat comprising areas with many shelter sites such as caves, rock piles and crevices (Pearson 2013). The population at Cavenagh Range is likely to be the closest known, and the edges of this range are about 2km south of the Eastern Borefields and 12 km east of the Nebo-Babel Area. There is an historic sighting at Lightning Rocks, 2km north of the Project Area, on DBCA's Threatened and Priority Fauna Database (Figure 8), but it is unknown whether the species currently occurs at this site. Although usually sedentary, individual wallabies have been reported to forage more than 1km from rocky habitats and individuals may disperse between isolated rocky habitats (Woinarski *et al*. 2014). The MacDonnell Ranges Black-footed Rock-Wallaby potentially occurs in the smaller rocky hills near the Project Area. This was unable to be confirmed during the fauna survey as rocky areas have generally been excised from the Project Area due to their importance as heritage sites, and access is restricted. The Project Area is probably too far from rocky habitats to be regular foarging habitat, but individuals may disperse across the Projetc Area on occasion, when moving between rocky hills.

Conservation Significance 2

Brush-tailed Mulgara *Dasycercus blythi*
This species is listed as Priority 4 by DBCA.

Long-tailed Dunnart *Sminthopsis longicaudata*
This species is listed as Priority 4 by DBCA.

Southern Marsupial Mole *Notoryctes typhlops*
This species is listed as Priority 4 by DBCA.

Central Long-eared Bat *Nyctophilus major tor*
This species is listed as Priority 3 by DBCA.

The **Brush-tailed Mulgara** is widely distributed across arid Australia, and though its population has declined in the past, it is currently thought to be stable or declining only slowly (Woinarski *et al*. 2014). It is thought that its ability to use a variety of food resources, tolerate severe declines in bodyweight, enter torpor and dig deep burrows has buffered the species from the impacts of feral predators and a variable climate and resource availability (Masters and Dickman 2012). It is therefore listed as of 'Least Concern' in the Action Plan for Australian Mammals 2012 (Woinarski *et al*. 2014). The Brush-tailed Mulgara occurs mostly on Spinifex grasslands, sheltering during the day in burrows. Tracks, burrows and diggings of this species were recorded across the Project Area, records were obtained on remote cameras on the Western Access Rd and one individual was trapped at Site 7 (Figure 12, Plate 21). Examination of the trapped individual and a road-killed individual confirmed that the mulgara present was the Brush-tailed Mulgara. This species is likely to occur in the Spinifex, Mulga and Mallee sandplains of the Project Area. During the field survey evidence of this species was particularly abundant on the Spinifex plains on the Southern Borefield and Western Access Road (Figure 12).

The **Long-tailed Dunnart** is associated with breakaways and scree slopes, but also occurs on gravel or stony plains (Van Dyck and Strahan 2008). This species potentially occurs on low rocky hills nearby, and may range onto stony hills and adjacent habitats in the Project Area. Much of the Project Area is unlikely to be significant habitat for the Long-tailed Dunnart, though this species may disperse through the area between isolated rocky hills.

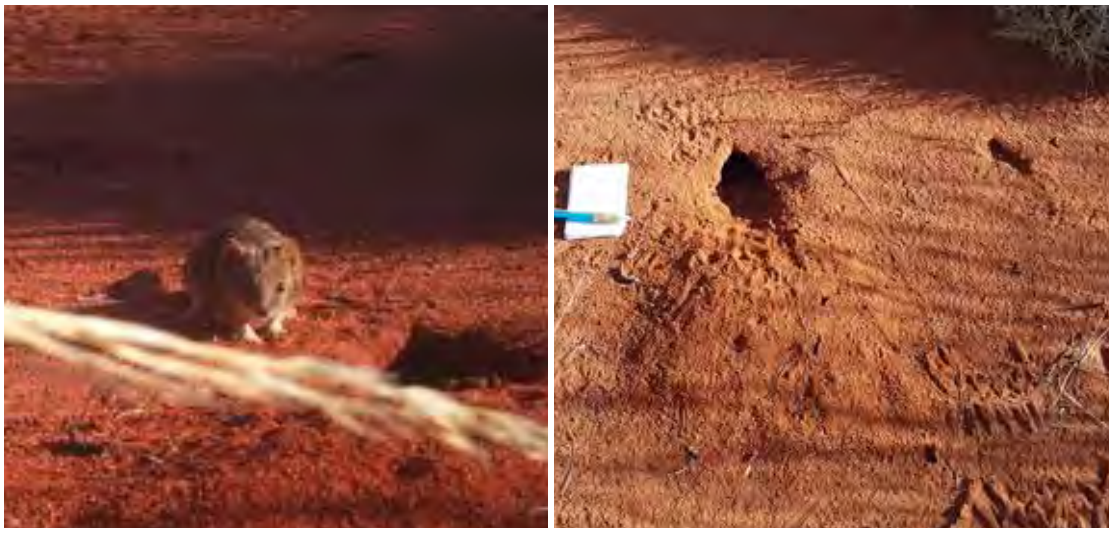
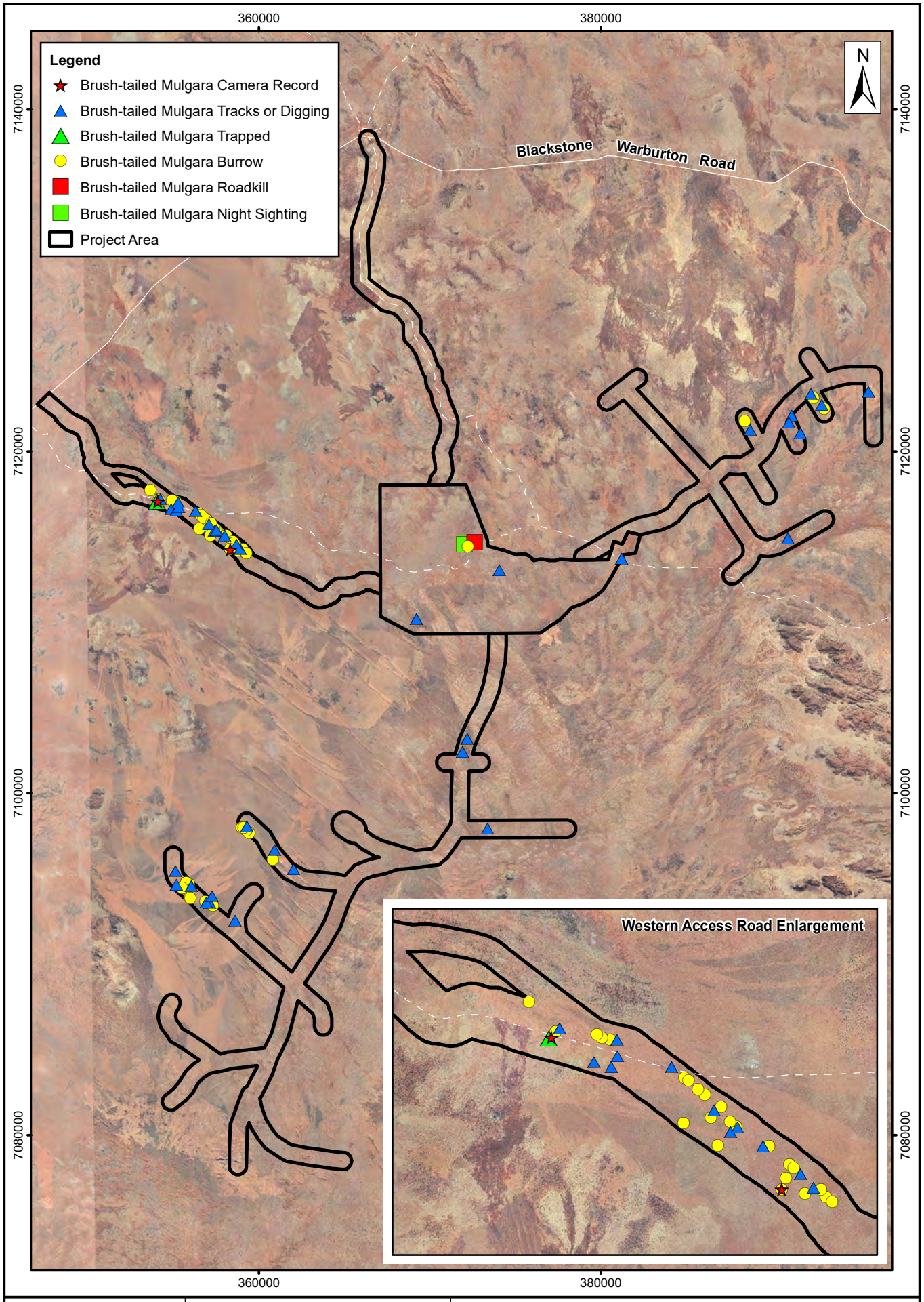


Plate 21. Brush-tailed Mulgara on camera (left) and burrow (right).

The **Southern Marsupial Mole** is widespread across the deserts of central Australia, occurring where its sand dune habitat is present (Woinarski *et al*. 2014). Although there are no robust estimates of population size, there is no evidence of on-going population decline and it is listed as of 'Least Concern' in the Action Plan for Australian Mammals 2012 (Woinarski *et al*. 2014). The Southern Marsupial Mole spends most of its time underground, where it 'swims' through the sand. Its underground lifestyle means that it may be less vulnerable to predation by feral Cats and Foxes (Woinarski *et al*. 2014). Evidence of its presence was found in dune cuttings on the Eastern Borefield, where numerous back-filled tunnels were observed, as well as a surface track on a dune (Figure 13, Plate 22). The Southern Marsupial Mole is likely to occur throughout the dune habitat in the Project Area.

Plate 22. Back-filled tunnel of a Southern Marsupial Mole.



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Scale: 1:300,000
MGA94 (Zone 52)

CAD Ref: a2231_Mus_Fauna01_10
Date: August 2018 | Rev: A | A4

Western Wildlife

Author: J. Wilcox | WW Ref:

Drawn: CAD Resources ~ www.cadresources.com.au
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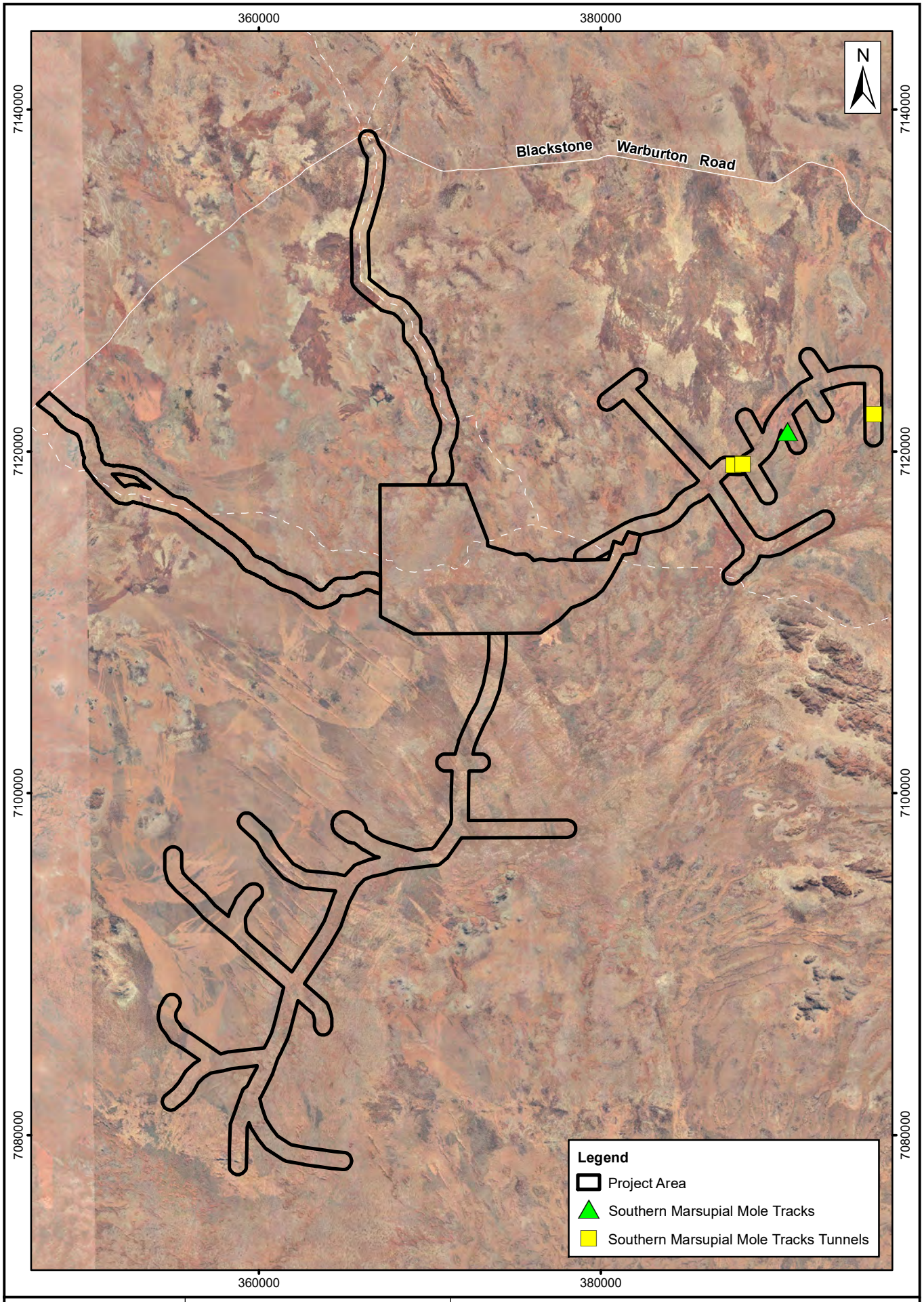
Figure 12

West Musgrave Project

Brush-tailed Mulgara (*Dasycercus blythi*) records



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MGA94 (Zone 52)

CAD Ref: a2231_Mus_Fauna01_11

Date: August 2018 | Rev: A | A4

Western Wildlife

Author: J. Wilcox | WW Ref:

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Figure 13

West Musgrave Project

Southern Marsupial Mole (*Notoryctes typhlops*) records

The **Central Long-eared Bat** occurs across southern central Australia, inhabiting woodlands, mallee and thickets (Woinarski *et al*. 2014). Although there are no estimates of population size, it is not thought to be declining and the there is no evidence that its range has contracted (Woinarski *et al*. 2014). The Central Long-eared Bat was recorded 115 km east of the Project Area in mulga woodland at Wingellina (Outback Ecology 2012), and this appears to represent the northern-most extent of its range in Western Australia. The Central Long-eared Bat is likely to occur in the mulga woodlands of the Project Area. Although *Nyctophilus sp*. were present, this species was not positively identified as the calls of the Central Long-eared Bat are difficult to distinguish from other species of *Nyctophilus* in range (Appendix 11). Therefore, the presence of this species in the Projetc Area remains unconfirmed.

5.4.2 Feral Mammals

Seven feral mammal species were recorded in the Project Area (Table 13, Appendix 7). Camels (*Camelus dromedarius*) were very common, with several groups sighted and evidence, such as tracks, scats and trampling of vegetation, almost ubiquitous across the Project Area (Plate 23). Camels cause environmental damage through their foraging behaviour and trampling of vegetation, competing with native species for food and shelter (Edwards *et al*. 2008). Camels can range over extremely large areas of thousands to tens of thousands of square kilometres. Though they can live without free water for considerable periods of time, in hot dry summers they may encroach into communities searching for water and cause damage to wetland habitats (Edwards *et al*. 2008, Saalfeld and Edwards 2008). The Project Area is within an area with some of the highest camel densities in Australia, estimated at between 0.5 and up to 1.0 camel per square kilometre in 2013, though this is down from 2008 estimates of up to 2.0 camels per square kilometre (McGregor *et al*. 2013).

Plate 23. Feral Camels in the Project Area.

The Cat (*Felis catus*), Fox (*Vulpes vulpes*) and Wild Dog (*Canis familiaris*) are feral predators known to prey on native fauna species. 'Predation by Feral Cats' and 'Predation by the European Red Fox' are listed as a key threatening processes under the EPBC Act.

Foxes prey on 'critical weight range' mammals (i.e. those between 35g and 5.5kg) and ground-nesting birds (Commonwealth of Australia 2008). Feral Cats have contributed to the extinction of many small to medium sized native mammals and ground-nesting birds in the arid zone (Commonwealth of Australia 2015a). Though mammals tend to be the dominant prey (Commonwealth of Australia 2015a), each Feral Cat in natural environments kills on average 225 reptiles per year, with cats in arid areas taking even more, equating to the predation of about 1.8 million reptiles per day (Woinarski *et al*. 2018). Though the overall impact on reptile populations remains undetermined, Cats are known to prey on the Great Desert Skink (*Liopholis kintorei*). Predation by Cats and/or Foxes is listed as a threat to many EPBC-listed species, including the Bilby (*Macrotis lagotis*) and the MacDonnell Ranges Black-footed Rock-Wallaby (*Petrogale lateralis*) (Woinarski *et al*. 2014, Commonwealth of Australia 2015a).

The relationships between feral predators are complex, as they may compete for prey, prey on each other or kill to remove a competitor. The presence of one predator, such as a wild dog or dingo, may affect the behaviour or suppress the abundance of smaller species, such as Cats (Commonwealth of Australia 2015b). Also, the presence of feral prey species such as Rabbits (*Oryctolagus cuniculus*) can support Fox populations (Commonwealth of Australia 2008). These complex interactions mean that control of these species is not straightforward, as reducing the population of one species may result in the increase in another.

6. Conclusions

The faunal assemblage of the Project Area is likely to be diverse, though many of the species that occur are widely distributed through arid Australia. The fauna is dominated by species that favour sandy habitats, and there is a predominance of these in the Project Area (e.g. dune fields, sandplains). The predicted faunal assemblage includes up to seven frogs, 95 reptiles, 120 birds and 42 mammals (34 native mammals). The observed assemblage thus far includes no frogs, 48 reptiles, 67 birds and 19 mammals (11 native mammals).

Twenty-one conservation significant fauna have been recorded or potentially occur in the Project Area, though three of these are considered likely to be locally extinct (Table 13). Their use, or potential use, of the Project Area can be divided into the following categories:

1. **Resident breeding species.**

The Great Desert Skink (CS1), Brush-tailed Mulgara (CS2), Southern Marsupial Mole (CS2), Striated Grasswren (CS2) and Woma (CS3) were all recorded in the Project Area and are all likely to be resident, breeding populations. The Central Long-eared Bat (CS2) remains unrecorded, but if present, is also likely to be resident.

Of these, the Great Desert Skink is listed as Vulnerable under the EPBC Act and has a small, declining population. The remaining species are listed as Priority, are relatively common and if they are declining, it is not at a sufficient rate to list them as Vulnerable. The Great Desert Skink was found in the Southern Borefields (Figure 9). Though the extent of the population remains undefined, it is potentially highly significant as this species is known from few localities. The distribution of this species in and around the Project Area is likely to have been influenced by extensive fires, the presence of feral predators and possibly also by feral camels trampling burrow systems. As a large diurnal lizard, this species may also be susceptible to road mortalities when active during the warmer months.

The Brush-tailed Mulgara and Striated Grasswren were widely recorded throughout the Project Area. The distribution of these species may also be influenced by fire, as they would be more susceptible to predation in open habitats, and extensive fires could cause local extinctions. The Southern Marsupial Mole is less susceptible to the impacts of fire and feral predators due to its subterranean habits, and is likely to occur in sand dunes in and around the Project Area.

2. Non-breeding visitors.

The Peregrine Falcon (CS1), Grey Falcon (CS1), Princess Parrot (CS1), Fork-tailed Swift (CS1), Common Sandpiper (CS1), Sharp-tailed Sandpiper (CS1), Pectoral Sandpiper (CS1) and Oriental Plover (CS1) are all likely to be non-breeding visitors to the Project Area. These species may make regular or occasional forays into the Project Area to forage, but breeding habitat is absent. These species are generally highly mobile, with the Princess Parrot, Fork-tailed Swift and falcon species potentially foraging over large tracts of land. The migratory shorebirds are only likely to visit in the summer months, occurring on inundated claypans.

3. Dispersing species.

Dispersing species are unlikely to regularly use habitats present in the Project Area, but may move through the Project Area between patches of suitable habitat. Dispersal is important as it can allow for recolonization after local extinctions and the exchange of genes between populations. The Project Area is unlikely to provide significant habitat for foraging or breeding for the MacDonnell Ranges Black-footed Rock Wallaby (CS1) and Long-tailed Dunnart (CS2), as they favour rocky habitats. However, these species may disperse through the Project Area on occasion, when moving between isolated rocky hills.

4. Scarce residents or visitors.

The Bilby (CS1) may be a scarce resident, or may only occur in years of high productivity. The one nearby record of this species is historical and the Project Area is to the south of its current known range is the species. The status of the Night Parrot (CS1) in the Project Area and in the region in general is difficult to ascertain, but if present, it is most likely to fit with this group.

5. Locally extinct species

The Crest-tailed Mulgara (CS1), Sandhill Dunnart (CS1) and Malleefowl (CS1) may have occurred in the Project Area historically, but it appears likely that these species are locally extinct. Whether or not the habitat in the region was suitable in the past, it appears that it is not presently suitable for these species based on current research, and there are no recent records of these species in the region.

Table 13. Summary of conservation significant (CS) fauna.

Key to status: En = Endangered, Vu = Vulnerable, Mig = Migratory, S1 – S7 = Schedule 1 – 7, P1 – P4 = Priority 1 – 4, LS = Locally Significant.

Species	Conservation Status				Records within 100km (DBCA 2018, see also Figure 8)	Recorded in Project Area (this survey)	Likelihood of Occurrence	Likely Status in Project Area	Potential habitat use in the Project Area	Explanatory notes
	EPBC Act	WC Act	DBCA Priority	Locally significant						
CS1										
Pezoporus occidentalis **Night Parrot**	En	S1	-	-	No records within 100km	-	Low (?)	Scarce resident or visitor	• Spinifex, Mulga or Mallee Sandplain (where old-growth Spinifex present) • Sand dunes (where old-growth Spinifex present) • Chenopod shrubland	The paucity of data on this species means it is difficult to state with certainty its potential status in the Project Area. The habitats present lack the *Triodia longiceps* present at known Night Parrot localities and the chenopod shrubland is not extensive and very sparse.
Sminthopsis psammophila **Sandhill Dunnart**	En	S2	-	-	No records within 100km	-	Negligible	Locally extinct	• Unlikely to currently use any habitat in the Project Area.	Current research on the habitat requirements of this species suggests that it is unlikely to occur in the region.
Liopholis kintorei **Great Desert Skink**	Vu	S3	-	-	No records within 100km	Recorded in Southern Borefields	Known to occur	Resident	• Spinifex sandplain	This species was recorded in Spinifex sandplains during the fauna survey.

Table 13. (cont.)

Species	Conservation Status				Records within 100km (DBCA 2018, see also Figure 8)	Recorded in Project Area (this survey)	Likelihood of Occurrence	Likely Status in Project Area	Potential habitat use in the Project Area	Explanatory notes
	EPBC Act	WC Act	DBCA Priority	Locally significant						
Leipoa ocellata **Malleefowl**	Vu	S3	-	-	Four records: • Tomkinson Range (undated historical record) • Fort Mueller, 12km southeast of the Project Area (undated historical record) • 35miles SSE of Giles Meteorological Station, 65km northeast of the Project Area (1956) • 8 miles SW of Mt Palgrave, 34km west of the Project Area (1972)	-	Negligible	Locally extinct	• Unlikely to currently use any habitat in the Project Area.	This species is only known from historical records in the region. No mounds or other evidence was detected during the fauna survey. It is likely that its range has contracted south. As a large diurnal bird with distinctive mounds, it is unlikely that this species would remain unrecorded if still present in the region.
Polytelis alexandrae **Princess Parrot**	Vu	-	P4	-	No records within 100km	-	Moderate	Non-breeding visitor	• Mulga sandplain • Mallee sandplain	The Project Area lacks breeding habitat, but this wide-ranging species may occur as a foraging visitor. An irruptive species, it may occur in some years and not others.

Table 13. (cont.)

Species	Conservation Status				Records within 100km (DBCA 2018, see also Figure 8)	Recorded in Project Area (this survey)	Likelihood of Occurrence	Likely Status in Project Area	Potential habitat use in the Project Area	Explanatory notes
	EPBC Act	WC Act	DBCA Priority	Locally significant						
Dasycercus cristicauda **Crest-tailed Mulgara**	Vu	-	P4	-	No records within 100km	-	Negligible	Locally extinct	• Unlikely to currently use any habitat in the Project Area.	This species is not currently known to occur in Western Australia. The habitats of the Project Area are dissimilar to the habitats where this species currently occurs.
Macrotis lagotis **Bilby**	Vu	S3	-	-	One record: • 19km SW of Mt Aloysius, Blackstone Range, 50km east of the Project Area (1966)	-	Low	Scarce resident or visitor	• Mulga sandplain • Spinifex sandplain • May also forage across adjoining habitats.	Though not known to occur as far south as the Project Area, this wide-ranging nocturnal species can be cryptic and therefore difficult to record.

Table 13. (cont).

Species	Conservation Status				Records within 100km (DBCA 2018, see also Figure 8)	Recorded in Project Area (this survey)	Likelihood of Occurrence	Likely Status in Project Area	Potential habitat use in the Project Area	Explanatory notes
	EPBC Act	WC Act	DBCA Priority	Locally significant						
Petrogale lateralis **MacDonnell R. Black-footed Rock Wallaby**	Vu	S3	-	-	Seven records, including: • Cavenagh Range, 12km southeast of the Poject Area (undated historical record) • Lightning Rocks, 2km north of the Project Area (1959) • Cumming Gorge in the Rawlinson Ranges, 69km north of the Project Area (2012) • Fort Mueller in the Cavenagh Range, 12km southeast of the Project Area (undated historical record) • Ngaanyatjarra-Giles, 2km north of the Project Area (1959) • Two records from Townsend Ridges, 65km west of the Project Area (1996)	-	Moderate	Dispersing visitor (occasional)	• Disperse through any habitat.	This species in known to occur in the region. Though it spends most of its time in rugged rocky habitats, it may occasionally disperse through the Project Area between isolated rocky hills.

Table 13. (cont).

Species	Conservation Status				Records within 100km (DBCA 2018, see also Figure 8)	Recorded in Project Area (this survey)	Likelihood of Occurrence	Likely Status in Project Area	Potential habitat use in the Project Area	Explanatory notes
	EPBC Act	WC Act	DBCA Priority	Locally significant						
Charadrius veredus **Oriental Plover**	Mig	S5			No records within 100km	-	Low	Non-breeding visitor (occasional)	• Claypans • Chenopod shrublands • Burnt or open areas in other habitats	This species is known to occur at inland sites. It may occur in low numbers.
Tringa hypoleucos **Common Sandpiper**	Mig	S5			No records within 100km	-	Low	Non-breeding visitor (occasional)	• Claypans (when inundated)	This species is known to occur on inland waters. The small claypans in the Project Area may provide some habitat after summer rain.
Calidris acuminata **Sharp-tailed Sandpiper**	Mig	S5			No records within 100km	-	Low	Non-breeding visitor (occasional)	• Claypans (when inundated)	This species is known to occur on inland waters. The small claypans in the Project Area may provide some habitat after summer rain.
Calidris melanotos **Pectoral Sandpiper**	Mig	S5			No records within 100km	-	Low	Non-breeding visitor (occasional)	• Claypans (when inundated)	This species is known to occur on inland waters. The small claypans in the Project Area may provide some habitat after summer rain.
Apus pacificus **Fork-tailed Swift**	Mig	S5			No records within 100km	-	Moderate	Non-breeding visitor	• May overfly any habitat.	This species is largely aerial in Australia, thought to sleep on the wing. Though not recorded nearby, it occurs across most of Australia.

Table 13. (cont).

Species	Conservation Status				Records within 100km (DBCA 2018, see also Figure 8)	Recorded in Project Area (this survey)	Likelihood of Occurrence	Likely Status in Project Area	Potential habitat use in the Project Area	Explanatory notes
	EPBC Act	WC Act	DBCA Priority	Locally significant						
Falco hypoleucos **Grey Falcon**		S3			No records within 100km	-	Low	Non-breeding visitor	• May forage over any habitat.	The Project Area lacks breeding habitat for this species and is distant from potential breeding habitat such as larger rivers.
Falco peregrinus **Peregrine Falcon**		S7			One record: • Ngaanyatjarra-Giles, 44km north of the Project Area (1978)	-	Moderate	Non-breeding visitor	• May forage over any habitat.	The Project Area lacks breeding habitat for this species, though potential breeding habitat occurs in nearby hills and ranges. Known to occur in the region, if a pair is nesting nearby they may forage over the Project Area.
CS2										
Amytornis striatus striatus **Striated Grasswren (sandplain)**			P4		Two records: • 2 records from Mt Palgrave, 20km west of the Project Area (1969)	Recorded in Nebo-Babel Area, Southern Borefields, Eastern Borefields, Western Access Rd	Known to occur	Resident	• Spinifex sandplain • Mallee sandplain • Mulga sandplain	This species is known to occur in the region and was recorded during the fauna survey.

Table 13. (cont.)

Species	Conservation Status				Records within 100km (DBCA 2018, see also Figure 8)	Recorded in Project Area (this survey)	Likelihood of Occurrence	Likely Status in Project Area	Potential habitat use in the Project Area	Explanatory notes
	EPBC Act	WC Act	DBCA Priority	Locally significant						
Dasycercus blythi **Brush-tailed Mulgara**			P4		129 records: • 4 within the south-west corner of the Nebo-Babel Area and 121 within 1.5km of the south-west corner of the Nebo-Babel Area (from 2011 & 2012). • 8 records from Bergenost Prospect, 25km northeast of the Project Area (2013)	Recorded in Nebo-Babel Area, Southern Borefields, Eastern Borefields, Western Access Rd	Known to occur	Resident	• Spinifex sandplain (favoured) • Also occurs in Mallee sandplain and Mulga sandplain	This species is known to occur in the region and was positively identified in the Project Area from a roadkilled individual and a trapped individual. Evidence of this species was common, particularly in the Spinifex Sandplain habitat.
Sminthopsis longicaudata **Long-tailed Dunnart**			P4		No records within 100km	-	Low	Dispersing visitor (occasional)	• Stony hills and plains	Though there are no nearby records, this species is not often trapped and the Project Area is within its known range. However, the Project Area lacks the rocky and scree habitats favoured by this species.

Table 13. (cont.)

Species	Conservation Status				Records within 100km (DBCA 2018, see also Figure 8)	Recorded in Project Area (this survey)	Likelihood of Occurrence	Likely Status in Project Area	Potential habitat use in the Project Area	Explanatory notes
	EPBC Act	WC Act	DBCA Priority	Locally significant						
Notoryctes typhlops **Southern Marsupial Mole**	-	-	P4	-	Four records: • 2 from the Mitika Area, 80km northeast of Warburton and 63km northwest of the Project Area (1983 & 1984) • Near Murtimurti rockhole, 55km southeast of the Project Area (1996) • 5km northwest of Windich Hill, 38km west of the Project Area (1993)	Recorded in Eastern Borefields	Known to occur	Resident	• Sand dunes	Evidence of this species was recorded on sand dunes in the Project Area.
Nyctophilus major tor **Central Long-eared Bat**	-	-	P3	-	No records within 100km	-	Moderate	Resident	• Mulga woodland • Mulga sandplain	The Project Area is within the known range of this species, and Mulga potentially provides roosting and foraging habitat.
CS3										
Aspidites ramsayi **Woma**	-	-	-	LS	No records within 100km	Recorded on Western Access Rd	Known to occur	Resident	• Spinifex sandplain • Mulga sandplain • Mallee sandplain	This species is known to occur in sandy habitats and was recorded in the Project Area.

7. References

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

Barton, B. and Cowan, M. (2001). Great Victoria Desert 2 (GVD 2 – Great Victoria Desert Central Subregion). In 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002). Ed by J.E. May and N.L. McKenzie. Department of Conservation and land Management, Western Australia.

Benshemesh, J. (2007). *National Recovery Plan for Malleefowl*. Department of Environment and Heritage, South Australia.

Biota Environmental Sciences (2012a). *Babel West Targeted Fauna Survey*. Unpublished report prepared for BHP Billiton, March 2012.

Biota Environmental Sciences (2012b). *NVCP CPS4631 Targeted Fauna Survey for the Gerar Prospect*. Unpublished report prepared for BHP Billiton, January 2012.

BirdLife International (2018) IUCN Red List for birds. URL: http://www.birdlife.org

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

Bruton, M., Wilson, S., Shea, G., Ellis, R., Venz, M., Hobson, R. & Sanderson, C. (2017). *Aspidites ramsayi*. The IUCN Red List of Threatened Species 2017. URL: http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T2176A83765377.en.

Bureau of Meterology (2018). Monthly Climate Statistics for Giles Meterological Office and Warburton Airfield. URL: http://www.bom.gov.au/climate/

Cadenhead, N.C.R., M.R. Kearney, D. Moore, S. McAlpin & B.A. Wintle (2016). Climate and Fire Scenario Uncertainty Dominate the Evaluation of Options for Conserving the Great Desert Skink. *Conservation Letters*. 9(3):181-190.

Churchill, S. (1998). *Australian Bats*. Reed New Holland, Sydney.

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

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

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

Commonwealth of Australia (2015b). Bacground Information for the threat abatement plan for predation by feral cats.

Debus, S. (1998). *The Birds of Prey of Australia: A Field Guide*. Oxford University Press, Australia.

DBCA (2007-). *Naturemap: Mapping Western Australia's Biodiversity*. Department of Environment and Conservation. URL: http://naturemap.dec.wa.gov.au/

DBCA (2016). *Guidelines for surveys to detect the presence of bilbies, and assess the importance of habitat in Western Australia*. Version 1. URL:

https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/guidelines_for_surveys_to_detect_the_presence_of_bilbies.pdf

DBCA (2018). Threatened and Priority Fauna Database extract, August 2018.

DPAW (2016). *Survey and monitoring guidelines for the Sandhill Dunnart in Western Australia*. Prepared by Tamra Chapman for the Great Victoria Desert Trust.

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

DEWHA (Department of the Environment, Water, Heritage and the Arts) (2004). Interim Biogeographic Regionalisation for Australia (IBRA), Version 6.1.

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

Edwards, G. P., Zeng, B. and Saalfeld, W.K. (2008). Ecology of feral camels in Australia. In: 'Managing the impacts of feral camels in Australia: a new way of doing business'. (Eds G. P. Edwards, B. Zeng, W. K. Saalfeld, P. Vaarzon-Morel and M. McGregor.) Pp. 9-34. Desert Knowledge Cooperative Research Centre (DKCRC) Report 47, Alice Springs.

Environmental Protection Authority (EPA) (2016a). *Statement of Environmental Principles, Factors and Objectives.* EPA, Western Australia.

EPA (2016b). *Environmental Factor Guideline – Terrestrial Fauna*. EPA, Western Australia.

EPA (2016c). *Technical Guidance – Terrestrial Fauna Surveys*. EPA, Western Australia.

EPA and DEC (Department of Environment and Conservation) (2010). *Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Eds B.M. Hyder, J. Dell and M.A. Cowan. Perth, Western Australia.

Everard, C. and Bamford, M. (2018a). *Significant Fauna Assessment – West Musgrave Project*. Unpublished report to Cassini Resources Limited by Bamford Consulting Ecologists, Kingsley.

Everard, C. and Bamford, M. (2018b). *Cassini Resource Limited Nebo-Babel Mining Areas – West Musgrave Project, Level 1 Fauna Assessment*. Unpublished report to Cassini Resources Limited by Bamford Consulting Ecologists, Kingsley.

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

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

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

Graham, D. and Cowan, M. (2001). Central Ranges 1 (CR1 – Mann-Musgrave Block Subregion). In 'A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002). Ed by J.E. May and N.L. McKenzie. Department of Conservation and land Management, Western Australia.

HGM Maunsell (2002). *Wingellina Baseline Biological Survey*. Unpublished report prepared for Acclaimed Exploration NL.

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

(Emu to Dollarbird). Western Australian Museum, Perth.

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

McGregor, M., Hart, Q. Bubb, A. and Davies R. (2013). *Managing the impacts of feral camels across remote Australia – final report of the Australian Feral Camel Management Project*. Report by Ninti One Limited.

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

Outback Ecology (2008). *Wingellina Nickel Project, Flora and Fauna Desktop Study of tenement L69/12 or 69/2453*. Unpublished report prepared for Metals X Limited, May 2008.

Outback Ecology (2009). *Wingellina Nickel Project, Level 2 Terrestrial Fauna Assessment*. Unpublished report prepared for Metals X Limited, April 2009.

Outback Ecology (2012). *Level 1 Terrestrial Fauna Assessment of the Wingellina Borefield and Borefield Pipeline Route.* Unpublished report prepared for Metals X Limited, May 2012.

Pavey, C.R., Nano, C.E.M., Cooper, J.B., Cole, J.R. and McDonald, P.J. (2011). Habitat use, population dynamics and species identification of mulgara, *Dasycercus blythi* and *D. cristicauda*, in a zone of sympatry in central Australia. *Australian Journal of Zoology*. 59:156-159.

Pearson, D.J. (2013). *Recovery plan for five species of rock wallabies: Black-footed rock wallaby* (Petrogale lateralis)*, Rothschild rock wallaby* (Petrogale rothschildi)*, Short-eared rock wallaby* (Petrogale brachyotis)*, Monjon* (Petrogale burbidgei) *and Nabarlek* (Petrogale concinna) *2012-2022*. Department of Parks and Wildlife, Perth, WA.

Pavey, C. (2006). National Recovery Plan for the Greater Bilby *Macrotis lagotis*. Northern Territory Department of Natural Resources, Environment and the Arts.

Riley, J. (2018). PhD candidate researching Sandhill Dunnart in the Great Victoria Desert. Unpublished research and personal communications.

Saalfeld, W. K., and Edwards, G. P. (2008). Ecology of feral camels in Australia. In: 'Managing the impacts of feral camels in Australia: a new way of doing business'. (Eds G. P. Edwards, B. Zeng, W. K. Saalfeld, P. Vaarzon-Morel and M. McGregor.) Pp. 9-34. Desert Knowledge Cooperative Research Centre (DKCRC) Report 47, Alice Springs.

Storr, G.M. (1985). Birds of the Mid-eastern Interior of Western Australia. *Records of the Western Australian Museum* Supplement 22.

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

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

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

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

TSSC (Threatened Species Scientific Committee) (2016a). *Conservation Advice* Liopholis kintorei *great desert skink*. Canberra: Department of the Environment and Energy. Available

from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/83160-conservation-advice-16122016.pdf. In effect under the EPBC Act from 16-Dec-2016.

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

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

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

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

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

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

Wilson, S. and Swan, G. (2010). *A complete guide to the reptiles of Australia. 3rd Edition*. New Holland Publishers (Australia).

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

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

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

Woolley, P.A., Haslem, A. and Westerman, M. (2013). Past and present distribution of Dasycercus: towards a better understanding of the identity of specimens in cave deposits and the conservation status of the currently recognised species D. blythi and D. cristicauda (Marsupialia: Dasyuridae). *Australian Journal of Zoology* 61(4)

Appendices.

Appendix 1. Targeted Transects.

Transect Name	Habitat	Location	Date	Distance
T001 AG	Spinifex sandplain	Western Access Road	26/06/2018	10.4km
T001 RL	Sandplain/dune	Nebo-Babel Area	27/06/2018	3.8km
T001_JR	Calcrete/sand sheet, dunes	Nebo-Babel Area	27/06/2018	2.6km
T001_JW	Spinifex sandplain and Mulga Grove	Nebo-Babel Area	26/06/2018	5.4km
T001_MB	Spinifex sandplain	Western Access	26/06/2018	10.5km
T002 AG	Spinifex sandplain with some Mulga	Eastern Borefields	28/06/2018	5.1km
T002 RL	Undulating Spinifex sandplain with dunes & calcrete rises	Southern Borefields	29/06/2018	3.1km
T002_JR	Sandplain/calcrete rises	Nebo-Babel Area	28/06/2018	4.8km
T003 AG	Spinifex sandplain	Eastern Borefields	29/06/2018	5.0km
T003 RL	Sandy undulating plains & dunefields	Southern Borefields	29/06/2018	6.8km
T003_JR	Dunes	Nebo-Babel Area	28/06/2018	2.4km
T003_JW	Calcrete/sand sheet	Nebo-Babel Area	27/06/2018	3.9km
T004 AG	Spinifex sandplain	Southern Borefields	30/06/2018	4.1km
T004 RL	Mallee/bloodwood undulating sandplain with calcrete rises	Southern Borefields	29/06/2018	6.1km
T004_JR	Mallee grove/dunes & calcrete rises	Nebo-Babel Area	28/06/2018	2.3km
T005 AG	Spinifex sandplain	Eastern Borefields	1/07/2018	4.1km
T005 RL	Undulating mallee/Spinifex sandplain/low dunes, recent burn	Southern Borefields	30/06/2018	1.5km
T005_JR	Undulating mallee sandplain & dunes	Nebo-Babel Area	28/06/2018	2.1km
T005_MB	Sand dunes with sand on calcrete between dunes	Eastern Borefields	28/06/2018	3.4km
T006 AG	Spinifex sandplain	Eastern Borefields	2/07/2018	6.2km
T006 RL	Spinifex/shrubby sandplain, recently burnt	Southern Borefields	30/06/2018	3.4km
T006_JR	Mallee sandplain & dunes	Nebo-Babel Area	28/06/2018	1.9km
T006_JW	Calcrete/sand sheet, burnt	Southern Borefields	29/06/2018	0.9km
T007 AG	Mostly spinifex on loamy sand plain - see habitat description	Eastern Borefields	2/07/2018	5.3km
T007 RL	Undulating mallee/bloodwood sandplain with isolated red dunes & calcrete rises	Southern Borefields	30/06/2018	7.2km
T007_JR	Calcrete, sandplain and dunes, scattered bloodwoods	Southern Borefields	29/06/2018	2.5km
T007_JW	Mulga woodland, scattered Mallee, some over Spinifex	Southern Borefields	29/06/2018	4.6km
T007_MB	Eucs. Mallee over spinifex on sand. Mulga grove. Sand dunes	Eastern Borefields	29/06/2018	5.8km
T008 RL	Open shrubland & sparse bloodwoods on low undulating calcrete sandy rises & dunes	Southern Borefields	1/07/2018	5.7km
T008_JR	Calcrete, sandplain and dunes, scattered bloodwoods	Southern Borefields	29/06/2018	3.1km
T008_MB	Sand dunes with sand on calcrete between dunes	Southern Borefields	30/06/2018	4.6km
T009 RL	Spinifex sandplain with sparse shrubland	Southern Borefields	1/07/2018	7.5km

Transect Name	Habitat	Location	Date	Distance
T009_JR	Calcrete, sandplain and dunes, scattered bloodwoods	Southern Borefields	29/06/2018	4.0km
T009_MB	Sand dunes	Eastern Borefields	1/07/2018	3.5km
T010 RL	Sandy calcrete rises & plains with bloodwood & shrubland	Southern Borefields	1/07/2018	5.3km
T010_JR	Sandplain, scattered bloodwoods	Southern Borefields	30/06/2018	2.3km
T010_MB	Sand dunes with sand on calcrete between dunes	Eastern Borefields	2/07/2018	5.0km
T011_JR	Sandplain, dunes, some long-unburnt habitat	Southern Borefields	30/06/2018	5.2km
T011_MB	Calcrete and sand with occasional dune	Eastern Borefields	2/07/2018	5.2km
T012 RL	Shrubby Spinifex sandplain	Southern Borefields	2/07/2018	9.6km
T012_JR	Calcrete, sandplain and dunes, scattered bloodwoods	Southern Borefields	1/07/2018	3.4km
T013_JR	Sandplain	Southern Borefields	1/07/2018	5.3km
T014_JR	Calcrete, sandplain and dunes	Southern Borefields	1/07/2018	3.5km
T015 RL	Spinifex grassland with sparse shrubland on stony (calcrete) plains	Southern Borefields	2/07/2018	5.0km
T015_JR	Sandplain, dunes	Southern Borefields	2/07/2018	6.1km
T015_MB	Grassland with open Mulga	Western Access Road	3/07/2018	3.9km
T016 RL	Spinifex sandplain & dunes	Southern Borefields	3/07/2018	3.5km
T016_JR	Sandplain, dunes	Southern Borefields	2/07/2018	3.0km
T017 RL	Open shrubland with sparse bloodwoods over Spinifex on calcrete sandy plains	Southern Borefields	3/07/2018	3.1km
T017_JR	Calcrete, sandplain and dunes	Southern Borefields	2/07/2018	3.8km
T018_JR	Sandplain, dunes	Nebo-Babel Area	3/07/2018	1.9km
T019_JR	Sandplain, dunes, some mulga	Nebo-Babel Area	3/07/2018	2.3km
T020_JR	Calcrete, sandplain and dunes	Nebo-Babel Area	3/07/2018	3.2km

Appendix 2. Targeted Search Sites.

Site	Habitat	Location	Date	Duration	GPS Location
S001 RL	Sandplain/calcrete rises	Project Area	28/06/2018	2hrs	52J 369292 7111335
S002 AG	Mulga w/ Euc/corymbia over spinifex on sand and calcrete	Eastern Borefields	28/06/2018	45 min	52 J 386203 7118733
S002 RL	Dune	Project Area	28/06/2018	1hr	52J 371288 7113413
S002_JW	Mulga woodland over tussock grass on plain	Eastern Borefields	26/06/2018	20 min	52 J 379789 7114404
S002_MB	Open mulga	Southern Borefields	27/06/2018	1 hr	52 J 367022 7097069
S003 AG	Mulga woodland over grass and spinifex on loamy sand	Eastern Borefields	28/06/2018	15 min	52 J 396114 7120638
S003 RL	Mallee grove/dunes & calcrete rises	Project Area	28/06/2018	1hr	52J 372097 7112819
S003_MB	Dunes	Eastern Borefields	2/07/2018	30 min	52 J 387713 7119196
S004 AG	Dense Spinifex w/ sparse shrubs on loamy sand plain; dune system on one side, Mulga on other side.	Eastern Borefields	28/06/2018	15 min	52 J 395974 7120570
S004 RL	Sparse mulga with low shrubs on soft grasses on sandy soils	Project Area	28/06/2018	20 min	52J 370934 7116404
S004_JW	Mulga grove	Western Access Road	28/06/2018	1hr 20 min	52 J 353210 7117321
S004_MB	Sandplain	Eastern Borefields	28/06/2018	20 min	52 J 388687 7119342
S005 AG	Fairly young Spiniex on loamy sandplain with sparse low shrubs.	Eastern Borefields	28/06/2018	15 min	52 J 395754 7120884
S005 RL	Undulating mallee sandplain & dunes	Project Area	28/06/2018	1hr	52J 371787 7111782
S005_JW	Mulga grove	Project Area	28/06/2018	20 min	52 J 367306 7113599
S006 AG	Young Spinifex plain on firm loamy sand. Low herbs, Eremophila etc scattered through. Between dune and mulga.	Southern Borefields	29/06/2018	15 min	52 J 392327 7123471
S006 RL	Mallee sandplain & dunes	Project Area	28/06/2018	1hr	52J 372788 7110872
S006_MB	Sand dune	Eastern Borefields	28/06/2018	30 min	52 J 395756 7123243
S007 AG	Young Spinifex on loamy sand. Some calcrete. Mallee and small shrubs.	Southern Borefields	30/06/2018	30 min	52 J 370994 7101817
S007 RL	Acacia shrubland & dunes	Project Area	28/06/2018	40min	52J 372818 7113167
S007_MB	Spinifex sandplain	Southern Borefields	29/06/2018	1 hour	52 J 370319 7099420
S008 AG	Loamy sand with Spinifex and sparse shrubs/mallee. Several dune systems.	Southern Borefields	30/06/2018	15 min	52 J 372190 7103204
S008 RL	Sandy mulga woodland over triodia and soft grasses	Southern Borefields	30/06/2018	30min	52J 355666 7085107
S008_JW	Calcrete/sand sheet	Southern Borefields	29/06/2018	20 min	52 J 354948 7082415

Site	Habitat	Location	Date	Duration	GPS Location
S009 AG	Young Spinifex on loamy sand with calcrete, Mallee and spiny shrubs.	Southern Borefields	30/06/2018	15 min	52 J 371769 7102113
S009 RL	Shrubland with scattered bloodwoods on triodia sandplain with calcrete outcropping	Southern Borefields	30/06/2018	20min	52J 358509 7080027
S009_JW	Mulga woodland	Western Access Road	1/07/2018	20 min	52 J 349875 7121147
S010 AG	Fairly mature spinifex on fine loamy sand. Base of dune becoming plain. Mallee and sparse shrubs.	Eastern Borefields	1/07/2018	15 min	52 J 391038 7122539
S010 RL	Undulating mallee/shrubby triodia sandplain	Southern Borefields	30/06/2018	25min	52J 361323 7090067
S010_JW	Mulga woodland, granite outcropping	Western Access Road	1/07/2018	20 min	52 J 349490 7121494
S011 AG	Spinifex on firm loamy sand, mallee shrubs giving way to mulga and other shrubs. Calcrete nearby.	Eastern Borefields	2/07/2018	15 min	52 J 388142 7122167
S011 RL	Triodia sandplain with low open shrubland	Southern Borefields	30/06/2018	25min	52J 358606 7092566
S011_JW	Mulga woodland, granite outcropping	Western Access Road	1/07/2018	1 hr	52 J 349901 7120589
S012 AG	Base of dune. Spinifex on sand with Geraldton Wax and other shrubs.	Eastern Borefields	2/07/2018	15 min	52 J 390879 7115149
S012 RL	Low rolling calcrete sandy plains & rises with mallee/shrubland over triodia and isolated dunes	Southern Borefields	2/07/2018	30min	52J 366271 7097015
S012_JW	Calcrete/sand sheet	Southern Borefields	1/07/2018	45 min	52 J 358492 7080016
S012_MB	Calcrete / sand sheet	Eastern Borefields	2/07/2018	30 min	52 J 388798 7114585
S013 AG	Mulga and spinifex on firm loamy sand and quartz gravel	Eastern Borefields	2/07/2018	30 min	52 J 383847 7121330
S013 RL	Open shrubland & scattered mallee over triodia on undulating calcrete sandy plains & rises with isolated dunes	Project Area	3/07/2018	1hr	52J 374037 7110803
S013_JW	Spinifex sandplain	Eastern Borefields	30/06/2018	30 min	52 J 390921 7120819
S013_MB	Open mulga	Eastern Borefields	2/07/2018	30 min	52 J 383835 7121321
S014 AG	Spinifex on sandy loam with calcrete. Mulga and other large shrubs.	Eastern Borefields	2/07/2018	30 min	52 J 383750 7116175
S014 RL	Dunes	Project Area	3/07/2018	30min	52J 374901 7111248
S014_JW	Calcrete/sand sheet	Southern Borefields	1/07/2018	30 min	52 J 355137 7081801
S014_MB	Scattered mulga over triodia on sand plain	Eastern Borefields	2/07/2018	30 min	52 J 383756 7116161
S015 AG	Spinifex on loamy sand with sparse mixed shrubs and occasuional small trees	Western Access Road	3/07/2018	15 min	52 J 355288 7117040
S015_JW	Mulga over Spinifex	Northern Access Road	2/07/2018	20 min	52 J 370431 7123722
S016_JW	Mulga woodland over tussock grass on plain	Northern Access Road	2/07/2018	20 min	52 J 366726 7135830

Site	Habitat	Location	Date	Duration	GPS Location
S016_MB	Stony Plain with Mallee	Southern Borefields	30/06/2018	30 min	52 J 370997 7101818
S017_JW	Acacia shrubland over grass on loamy plain	Northern Access Road	2/07/2018	20 min	52 J 365821 7132776
S018_JW	Mulga thicket	Northern Access Road	2/07/2018	30 min	52 J 365852 7130745
S019_JW	Sandplain	Project Area	2/07/2018	20 min	52 J 373992 7112704

Appendix 3. Camera Trap Locations.

Site	Start Date	Stop Date	Trap-nights	GPS Co-ordinate	Location
CamJEN-1	27/06/2018	3/07/18	6	52 J 358334 7114275	Western Access Rd (mulgara)
CamJEN-2	3/07/2018			52 J 354295 7117137	Western Access Rd
CamW02-1	25/06/2018	29/06/2018	4	52 J 354162 7117053	Western Access Rd, Site 7
CamW02-2	2/07/2018			52 J 356337 7093548	Southern Borefield
CamW03-1	25/06/2018	29/06/2018	4	52 J 370460 7114398	Project Area, Site 6
CamW03-2	3/07/2018			52 J 373997 7112814	Project Area
CamW04-1	25/06/2018	29/06/2018	4	52 J 370855 7116390	Project Area, Site 3
CamW04-2	3/07/2018			52 J 377249 7112683	Project Area
CamW05-1	25/06/2018	29/06/2018	4	52 J 369281 7111074	Project Area, Site 2
CamW05-2	30/06/2018			52 J 361295 7090066	Southern Borefield
CamW06-1	25/06/2018	29/06/2018	4	52 J 350043 7120039	Western Access Rd, Site 8
CamW06-2	30/06/2018			52 J 354825 7082169	Southern Borefield
CamW07-1	25/06/2018	29/06/2018	4	52 J 367962 7113481	Project Area, Site 1
CamW07-2	30/06/2018			52 J 358551 7080036	Southern Borefield
CamW08-2	3/07/2018			52 J 369984 7112797	Project Area
CamW09-1	25/06/2018	29/06/2018	4	52 J 372697 7111883	Project Area, Site 5
CamW09-2	2/07/2018			52 J 368851 7110271	Project Area
CamW10-1	25/06/2018	29/06/2018	4	52 J 368992 7110345	Project Area, Site 4
CamW10-2	30/06/2018			52 J 358632 7092553	Southern Borefield
CamW11-1	27/06/2018	3/07/18	6	52 J 357492 7115440	Western Access Rd (mulgara)
CamW11-2	3/07/2018			52 J 349899 7120604	Western Access Rd
CamW13-1	25/06/2018	29/06/2018	4	52 J 381147 7113790	Project Area, Site 9
CamW13-2	3/07/2018			52 J 376905 7111674	Project Area
CamW14-1	25/06/2018	29/06/2018	4	52 J 370381 7114379	Project Area, Site 6
CamW15-1	25/06/2018	29/06/2018	4	52 J 350029 7120099	Western Access Rd, Site 8
CamW15-2	2/07/2018			52 J 366181 7097038	Southern Borefield
CamW16-1	25/06/2018	29/06/2018	4	52 J 368935 7110305	Project Area, Site 4
CamW16-2	2/07/2018			52 J 374798 7098407	Southern Borefield
CamW17-1	25/06/2018	29/06/2018	4	52 J 381213 7113747	Project Area, Site 9
CamW17-2	3/07/2018			52 J 374131 7110774	Project Area
CamW18-1	25/06/2018	29/06/2018	4	52 J 369229 7111038	Project Area, Site 2
CamW18-2	2/07/2018			52 J 358878 7098208	Southern Borefield
CamW19-1	25/06/2018	29/06/2018	4	52 J 372691 7111840	Project Area, Site 5
CamW19-2	3/07/2018			52 J 372022 7111461	Project Area
CamW20-1	25/06/2018	29/06/2018	4	52 J 370882 7116365	Project Area, Site 3
CamW20-2	30/06/2018			52 J 355226 7088123	Southern Borefield
CamW21-1	25/06/2018	29/06/2018	4	52 J 367871 7113472	Project Area, Site 1
CamW21-2	3/07/2018			52 J 372231 7114481	Project Area
CamW22-1	25/06/2018	29/06/2018	4	52 J 354078 7117079	Western Access Rd, Site 7
CamW22-2	30/06/2018			52 J 355615 7085143	Southern Borefield
CamW23-1	26/06/2018	30/06/2018	4	52 J 374716 7112016	Project Area, Site 10
CamW23-2	1/07/2018			52 J 395964 7122480	Eastern Borefields
CamW24-1	26/06/2018	30/06/2018	4	52 J 374796 7111962	Project Area, Site 10
CamW24-2	1/07/2018			52 J 382494 7115562	Eastern Borefields

Site	Start Date	Stop Date	Trap-nights	GPS Co-ordinate	Location
CamW25-1	26/06/2018	30/06/2018	4	52 J 374724 7112565	Project Area (mulgara)
CamW25-2	1/07/2018			52 J 384926 7117329	Eastern Borefields
CamW26-2	1/07/2018			52 J 389308 7120129	Eastern Borefields
CamW27-2	1/07/2018			52 J 381341 7124048	Eastern Borefields
CamW28-2	2/07/2018			52 J 379352 7111993	Project Area (east)
CamW29-2	1/07/2018			52 J 391579 7120900	Eastern Borefields
CamW30-2	1/07/2018			52 J 393385 7122160	Eastern Borefields
CamW31-2	2/07/2018			52 J 377919 7110897	Project Area (east)
CamW32-2	1/07/2018			52 J 388713 7114846	Eastern Borefields

Appendix 4. Amphibians potentially occurring in the Project Area.

2018 = species recorded in this survey, June 2018.
BCE = species recorded in the Project Area by Everard and Bamford (2018b).
Wingellina = species recorded at Wingelline, 115km east of the Project Area.
WAM = species recorded in the area on the Western Australian Museum Specimen Database (see Table 4).
FSDB = species recorded in the area on the Fauna Survey Returns Database (see Table 4).
ALA = species recorded on the Atlas of Living Australia Database (see Table 4).
TF = species recorded in the area on DPAW's Threatened and Priority Fauna Database (see Table 4).
EPBC = species or species habitat in the area on the EPBC Protected Matters Search Tool (see Table 4).

Species	Conservation Status	Records							
		2018	BCE	Wingellina	WAM	FSDB	ALA	TF	EPBC
Pelodraydidae (tree frogs and water-holding frogs)									
Main's Frog *Cyclorana maini*									
Western Water-holding Frog *Cyclorana occidentalis*									
Limnodynastidae (burrowing frogs)									
Centralian Burrowing Frog *Platyplectrum spenceri*									
Desert Trilling Frog *Neobatrachus sudellae*									
Shoemaker Frog *Neobatrachus sutor*							+		
Desert Spadefoot *Notaden nichollsi*									
Myobatrachidae (ground frogs)									
Orange-crowned Toadlet *Pseudophryne occidentalis*									
# frog species expected:	**7**								

Appendix 5. Reptiles potentially occurring in the Project Area.

2018 = species recorded in this survey, June 2018.
BCE = species recorded in the Project Area by Everard and Bamford (2018b).
Wingellina = species recorded at Wingellina, 115km east of the Project Area.
WAM = species recorded in the area on the Western Australian Museum Specimen Database (see Table 4).
FSDB = species recorded in the area on the Fauna Survey Returns Database (see Table 4).
ALA = species recorded on the Atlas of Living Australia Database (see Table 4).
TF = species recorded in the area on DPAW's Threatened and Priority Fauna Database (see Table 4).
EPBC = species or species habitat in the area on the EPBC Protected Matters Search Tool (see Table 4).

Species		Conservation Status	Records							
			2018	BCE	Wingellina	WAM	FSDB	ALA	TF	EPBC
Carphodactylidae (knob-tailed geckoes)										
Three-lined Knob-tailed Gecko	*Nephrurus levis*			+	+			+		
Smooth Knob-tailed Gecko	*Nephrurus laevissimus*				+					
Diplodactylidae (ground geckoes)										
Desert Fat-tailed Gecko	*Diplodactylus laevis*			+	+			+		
Fat-tailed Gecko	*Diplodactylus conspicillatus*					+		+		
Beaded Gecko	*Lucasium dameum*									
	Lucasium stenodactylum			+	+			+		
Beaked Gecko	*Rhynchoedura ornata*			+	+	+		+		
Northern Spiny-tailed Gecko	*Strophurus ciliaris*		+	+	+			+		
Jewelled Gecko	*Strophurus elderi*		+		+	+		+		
	Strophurus strophurus		+							
Gekkonidae (geckoes)										
Central Rock Dtella	*Gehyra montium*					+		+		
Purple Dtella	*Gehyra purpurescens*		+	+	+	+		+		
Variegated Dtella	*Gehyra variegata*		+		+	+		+		
Bynoe's Gecko	*Heteronotia binoei*		+	+	+	+		+		
Pygopodidae (legless lizards)										
	Delma australis									
	Delma butleri		+					+		
	Delma borea									
	Delma desmosa		+					+		
	Delma nasuta				+	+		+		
	Delma tincta									
Burton's Legless Lizard	*Lialis burtonis*		+	+	+			+		
Hooded Scaly-foot	*Pygopus nigriceps*		P			+		+		
Agamidae (dragon lizards)										
Central Rock Dragon	*Ctenophorus graafi*					+		+		
Collared Dragon	*Ctenophorus clayi*				+	+		+		
Military Dragon	*Ctenophorus isolepis*		+	+	+			+		
Central Netted Dragon	*Ctenophorus nuchalis*		+	+	+	+		+		
Painted Dragon	*Ctenophorus pictus*									
Western Netted Dragon	*Ctenophorus reticulatus*					+		+		
Red Rock Dragon	*Ctenophorus rufescens*							+		

Appendix 5. (cont.)

Species		Conservation Status	Records							
			2018	BCE	Wingellina	WAM	FSDB	ALA	TF	EPBC
Agamidae (cont.)										
Grey-striped West'n Desert Dragon	*Diporiphora paraconvergens*							+		
Undescribed Diporiphora	*Diporiphora sp.*									
Long-nosed Dragon	*Gowidon longirostris*		+		+			+		
Thorny Devil	*Moloch horridus*		+	+	+			+		
Bearded Dragon	*Pogona minor*							+		
Central Earless Dragon	*Tympanocryptis centralis*			+	+	+		+		
Pebble Dragon	*Tympanocryptis cephalus*				+					
Scincidae (skink lizards)										
	Carlia triacantha							+		
	Cryptoblepharus australis				+			+		
	Ctenotus ariadnae				+					
	Ctenotus brooksi		+							
	Ctenotus calurus			+	+			+		
	Ctenotus dux							+		
	Ctenotus grandis							+		
	Ctenotus greeri				+			+		
	Ctenotus hanloni									
	Ctenotus helenae			+	+					
	Ctenotus leae									
	Ctenotus leonhardii		+		+	+		+		
	Ctenotus nasutus							+		
	Ctenotus pantherinus		+	+	+			+		
	Ctenotus piankai									
	Ctenotus quattuordecimlineatus		+		+			+		
Rock Ctenotus	*Ctenotus saxatilis**		+							
	Ctenotus schomburgkii					+		+		
Slender Blue-tongue	*Cyclodomorphus melanops*		+		+	+		+		
Central Pygmy Spiny-tailed Skink	*Egernia eos*					+		+		
	Liopholis kintorei	En,S2	+	+				+		+
	Liopholis inornata		+	+	+			+		
	Liopholis striata		+	+			+	+		
Western Narrow-banded Skink	*Eremiascincus pallidus*			+				+		
Broad-banded Sand Swimmer	*Eremiascincus richardsonii*				+			+		
	Lerista bipes		+	+	+			+		
	Lerista desertorum		+			+		+		
	Lerista labialis		+			+		+		
	Lerista taeniata		+							
	Lerista timida				+	+		+		
Dwarf Skink	*Menetia greyii*		+	+		+		+		

Appendix 5. (cont.)

Species		Conservation Status	Records							
			2018	BCE	Wingellina	WAM	FSDB	ALA	TF	EPBC
Scincidae (cont.)										
	Morethia ruficauda		+		+			+		
	Proablepharus reginae				+					
Central Blue-tongue	*Tiliqua multifasciata*			+				+		
Western Bluetongue	*Tiliqua occidentalis*							+		
Varanidae (goanna or monitor lizards)										
Spiny-tailed Goanna	*Varanus acanthurus*		+							
Short-tailed Pygmy Goanna	*Varanus brevicauda*									
Pygmy Desert Goanna	*Varanus eremius*			+	+	+		+		
Perentie	*Varanus giganteus*				+					
Pygmy Mulga Monitor	*Varanus gilleni*		+		+			+		
Sand Goanna	*Varanus gouldii*			+	+			+		
Black-tailed Monitor	*Varanus tristis*							+		
Typhlopidae (blind snakes)										
Interior Blind Snake	*Anilios endoterus*							+		
Beaked Blind Snake	*Anilios grypus*									
	Anilios waitii									
Boidae (pythons)										
Stimson's Python	*Antaresia stimsoni*		**P**							
Woma	*Aspidites ramsayi*	LS	**P**							
Elapidae (front-fanged snakes)										
Desert Death Adder	*Acanthophis pyrrhus*									
Narrow-banded Shovel-nosed Snake	*Brachyurophis fasciolatus*							+		
Southern Shovel-nosed Snake	*Brachyurophis semifasciatus*							+		
Yellow-faced Whipsnake	*Demansia psammophis*					+		+		
Moon Snake	*Furina ornata*									
Western Desert Taipan	*Oxyuranus temporalis*			+				+		
Monk Snake	*Parasuta monachus*		+		+					
Mulga Snake	*Pseudechis australis*		+							
Ringed Brown Snake	*Pseudonaja modesta*					+		+		
Gwardar	*Pseudonaja mengdeni*			+				+		
Desert Banded Snake	*Simoselaps anomalus*							+		
Jan's Banded Snake	*Simoselaps bertholdi*									
Number of species expected:				**95**						

* Note that though some authors merge *Ctenotus saxatilis* under *Ctenotus inornatus,* we have separated it here as per the current WA Museum list.

Appendix 6. Birds potentially occurring in the Project Area.

2018 = species recorded in this survey, June 2018.
BCE = species recorded in the Project Area by Everard and Bamford (2018b).
Wingellina = species recorded at Wingelline, 115km east of the Project Area.
Birdata = species recorded in the area by Birds Australia 2010 – 2018 (see Table 3).
Atlas = species recorded in the area on Birds Australia's Atlas Database 1998 – 2009 (see Table 4).
WAM = species recorded in the area on the Western Australian Museum Specimen Database (see Table 4).
FSDB = species recorded in the area on the Fauna Survey Returns Database (see Table 4).
ALA = species recorded on the Atlas of Living Australia Database (see Table 4).
TF = species recorded in the area on DBCA's Threatened and Priority Fauna Database (see Table 4).
EPBC = species or species habitat in the area on the EPBC Protected Matters Search Tool (see Table 4).

Species	Conservation Status	Records									
		2018	BCE	Wingellina	Birdata	Atlas	WAM	FSDB	ALA	TF	EPBC
Dromaiidae (emus)											
Emu *Dromaius novaehollandiae*		+							+		
Megapodiidae											
Malleefowl *Leipoa ocellata*	Vu,S3								+	+	+
Phasianidae (quails)											
Stubble Quail *Coturnix pectoralis*				+							
Ardeidae (herons, egrets, bitterns & night-herons)											
White-faced Heron *Ardea novaehollandiae*			+								
Accipitridae (osprey, hawks, eagles & harriers)											
Black-shouldered Kite *Elanus caeruleus*				+					+		
Square-tailed Kite *Hamirostra isura*											
Black-breasted Buzzard *Hamirostra melanosternon*									+		
Black Kite *Milvus migrans*				+					+		
Whistling Kite *Haliastur sphenurus*		+							+		
Brown Goshawk *Accipiter fasciatus*				+					+		
Collared Sparrowhawk *Accipiter cirrocephalus*				+					+		
Little Eagle *Hieraaetus morphnoides*									+		
Wedge-tailed Eagle *Aquila audax*		+		+					+		
Spotted Harrier *Circus assimilis*		+	+						+		
Otididae (bustard)											
Australian Bustard *Ardeotis australis*		+	+	+		+		+	+		
Turnicidae (button-quails)											
Little Button-Quail *Turnix velox*		+	+	+					+		
Burhinidae (stone-curlews)											
Bush Stone-Curlew *Burhinus grallarius*		+							+		
Charadriidae (plovers, dotterels & lapwings)											
Oriental Plover *Charadrius veredus*	Mi,S5										+
Banded Lapwing *Vanellus tricolor*			+								
Scolopacidae (sandpipers, curlews, stints & allies)											
Common Sandpiper *Tringa hypoleucos*	Mi,S5										+
Sharp-tailed Sandpiper *Calidris acuminata*	Mi,S5										+
Pectoral Sandpiper *Calidris melanotos*	Mi,S5										+

Appendix 6. (cont.)

Species		Conservation Status	Records									
			2018	BCE	Wingellina	Birdata	Atlas	WAM	FSDB	ALA	TF	EPBC
Columbidae (pigeons and doves)												
Common Bronzewing	*Phaps chalcoptera*		+	+	+					+		
Crested Pigeon	*Ocyphaps lophotes*		+	+	+	+	+			+		
Spinifex Pigeon	*Geophaps plumifera*											
Diamond Dove	*Geopelia cuneata*			+	+					+		
Cuculidae (cuckoos)												
Pallid Cuckoo	*Cacomantis pallidus*		+		+		+			+		
Black-eared Cuckoo	*Chrysococcyx osculans*									+		
Horsfield's Bronze-Cuckoo	*Chrysococcyx basalis*			+						+		
Tytonidae (barn owls)												
Barn Owl	*Tyto alba*				+					+		
Strigidae (hawk owls)												
Southern Boobook	*Ninox boobook*									+		
Podargidae (frogmouths)												
Tawny Frogmouth	*Podargus strigoides*									+		
Caprimulgidae (nightjars)												
Spotted Nightjar	*Eurostopodus argus*				+					+		
Aegothelidae (owlet-nightjars)												
Australian Owlet-Nightjar	*Aegotheles cristatus*				+							
Apodidae (swifts)												
Fork-tailed Swift	*Apus pacificus*	Mi,S5										+
Alcedinidae (kingfishers)												
Red-backed Kingfisher	*Todiramphus pyrrhopygius*		+	+	+		+			+		
Meropidae (bee-eaters)												
Rainbow Bee-eater	*Merops ornatus*		+		+					+		
Falconidae (falcons)												
Brown Falcon	*Falco berigora*		+	+	+		+			+		
Australian Kestrel	*Falco cenchroides*		+	+	+	+	+			+		
Australian Hobby	*Falco longipennis*		+	+	+					+		
Grey Falcon	*Falco hypoleucos*	S3										
Peregrine Falcon	*Falco peregrinus*	S7								+		
Black Falcon	*Falco subniger*									+		
Cacatuidae (cockatoos)												
Galah	*Cacatua roseicapilla*		+	+	+					+		
Major Mitchell's Cockatoo	*Cacatua leadbeateri*									+		
Cockatiel	*Nymphicus hollandicus*		+	+	+					+		

Appendix 6. (cont.)

Species	Conservation Status	Records									
		2018	BCE	Wingellina	Birdata	Atlas	WAM	FSDB	ALA	TF	EPBC
Psittacidae (parrots, lorikeets & rosellas)											
Princess Parrot *Polytelis alexandrae*	Vu,P4								+		+
Australian Ringneck *Platycercus zonarius*		+		+							
Mulga Parrot *Platycercus varius*		+		+					+		
Bourke's Parrot *Neophema bourkii*		+		+					+		
Scarlet-chested Parrot *Neophema splendens*									+		
Budgerigar *Melopsittacus undulatus*		+	+	+	+	+			+		
Night Parrot *Pezoporus occidentalis*	En,S1										+
Ptilonorhynchidae (bowerbirds)											
Western Bowerbird *Ptilonorhynchus maculatus guttatus*		+							+		
Climacteridae (treecreepers)											
White-browed Treecreeper *Climacteris affinis*									+		
Maluridae (fairy-wrens, grasswrens & emu-wrens)											
Dusky Grasswren *Amytornis purnelli*				+			+		+		
Striated Grasswren *Amytornis striatus striatus*	P4	+	+				+		+	+	
Variegated Fairy-wren *Malurus lamberti*		+		+		+			+		
White-winged Fairy-wren *Malurus leucopterus*		+	+	+		+			+		
Splendid Fairy-wren *Malurus splendens*						+			+		
Rufous-crowned Emu-wren *Stipiturus ruficeps*		+		+					+		
Meliphagidae (honeyeaters & chats)											
Brown Honeyeater *Lichmera indistincta*											
Black Honeyeater *Sugomel niger*						+			+		
Grey Honeyeater *Lacustroica whitei*											
Pied Honeyeater *Certhionyx variegatus*		+	+		+	+			+		
Singing Honeyeater *Gavicalis virescens*		+		+	+	+			+		
Grey-headed Honeyeater *Ptilotula keartlandi*				+					+		
Grey-fronted Honeyeater *Ptilotula plumula*		+	+	+					+		
White-plumed Honeyeater *Ptilotula penicillata*			+	+		+			+		
Yellow-throated Miner *Manorina flavigula*		+	+	+		+			+		
White-fronted Honeyeater *Purnella albifrons*		+	+	+	+				+		
Spiny-cheeked Honeyeater *Acanthagenys rufogularis*		+	+	+	+	+			+		
Crimson Chat *Epthianura tricolor*		+	+	+	+	+			+		
Pardalotidae (pardalotes)											
Red-browed Pardalote *Pardalotus rubricatus*		+		+					+		
Striated Pardalote *Pardalotus striatus*									+		

Appendix 6. (cont.)

Species	Conservation Status	Records									
		2018	BCE	Wingellina	Birdata	Atlas	WAM	FSDB	ALA	TF	EPBC
Acanthizidae (thornbills, gerygones & allies)											
Weebill *Smicrornis brevirostris*		+	+	+					+		
Western Gerygone *Gerygone fusca*									+		
Redthroat *Pyrrholaemus brunneus*		+							+		
Inland Thornbill *Acanthiza apicalis*		+							+		
Yellow-rumped Thornbill *Acanthiza chrysorrhoa*				+					+		
Slaty-backed Thornbill *Acanthiza robustirostris*		+				+			+		
Chestnut-rumped Thornbill *Acanthiza uropygialis*		+		+		+			+		
Southern Whiteface *Aphelocephala leucopsis*		+		+		+	+		+		
Banded Whiteface *Aphelocephala nigricincta*		+	+						+		
Pomatostomidae (babblers)											
White-browed Babbler *Pomatostomus superciliosus*		+		+		+	+		+		
Psophodiidae (whipbirds, wedgebills & quail-thrush)											
Western Wedgebill *Psophodes occidentalis*									+		
Copperback Quail-thrush *Cinclosoma clarum*									+		
Western Quail-thrush *Cinclosoma marginatum*									+		
Artamidae (woodswallows)											
White-breasted Woodswallow *Artamus leucorynchus*									+		
Masked Woodswallow *Artamus personatus*			+	+	+	+			+		
Black-faced Woodswallow *Artamus cinereus*		+	+	+	+	+			+		
Little Woodswallow *Artamus minor*				+					+		
Cracticidae (butcherbirds & magpie)											
Grey Butcherbird *Cracticus torquatus*									+		
Pied Butcherbird *Cracticus nigrogularis*		+	+	+	+	+			+		
Australian Magpie *Cracticus tibicen*		+	+	+					+		
Campephagidae (cuckoo-shrikes and trillers)											
Black-faced Cuckoo-Shrike *Coracina novaehollandiae*		+	+	+		+			+		
Ground Cuckoo-shrike *Coracina maxima*		+		+					+		
White-winged Triller *Lalage tricolor*				+					+		
Oreoicidae (bellbirds)											
Crested Bellbird *Oreoica gutturalis*		+	+	+	+	+			+		
Pachycephalidae (shrike-tits, whistlers and allies)											
Rufous Whistler *Pachycephala rufiventris*		+	+	+	+	+			+		
Grey Shrike-thrush *Colluricincla harmonica*			+	+					+		
Rhipiduridae (fantails)											
Grey Fantail *Rhipidura albiscapa*											
Willie Wagtail *Rhipidura leucophrys*		+	+	+	+	+			+		
Monarchidae (flycatchers, monarchs and magpie-lark)											
Magpie-Lark *Grallina cyanoleuca*		+	+	+							

Appendix 6. (cont.)

Species	Conservation Status	Records									
		2018	BCE	Wingellina	Birdata	Atlas	WAM	FSDB	ALA	TF	EPBC
Corvidae (ravens and crows)											
Torresian Crow *Corvus orru*		+		+					+		
Little Crow *Corvus bennetti*			+	+					+		
Petroicidae (robins)											
Red-capped Robin *Petroica goodenovii*		+	+	+	+				+		
Hooded Robin *Melanodryas cucullata*		+		+		+			+		
Jacky Winter *Microeca fascinans*	`		+	+			+		+		
Hirundinidae (swallows and martins)											
White-backed Swallow *Cheramoeca leucosterna*		+	+	+					+		
Welcome Swallow *Hirundo neoxena*											
Tree Martin *Petrochelidon nigricans*				+							
Fairy Martin *Petrochelidon ariel*											
Locustellidae (warblers, songlarks and grassbirds)											
Spinifexbird *Eremiornis carteri*			+								
Rufous Songlark *Cincloramphus mathewsi*				+	+	+			+		
Brown Songlark *Cincloramphus cruralis*		+	+	+					+		
Dicaeidae (flowerpeckers)											
Mistletoebird *Dicaeum hirundinaceum*				+					+		
Estrildidae (grassfinches, sparrows and allies)											
Zebra Finch *Taeniopygia guttata*		+	+	+	+	+			+		
Painted Finch *Emblema pictum*									+		
Motacillidae (pipits and wagtails)											
Australian Pipit *Anthus australis*		+	+	+					+		
Number of species expected:	**120**										

Appendix 7. Mammals potentially occurring in the Project Area.

2018 = species recorded in this survey, June 2018.
BCE = species recorded in the Project Area by Everard and Bamford (2018b).
Wingellina = species recorded at Wingelline, 115km east of the Project Area.
WAM = species recorded in the area on the Western Australian Museum Specimen Database (see Table 4).
FSDB = species recorded in the area on the Fauna Survey Returns Database (see Table 4).
ALA = species recorded on the Atlas of Living Australia Database (see Table 4).
TF = species recorded in the area on DBCA's Threatened and Priority Fauna Database (see Table 4).
EPBC = species or species habitat in the area on the EPBC Protected Matters Search Tool (see Table 4).

Species		Conservation Status	Records							
			2018	BCE	Wingellina	WAM	FSDB	ALA	TF	EBPC
Tachyglossidae (echidnas)										
Echidna	*Tachyglossus aculeatus*				+					
Dasyuridae (dasyurid marsupials)										
Kultarr	*Antechinomys laniger*									
Brush-tailed Mulgara	*Dasycercus blythi*	P4	+	+			+		+	
Crest-tailed Mulgara	*Dasycercus cristicauda*	Vu,P4						+		
Wongai Ningaui	*Ningaui ridei*		+					+		
Fat-tailed Pseudantechinus	*Pseudantechinus macdonnellensis*				+	+				
Fat-tailed Dunnart	*Sminthopsis crassicaudata*				+					
Long-tailed Dunnart	*Sminthopsis longicaudata*	P4								
Striped-faced Dunnart	*Sminthopsis macroura*				+					
Hairy-footed Dunnart	*Sminthopsis hirtipes*									
Ooldea Dunnart	*Sminthopsis ooldea*		+							
Sandhill Dunnart	*Sminthopsis psammophila*	En,S2								+
Lesser Hairy-footed Dunnart	*Sminthopsis youngsoni*		+							
Thylacomyidae (bilbies)										
Bilby	*Macrotis lagotis*	Vu,S3						+	+	+
Notoryctidae (marsupial moles)										
Southern Marsupial Mole	*Notoryctes typhlops*	P4	+					+	+	
Macropodidae (kangaroos & wallabies)										
Euro	*Osphranter robustus*				+			+		
Red Kangaroo	*Osphranter rufus*				+			+		
MacDonnell Range Black-footed Rock-wallaby	*Petrogale lateralis*	Vu,S3				+		+	+	+
Muridae (rats & mice)										
Forest's Mouse	*Leggadina forresti*							+		
House Mouse	*Mus musculus*	Int.	+		+	+		+		
Spinifex Hopping Mouse	*Notomys alexis*		+	+	+	+		+		
Desert Mouse	*Pseudomys desertor*		+							
Sandy Inland Mouse	*Pseudomys hermannsburgensis*		+		+	+		+		
Leporidae (rabbits & hares)										
Rabbit	*Oryctolagus cuniculus*	Int.	+	+	+			+		
Emballonuridae (sheathtail bats)										
Yellow-bellied Sheathtail Bat	*Saccolaimus flaviventris*				+					
Hill's Sheathtail bat	*Taphozous hilli*									

Appendix 7. (cont.)

Species		Conservation Status	Records							
			2018	BCE	Wingellina	WAM	FSDB	ALA	TF	EBPC
Molossidae (freetail bats)										
Inland Freetail Bat	*Ozimops petersi*		+							
White-striped Freetail Bat	*Austronomus australis*		+		+					
Vespertilionidae (ordinary bats)										
Gould's Wattled Bat	*Chalinolobus gouldii*				+					
Chocolate Wattled Bat	*Chalinolobus morio*		+		+					
Lesser Long-eared Bat	*Nyctophilus geoffroyi*				+					
Central Long-eared Bat	*Nyctophilus major tor*	P3			+					
Inland Broad-nosed Bat	*Scotorepens balstoni*									
Little Broad-nosed Bat	*Scotorepens greyii*									
Finlayson's Cave Bat	*Vespadelus finlaysoni*				+			+		
Inland Forest Bat	*Vespadelus baverstocki*									
Canidae (dogs and foxes)										
Dog / Dingo	*Canis familiaris*	Int.	+	+	+	+		+		
Fox	*Vulpes vulpes*	Int.	+		+					
Felidae (cats)										
Feral Cat	*Felis catus*	Int.	+	+	+					
Equidae (horses and donkeys)										
Horse	*Equus caballus*	Int.	+							
Camelidae (camels)										
Camel	*Camelus dromedarius*	Int.	+	+	+			+		
Bovidae (horned ruminants)										
Cow	*Bos taurus*	Int.	+							
Number of species expected:			**42**							

Appendix 8. EPBC Protected Matters Search Tool results.

Species listed for the area 100km in radius from 26.117ºS, 127.758ºE on the EPBC Protected Matters Search Tool.

Species	Status	Author's Comment
Malleefowl *Leipoa ocellata*	Vulnerable	May occur.
Night Parrot *Pezoporus occidentalis*	Endangered	May occur.
Princess Parrot *Polytelis alexandrae*	Vulnerable	May occur.
Bilby *Macrotis lagotis*	Vulnerable	May occur.
MacDonnel Ranges Black-footed Rock Wallaby *Petrogale lateralis*	Vulnerable	May occur.
Sandhill Dunnart *Sminthopsis psammophila*	Endangered	Unlikely to occur.
Great Desert Skink *Liopholis kintorei*	Vulnerable	Known to occur in the Project Area.
Fork-tailed Swift *Apus pacificus*	Migratory (marine)	May occur.
Grey Wagtail *Motacilla cinerea*	Migratory (terrestrial)	Unlikely to occur, vagrant to the area.
Yellow Wagtail Motacilla flava	Migratory (terrestrial)	Unlikely to occur, vagrant to the area.
Common Sandpiper *Tringa hypoleucos*	Migratory (wetland)	May occur.
Sharp-tailed Sandpiper *Calidris acuminata*	Migratory (wetland)	May occur.
Pectoral Sandpiper *Calidris melanotos*	Migratory (wetland)	May occur.
Oriental Plover *Charadrius veredus*	Migratory (wetland)	May occur.

Appendix 9. Fauna Recorded in the Project Area, June 2018.

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	Site 9	Day Sighting	Bird Survey	28/06/2018
BIRD	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	Southern Borefields, T006_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	Eastern Borefields, S013_JW	Day Sighting	Target Site	30/06/2018
BIRD	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	Southern Borefield, T011_JR	Day Sighting	Target Transect	30/06/2018
BIRD	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	Site 9	Day Sighting	Opportunistic	30/06/2018
BIRD	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	Southern Borefield, S014_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	Eastern Borefields, S007 AG	Day Sighting	Target Site	2/07/2018
BIRD	*Acanthagenys rufogularis*		Spiny-cheeked Honeyeater	Northern Access Road, S017_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Acanthiza apicalis*		Inland Thornbill	Site 4	Day Sighting	Bird Survey	24/06/2018
BIRD	*Acanthiza apicalis*		Inland Thornbill	Eastern Borefields, T009_MB	Day Sighting	Target Transect	1/07/2018
BIRD	*Acanthiza robustirostris*		Slaty-backed Thornbill	Project Area, T001_JW	Day Sighting	Target Transect	26/06/2018
BIRD	*Acanthiza robustirostris*		Slaty-backed Thornbill	Western Access Road, S004_JW	Day Sighting	Target Site	28/06/2018
BIRD	*Acanthiza robustirostris*		Slaty-backed Thornbill	Project Area, S005_JW	Day Sighting	Target Site	28/06/2018
BIRD	*Acanthiza robustirostris*		Slaty-backed Thornbill	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Acanthiza robustirostris*		Slaty-backed Thornbill	Northern Access Road, S018_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Acanthiza uropygialis*		Chestnut-rumped Thornbill	Site 6	Day Sighting	Bird Survey	28/06/2018
BIRD	*Acanthiza uropygialis*		Chestnut-rumped Thornbill	Site 5	Day Sighting	Bird Survey	29/06/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Site 5	Day Sighting	Bird Survey	24/06/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Western Access Road, T001_MB	Day Sighting	Target Transect	25/06/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Site 5	Day Sighting	Bird Survey	25/06/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Site 7	Day Sighting	Bird Survey	27/06/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Site 5	Day Sighting	Bird Survey	27/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Project Area, T004_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Site 5	Day Sighting	Bird Survey	29/06/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Southern Borefield, T008_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Southern Borefield, T012_JR	Day Sighting	Target Transect	1/07/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Southern Borefield, T013_JR	Day Sighting	Target Transect	1/07/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Southern Borefield, T014_JR	Day Sighting	Target Transect	1/07/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Southern Borefield, T015_JR	Day Sighting	Target Transect	2/07/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Eastern Borefields, T011_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Southern Borefield, S012 RL	Day Sighting	Target Site	2/07/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Project Area, T018_JR	Day Sighting	Target Transect	3/07/2018
BIRD	*Amytornis striatus striatus*	P4	Striated Grasswren	Project Area, T019_JR	Day Sighting	Target Transect	3/07/2018
BIRD	*Anthus australis*		Australian Pipit	Site 3	Day Sighting	Bird Survey	26/06/2018
BIRD	*Anthus australis*		Australian Pipit	Site 3	Day Sighting	Bird Survey	27/06/2018
BIRD	*Anthus australis*		Australian Pipit	Project Area, S005_JW	Day Sighting	Target Site	28/06/2018
BIRD	*Anthus australis*		Australian Pipit	southern borefields, T003 RL	Observation	Target Transect	29/06/2018
BIRD	*Aphelocephala leucopsis*		Southern Whiteface	Site 1	Day Sighting	Bird Survey	24/06/2018
BIRD	*Aphelocephala nigricincta*		Banded Whiteface	Site 2	Day Sighting	Bird Survey	22/06/2018
BIRD	*Aquila audax*		Wedge-tailed Eagle	Site 2	Day Sighting	Bird Survey	27/06/2018
BIRD	*Aquila audax*		Wedge-tailed Eagle	Project Area, T005_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Aquila audax*		Wedge-tailed Eagle	Site 7	Day Sighting	Bird Survey	28/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Site 7	Tracks	Opportunistic	23/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Site 6	Tracks	Opportunistic	26/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Site 7	Day Sighting	Bird Survey	26/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Project Area, T003_JR	Tracks	Target Transect	28/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Ardeotis australis*		Australian Bustard	Site 10	Day Sighting	Bird Survey	28/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	southern borefields, T002 RL	Tracks	Target Transect	29/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	southern borefields, T003 RL	Tracks	Target Transect	29/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	southern borefields, T004 RL	Tracks	Target Transect	29/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Southern Borefields, T006_JW	Tracks	Target Transect	29/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Southern Borefields, T007_JW	Tracks	Target Transect	29/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Eastern Borefields, T007_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Southern Borefield, T010_JR	Tracks	Target Transect	30/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Site 7	Day Sighting	Bird Survey	30/06/2018
BIRD	*Ardeotis australis*		Australian Bustard	Southern Borefield, T013_JR	Tracks	Target Transect	1/07/2018
BIRD	*Ardeotis australis*		Australian Bustard	Southern Borefield, T014_JR	Tracks	Target Transect	1/07/2018
BIRD	*Ardeotis australis*		Australian Bustard	Northern Access Road, S015_JW	Tracks	Target Site	2/07/2018
BIRD	*Ardeotis australis*		Australian Bustard	Southern Borefield, T015_JR	Tracks	Target Transect	2/07/2018
BIRD	*Ardeotis australis*		Australian Bustard	Southern Borefield, T016_JR	Tracks	Target Transect	2/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 1	Day Sighting	Bird Survey	24/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 1	Day Sighting	Bird Survey	24/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 1	Day Sighting	Bird Survey	25/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Project Area, T001_JW	Day Sighting	Target Transect	26/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 3	Day Sighting	Bird Survey	26/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 5	Day Sighting	Bird Survey	26/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 6	Day Sighting	Bird Survey	26/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 9	Day Sighting	Bird Survey	26/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 3	Day Sighting	Bird Survey	27/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 6	Day Sighting	Bird Survey	27/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 9	Day Sighting	Bird Survey	27/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Project Area, S004 RL	Observation	Target Site	28/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Project Area, T003_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Project Area, T004_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 9	Day Sighting	Bird Survey	28/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Southern Borefields, T006_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 9	Day Sighting	Bird Survey	29/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Eastern Borefields, T007_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Southern Borefield, T008_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Southern Borefield, T010_JR	Day Sighting	Target Transect	30/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Site 9	Day Sighting	Bird Survey	30/06/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Western Access Road, S010_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Eastern Borefields, T009_MB	Day Sighting	Target Transect	1/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Southern Borefield, T012_JR	Day Sighting	Target Transect	1/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Northern Access Road, S017_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Eastern Borefields, T010_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Eastern Borefields, T011_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Southern Borefield, T015_JR	Day Sighting	Target Transect	2/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Southern Borefield, T016_JR	Day Sighting	Target Transect	2/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Western Access Road, T015_MB	Day Sighting	Target Transect	3/07/2018
BIRD	*Artamus cinereus*		Black-faced Woodswallow	Project Area, T019_JR	Day Sighting	Target Transect	3/07/2018
BIRD	*Burhinus grallarius*		Bush Stone-curlew	Southern Borefields, S013 RL	Tracks	Target Site	2/07/18
BIRD	*Cacatua roseicapilla*		Galah	Site 1	Day Sighting	Bird Survey	22/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Cacatua roseicapilla*		Galah	Site 4	Day Sighting	Bird Survey	26/06/2018
BIRD	*Cacatua roseicapilla*		Galah	Site 6	Day Sighting	Bird Survey	27/06/2018
BIRD	*Cacatua roseicapilla*		Galah	Project Area, T002_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Cacatua roseicapilla*		Galah	Southern Borefields, S016_MB	Day Sighting	Target Site	30/06/2018
BIRD	*Cacomantis pallidus*		Pallid Cuckoo	Site 1	Day Sighting	Bird Survey	26/06/2018
BIRD	*Certhionyx variegata*		Pied Honeyeater	Site 10	Day Sighting	Bird Survey	28/06/2018
BIRD	*Cheramoeca leucosterna*		White-backed Swallow	Site 9	Day Sighting	Bird Survey	26/06/2018
BIRD	*Cheramoeca leucosterna*		White-backed Swallow	Project Area, S003 RL	Observation	Target Site	28/06/2018
BIRD	*Cheramoeca leucosterna*		White-backed Swallow	Eastern Borefields, S006 AG	Day Sighting	Target Site	2/07/2018
BIRD	*Cheramoeca leucosterna*		White-backed Swallow	Eastern Borefields, T010_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Circus assimilis*		Spotted Harrier	Eastern Borefields, T009_MB	Day Sighting	Target Transect	1/07/2018
BIRD	*Circus assimilis*		Spotted Harrier	Southern Borefield, T015_JR	Day Sighting	Target Transect	2/07/2018
BIRD	*Coracina maxima*		Ground Cuckoo-shrike	Site 3	Day Sighting	Bird Survey	23/06/2018
BIRD	*Coracina novaehollandiae*		Black-faced Cuckoo-shrike	Site 5	Day Sighting	Bird Survey	23/06/2018
BIRD	*Coracina novaehollandiae*		Black-faced Cuckoo-shrike	Site 2	Day Sighting	Bird Survey	24/06/2018
BIRD	*Coracina novaehollandiae*		Black-faced Cuckoo-shrike	Eastern Borefields, S006_MB	Day Sighting	Target Site	28/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 2	Day Sighting	Bird Survey	23/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 3	Day Sighting	Bird Survey	23/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 1	Day Sighting	Bird Survey	24/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 6	Day Sighting	Bird Survey	24/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 7	Camera	Camera	25/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 7	Day Sighting	Bird Survey	25/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 2	Day Sighting	Bird Survey	26/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 7	Day Sighting	Bird Survey	26/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 8	Day Sighting	Bird Survey	27/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Corvus orru*		Torresian Crow	Western Access Road, S004_JW	Day Sighting	Target Site	28/06/2018
BIRD	*Corvus orru*		Torresian Crow	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 5	Day Sighting	Bird Survey	29/06/2018
BIRD	*Corvus orru*		Torresian Crow	Site 7	Day Sighting	Bird Survey	30/06/2018
BIRD	*Corvus orru*		Torresian Crow	Eastern Borefields, S013_MB	Day Sighting	Target Site	2/07/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 1	Day Sighting	Bird Survey	22/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 2	Day Sighting	Bird Survey	23/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 3	Day Sighting	Bird Survey	24/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 8	Day Sighting	Bird Survey	24/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 1	Day Sighting	Bird Survey	25/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 9	Day Sighting	Bird Survey	25/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 8	Camera	Camera	26/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 2	Day Sighting	Bird Survey	26/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 8	Camera	Camera	27/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 8	Camera	Camera	28/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Project Area, S001 RL	Observation	Target Site	28/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Western Access Road, S004_JW	Day Sighting	Target Site	28/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 4	Day Sighting	Bird Survey	28/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 6	Day Sighting	Bird Survey	28/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 8	Day Sighting	Bird Survey	28/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 8	Day Sighting	Bird Survey	29/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Southern Borefield, T011_JR	Day Sighting	Target Transect	30/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 7	Day Sighting	Bird Survey	30/06/2018
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Site 10	Day Sighting	Bird Survey	30/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Cracticus nigrogularis*		Pied Butcherbird	Western Access Road, S009_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Site 2	Day Sighting	Bird Survey	22/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Site 1	Day Sighting	Bird Survey	23/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Site 7	Day Sighting	Bird Survey	25/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Site 8	Day Sighting	Bird Survey	25/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Site 9	Day Sighting	Bird Survey	25/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Site 6	Day Sighting	Bird Survey	26/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Western Access Road, S004_JW	Day Sighting	Target Site	28/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Site 9	Day Sighting	Bird Survey	28/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Site 9	Day Sighting	Bird Survey	29/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Eastern Borefields, T007_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Cracticus tibicen*		Australian Magpie	Western Access Road, T015_MB	Day Sighting	Target Transect	3/07/2018
BIRD	*Dromaius novaehollandiae*		Emu	Project Area, T003_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Dromaius novaehollandiae*		Emu	Northern Access Road, S018_JW	Scat	Target Site	2/07/2018
BIRD	*Dromaius novaehollandiae*		Emu	Project Area, T017 RL	Tracks	Target Transect	3/07/2018
BIRD	*Dromaius novaehollandiae*		Emu	Project Area, T020_JR	Tracks	Target Transect	3/07/2018
BIRD	*Epthianura tricolor*		Crimson Chat	southern borefields, T003 RL	Observation	Target Transect	29/06/2018
BIRD	*Epthianura tricolor*		Crimson Chat	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Epthianura tricolor*		Crimson Chat	Southern Borefield, T010_JR	Day Sighting	Target Transect	30/06/2018
BIRD	*Falco berigora*		Brown Falcon	Site 6	Day Sighting	Opportunistic	23/06/2018
BIRD	*Falco berigora*		Brown Falcon	Site 1	Day Sighting	Bird Survey	24/06/2018
BIRD	*Falco berigora*		Brown Falcon	Site 3	Day Sighting	Bird Survey	24/06/2018
BIRD	*Falco berigora*		Brown Falcon	Camp	Day Sighting	Opportunistic	26/06/2018
BIRD	*Falco berigora*		Brown Falcon	Site 1	Day Sighting	Bird Survey	27/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Falco berigora*		Brown Falcon	Site 5	Day Sighting	Bird Survey	27/06/2018
BIRD	*Falco berigora*		Brown Falcon	Western Access Road, S004_JW	Day Sighting	Target Site	28/06/2018
BIRD	*Falco berigora*		Brown Falcon	Project Area, T003_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Falco berigora*		Brown Falcon	southern borefields, T004 RL	Observation	Target Transect	29/06/2018
BIRD	*Falco berigora*		Brown Falcon	Western Access Road, S009_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Falco cenchroides*		Australian Kestrel	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Falco cenchroides*		Australian Kestrel	Western Access Road, S004_JW	Day Sighting	Target Site	28/06/2018
BIRD	*Falco cenchroides*		Australian Kestrel	Project Area, T003_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Falco cenchroides*		Australian Kestrel	Project Area, T004_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Falco cenchroides*		Australian Kestrel	Western Access Road, S010_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Falco cenchroides*		Australian Kestrel	Western Access Road, T015_MB	Day Sighting	Target Transect	3/07/2018
BIRD	*Falco longipennis*		Australian Hobby	Site 10	Day Sighting	Bird Survey	29/06/2018
BIRD	*Falco longipennis*		Australian Hobby	Northern Access Road, S016_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 1	Day Sighting	Bird Survey	22/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 2	Day Sighting	Bird Survey	22/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 1	Day Sighting	Bird Survey	23/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 4	Day Sighting	Bird Survey	23/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 5	Day Sighting	Bird Survey	23/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 1	Day Sighting	Bird Survey	24/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 2	Day Sighting	Bird Survey	24/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 3	Day Sighting	Bird Survey	24/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 4	Day Sighting	Bird Survey	24/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 5	Day Sighting	Bird Survey	24/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 6	Day Sighting	Bird Survey	24/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 1	Day Sighting	Bird Survey	25/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 1	Day Sighting	Bird Survey	25/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 2	Day Sighting	Bird Survey	25/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 8	Day Sighting	Bird Survey	25/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 9	Day Sighting	Bird Survey	25/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Project Area, T001_JW	Day Sighting	Target Transect	26/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 2	Day Sighting	Bird Survey	26/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 3	Day Sighting	Bird Survey	26/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 4	Day Sighting	Bird Survey	26/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 6	Day Sighting	Bird Survey	26/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 7	Day Sighting	Bird Survey	26/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 9	Day Sighting	Bird Survey	26/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Project Area, T003_JW	Day Sighting	Target Transect	27/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 1	Day Sighting	Bird Survey	27/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 3	Day Sighting	Bird Survey	27/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 4	Day Sighting	Bird Survey	27/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 6	Day Sighting	Bird Survey	27/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 9	Day Sighting	Bird Survey	27/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 10	Day Sighting	Bird Survey	27/06/2018
BIRD	*Gavicallis virescens*		Singing honeyeater	Project Area, S001 RL	Observation	Spotlight	28/06/2018
BIRD	*Gavicallis virescens*		Singing honeyeater	Project Area, S004 RL	Observation	Target Site	28/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Project Area, T002_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 3	Day Sighting	Bird Survey	28/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 4	Day Sighting	Bird Survey	28/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 5	Day Sighting	Bird Survey	28/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 6	Day Sighting	Bird Survey	28/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 10	Day Sighting	Bird Survey	28/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Southern Borefields, S008_JW	Day Sighting	Target Site	29/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Southern Borefield, T008_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 3	Day Sighting	Bird Survey	29/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 6	Day Sighting	Bird Survey	29/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 9	Day Sighting	Bird Survey	29/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 10	Day Sighting	Bird Survey	29/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Eastern Borefields, S013_JW	Day Sighting	Target Site	30/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Eastern Borefields, T007_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Southern Borefield, T011_JR	Day Sighting	Target Transect	30/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 7	Day Sighting	Bird Survey	30/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 9	Day Sighting	Bird Survey	30/06/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Western Access Road, S009_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Western Access Road, S010_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Southern Borefield, S012_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Eastern Borefields, T009_MB	Day Sighting	Target Transect	1/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Southern Borefield, T012_JR	Day Sighting	Target Transect	1/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Site 9	Day Sighting	Bird Survey	1/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Eastern Borefields, S013_MB	Day Sighting	Target Site	2/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Eastern Borefields, S014_MB	Day Sighting	Target Site	2/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Northern Access Road, S016_JW	Day Sighting	Target Site	2/07/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Gavicallis virescens*		Singing Honeyeater	Northern Access Road, S017_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Eastern Borefields, T010_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Eastern Borefields, T011_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Project Area, T018_JR	Day Sighting	Target Transect	3/07/2018
BIRD	*Gavicallis virescens*		Singing Honeyeater	Project Area, T019_JR	Day Sighting	Target Transect	3/07/2018
BIRD	*Grallina cyanoleuca*		Magpie-Lark	Site 2	Day Sighting	Bird Survey	22/06/2018
BIRD	*Haliastur sphenurus*		Whistling Kite	Western Access Road	Day Sighting	Opportunistic	1/07/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Site 7	Day Sighting	Bird Survey	26/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Site 4	Day Sighting	Bird Survey	27/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Project Area, S003 RL	Observation	Target Site	28/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Site 9	Day Sighting	Bird Survey	28/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Southern Borefield, T007_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Southern Borefield, T008_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Site 9	Day Sighting	Bird Survey	29/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Eastern Borefields, S013_JW	Day Sighting	Target Site	30/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Southern Borefields, S016_MB	Day Sighting	Target Site	30/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Southern Borefield, T008_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Site 7	Day Sighting	Bird Survey	30/06/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Southern Borefield, T012_JR	Day Sighting	Target Transect	1/07/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Site 9	Day Sighting	Bird Survey	1/07/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Eastern Borefields, S013_MB	Day Sighting	Target Site	2/07/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Northern Access Road, S018_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Eastern Borefields, T010_MB	Day Sighting	Target Transect	2/07/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Malurus lamberti*		Variegated Fairy-wren	Eastern Borefields, T011_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 2	Day Sighting	Bird Survey	22/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 4	Day Sighting	Bird Survey	23/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 5	Day Sighting	Bird Survey	23/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 2	Day Sighting	Bird Survey	24/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 2	Day Sighting	Bird Survey	25/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 7	Day Sighting	Bird Survey	25/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 10	Day Sighting	Bird Survey	27/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 4	Day Sighting	Bird Survey	28/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 7	Day Sighting	Bird Survey	28/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 10	Day Sighting	Bird Survey	30/06/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Site 10	Day Sighting	Bird Survey	1/07/2018
BIRD	*Malurus leucopterus*		White-winged Fairy-wren	Southern Borefield, T016_JR	Day Sighting	Target Transect	2/07/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 1	Day Sighting	Bird Survey	23/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 5	Day Sighting	Bird Survey	23/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 3	Day Sighting	Bird Survey	24/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 5	Day Sighting	Bird Survey	25/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 8	Day Sighting	Bird Survey	25/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 8	Day Sighting	Bird Survey	25/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 9	Day Sighting	Bird Survey	25/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Project Area, T001_JW	Day Sighting	Target Transect	26/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 6	Day Sighting	Bird Survey	26/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 8	Day Sighting	Bird Survey	26/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 7	Day Sighting	Bird Survey	27/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 5	Day Sighting	Bird Survey	28/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 6	Day Sighting	Bird Survey	28/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 8	Day Sighting	Bird Survey	28/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 9	Day Sighting	Bird Survey	28/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Southern Borefields, T006_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 8	Day Sighting	Bird Survey	29/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 9	Day Sighting	Bird Survey	29/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Site 9	Day Sighting	Bird Survey	30/06/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Western Access Road, S009_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Western Access Road, S010_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Western Access Road, S011_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Southern Borefield, S014_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Manorina flavigula*		Yellow-throated Miner	Northern Access Road, S018_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Megalurus cruralis*		Brown Songlark	Site 3	Day Sighting	Bird Survey	27/06/2018
BIRD	*Melanodryas cucullata*		Hooded Robin	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Southern Borefields, S002_MB	Day Sighting	Target Site	27/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Eastern Borefields, S006_MB	Day Sighting	Target Site	28/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	southern borefields, T003 RL	Observation	Target Transect	29/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Southern Borefields, T006_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Southern Borefield, T008_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Site 5	Day Sighting	Bird Survey	29/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Southern Borefields, S016_MB	Day Sighting	Target Site	30/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Eastern Borefields, T007_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Southern Borefield, T008_MB	Day Sighting	Target Transect	30/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Melopsittacus undulatus*		Budgerigar	Southern Borefield, T010_JR	Day Sighting	Target Transect	30/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Site 9	Day Sighting	Bird Survey	30/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Site 10	Day Sighting	Bird Survey	30/06/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Western Access Road, S009_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Eastern Borefields, T009_MB	Day Sighting	Target Transect	1/07/2018
BIRD	*Melopsittacus undulatus*		Budgerigar	Site 9	Day Sighting	Bird Survey	1/07/2018
BIRD	*Merops ornatus*		Rainbow Bee-eater	Site 9	Day Sighting	Bird Survey	25/06/2018
BIRD	*Neophema bourkii*		Bourkes Parrot	Project Area, T001_JW	Day Sighting	Target Transect	26/06/2018
BIRD	*Neophema bourkii*		Bourkes Parrot	Northern Access Road, S017_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Nymphicus hollandicus*		Cockatiel	Northern Access Road, S016_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 1	Day Sighting	Bird Survey	22/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 2	Day Sighting	Bird Survey	22/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 2	Day Sighting	Bird Survey	23/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 1	Day Sighting	Bird Survey	24/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 2	Day Sighting	Bird Survey	24/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 3	Day Sighting	Bird Survey	24/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 6	Day Sighting	Bird Survey	24/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 1	Day Sighting	Bird Survey	25/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 9	Day Sighting	Bird Survey	25/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 1	Day Sighting	Bird Survey	26/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 2	Day Sighting	Bird Survey	26/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 4	Day Sighting	Bird Survey	26/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 6	Day Sighting	Bird Survey	26/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Project Area, T001 RL	Observation	Target Transect	27/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Project Area, T003_JW	Day Sighting	Target Transect	27/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 7	Day Sighting	Bird Survey	27/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Project Area, T006_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 3	Day Sighting	Bird Survey	28/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 5	Day Sighting	Bird Survey	29/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 10	Day Sighting	Bird Survey	30/06/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Western Access Road, S011_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Site 10	Day Sighting	Bird Survey	1/07/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Northern Access Road, S016_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Eastern Borefields, T010_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Ocyphaps lophotes*		Crested Pigeon	Project Area, T018_JR	Day Sighting	Target Transect	3/07/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 1	Day Sighting	Bird Survey	22/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 1	Day Sighting	Bird Survey	23/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 1	Day Sighting	Bird Survey	23/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 1	Day Sighting	Bird Survey	25/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 7	Day Sighting	Bird Survey	25/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 9	Day Sighting	Bird Survey	25/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Project Area, T001_JW	Day Sighting	Target Transect	26/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 3	Day Sighting	Bird Survey	26/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Eastern Borefields, S006_MB	Day Sighting	Target Site	28/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Project Area, T005_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 6	Day Sighting	Bird Survey	28/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 10	Day Sighting	Bird Survey	29/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Site 10	Day Sighting	Bird Survey	30/06/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Western Access Road, S010_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Western Access Road, S011_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Oreoica gutteralis*		Crested Bellbird	Southern Borefield, S012_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Pachycephala rufiventris*		Rufous Whistler	Site 1	Day Sighting	Bird Survey	25/06/2018
BIRD	*Pachycephala rufiventris*		Rufous Whistler	Project Area, S005_JW	Day Sighting	Target Site	28/06/2018
BIRD	*Pachycephala rufiventris*		Rufous Whistler	Eastern Borefields, S013_JW	Day Sighting	Target Site	30/06/2018
BIRD	*Pachycephala rufiventris*		Rufous Whistler	Western Access Road, S011_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Pachycephala rufiventris*		Rufous Whistler	Northern Access Road, S016_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Pachycephala rufiventris*		Rufous Whistler	Project Area, S019_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Pardalotus rubricatus*		Red-browed Pardalote	Site 9	Day Sighting	Opportunistic	27/06/2018
BIRD	*Pardalotus rubricatus*		Red-browed Pardalote	Site 9	Day Sighting	Bird Survey	30/06/2018
BIRD	*Pardalotus rubricatus*		Red-browed Pardalote	Southern Borefield, S012_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Petroica goodenovii*		Red-capped Robin	Project Area, T001_JW	Day Sighting	Target Transect	26/06/2018
BIRD	*Petroica goodenovii*		Red-capped Robin	Project Area, S002 RL	Observation	Target Site	28/06/2018
BIRD	*Phaps chalcoptera*		Common Bronzewing	Camp	Day Sighting	Opportunistic	3/07/2018
BIRD	*Platycercus varius*		Mulga Parrot	Southern Borefields, S016_MB	Day Sighting	Target Site	30/06/2018
BIRD	*Platycercus zonarius*		Australian Ringneck	Southern Borefields	Day Sighting	Opportunistic	29/06/2018
BIRD	*Pomatostomus superciliosus*		White-browed Babbler	Site 1	Day Sighting	Bird Survey	23/06/2018
BIRD	*Pomatostomus superciliosus*		White-browed Babbler	Site 1	Day Sighting	Bird Survey	24/06/2018
BIRD	*Pomatostomus superciliosus*		White-browed Babbler	Project Area, T006_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Pomatostomus superciliosus*		White-browed Babbler	Western Access Road, S010_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Ptilorhynchus maculatus guttatus*		Western Bowerbird	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Site 5	Day Sighting	Bird Survey	23/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Site 5	Day Sighting	Bird Survey	24/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Site 5	Day Sighting	Bird Survey	25/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Site 5	Day Sighting	Bird Survey	26/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Site 6	Day Sighting	Bird Survey	26/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Site 5	Camera	Camera	27/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Site 5	Day Sighting	Bird Survey	27/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Project Area, T006_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Site 5	Day Sighting	Bird Survey	28/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Southern Borefields, T006_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Site 5	Day Sighting	Bird Survey	29/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Southern Borefields, S016_MB	Day Sighting	Target Site	30/06/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Southern Borefield, S014_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Eastern Borefields, T009_MB	Day Sighting	Target Transect	1/07/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Eastern Borefields, T010_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Ptilotula plumula*		Grey-fronted Honeyeater	Eastern Borefields, T011_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Purnella albifrons*		White-fronted Honeyeater	Southern Borefields, T006_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Purnella albifrons*		White-fronted Honeyeater	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Purnella albifrons*		White-fronted Honeyeater	Eastern Borefields, T009_MB	Day Sighting	Target Transect	1/07/2018
BIRD	*Purnella albifrons*		White-fronted Honeyeater	Eastern Borefields, T011_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Pyrrholaemus brunneus*		Redthroat	Site 4	Day Sighting	Bird Survey	24/06/2018
BIRD	*Pyrrholaemus brunneus*		Redthroat	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Site 4	Day Sighting	Bird Survey	23/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Site 5	Day Sighting	Bird Survey	24/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Site 5	Day Sighting	Bird Survey	25/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Eastern Borefields, S002_JW	Day Sighting	Target Site	26/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Site 4	Day Sighting	Bird Survey	26/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Site 9	Day Sighting	Bird Survey	26/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Project Area, T001 RL	Observation	Target Transect	27/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Site 4	Day Sighting	Bird Survey	27/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Eastern Borefields, S006_MB	Day Sighting	Target Site	28/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Project Area, T003_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Project Area, T005_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Project Area, T006_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Site 9	Day Sighting	Bird Survey	30/06/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Western Access Road, S011_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Eastern Borefields, S014_MB	Day Sighting	Target Site	2/07/2018
BIRD	*Rhiphidura leucophrys*		Willie Wagtail	Eastern Borefields, T010_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Smicrornis brevirostris*		Weebill	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Stipiturus ruficeps*		Rufous-crowned Emuwren	Eastern Borefields, S013_JW	Day Sighting	Target Site	30/06/2018
BIRD	*Stipiturus ruficeps*		Rufous-crowned Emuwren	Southern Borefield, S012_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 1	Day Sighting	Bird Survey	22/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 1	Day Sighting	Bird Survey	23/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 3	Day Sighting	Bird Survey	23/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 4	Day Sighting	Bird Survey	23/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 5	Day Sighting	Bird Survey	23/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 1	Day Sighting	Bird Survey	24/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 2	Day Sighting	Bird Survey	24/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 3	Day Sighting	Bird Survey	24/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 4	Day Sighting	Bird Survey	24/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 5	Day Sighting	Bird Survey	24/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 1	Day Sighting	Bird Survey	25/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 1	Day Sighting	Bird Survey	25/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 5	Day Sighting	Bird Survey	25/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 6	Day Sighting	Bird Survey	25/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 9	Day Sighting	Bird Survey	25/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 1	Day Sighting	Bird Survey	26/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 3	Day Sighting	Bird Survey	26/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 4	Day Sighting	Bird Survey	26/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 5	Day Sighting	Bird Survey	26/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 6	Day Sighting	Bird Survey	26/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 6	Day Sighting	Bird Survey	26/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 7	Day Sighting	Bird Survey	26/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 9	Day Sighting	Bird Survey	26/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 9	Camera	Camera	27/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Project Area, T003_JW	Day Sighting	Target Transect	27/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 1	Day Sighting	Bird Survey	27/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 3	Day Sighting	Bird Survey	27/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 5	Day Sighting	Bird Survey	27/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 9	Day Sighting	Bird Survey	27/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 10	Day Sighting	Bird Survey	27/06/2018
BIRD	*Taeniopygia guttata*		Zebra finch	Project Area, S002 RL	Observation	Target Site	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra finch	Project Area, S004 RL	Observation	Target Site	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Eastern Borefields, S006_MB	Day Sighting	Target Site	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Project Area, T002_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Project Area, T004_JR	Day Sighting	Target Transect	28/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Taeniopygia guttata*		Zebra Finch	Project Area, T005_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Project Area, T006_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 3	Day Sighting	Bird Survey	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 4	Day Sighting	Bird Survey	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 5	Day Sighting	Bird Survey	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 6	Day Sighting	Bird Survey	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 7	Day Sighting	Bird Survey	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 9	Day Sighting	Bird Survey	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 10	Day Sighting	Bird Survey	28/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Southern Borefields, T006_JW	Day Sighting	Target Transect	29/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Southern Borefield, T008_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 3	Day Sighting	Bird Survey	29/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 5	Day Sighting	Bird Survey	29/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 6	Day Sighting	Bird Survey	29/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 7	Day Sighting	Bird Survey	29/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 9	Day Sighting	Bird Survey	29/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 10	Day Sighting	Bird Survey	29/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Eastern Borefields, S013_JW	Day Sighting	Target Site	30/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Southern Borefield, T008_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 9	Day Sighting	Bird Survey	30/06/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Southern Borefield, S012_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Southern Borefield, S014_JW	Day Sighting	Target Site	1/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Eastern Borefields, T009_MB	Day Sighting	Target Transect	1/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Southern Borefield, T012_JR	Day Sighting	Target Transect	1/07/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
BIRD	*Taeniopygia guttata*		Zebra Finch	Site 9	Day Sighting	Bird Survey	1/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Eastern Borefields, S013_MB	Day Sighting	Target Site	2/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Northern Access Road, S017_JW	Day Sighting	Target Site	2/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Eastern Borefields, T011_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Eastern Borefields, T011_MB	Day Sighting	Target Transect	2/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Western Access Road, T015_MB	Day Sighting	Target Transect	3/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Project Area, T018_JR	Day Sighting	Target Transect	3/07/2018
BIRD	*Taeniopygia guttata*		Zebra Finch	Project Area, T019_JR	Day Sighting	Target Transect	3/07/2018
BIRD	*Todiramphus pyrrhopygius*		Red-backed Kingfisher	Site 9	Day Sighting	Opportunistic	27/06/2018
BIRD	*Turnix velox*		Little Button-quail	Site 5	Day Sighting	Opportunistic	22/06/2018
BIRD	*Turnix velox*		Little Button-quail	Site 4	Day Sighting	Bird Survey	23/06/2018
BIRD	*Turnix velox*		Little Button-quail	Project Area, T001_JR	Day Sighting	Target Transect	27/06/2018
BIRD	*Turnix velox*		Little Button-quail	Project Area, T003_JW	Day Sighting	Target Transect	27/06/2018
BIRD	*Turnix velox*		Little Button-quail	Project Area, T002_JR	Day Sighting	Target Transect	28/06/2018
BIRD	*Turnix velox*		Little Button-quail	Southern Borefield, T007_JR	Day Sighting	Target Transect	29/06/2018
BIRD	*Turnix velox*		Little Button-quail	Eastern Borefields, T007_MB	Day Sighting	Target Transect	30/06/2018
BIRD	*Turnix velox*		Little Button-quail	Southern Borefield, T013_JR	Day Sighting	Target Transect	1/07/2018
BIRD	*Turnix velox*		Little Button-quail	Eastern Borefields, S013 AG	Day Sighting	Target Site	2/07/2018
BIRD	*Turnix velox*		Little Button-quail	Southern Borefield, T015_JR	Day Sighting	Target Transect	2/07/2018
BIRD	*Turnix velox*		Little Button-quail	Project Area, JR_Spotlight_1	Night sighting	Spotlight	3/07/2018
MAMMAL	*Austronomus australis*		White-striped Freetail Bat	Site 8	Anabat recording	Anabat recording	27/06/2018
MAMMAL	*Austronomus australis*		White-striped Freetail Bat	Camp	Anabat recording	Anabat recording	1/07/2018
MAMMAL	*Austronomus australis*		White-striped Freetail Bat	Project Area, JR_Spotlight_3	Night sighting	Spotlight	3/07/2018
MAMMAL	*Bettongia lesueur*	Ex	Boodie	Southern Borefield, T017_JR	Extinct mound	Target Transect	2/07/2018
MAMMAL	*Bettongia lesueur*	Ex	Boodie	Southern Borefield, T015 RL	Extinct mound	Target Transect	2/07/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Bos taurus*	Int.	Cow	Site 1	Scats	Opportunistic	25/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Site 1	Tracks, Scats	Opportunistic	22/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Site 1	Tracks, Scats	Opportunistic	23/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Site 7	Tracks	Opportunistic	25/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Site 8	Tracks	Opportunistic	25/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Site 9	Tracks	Opportunistic	25/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Eastern Borefields, S002_JW	Tracks	Target Site	26/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T001_JW	Tracks	Target Transect	26/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Site 6	Tracks	Opportunistic	26/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T001 RL	Tracks	Target Transect	27/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T003_JW	Tracks	Target Transect	27/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Western Access Road, S004_JW	Tracks	Target Site	28/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, S005_JW	Tracks	Target Site	28/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T002_JR	Tracks	Target Transect	28/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T004_JR	Tracks	Target Transect	28/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T005_JR	Tracks	Target Transect	28/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T006_JR	Tracks	Target Transect	28/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefields, S008_JW	Tracks	Target Site	29/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefields, T006_JW	Tracks	Target Transect	29/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefields, T007_JW	Tracks, scats	Target Transect	29/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, T008_JR	Tracks	Target Transect	29/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, T009_JR	Day Sighting	Target Transect	29/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, T010_JR	Tracks	Target Transect	30/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, T011_JR	Tracks	Target Transect	30/06/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Site 7	Tracks	Opportunistic	30/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Camelus dromedarius*	Int.	Camel	Western Access Road, S009_JW	Tracks	Target Site	1/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Western Access Road, S010_JW	Tracks, scats	Target Site	1/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, S012_JW	Tracks, scats	Target Site	1/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, S014_JW	Tracks	Target Site	1/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, T012_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, T013_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, T014_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Northern Access Road, S015_JW	Tracks	Target Site	2/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Northern Access Road, S016_JW	Tracks	Target Site	2/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Northern Access Road, S017_JW	Tracks	Target Site	2/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Northern Access Road, S018_JW	Tracks, scats	Target Site	2/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, S019_JW	Tracks, scats	Target Site	2/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Southern Borefield, T016_JR	Tracks	Target Transect	2/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T018_JR	Tracks	Target Transect	3/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T019_JR	Tracks	Target Transect	3/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T019_JR	Tracks	Target Transect	3/07/2018
MAMMAL	*Camelus dromedarius*	Int.	Camel	Project Area, T020_JR	Tracks	Target Transect	3/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Site 1	Tracks	Opportunistic	22/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Site 1	Tracks	Opportunistic	22/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Site 1	Tracks	Opportunistic	23/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Site 1	Tracks	Opportunistic	24/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Site 7	Tracks	Opportunistic	25/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Site 8	Tracks	Opportunistic	25/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Site 9	Tracks	Opportunistic	25/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Eastern Borefields, S002_JW	Tracks	Target Site	26/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Canis familiaris*	Int.	Dog	Site 6	Tracks	Opportunistic	26/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Site 7	Tracks	Opportunistic	26/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Project Area, T001 RL	Tracks	Target Transect	27/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Project Area, T003_JW	Tracks	Target Transect	27/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Western Access Road, S004_JW	Tracks	Target Site	28/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Project Area, S005_JW	Tracks	Target Site	28/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Project Area, T004_JR	Day Sighting	Target Transect	28/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Project Area, T005_JR	Tracks	Target Transect	28/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T007_JR	Tracks	Target Transect	29/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T008_JR	Tracks	Target Transect	29/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T009_JR	Tracks	Target Transect	29/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Site 9	Tracks	Opportunistic	29/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T010_JR	Tracks	Target Transect	30/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T011_JR	Tracks	Target Transect	30/06/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Western Access Road, S010_JW	Day Sighting	Target Site	1/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T012_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T013_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T014_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Northern Access Road, S018_JW	Tracks	Target Site	2/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Project Area, S019_JW	Tracks, scats	Target Site	2/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T015_JR	Tracks	Target Transect	2/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Southern Borefield, T016_JR	Tracks	Target Transect	2/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Project Area, T018_JR	Tracks	Target Transect	3/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Project Area, T019_JR	Tracks	Target Transect	3/07/2018
MAMMAL	*Canis familiaris*	Int.	Dog	Project Area, T020_JR	Tracks	Target Transect	3/07/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Chalinolobus morio*		Chocolate-wattled Bat	Site 7	Anabat recording	Anabat recording	26/06/2018
MAMMAL	*Chalinolobus morio*		Chocolate-wattled Bat	Site 10	Anabat recording	Anabat recording	26/06/2018
MAMMAL	*Chalinolobus morio*		Chocolate-wattled Bat	Northern Access Road	Anabat recording	Anabat recording	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	near Site 4	Digging	Opportunistic	24/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Site 7	Camera	Camera	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Tracks	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Tracks	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Tracks	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Tracks	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Tracks	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001_MB	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow, Tracks	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow, Tracks, Scats	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow, Tracks	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Tracks, scats	Target Transect	26/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow, Tracks	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow, Tracks, Scats	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T001 AG	Burrow, Tracks, Scats	Target Transect	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	near camp, Spinifex sandplain	Dead	Opportunistic	26/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road	Camera	Camera	27/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T005_MB	Tracks	Target Transect	28/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Site 7	Tracks	Opportunistic	28/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T007_MB	Burrow	Target Transect	29/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T003 AG	Scats	Target Transect	29/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T003 AG	Tracks	Target Transect	29/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T003 AG	Tracks, scats	Target Transect	29/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Site 7	Burrow	Opportunistic	29/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern borefields, S011 RL	Tracks	Target Site	30/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern Borefields, T004 AG	Tracks	Target Transect	30/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern Borefields, T004 AG	Tracks	Target Transect	30/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Site 9	Tracks	Opportunistic	30/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Site 7	Trapped	Elliott trap	30/06/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Tracks	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Burrow	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Tracks	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Burrow	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Tracks	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Burrow	Target Transect	1/07/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Burrow	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Tracks	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Tracks	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Burrow	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Burrow	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T009 RL	Burrow	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T009_MB	Tracks	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T005 AG	Tracks	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T005 AG	Tracks	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern Borefield, T013_JR	Burrow, Scats	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern Borefield, T013_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road	Digging, Tracks	Opportunistic	1/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T012 RL	Tracks	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T012 RL	Tracks	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T012 RL	Tracks	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T012 RL	Burrow	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	southern borefields, T012 RL	Burrow	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T006 AG	Tracks	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T006 AG	Burrow, Tracks	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T007 AG	Tracks	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern Borefield, T015_JR	Burrow	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern Borefield, T015_JR	Burrow	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern Borefield, T017_JR	Tracks	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern Borefield, T015_JR	Burrow	Target Transect	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Southern Borefield, T015_JR	Burrow	Target Transect	2/07/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Project Area	Digging, Tracks	Opportunistic	2/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Western Access Road, T015_MB	Burrow	Target Transect	3/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T008 AG	Tracks	Target Transect	3/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T008 AG	Tracks	Target Transect	3/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T008 AG	Tracks	Target Transect	3/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T008 AG	Tracks	Target Transect	3/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T008 AG	Burrow, Tracks	Target Transect	3/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T008 AG	Burrow, Tracks	Target Transect	3/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Eastern Borefields, T008 AG	Burrow, Tracks	Target Transect	3/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Project Area	Burrow, Tracks	Opportunistic	3/07/2018
MAMMAL	*Dasycercus blythi*	P4	Brush-tailed Mulgara	Project Area	Night sighting	Spotlight	3/07/2018
MAMMAL	*Equus caballus*	Int.	Horse	Northern Access Road, S016_JW	Tracks, scats	Target Site	2/07/2018
MAMMAL	*Felis catus*	Int.	Cat	Site 1	Tracks	Opportunistic	22/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Site 2	Tracks	Opportunistic	22/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Site 1	Tracks	Opportunistic	23/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Site 5	Tracks	Opportunistic	23/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Site 7	Tracks	Opportunistic	23/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Site 7	Tracks	Opportunistic	25/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Site 8	Tracks	Opportunistic	25/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Eastern Borefields, S002_JW	Tracks	Target Site	26/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Project Area, T001_JW	Tracks	Target Transect	26/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Site 6	Tracks	Opportunistic	26/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Project Area, T003_JW	Tracks	Target Transect	27/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Project Area, T003_JR	Tracks	Target Transect	28/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Southern Borefields, S008_JW	Tracks	Target Site	29/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Felis catus*	Int.	Cat	Southern Borefield, T007_JR	Tracks	Target Transect	29/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Southern Borefields, T007_JW	Tracks	Target Transect	29/06/2018
MAMMAL	*Felis catus*	Int.	Cat	Southern Borefield, T012_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Felis catus*	Int.	Cat	Project Area, S019_JW	Tracks, scats	Target Site	2/07/2018
MAMMAL	*Felis catus*	Int.	Cat	Southern Borefield, T016_JR	Tracks	Target Transect	2/07/2018
MAMMAL	*Felis catus*	Int.	Cat	Project Area, T019_JR	Scats	Target Transect	3/07/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 5	Trapped	Elliott trap	24/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 5	Trapped	Elliott trap	25/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 8	Trapped	Pitfall	25/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 9	Trapped	Elliott trap	26/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 1	Trapped	Elliott trap	27/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 2	Trapped	Cage trap	27/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 1	Trapped	Elliott trap	28/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 5	Trapped	Elliott trap	28/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 5	Trapped	Elliott trap	29/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 9	Trapped	Elliott trap	29/06/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 9	Trapped	Elliott trap	1/07/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 9	Trapped	Elliott trap	1/07/2018
MAMMAL	*Mus musculus*	Int.	House Mouse	Site 10	Trapped	Elliott trap	1/07/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 2	Trapped	Pitfall	22/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 5	Trapped	Pitfall	24/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 7	Trapped	Pitfall	24/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 1	Trapped	Pitfall	25/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 2	Trapped	Pitfall	25/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 7	Trapped	Pitfall	25/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 9	Trapped	Pitfall	25/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 9	Trapped	Pitfall	26/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 5	Trapped	Pitfall	28/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 10	Trapped	Pitfall	28/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 10	Trapped	Pitfall	29/06/2018
MAMMAL	*Ningaui ridei*		Wongai Ningaui	Site 10	Trapped	Pitfall	2/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 1	Tracks	Opportunistic	23/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 5	Camera	Camera	25/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 1	Trapped	Elliott trap	25/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 5	Trapped	Elliott trap	25/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 7	Tracks	Opportunistic	25/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 1	Camera	Camera	26/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 9	Camera	Camera	26/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Eastern Borefields, S002_JW	Tracks	Target Site	26/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, T001_JW	Tracks	Target Transect	26/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 5	Trapped	Elliott trap	26/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 1	Camera	Camera	27/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 5	Camera	Camera	27/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 9	Camera	Camera	27/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, T001_JR	Tracks	Target Transect	27/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, T003_JW	Tracks	Target Transect	27/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 1	Trapped	Elliott trap	27/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 4	Trapped	Elliott trap	27/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 1	Camera	Camera	28/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, S005_JW	Tracks	Target Site	28/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, T004_JR	Tracks	Target Transect	28/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, T005_JR	Tracks	Target Transect	28/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, T006_JR	Tracks	Target Transect	28/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T007_JR	Tracks	Target Transect	29/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefields, T007_JW	Tracks	Target Transect	29/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T008_JR	Tracks	Target Transect	29/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T009_JR	Tracks	Target Transect	29/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T010_JR	Tracks	Target Transect	30/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T011_JR	Tracks	Target Transect	30/06/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Western Access Road, S010_JW	Tracks	Target Site	1/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T012_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T013_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T014_JR	Tracks	Target Transect	1/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Northern Access Road, S018_JW	Tracks	Target Site	2/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, S019_JW	Tracks	Target Site	2/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T015_JR	Tracks	Target Transect	2/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Southern Borefield, T016_JR	Tracks	Target Transect	2/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Western Access Road	Camera	Camera	3/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, T018_JR	Tracks	Target Transect	3/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, T019_JR	Tracks	Target Transect	3/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Project Area, T020_JR	Tracks	Target Transect	3/07/2018
MAMMAL	*Notomys alexis*		Spinifex Hopping Mouse	Site 9	Camera	Camera	26/07/2018
MAMMAL	*Notoryctes typhlops*	P4	Southern Marsupial Mole	Eastern Borefields	mole holes	Opportunistic	30/06/2018
MAMMAL	*Notoryctes typhlops*	P4	Southern Marsupial Mole	Eastern Borefields	mole holes	Opportunistic	30/06/2018
MAMMAL	*Notoryctes typhlops*	P4	Southern Marsupial Mole	Eastern Borefields	mole holes	Opportunistic	30/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Notoryctes typhlops*	P4	Southern Marsupial Mole	Eastern Borefields, T009_MB	Tracks	Target Transect	1/07/2018
MAMMAL	*Oryctolagus cuniculus*	Int.	Rabbit	Camp	Dusk Sighting	Opportunistic	23/06/2018
MAMMAL	*Oryctolagus cuniculus*	Int.	Rabbit	Project Area, T001 RL	Scats	Target Transect	27/06/2018
MAMMAL	*Oryctolagus cuniculus*	Int.	Rabbit	Southern Borefield, T008_JR	Scats	Target Transect	29/06/2018
MAMMAL	*Oryctolagus cuniculus*	Int.	Rabbit	Project Area, JR_Spotlight_2	Night sighting	Spotlight	3/07/2018
MAMMAL	*Osphranter sp.*		Kangaroo sp.	Southern Borefield, T009_JR	Scats	Target Transect	29/06/2018
MAMMAL	*Ozimops petersi*		Inland Freetail Bat	Site 2	Anabat recording	Anabat recording	29/06/2018
MAMMAL	*Pseudomys desertor*		Desert Mouse	Site 2	Trapped	Elliott trap	25/06/2018
MAMMAL	*Pseudomys desertor*		Desert Mouse	Site 9	Trapped	Elliott trap	29/06/2018
MAMMAL	*Pseudomys desertor*		Desert Mouse	Site 10	Trapped	Elliott trap	29/06/2018
MAMMAL	*Pseudomys desertor*		Desert Mouse	Site 10	Trapped	Elliott trap	2/07/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 2	Trapped	Pitfall	23/06/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 5	Trapped	Elliott trap	23/06/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 5	Trapped	Pitfall	24/06/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 5	Trapped	Elliott trap	26/06/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 5	Trapped	Elliott trap	26/06/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 5	Trapped	Elliott trap	27/06/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 5	Trapped	Elliott trap	28/06/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 5	Trapped	Elliott trap	29/06/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 9	Trapped	Elliott trap	29/06/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 9	Trapped	Elliott trap	1/07/2018
MAMMAL	*Pseudomys hermannsburgensis*		Sandy Inland Mouse	Site 10	Trapped	Elliott trap	1/07/2018
MAMMAL	*Pseudomys/Mus sp.*		Mouse sp.	Site 2	Camera	Camera	26/06/2018
MAMMAL	*Pseudomys/Mus sp.*		Mouse sp.	Site 3	Camera	Camera	27/06/2018
MAMMAL	*Pseudomys/Mus sp.*		Mouse sp.	Site 8	Camera	Camera	27/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
MAMMAL	*Pseudomys/Mus sp.*		Mouse sp.	Site 5	Camera	Camera	27/06/2018
MAMMAL	*Pseudomys/Mus sp.*		Mouse sp.	Site 3	Camera	Camera	28/06/2018
MAMMAL	*Pseudomys/Mus sp.*		Mouse sp.	Site 5	Camera	Camera	28/06/2018
MAMMAL	*Pseudomys/Mus sp.*		Mouse sp.	Site 9	Camera	Camera	26/07/2018
MAMMAL	*Sminthopsis ooldea*		Ooldea Dunnart	Site 1	Trapped	Pitfall	27/06/2018
MAMMAL	*Sminthopsis youngsoni*		Lesser Hairy-footed Dunnart	Site 10	Trapped	Pitfall	1/07/2018
MAMMAL	*Vulpes vulpes*	Int.	Fox	Site 4	Camera	Camera	27/06/2018
MAMMAL	*Vulpes vulpes*	Int.	Fox	Project Area, T001 RL	Tracks	Target Transect	27/06/2018
REPTILE	*Antaresia stimsoni*		Stimson's Python	Camp	Photograph	Photograph	
REPTILE	*Aspidites ramsayi*	LS	Woma	Western Access Road	Photograph	Photograph	
REPTILE	*Ctenophorus isolepis*		Military Dragon	southern borefields, T003 RL	Observation	Target Transect	29/06/2018
REPTILE	*Ctenophorus isolepis*		Military Dragon	Southern Borefields, T007_JW	Day Sighting	Target Transect	29/06/2018
REPTILE	*Ctenophorus isolepis*		Military Dragon	southern borefields, S010 RL	Observation	Target Site	30/06/2018
REPTILE	*Ctenophorus isolepis*		Military Dragon	Southern Borefield, T008_MB	Day Sighting	Target Transect	30/06/2018
REPTILE	*Ctenophorus isolepis*		Military Dragon	Eastern Borefields, S005 AG	Day Sighting	Target Site	1/07/2018
REPTILE	*Ctenophorus isolepis*		Military Dragon	Eastern Borefields, S006 AG	Day Sighting	Target Site	2/07/2018
REPTILE	*Ctenophorus isolepis*		Military Dragon	Eastern Borefields, T010_MB	Day Sighting	Target Transect	2/07/2018
REPTILE	*Ctenophorus isolepis*		Military Dragon	Eastern Borefields, T011_MB	Day Sighting	Target Transect	2/07/2018
REPTILE	*Ctenophurus nuchalus*		Central Netted Dragon	Southern Borefields, S002_MB	Day Sighting	Target Site	27/06/2018
REPTILE	*Ctenotus brooksi*			Site 4	Trapped	Pitfall	24/06/2018
REPTILE	*Ctenotus brooksi*			Site 9	Day Sighting	Opportunistic	27/06/2018
REPTILE	*Ctenotus brooksi*			Site 4	Trapped	Pitfall	28/06/2018
REPTILE	*Ctenotus inornatus*			Site 8	Day Sighting	Opportunistic	24/06/2018
REPTILE	*Ctenotus leonhardii*			Site 1	Trapped	Pitfall	23/06/2018
REPTILE	*Ctenotus pantherinus*		Leopard Ctenotus	Site 5	Day Sighting	Opportunistic	22/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
REPTILE	*Ctenotus pantherinus*		Leopard Ctenotus	Site 5	Trapped	Pitfall	25/06/2018
REPTILE	*Ctenotus pantherinus*		Leopard Ctenotus	Site 7	Day Sighting	Opportunistic	27/06/2018
REPTILE	*Ctenotus pantherinus*		Leopard Ctenotus	Site 10	Trapped	Pitfall	27/06/2018
REPTILE	*Ctenotus pantherinus*		Leopard Ctenotus	southern borefields, T007 RL	Observation	Target Transect	30/06/2018
REPTILE	*Ctenotus pantherinus*		Leopard Ctenotus	Eastern Borefields, S006 AG	Day Sighting	Target Site	2/07/2018
REPTILE	*Ctenotus quattuordecimlineatus*		Fourteen-lined Ctenotus	Site 1	Trapped	Pitfall	23/06/2018
REPTILE	*Ctenotus quattuordecimlineatus*		Fourteen-lined Ctenotus	Site 4	Trapped	Pitfall	26/06/2018
REPTILE	*Ctenotus quattuordecimlineatus*		Fourteen-lined Ctenotus	Site 9	Trapped	Pitfall	1/07/2018
REPTILE	*Cyclodomorphus melanops*		Slender Bluetongue	Project Area, S002 RL	Observation	Target Site	28/06/2018
REPTILE	*Cyclodomorphus melanops*		Slender Bluetongue	Project Area, S005 RL	Observation	Target Site	28/06/2018
REPTILE	*Cyclodomorphus melanops*		Slender Bluetongue	Project Area, S007 RL	Observation	Target Site	28/06/2018
REPTILE	*Cyclodomorphus melanops*		Slender Bluetongue	Eastern Borefields, S012_MB	Day Sighting	Target Site	2/07/2018
REPTILE	*Delma butleri*			Project Area, S005 RL	Observation	Target Site	28/06/2018
REPTILE	*Delma desmosa*			Site 5	Trapped	Elliott trap	26/06/2018
REPTILE	*Gehyra sp.*			Project Area, S001 RL	Observation	Target Site	28/06/2018
REPTILE	*Gehyra sp.*			Project Area, S004 RL	Observation	Target Site	28/06/2018
REPTILE	*Gehyra purpurascens*			Project Area, S007 RL	Observation	Target Site	28/06/2018
REPTILE	*Gehyra purpurascens*			Eastern Borefields, S004 AG	Day Sighting	Target Site	30/06/2018
REPTILE	*Gehyra purpurascens*			Project Area, RL_Spotlight_1	Observation	Spotlight	3/07/2018
REPTILE	*Gehyra purpurascens*			Project Area, RL_Spotlight_2	Observation	Spotlight	3/07/2018
REPTILE	*Gehyra variegata*			Site 6	Day Sighting	Opportunistic	23/06/2018
REPTILE	*Gehyra variegata*			Project Area, T001_JW	Day Sighting	Target Transect	26/06/2018
REPTILE	*Gehyra variegata*			Site 6	Day Sighting	Opportunistic	27/06/2018
REPTILE	*Gehyra variegata*			Site 6	Day Sighting	Opportunistic	27/06/2018
REPTILE	*Gehyra variegata*			Site 6	Day Sighting	Opportunistic	27/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
REPTILE	*Gehyra variegata*			Western Access Road, S011_JW	Day Sighting	Target Site	1/07/2018
REPTILE	*Gehyra variegata*			Eastern Borefields, S013_MB	Day Sighting	Target Site	2/07/2018
REPTILE	*Gehyra variegata*			Western Access Road, MB_Spotlight_1	Night sighting	Spotlight	3/07/2018
REPTILE	*Gowidon longirostris*		Long-nosed Dragon	Eastern Borefields, S014 AG	Day Sighting	Target Site	2/07/2018
REPTILE	*Heteronotia binoei*			Project Area, S001 RL	Observation	Target Site	28/06/2018
REPTILE	*Lerista bipes*			Project Area, S003 RL	Observation	Target Site	28/06/2018
REPTILE	*Lerista bipes*			Project Area, S005 RL	Observation	Target Site	28/06/2018
REPTILE	*Lerista desertorum*			Project Area, S006 RL	Observation	Target Site	28/06/2018
REPTILE	*Lerista labialis*			Site 2	Day Sighting	Opportunistic	21/06/2018
REPTILE	*Lerista taeniata*			Project Area, S013 RL	Observation	Target Site	3/07/2018
REPTILE	*Lialis burtonis*		Burton's Legless Lizard	Site 7	Day Sighting	Opportunistic	27/06/2018
REPTILE	*Lialis burtonis*		Burton's Legless Lizard	Project Area, S001 RL	Observation	Target Site	28/06/2018
REPTILE	*Lialis burtonis*		Burton's Legless Lizard	Project Area, S002 RL	Observation	Target Site	28/06/2018
REPTILE	*Lialis burtonis*		Burton's Legless Lizard	Project Area, S006 RL	Observation	Target Site	28/06/2018
REPTILE	*Lialis burtonis*		Burton's Legless Lizard	Project Area, S007 RL	Observation	Target Site	28/06/2018
REPTILE	*Lialis burtonis*		Burton's Legless Lizard	southern borefields, S009 RL	Observation	Target Site	30/06/2018
REPTILE	*Lialis burtonis*		Burton's Legless Lizard	southern borefields, S012 RL	Observation	Target Site	2/07/2018
REPTILE	*Lialis burtonis*		Burton's Legless Lizard	Eastern Borefields, S013 AG	Day Sighting	Target Site	2/07/2018
REPTILE	*Liopholis inornata*			Site 2	Day Sighting	Opportunistic	21/06/2018
REPTILE	*Liopholis inornata*			Project Area, S001 RL	Burrow	Spotlight	28/06/2018
REPTILE	*Liopholis kintorei*	Vu, S3	Great Desert Skink	southern borefields, T009 RL	Burrow	Target Transect	30/06/2018
REPTILE	*Liopholis kintorei*	Vu, S3	Great Desert Skink	southern borefields, T009 RL	Burrow	Target Transect	1/07/2018
REPTILE	*Liopholis kintorei*	Vu, S3	Great Desert Skink	southern borefields, T009 RL	Burrow	Target Transect	1/07/2018
REPTILE	*Liopholis striata*		Night Skink	southern borefields, T012 RL	Burrow	Target Transect	2/07/2018
REPTILE	*Menetia greyii*		Dwarf Skink	Site 5	Day Sighting	Opportunistic	22/06/2018

Appendix 9 – fauna recorded in the Project Area, June 2018							
Species Group	**Scientific Name**	**Status**	**Common Name**	**Site**	**Observation Type**	**Method**	**Date**
REPTILE	*Menetia greyii*		Dwarf Skink	Site 3	Trapped	Pitfall	26/06/2018
REPTILE	*Menetia greyii*		Dwarf Skink	Site 7	Trapped	Pitfall	29/06/2018
REPTILE	*Menetia greyii*		Dwarf Skink	southern borefields, S010 RL	Observation	Target Site	30/06/2018
REPTILE	*Menetia greyii*		Dwarf Skink	Southern Borefields, S016_MB	Day Sighting	Target Site	30/06/2018
REPTILE	*Menetia greyii*		Dwarf Skink	Eastern Borefields, S012_MB	Day Sighting	Target Site	2/07/2018
REPTILE	*Menetia greyii*		Dwarf Skink	Project Area, S013 RL	Observation	Target Site	3/07/2018
REPTILE	*Moloch horridus*		Thorny Devil	Project Area, T001 RL	Tracks	Target Transect	27/06/2018
REPTILE	*Morethia ruficauda*			Site 10	Trapped	Pitfall	27/06/2018
REPTILE	*Morethia ruficauda*			Project Area, S001 RL	Observation	Target Site	28/06/2018
REPTILE	*Morethia ruficauda*			Project Area, S005 RL	Observation	Target Site	28/06/2018
REPTILE	*Morethia ruficauda*		Lined Firetail Skink	Site 10	Trapped	Pitfall	28/06/2018
REPTILE	*Parasuta monarchus*		Monk Snake	Northern Access Road	Night sighting	Spotlight	3/07/2018
REPTILE	*Pseudechis australis*		Mulga Snake	Site 7	Day Sighting	Opportunistic	24/06/2018
REPTILE	*Pygopus nigriceps*			Nebo-Babel Area	Photograph	Photograph	
REPTILE	*Strophurus ciliaris*			Project Area, RL_Spotlight_3	Observation	Spotlight	3/07/2018
REPTILE	*Strophurus ciliaris*			Project Area, RL_Spotlight_4	Observation	Spotlight	3/07/2018
REPTILE	*Strophurus ciliaris*			Project Area, RL_Spotlight_5	Observation	Spotlight	3/07/2018
REPTILE	*Strophurus elderi*			Project Area, S001 RL	Observation	Target Site	28/06/2018
REPTILE	*Strophurus elderi*			Project Area, S002 RL	Observation	Target Site	28/06/2018
REPTILE	*Strophurus strophurus*			Project Area, RL_Spotlight_6	Observation	Spotlight	3/07/2018
REPTILE	*Varanus acanthurus*		Spiny-tailed Goanna	Western Access Road, MB_Spotlight_2	Night sighting	Spotlight	3/07/2018
REPTILE	*Varanus gilleni*		Pygmy Mulga Monitor	Project Area, T001_JW	Day Sighting	Target Transect	26/06/2018
REPTILE	*Varanus gilleni*		Pygmy Mulga Monitor	Western Access Road, MB_Spotlight_3	Night sighting	Spotlight	3/07/2018

Appendix 10. Conservation Significant Fauna Records in the Project Area.

Appendix 10 – Conservation Significant Fauna Records			
Location	**Date**	**Coordinates**	**Notes**
Striated Grasswren (*Amytornis striatus striatus*) – Priority 4			
Site 5	24/06/2018	52 J 372677 7111866	Sighting
Western Access Road, T001_MB	25/06/2018	52 J 356868 7116434	Sighting
Site 5	25/06/2018	52 J 372622 7111735	Sighting
Site 7	27/06/2018	52 J 353752 7117278	Sighting
Site 5	27/06/2018	52 J 372677 7111866	Sighting
Project Area, T004_JR	28/06/2018	52 J 358735 7092305	Sighting
Southern Borefield, T009_JR	29/06/2018	52 J 354979 7082441	Sighting
Site 5	29/06/2018	52 J 372677 7111866	Sighting
Southern Borefield, T008_MB	30/06/2018	52 J 372244 7102801	Sighting
Southern Borefield, T012_JR	1/07/2018	52 J 352348 7095062	Sighting
Southern Borefield, T013_JR	1/07/2018	52 J 358682 7092583	Sighting
Southern Borefield, T014_JR	1/07/2018	52 J 366697 7095542	Sighting
Southern Borefield, T015_JR	2/07/2018	52 J 359368 7097772	Sighting
Eastern Borefields, T011_MB	2/07/2018	52 J 388381 7114384	Sighting
Southern Borefield, S012 RL	2/07/2018	52 J 366998 7097174	Sighting
Project Area, T018_JR	3/07/2018	52 J 374268 7110940	Sighting
Project Area, T019_JR	3/07/2018	52 J 376789 7112370	Sighting
Brush-tailed Mulgara (*Dasycercus blythi*) – Priority 4			
near Site 4	24/06/2018	52 J 369215 7110208	Digging
Site 7	26/06/2018	52 J 354078 7117079	Camera record
Western Access Road, T001_MB	26/06/2018	52 J 356917 7116027	Burrow
Western Access Road, T001_MB	26/06/2018	52 J 357492 7115441	Burrow
Western Access Road, T001_MB	26/06/2018	52 J 357383 7115528	Burrow
Western Access Road, T001_MB	26/06/2018	52 J 358916 7114307	Tracks
Western Access Road, T001_MB	26/06/2018	52 J 359146 7114136	Burrow
Western Access Road, T001_MB	26/06/2018	52 J 357390 7115347	Tracks
Western Access Road, T001_MB	26/06/2018	52 J 357024 7115604	Burrow
Western Access Road, T001_MB	26/06/2018	52 J 358769 7114198	Burrow
Western Access Road, T001_MB	26/06/2018	52 J 357084 7115745	Tracks
Western Access Road, T001_MB	26/06/2018	52 J 357520 7115424	Tracks
Western Access Road, T001_MB	26/06/2018	52 J 357992 7115081	Tracks
Western Access Road, T001_MB	26/06/2018	52 J 358415 7114485	Burrow
Western Access Road, T001 AG	26/06/2018	52 J 356539 7116345	Burrow
Western Access Road, T001 AG	26/06/2018	52 J 356609 7116286	Burrow, Tracks
Western Access Road, T001 AG	26/06/2018	52 J 356790 7116132	Burrow
Western Access Road, T001 AG	26/06/2018	52 J 357212 7115808	Burrow

Appendix 10 – Conservation Significant Fauna Records			
Location	**Date**	**Coordinates**	**Notes**
Western Access Road, T001 AG	26/06/2018	52 J 358099 7115073	Burrow, Tracks, Scats
Western Access Road, T001 AG	26/06/2018	52 J 358475 7114732	Burrow, Tracks
Western Access Road, T001 AG	26/06/2018	52 J 358554 7114667	Burrow
Western Access Road, T001 AG	26/06/2018	52 J 358678 7114569	Tracks, scats
Western Access Road, T001 AG	26/06/2018	52 J 359062 7114272	Burrow
Western Access Road, T001 AG	26/06/2018	52 J 359258 7114050	Burrow
Western Access Road, T001 AG	26/06/2018	52 J 358336 7114275	Burrow, Tracks
Western Access Road, T001 AG	26/06/2018	52 J 357154 7115099	Burrow, Tracks, Scats
Western Access Road, T001 AG	26/06/2018	52 J 356524 7115507	Burrow, Tracks, Scats
Near camp, Spinifex sandplain	26/06/2018	52 J 372617 7114683	Dead
Western Access Road	27/06/2018	52 J 358334 7114275	Camera
Western Access Road, T005_MB	28/06/2018	52 J 395682 7123501	Tracks
Site 7	28/06/2018	52 J 354230 7117254	Tracks
Western Access Road, T007_MB	29/06/2018	52 J 392453 7123126	Burrow
Eastern Borefields, T003 AG	29/06/2018	52 J 393097 7122472	Scats
Eastern Borefields, T003 AG	29/06/2018	52 J 392927 7122737	Tracks
Eastern Borefields, T003 AG	29/06/2018	52 J 392296 7123407	Tracks, scats
Site 7	29/06/2018	52 J 354163 7117196	Burrow
Southern borefields, S011 RL	30/06/2018	52 J 358615 7092570	Tracks
Southern Borefields, T004 AG	30/06/2018	52 J 372186 7103208	Tracks
Southern Borefields, T004 AG	30/06/2018	52 J 371910 7102433	Tracks
Site 9	30/06/2018	52 J 381225 7113751	Tracks
Site 7	30/06/2018	52 J 354036 7117072	Trapped
southern borefields, T009 RL	1/07/2018	52 J 357149 7093618	Tracks
southern borefields, T009 RL	1/07/2018	52 J 357030 7093612	Burrow
southern borefields, T009 RL	1/07/2018	52 J 356926 7093646	Tracks
southern borefields, T009 RL	1/07/2018	52 J 356890 7093659	Burrow
southern borefields, T009 RL	1/07/2018	52 J 356035 7094611	Tracks
southern borefields, T009 RL	1/07/2018	52 J 355925 7094697	Burrow
southern borefields, T009 RL	1/07/2018	52 J 355775 7094779	Burrow
southern borefields, T009 RL	1/07/2018	52 J 355121 7095474	Tracks
southern borefields, T009 RL	1/07/2018	52 J 355183 7094653	Tracks
southern borefields, T009 RL	1/07/2018	52 J 355501 7094465	Burrow
southern borefields, T009 RL	1/07/2018	52 J 355938 7093918	Burrow
southern borefields, T009 RL	1/07/2018	52 J 356001 7093892	Burrow
Western Access Road, T009_MB	1/07/2018	52 J 391702 7121086	Tracks
Eastern Borefields, T005 AG	1/07/2018	52 J 391182 7122121	Tracks
Eastern Borefields, T005 AG	1/07/2018	52 J 391011 7121715	Tracks
Southern Borefield, T013_JR	1/07/2018	52 J 357303 7093443	Burrow, Scats
Southern Borefield, T013_JR	1/07/2018	52 J 357272 7093992	Tracks

Appendix 10 – Conservation Significant Fauna Records			
Location	**Date**	**Coordinates**	**Notes**
Western Access Road	1/07/2018	52 J 356299 7116542	Digging, Tracks
southern borefields, T012 RL	2/07/2018	52 J 359286 7098070	Tracks
southern borefields, T012 RL	2/07/2018	52 J 360925 7096694	Tracks
southern borefields, T012 RL	2/07/2018	52 J 362027 7095555	Tracks
southern borefields, T012 RL	2/07/2018	52 J 360810 7096122	Burrow
southern borefields, T012 RL	2/07/2018	52 J 359437 7097672	Burrow
Eastern Borefields, T006 AG	2/07/2018	52 J 388747 7121280	Tracks
Eastern Borefields, T006 AG	2/07/2018	52 J 388434 7121766	Burrow, Tracks
Eastern Borefields, T007 AG	2/07/2018	52 J 390945 7114930	Tracks
Southern Borefield, T015_JR	2/07/2018	52 J 359264 7097865	Burrow
Southern Borefield, T015_JR	2/07/2018	52 J 359117 7098007	Burrow
Southern Borefield, T017_JR	2/07/2018	52 J 373374 7097952	Tracks
Southern Borefield, T015_JR	2/07/2018	52 J 359011 7098009	Burrow
Southern Borefield, T015_JR	2/07/2018	52 J 359129 7097974	Burrow
Project Area	2/07/2018	52 J 374067 7113061	Digging, Tracks
Western Access Road, T015_MB	3/07/2018	52 J 353669 7117734	Burrow
Eastern Borefields, T008 AG	3/07/2018	52 J 354865 7116630	Tracks
Eastern Borefields, T008 AG	3/07/2018	52 J 355188 7116537	Tracks
Eastern Borefields, T008 AG	3/07/2018	52 J 355297 7116739	Tracks
Eastern Borefields, T008 AG	3/07/2018	52 J 355287 7117040	Tracks
Eastern Borefields, T008 AG	3/07/2018	52 J 355167 7117042	Burrow, Tracks
Eastern Borefields, T008 AG	3/07/2018	52 J 355022 7117079	Burrow, Tracks
Eastern Borefields, T008 AG	3/07/2018	52 J 354919 7117139	Burrow, Tracks
Project Area	3/07/2018	52 J 372231 7114437	Burrow, Tracks
Project Area	3/07/2018	52 J 372041 7114588	Night sighting
Southern Marsupial Mole (*Notoryctes typhlops*) – Priority 4			
Eastern Borefields	30/06/2018	52 J 387782 7119194	mole holes
Eastern Borefields	30/06/2018	52 J 388304 7119261	mole holes
Eastern Borefields	30/06/2018	52 J 396019 7122173	mole holes
Eastern Borefields, T009_MB	1/07/2018	52 J 390936 7121167	Tracks
Great Desert Skink (*Liopholis kintorei*) – Vulnerable, Schedule 3			
Southern borefields, T009 RL	30/06/2018	52 J 354636 7087000	Old burrow system with many entrances and scat latrine. Burnt.
Southern borefields, T009 RL	1/07/2018	52 J 355068 7095634	Large, active burrow system with large scat latrine present.
Southern borefields, T009 RL	1/07/2018	52 J 354924 7094995	Very large active burrow system with large scat latrine.
Southern Borefield	2018	52J 356462E, 7094008N	Burrow system with large scat latrine. Camera record of individual. Record from Everard and Bamford (2018a)

Appendix 10 – Conservation Significant Fauna Records			
Location	**Date**	**Coordinates**	**Notes**
Southern Borefield	2018	52J 358851E, 7093180N	Burrow system with scat latrine. Record from Everard and Bamford (2018a)
Southern Borefield	2018	52J 357341E, 7093661N	Sighting of individual crossing track. Record from Everard and Bamford (2018a)

Appendix 11. Bat Call Analysis

Specialised Zoological

Bat call identification from near Jameson, WA

Type:	Acoustic analysis
Prepared for:	Western Wildlife
Date:	1 August 2018
Job No.:	SZ464
Prepared by:	Kyle Armstrong and Yuki Konishi Specialised Zoological ABN 92 265 437 422 Tel 0404 423 264 kyle.n.armstrong@gmail.com http://szool.com.au

This report should be included amongst the technical appendices of the main report, and cited as:

Specialised Zoological (2018). Bat call identification from near Jameson, WA. Acoustic analysis. Unpublished report by Specialised Zoological for Western Wildlife, 1 August 2018, Job number SZ464.

Summary

Bat identifications from acoustic recordings are provided from near Jameson, in Western Australia near the border intersection of South Australia and the Northern Territory. Five species of bat were identified as being present (**Tables 1** and **2**). Representative echolocation calls for each identification are illustrated (**Figure 1**), as recommended by the Australasian Bat Society (ABS 2006). Further data are available should verification be required.

Comments on identifications

The identification of bat species from full spectrum WAV-format recordings of their echolocation calls was based on measurements of characteristic frequency, observation of pulse shape, and the pattern of harmonics.

Some calls could not be attributed unambiguously to one species. The calls of the Inland Free-tailed Bat *Ozimops petersi* are similar and overlap with the call variation of Gould's Wattled Bat *Chalinolobus gouldii*. In one case, *O. petersi* could be distinguished. Calls of *Chalinolobus gouldii* could not be confirmed unambiguously because no sequences with successive pulses that alternate between higher and lower frequencies were observed. Calls attributed to a species of long-eared bat could have been derived from either the Central Long-eared Bat *Nyctophilus major tor* or the Lesser Long-eared Bat *Nyctophilus geoffroyi*. Calls attributed to the Chocolate Wattled Bat *Chalinolobus morio* could instead have come from Finlayson's Cave Bat *Vespadelus finlaysoni*, but *C. morio* is more likely based on the characteristic frequency of pulses.

Methods

Data were recorded in full spectrum WAV format with Titley Scientific AnaBat Swift bat detectors (sampling rate 500 kHz, set to turn on automatically at sunset and off at sunrise). After download, each WAV file was opened and inspected in a spectrogram in Adobe Audition CS6 version 5.0.2. Species were identified based on information in Fullard et al. (1991) and Churchill (2008), and nomenclature follows Jackson and Groves (2015).

Limitations

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

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

References

ABS (2006). Recommendations of the Australasian Bat Society Inc for reporting standards for insectivorous bat surveys using bat detectors. *The Australasian Bat Society Newsletter* 27: 6–9. [ISSN 1448-5877]

Churchill, S.K. (2008). *Australian bats*. 2nd ed. Allen and Unwin, Crows Nest, NSW.

Fullard, J.H., Koehler, C., Surlykke, A. and McKenzie, N.L. (1991). Echolocation ecology and flight morphology of insectivorous bats (Chiroptera) in south-western Australia. *Australian Journal of Zoology* 39: 427–438.

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

Table 1. Species identified in the present survey from all sites combined.

VESPERTILIONIDAE	
Chocolate Wattled Bat	*Chalinolobus morio*
MOLOSSIDAE	
White-striped Free-tailed Bat	*Austronomus* (=*Tadarida*) *australis*
Inland Free-tailed Bat	*Ozimops* (=*Mormopterus*) *petersi*
Ambiguous identifications	
Gould's Wattled Bat	*Chalinolobus gouldii*
Unidentified long-eared bat	*Nyctophilus* sp.

Table 2. Species identifications, with the degree of confidence indicated by a code. Date and serial/unit number correlates with site; see **Table 1** for full species names. Note: not all dates had deployment of the detectors, the list below represents the nightly data folders present in the recording dataset.

	A. australis	*C. gouldii*	*C. morio*	*M. petersi*	*Nyctophilus* sp.		*A. australis*	*C. gouldii*	*C. morio*	*M. petersi*	*Nyctophilus* sp.
Swift 450057						**Swift 450083**					
23/06/2018	—	—	—	—	NC	23/06/2018	—	—	—	—	—
24/06/2018	—	—	—	—	—	24/06/2018	—	—	—	—	—
25/06/2018	—	—	—	—	—	25/06/2018	—	—	—	—	—
26/06/2018	—	—	◆	—	—	26/06/2018	—	—	◆	—	—
27/06/2018	◆	—	—	—	—	27/06/2018	—	—	—	—	—
28/06/2018	—	—	—	—	—	28/06/2018	—	—	—	—	—
29/06/2018	—	—	—	—	—	29/06/2018	—	—	—	◆	—
30/06/2018	—	—	—	—	—	30/06/2018	—	—	—	—	—
1/07/2018	—	—	—	—	—	1/07/2018	◆	—	—	—	—
2/07/2018	—	—	—	—	—	2/07/2018	—	NC	◆	—	NC

Definition of confidence level codes:

— Not detected.

◆ Unambiguous identification of the species at the site based on measured call characteristics and comparison with available reference material. Greater confidence in this ID would come only after capture and supported by morphological measurements or a DNA sequence.

NC Needs Confirmation. Either call quality was poor, or the species cannot be distinguished reliably from another that makes similar calls. Alternative identifications are indicated in the *Comments on identifications* section of this report. If this is a species of conservation significance, further survey work might be required to confirm the record.

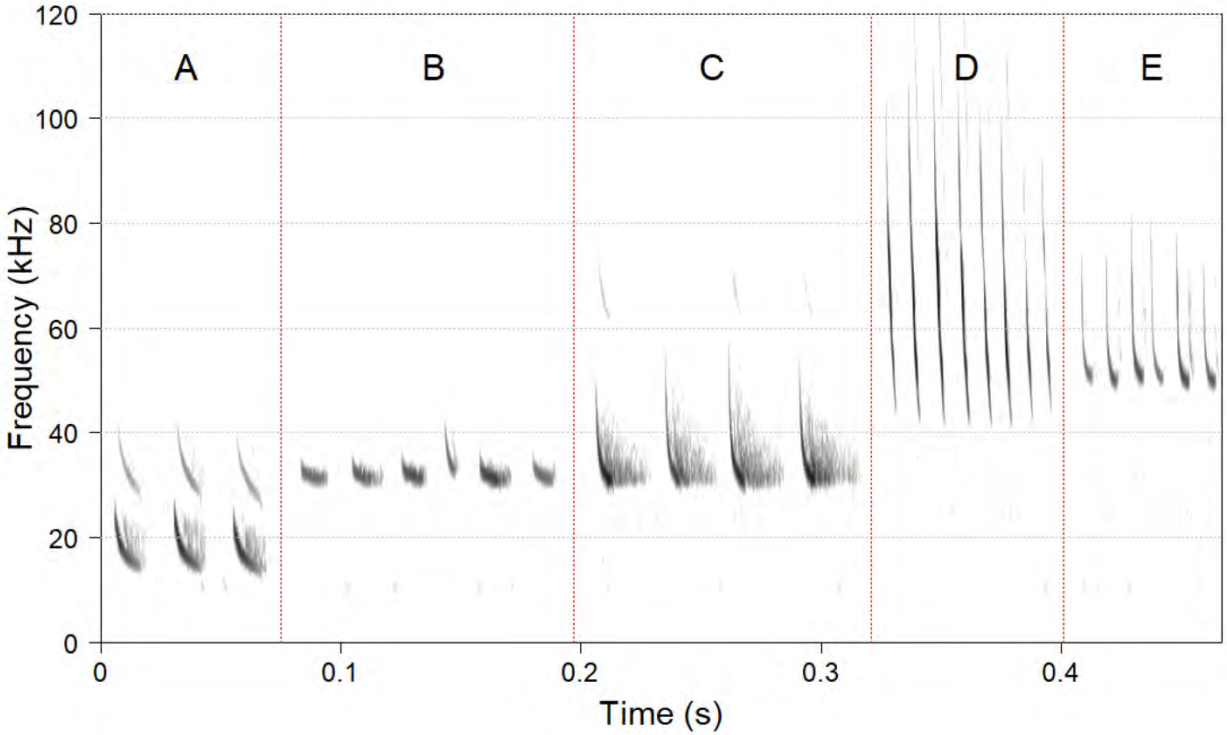

Figure 1. Representative call sequence portions of the species identified (**A**: *Austronomus australis*; **B**: *Ozimops petersi*; **C**: *Chalinolobus gouldii?*; **D**: *Nyctophilus* sp.; **E**: *Chalinolobus morio*; time between pulses has been compressed).