

Basic Vertebrate Fauna Survey and Risk Assessment

MAU Laverton Gold Project

Prepared for: Magnetic Resources NL

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Prepared For: Magnetic Resources NL
PO Box 1388
West Perth, WA 6872

Prepared By: Terrestrial Ecosystems
10 Houston Place
Mt Claremont WA 6010
Phone: 08 9385 2398, 0407 385 289
Website: www.terrestrialecosystems.com
ABN: 40921131346

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EXECUTIVE SUMMARY

Blue Cap Mining on behalf of Magnetic Resources NL requested a Basic vertebrate fauna survey and risk assessment for the Laverton Gold Project. The project area is an irregular shape and includes tenements P38/4170, E38/3209, P38/4379, P38/4381, P38/4382, P38/4380, P38/4383, P38/4384, P38/3100, M38/1041, E38/3127 and P38/4205 (Figures 1 and 2). The total area assessed was approximately 2,890ha, but development is expected to be less than 1,030ha. The project area straddles the Old Laverton Road but is mostly on the southern side and is approximately 12km south-west of Laverton. The project area includes the following three broad fauna habitats: mulga and mixed shrubland, chenopod shrublands, and rocky ridges and breakaways. In addition, there are multiple areas that have been disturbed by exploration and mining activity.

The Southern Whiteface (*Aphelocephala leucopsis*), listed as Vulnerable under the *EPBC Act*, is likely to occur in the project area but is unlikely to be significantly impacted by vegetation clearing and mining activity as it is a mobile species and is found widely across neighbouring areas, and there is similar habitat in adjacent areas for this bird to move into. The proposed disturbance is unlikely to significantly impact on this conservation significant species, so a referral under the *EPBC Act* is not recommended.

Although they are in the project area, the proposed disturbance areas do not include breakaways and rocky ridges, so potential impacts on the Priority 4 Long-tailed Dunnart (*Antechinomys longicaudatus*) are likely to be low.

Clearing native vegetation in the project area is likely to result in the loss of small vertebrate fauna on-site that are unable to move away during the vegetation clearing process, however, this loss is not likely to be significant when viewed in a bioregional context. The few larger animals, such as kangaroos, large goannas and snakes, and most of the birds will move into adjacent areas once vegetation clearing commences, so potential impacts will be low. There may be an on-going loss of small native fauna to vehicle strikes on access tracks, but overall, this impact will be very low. Forced fauna migrants because of vegetation clearing will increase competition for resources in adjacent areas, which may result in the subsequent loss of migrants or local individuals. Individuals shifted out of their established activity areas are also vulnerable to predation until they have become established in their new areas. There was evidence of rabbits, feral cats and wild dogs in the project area.

It is recommended that:

- an induction program is implemented that includes a component on managing vertebrate fauna for staff working in the project area;
- the impact of dust on adjacent vegetation and fauna habitat is managed;
- a log is maintained of all drill holes, and who was responsible for capping each hole;
- all areas disturbed during exploration are rehabilitated as soon as practical after they are no longer required;
- where possible, access routes are aligned to existing roads, tracks and other barriers or follow the boundaries of broad-scale vegetation associations in the area;
- pets are not permitted in the project area;
- all waste and rubbish to be contained in bins and regularly removed from the site or placed in land fill and suitably covered to exclude access to predator species;
- feeding of native fauna is prohibited;
- a feral pest control program is implemented in the project area and surrounds; and
- Vertebrate fauna management protocol be prepared and implemented for the life of the project.

1. INTRODUCTION

1.1 BACKGROUND

Blue Cap Mining on behalf of Magnetic Resources NL requested a Basic vertebrate fauna survey and risk assessment for the Laverton Gold Project. The project area is an irregular shape and includes tenements P38/4170, E38/3209, P38/4379, P38/4381, P38/4382, P38/4380, P38/4383, P38/4384, P38/3100, M38/1041 and E38/3127 (Figures 1 and 2). The project area straddles the Old Laverton Road but is mostly on the southern side and is approximately 12km south-west of Laverton.

The total area assessed project area was ~2,890ha, but development is expected to be less than 1,030ha.

1.2 PROJECT OBJECTIVES AND SCOPE OF WORKS

Terrestrial Ecosystems was commissioned by Magnetic Resources NL to undertake a Basic vertebrate fauna survey and risk assessment of the project area to support a mining application. The methodology broadly follows that described in the Environmental Protection Authority's (2020) *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. A Basic fauna assessment involves undertaking a desktop review and reconnaissance site visit. The objectives of this fauna assessment were to:

- provide an indication of the vertebrate fauna assemblage (reptiles, amphibians, mammals and birds) in and near the project area, so that potential impacts on the fauna and fauna assemblage might be adequately assessed;
- describe the major vertebrate fauna habitats present;
- discuss potential impacts on conservation significant fauna; and
- recommend strategies to mitigate potential impacts on the vertebrate fauna, and in particular conservation significant fauna.

To achieve these objectives, Terrestrial Ecosystems:

- reviewed Terrestrial Ecosystems' database [includes Atlas of Living Australia and Western Australian Museum records] to identify potential vertebrate fauna within the area;
- searched the Commonwealth Governments online database of fauna of national environmental significance to identify species potentially occurring near the project area that are protected under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* or international migratory bird agreements (JAMBA/CAMBA);
- undertook a site reconnaissance survey, mapped fauna habitats and searched the project area for Malleefowl, their mounds and tracks;
- reviewed previous fauna surveys conducted near the project area in similar habitat types; and
- discussed the likelihood of *EPBC Act 1999* and *Biodiversity Conservation (BC) Act 2016* listed species being present in the project area.

2. EXISTING ENVIRONMENT

2.1 LOCATION OF PROJECT AREA

The project area is within the Eastern Murchison (MUR1) Interim Biogeographic Regionalisation of Australia (IBRA) subregion. This subregion is characterised by its internal drainage and extensive areas of elevated red semi-arid sandplains with minimal dune development, broad plains of red-brown soils and breakaway complexes (Cowan 2001). The vegetation is dominated by Mulga woodlands, hummock grasslands, saltbush and Halosarcia shrublands (Cowan 2001).

2.2 LAND USE HISTORY

The dominant land uses in the IBRA subregion are native pasture, unallocated crown land and crown reserves, mining and conservation reserves (Cowan 2001).

2.3 CLIMATE

The project area is characterised as semi-arid. Laverton, which is approximately 12km to the north-east has an annual rainfall of approximately 236mm, although this varies considerably from year-to-year. The highest mean maximum and minimum temperatures in Laverton are in December to February (Bureau of Meteorology 2023). The lowest mean daily maximum and minimum temperatures occur in July (Chart 1). Rainfall predominantly occurs between January and March from low pressure cells moving in from the north-west.

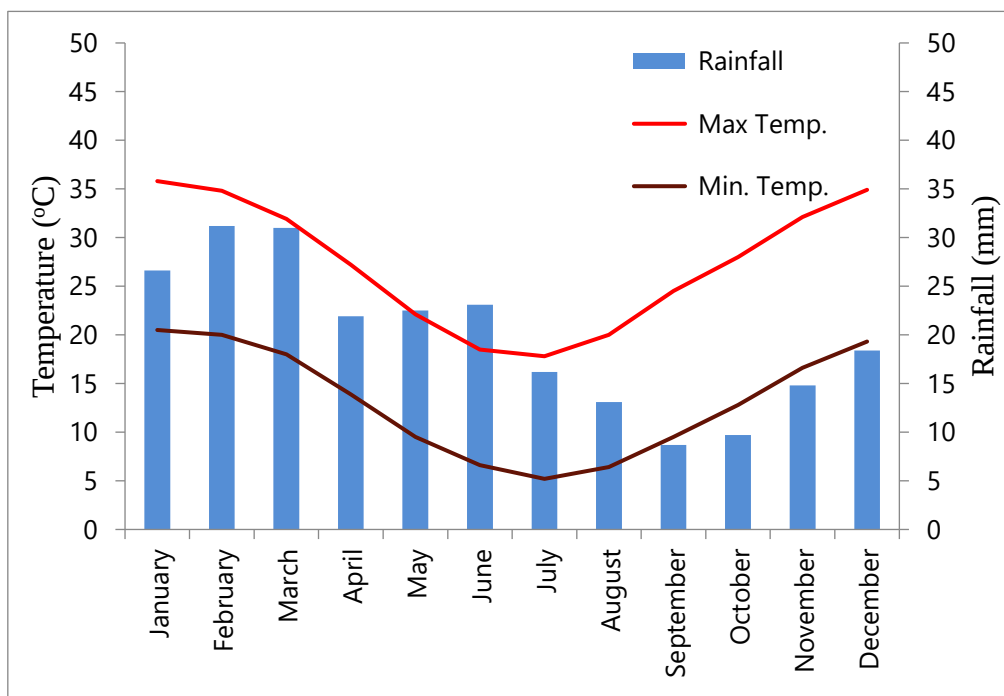


Chart 1. Climatic averages for Laverton

2.4 REGIONAL BIOLOGICAL FAUNA CONTEXT OF PROJECT AREA

The frogs, reptiles, mammals and birds in the vicinity of the project area have been surveyed for other environmental assessments and research purposes and are therefore known. Fauna surveys and assessments undertaken in the vicinity of the project area that have been reviewed for this assessment include:

- Bamford Consulting Ecologists (2007) *Fauna Assessment and Targeted Mulgara Search of the Fish Deposit, Laverton Gold Project*, Perth.
- Bell, D. T., Bell, R. C. and Loneragan, W. A. (2007) Winter bird assemblages across an arid gradient in south-west Western Australia. *Journal of the Royal Society of Western Australia* 90, 219-227.
- Biota Environmental Sciences (2004) *Cosmos Nickel Mine Extension Fauna Survey*. Unpublished report for Sir Samuel Mines NL and URS, Perth.
- Biota Environmental Sciences (2007) *Bannockburn Fauna Habitat and Assemblage Survey*. Unpublished report for Jubilee Mines NL, Perth.
- Coffey Environments (2007) *Level 1 Fauna Assessment, Leinster Nickel Operations*, Perth.
- Coffey Environments (2008) *Level 2 Fauna Assessment for the Duketon Gold Project*. Unpublished report for Regis Resources, Perth.
- Craig, M. D. and Chapman, A. (2003) Effects of short-term drought on the avifauna of Wanjarri Nature Reserve: What do they tell us about drought refugia. *Journal of the Royal Society of Western Australia* 86: 133-137.
- Dell, J. and How, R. A. (1988) Vertebrate fauna. In: The biological survey of the Eastern Goldfields of Western Australia, Part 5, Edjudina - Menzies Study Area. *Records of the Western Australian Museum*, Supplement No 31, 38-77.
- Dell, J., How, R. A. and Milewski, A. V. (1992) The biological survey of the Eastern Goldfields, Part 6, Youanmi-Leonora Study Area. *Records of the Western Australian Museum*, Supplement No 40, 131.
- Donarto Environmental Services (2005) *Leinster Nickel Operations Tailing Storage Facility and Water Storage Areas: Wildlife Interactions and Assessment of Risks*, Perth.
- Dunlop, J. N. (1990) The small vertebrate ground fauna of Mulga habitats near Wiluna, Western Australia. *Mulga Research Centre Journal*, 10, 19-27.
- ENV Australia (2008) *Agnew Prospects Fauna Assessment*. Unpublished report for Agnew Gold Mining Company Pty Limited, Perth.
- Halpern Glick Maunsell (1999) *Rosemont Gold Project Biological Assessment Survey - Phases 1 & 2*. Unpublished report for Johnson's Well Mining NL, Perth.
- Harewood, G. (2011) *Terrestrial Fauna Survey (Level 1) of the West Laverton Area (P38/3717, P38/3718, P38/3491, P38/3492, P38/3314, P38/3490, P38/3315, M38/0046, M38/0049, M38/0040, M38/0358, M38/0048, M38/0101, M38/0364, M38/0342, M38/0345, L38/0179, L38/0177, L38/0178, L38/0153, L38/0092, E38/1930, E38/2347, E38/2084 & E38/1966)*. Unpublished report for Crescent Gold Limited.
- Hart, Simpson and Associates (2000) *Cawse Expansion Project Fauna Survey*. Unpublished report for Anaconda Nickel Ltd, Perth.
- How, R. A. and Dell, J. (1992) Vertebrate fauna. In: The Biological Survey of the Eastern Goldfields of Western Australia Part 7. Duketon - Sir Samuel Study Area. *Records of the Western Australian Museum*; Supplement 40, 90-109.
- MBS Environmental (2004) *Vegetation and Habitat Assessment of the Euro, Sickie and Admiral Hill Project Areas, Laverton*. Unpublished report for Crescent Gold Limited, Perth.
- McKenzie, N. L., Rolfe, J. K. and Youngson, W. K. (1994) Vertebrate fauna. In: The Biological Survey of the Eastern Goldfields of Western Australia Part 10, Sandstone-Sir Samuel and Laverton-Leonora Study Areas. *Records of the Western Australian Museum*, Supplement No 47, pp. 51-85.
- Moriarty, T. K. (1972) Birds of Wanjarri; WA (27°; 25'S; 120° 40'E) *The Emu*, 72, 1-7.
- Murphy, D. (1994) *Vertebrate fauna species of the North-eastern Goldfields*. Report to Western Mining's Leinster Nickel and Mount Keith Operations, Perth.
- Ninox Wildlife Consulting (1998) *A Vertebrate Fauna Survey of the Murrin Expansion Project*. Unpublished report for Anaconda Nickel Ltd, Perth.

- Ninnox Wildlife Consulting (2005) *Vertebrate Fauna Habitat Assessment of the Proposed Expansions to the Cosmos Nickel Mine, near Leinster, Western Australia*. Unpublished report for URS Australia Pty Ltd, Perth.
- Ninnox Wildlife Consulting (2006) *A Vertebrate Fauna Assessment of the Tarmoola Area*, Unpublished report for St Barbara Ltd, Perth.
- Onus, M. L., Rolfe, J.K., and Algar, D. (2011) *Assessment of feral cat abundance and control options at Barrick, Granny Smith*. Perth.
- Terrestrial Ecosystems (2010) *Level 2 Fauna Risk Assessment for the Garden Well Project Area*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2011a) *Level 2 Fauna Risk Assessment for Granny Deeps Project Area*. Unpublished report for Barrick Gold Corporation, Perth.
- Terrestrial Ecosystems (2011b) *Targeted Survey for Long-tailed Dunnarts for the Granny Deeps Project Area*. Perth.
- Terrestrial Ecosystems (2012g) *Level 1 Vertebrate Fauna Risk Assessment for the Proposed Exploration Areas around the Granny Open Pit Project Area*. Unpublished report for Granny Smith Mining Pty Ltd, Perth.
- Terrestrial Ecosystems (2012a) *Level 1 Fauna Risk Assessment for the Anchor Project*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2012b) *Level 1 Fauna Risk Assessment for the Moolart Well to Garden Well Access Road on M38/354, M38/302, M38/303 and L38/216*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2012c) *Level 1 Fauna Risk Assessment for the Petra Project*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2012d) *Level 1 Fauna Risk Assessment for the Reichelt Project*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2012e) *Level 1 Fauna Risk Assessment for the Rosemont Project Area*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2012f) *Level 1 Fauna Risk Assessment for the Russell Find Project*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2012h) *Level 1 Vertebrate Fauna Risk Assessment for the Proposed Mining Areas around the Granny Open Pit Project Area*. Unpublished report for Granny Smith Mining Pty Ltd, Perth.
- Terrestrial Ecosystems (2013) *Level 1 Fauna Risk Assessment for Two Waste Dumps either side of the proposed Rosemont Project Area (G38/29, G38/30, G38/31, G38/32) and a Slurry Pipeline from the Rosemont mine to the Garden Well processing plant (L38/219)*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2014) *Level 1 Fauna Risk Assessment for a proposed power station site*. Unpublished report for Granny Smith Mining Pty Ltd, Perth.
- Terrestrial Ecosystems (2015a) *Fauna risk assessment of the proposed borrow pit expansion*. Unpublished report for Granny Smith Mining Pty Ltd, Perth.
- Terrestrial Ecosystems (2015b) *Level 1 Fauna Risk Assessment for the Gloster Project and haul road*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2016a) *Level 1 Fauna Risk Assessment for the Anchor Project Area*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2016b) *Level 1 Fauna Risk Assessment for the Baneygo Project*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2016c) *Level 1 Fauna Risk Assessment for the Dogbolter-Coopers Project Area*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2016d) *Level 1 Fauna Risk Assessment for the Petra Project Area*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2016e) *Level 1 Fauna Risk Assessment for the Tooheys Project Area*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2017a) *Level 1 Fauna Risk Assessment for the proposed Haul Road to the Baneygo Project Area*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2017b) *Level 1 Fauna Risk Assessment for the proposed Haul Road to the proposed Petra Mining area*. Unpublished report for Regis Resources Ltd, Perth.

- Terrestrial Ecosystems (2018a) *Level 1 Fauna Risk Assessment for the proposed Haul Road to the proposed Petra Mining area*. Unpublished report for Regis Resources Ltd, Perth.
- Terrestrial Ecosystems (2018c) *Vertebrate Fauna Risk Assessment for the Petra Mining Project*, Perth.
- Terrestrial Ecosystems (2018b) *Vertebrate Fauna Risk Assessment for the Granny Smith Solar Power Farm Project*, Unpublished report for Granny Smith Mining Company Pty Ltd, Perth.
- Terrestrial Ecosystems (2023) *Basic and detailed vertebrate fauna survey and assessment for the northern project areas*. Unpublished report for Regis Resources, Perth

In addition, there are individual records for fauna contained in the Atlas of Living Australia that have also been accessed.

The most relevant survey reports are those by Coffey Environments (2008), and Terrestrial Ecosystems (2010, 2011a, 2020, 2023) as they were detailed trapping surveys. Most of the other assessments were Level 1 or Basic vertebrate fauna risk assessments that have relied upon data collected in other surveys.

2.4.1 Fauna species at risk

An outdated report by Cowan (2001) indicated the following vertebrate species at risk in the IBRA subregion: *Macrotis lagotis* (Bilby), *Notoryctes typhlops* (Southern Marsupial Mole), *Dasycercus cristicauda* (Mulgara), *Leipoa ocellata* (Malleefowl), *Polytelis alexandrae* (Princess Parrot), *Acanthiza iredalei* (Slender-billed Thornbill), *Egernia kintorei* (Great Desert Skink) and *Falco peregrinus* (Peregrine Falcon). Since 2001, the Night Parrot (*Pezoporus occidentalis*) has been rediscovered in Western Australia and is also considered a species at risk in the region. In 2023, *Aphelocephala leucopsis* (Southern Whiteface) was also listed as Vulnerable under the EPBC Act and is considered a species at risk in the region.

3. METHODOLOGY

3.1 DATABASE SEARCHES

A search of the *EPBC Act* online database of matters of national environmental significance (MNES) was undertaken to extract a list of conservation significant species that could potentially be in the project area (Appendix A). In addition, a desktop search of the Terrestrial Ecosystems' fauna survey database was used to develop an appreciation of the vertebrate fauna assemblages in relevant sections of the bioregion near the project area.

Other more general texts were also used to provide supplementary information on vertebrate fauna in the bioregion, including Tyler et al. (2000) for frogs; Storr et al. (1983, 1990, 1999, 2002) and Thompson and Thompson (2006) for reptiles; Johnstone and Storr (1998, 2004) for birds; and Van Dyck and Strahan (2008) for mammals.

Collectively these sources of information were used to create lists of species expected to utilise the project area and broader subregion. It should be noted that these lists will include species that have been recorded in the general region but are possibly vagrants and they will not generally be found in the project area due to a lack of suitable habitat (e.g. wetland and shore birds). Vagrants can be recorded almost anywhere. Many of the records are historical and some of the species are no longer present in the area (e.g. Bilby). Many of the bird, mammal, reptile and amphibian species have specific habitat requirements that may be present in the general area but not in the project area. Also, the ecology of many of these species is often not well understood and it can sometimes be difficult to indicate those species whose specific habitat requirements are not present in the project area. Therefore, many species will be included in the lists produced from database searches but will not be present in the actual project area.

There are errors in most databases, including Atlas of Living Australia and the WAM collection. These errors occur because of a misidentification of individuals, taxonomic name changes and incorrect coordinates being entered into the database. Terrestrial Ecosystems was unable to verify the primary records, so it has used the information provided. Obvious errors have been removed but readers should appreciate that species lists, and fauna surveys reported in the appendices may include these errors.

3.2 SITE INSPECTION AND FAUNA HABITAT ASSESSMENT

A site visit was undertaken between 19-20 February 2023 to assess fauna habitat types and condition in the project area. This information included a description of the habitat structure, habitat condition, landform, soils and vegetation and time since last fire.

The fauna habitat assessment had two foci:

- assessing fauna habitat types and their condition; and
- assessing the possible presence of and recording evidence of conservation significant fauna.

This information included a description of the habitat structure, habitat condition, landform, soils and vegetation and time since last fire. The data in Table 1 were assessed at each location as part of the habitat assessment:

Table 1. Habitat assessment variables

Observer's Name:		
Coordinates of the location as UTM (GDA94):		
Fire history – options		
☐ > 5 years		
☐ 1-5 years		
☐ < 1 year		
Landform – options		
☐ Beach	☐ Lower slope	
☐ Clay plain	☐ Mid slope	
☐ Cliff	☐ Ridge	
☐ Creek line	☐ River	
☐ Dam	☐ Rocky outcrop / breakaway	
☐ Drainage line	☐ Salt lake	
☐ Dune crest	☐ Sand dune	
☐ Dune slope	☐ Sand plain	
☐ Dune swale	☐ Stony plain	
☐ Escarpment	☐ Swamp	
☐ Flat	☐ Undulating	
☐ Gorge	☐ Upper slope	
☐ Gully	☐ Wetland	
☐ Intertidal / mangrove	☐ Water hole	
☐ Lake / lake edge		
Habitat quality – options		
☐ <i>High quality fauna habitat</i> – These areas closely approximate the vegetation mix and quality that would have been in the area prior to any disturbance. The habitat has connectivity with other habitats and is likely to contain the most natural vertebrate fauna assemblage.		
☐ <i>Very good fauna habitat</i> - These areas show minimal signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) and generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be minimally effected by disturbance.		
☐ <i>Good fauna habitat</i> – These areas showed signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) but generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be affected by disturbance.		
☐ <i>Disturbed fauna habitat</i> – These areas showed signs of significant disturbance. Many of the trees, shrubs and undergrowth are cleared. These areas may be in the early succession and regeneration stages. Areas may show signs of significant grazing, containing weeds or have been damaged by vehicle or machinery. Habitats are fragmented or have limited connectivity with other fauna habitats. Fauna assemblages in these areas are likely to differ significantly from what might be expected in the area had the disturbance not occurred.		
☐ <i>Highly degraded fauna habitat</i> – These areas often have a significant loss of vegetation, an abundance of weeds, and a large number of vehicle tracks or are completely cleared. Limited or no fauna habitat connectivity. Fauna		

Observer's Name:	
assemblages in these areas are likely to be significantly different to what might have been in the area pre-disturbance.	
Soil colour - options	
☐ Black	☐ Red
☐ Brown	☐ White
☐ Grey	☐ Yellow
☐ Orange	
Surface stones – options	
☐ None	☐ Boulders (>250mm)
☐ Pebbles (0-50mm)	☐ Rocks
☐ Cobbles (51-250)	

In addition, the project area was searched for Malleefowl, their mounds and tracks.

Dr Scott Thompson and Tom Raymond undertook the site investigation and fauna habitat assessment. Dr Graham Thompson and Simon Pitt drafted the report and Dr Scott Thompson reviewed the report before it was sent to the client. Fauna habitat mapping was prepared based on the field assessment and a review of Botanica Consulting's (2023) flora and vegetation surveys that were completed for a portion of the project area.

Both senior scientists have appropriate relevant post-graduate qualifications, extensive experience in conducting fauna assessments in the Goldfields, have published research articles on biodiversity, fauna assemblages, conservation significant species, trapping techniques and temporal variations in trapped fauna assemblages and are therefore appropriately trained and experienced for the task of preparing this assessment.

Dr Scott Thompson is the only environmental practitioner in Western Australia who has independent specialist certification (CEnvP – Ecology Specialist) in combination with post-graduate tertiary qualifications and is a licenced pest management technician (LPMT). This unique set of skills and qualifications ensures Scott undertakes fauna surveys, assessments and control programs to the highest standard and quality assurance.

All staff have undertaken multiple assessments in the goldfields and are familiar with the habitat in the project area and surrounds. The qualifications and experience of the survey and reporting personnel are shown in Table 2.

Table 2. Project personnel and their qualifications

Name	Qualifications	Experience	Role
Dr Scott Thompson	BSc. (Env. Sc.), MSc. (Env. Mngt.), PhD (Env. Sc./Mngt), Cert III (Vertebrate Pest Mngt), Cert IV (WHS). CEnvP (Ecology Specialist)	> 20 years	Field work, fauna habitat mapping and reviewing report
Dr Graham Thompson	Post Grad. Dip. (Zool.), PhD (Zoology), Cert III (Vertebrate Pest Mngt)	> 20 years	Fauna habitat analysis and reporting
Simon Pitt	BSc (Nat Res Mng)	> 15 years	Fauna habitat analysis and reporting
Tom Raymond	BA (Hons) Zoology	> 2 year	Field work, habitat analysis and mapping

3.3 TAXONOMY AND NOMENCLATURE

Taxonomy and nomenclature for fauna species used in this report are generally based on the WA Museum species list. Terrestrial Ecosystems has presumed that the identifications referred to in the appendices or in reports used to provide local and regional comparative data are correct and we have only corrected obvious records where the nomenclature was known to be incorrect.

3.4 LIMITATIONS

This Basic vertebrate fauna risk assessment is based on information contained in the Commonwealth Government database and other published and unpublished fauna survey data for the bioregion and a site visit. It is acknowledged that multiple surveys conducted in different seasons, repeated over several years are necessary to fully appreciate the fauna assemblage in the project area.

The EPA's (2020) *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment* suggested that fauna surveys may be limited by many variables. Limitations associated with each of these variables are assessed in Table 3.

Table 3. Fauna survey limitations and constraints

Possible limitations	Constraint (yes/no); significant, moderate or negligible	Comment
Availability of data and information	Yes, negligible	There are vertebrate fauna survey data available for similar habitats near the project area.
Competency/experience of the survey team, including experience in the bioregion surveyed	No	The authors of this report have appropriate qualifications, have undertaken multiple surveys and assessments in the Goldfields, one has published a book and multiple refereed journal articles based on fauna surveys in the region and are familiar with the vertebrate fauna in this bioregion.
Scope of the survey, e.g. where faunal groups were excluded from the survey	N/A	Although no surveys were undertaken during the site assessment, the available fauna survey data are adequate to represent the vertebrate fauna in the project area.
Timing, weather and season	No	Weather was suitable for a site visit.
Disturbance that may have affected results, e.g. fire, flood	No	Disturbances in the project area have been factored into this assessment.
The proportion of fauna identified, recorded or collected	N/A	
Adequacy of the survey intensity and proportion of survey achieved, e.g. the extent to which the area was surveyed	No	Basic fauna survey and risk assessment requirements were met.
Access problems	No	The site was accessible
Problems with data and analysis, including sampling biases	N/A	

N/A = not applicable, Significant = major impact on outcome of the assessment, Moderate = impacted parts of the assessment, Negligible = almost no impact on the assessment.

4. RESULTS

4.1 FAUNA HABITAT

Two hundred and twenty-six fauna habitat assessments were completed in the project area (Figure 2; Appendix D). There are three broad fauna habitats in the project area excluding the historically cleared and disturbed areas (e.g. roads, tracks, exploration areas, etc). The fauna habitats are:

- Mulga and mixed shrubland (Plates 1-4);
- Chenopod shrublands (Plates 5-6); and
- Rocky ridges and breakaways (Plates 7-10).

In addition, there are multiple areas that have been disturbed by exploration and mining activity (Plates 11-12).



Plate 1. Mulga and mixed shrubland



Plate 2. Mulga and mixed shrubland



Plate 3. Mulga and mixed shrubland



Plate 4. Mulga and mixed shrubland



Plate 5. Chenopod shrublands



Plate 6. Chenopod shrublands



Plate 7. Rocky ridges and breakaways



Plate 8. Rocky ridges and breakaways



Plate 9. Rocky ridges and breakaways



Plate 10. Rocky ridges and breakaways



Plate 11. Disturbed area



Plate 12. Disturbed area

The condition of the fauna habitat varied from completely degraded to good. The completely degraded areas included historical and recent anthropogenic activity, new and existing drill lines, access tracks, cattle and pest species.

The search for Malleefowl, their mounds and tracks found no evidence of this bird in the project area.

4.1.1 Feral and pest fauna

There was evidence to indicate that rabbits (Plate 13), feral cats and wild dogs (Plate 14) were in the project area.



Plate 13. Rabbit scats



Plate 14. Wild dog tracks

4.1.2 Unclosed drill holes

Drill holes that remain open at ground level are a permanent pit-trap for small terrestrial fauna, as there is no possible escape route once an animal has fallen into the hole (Malnic 1997). Drill holes can also be broken off after they have been capped (Plates 15 and 16). It is therefore important that drill holes are properly capped after use, and where they are damaged, then the damage is rectified.



Plate 15. Uncapped drill hole in the project area



Plate 16. Uncapped drill hole in the project area

4.2 BIOREGIONAL VERTEBRATE FAUNA ASSEMBLAGE

Appendix B provides a summary of the fauna survey data that are available near the project area. There are appreciable differences in the recorded fauna assemblages within and among fauna surveys shown in Appendix B. These differences are partially due to the low survey effort deployed by some of the surveys and they also reflect variations in soils and vegetation as well as temporal variations in the fauna assemblages.

Tables 3-6 provide a list of vertebrate species potentially found near the project area that have been compiled based on the fauna survey report results shown in Appendix B.

Table 4. Birds potentially found near the project area

Family	Species	Common Name
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu
Anatidae	<i>Cygnus atratus</i>	Black Swan
	<i>Tadorna tadornoides</i>	Australian Shelduck
	<i>Chenonetta jubata</i>	Australian Wood Duck
	<i>Anas superciliosa</i>	Pacific Black Duck
	<i>Anas gracilis</i>	Grey Teal
	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck
	<i>Aythya australis</i>	Hardhead
	<i>Biziura lobata</i>	Musk Duck
Megapodiidae	<i>Leipoa ocellata</i>	Malleefowl
Podicipedidae	<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing
	<i>Ocyphaps lophotes</i>	Crested Pigeon
	<i>Geopelia cuneata</i>	Diamond Dove

Family	Species	Common Name
Cuculidae	<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo
Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar
Podargidae	<i>Podargus strigoides</i>	Tawny Frogmouth
Caprimulgidae	<i>Eurostopodus argus</i>	Spotted Nightjar
Rallidae	<i>Tribonyx ventralis</i>	Black-tailed Nativehen
	<i>Fulica atra</i>	Eurasian Coot
Recurvirostridae	<i>Himantopus leucocephalus</i>	Pied Stilt
	<i>Cladorhynchus leucocephalus</i>	Banded Stilt
	<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet
Charadriidae	<i>Vanellus tricolor</i>	Banded Lapwing
	<i>Charadrius ruficapillus</i>	Red-capped Plover
	<i>Elseyonis melanops</i>	Black-fronted Dotterel

Family	Species	Common Name
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper
Otididae	<i>Ardeotis australis</i>	Australian Bustard
Ardeidae	<i>Ardea pacifica</i>	White-necked Heron
	<i>Egretta novaehollandiae</i>	White-faced Heron
Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant
Accipitridae	<i>Hieraaetus morphnoides</i>	Little Eagle
	<i>Aquila audax</i>	Wedge-tailed Eagle
	<i>Circus assimilis</i>	Spotted Harrier
Cuculidae	<i>Heterosceles pallidus</i>	Pallid Cuckoo
Alcedinidae	<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel
	<i>Falco longipennis</i>	Australian Hobby
	<i>Falco berigora</i>	Brown Falcon
	<i>Falco peregrinus</i>	Peregrine Falcon
Cacatuidae	<i>Eolophus roseicapilla</i>	Galah
	<i>Nymphicus hollandicus</i>	Cockatiel
Psittaculidae	<i>Neopsephotus bourkii</i>	Bourke's Parrot
	<i>Barnardius zonarius</i>	Australian Ringneck
	<i>Psephotus varius</i>	Mulga Parrot
	<i>Melopsittacus undulatus</i>	Budgerigar
Ptilonorhynchidae	<i>Chlamydera guttata</i>	Western Bowerbird
Climacteridae	<i>Climacteris affinis</i>	White-browed Treecreeper
Maluridae	<i>Malurus lamberti</i>	Variegated Fairywren
	<i>Malurus lamberti</i>	Variegated Fairywren
	<i>Malurus splendens</i>	Splendid Fairywren
	<i>Malurus leucopterus</i>	White-winged Fairywren
Meliphagidae	<i>Certhionyx variegatus</i>	Pied Honeyeater
	<i>Purnella albifrons</i>	White-fronted Honeyeater
	<i>Manorina flavigula</i>	Yellow-throated Miner
	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater
	<i>Anthochaera carunculata</i>	Red Wattlebird

Family	Species	Common Name
	<i>Gavicalis virescens</i>	Singing Honeyeater
	<i>Ptilotula plumula</i>	Grey-fronted Honeyeater
	<i>Epthianura tricolor</i>	Crimson Chat
	<i>Epthianura aurifrons</i>	Orange Chat
	<i>Epthianura albifrons</i>	White-fronted Chat
	<i>Sugomel nigrum</i>	Black Honeyeater
	<i>Lichmera indistincta</i>	Brown Honeyeater
Pardalotidae	<i>Pardalotus striatus</i>	Striated Pardalote
Acanthizidae	<i>Pyrrholaemus brunneus</i>	Redthroat
	<i>Acanthiza apicalis</i>	Inland Thornbill
	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill
	<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill
	<i>Acanthiza robustirostris</i>	Slaty-backed Thornbill
	<i>Smicrornis brevirostris</i>	Weebill
	<i>Gerygone fusca</i>	Western Gerygone
	<i>Aphelocephala leucopsis</i>	Southern Whiteface
Pomatostomidae	<i>Pomatostomus superciliosus</i>	White-browed Babbler
Cinclosomatidae	<i>Cinclosoma castaneothorax</i>	Chestnut-breasted Quail-thrush
Campephagidae	<i>Coracina maxima</i>	Ground Cuckooshrike
	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike
	<i>Lalage tricolor</i>	White-winged Triller
Psophodidae	<i>Psophodes occidentalis</i>	Chiming Wedgebill
Oreoicidae	<i>Oreoica gutturalis</i>	Crested Bellbird
Pachycephalidae	<i>Colluricincla harmonica</i>	Grey Shrike-thrush
	<i>Pachycephala rufiventris</i>	Rufous Whistler
Artamidae	<i>Artamus personatus</i>	Masked Woodswallow
	<i>Artamus superciliosus</i>	White-browed Woodswallow
	<i>Artamus cinereus</i>	Black-faced Woodswallow
	<i>Artamus cyanopterus</i>	Dusky Woodswallow

Family	Species	Common Name
	<i>Artamus minor</i>	Little Woodswallow
	<i>Cracticus torquatus</i>	Grey Butcherbird
	<i>Cracticus nigrogularis</i>	Pied Butcherbird
	<i>Gymnorhina tibicen</i>	Australian Magpie
	<i>Strepera versicolor</i>	Grey Currawong
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie Wagtail
	<i>Rhipidura albiscapa</i>	Grey Fantail
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark
Corvidae	<i>Corvus orru</i>	Torresian Crow
	<i>Corvus bennetti</i>	Little Crow
	<i>Corvus coronoides</i>	Australian Raven

Family	Species	Common Name
Petroicidae	<i>Microeca fascians</i>	Jacky Winter
	<i>Petroica goodenovii</i>	Red-capped Robin
	<i>Melanodryas cucullata</i>	Hooded Robin
Locustellidae	<i>Cincloramphus cruralis</i>	Brown Songlark
	<i>Cincloramphus mathewsi</i>	Rufous Songlark
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow
	<i>Hirundo neoxena</i>	Welcome Swallow
	<i>Petrochelidon nigricans</i>	Tree Martin
	<i>Cheramoeca leucosterna</i>	White-backed Swallow
Dicaeidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird
Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian Pipit

Table 5. Amphibians potentially found near the project area

Family	Species	Common Name
Limnodynastidae	<i>Neobatrachus kunapalari</i>	Wheatbelt Frog
	<i>Neobatrachus sudelli</i>	Sudell's Frog
	<i>Neobatrachus sutor</i>	Shoemaker Frog
	<i>Neobatrachus wilsmorei</i>	Plonking Frog

Family	Species	Common Name
	<i>Platyplectrum spenceri</i>	Spencer's Burrowing Frog
Myobatrachidae	<i>Pseudophryne occidentalis</i>	Western Toadlet
Pelodyadidae	<i>Cyclorana maini</i>	Main's Frog
	<i>Cyclorana occidentalis</i>	Western Water-holding Frog

Table 6. Mammals potentially found near the project area

Family	Species	Common Name
Tachyglossidae	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna
Bovidae	<i>Capra hircus</i>	Goat
	<i>Ovis aries</i>	Sheep
Camelidae	<i>Camelus dromedarius</i>	Dromedary
Canidae	<i>Canis lupus</i>	Dingo/Wild dog
	<i>Vulpes vulpes</i>	Red Fox
Felidae	<i>Felis catus</i>	Cat
Molossidae	<i>Austronomus australis</i>	White-striped Freetail Bat
	<i>Mormopterus planiceps</i>	Southern Free-tail Bat
Pteropodidae	<i>Syconycteris australis</i>	Common Blossom-bat

Family	Species	Common Name
Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat
	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat
	<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat
Dasyuridae	<i>Antechinomys laniger</i>	Kultarr
	<i>Ningai ridei</i>	Wongai Ningai
	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart
	<i>Sminthopsis dolichura</i>	Little Long-tailed Dunnart
	<i>Sminthopsis hirtipes</i>	Hairy-footed Dunnart
	<i>Antechinomys longicaudatus</i>	Long-tailed Dunnart

Family	Species	Common Name
	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart
	<i>Sminthopsis murina</i>	Slender-tailed Dunnart
	<i>Sminthopsis ooldea</i>	Ooldea Dunnart
Macropodidae	<i>Macropus fuliginosus</i>	Western Grey Kangaroo
	<i>Osphranter robustus</i>	Euro
	<i>Osphranter rufus</i>	Red Kangaroo
Leporidae	<i>Oryctolagus cuniculus</i>	Rabbit

Thylacomyidae	<i>Macrotis lagotis</i>	Bilby
Equidae	<i>Equus asinus</i>	Donkey
	<i>Equus caballus</i>	Horse
Muridae	<i>Mus musculus</i>	House Mouse
	<i>Notomys alexis</i>	Spinifex Hopping Mouse
	<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse

Table 7. Reptiles potentially found near the project area

Family	Species	Common Name
Agamidae	<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon
	<i>Ctenophorus fordi</i>	Mallee Dragon
	<i>Ctenophorus inermis</i>	Military Dragon
	<i>Ctenophorus infans</i>	Ring-tailed Dragon
	<i>Ctenophorus isolepis</i>	Central Military Dragon
	<i>Ctenophorus maculatus</i>	Spotted Dragon
	<i>Ctenophorus nuchalis</i>	Central Netted Dragon
	<i>Ctenophorus reticulatus</i>	Western Netted Dragon
	<i>Ctenophorus salinarum</i>	Saltpan Dragon
	<i>Ctenophorus scutulatus</i>	Lozenge-marked Dragon
	<i>Diporiphora amphiboluroides</i>	Mulga Dragon
	<i>Moloch horridus</i>	Thorny Devil
	<i>Pogona minor</i>	Western Bearded Dragon
	<i>Tympanocryptis cephalus</i>	Pebble Dragon
Carphodactylidae	<i>Nephurus levis</i>	Three-lined Knob-tail
	<i>Nephurus vertebralis</i>	Midline Knob-tail
	<i>Nephurus wheeleri</i>	Banded Knob-tail
	<i>Underwoodisaurus milii</i>	Barking Gecko
Diplodactylidae	<i>Diplodactylus conspicillatus</i>	Fat-tailed Gecko
	<i>Diplodactylus granariensis</i>	Wheatbelt Stone Gecko
	<i>Diplodactylus pulcher</i>	Beautiful Gecko
	<i>Lucasium damaeum</i>	Beaded Gecko

	<i>Lucasium squarrosus</i>	Mottled Ground Gecko
	<i>Rhynchoedura ornata</i>	Beaked Gecko
	<i>Strophurus assimilis</i>	Goldfields Spiny-tailed Gecko
Diplodactylidae	<i>Strophurus ciliaris</i>	Spiny-tailed Gecko
Diplodactylidae	<i>Strophurus elderi</i>	Jewelled Gecko
Diplodactylidae	<i>Strophurus strophurus</i>	Western Spiny-tailed Gecko
Diplodactylidae	<i>Strophurus wellingtonae</i>	Western Shield Spiny-tailed Gecko
Elapidae	<i>Brachyuropsis fasciolatus</i>	Narrow-banded Burrowing Snake
	<i>Furina ornata</i>	Orange-naped Snake
	<i>Suta monachus</i>	Hooded Snake
	<i>Pseudechis australis</i>	Mulga Snake
	<i>Pseudechis butleri</i>	Spotted Mulga Snake
	<i>Pseudonaja mengdeni</i>	Western Brown Snake
	<i>Pseudonaja modesta</i>	Ringed Brown Snake
	<i>Simoselaps bertholdi</i>	Jan's Banded Snake
	<i>Suta fasciata</i>	Rosen's Snake
Gekkonidae	<i>Gehyra purpurascens</i>	Purplish Dtella
	<i>Gehyra variegata</i>	Variegated Gehyra
	<i>Heteronotia binoei</i>	Bynoe's Gecko
	<i>Gehyra xenopus</i>	Crocodile-faced Dtella

Family	Species	Common Name	Family	Species	Common Name
Pygopodidae	<i>Aprasia picturata</i>	Black-headed Worm-lizard		<i>Lerista bipes</i>	North-western Sandslider
	<i>Delma butleri</i>	Unbanded Delma		<i>Lerista desertorum</i>	Central Desert Robust Slider
	<i>Delma nasuta</i>	Sharp-snouted Delma		<i>Lerista distinguenda</i>	South-western Orange-tailed Slider
	<i>Lialis burtonis</i>	Burton's Legless Lizard		<i>Lerista kingi</i>	King's Slider
	<i>Pygopus nigriceps</i>	Western Hooded Scaly-foot		<i>Lerista muelleri</i>	Wood Mulch-slider
Scincidae	<i>Cryptoblepharus australis</i>	Inland Snake-eyed Skink		<i>Lerista timida</i>	Timid Slider
	<i>Cryptoblepharus buehneri</i>	Buehner's Snake-eyed Skink		<i>Liopholis inornata</i>	Desert Skink
	<i>Ctenotus ariadnae</i>	Ariadna's Ctenotus		<i>Liopholis striata</i>	Nocturnal Desert Skink
	<i>Ctenotus atlas</i>	Southern Mallee Ctenotus		<i>Menetia greyii</i>	Common Dwarf Skink
	<i>Ctenotus grandis</i>	Grand Ctenotus		<i>Morethia butleri</i>	Woodland Morethia Skink
	<i>Ctenotus greeri</i>	Spotted-necked Ctenotus		<i>Tiliqua multifasciata</i>	Central Blue-tongue
	<i>Ctenotus hanloni</i>	Nimbel Ctenotus		<i>Tiliqua occipitalis</i>	Western Blue-tongued Lizard
	<i>Ctenotus helenae</i>	Clay-soil Ctenotus		<i>Tiliqua rugosa</i>	Bobtail
	<i>Ctenotus leonhardi</i>	Leonhardi's Ctenotus	Typhlopidae	<i>Anilius australis</i>	Austral Blind Snake
	<i>Ctenotus pantherinus</i>	Leopard Ctenotus		<i>Anilius bicolor</i>	Dark-spined Blind Snake
	<i>Ctenotus schomburgkii</i>	Barred Wedgesnout Ctenotus		<i>Anilius hamatus</i>	Pale-headed Blind Snake
	<i>Ctenotus severus</i>	Stern Ctenotus		<i>Anilius waitii</i>	Waite's Blind Snake
	<i>Ctenotus uber</i>	Spotted Ctenotus	Varanidae	<i>Varanus brevicauda</i>	Short-tailed Pygmy Monitor
	<i>Cyclodomorphus melanops</i>	Spinifex Slender Blue-tongue		<i>Varanus caudolineatus</i>	Stripe-tailed Monitor
	<i>Egernia depressa</i>	Southern Pygmy Spiny-tailed Skink		<i>Varanus eremius</i>	Pygmy Desert Monitor
	<i>Egernia formosa</i>	Goldfields Crevice Skink		<i>Varanus gouldii</i>	Gould's Goanna
	<i>Eremiascincus richardsonii</i>	Broad-banded Sand-swimmer		<i>Varanus panoptes</i>	Yellow-spotted Monitor
				<i>Varanus tristis</i>	Black-headed Monitor

4.3 CONSERVATION SIGNIFICANT FAUNA

Conservation significant fauna are protected by the Commonwealth *EPBC Act 1999*, and this list includes species covered by international treaties such as the Japan-Australia Migratory Bird Agreement (JAMBA) and China-Australia Migratory Bird Agreement (CAMBA) and the Western Australia (WA) *BC Act 2016*. The *BC Act 2016* provides for the publishing of the *Wildlife Conservation (Specially Protected Fauna) Notice* that lists species under multiple categories. In addition, DBCA maintains a list of fauna that require monitoring under four priorities based on the current knowledge of their distribution, abundance and threatening processes. The

EPBC Act 1999 and *BC Act 2016* imply legislative requirements for the management of anthropogenic impacts to minimise the effects of disturbances on species and their habitats. Priority species have no statutory protection, other than the DBCA wishes to monitor potential impacts on these species. Environmental consultants and proponents of developments are encouraged to avoid and minimise impacts on these species. Definitions of the significant fauna under the *BC Act 2016* are provided in Table 8.

The fauna species that have special status in either State or Commonwealth government legislation or are on the DBCA Priority species list and are potentially present in the vicinity of the project area are listed in Table 8. Although they were recorded in the search of the MNES online database, migratory waders and shorebirds that typically would be found around the edge of salt lakes, clay pans, estuaries and marshes have been excluded from Table 8 and the subsequent discussion as there is no suitable habitat nearby.

Two threatened species of fauna, one migratory species of bird listed under the *EPBC Act 1999*, and one priority species may potentially occur in the project area or surrounds. The following is an assessment of the likelihood of each of the species listed in Table 8 being found in the project area.

Table 8. Assessment of the potential presence of a conservation significant fauna species in the project area

Species	DBCA Schedule / Priority	EPBC Act	Comment on the potential presence of a species
Night Parrot <i>Pezoporus occidentalis</i>	Critically Endangered	Endangered	Not present in the project area due to a lack of suitable habitat.
Sandhill Dunnart <i>Sminthopsis psammophila</i>	Endangered	Endangered	Not present in the project area due to a lack of suitable habitat.
Grey Falcon <i>Falco hypoleucos</i>	Vulnerable	Vulnerable	Highly unlikely to be present.
Malleefowl <i>Leipoa ocellata</i>	Vulnerable	Vulnerable	Not present in the project area.
Chuditch <i>Dasyurus geoffroii</i>	Vulnerable	Vulnerable	Locally extinct
Princess Parrot <i>Polytelis alexandrae</i>	Vulnerable	Vulnerable	May occasionally be seen in the region.
Great Desert Skink <i>Liopholis kintorei</i>	Vulnerable	Vulnerable	Not present in the project area due to a lack of suitable habitat.
Southern Whiteface <i>Aphelocephala leucopsis</i>		Vulnerable	Possibly present in the area due to an abundance of habitat
Fork-tailed Swift <i>Apus pacificus</i>	Migratory	Migratory	May very infrequently be seen flying in the region.
Grey Wagtail <i>Motacilla cinerea</i>	Migratory	Migratory	Highly unlikely to be seen in the project area.
Yellow Wagtail <i>Motacilla flava</i>	Migratory	Migratory	Highly unlikely to be seen in the project area.
Peregrine Falcon <i>Falco peregrinus</i>	OS		May occasionally be seen in the region.
Long-tailed Dunnart <i>Antechinomys longicaudatus</i>	P4		Possibly present in the project area due to the presence of rocky habitat and breakaways, but only a low possibility of being present in the proposed disturbance area.
Brush-tailed Mulgara <i>Dasymercus blythi</i>	P4		Highly unlikely to be in the project area.

Results of the Commonwealth *EPBC Act 1999* protected matters database search are provided in Appendix A.

Night Parrot (*Pezoporus occidentalis*) - Critically Endangered under the *BC Act 2016* and Endangered under the *EPBC Act 1999*

The Night Parrot is a small, arid-adapted, nocturnal, ground-feeding parrot (Johnstone and Storr 1998, Threatened Species Scientific Committee 2016). Its length is 22-25cm with a body mass of approximately 104g (Threatened Species Scientific Committee 2016), although it was suggested that they were semi-nomadic, the Night Parrots in south-western Queensland appear to be sedentary (Murphy 2015).

The Night Parrot was probably originally distributed over much of semi-arid and arid Australia (Garnett et al. 1993, Threatened Species Scientific Committee 2016). Records in north-west and western Queensland in the early 1990-2000s were in a broad cross section of the habitats available (Garnett et al. 1993, Cupitt and Cupitt 2008, Boles et al. 2016). There have been recent sightings in the Pilbara in 1980, 2005 and 2017, central WA in 1979, north-eastern South Australia in 1979, western Queensland (including Pullen-Pullen-Mt Windsor-Diamantina population) in 1980, 1990, 1993, 2006 and 2013-17 (Davis and Metcalf 2008, Garnett et al. 2011, Charalambous 2016, Pickrell 2016, AG staff 2017, Palaszczuk and Miles 2017, Rykers 2017, AG staff 2018), Pilbara in 2017 (Jones 2017) and the northern Goldfields (Jackett et al. 2017). Garnett *et al.* (Garnett et al. 2011) suggested that there were between 50-250 mature individuals in less than 5% of its previous range.

Wilson's (Wilson 1937) summary of observations provided information on the early records of Night Parrots' preferred habitat and breeding sites. Recent information indicates its preferred habitat appears to be in *Triodia* grasslands, chenopod shrublands, shrubby samphire and floristically diverse habitats dominated by large-seeded species (Threatened Species Scientific Committee 2016, McCarthy 2017, Murphy et al. 2017a). At Pullen Pullen Reserve it nests in large, more or less ring-shaped *Triodia*, and the nest consists of a tunnel (25-30° and 0° to the ground; 20-33cm long) through an apron of dead spinifex leaves that leads to a chamber under a live hummock, with a shallow depression (3-4cm) excavated into the gravelly/sandy soil (Murphy et al. 2017a). In the northern Goldfields the nest was again in a spinifex hummock, it was circular, with an excavated depression (~1.5-2.0cm) in sandy substrate (Hamilton et al. 2017, Jackett et al. 2017). The entrance tunnel was 62cm long, and was downward sloping (27°) with the entrance 28cm above the ground (Hamilton et al. 2017). It has clutches of two to four sub-elliptical, white eggs with a lustrous appearance (Murphy et al. 2017a). Breeding followed significant rains in March for the observations in Pullen-Pullen Reserve and in April in the northern Goldfields (Hamilton et al. 2017, Murphy et al. 2017b), but it is thought that breeding generally occurs between April and October (Murphy et al. 2017a).

Murphy *et al.* (2017b) placed a GPS tag on Night Parrots and reported that the two birds called at dusk from their diurnal roosts among spinifex hummocks and then flew to more floristically diverse habitats dominated by large-seeded, prolifically seeding species to feed.

The Department of Parks and Wildlife (2017) described localised Night Parrot habitat as 'roosting and nesting sites are in clumps of dense vegetation, primarily old and large spinifex clumps (often >50 years unburnt), especially hummocks that are ring-forming. These may be in expanses or isolated patches, but sometimes associated with other vegetation types, such as dense chenopod shrubs. Spinifex hummocks that are collapsed (i.e. less than about 40-50 cm in height) are not likely to provide adequate shelter'.

There are no substantive mature spinifex hummocks in the project area and numerous feral fauna. As the preferred roosting and nesting sites for Night Parrots is not present and there is a significant threatening process for the species in the area (i.e. wild dogs and feral cats), it is improbable that Night Parrots are present in the project area and will therefore not be impacted by any proposed development.

Sandhill Dunnart (*Sminthopsis psammophila*) – Endangered under the *BC Act 2016* and *EPBC Act 1999*

The Sandhill Dunnart is a small (30-45g) arid adapted dasyurid that is found in the eastern part of the Western Australian section of the Great Victoria Desert, eastern Goldfields and the western and southern parts of South Australia. Recent surveys undertaken for the Great Victoria Desert Trust has increased their geographic range in the Great Victoria Desert and into the eastern Goldfields.

Riley (2020) and Riley et al. (2021) indicated that the Sandhill Dunnart typically uses Stage 4 and 5 hummocks, and occasionally Stage 3, with Stage 4 being an open hummock ring with soft, dead leaves centrally and Stage 5 is where the hummock breaks appear and continues spreading, and the larger parts remain as suitable shelter for the dunnart.

The habitat in the project area is not suitable for this dunnart and there are no records of the Sandhill Dunnart near the project area in the Atlas of Living Australia, so it is highly unlikely that they are present in the project area.

Grey Falcon (*Falco hypoleucos*) - Vulnerable species under the *EPBC Act 1999* and *BC Act 2016*

The Grey Falcon is a moderately large raptor that is found mostly in the northern half of Western Australia, mostly in lightly wooded, coastal or riverine areas.

There are multiple records of the Grey Falcon in the Pilbara, but very few in the Goldfields. They are mostly recorded along the drainage lines and around the permanent or semi-permanent pools.

It is highly unlikely that the Grey Falcon is in the project area.

Malleefowl (*Leipoa ocellata*) - Vulnerable under the *BC Act 2016* and *EPBC Act 1999*

Malleefowl are large, ground-dwelling birds that rarely fly unless alarmed or are perching for the night. Historically, Malleefowl have been found in mallee regions of southern Australia from approximately the 26th parallel of latitude southwards. Prior to vegetation clearing for agriculture, Malleefowl were abundant in the WA Wheatbelt. Vegetation clearing for agriculture also opened adjacent bushland to predators, and in the south-west of WA, Malleefowl often only persist in isolated remnant patches of native vegetation. Sheep and other herbivores (e.g. goats, kangaroos) grazing in remnant vegetation removes or thins the undergrowth, and they also compete with Malleefowl for herbaceous foods and can cause changes to the structure and floristic diversity of foraging habitats (Benshemesh 2007)

Malleefowl and their eggs are vulnerable to predation by foxes, and newly hatched chicks are vulnerable to foxes, cats and raptors (Priddel and Wheeler 1990, Benshemesh and Burton 1999, Benshemesh 2007, Lewis and Hines 2014). Their abundance in the Goldfields is low and they are sparsely distributed, favouring those areas that are more densely vegetated. Malleefowl build distinctive nests that comprise a large mound of soil/rock covering a central core of leaf litter. These nest mounds range in diameter but can span more than five metres and may be up to one metre high. Malleefowl are generally monogamous and once breeding commences, and they typically pair for life. The presence of nest mounds provides an indication of the presence of Malleefowl in the area.

Malleefowl have been observed in the bioregion, however, there are no recent records of active breeding mounds in the vicinity of the project area. There were no Malleefowl mounds, and no tracks of Malleefowl recorded in the project area.

Chuditch (*Dasyurus geoffroii*) – Vulnerable under the *BC Act 2016* and *EPBC Act 1999*

The Chuditch is the largest extant carnivorous marsupial in WA. It is usually active from dusk to dawn. Formally known from over 70% of Australia, the Chuditch now has a patchy distribution throughout the Jarrah forest and mixed Karri/Marri/Jarrah forest of south-west WA and other isolated areas. Chuditch are solitary animals for most of their life and den in hollow logs, burrows, culverts, etc. and have also been recorded in tree hollows and rock cavities. Chuditch are opportunistic feeders, and forage primarily on the ground at night. Their diet can include other mammals, birds, lizards, bird and reptile eggs but the majority is a mixture of large invertebrates (e.g. spiders, scorpions and crickets).

How *et al.* (1988) reported Chuditch being found near the Norseman-Lake King Road and near Mount Holland. DBCA records show that one specimen was recorded in 1974 in Kambalda East. There are multiple records

south of Southern Cross and Marvel Loch and there have been other reported sightings east of Kambalda and near Norseman, but Terrestrial Ecosystems can find none north of Kalgoorlie. It is therefore highly unlikely that the Chuditch will be found as far north at Leonora and Laverton and in atypical habitat.

As the project area is a long way north of the known extant distribution for this dasyurid, it is unlikely that the Chuditch would be found in the project area. Therefore, Terrestrial Ecosystems' assessment is that any development is highly unlikely to have a significant impact on this species.

Princess Parrot (*Polytelis alexandrae*) - Vulnerable under the *EPBC Act 1999* and a Priority 4 species with DBCA

The Princess Parrot is found mostly in the inland arid areas of Australia, and in Western Australia in the Gibson, Little Sandy and Great Victoria Deserts (Johnstone and Storr 1998, Pavey et al. 2014). They are also occasionally found in lightly wooded areas adjacent to the sandy deserts (Moriarty 1972).

Very little is known about the Princess Parrot, even the exact extent of its geographical distribution is poorly understood. It is thought to be nomadic within the central desert regions of Australia, occupying arid shrub lands, particularly those dominated by Mulga, Desert Oak and spinifex. Due to the paucity of information on the species, accurate estimates of its conservation significance are difficult to make, however, this species is probably threatened by habitat loss to agricultural practices and changes in fire regimes.

Dr S. Thompson sighted this parrot in a survey near the Wanjarri Nature Reserve in 2006 and Moriarty (1972) also reported it in the same area, so it may occasionally be seen in the region. If it was present in the project area, any proposed development is unlikely to significantly impact on this species as it will move away to other areas if it is disturbed.

Great Desert Skink (*Liopholis kintorei*) - Vulnerable under the *BC Act 2016* and *EPBC Act 1999*

The Great Desert Skink is a large burrowing skink found in the sandy and gravelly habitats of the central and western deserts, where it lives in small colonies. It constructs large burrow systems to a depth of over 1m and up to 10m in diameter. The burrow system may be a single entrance tunnel or multiple entrances. Long-used burrows are often large and complex. The local skink community will have established a latrine site(s), which for old burrow complexes, is often quite large and visible. Habitat critical to their survival is typically hummock grass sandplains and some adjacent dunefield swales, often associated with paleodrainage channels, however, they have been recorded in open Mulga woodland in South Australia (McAlpin 2001).

Pearson et al. (2001) reported Great Desert Skinks in the Gibson Desert in undulating sandplain of deep red sands with a surface cover of fine laterite and vegetated with spinifex grass. This habitat is not present in the project area. A search of the Atlas of Living Australia records indicated that there are no recent records near the project area, so it is highly unlikely to be present in the project area.

Southern Whiteface (*Aphelocephala leucopsis*) - Vulnerable species under the *EPBC Act 1999*

The Southern Whiteface is a recent addition to the *EPBC Act* listing of vulnerable species. It is a small bird found in the arid and semi-arid interior from the WA coast near Hamelin Bay through the Great Victoria Desert into the arid areas of South Australia, Victoria, NSW and Queensland (Johnstone and Storr 2004, Department of Climate Change Energy the Environment and Water 2023).

It is found in open woodlands and shrublands with an understorey of grasses and low shrubs (Department of Climate Change Energy the Environment and Water 2023). It forages on the ground, feeding on insects, spiders and seeds, mostly found in the leaf-litter (Johnstone and Storr 2004, Department of Climate Change Energy the Environment and Water 2023).

The major threat to the Southern Whiteface across its range is broad scale clearing for intensive agriculture. The project occurs in the Murchison IBRA which occupies an area of approximately 28,206,195ha and occurs

outside the intensive land use zone for Western Australia. It contains mainly intact native vegetation although this has been heavily influenced by grazing pressures (Shepherd et al. 2002). The development area represents a tiny portion of this area. Other threats to the species include climate change, impacts of agriculture on habitat and predation by introduced predators such as foxes and cats.

The Southern Whiteface have been recorded in multiple avifauna surveys in adjacent areas. The nearest record to the project area is approximately 1km. Almost every comprehensive avifauna survey undertaken recently in the nearby mulga woodland habitat has recorded the presence of Southern Whiteface. This small bush bird is widespread and relatively abundant in the northern Goldfields and will readily move if disturbed, so, it is unlikely to be significantly impacted by the development of the mine.

Fork-tailed Swift (*Apus pacificus*) - Migratory species under the *EPBC Act 1999* and *BC Act 2016*

This species breeds in the northeast and mid-east Asia and winters in Australia and southern New Guinea. It is a visitor to most parts of Western Australia, beginning to arrive in the Kimberley in late September, in the Pilbara in November and in the southwest land division in mid-December, and leaving by late April. The Fork-tailed swift is an almost exclusively an aerial species, foraging and sleeping on the wing. It rarely comes to earth, usually only for breeding. It is common in the Kimberley, uncommon to moderately common near northwest, west and southeast coasts and rare to scarce elsewhere. It is rarely seen in the Goldfields (Plate 17).

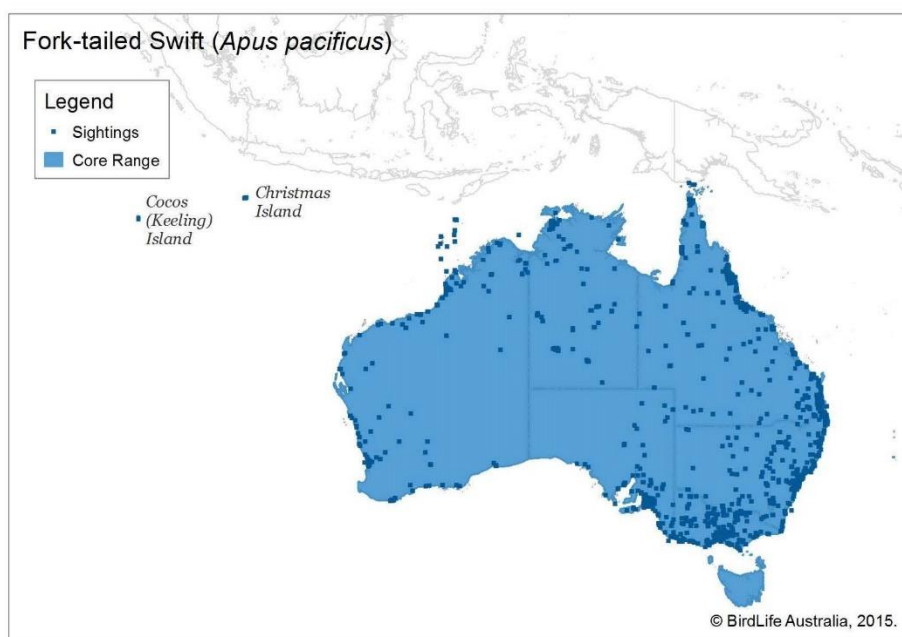


Plate 17. Range and actual reported sightings of the Fork-tailed Swift

(taken from <http://www.environment.gov.au/biodiversity/threatened/publications/epbc-act-referral-guidelines-migratory-birds>)

Terrestrial Ecosystems' assessment is that the Fork-tailed Swift may infrequently be seen in the region. However, any proposed vegetation clearing, or development is unlikely to significantly impact on this species as it is an aerial species and will move away to other areas if it is disturbed.

Grey Wagtail (*Motacilla cinerea*) - Migratory under the *EPBC Act 1999* and *BC Act 2016*

The Grey Wagtail is a small yellow breasted bird with a grey back and head. Johnstone and Storr (2004) reported this migratory species as breeding in Palearctic from western Europe and north-west Africa to eastern Asia and wintering in Africa, south-east Asia, Indonesia, the Philippines, New Guinea and Australia. Its preferred habitat

in Australia is banks and rocks in fast-running fresh water including rivers, streams and creeks where it feeds on insects.

The Atlas of Living Australia records two sightings on the south-coast of Western Australia and none around the project area (Plate 18). It is highly unlikely to be seen in the project area due to a lack of records and suitable habitat.

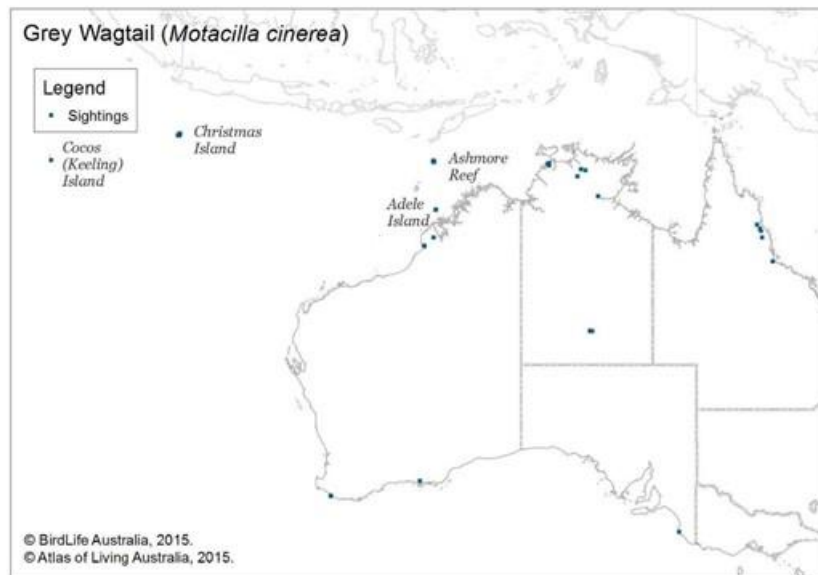


Plate 18. Reported sightings of the Grey Wagtail

(taken from <http://www.environment.gov.au/biodiversity/threatened/publications/epbc-act-referral-guidelines-migratory-birds>)

Yellow Wagtail (*Motacilla flava*) - Migratory under the *EPBC Act 1999* and *BC Act 2016*

The Yellow Wagtail is found in the millions in the northern hemisphere and the Atlas of Living Australia records multiple records of this bird in Australia in the coastal areas (Plate 19). There are no records for this species in inland Western Australia near the project area, therefore it is highly unlikely to be impacted by the proposed development.

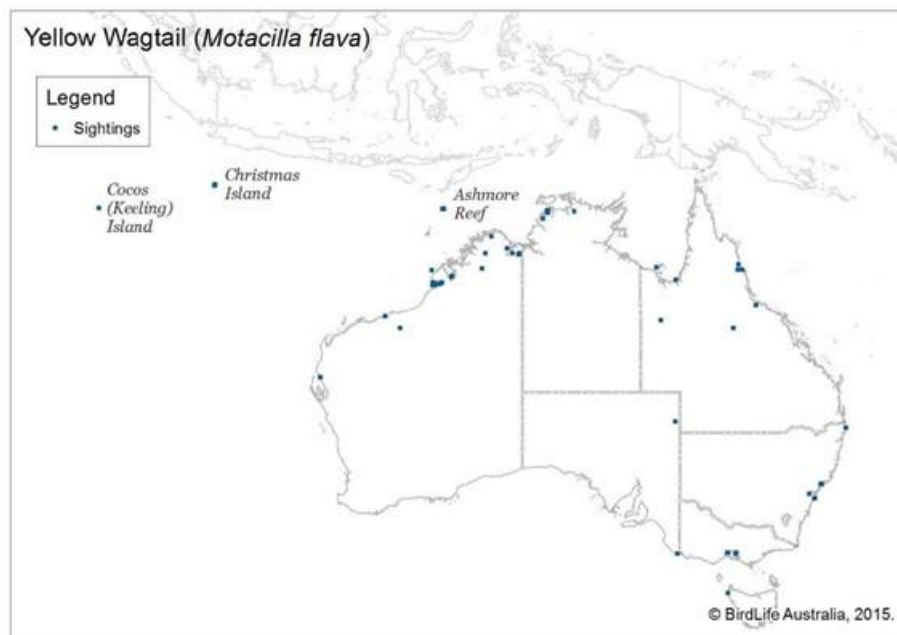


Plate 19. Reported sightings of the Yellow Wagtail

(taken from <http://www.environment.gov.au/biodiversity/threatened/publications/epbc-act-referral-guidelines-migratory-birds>)

Peregrine Falcon (*Falco peregrinus*) – Otherwise specially protected under the *BC Act 2016*

The Peregrine Falcon is uncommon, although widespread throughout much of Australia excluding the extremely dry areas and has a wide and patchy distribution. It shows habitat preference for areas near cliffs along coastlines, rivers and ranges and within woodlands along watercourses and around lakes. Nesting sites include ledges along cliffs, granite outcrops and quarries, hollow trees near wetlands and old nests of other large bird species. There is no evidence to suggest any change in status in the last 50 years. The Peregrine Falcon has been seen in the Wanjarri Nature Reserve (Moriarty 1972, Ninox Wildlife Consulting 1994, Shepherd et al. 2002), at Honeymoon Well (Ninox Wildlife Consulting 1994) and Mileura (Tingay and Tingay 1977), so they could infrequently be seen in the general area.

Terrestrial Ecosystems' assessment is that the Peregrine Falcon may infrequently be seen in the project area (Dell and How 1988, Ninox Wildlife Consulting 1998), however, mining and exploration activity is unlikely to have a significant impact on this species as it will readily move away from disturbance and there are abundant areas of similar habitat in the region.

Long-tailed Dunnart (*Antechinomys longicaudatus*) - Priority 4 species with DBCA.

Burbidge *et al.* (2008) summarised the Long-tailed Dunnart geographic distribution as widely scattered in arid zone where it inhabits rugged rocky areas. They went on to suggest that its striated footpads, long tail and behaviour in captivity indicated that it was an active and capable climber. Specimens have been recorded in several rocky ranges in the Gibson Desert, West MacDonnell National Park, Murchison, Carnarvon Basin and the Pilbara. All previous capture sites for Long-tailed Dunnarts are within rugged rocky landscapes that support a low open woodland or shrubland of Acacias (especially mulga) with an understorey of spinifex hummocks, and (occasionally) also perennial grasses and cassias.

Long-tailed Dunnarts have also more recently been found on banded ironstone formations (BIFs), rocky hills and ridges or the adjacent areas in much lower numbers (Department of Environment and Conservation 2007, Harewood 2014) in the Goldfields (e.g. Mt Ida, Bottle Creek and Granny Smith) and midwest. Figure 4 shows records from areas near the project area.

There are a number of rocky outcrops in the project area, so it is possible that the Long-tailed Dunnart is present in at least some of these areas. However, the proposed disturbance areas do not include rocky areas and breakaways, so there is unlikely to be a significant impact on the Priority 4 Long-tailed Dunnart.

Brush-tailed Mulgara (*Dasyercus blythi*) - Priority 4 with the DBCA

Woolley (2005) recognises two species of 'Mulgara'; *Dasyercus blythi* and *D. cristicauda*. *Dasyercus blythi* has a non-crested tail, two upper premolars and six nipples; *D. cristicauda* has a crested tail, three upper premolars and eight nipples. Both species potentially have overlapping distributions in arid Australia, but it is thought that *D. cristicauda* does not currently exist in Western Australia, although there are old records indicating its presence. Woolley (2005) suggested the common names for these two species be Brush-tailed Mulgara for *D. blythi* and Crest-tailed Mulgara for *D. cristicauda*. These two species can be sympatric in places, but probably utilise different parts of the habitat on a local scale when they are recorded in the same area. Currently, there are insufficient data to separate the spatial ecology, burrows and reproductive biology of these two species. Information that follows is based on what is known for 'Mulgara' without distinguishing between the species.

The reported distribution of Mulgara includes much of the inland spinifex covered sandy desert and spinifex vegetated areas in the Pilbara and northern goldfields. Within these areas their distribution is patchy and it is most frequently confined to mature spinifex dominated habitat (Gibson and Cole 1992, Masters 1998, Masters et al. 2003, Thompson and Thompson 2008). In some areas, their relative abundance is positively associated with rainfall in the previous 12 to 24 months (Gibson and Cole 1992, Masters 1998, Dickman et al. 2001, Letnic and Dickman 2005) and recent burning of the spinifex does not seem to be sufficient to shift Mulgara out of an area (Thompson and Thompson 2007). Mulgara are generally sedentary in contrast with some other small dasyurids and have high site fidelity and a low propensity for dispersal once a home range has been established (Masters 1998, Dickman et al. 2001).

The fauna habitat in the project area is unsuitable for Mulgara, so it is highly improbable that they are present.

5. DISCUSSION

5.1 ADEQUACY OF THE FAUNA SURVEY DATA FOR FAUNA HABITATS REPRESENTED IN THE PROJECT AREA

The EPA's (2020) *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* indicated that the level of fauna assessment should be determined considering the following criteria:

- level of existing regional knowledge;
- type and comprehensiveness of recent local surveys;
- degree of existing disturbance or fragmentation at the regional scale;
- extent, distribution and significance of habitats;
- significance of species likely to be present;
- sensitivity of the environment to the proposed activities; and
- scale and nature of impact.

There are detailed vertebrate fauna surveys in similar habitats nearby (Coffey Environments 2008, Terrestrial Ecosystems 2010, 2011a, 2020, 2023) and survey sites from two State Government surveys (Dell and How 1988, McKenzie et al. 1994) again in similar habitats, so additional survey effort is unlikely to provide data on the fauna assemblage that would alter the regulators assessments of potential impacts.

The only conservation significant species potentially in the project area are the Southern Whiteface (listed as Vulnerable under the *EPBC Act*) and the Long-tailed Dunnart (Priority 4 with DBCA). Southern Whiteface is widespread and relatively abundant in the mulga woodland areas of the Murchison, Midwest and Goldfields, so the removal of a small area of vegetation in the project area is unlikely to have a significant impact on this species. Breakaways and rocky ridges are not in the proposed disturbance area, so there is unlikely to be a significant impact on the Long-tailed Dunnart.

5.1.1 Amphibians

Frogs are normally only detected immediately after rainfall or around semi-permanent pools. The ephemeral creeks would form pools after heavy rainfall events, and it would be expected that numerous frog species would be recorded after these rain events. *Neobatrachus sutor*, *Cyclorana occidentalis*, *Litoria rubella*, *Neobatrachus kunapalari*, *Neobatrachus wilmorei*, *Cyclorana maini* and *Platyplectrum spenceri* could be found in the general area based on the available regional data (Table 5). Development of the project area could result in a loss of individuals within the disturbed area, however, vegetation clearing, and mining operations are unlikely to have a significant impact on these species when assessed in a bioregional context.

5.1.2 Reptiles

Typically, approximately 35-40 species of reptiles are caught in open mulga woodland (Coffey Environments 2008, Terrestrial Ecosystems 2010, 2011a, 2020, 2023). The regional reptile data provided in Appendix B and listed in Table 7 provides an indication of the diversity of herpetofauna in this part of the Goldfields.

Further exploration and mining activity in the project area is unlikely to significantly impact on the reptile fauna when considered in a bioregional context.

5.1.3 Birds

The number of birds and bird species in the northern Goldfields fluctuates based on seasons and recent rainfall (Craig and Chapman 2003). Semi-arid and arid areas of inland Australia support a diverse range of transient and nomadic species that move through large areas in search of available resources. Heavy rain that is followed by flowering and seeding of many plant species is often sufficient to draw a large number of these nomadic species to the general area. These species move on to other areas once the resource is depleted or better resources are available in adjacent areas.

The project area is likely to support a similar avifauna assemblage to that present in the adjacent areas. There are no bird species of conservation significance likely to be dependent on the project area to survive, although the Southern Whiteface is potentially in the project area. This is a mobile species that will readily move to adjacent habitat if disturbed. The Princess Parrot is nomadic and moves around the arid interior often in search of water and resources, and potentially only recorded in the project area on very rare occasions and the Peregrine Falcon has a large home range and would readily move to adjacent areas if disturbed.

The clearing of vegetation in a portion of the project area, when similar habitat exists in the adjacent areas, is unlikely to significantly impact on any conservation significant avifauna, as all birds will readily shift to other areas when there is a disturbance.

5.1.4 Non-volant Mammals

All the terrestrial mammals potentially in the survey area, would be present in the many square kilometres of similar habitat in adjacent areas. The only mammal species of conservation significance potentially in the project area is the Long-tailed Dunnart, which would typically be found on the breakaways and rocky ridges. The abundance of rocky outcrops would suggest that it is possibly present. However, the proposed disturbance areas do not include breakaways and rocky ridges, so there is unlikely to be a significant impact on the Priority 4 Long-tailed Dunnart.

5.1.5 Bats

All of the bats likely to be recorded in the project area are common throughout the Goldfields and many other parts of semi-arid Western Australia and none are of conservation significance. Clearing of vegetation for exploration and mining operations will not significantly impact on the bat fauna when considered in a bioregional context.

5.2 BIODIVERSITY VALUE

An ecological assessment of a site should consider its biodiversity value at the genetic, species and ecosystem levels, and its ecological functional value at the ecosystem level. There are inadequate data to assess the ecological value at the genetic level.

The fauna habitat types represented in the project area are abundant and in similar condition in adjacent areas. Therefore, the fauna assemblage that is present in the project area will also be present and abundant in the adjacent areas.

5.2.1 Ecological functional value at the ecosystem level

Exploration, mining and anthropogenic activity over many years has had a negative impact on the fauna habitat and therefore the vertebrate fauna assemblage in the project area. The presence of feral cats and wild dogs in the project area is likely to be having an on-going negative impact on vertebrate fauna in the project area and

surrounds. Rabbits are present in the project area, but in low abundance. Rabbits remove ground level vegetation that provides cover and retreat sites for numerous small vertebrates, so they are a threatening process.

5.2.2 Maintenance of threatened ecological communities

No threatened ecological fauna communities were identified in the project area.

5.2.3 Condition of fauna habitat

Some of the project area has been negatively impacted by exploration, mining and anthropogenic activity, resulting in an assessment of the condition of sections of the project area as being degraded or completely degraded. The uncleared fauna habitat present in the project area is like many square kilometres of adjacent habitat, therefore, any proposed development is unlikely to have a significant impact on the vertebrate fauna when considered in a bioregional context.

The project area supports rabbits and wild dogs, and probably feral cats, all of which are threatening processes for the vertebrate fauna assemblage.

5.2.4 Ecological linkages

Lake Carey is ~10km to the south of the project area, but the proposed vegetation clearing and development in the project area is unlikely to impact on this lake unless there is a water discharge into the lake, in which case, this impact would need to be assessed.

5.2.5 Size and scale of the proposed disturbance

The proposed disturbance area of ~1,030ha represents a small proportion of similar fauna habitat found in the adjacent area and the bioregion. However, given its irregular shape, if the entire area was to be cleared of vegetation, then the impact would be much larger, however, clearing of the entire project area is very unlikely and the footprint of any mining activity is likely to be much smaller.

5.2.6 Abundance and distribution of similar habitat in the adjacent areas

Fauna habitats present in the project area are abundant in adjacent areas. It is therefore likely that the fauna assemblage in the project area is like the many square kilometres of similar habitat in adjacent areas and the bioregion.

5.2.7 Potential impacts on ecosystem function

Clearing native vegetation is likely to result in the loss of small vertebrate fauna on-site that are unable to move away during the clearing process. The few larger animals, such as kangaroos and large goannas, and most of the birds will move into adjacent areas once clearing commences. Shifting animals into adjacent areas will increase the pressure on resources in those areas and it is likely that there will be some disruption to the ecosystems in these areas for a short period until a balance is restored.

Impacts associated with clearing vegetation and development in the project area in a landscape or bioregional context on the vertebrate fauna are likely to be low as the proposed disturbance area is small relative to the quantity of similar habitat in the bioregion and there will be no impact on conservation significant fauna.

The impact of feral and pest fauna which are present in the project area will possibly be doing more environmental damage, when considered in the long-term, than the proposed vegetation clearing and mining activity in the project area.

6. POTENTIAL ENVIRONMENTAL IMPACTS

Additional exploration and mining activity in the project area will potentially affect vertebrate fauna in numerous ways, including death/injury of fauna during vegetation clearing, impacts with vehicles and the loss of habitat.

6.1 ANIMAL DEATHS DURING THE CLEARING PROCESS AND DISPLACEMENT OF FAUNA

Clearing vegetation and activities associated with exploration and mining will result in the loss of some small fauna that retreat to burrows, such as reptiles and mammals and the larger terrestrial animals and avian species will most often move to adjacent areas. Nocturnal species (e.g. dunnarts and mice) are unlikely to be active when most of the vegetation clearing is taking place which may result in these individuals being adversely impacted when they attempt to escape. This loss of fauna habitat is unlikely to have a significant impact when considered in a bioregional context.

Clearing large areas increases fauna habitat edges. Small mammals can respond both positively and negatively to edges depending on their ecological traits (Laurance 1991, 1994, Goosem 2000, Goosem et al. 2001, Craig and Chapman 2003). Edge and disturbance effects can lead to altered and most often higher levels of predation, restricting or increasing fauna movements and altering assemblage structure (Oxley et al. 1974, Paton 1994, Baker et al. 1998, Temple 1998, Luck et al. 1999, Goosem et al. 2001). Goldingay and Whelan (1997) and Clarke and Oldland (2007) reported that edge effects can extend up to 150-200m from the edge for some species, meaning the impact area on vertebrate fauna is likely to be larger than the cleared footprint.

Edge effects can lead to the disruption of ecological processes such as predation and dispersal, animal movements and can change assemblage structure. The consequence is that the impact area will typically be larger than the cleared area. However, the sparseness of the vegetation in the project area would indicate edge effects would generally be insignificant in the project area.

6.2 REDUCTION OR LOSS OF ACTIVITY AREAS AND CLOSURE OF BURROWS

Clearing vegetation and associated development activities are likely to destroy reptile and mammal burrows or foraging habitat that are currently in use or could be used again. Clearing vegetation that forms part of the activity area of individuals has the potential to force these animals into adjacent areas. These areas may offer fewer resources placing individuals under survival pressure. It could also cause individuals to move into the territories of other individuals increasing competition for resources. Forced relocations could increase the possibility of predation.

Although vegetation clearing seldom results in the death of adult avian species, clearing of vegetation reduces and alters their foraging areas. The loss of foraging areas shifts individuals into adjacent areas and increases competition for resources, with the inevitable result that some of the migrants and some of the residents fail to thrive in the altered environment and some could be lost.

6.3 HABITAT FRAGMENTATION

In addition to direct impacts of vegetation clearing, infrastructure including tracks, has the potential to fragment habitat. Clearing vegetation isolates sections of established communities and may alter long and medium-term patterns of movement around established home ranges particularly for small mammals and reptiles. A reduction in the population because of this development would be difficult to detect given our current knowledge of the spatial ecology for most of the small mammals known to be in the area. The project area contains mostly sparse vegetation, multiple exploration areas and tracks. Any habitat fragmentation is likely to be not significant.

6.4 INTRODUCED FAUNA AND WEEDS

Cats and wild dogs are known to be established in the region and the project area. In many situations, both these species have become a 'naturalised' species in the Australian bush. Increases in dog or cat numbers can have a detrimental impact on native fauna because they predate on and compete with native species, severely disrupting the natural balance. The feral cat is a particularly damaging predator on native fauna and any increase in their numbers could have a detrimental effect on local native fauna (Kinnear 1993, Bamford 1995, Woinarski et al. 2017, Woinarski et al. 2018, Murphy et al. 2019); hence it is important to ensure that populations of the feral predators, such as cats under control.

Infrastructure known to support feral species, such as poorly managed waste disposal sites and bins and permanent water, should be managed to minimise increases in these populations.

Introduced plant species can successfully and rapidly invade areas of cleared native vegetation or otherwise disturbed by humans. Introduced plant species may replace native species that provide shelter or foraging areas for native fauna.

6.5 ROAD FAUNA DEATHS

An increase in road fauna deaths is likely to occur where new roads / tracks are constructed or upgraded. This affects kangaroos, nocturnal birds and ground dwelling large carnivorous predators. Species such as goannas and raptors are attracted to carrion on road verges and therefore, there is an increased propensity for these species to be killed by vehicles. Given the size of the project area, sparseness of the vegetation and the low abundance of vertebrate fauna, the impacts of road fauna deaths are likely to be low.

6.6 FIRE

Increased human activity is often associated with an altered fire regime which leads to a degradation of natural ecosystems. Fire has been identified as one of the threatening processes for some conservation significant species as numerous small mammal and bird species rely on long unburnt vegetation, however, many Australian small mammal and reptile species are adapted to landscape scale wild fires (Pianka and Goodyear 2012, Letnic et al. 2013, Swan et al. 2016).

Large and widespread fires are unlikely to be a significant threat to native fauna species in and adjacent to the project area due to the sparseness of the vegetation.

6.7 ANTHROPOGENIC ACTIVITY

Unnatural noises, vibrations, artificial light sources, and vehicle and human movement in an area may be sufficient to force individuals or fauna species to move from adjacent areas or alter their activity periods. This form of disturbance is likely to occur during the vegetation clearing and on-going mining operations. The overall impact is likely to be confined to small areas adjacent to mining operations and infrastructure.

6.8 DUST

Dust generated from shifting topsoil and increased vehicle traffic can potentially degrade surrounding vegetation, reducing its ability to absorb sunlight and influencing photosynthetic rates. Degradation of these areas may potentially render habitat unsuitable for fauna. Dust suppression and management programs are an essential component of minimising impacts on fauna in areas adjacent to the mine. An effective dust management program should be implemented.

6.9 POTENTIAL IMPACTS ON LONG-TAILED DUNNARTS

Long-tailed Dunnarts are typically recorded in rugged rocky landscapes that support a low open woodland or shrubland of Acacias (especially mulga) with an understorey of spinifex hummocks, and (occasionally) also perennial grasses and cassias. They have also been found on banded ironstone formations (BIFs), rocky hills and ridges or the adjacent areas in much lower numbers (Department of Environment and Conservation 2007, Harewood 2014) in the Goldfields (e.g. Mt Ida, Bottle Creek and Granny Smith) and midwest. Figure 4 shows records from areas near the project area.

Magnetic Resources have designed to project area to avoid breakaways and rocky ridges, and therefore the potential impact of Long-tailed Dunnarts is likely to be low.

6.10 POTENTIAL IMPACTS ON SOUTHERN WHITEFACE

The Southern Whiteface is found widely across the region and is likely to occur in the project area. The major impacts to this species in the project area will be habitat clearing and the impacts of introduced predators namely foxes and cats. The habitat in the project area is like most of the surrounding habitat in the region and the loss of a small section of habitat is unlikely to have a significant impact on the species in the region.

Department of Climate Change Energy the Environment and Water (2023) defined threats to Southern Whiteface as:

- habitat loss caused by clearing for agriculture;
- habitat degradation caused by domestic livestock grazing;
- increased frequency or length of droughts; and
- increased likelihood of extreme events (i.e., wildfire, drought and heatwaves).

The Magnetic Resources proposed operations is not for the purposes of agriculture and grazing of domestic stock and it is unlikely to be significant contributor to droughts or other extreme events any more than any other mining operations. So, based on the nominated major threats, the Laverton Gold Operations are unlikely to significantly impact on Southern Whiteface.

The control of introduced predators through appropriate management of rubbish and site design combined with an effective trapping/baiting program will potentially benefit the species in the project area and surrounding region.

7. VERTEBRATE FAUNA RISK ASSESSMENT

7.1 IMPACT RISK ASSESSMENT

Fauna surveys to support mining applications are part of the environmental risk assessment undertaken to consider what potential impacts a development might have on the biodiversity on a particular area and region. Potential impacts on fauna from the proposed development are identified and briefly described above. Tables 8, 9 and 10 provide a summary of the risk assessment associated with this project.

Any risk assessment is a product of the likelihood of an impact occurring and the consequences of that impact. Likelihood and consequences are categorised and described below. The assessed risk level (likelihood x consequences) is then calculated as the overall risk for the development. This is followed by an assessment of the acceptability of the risk associated with each of the impacts. Disturbances and vegetation clearing have an impact on the fauna at multiple scales – site, local, landscape and regional. Each of these is considered in the risk assessment. This assessment should be considered in the context of the summary in Table 11.

Table 9. Fauna impact risk assessment descriptors

Likelihood		
Level	Description	Criteria
A	Rare	The environmental event may occur, or one or more conservation significant species may be present in exceptional circumstances.
B	Unlikely	The environmental event could occur, or one or more conservation significant species could be present at some time.
C	Moderate	The environmental event should occur, or one or more conservation significant species should be present at some time.
D	Likely	The environmental event will probably occur, or one or more conservation significant species will be present in most circumstances.
E	Almost certain	The environmental event is expected to occur, or one or more conservation significant species is expected be present in most circumstances.
Consequences		
Level	Description	Criteria
1	Insignificant	Insignificant impact on fauna of conservation significance or regional biodiversity, and the loss of individuals will be insignificant in the context of the availability of similar fauna or fauna assemblages in the area.
2	Minor	Impact on fauna localised and no significant impact on species of conservation significance in the project area. Loss of species at the local scale.
3	Moderate	An appreciable loss of fauna in a regional context or a limited impact on species of conservation significance in the project area.
4	Major	Significant impact on conservation significant fauna or their habitat in the project area and/or regional biodiversity and/or a significant loss in the biodiversity at the landscape scale.
5	Catastrophic	Loss of species at the regional scale and/or a significant loss of species categorised as 'vulnerable' or 'endangered' under the EPBC Act (1999) at a regional scale.
Acceptability of Risk		
Level of risk	Management Action Required	
Low	No action required.	
Moderate	Avoid if possible, routine management with internal audit and review of monitoring results annually.	
High	Externally approved management plan to reduce risks, monitor major risks annually with external audit and review of management plan outcomes annually. May a referral to the Commonwealth under the EPBC Act 1999.	
Extreme	Unacceptable, project should be redesigned or not proceed.	

Table 10. Levels of acceptable risk

		Likelihood				
		Rare or very low (A)	Unlikely or low (B)	Moderate (C)	Likely (D)	Almost certain (E)
Consequence	Insignificant (1)	Low	Low	Low	Low	Low
	Minor (2)	Low	Low	Low	Moderate	Moderate
	Moderate (3)	Low	Moderate	Moderate	High	High
	Major (4)	Moderate	Moderate	High	High	Extreme
	Catastrophic (5)	Moderate	High	High	Extreme	Extreme

Table 11. A risk assessment of the impact of ground disturbance activity on fauna

			Before management				With management		
	Potential impacts		Inherent risk			Risk controls	Residual risk		
Factor			Likelihood	Consequence	Significance		Likelihood	Consequence	Significance
Fauna survey data	Inadequate vertebrate fauna survey data to adequately assess the risks	Unknown loss of fauna, fauna of conservation significance, and fauna assemblages, and an incomplete fauna assessment.	A	1	Low				
Clearing vegetation	Loss of fauna habitat – local scale	Loss of terrestrial fauna in the project area.	E	2	Mod.				
	Loss of fauna habitat – landscape scale	Loss of some fauna during vegetation clearing.	B	1	Low				
	Loss of fauna habitat – regional scale	Small loss of some fauna from the region.	B	1	Low				
	Loss of a threatened ecological fauna community	Loss of an undetected threatened ecological fauna community.	A	3	Low				
	Habitat fragmentation	Fauna movement restricted resulting in the death of fauna and a loss of biodiversity.	A	2	Low				
Death or loss of conservation significant fauna	Loss of a unique terrestrial fauna ecosystem	Loss of an ecosystem containing fauna with high species richness, high abundance and numerous top of the food chain predators.	A	2	Low				
	Long-tailed Dunnart	Death or reduced viability of this species.	C	2	Low				
	Southern Whiteface	Death or reduced viability of this species	B	2	Low				
	Princess Parrot	Death or reduced viability of this species.	A	2	Low				
	Peregrine Falcon	Death or reduced viability of this species.	A	2	Low				
Human impacts	Increase or spread of weeds	Changed vegetation and a resulting loss of fauna habitat.	E	2	Mod.	Implementation of a noxious weeds management program.	D	2	Low

			Before management				With management		
	Road kills	Animals being killed by vehicles as they cross roads	E	1	Low	Limiting speeds	E	1	Low
	Increase in feral pests, specifically wild dogs and feral cats	Increased predation on the native fauna	C	3	Mod.	Implementation of feral animal program.	C	2	Low

7.2 NATIVE VEGETATION CLEARING PRINCIPLES AS THEY PERTAIN TO VERTEBRATE FAUNA

The *Environmental Protection Act 1986* outlines 10 principles that are to be used in the assessment of native vegetation clearing permit applications which are also applicable for other assessments and approvals (Table 12). Where possible, native vegetation should not be cleared if any of the following principles are compromised.

Table 12. Assessment of impact using the native vegetation clearing principles

Principle	Response
It comprises a high level of biological diversity.	Clearing vegetation will not compromise a high level of biodiversity. It is possible that the Southern Whiteface (listed as Vulnerable under the <i>EPBC Act</i>) and the Long-tailed Dunnart (i.e. Priority 4 species with DBCA) are present in the project area. However, Magnetic Resources has designed the disturbance area to avoid breakaways and rocky areas, so potential impacts on Long-tailed Dunnarts will be low and are unlikely to be significant. Southern Whiteface are widespread and relatively abundant in the Murchison, Midwest and Goldfields, so the loss of a small parcel of vegetation in the project area is unlikely to have a significant impact on this species, and it will readily move to an adjacent area when vegetation clearing commences.
It comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	Clearing vegetation will not result in the loss of significant habitat necessary for the maintenance of indigenous fauna. Although it is possible the project area supports Long-tailed Dunnarts, any impacts on this species are unlikely to be significant as rocky areas and breakaways will be avoided. Southern Whiteface are likely to occur in the project area; however, the project area represents a small fraction of this habitat type and the loss of mulga woodland habitat in the disturbance area does not pose a significant threat to this species.
It includes, or is necessary for the continued existence of, rare flora.	N/A
It comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.	The area does not contain a threatened ecological fauna community.
It is significant as a remnant of native vegetation in an area that has been extensively cleared.	The area is not a remnant.
It is growing in, or in association with, an environment associated with a watercourse or wetland.	The area does not contain a natural wetland.
The clearing of the vegetation is likely to cause appreciable land degradation.	N/A

Principle	Response
The clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	Clearing of vegetation is unlikely to impact on conservation areas in the region.
The clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	N/A
The clearing of the vegetation is likely to cause or exacerbate the incidence of flooding.	N/A

7.3 REFERRAL UNDER THE EPBC ACT

The proposed project is unlikely to significantly impact on a conservation significant vertebrate fauna species listed under the *EPBC Act*, so a referral under the *EPBC Act 1999* is not recommended.

8. SUMMARY

Blue Cap Mining on behalf of Magnetic Resources NL requested a Basic vertebrate fauna survey and risk assessment for the Laverton Gold Project. The project area is an irregular shape and is ~2,890ha, but development is expected to be less than 1,030ha. The project area straddles the Old Laverton Road but is mostly on the southern side and is approximately 12km south-west of Laverton. The project area includes the following three broad fauna habitats: mulga and mixed shrubland, chenopod shrublands, and rocky ridges and breakaways. In addition, there are multiple areas that have been disturbed by exploration and mining activity.

The Southern Whiteface (*Aphelocephala leucopsis*), listed as Vulnerable under the *EPBC Act*, is likely to occur in the project area but is unlikely to be significantly impacted by vegetation clearing and mining activity as it is a mobile species and is found widely across neighbouring areas, and there is similar habitat in adjacent areas for this bird to move into. The proposed disturbance is unlikely to significantly impact on this conservation significant species, so a referral under the *EPBC Act* is not recommended.

Although they are in the project area, the proposed disturbance areas do not include breakaways and rocky ridges, so potential impacts on the Priority 4 Long-tailed Dunnart (*Antechinomys longicaudatus*) are likely to be low.

Clearing native vegetation in the project area is likely to result in the loss of small vertebrate fauna on-site that are unable to move away during the vegetation clearing process, however, this loss is not likely to be significant when viewed in a bioregional context. The few larger animals, such as kangaroos, large goannas and snakes, and most of the birds will move into adjacent areas once vegetation clearing commences, so potential impacts will be low. There may be an on-going loss of small native fauna to vehicle strikes on access tracks, but overall, this impact will be very low. Forced fauna migrants because of vegetation clearing will increase competition for resources in adjacent areas, which may result in the subsequent loss of migrants or local individuals. Individuals shifted out of their established activity areas are also vulnerable to predation until they have become established in their new areas. There was evidence of rabbits, feral cats and wild dogs in the project area.

9. MANAGEMENT STRATEGIES

The purpose of this section is to identify generic management and mitigation strategies to address the potential impacts of development in the project area. Specific management and mitigation strategies to address potential impacts should be addressed in project approvals or management documents.

9.1.1 Induction and awareness

All contractors and staff involved in vegetation clearing, exploration and mining activities in the project area should be made aware of the possible presence and issues associated with terrestrial fauna in the area through the induction process. The induction program can also draw to staff's attention the problems associated with uncapped drill holes and indicate what action is required to rectify the situation.

Recommendation 1: Implement an induction program that includes a component on managing vertebrate fauna for personnel working in the project area.

9.1.2 Dust

Dust generated from the vegetation clearing and mining operations could potentially degrade surrounding vegetation, reducing its ability to absorb sunlight and influencing photosynthetic rates. Degradation of these areas will potentially render habitat unsuitable for fauna. Dust suppression and management programs are an essential component of minimising mining impacts on fauna during the construction program.

Recommendation 2: The impact of dust on adjacent vegetation and fauna habitat is managed.

9.1.3 Uncapped drill holes

Uncapped drill holes are a hazard for small terrestrial fauna. This can partially be rectified by maintaining a log of where the holes are and who was responsible to capping each hole.

Recommendation 3: A log is maintained of all drill holes, and who was responsible for capping each hole.

9.1.4 Minimising habitat fragmentation

Loss of vegetation and habitat may contribute to the decline in the number of fauna on and in the vicinity of survey area. Where possible, access routes should be aligned to existing tracks and other barriers or follow the boundaries of broad-scale vegetation associations in the area to minimise the impact on the terrestrial fauna, which are often dependent upon specific habitat types. Clearing should be minimised, and fragmentation of remnant vegetation should be avoided wherever possible. Once areas are no longer required then they should be rehabilitated.

Recommendation 4: All areas disturbed during exploration are rehabilitated as soon as practical after they are no longer required.

Recommendation 5: Where possible, access routes are aligned to existing roads, tracks and other barriers or follow the boundaries of broad-scale vegetation associations in the area.

9.1.5 Minimising secondary impacts to fauna and fauna habitat

Pets and feral animals have the potential to impact on fauna. Pets should not be permitted on site and feral and pest fauna numbers monitored and controlled. To be effective, management of feral and pest species needs to be undertaken in collaboration with the landowner, pastoralist, and neighbouring tenement holders. All rubbish likely to attract animals should be suitably contained and disposed of so as not to encourage the feeding of fauna around the site.

Based on feral cat tracks and scats recorded in the project area it is probable that the study area currently supports a population of feral cats. Reducing the impacts of feral cats will reduce the stress on fauna and fauna assemblages in the area. Wild dogs are also common in the area and will be impacting on the local and regional vertebrate fauna assemblage.

Increased activity will result in increased traffic and a consequential increase in the fauna deaths on tracks and roads in the area. Limiting vehicle speed on access tracks can reduce collisions with fauna, particularly larger animals such as kangaroos and emus. Dead animals on the road also have the propensity to attract raptors, goannas and even cattle, which are then likely to be killed.

Recommendation 6: Pets are not permitted in the project area.

Recommendation 7: All waste and rubbish to be contained in bins and regularly removed from the site or placed in land fill and suitably covered to exclude access to predator species.

Recommendation 8: Feeding of native fauna is prohibited.

Recommendation 9: A feral pest control program is implemented in the project area and surrounds.

Recommendation 10: Vertebrate fauna management protocol be prepared and implemented for the life of the project.

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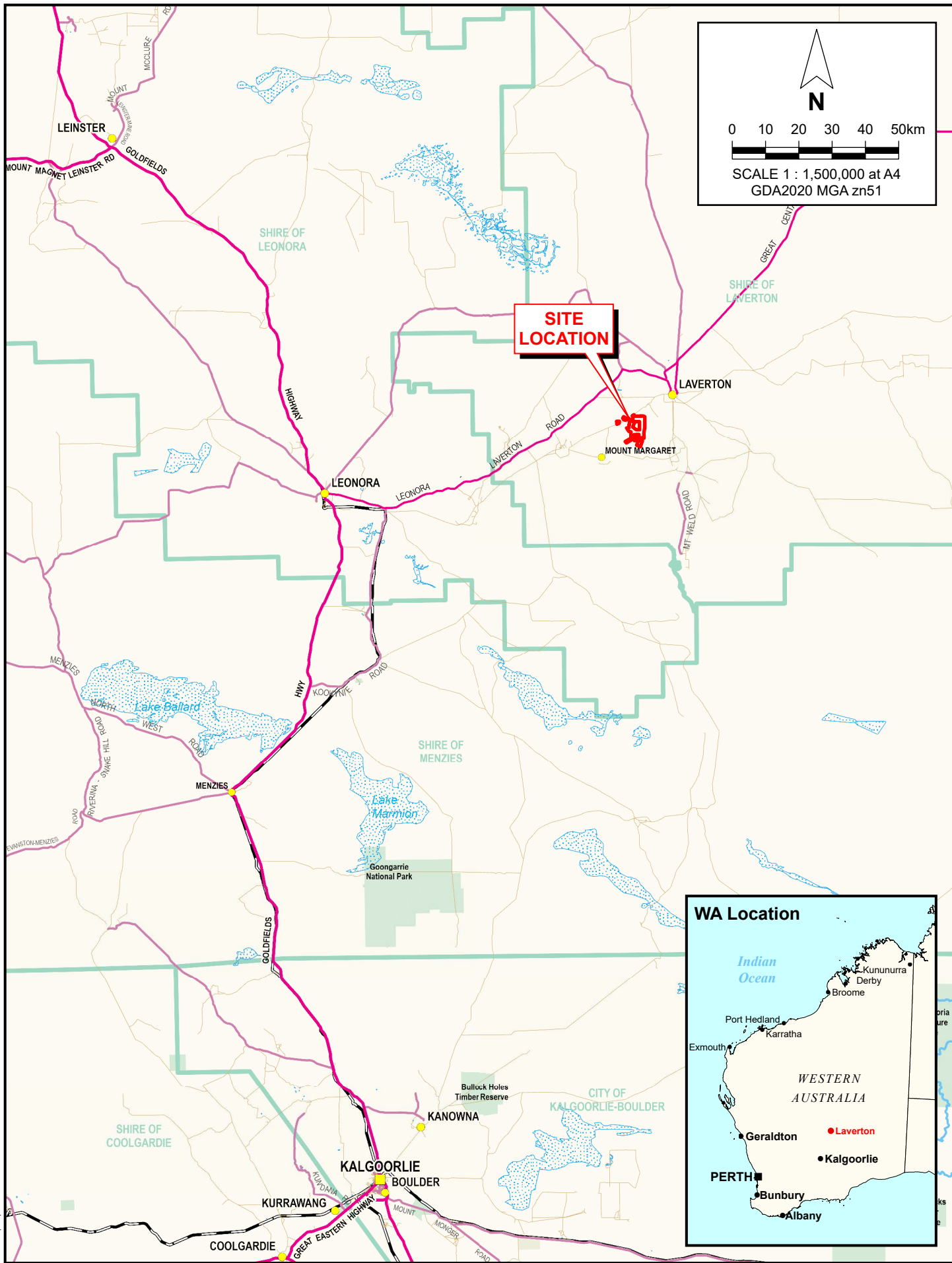
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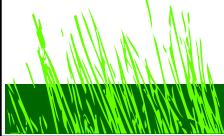
Figures

**Basic Vertebrate Fauna Survey and Risk Assessment
MAU Laverton Gold Project**



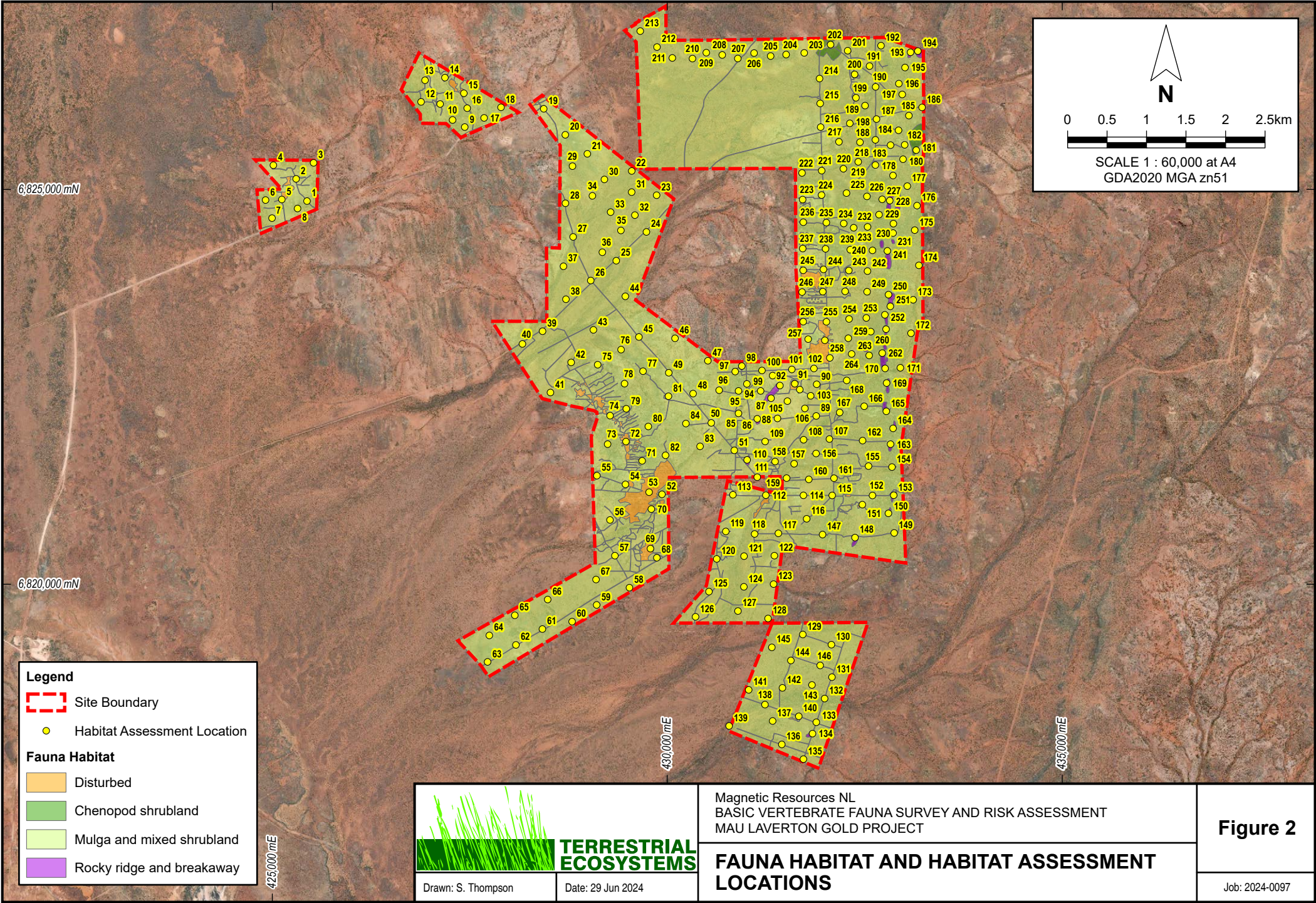


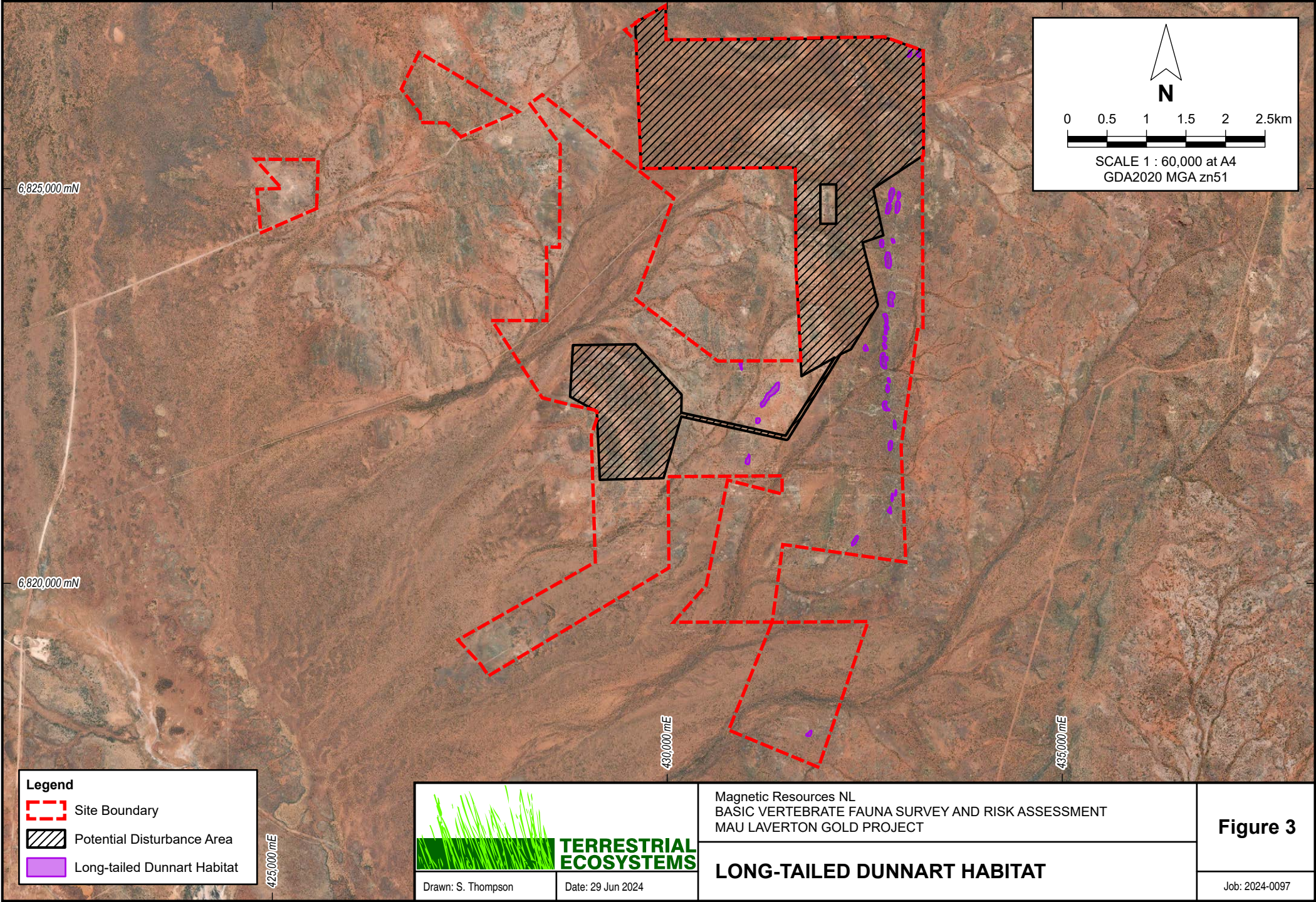
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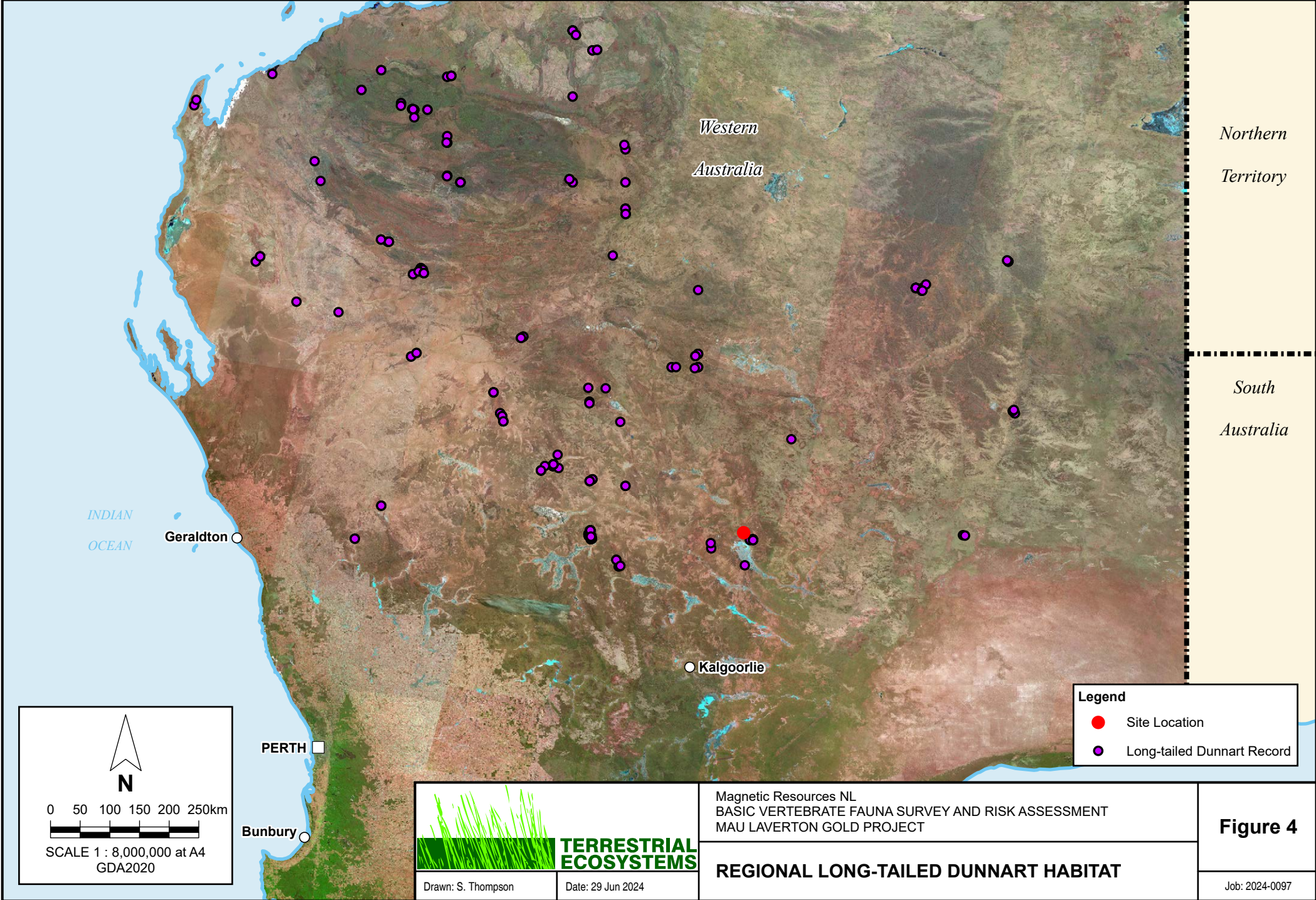
 TERRESTRIAL ECOSYSTEMS	
Drawn: S. Thompson	Date: 29 Jun 2024

Magnetic Resources NL BASIC VERTEBRATE FAUNA SURVEY AND RISK ASSESSMENT MAU LAVERTON GOLD PROJECT
REGIONAL LOCATION

Figure 1
Job: 2024-0097







Appendix A.

Results of the EPBC Act Protected Matters Search

**Basic Vertebrate Fauna Survey and Risk Assessment
MAU Laverton Gold Project**





Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 06-Jun-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

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

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	4
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	5
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species

[Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			
Sminthopsis psammophila Sandhill Dunnart [291]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
REPTILE			
Liopholis kintorei			
Great Desert Skink, Tjakura, Warrarna, Mulyamiji, Tjalapa, Nampu [83160]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Migratory Terrestrial Species			
Motacilla cinerea			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area

Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius veredus			
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands

[Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - JINDALEE STATION [50256]	WA	In buffer area only
Unknown		
Commonwealth Land - [51827]	WA	In buffer area only
Commonwealth Land - [51828]	WA	In buffer area only
Commonwealth Land - [51829]	WA	In buffer area only

Listed Marine Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans			
Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius veredus			
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat may occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

EPBC Act Referrals [Resource Information]				
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Mt Weld Rare Earths Project ? Life of Mine Proposal	2023/09681		Completed	In buffer area only
Not controlled action				
Eastern Goldfields Gas Pipeline Construction, WA	2014/7284	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Murrin Murrin East Nickel and Cobalt Mine Expansion	2008/4140	Not Controlled Action	Completed	In buffer area only
Re-establish and Recommencement of Mount Windarra Nickel Mine	2008/4016	Not Controlled Action	Completed	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

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

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

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

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Department of Climate Change, Energy, the Environment and Water

GPO Box 3090

Canberra ACT 2601 Australia

+61 2 6274 1111

Appendix B.

Vertebrate Fauna Recorded in Biological Surveys in the Region

Basic Vertebrate Fauna Survey and Risk Assessment
MAU Laverton Gold Project



Family	Species	Common name	Surveys		A										B										C										Opportunisti	Granny birds
					Site 1E	Site LL4	Site LL5	Site LL3	Site LL6	Site LL1	Site LL2	Site 7	Site 8	Site 9	Site 10	Site 2	Site 3	Site 12	Site 4	Site 5	Site 1	Site 8	Site 11	Site 13	Site 6	Site 7										
	<i>Egernia formosa</i>	Goldfields Crevice Skink	X																																	
	<i>Eremiascincus richardsonii</i>	Broad-banded Sand-swimmer	X														2					1														
	<i>Lerista bipes</i>	North-western Sandslider	X																																	
	<i>Lerista desertorum</i>	Central Desert Robust Slider	X	1		1	1		1													2														
	<i>Lerista kingi</i>	King's Slider	X																																	
	<i>Lerista muelleri</i>	Wood Mulch-slider	X																																	
	<i>Lerista sp.</i>			4					1	1																										
	<i>Lerista timida</i>	Timid Slider	X																																	
	<i>Liopholis inornata</i>	Desert Skink	X																																	
	<i>Liopholis striata</i>	Nocturnal Desert Skink	X																																	
	<i>Menetia greyii</i>	Common Dwarf Skink	X	2			1		1												1															
	<i>Morethia butleri</i>	Woodland Morethia Skink	X	2									6	1	1		3	1					2													
	<i>Tiliqua multifasciata</i>	Central Blue-tongue	X																1																	
	<i>Tiliqua occipitalis</i>	Western Blue-tongued Lizard	X	2																																
	<i>Tiliqua rugosa</i>	Bobtail	X																																	
Typhlopidae	<i>Anilius australis</i>	Austral Blind Snake	X										1							1																
	<i>Anilius bicolor</i>	Dark-spined Blind Snake														1																				
	<i>Anilius hamatus</i>	Pale-headed Blind Snake					1																													
Varanidae	<i>Varanus brevicauda</i>	Short-tailed Pygmy Monitor	X		1					1																										
	<i>Varanus caudolineatus</i>	Stripe-tailed Monitor	X	1		1							1	2		2	1	3					1	1												
	<i>Varanus eremius</i>	Pygmy Desert Monitor	X																																	
	<i>Varanus gouldii</i>	Gould's Goanna	X	1																																
	<i>Varanus panoptes</i>	Yellow-spotted Monitor	X										4		7			3	4		2	6	2	2												
	<i>Varanus tristis</i>	Black-headed Monitor	X																																	
Birds																																				
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu					2			1																						3				
Anatidae	<i>Tadorna tadornoides</i>	Australian Shelduck		1																																
	<i>Chenonetta jubata</i>	Australian Wood Duck		1																												77	2			
	<i>Anas superciliosa</i>	Pacific Black Duck		1																													13			
	<i>Anas gracilis</i>	Grey Teal		1																													74			
	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck		1																													5			
	<i>Aythya australis</i>	Hardhead																															2			
	<i>Biziura lobata</i>	Musk Duck																															2			
Podicipedidae	<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe		1																													30			

Family	Species	Common name	Surveys A		B								C													Opportunistic	Granny birds
					Site 1E	Site LL4	Site LL5	Site LL3	Site LL6	Site LL1	Site LL2	Site 7	Site 8	Site 9	Site 10	Site 2	Site 3	Site 12	Site 4	Site 5	Site 1	Site 8	Site 11	Site 13	Site 6	Site 7	
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing					4																				5
	<i>Ocyphaps lophotes</i>	Crested Pigeon			5	4				2																	
	<i>Geopelia cuneata</i>	Diamond Dove					8																				
Cuculidae	<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo					1																				
Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar		1																							
Podargidae	<i>Podargus strigoides</i>	Tawny Frogmouth		1																							
Rallidae	<i>Tribonyx ventralis</i>	Black-tailed Nativehen		1																							
	<i>Fulica atra</i>	Eurasian Coot		1																						21	
Recurvirostridae	<i>Himantopus leucocephalus</i>	Pied Stilt		1																						5	
	<i>Cladorhynchus leucocephalus</i>	Banded Stilt																								14	
Charadriidae	<i>Vanellus tricolor</i>	Banded Lapwing		1																							
	<i>Charadrius ruficapillus</i>	Red-capped Plover		1																							
	<i>Euseyornis melanops</i>	Black-fronted Dotterel		1																					1	1	
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper		1																							
Otididae	<i>Ardeotis australis</i>	Australian Bustard		1																							
Ardeidae	<i>Ardea pacifica</i>	White-necked Heron		1																							
	<i>Egretta novaehollandiae</i>	White-faced Heron		1																						2	
Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant		1																							
Accipitridae	<i>Hieraaetus morphnoides</i>	Little Eagle		1																							
	<i>Aquila audax</i>	Wedge-tailed Eagle					4			8	3															2	1
	<i>Circus assimilis</i>	Spotted Harrier		1																							
Cuculidae	<i>Heteroscenes pallidus</i>	Pallid Cuckoo		1																						2	1
Alcedinidae	<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher		1																							
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel					1			1	2															2	
	<i>Falco longipennis</i>	Australian Hobby		1																							
	<i>Falco berigora</i>	Brown Falcon						1																		1	
Cacatuidae	<i>Eolophus roseicapilla</i>	Galah			26	4				10																	
	<i>Nymphicus hollandicus</i>	Cockatiel			15	12				20																	
Psittaculidae	<i>Neopsephotus bourkii</i>	Bourke's Parrot					6																				
	<i>Barnardius zonarius</i>	Australian Ringneck			3	4	3			2																	1
	<i>Psephotus varius</i>	Mulga Parrot					9																			8	3
	<i>Melopsittacus undulatus</i>	Budgerigar			6	9	6			5	8																
Ptilonorhynchidae	<i>Chlamydera guttata</i>	Western Bowerbird	X																							2	5
Climacteridae	<i>Climacteris affinis</i>	White-browed Treecreeper	X	1																							
Maluridae	<i>Malurus lamberti</i>	Variegated Fairywren	X			2																					

		Surveys		A	B								C															
					Site 1E	Site LL4	Site LL5	Site LL3	Site LL6	Site LL1	Site LL2	Site 7	Site 8	Site 9	Site 10	Site 2	Site 3	Site 12	Site 4	Site 5	Site 1	Site 8	Site 11	Site 13	Site 6	Site 7	Opportunisti	Granny birds
Family	Species	Common name																										
	<i>Sminthopsis dolichura</i>	Little Long-tailed Dunnart	X											5	3	1	3	1	7	5	1	3		1	4	13		
	<i>Sminthopsis hirtipes</i>	Hairy-footed Dunnart	X					2								1			1						4	13		
	<i>Antechinomys longicaudatus</i>	Long-tailed Dunnart																		1				1	1			
	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart	X			3	2			1				1	5	3		3	2	1	2	1	5	2	1	1		
	<i>Sminthopsis murina</i>	Slender-tailed Dunnart	X																									
	<i>Sminthopsis ooldea</i>	Ooldea Dunnart	X		2		1		1																			
Macropodidae	<i>Osphranter robustus</i>	Euro	X	3																								
	<i>Osphranter rufus</i>	Red Kangaroo		38		1	2		4																			
Leporidae	<i>Oryctolagus cuniculus</i>	Rabbit	X	3					1																			
Thylacomyidae	<i>Macrotis lagotis</i>	Bilby	X																									
Equidae	<i>Equus caballus</i>	Horse	X																									
Muridae	<i>Mus musculus</i>	House Mouse	X		2	3	3		3	8													5		1			
	<i>Notomys alexis</i>	Spinifex Hopping Mouse						1													3							
	<i>Notomys alexis</i>	Spinifex Hopping Mouse	X											1	2		1	5	3									
	<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse	X	1	8	1	6	1	1					1	2	1	1	5	3		1		2	6				

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B McKenzie N.L., Rolfe, J.K. and Youngson, W.K. (1994) Vertebrate fauna. In: The Biological Survey of the Eastern Goldfields of Western Australia Part 10, Sandstone-Sir Samuel and Laverton-Leonora Study Areas. *Records of the Western Australian Museum*, Supplement No 47, PP. 51-85.

C Terrestrial Ecosystems (2011a) *Level 2 Fauna Risk Assessment for the Granny Deeps Project Area*, Unpublished report for Barrick Gold Corporation, Perth.

		Surveys	A										B								C					D		
			MME1	MME2	Opportuni	MME3	MME5	MME7	MME8	MME9	MME6	MME4	TM1	JS2	WM2	WS2	WM1	WS1	JS3	JS1	JS4	HB1	Site 14a	Site 1a	Site 17a	Site 11	Site 11a	
Family	Species	Common name																										
Amphibians																												
Limnodynastidae	<i>Neobatrachus sutor</i>	Shoemaker Frog	1	1																								
	<i>Neobatrachus wilmorei</i>	Plonking Frog											3	1														
	<i>Platyplectrum spenceri</i>	Spencer's Burrowing Frog																					8					
Pelodyridae	<i>Cyclorana maini</i>	Main's Frog			1																							
Reptiles																												
Agamidae	<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon																						12				
	<i>Ctenophorus inermis</i>	Military Dragon													1										1			
	<i>Ctenophorus isolepis</i>	Central Military Dragon	1																									
	<i>Ctenophorus maculatus</i>	Spotted Dragon														2												
	<i>Ctenophorus reticulatus</i>	Western Netted Dragon		1	1	1	1	3	1								1						1		2			
	<i>Ctenophorus salinarum</i>	Saltpan Dragon														2		1								5	1	
	<i>Pogona minor</i>	Western Bearded Dragon								1			1		2				2	1	1					2	1	
	<i>Tympanocryptis cephalus</i>	Pebble Dragon																									1	
Carphodactylidae	<i>Nephrurus vertebralis</i>	Midline Knob-tail															1		1							1		
	<i>Underwoodisaurus milii</i>	Barking Gecko									2														9			
Diplodactylidae	<i>Diplodactylus pulcher</i>	Beautiful Gecko									1												4	3				
	<i>Lucasium squarrosus</i>	Mottled Ground Gecko											2	1	5	2	1					2	1	3	1	3		
	<i>Strophurus ciliaris</i>	Spiny-tailed Gecko																					2	1				
	<i>Strophurus elderi</i>	Jewelled Gecko												1					1	2								
	<i>Strophurus wellingtonae</i>	Western Shield Spiny-tailed Gecko		1																								
Elapidae	<i>Suta monachus</i>	Hooded Snake			1																		1	3				
	<i>Pseudechis butleri</i>	Spotted Mulga Snake			1																							
Gekkonidae	<i>Gehyra variegata</i>	Variegated Gehyra	3	9	1	3	3	2		3	9	16												1	15			
	<i>Heteronotia binoei</i>	Bynoe's Gecko		3	1							1	1				2					2	3		34			
	<i>Gehyra xenopus</i>	Crocodile-faced Dtella												1			1			1	1							
Pygopodidae	<i>Delma nasuta</i>	Sharp-snouted Delma																			1							
	<i>Lialis burtonis</i>	Burton's Legless Lizard																			1							
	<i>Pygopus nigriceps</i>	Western Hooded Scaly-foot																			1				1			
Scincidae	<i>Cryptoblepharus buchananii</i>	Buchanan's Snake-eyed Skink		2	1																		1					
	<i>Ctenotus helenae</i>	Clay-soil Ctenotus												2					2	1								
	<i>Ctenotus leonhardii</i>	Leonhardi's Ctenotus				1							6	3	3	6	7				2	4				5	4	
	<i>Ctenotus schomburgkii</i>	Barred Wedgesnout Ctenotus	1		1					2																3		
	<i>Ctenotus severus</i>	Stern Ctenotus																						1	6			

Family	Species	Common name	Surveys			A								B								C					D
			MME1	MME2	Opportuni	MME3	MME5	MME7	MME8	MME9	MME6	MME4	TM1	JS2	WM2	WS2	WM1	WS1	JS3	JS1	JS4	HB1	Site 14a	Site 1a	Site 17a	Site 11	
	<i>Ctenotus uber</i>	Spotted Ctenotus																				3		2			
	<i>Egernia depressa</i>	Southern Pygmy Spiny-tailed Skink								1																	
	<i>Eremiascincus richardsonii</i>	Broad-banded Sand-swimmer																				1		1			
	<i>Lerista bipes</i>	North-western Sandslider																									
	<i>Lerista desertorum</i>	Central Desert Robust Slider			1					1	1		4	1	1			1	2	1				6			
	<i>Lerista kingi</i>	King's Slider														1											
	<i>Lerista sp.</i>				1					1	2													9			
	<i>Menetia greyii</i>	Common Dwarf Skink	4		1					1	2																
	<i>Morethia butleri</i>	Woodland Morethia Skink		2	1		2	1	1	1	3	4												6			
Typhlopidae	<i>Anilius hamatus</i>	Pale-headed Blind Snake														1				1		1					
	<i>Anilius waitii</i>	Waite's Blind Snake																			2						
Varanidae	<i>Varanus caudolineatus</i>	Stripe-tailed Monitor		1						1				1								1					
	<i>Varanus gouldii</i>	Gould's Goanna														1		1						1			
	<i>Varanus panoptes</i>	Yellow-spotted Monitor			1					1	1											2			1		
	<i>Varanus tristis</i>	Black-headed Monitor																				1					
Birds																											
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu	1	1	1				1	1	1											1				2	
Anatidae	<i>Cygnus atratus</i>	Black Swan			1																						
	<i>Tadorna tadornoides</i>	Australian Shelduck			1																						
	<i>Anas superciliosa</i>	Pacific Black Duck			1																						
	<i>Anas gracilis</i>	Grey Teal			1																						
	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck			1																						
Megapodiidae	<i>Leipoa ocellata</i>	Malleefowl			1																						X
Columbidae	<i>Phaps chalcoptera</i>	Common Bronzewing			1																						
	<i>Ocyphaps lophotes</i>	Crested Pigeon	2		1					3	2											5		11			
Cuculidae	<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo																								3	
Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar																				3					
Podargidae	<i>Podargus strigoides</i>	Tawny Frogmouth								2																	
Caprimulgidae	<i>Eurostopodus argus</i>	Spotted Nightjar																					2				
Rallidae	<i>Tribonyx ventralis</i>	Black-tailed Nativehen			1																						
Recurvirostridae	<i>Himantopus leucocephalus</i>	Pied Stilt			1																						
	<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet			1																						
Charadriidae	<i>Charadrius ruficapillus</i>	Red-capped Plover			1																						
	<i>Elseyornis melanops</i>	Black-fronted Dotterel			1																						
Otididae	<i>Ardeotis australis</i>	Australian Bustard																				4				1	

Family	Species	Common name	Surveys			A								B								C					D
			MME1	MME2	Opportuni	MME3	MME5	MME7	MME8	MME9	MME6	MME4	TM1	JS2	WM2	WS2	WM1	WS1	JS3	JS1	JS4	HB1	Site 14a	Site 1a	Site 17a	Site 11	
Ardeidae	<i>Ardea pacifica</i>	White-necked Heron			1																						
	<i>Egretta novaehollandiae</i>	White-faced Heron			1																						
Accipitridae	<i>Hieraaetus morphnoides</i>	Little Eagle		1																							
	<i>Aquila audax</i>	Wedge-tailed Eagle																			2		2				
Cuculidae	<i>Heteroscenes pallidus</i>	Pallid Cuckoo			1																						
Alcedinidae	<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher																					6				
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel							1												5		2				
	<i>Falco longipennis</i>	Australian Hobby				1			1																		
	<i>Falco berigora</i>	Brown Falcon							1													3		2			
	<i>Falco peregrinus</i>	Peregrine Falcon		1																							
Cacatuidae	<i>Eolophus roseicapilla</i>	Galah			1		15																2		1		
	<i>Nymphicus hollandicus</i>	Cockatiel																				2				6	
Psittaculidae	<i>Neopsephotus bourkii</i>	Bourke's Parrot			1																						
	<i>Barnardius zonarius</i>	Australian Ringneck		1	1		4	2		2	3											31					
	<i>Psephotus varius</i>	Mulga Parrot			1	1		5			5																
	<i>Melopsittacus undulatus</i>	Budgerigar																				9		2		20	
Climacteridae	<i>Climacteris affinis</i>	White-browed Treecreeper			1			2																			
Maluridae	<i>Malurus splendens</i>	Splendid Fairywren			1			9																			
	<i>Malurus leucopterus</i>	White-winged Fairywren	3							8												1			3	76	
Meliphagidae	<i>Certhionyx variegatus</i>	Pied Honeyeater																								2	
	<i>Purnella albifrons</i>	White-fronted Honeyeater	80	100	1	12	8	10	6	6	1	40														1	
	<i>Manorina flavigula</i>	Yellow-throated Miner	10	5	1	7	2		2	2	10											15		1			
	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	25	20	1		6	1	1	2	2	1										2		5			
	<i>Anthochaera carunculata</i>	Red Wattlebird								3																	
	<i>Gavicalis virescens</i>	Singing Honeyeater		4	1	2	1	1	1	1	1													2		3	
	<i>Ptilotula plumula</i>	Grey-fronted Honeyeater					7																				
	<i>Epthianura tricolor</i>	Crimson Chat																				24		6		18	
	<i>Epthianura aurifrons</i>	Orange Chat																								5	
Pardalotidae	<i>Pardalotus striatus</i>	Striated Pardalote			1		3																				
Acanthizidae	<i>Pyrrholaemus brunneus</i>	Redthroat			1						1																
	<i>Acanthiza apicalis</i>	Inland Thornbill	2		1			6			2																
	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	5	6	1		17	4			2	6															
	<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill	8	30	1	2	14	50			15	10										3					
	<i>Acanthiza robustirostris</i>	Slaty-backed Thornbill			1			2																			
	<i>Smicrornis brevirostris</i>	Weebill			1		10																				

Family	Species	Common name	Surveys			A						B								C					D		
			MME1	MME2	Opportuni	MME3	MME5	MME7	MME8	MME9	MME6	MME4	TM1	JS2	WM2	WS2	WM1	WS1	JS3	JS1	JS4	HB1	Site 14a	Site 1a		Site 17a	Site 11
	<i>Aphelocephala leucopsis</i>	Southern Whiteface			1			20		6	4																
Pomatostomidae	<i>Pomatostomus superciliosus</i>	White-browed Babbler			1					6	4																
Cinclosomatidae	<i>Cinclosoma castaneothorax</i>	Chestnut-breasted Quail-thrush																								2	
Campephagidae	<i>Coracina maxima</i>	Ground Cuckooshrike																			31		3		4		
	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike		2	1					1											5		1				
	<i>Lalage tricolor</i>	White-winged Triller																			3						
Oreoicidae	<i>Oreoica gutturalis</i>	Crested Bellbird	1	3	1	1	1	2		1	2										5	2			3		
Pachycephalidae	<i>Colluricincla harmonica</i>	Grey Shrikethrush			1			2		1																	
	<i>Pachycephala rufiventris</i>	Rufous Whistler			1		1	1	1	1																	
Artamidae	<i>Artamus personatus</i>	Masked Woodswallow																							2		
	<i>Artamus superciliosus</i>	White-browed Woodswallow			1	4	1			1																	
	<i>Artamus cinereus</i>	Black-faced Woodswallow																			25		11		7		
	<i>Cracticus torquatus</i>	Grey Butcherbird	1	1	1	1	2	1		2	1										4						
	<i>Cracticus nigrogularis</i>	Pied Butcherbird	2	1	1	1				1											23	1					
	<i>Gymnorhina tibicen</i>	Australian Magpie	3		1					3											3		9				
	<i>Strepera versicolor</i>	Grey Currawong				1															2						
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie Wagtail	1		1																2		1				
	<i>Rhipidura albiscapa</i>	Grey Fantail						1																			
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark		1	1	2				2	2										12		2				
Corvidae	<i>Corvus orru</i>	Torresian Crow		1	1	2	1		2		1														2		
	<i>Corvus bennetti</i>	Little Crow		2	1		6	1													50		12		11		
Petroicidae	<i>Microeca fascinans</i>	Jacky Winter																			1						
	<i>Petroica goodenovii</i>	Red-capped Robin	1	2	1			6		2	1										5	3	1				
	<i>Melanodryas cucullata</i>	Hooded Robin			1	3															1				1		
Locustellidae	<i>Cincloramphus cruralis</i>	Brown Songlark																			7		8	7	7		
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow								5																	
	<i>Hirundo neoxena</i>	Welcome Swallow																									
	<i>Cheramoeca leucosterna</i>	White-backed Swallow			1	2																	2				
Estrildidae	<i>Taeniopygia guttata</i>	Zebra Finch			1																				9		
Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian Pipit			1	4															16		36	7	18		
Mammals																											
Tachyglossidae	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna		1	1																						
Bovidae	<i>Capra hircus</i>	Goat			1																1						
	<i>Ovis aries</i>	Sheep																			1						
Camelidae	<i>Camelus dromedarius</i>	Dromedary																						1			

Family	Species	Common name	Surveys			A						B						C					D				
			MME1	MME2	Opportuni	MME3	MME5	MME7	MME8	MME9	MME6	MME4	TM1	JS2	WM2	WS2	WM1	WS1	JS3	JS1	JS4	HB1	Site 14a	Site 1a	Site 17a	Site 11	Site 11a
Canidae	<i>Canis lupus</i>	Dingo			1																				1		
	<i>Vulpes vulpes</i>	Red Fox			1																						
Felidae	<i>Felis catus</i>	Cat																							1		
Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat																				1					
	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat																				4		9			
	<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat																				6					
Dasyuridae	<i>Ningai ridei</i>	Wongai Ningai																1									
	<i>Sminthopsis crassicaudata</i>	Fat-tailed Dunnart	1			1																			5		
	<i>Sminthopsis dolichura</i>	Little Long-tailed Dunnart																				2			1		
Macropodidae	<i>Macropus fuliginosus</i>	Western Grey Kangaroo			1																						
	<i>Osphranter robustus</i>	Euro			1					1															1		
	<i>Osphranter robustus</i>	Euro																									
	<i>Osphranter rufus</i>	Red Kangaroo			1	5			6													1		1	1	1	
Leporidae	<i>Oryctolagus cuniculus</i>	Rabbit			1					1														1	1		
Equidae	<i>Equus asinus</i>	Donkey			1																						
Muridae	<i>Mus musculus</i>	House Mouse	1	2		2	2			2	1													1	2		
	<i>Notomys alexis</i>	Spinifex Hopping Mouse	7					2										1									
	<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse							4	1												1			1		

A Ninox Wildlife Consulting (1998) A Vertebrate Fauna Survey of the Murrin Murrin Expansion Project. Unpublished report for Anaconda Nickel Ltd, Perth.

B Dunlop, J.N and Paynes, W. (1999) A vertebrate fauna survey of the North Lake Carey region. Unpublished report for Placer (Granny Smith) and Homestake, Perth.

C Dell, J and How, R.A. Dell et al. (1988) Vertebrate fauna. In: The biological Survey of the Eastern Goldfields of Western Australia, Part 5, Edjudina - Menzies Study Area. Records of the Western Australian Museum, Supplement No 31., pp. 38-77.

D Kingfisher Environmental Consulting (2014) Sunrise Dam - Tropicana Infrastructure Corridor Fauna Survey, Unpublished report for Anglogold Ashanti Australia, Perth.

		Survey A																																			
			LTD172	LTD42	LTD272	LTD336	LTD370	LTD284	LTD344	LTD136	LTD20	LTD21	LTD41	LTD62	LTD64	LTD68	LTD132	LTD142	LTD147	LTD155	LTD161	LTD190	LTD196	LTD210	LTD289	LTD296	LTD320	LTD367	LTD131	LTD292	LTD375	LTD145	LTD184	LTD212	LTD288	LTD310	LTD321
Family	Species	Common name																																			
Reptiles																																					
Scincidae	<i>Egernia depressa</i>	Southern Pygmy Spiny-tailed Skink	X																																		
Varanidae	<i>Varanus panoptes</i>	Yellow-spotted Monitor		X	X	X	X																														
Mammals																																					
Dasyuridae	<i>Antechinomys laniger</i>	Kultarr					X																														
	<i>Antechinomys longicaudatus</i>	Long-tailed Dunnart						X																													
	<i>Sminthopsis macroura</i>	Stripe-faced Dunnart							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X										
Muridae	<i>Mus musculus</i>	House Mouse							X																				X	X	X						
	<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse																														X	X	X	X	X	X

A Terrestrial Ecosystems (2011b) *Targeted Survey for Long-tailed Dunnarts for the Granny Deeps Project Area*, Unpublished report for Barrick Gold Corporation, Perth.

Appendix C.

Definitions of Significant Fauna under the WA Biodiversity Conservation Act 2016 and Priority Species

Basic Vertebrate Fauna Survey and Risk Assessment
MAU Laverton Gold Project



ATTACHMENT C

DEFINITIONS OF SIGNIFICANT FAUNA UNDER THE WA BIODIVERSITY CONSERVATION ACT 2016

Threatened, Extinct and Specially Protected fauna or flora¹ are species² which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such. The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016*. Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T Threatened Species

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR Critically endangered species

Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

¹ The definition of flora includes algae, fungi and lichens

² Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

EN Endangered species

Threatened species considered to be *"facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines"*.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be *"facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines"*.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species

Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.

EX Extinct species

Species where *"there is no reasonable doubt that the last member of the species has died"*, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that *"is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form"*, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the pwild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially Protected Species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory birds protected under an international agreement

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependant fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

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

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

P1 Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

P2 Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

P3 Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

P4 Priority 4: Rare, Near Threatened and other species in need of monitoring

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Appendix D.

Rapid habitat assessment

Basic Vertebrate Fauna Survey and Risk Assessment
MAU Laverton Gold Project



Date: 19/02/2023

Habitat Assessment #: 1

Observer: Dr Scott Thompson

Zone: 51

Easting: 425438 mE

Northing: 6824851 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 2

Observer: Dr Scott Thompson

Zone: 51

Easting: 425300 mE

Northing: 6825132 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 3

Observer: Dr Scott Thompson

Zone: 51

Easting: 425521 mE

Northing: 6825335 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 4

Observer: Dr Scott Thompson

Zone: 51

Easting: 425012 mE

Northing: 6825305 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 5

Observer: Dr Scott Thompson

Zone: 51

Easting: 425119 mE

Northing: 6824871 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 6

Observer: Dr Scott Thompson

Zone: 51

Easting: 424913 mE

Northing: 6824864 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 7

Observer: Dr Scott Thompson

Zone: 51

Easting: 424995 mE

Northing: 6824635 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 8

Observer: Dr Scott Thompson

Zone: 51

Easting: 425318 mE

Northing: 6824757 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Sandy Clay



Date: 19/02/2023

Habitat Assessment #: 9

Observer: Dr Scott Thompson

Zone: 51

Easting: 427435 mE

Northing: 6825788 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Stones



Date: 19/02/2023

Habitat Assessment #: 10

Observer: Dr Scott Thompson

Zone: 51

Easting: 427281 mE

Northing: 6825878 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Stones



Date: 19/02/2023

Habitat Assessment #: 11

Observer: Dr Scott Thompson

Zone: 51

Easting: 427123 mE

Northing: 6826080 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Stones



Date: 19/02/2023

Habitat Assessment #: 12

Observer: Dr Scott Thompson

Zone: 51

Easting: 426882 mE

Northing: 6826107 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 13

Observer: Dr Scott Thompson

Zone: 51

Easting: 426932 mE

Northing: 6826381 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 14

Observer: Dr Scott Thompson

Zone: 51

Easting: 427184 mE

Northing: 6826414 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 15

Observer: Dr Scott Thompson

Zone: 51

Easting: 427424 mE

Northing: 6826216 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Disturbed

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 16

Observer: Dr Scott Thompson

Zone: 51

Easting: 427466 mE

Northing: 6826027 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 17

Observer: Dr Scott Thompson

Zone: 51

Easting: 427680 mE

Northing: 6825904 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 18

Observer: Dr Scott Thompson

Zone: 51

Easting: 427894 mE

Northing: 6826038 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 19

Observer: Dr Scott Thompson

Zone: 51

Easting: 428435 mE

Northing: 6826019 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 20

Observer: Dr Scott Thompson

Zone: 51

Easting: 428708 mE

Northing: 6825690 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 21

Observer: Dr Scott Thompson

Zone: 51

Easting: 428987 mE

Northing: 6825449 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 22

Observer: Dr Scott Thompson

Zone: 51

Easting: 429549 mE

Northing: 6825232 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 23

Observer: Dr Scott Thompson

Zone: 51

Easting: 429864 mE

Northing: 6824925 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 24

Observer: Dr Scott Thompson

Zone: 51

Easting: 429735 mE

Northing: 6824460 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 25

Observer: Dr Scott Thompson

Zone: 51

Easting: 429353 mE

Northing: 6824096 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 26

Observer: Dr Scott Thompson

Zone: 51

Easting: 429030 mE

Northing: 6823845 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 27

Observer: Dr Scott Thompson

Zone: 51

Easting: 428807 mE

Northing: 6824397 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 28

Observer: Dr Scott Thompson

Zone: 51

Easting: 428710 mE

Northing: 6824823 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 29

Observer: Dr Scott Thompson

Zone: 51

Easting: 428799 mE

Northing: 6825293 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 30

Observer: Dr Scott Thompson

Zone: 51

Easting: 429203 mE

Northing: 6825125 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 31

Observer: Dr Scott Thompson

Zone: 51

Easting: 429548 mE

Northing: 6824964 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 32

Observer: Dr Scott Thompson

Zone: 51

Easting: 429589 mE

Northing: 6824673 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 33

Observer: Dr Scott Thompson

Zone: 51

Easting: 429282 mE

Northing: 6824711 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 34

Observer: Dr Scott Thompson

Zone: 51

Easting: 429051 mE

Northing: 6824917 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 35

Observer: Dr Scott Thompson

Zone: 51

Easting: 429412 mE

Northing: 6824479 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 36

Observer: Dr Scott Thompson

Zone: 51

Easting: 429177 mE

Northing: 6824203 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 37

Observer: Dr Scott Thompson

Zone: 51

Easting: 428685 mE

Northing: 6824025 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 38

Observer: Dr Scott Thompson

Zone: 51

Easting: 428716 mE

Northing: 6823608 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 39

Observer: Dr Scott Thompson

Zone: 51

Easting: 428420 mE

Northing: 6823203 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 40

Observer: Dr Scott Thompson

Zone: 51

Easting: 428165 mE

Northing: 6823042 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 41

Observer: Dr Scott Thompson

Zone: 51

Easting: 428520 mE

Northing: 6822427 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 42

Observer: Dr Scott Thompson

Zone: 51

Easting: 428782 mE

Northing: 6822808 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 43

Observer: Dr Scott Thompson

Zone: 51

Easting: 429064 mE

Northing: 6823220 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 44

Observer: Dr Scott Thompson

Zone: 51

Easting: 429468 mE

Northing: 6823645 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 45

Observer: Dr Scott Thompson

Zone: 51

Easting: 429640 mE

Northing: 6823130 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 46

Observer: Dr Scott Thompson

Zone: 51

Easting: 430097 mE

Northing: 6823113 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 47

Observer: Dr Scott Thompson

Zone: 51

Easting: 430513 mE

Northing: 6822829 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 48

Observer: Dr Scott Thompson

Zone: 51

Easting: 430326 mE

Northing: 6822413 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 49

Observer: Dr Scott Thompson

Zone: 51

Easting: 430018 mE

Northing: 6822677 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 50

Observer: Dr Scott Thompson

Zone: 51

Easting: 430556 mE

Northing: 6822042 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 51

Observer: Dr Scott Thompson

Zone: 51

Easting: 430848 mE

Northing: 6821695 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 52

Observer: Dr Scott Thompson

Zone: 51

Easting: 429932 mE

Northing: 6821138 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 53

Observer: Dr Scott Thompson

Zone: 51

Easting: 429769 mE

Northing: 6821165 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Disturbed

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 54

Observer: Dr Scott Thompson

Zone: 51

Easting: 429470 mE

Northing: 6821264 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 55

Observer: Dr Scott Thompson

Zone: 51

Easting: 429108 mE

Northing: 6821374 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 56

Observer: Dr Scott Thompson

Zone: 51

Easting: 429274 mE

Northing: 6820813 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 57

Observer: Dr Scott Thompson

Zone: 51

Easting: 429336 mE

Northing: 6820361 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 58

Observer: Dr Scott Thompson

Zone: 51

Easting: 429520 mE

Northing: 6819956 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 59

Observer: Dr Scott Thompson

Zone: 51

Easting: 429105 mE

Northing: 6819737 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 60

Observer: Dr Scott Thompson

Zone: 51

Easting: 428794 mE

Northing: 6819526 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 61

Observer: Dr Scott Thompson

Zone: 51

Easting: 428418 mE

Northing: 6819432 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 62

Observer: Dr Scott Thompson

Zone: 51

Easting: 428083 mE

Northing: 6819231 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 63

Observer: Dr Scott Thompson

Zone: 51

Easting: 427724 mE

Northing: 6819016 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 64

Observer: Dr Scott Thompson

Zone: 51

Easting: 427746 mE

Northing: 6819351 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 65

Observer: Dr Scott Thompson

Zone: 51

Easting: 428069 mE

Northing: 6819606 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 66

Observer: Dr Scott Thompson

Zone: 51

Easting: 428485 mE

Northing: 6819806 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 67

Observer: Dr Scott Thompson

Zone: 51

Easting: 429097 mE

Northing: 6820059 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 68

Observer: Dr Scott Thompson

Zone: 51

Easting: 429867 mE

Northing: 6820335 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 69

Observer: Dr Scott Thompson

Zone: 51

Easting: 429786 mE

Northing: 6820450 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Disturbed

Habitat Quality: Completely degraded Surface: Pebbles and Cobbles sand



Date: 19/02/2023

Habitat Assessment #: 70

Observer: Dr Scott Thompson

Zone: 51

Easting: 429797 mE

Northing: 6820951 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Disturbed

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 71

Observer: Dr Scott Thompson

Zone: 51

Easting: 429681 mE

Northing: 6821562 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 72

Observer: Dr Scott Thompson

Zone: 51

Easting: 429476 mE

Northing: 6821806 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Disturbed

Habitat Quality: Completely degraded Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 73

Observer: Dr Scott Thompson

Zone: 51

Easting: 429244 mE

Northing: 6821773 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 74

Observer: Dr Scott Thompson

Zone: 51

Easting: 429275 mE

Northing: 6822134 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Disturbed

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 75

Observer: Dr Scott Thompson

Zone: 51

Easting: 429118 mE

Northing: 6822779 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 76

Observer: Dr Scott Thompson

Zone: 51

Easting: 429414 mE

Northing: 6822970 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 77

Observer: Dr Scott Thompson

Zone: 51

Easting: 429692 mE

Northing: 6822697 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 78

Observer: Dr Scott Thompson

Zone: 51

Easting: 429458 mE

Northing: 6822539 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 79

Observer: Dr Scott Thompson

Zone: 51

Easting: 429480 mE

Northing: 6822221 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 80

Observer: Dr Scott Thompson

Zone: 51

Easting: 429759 mE

Northing: 6821997 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 81

Observer: Dr Scott Thompson

Zone: 51

Easting: 430014 mE

Northing: 6822380 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 82

Observer: Dr Scott Thompson

Zone: 51

Easting: 429977 mE

Northing: 6821632 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 83

Observer: Dr Scott Thompson

Zone: 51

Easting: 430414 mE

Northing: 6821745 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 84

Observer: Dr Scott Thompson

Zone: 51

Easting: 430235 mE

Northing: 6822034 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 85

Observer: Dr Scott Thompson

Zone: 51

Easting: 430901 mE

Northing: 6822163 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 86

Observer: Dr Scott Thompson

Zone: 51

Easting: 431138 mE

Northing: 6822094 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 87

Observer: Dr Scott Thompson

Zone: 51

Easting: 431313 mE

Northing: 6822355 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 88

Observer: Dr Scott Thompson

Zone: 51

Easting: 431394 mE

Northing: 6822099 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 89

Observer: Dr Scott Thompson

Zone: 51

Easting: 431885 mE

Northing: 6822130 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 90

Observer: Dr Scott Thompson

Zone: 51

Easting: 431891 mE

Northing: 6822531 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 91

Observer: Dr Scott Thompson

Zone: 51

Easting: 431613 mE

Northing: 6822538 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 92

Observer: Dr Scott Thompson

Zone: 51

Easting: 431425 mE

Northing: 6822515 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 93

Observer: Dr Scott Thompson

Zone: 51

Easting: 431333 mE

Northing: 6822641 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 94

Observer: Dr Scott Thompson

Zone: 51

Easting: 431181 mE

Northing: 6822447 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 95

Observer: Dr Scott Thompson

Zone: 51

Easting: 430901 mE

Northing: 6822447 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 96

Observer: Dr Scott Thompson

Zone: 51

Easting: 430656 mE

Northing: 6822456 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 97

Observer: Dr Scott Thompson

Zone: 51

Easting: 430859 mE

Northing: 6822692 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 98

Observer: Dr Scott Thompson

Zone: 51

Easting: 430943 mE

Northing: 6822762 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 99

Observer: Dr Scott Thompson

Zone: 51

Easting: 431007 mE

Northing: 6822536 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 100

Observer: Dr Scott Thompson

Zone: 51

Easting: 431198 mE

Northing: 6822706 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 101

Observer: Dr Scott Thompson

Zone: 51

Easting: 431576 mE

Northing: 6822719 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 102

Observer: Dr Scott Thompson

Zone: 51

Easting: 431856 mE

Northing: 6822731 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 103

Observer: Dr Scott Thompson

Zone: 51

Easting: 431815 mE

Northing: 6822385 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 104

Observer: Dr Scott Thompson

Zone: 51

Easting: 431677 mE

Northing: 6822464 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Completely degraded Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 105

Observer: Dr Scott Thompson

Zone: 51

Easting: 431520 mE

Northing: 6822318 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 106

Observer: Dr Scott Thompson

Zone: 51

Easting: 431741 mE

Northing: 6822226 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 107

Observer: Dr Scott Thompson

Zone: 51

Easting: 432052 mE

Northing: 6821838 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 108

Observer: Dr Scott Thompson

Zone: 51

Easting: 431725 mE

Northing: 6821829 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 109

Observer: Dr Scott Thompson

Zone: 51

Easting: 431238 mE

Northing: 6821807 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 110

Observer: Dr Scott Thompson

Zone: 51

Easting: 431010 mE

Northing: 6821574 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Rocky ridge and breakaway

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 111

Observer: Dr Scott Thompson

Zone: 51

Easting: 431138 mE

Northing: 6821355 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 112

Observer: Dr Scott Thompson

Zone: 51

Easting: 431247 mE

Northing: 6821127 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 113

Observer: Dr Scott Thompson

Zone: 51

Easting: 430830 mE

Northing: 6821132 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 114

Observer: Dr Scott Thompson

Zone: 51

Easting: 431723 mE

Northing: 6821125 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 115

Observer: Dr Scott Thompson

Zone: 51

Easting: 432087 mE

Northing: 6821124 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 116

Observer: Dr Scott Thompson

Zone: 51

Easting: 431764 mE

Northing: 6820828 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 117

Observer: Dr Scott Thompson

Zone: 51

Easting: 431406 mE

Northing: 6820644 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 118

Observer: Dr Scott Thompson

Zone: 51

Easting: 431105 mE

Northing: 6820636 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 119

Observer: Dr Scott Thompson

Zone: 51

Easting: 430740 mE

Northing: 6820668 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 120

Observer: Dr Scott Thompson

Zone: 51

Easting: 430625 mE

Northing: 6820320 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 121

Observer: Dr Scott Thompson

Zone: 51

Easting: 430971 mE

Northing: 6820355 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 122

Observer: Dr Scott Thompson

Zone: 51

Easting: 431355 mE

Northing: 6820361 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 123

Observer: Dr Scott Thompson

Zone: 51

Easting: 431345 mE

Northing: 6820001 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 124

Observer: Dr Scott Thompson

Zone: 51

Easting: 430969 mE

Northing: 6819967 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 125

Observer: Dr Scott Thompson

Zone: 51

Easting: 430527 mE

Northing: 6819906 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 126

Observer: Dr Scott Thompson

Zone: 51

Easting: 430357 mE

Northing: 6819587 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 127

Observer: Dr Scott Thompson

Zone: 51

Easting: 430894 mE

Northing: 6819660 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 128

Observer: Dr Scott Thompson

Zone: 51

Easting: 431275 mE

Northing: 6819566 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 129

Observer: Dr Scott Thompson

Zone: 51

Easting: 431715 mE

Northing: 6819363 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 130

Observer: Dr Scott Thompson

Zone: 51

Easting: 432077 mE

Northing: 6819234 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 131

Observer: Dr Scott Thompson

Zone: 51

Easting: 432084 mE

Northing: 6818823 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 132

Observer: Dr Scott Thompson

Zone: 51

Easting: 431991 mE

Northing: 6818552 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 133

Observer: Dr Scott Thompson

Zone: 51

Easting: 431886 mE

Northing: 6818252 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 134

Observer: Dr Scott Thompson

Zone: 51

Easting: 431838 mE

Northing: 6818108 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Stones



Date: 19/02/2023

Habitat Assessment #: 135

Observer: Dr Scott Thompson

Zone: 51

Easting: 431723 mE

Northing: 6817785 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 136

Observer: Dr Scott Thompson

Zone: 51

Easting: 431449 mE

Northing: 6817971 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 137

Observer: Dr Scott Thompson

Zone: 51

Easting: 431333 mE

Northing: 6818268 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 138

Observer: Dr Scott Thompson

Zone: 51

Easting: 431236 mE

Northing: 6818475 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 139

Observer: Dr Scott Thompson

Zone: 51

Easting: 430782 mE

Northing: 6818205 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 140

Observer: Dr Scott Thompson

Zone: 51

Easting: 431664 mE

Northing: 6818327 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 141

Observer: Dr Scott Thompson

Zone: 51

Easting: 431030 mE

Northing: 6818662 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 142

Observer: Dr Scott Thompson

Zone: 51

Easting: 431457 mE

Northing: 6818687 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 143

Observer: Dr Scott Thompson

Zone: 51

Easting: 431831 mE

Northing: 6818724 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 144

Observer: Dr Scott Thompson

Zone: 51

Easting: 431564 mE

Northing: 6819034 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 145

Observer: Dr Scott Thompson

Zone: 51

Easting: 431323 mE

Northing: 6819200 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 146

Observer: Dr Scott Thompson

Zone: 51

Easting: 431935 mE

Northing: 6818971 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 19/02/2023

Habitat Assessment #: 147

Observer: Dr Scott Thompson

Zone: 51

Easting: 431965 mE

Northing: 6820628 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 148

Observer: Dr Scott Thompson

Zone: 51

Easting: 432376 mE

Northing: 6820590 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 149

Observer: Dr Scott Thompson

Zone: 51

Easting: 432872 mE

Northing: 6820649 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 150

Observer: Dr Scott Thompson

Zone: 51

Easting: 432799 mE

Northing: 6820897 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Stones



Date: 19/02/2023

Habitat Assessment #: 151

Observer: Dr Scott Thompson

Zone: 51

Easting: 432469 mE

Northing: 6821007 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 19/02/2023

Habitat Assessment #: 152

Observer: Dr Scott Thompson

Zone: 51

Easting: 432597 mE

Northing: 6821123 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles



Date: 19/02/2023

Habitat Assessment #: 153

Observer: Dr Scott Thompson

Zone: 51

Easting: 432866 mE

Northing: 6821126 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Stones



Date: 19/02/2023

Habitat Assessment #: 154

Observer: Dr Scott Thompson

Zone: 51

Easting: 432844 mE

Northing: 6821483 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 155

Observer: Dr Scott Thompson

Zone: 51

Easting: 432547 mE

Northing: 6821495 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 19/02/2023

Habitat Assessment #: 156

Observer: Dr Scott Thompson

Zone: 51

Easting: 431883 mE

Northing: 6821655 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 157

Observer: Dr Scott Thompson

Zone: 51

Easting: 431605 mE

Northing: 6821525 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 158

Observer: Dr Scott Thompson

Zone: 51

Easting: 431364 mE

Northing: 6821553 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 159

Observer: Dr Scott Thompson

Zone: 51

Easting: 431510 mE

Northing: 6821343 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 160

Observer: Dr Scott Thompson

Zone: 51

Easting: 431791 mE

Northing: 6821327 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 161

Observer: Dr Scott Thompson

Zone: 51

Easting: 432110 mE

Northing: 6821342 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 162

Observer: Dr Scott Thompson

Zone: 51

Easting: 432472 mE

Northing: 6821818 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 163

Observer: Dr Scott Thompson

Zone: 51

Easting: 432826 mE

Northing: 6821773 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Stones



Date: 20/02/2023

Habitat Assessment #: 164

Observer: Dr Scott Thompson

Zone: 51

Easting: 432858 mE

Northing: 6821973 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Stones



Date: 20/02/2023

Habitat Assessment #: 165

Observer: Dr Scott Thompson

Zone: 51

Easting: 432772 mE

Northing: 6822189 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Rocky ridge and breakaway

Habitat Quality: Good

Surface: Stones



Date: 20/02/2023

Habitat Assessment #: 166

Observer: Dr Scott Thompson

Zone: 51

Easting: 432492 mE

Northing: 6822253 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 167

Observer: Dr Scott Thompson

Zone: 51

Easting: 432182 mE

Northing: 6822174 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 168

Observer: Dr Scott Thompson

Zone: 51

Easting: 432271 mE

Northing: 6822580 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 169

Observer: Dr Scott Thompson

Zone: 51

Easting: 432776 mE

Northing: 6822547 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Stones



Date: 20/02/2023

Habitat Assessment #: 170

Observer: Dr Scott Thompson

Zone: 51

Easting: 432757 mE

Northing: 6822732 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Rocky ridge and breakaway

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 171

Observer: Dr Scott Thompson

Zone: 51

Easting: 432950 mE

Northing: 6822740 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Sandy Clay



Date: 20/02/2023

Habitat Assessment #: 172

Observer: Dr Scott Thompson

Zone: 51

Easting: 433085 mE

Northing: 6823177 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Sandy Clay



Date: 20/02/2023

Habitat Assessment #: 173

Observer: Dr Scott Thompson

Zone: 51

Easting: 433112 mE

Northing: 6823601 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Sandy Clay



Date: 20/02/2023

Habitat Assessment #: 174

Observer: Dr Scott Thompson

Zone: 51

Easting: 433185 mE

Northing: 6824037 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 175

Observer: Dr Scott Thompson

Zone: 51

Easting: 433132 mE

Northing: 6824483 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 176

Observer: Dr Scott Thompson

Zone: 51

Easting: 433161 mE

Northing: 6824793 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 20/02/2023

Habitat Assessment #: 177

Observer: Dr Scott Thompson

Zone: 51

Easting: 433038 mE

Northing: 6825040 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 178

Observer: Dr Scott Thompson

Zone: 51

Easting: 432857 mE

Northing: 6825174 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 179

Observer: Dr Scott Thompson

Zone: 51

Easting: 432634 mE

Northing: 6825307 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 180

Observer: Dr Scott Thompson

Zone: 51

Easting: 432984 mE

Northing: 6825381 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 181

Observer: Dr Scott Thompson

Zone: 51

Easting: 433151 mE

Northing: 6825496 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Chenopod shrubland

Habitat Quality: Impacted

Surface: Sand and Pebbles



Date: 20/02/2023

Habitat Assessment #: 182

Observer: Dr Scott Thompson

Zone: 51

Easting: 433005 mE

Northing: 6825563 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 183

Observer: Dr Scott Thompson

Zone: 51

Easting: 432826 mE

Northing: 6825559 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 184

Observer: Dr Scott Thompson

Zone: 51

Easting: 432927 mE

Northing: 6825747 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 185

Observer: Dr Scott Thompson

Zone: 51

Easting: 433058 mE

Northing: 6825933 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 186

Observer: Dr Scott Thompson

Zone: 51

Easting: 433225 mE

Northing: 6826037 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 20/02/2023

Habitat Assessment #: 187

Observer: Dr Scott Thompson

Zone: 51

Easting: 432648 mE

Northing: 6825889 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 188

Observer: Dr Scott Thompson

Zone: 51

Easting: 432634 mE

Northing: 6825626 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 189

Observer: Dr Scott Thompson

Zone: 51

Easting: 432503 mE

Northing: 6826060 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: pebbles and sand



Date: 20/02/2023

Habitat Assessment #: 190

Observer: Dr Scott Thompson

Zone: 51

Easting: 432637 mE

Northing: 6826297 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: pebbles and sand



Date: 20/02/2023

Habitat Assessment #: 191

Observer: Dr Scott Thompson

Zone: 51

Easting: 432560 mE

Northing: 6826560 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: pebbles and sand



Date: 20/02/2023

Habitat Assessment #: 192

Observer: Dr Scott Thompson

Zone: 51

Easting: 432705 mE

Northing: 6826819 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 193

Observer: Dr Scott Thompson

Zone: 51

Easting: 433079 mE

Northing: 6826735 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Rocky ridge and breakaway

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 194

Observer: Dr Scott Thompson

Zone: 51

Easting: 433172 mE

Northing: 6826750 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Rocky ridge and breakaway

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 195

Observer: Dr Scott Thompson

Zone: 51

Easting: 433009 mE

Northing: 6826542 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 196

Observer: Dr Scott Thompson

Zone: 51

Easting: 432931 mE

Northing: 6826338 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 197

Observer: Dr Scott Thompson

Zone: 51

Easting: 432974 mE

Northing: 6826201 mN

Fire History: > 5 years

Landform: Drainage

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: pebbles and sand



Date: 20/02/2023

Habitat Assessment #: 198

Observer: Dr Scott Thompson

Zone: 51

Easting: 432310 mE

Northing: 6825835 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 20/02/2023

Habitat Assessment #: 199

Observer: Dr Scott Thompson

Zone: 51

Easting: 432388 mE

Northing: 6826159 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Sand



Date: 20/02/2023

Habitat Assessment #: 200

Observer: Dr Scott Thompson

Zone: 51

Easting: 432371 mE

Northing: 6826455 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: pebbles and sand



Date: 20/02/2023

Habitat Assessment #: 201

Observer: Dr Scott Thompson

Zone: 51

Easting: 432283 mE

Northing: 6826755 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: pebbles and sand



Date: 20/02/2023

Habitat Assessment #: 202

Observer: Dr Scott Thompson

Zone: 51

Easting: 432067 mE

Northing: 6826832 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 20/02/2023

Habitat Assessment #: 203

Observer: Dr Scott Thompson

Zone: 51

Easting: 431733 mE

Northing: 6826727 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 204

Observer: Dr Scott Thompson

Zone: 51

Easting: 431504 mE

Northing: 6826706 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 205

Observer: Dr Scott Thompson

Zone: 51

Easting: 431308 mE

Northing: 6826687 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 206

Observer: Dr Scott Thompson

Zone: 51

Easting: 431098 mE

Northing: 6826725 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: pebbles and sand



Date: 20/02/2023

Habitat Assessment #: 207

Observer: Dr Scott Thompson

Zone: 51

Easting: 430892 mE

Northing: 6826656 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 208

Observer: Dr Scott Thompson

Zone: 51

Easting: 430695 mE

Northing: 6826701 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 209

Observer: Dr Scott Thompson

Zone: 51

Easting: 430493 mE

Northing: 6826730 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: pebbles and sand



Date: 20/02/2023

Habitat Assessment #: 210

Observer: Dr Scott Thompson

Zone: 51

Easting: 430318 mE

Northing: 6826655 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 20/02/2023

Habitat Assessment #: 211

Observer: Dr Scott Thompson

Zone: 51

Easting: 430063 mE

Northing: 6826663 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 212

Observer: Dr Scott Thompson

Zone: 51

Easting: 429869 mE

Northing: 6826801 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 213

Observer: Dr Scott Thompson

Zone: 51

Easting: 429657 mE

Northing: 6827003 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 214

Observer: Dr Scott Thompson

Zone: 51

Easting: 431927 mE

Northing: 6826402 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 215

Observer: Dr Scott Thompson

Zone: 51

Easting: 431935 mE

Northing: 6826087 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles



Date: 20/02/2023

Habitat Assessment #: 216

Observer: Dr Scott Thompson

Zone: 51

Easting: 431941 mE

Northing: 6825787 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 217

Observer: Dr Scott Thompson

Zone: 51

Easting: 432173 mE

Northing: 6825601 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 218

Observer: Dr Scott Thompson

Zone: 51

Easting: 432439 mE

Northing: 6825596 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 219

Observer: Dr Scott Thompson

Zone: 51

Easting: 432417 mE

Northing: 6825348 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 220

Observer: Dr Scott Thompson

Zone: 51

Easting: 432229 mE

Northing: 6825260 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 221

Observer: Dr Scott Thompson

Zone: 51

Easting: 431954 mE

Northing: 6825236 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 222

Observer: Dr Scott Thompson

Zone: 51

Easting: 431705 mE

Northing: 6825207 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 223

Observer: Dr Scott Thompson

Zone: 51

Easting: 431713 mE

Northing: 6824870 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 224

Observer: Dr Scott Thompson

Zone: 51

Easting: 431952 mE

Northing: 6824927 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 225

Observer: Dr Scott Thompson

Zone: 51

Easting: 432268 mE

Northing: 6824952 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 226

Observer: Dr Scott Thompson

Zone: 51

Easting: 432527 mE

Northing: 6824910 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 227

Observer: Dr Scott Thompson

Zone: 51

Easting: 432720 mE

Northing: 6824873 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 228

Observer: Dr Scott Thompson

Zone: 51

Easting: 432816 mE

Northing: 6824857 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Rocky ridge and breakaway

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 229

Observer: Dr Scott Thompson

Zone: 51

Easting: 432680 mE

Northing: 6824679 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 230

Observer: Dr Scott Thompson

Zone: 51

Easting: 432862 mE

Northing: 6824565 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 231

Observer: Dr Scott Thompson

Zone: 51

Easting: 432858 mE

Northing: 6824446 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 232

Observer: Dr Scott Thompson

Zone: 51

Easting: 432535 mE

Northing: 6824524 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 233

Observer: Dr Scott Thompson

Zone: 51

Easting: 432359 mE

Northing: 6824513 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 234

Observer: Dr Scott Thompson

Zone: 51

Easting: 432233 mE

Northing: 6824567 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: pebbles and sand



Date: 20/02/2023

Habitat Assessment #: 235

Observer: Dr Scott Thompson

Zone: 51

Easting: 432013 mE

Northing: 6824578 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 236

Observer: Dr Scott Thompson

Zone: 51

Easting: 431721 mE

Northing: 6824583 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 237

Observer: Dr Scott Thompson

Zone: 51

Easting: 431714 mE

Northing: 6824250 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 238

Observer: Dr Scott Thompson

Zone: 51

Easting: 432003 mE

Northing: 6824246 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 239

Observer: Dr Scott Thompson

Zone: 51

Easting: 432316 mE

Northing: 6824235 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 240

Observer: Dr Scott Thompson

Zone: 51

Easting: 432597 mE

Northing: 6824227 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 241

Observer: Dr Scott Thompson

Zone: 51

Easting: 432786 mE

Northing: 6824220 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 242

Observer: Dr Scott Thompson

Zone: 51

Easting: 432534 mE

Northing: 6823964 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 243

Observer: Dr Scott Thompson

Zone: 51

Easting: 432298 mE

Northing: 6823972 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 244

Observer: Dr Scott Thompson

Zone: 51

Easting: 431977 mE

Northing: 6823986 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 245

Observer: Dr Scott Thompson

Zone: 51

Easting: 431720 mE

Northing: 6823974 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Sandy Clay



Date: 20/02/2023

Habitat Assessment #: 246

Observer: Dr Scott Thompson

Zone: 51

Easting: 431706 mE

Northing: 6823699 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 247

Observer: Dr Scott Thompson

Zone: 51

Easting: 431968 mE

Northing: 6823704 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Sandy Clay



Date: 20/02/2023

Habitat Assessment #: 248

Observer: Dr Scott Thompson

Zone: 51

Easting: 432251 mE

Northing: 6823708 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 249

Observer: Dr Scott Thompson

Zone: 51

Easting: 432529 mE

Northing: 6823703 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 250

Observer: Dr Scott Thompson

Zone: 51

Easting: 432800 mE

Northing: 6823666 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 251

Observer: Dr Scott Thompson

Zone: 51

Easting: 432823 mE

Northing: 6823518 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Rocky ridge and breakaway

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 252

Observer: Dr Scott Thompson

Zone: 51

Easting: 432754 mE

Northing: 6823411 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Rocky ridge and breakaway

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 253

Observer: Dr Scott Thompson

Zone: 51

Easting: 432519 mE

Northing: 6823371 mN

Fire History: > 5 years

Landform: Gentle Slope

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 254

Observer: Dr Scott Thompson

Zone: 51

Easting: 432301 mE

Northing: 6823358 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 255

Observer: Dr Scott Thompson

Zone: 51

Easting: 432014 mE

Northing: 6823322 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Cobbles



Date: 20/02/2023

Habitat Assessment #: 256

Observer: Dr Scott Thompson

Zone: 51

Easting: 431720 mE

Northing: 6823324 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Degraded

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 257

Observer: Dr Scott Thompson

Zone: 51

Easting: 431783 mE

Northing: 6823103 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 258

Observer: Dr Scott Thompson

Zone: 51

Easting: 431994 mE

Northing: 6823088 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Completely degraded Surface: Sandy Clay



Date: 20/02/2023

Habitat Assessment #: 259

Observer: Dr Scott Thompson

Zone: 51

Easting: 432291 mE

Northing: 6823114 mN

Fire History: > 5 years

Landform: Undulating Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 260

Observer: Dr Scott Thompson

Zone: 51

Easting: 432576 mE

Northing: 6823198 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 261

Observer: Dr Scott Thompson

Zone: 51

Easting: 432769 mE

Northing: 6823229 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Rocky ridge and breakaway

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 262

Observer: Dr Scott Thompson

Zone: 51

Easting: 432721 mE

Northing: 6822926 mN

Fire History: > 5 years

Landform: Rocky Rise

Soil Type: Rock

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Good

Surface: Cobbles and Stones



Date: 20/02/2023

Habitat Assessment #: 263

Observer: Dr Scott Thompson

Zone: 51

Easting: 432555 mE

Northing: 6822896 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 264

Observer: Dr Scott Thompson

Zone: 51

Easting: 432333 mE

Northing: 6822915 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



Date: 20/02/2023

Habitat Assessment #: 265

Observer: Dr Scott Thompson

Zone: 51

Easting: 432057 mE

Northing: 6822865 mN

Fire History: > 5 years

Landform: Flat Plain

Soil Type: Sandy Clay

Habitat Structure: Mulga and mixed shrubland

Habitat Quality: Impacted

Surface: Pebbles and Cobbles



