

**Appendix O – Vertebrate Fauna and Short-Range Endemic Invertebrate Fauna Assessments  
(360 Environmental)**

# Independent Peer Review

<b>Client</b>	Mineral Resources Limited
<b>Title</b>	Ashburton Infrastructure Project Vertebrate and Short-Range Endemic Invertebrate Fauna Assessment
<b>Version</b>	Rev 1
<b>Date</b>	July 2021
<b>Author</b>	Webb et al.
<b>Reviewer</b>	M. Bamford
<b>Review Date</b>	20 <sup>th</sup> August 2021

Section	Review Comment	Response	Close
All report	There are comments throughout. Many of these are for information only and do not require action. Key comments summarised below.	Thank you for the thorough comments provided throughout the report, they provide valuable feedback and will be considered in future.	Actioned and acceptable
Executive summary	An outline of methods used would be useful	A summary of methods has been added.	Actioned and acceptable
Executive summary	Suggestion that the desktop assessment was only carried out to identify likely conservation significant species should be clarified	Amended to clarify that desktop assessment considered all fauna taxa, not just conservation significant taxa.	Actioned and acceptable
Executive summary	Why is discussion on CS species limited to those recorded? Should be a bit more in the Exec Summ about extent of habitat for CS species. The reader will want to know what is at risk...both CS species and general biodiversity	Executive summary focusses on species most likely to be at risk for succinctness. Discussion of all conservation significant species is several pages and is included in Section 5 of the main body of the report.	Response accepted
Section 1.2	Various comments. Of concern that the desktop is considered to be carried out only for the purpose of identifying CS species. Check the EPA's purpose; refers to biodiversity	Amended to clarify that desktop assessment considered all fauna taxa, not just conservation significant taxa.	Actioned and acceptable
Section 2.1	Suggest move to appendices. This is generic information that probably appears as is in every report	Acknowledged, feedback will be considered in future.	Response accepted
Section 2.2.3	Perhaps provide a broader site description	Broader site description has been added.	Actioned and acceptable
Section 3.1.1	There are several reports missing, notably for Onslow area (BHP Macedon project)	As outlined in methods, we sourced literature from the EPA Consultation Hub, the Index of Biodiversity Surveys for Assessments (IBSA) website, internet search engine, or literature provided by MRL. The literature review may not be exhaustive, but we believe that the 17 previous studies we have reviewed are	Response accepted

Section	Review Comment	Response	Close
		sufficient to provide context for the Survey Area and meet the scope of the assessment.	
Section 3.2.4.2 Table 14	Much longer trapping periods than recommended. Was this justified on the basis of continuing to record extra species, weather change? Would be an interesting analysis to look at number of species added over time (and more useful in assessing survey adequacy than species accumulation curves used later)	Longer trapping periods were due to logistics. Trap site installation was staggered, checking was undertaken primarily by helicopter, then all trap sites were removed at the same time.	Response accepted
Section 3.2.4.5	Was this a single 10 minute bird survey for each habitat assessment? So how many bird surveys in total?	Yes, therefore a total of 34 bird surveys, each for a duration of 10 minutes.	Response accepted
4 RESULTS	As a general comment, these are presented in a very fragmented manner which makes it hard for the reader. Significant species are considered in several locations, with background information on significant species appears in the Discussion. The division of significant species on the basis of likelihood of occurrence is not helpful. There are many comments in the text that the authors might like to consider	Thank you for the feedback, we will take this into consideration in future.	Response accepted
Significant species	Significant species are scattered across the report. Suggest placing significant species in one section with a sub-section on each species, presenting background information, observations, habitat in project area and comments on the species in relation to the project. For example, migratory waterbirds occur almost exclusively around Onslow and on seasonal wetlands just east of the town. There are records (including count data) from reports for the BHP Macedon project, and there are count data from Shorebirds 2020 database. A clear picture is needed of where waterbirds occur, which occur, in what numbers.....and how does this relate to the proposal.	Thank you for the feedback regarding report structure. Additional detail regarding migratory waterbirds and shorebirds has been added. We have checked the EPA, IBSA and BHP websites and have not been able to obtain a copy of the Macedon fauna reports. The Shorebird 2020 database has not been used as sufficient studies and data were available.	Response accepted
Section 4.1.2.2	See the first comment in this section. It would make more sense, and would be clearer, if there was one section on the vertebrate fauna assemblage drawing together desktop results and field species lists. For linear infrastructure passing through different landscapes, there should be some recognition that there are really multiple assemblages, with different suites of species in different landscapes. This can be interpreted from biology of the species and field observations.	Acknowledged, the fauna desktop assessment results are presented in Section 4.1.1. Thank you for your suggestion to combine desktop and field results for fauna assemblage, we will consider it in future.	Response accepted

Section	Review Comment	Response	Close
Section 4.1.2.3	Another section on significant species, but this time addressing only those recorded. Given that a high proportion of significant species returned from databases were migratory waterbirds, it is curious that no migratory waterbirds were recorded during surveys. If it was concluded that this group would not be at risk, this should be stated somewhere.	Thank you for the feedback regarding report structure. Additional detail regarding migratory waterbirds and shorebirds has been added. The extent of the seasonal wetlands within the Survey Area is much smaller than the extent of the seasonal wetlands outside the Survey Area.	Actioned and acceptable
Section 4.1.3	See very long comment in text. The question of survey adequacy is a complex one	We agree that species accumulation curves are not always the most appropriate way to address survey adequacy, however we have included this section in accordance with the Technical Guidance.	Response accepted
Section 4.2.1	Note comment re trog/stygofauna	Exclusion of troglofaunal and stygofauna is now clarified earlier in report.	Actioned and acceptable
Section 4.2.3	Note comment re separation of desktop and survey results	Acknowledged, feedback will be considered for future reports.	Response accepted
Section 5.1.1	Comment about the mesa near trapsite KBB06 should be reconsidered. Als see comments about impact assessment paragraph	Text regarding mesa has been revised. Impact assessment paragraph has been removed.	Actioned and acceptable
Section 5.1.3	Much of this is background information and results. It would be helpful if there was a section on each significant species, whether actually recorded or not, that summarises basic biology, discusses distribution and status in the project area, and identifies locations where the species may be at risk from the proposal Species groups with broadly similar ecology, like migratory waterbirds, can be discussed 'as one' As has previously been noted, the division of CS species by likelihood is unhelpful and potentially confusing	A subsection for each conservation species is provided across Sections 5.1.3 – 5.1.5. Thank you for the suggestion regarding the division of species by likelihood, this will be considered for future reports.	Response accepted
Section 5.1.4	This statement appears repeatedly in the CS accounts. 'The species is unlikely to rely on habitats within the Survey Area on a regional scale'. What does it mean?	Amended to say 'The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area.'	Actioned and acceptable
Section 5.1.4.5	Many shorebirds are listed as migratory and some are threatened. The project area appears to pass through seasonal wetland areas just east of Onslow and there is a small part of the project area near the coast. Appears to have ben no survey effort for this group of birds and no	Additional detail regarding migratory waterbirds and shorebirds has been added. Additional information sources, including the National Directory of Important Migratory	Actioned and acceptable





**Ashburton Infrastructure Project**

**Vertebrate Fauna  
and Short-Range  
Endemic  
Invertebrate Fauna  
Assessment**

Prepared for  
**Mineral Resources Limited**

September 2021

● people ● planet ● professional

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
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# Executive Summary

Mineral Resources Limited commissioned 360 Environmental to undertake a terrestrial vertebrate and Short-Range Endemic (SRE) invertebrate fauna assessment to support the development of the Ashburton Infrastructure Project. The Ashburton Infrastructure Project Haul Road involves developing a fully sealed private haul road that will begin at the boundary of the approved Buckland mine (Bungaroo South), about 45 km southwest of Pannawonica, and continue for approximately 150 km westward towards Onslow. The Survey Area comprises the proposed haul road alignment and associated buffer (approximately 250 m), supporting infrastructure areas such as the borrow pits, and a small area adjacent Wheatstone LNG. The Survey Area is approximately 30,238 ha. A portion of the Survey Area, comprising approximately 6,663 ha, was not assessed during field surveys because of access limitations. A 6,663 ha section of the Survey Area was included in the desktop assessment but could not be assessed during field surveys due to access limitations. Fauna habitat mapping has been extrapolated over a 3,418 ha portion of the area that could not be assessed to provide indicative fauna habitat mapping.

This report presents the background, methods, results, discussion, and conclusions of the following surveys<sup>1</sup>:

- Trip 1, June 2020 - basic terrestrial vertebrate fauna survey
- Trip 3, October 2020 - baseline detailed terrestrial vertebrate fauna survey, SRE pitfall trapping
- Trip 5, April 2021 - targeted conservation significant terrestrial vertebrate fauna survey and infill baseline detailed terrestrial vertebrate fauna survey
- Trip 10, May/June 2021 - infill targeted conservation significant terrestrial vertebrate fauna survey, detailed SRE survey.

Information from database search results and 17 previous studies undertaken within the region were reviewed during the desktop assessment. The desktop assessment identified 441 terrestrial vertebrate fauna taxa, of which 58 are conservation significant. An assessment of the likelihood of conservation significant vertebrate fauna occurring within the Survey Area was undertaken, which identified 21 taxa with a high likelihood of occurrence, eighteen taxa with a medium likelihood of occurrence, and eighteen taxa with a low likelihood of occurrence. The desktop assessment identified two possible SRE land snail species, however, these species are considered to have a low and very low likelihood of occurrence within the Survey Area.

The vertebrate fauna and SRE invertebrate fauna surveys followed the EPA (2020) *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* and the EPA (2016) *Technical Guidance for sampling of short-range endemic invertebrate fauna* where possible and practicable. A variety of fauna detection methods were utilised, including cage traps, pitfall traps, funnel traps, camera traps, autonomous recording units, active searching,

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<sup>1</sup> Field trips 2, 4, 6, 7, 8, and 9 were flora and vegetation surveys



leaf litter sampling and opportunistic observations. The vertebrate fauna surveys recorded a total of 144 taxa, comprising 62 birds, 25 mammals, 53 reptiles and three amphibians. The SRE field surveys recorded 307 individual specimens representing 24 taxa of invertebrates that have the potential to contain SRE species.

Fauna habitat mapping was based on a combination of field observations, fauna habitat assessment data and vegetation mapping undertaken by 360 Environmental botanists. Ten fauna habitats were mapped, of which the mesas and breakaways (0.13% of the Survey Area) and drainage line/river/creek habitats (6.90% of the Survey Area) represent the most value to conservation significant fauna and overall fauna assemblages. Stony hills and slopes (3.79% of the Survey Area) provide important dispersal and foraging habitat, particularly when adjacent the mesas and breakaways. The tidal flats and claypans (5.82% of the Survey Area) provide important seasonal habitat for conservation significant waterbirds and shorebirds. The plains, stony plains, and sand dune habitats contain less microhabitat opportunities and provide less value to most conservation significant fauna taxa and overall fauna assemblages than the aforementioned habitats.

The drainage line/river/creek and mesas and breakaway habitats are moderately suitable for SRE invertebrates. The remainder of the fauna habitats within the Survey Area have a low suitability for SRE invertebrates.

Four conservation significant fauna taxa were recorded confirmed to use the Survey Area during the fauna surveys:

- Northern Quoll (*Dasyurus hallucatus*) – Endangered under the BC Act and EPBC Act. High density populations were recorded in the stony hills and slopes and the mesas and breakaway habitats within the Survey Area. A population of Northern Quolls uses mesas within the Survey Area.
- Ghost Bat (*Macroderma gigas*) – Vulnerable under the BC Act and EPBC Act. Records consistent with foraging, potential night roosting and possible day roosting were recorded within mesas and breakaways. No deep, complex caves suitable for maternity roosts were identified.
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4 under the BC Act. A recently active mound was recorded on the boundary of the Survey Area in stony hills and slopes habitat.
- Pilbara Leaf-nosed Bat (*Rhinoicteris aurantia* Pilbara form) – Vulnerable under the BC Act and EPBC Act. Records consistent with foraging were recorded within or adjacent to mesas and breakaways. These records were consistent with known roost sites outside the Survey Area. No roosting was recorded within the Survey Area.

A fifth conservation significant fauna taxon, the Pilbara Olive Python (*Liasis olivaceus barroni*), listed as Vulnerable under the *Biodiversity Conservation Act 2016* and the *Environment Protection Biodiversity and Conservation Act 1999*, was opportunistically recorded approximately 20 km south of the Survey Area. The taxon is therefore likely to occur within the

Survey Area, where it will use drainage line/river/creek habitats and mesas and breakaway habitats but is most likely widely distributed in the region.

Two likely SRE taxa (taxa known to have closely related taxa that show evidence of short-range endemism) were recorded at single locations within the Survey Area:

- One Philosciid isopod Philosciidae sp. indet. 'Onslow', found in plains habitat.
- One Polydesmid millipede *Antichiropus?* Juvenile, found in minor drainage line/river/creek habitat.

Four possible SRE taxa (primarily due to the groups being considered data deficient) were recorded within the Survey Area:

- One armadillid isopod *Buddelundia* sp. '35/36', found in minor drainage line/river/creek, Mulga woodland, and stony plain habitat.
- One centipede *Cryptops* sp. 'Onslow', found in minor drainage line/river/creek, stony hills and slopes, and stony plain habitat.
- Two Olpid pseudoscorpions *Beierolpium* sp., and *Indolpium* sp., found in mesas and breakaways and stony plain habitat, and stony plain, tidal flats, and stony hills and slopes habitat respectively.

## Table of Abbreviations

Abbreviation	Description
360 Environmental	360 Environmental Pty Ltd
AIP	Ashburton Infrastructure Project
ARU	Autonomous Recording Unit
BC Act	<i>Biodiversity Conservation Act 2016</i>
BoM	Bureau of Meteorology
CD	Conservation Dependent Fauna
CR	Critically Endangered
DAWE	Department of Agriculture, Water, and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
EIA	Environmental Impact Assessment
EN	Endangered
EP Act	<i>Environmental Protection Act 1986</i>
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection Biodiversity and Conservation Act 1999</i>
Extrapolation Area	A section of the Survey Area that could not be accessed and has been extrapolated to provide indicative fauna habitat mapping
GIS	Geographic Information System
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
km	Kilometres
m	Metres
mm	millimetres
MA	Marine
MI	Migratory
MRL	Mineral Resources Limited
OS	Other Specially Protected Fauna
P	Priority
PPA	Pilbara Ports Authority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
SRE	Short Range Endemic
Survey Area	The AIP proposed haul road alignment and buffer, and associated borrow pit areas totalling approximately 30,238 ha
TEC	Threatened Ecological Community
VU	Vulnerable

Abbreviation	Description
WA	Western Australia



Short-tailed Pygmy Monitor (*Varanus brevicauda*)

## Table of Contents

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
1.1	The Project.....	1
1.2	Scope and Objectives .....	1
<b>2</b>	<b>Background</b> .....	<b>4</b>
2.1	Protection of Fauna.....	4
2.2	Existing Environment .....	5
<b>3</b>	<b>Methods</b> .....	<b>19</b>
3.1	Desktop Assessment .....	19
3.2	Field Surveys .....	21
3.3	Extrapolation Area .....	33
3.4	Survey Adequacy.....	34
3.5	Limitations.....	34
<b>4</b>	<b>Results</b> .....	<b>51</b>
4.1	Vertebrate Fauna .....	51
4.2	SRE Invertebrate Fauna .....	101
4.3	Extrapolation Area .....	120
<b>5</b>	<b>Discussion</b> .....	<b>132</b>
5.1	Terrestrial Vertebrate Fauna.....	132
5.2	SRE Invertebrate Fauna .....	140
<b>6</b>	<b>Conclusion</b> .....	<b>143</b>
<b>7</b>	<b>References</b> .....	<b>145</b>
<b>8</b>	<b>Disclaimer of this Report</b> .....	<b>150</b>

## List of Figures

<b>Figure 1: Survey Area</b> .....	<b>3</b>
<b>Figure 2: Long term and monthly total rainfall, maximum and minimum temperatures for Onslow Airport Weather Station (Station 5017) (Bureau of Meteorology, 2021).</b> 6	
<b>Figure 3: Long term and monthly total rainfall, maximum and minimum temperatures for Pannawonica Weather Station (Station 5069) (Bureau of Meteorology, 2021)....</b> 6	
<b>Figure 4: IBRA Subregions</b> .....	<b>8</b>
<b>Figure 5: Soil Land Systems and Hydrography</b> .....	<b>11</b>
<b>Figure 6: Broad Vegetation Types</b> .....	<b>15</b>
<b>Figure 7: Conservation and Environmentally Sensitive Areas</b> .....	<b>18</b>
<b>Figure 8: Baseline Trap Site Layout</b> .....	<b>26</b>
<b>Figure 9: Survey Effort</b> .....	<b>37</b>
<b>Figure 10: Previous Study Locations</b> .....	<b>53</b>
<b>Figure 11: DBCA Threatened and Priority Fauna Locations</b> .....	<b>69</b>
<b>Figure 12: Fauna Habitats and Conservation Significant Fauna</b> .....	<b>80</b>
<b>Figure 13: Bird Species Accumulation Curve</b> .....	<b>99</b>
<b>Figure 14: Mammal Species Accumulation Curve</b> .....	<b>100</b>
<b>Figure 15: Reptile and Amphibian Species Accumulation Curve</b> .....	<b>100</b>
<b>Figure 16: SRE Habitat Suitability</b> .....	<b>103</b>
<b>Figure 17: Southern Extrapolated Area Fauna Habitats</b> .....	<b>122</b>

<b>Figure 18: Northern Extrapolated Area Fauna Habitats .....</b>	<b>127</b>
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## List of Tables

<b>Table 1: IBRA regions and subregions within the Survey Area .....</b>	<b>7</b>
<b>Table 2: Land systems within the Survey Area .....</b>	<b>9</b>
<b>Table 3: Hydrographical features in the vicinity of the Survey Area .....</b>	<b>10</b>
<b>Table 4: Representation of broad vegetation types within the relevant subregion (Department of Biodiversity Conservation and Attractions, 2019a).....</b>	<b>13</b>
<b>Table 5: Database searches .....</b>	<b>20</b>
<b>Table 6: Vertebrate fauna likelihood of occurrence criteria .....</b>	<b>21</b>
<b>Table 7: SRE taxa likelihood of occurrence criteria .....</b>	<b>21</b>
<b>Table 8: Field trip scope and schedule .....</b>	<b>22</b>
<b>Table 9: Field Team Members .....</b>	<b>22</b>
<b>Table 10: Baseline detailed fauna survey (Trip 3) weather conditions.....</b>	<b>23</b>
<b>Table 11: Targeted and infill baseline detailed fauna survey (Trip 5) weather conditions</b>	<b>24</b>
<b>Table 12: Infill targeted fauna survey (Trip 10) weather conditions.....</b>	<b>24</b>
<b>Table 13: SRE survey (Trip 10) weather conditions.....</b>	<b>25</b>
<b>Table 14: Baseline trap site trapping effort .....</b>	<b>27</b>
<b>Table 15: Baseline camera trapping effort.....</b>	<b>28</b>
<b>Table 16: Targeted Northern Quoll trapping effort .....</b>	<b>29</b>
<b>Table 17: Ultrasonic call ARU trapping effort.....</b>	<b>29</b>
<b>Table 18: Audible call ARU trapping effort .....</b>	<b>30</b>
<b>Table 19: SRE habitat suitability definitions .....</b>	<b>32</b>
<b>Table 20: Short range endemic status of taxa.....</b>	<b>33</b>
<b>Table 21: Survey limitations.....</b>	<b>34</b>
<b>Table 22: Literature review summary .....</b>	<b>54</b>
<b>Table 23: Conservation Significant Vertebrate Fauna Likelihood of Occurrence .....</b>	<b>60</b>
<b>Table 24: Fauna habitat extents and descriptions .....</b>	<b>73</b>
<b>Table 25: Overview of vertebrate fauna taxa recorded .....</b>	<b>94</b>
<b>Table 26: SRE invertebrate fauna likelihood of occurrence within the Survey Area .....</b>	<b>101</b>
<b>Table 27: Habitat suitability for SRE invertebrates.....</b>	<b>101</b>
<b>Table 28: SRE invertebrates recorded during the field surveys .....</b>	<b>117</b>
<b>Table 29: Indicative fauna habitats within the southern portion of the Extrapolation Area .....</b>	<b>121</b>
<b>Table 30: Indicative fauna habitats within the northern portion of the Extrapolation Area .....</b>	<b>121</b>
<b>Table 31: Comparison of species diversity recorded in previous surveys and current survey.....</b>	<b>134</b>

## List of Plates

<b>Plate 1: Adult and juvenile Northern Quoll detected by camera trap at site KBT03 .....</b>	<b>96</b>
<b>Plate 2: Northern Quoll detected by camera trap at site KBT04.....</b>	<b>96</b>
<b>Plate 3: Possible Northern Quoll track (left), Spotted-Tail Quoll tracks (Triggs, 2004) (right).....</b>	<b>97</b>
<b>Plate 4: Ghost Bat detected via camera trap at site KBT05 .....</b>	<b>97</b>
<b>Plate 5: Inactive Western Pebble-mound Mouse mound .....</b>	<b>98</b>

**Plate 6: Pilbara Olive Python opportunistically recorded in a cattle trough at Cardo Camp**  
..... 98

## **List of Appendices**

**Appendix A Database Searches**

**Appendix B Licence and Authorisation**

**Appendix C Inventory of Vertebrate Fauna Identified by the Desktop Assessment**

**Appendix D Habitat Assessments**

**Appendix E Inventory of Vertebrate Fauna Recorded within the Survey Area**

**Appendix F SRE Sites**

**Appendix G SRE Specimen Abundance and Tracking Codes**



# 1 Introduction

## 1.1 The Project

Mineral Resources Limited (MRL) commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a terrestrial vertebrate and Short-Range Endemic (SRE) invertebrate fauna assessment to support the development of the Ashburton Infrastructure Project (AIP). The AIP Haul Road involves developing a fully sealed private haul road that will begin at the boundary of the approved Buckland mine (Bungaroo South), about 45 km southwest of Pannawonica, and continue for approximately 150 km westward towards Onslow. The Survey Area is approximately 30,238 ha and comprises the proposed haul road alignment and associated buffer (approximately 250 m), supporting infrastructure areas such as the borrow pits, and a small area adjacent Wheatstone LNG (the Pilbara Ports Authority (PPA) area) (Figure 1).

A 6,663 ha section of the Survey Area was included in the desktop assessment but could not be assessed during field surveys due to access limitations. Fauna habitat mapping has been extrapolated over a 3,418 ha portion of the area that could not be assessed (referred to as the Extrapolation Area) to provide indicative fauna habitat mapping. Additional surveys will be undertaken in this area in future, the outcomes of which will be documented in a separate report.

## 1.2 Scope and Objectives

The purpose of the terrestrial vertebrate and SRE invertebrate fauna assessment was to inform the Environmental Impact Assessment (EIA) process by undertaking surveys as per the relevant Technical Guidance (Environmental Protection Authority, 2016, 2020) and to provide baseline information for supporting documents as part of the approvals process required to develop the Project.

The specific objectives of the assessment were to:

- Undertake a desktop assessment including relevant database searches and a literature review to compile and summarise existing records of fauna within the vicinity of the Survey Area.
- Undertake a basic terrestrial vertebrate fauna survey during June 2020.
- Undertake a single season detailed terrestrial vertebrate fauna survey during November 2020 and an infill detailed terrestrial vertebrate fauna survey during April 2021 using a variety of fauna detection methods including cage traps, pitfall traps, funnel traps, camera traps, autonomous recording units (ARUs), active searching and opportunistic observations.
- Undertake targeted conservation significant vertebrate fauna surveys in April 2021 and June 2021 with a focus on Northern Quolls, Pilbara Leaf-nosed Bats, Ghost Bats and Pilbara Olive Pythons.
- Compile an inventory of terrestrial vertebrate fauna based on the results of the desktop assessment and field surveys.

- Undertake a dual season SRE assessment comprising dry pitfall trapping in October 2020 (dry season) and active searching and leaf litter sampling in June 2021 (post-wet season, immediately after a rainfall event). Troglifauna and stygofauna are outside the scope of this assessment.
- Extract, sort and identify potential SRE invertebrate specimens.
- Define and delineate the main fauna habitats present within the Survey Area.
- Extrapolate fauna habitat mapping to provide a map of indicative fauna habitats within the Extrapolation Area.
- Produce a combined fauna and SRE assessment report based on the findings of the above.
- Supply a geospatial data package prepared in accordance with IBSA requirements.

This report supersedes the interim report and presents the background, methods, results, discussion, and conclusions of the terrestrial vertebrate fauna and SRE surveys undertaken to support the above objectives.



**Legend**

- Local Roads
- Weather Stations
- Survey Area

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
 - LOCALITY MAP SOURCED LANDGATE 2020  
 - OTHER DATA SOURCED LANDGATE 2020  
 - AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020  
 © Western Australian Land Information Authority 2020

**SLIP ENABLER**

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0 5,000 10,000 15,000  
 Meters  
 1:650,000 @ A4

**LOCALITY MAP**

PROJECT ID 4441 007		DATE 26/08/2021	
HORIZONTAL DATUM AND PROJECTION GDA2020 MGA Zone 50			
CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03

**Mineral Resources Limited**  
**Ashburton Infrastructure Project**  
**Vertebrate Fauna and**  
**SRE Assessment**

**Figure 1**  
**Survey Area**

## 2 Background

### 2.1 Protection of Fauna

Western Australian fauna is formally protected by the following legislative measures:

- *WA Biodiversity Conservation Act 2016* (BC Act)
- *WA Environmental Protection Act 1986* (EP Act)
- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In addition to these legislative measures, the WA Department of Biodiversity, Conservation and Attractions (DBCA; formerly Department of Parks and Wildlife) priority fauna list provides a non-legislative list of possibly threatened, rare but not threatened or near threatened taxa.

In addition to these protection mechanisms, the EIA process is supported by various guidance documents published by the Environmental Protection Authority (EPA), DBCA and the Department of Agriculture Water and Environment (DAWE; formerly Department of Environment, and Department of Sustainability Environment Water Population and Communities).

#### Western Australia

- *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2020)
- *Technical Guidance - Sampling of short range endemic invertebrate fauna* (Environmental Protection Authority, 2016)
- *Interim guideline for preliminary surveys of Night Parrot (*Pezoporus occidentalis*) in Western Australia* (Department of Parks and Wildlife, 2017).

#### Commonwealth

- *Matters of National Environmental Significance – Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment, 2013)
- *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act* (Department of Sustainability Environment Population and Communities, 1999)
- *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act* (Department of the Environment Water Heritage and the Arts, 2010)
- *Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act* (Department of Sustainability Environment Water Population and Communities, 2011)

- *Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act* (Department of the Environment Water Heritage and the Arts, 1999)
- *EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (Department of the Environment and Energy, 2017)
- *EPBC Act referral guideline for the endangered Northern Quoll *Dasyurus hallucatus** (Department of the Environment, 2016).

## 2.2 Existing Environment

### 2.2.1 Climate

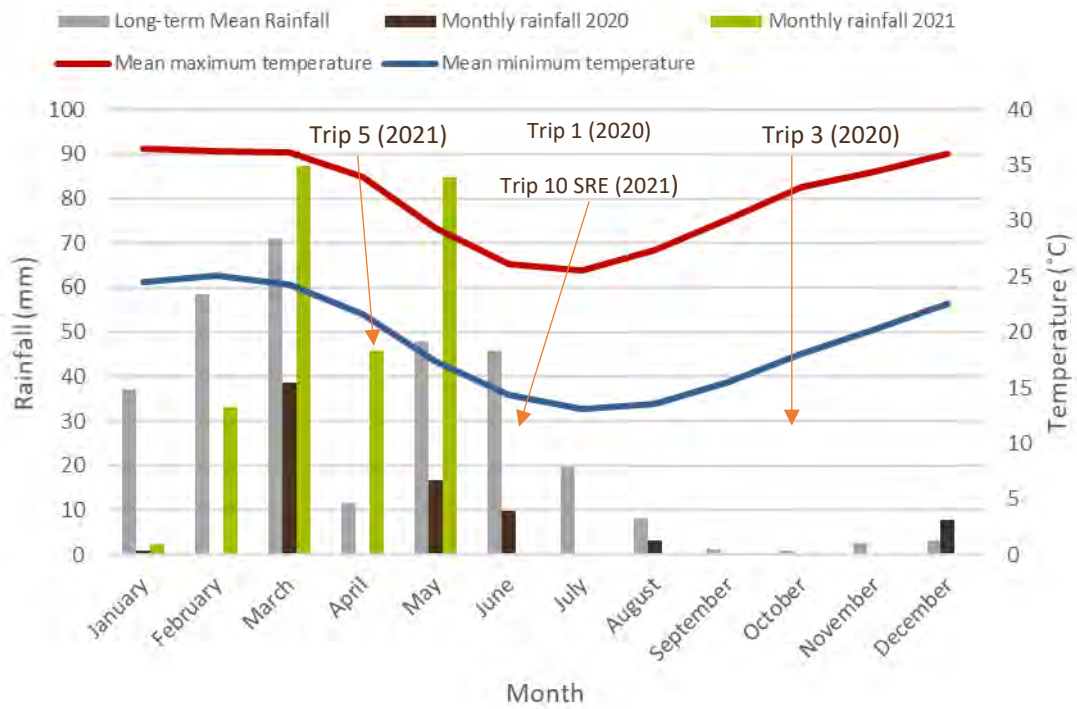
Two Bureau of Meteorology (BoM) weather stations were consulted due to the size of the Survey Area. The closest long-term BoM weather stations with a complete dataset are Onslow Airport (Station 5017) and Pannawonica Station (Station 5069), located approximately 9 km north of the western end of the Survey Area and 45 km north of the eastern end of the Survey Area, respectively (Figure 1).

The long-term mean minimum temperature for Onslow Airport ranges from 13.1°C (July) to 25.1°C (February) (1940 to 2021) and the long-term mean maximum temperature ranges from 25.5°C (July) to 36.5°C (January) (Figure 2) (Bureau of Meteorology, 2021).

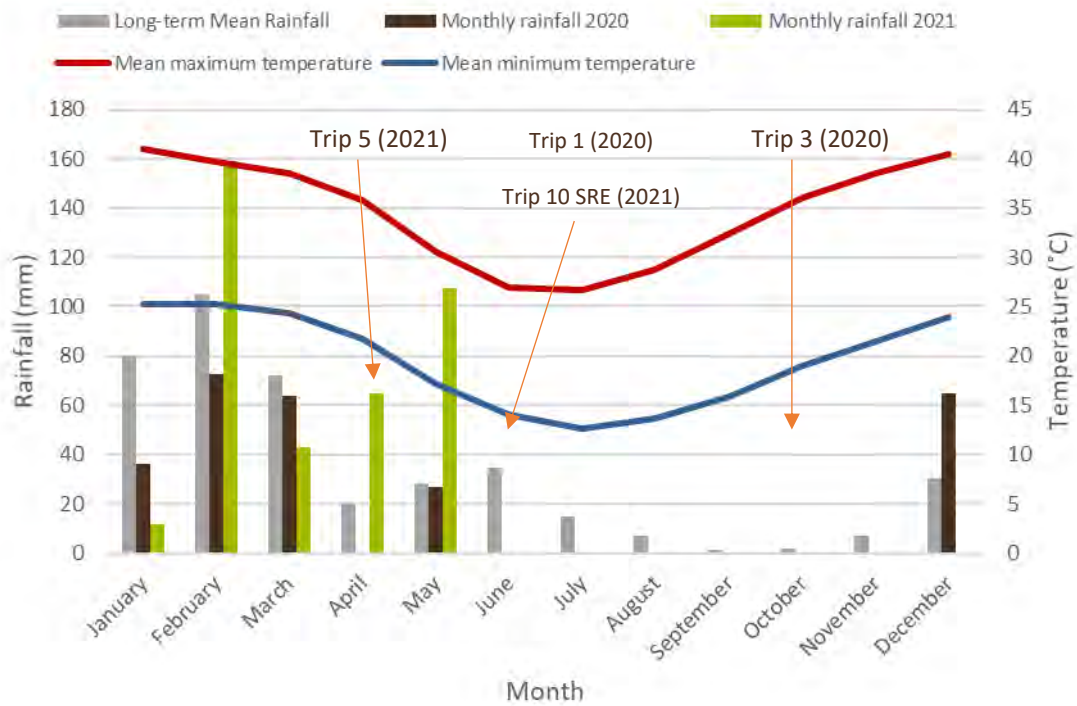
The long-term mean minimum temperature for Pannawonica ranges from 12.6°C (July) to 25.2°C (January and February) (1971 to 2021) and the long-term mean maximum temperature ranges from 26.7°C (July) to 41.0°C (January) (Figure 3) (Bureau of Meteorology, 2021).

The long-term annual average rainfall for Onslow Airport is 307.7 mm (Bureau of Meteorology, 2021). In 2020, the Onslow Airport weather station recorded 77.4 mm of rainfall, which is 230.3 mm below the long-term average of 307.7 mm (Bureau of Meteorology, 2021). The station recorded 253.6 mm of rainfall in January to May 2021, which is 27.6 mm above the long-term average of 226.0 mm for the same period (Bureau of Meteorology, 2021).

The long-term annual average rainfall for Pannawonica is 403.1 mm (Bureau of Meteorology, 2021). In 2020, the Pannawonica weather station recorded 263.9 mm of rainfall, which is 139.2 mm below the long-term average of 403.1 mm (Bureau of Meteorology, 2021). The station recorded 386.6 mm of rainfall in January to May 2021, which is 80.9 mm above the long-term average of 305.7 mm for the same period (Bureau of Meteorology, 2021).



**Figure 2: Long term and monthly total rainfall, maximum and minimum temperatures for Onslow Airport Weather Station (Station 5017) (Bureau of Meteorology, 2021).**



**Figure 3: Long term and monthly total rainfall, maximum and minimum temperatures for Pannawonica Weather Station (Station 5069) (Bureau of Meteorology, 2021).**

## 2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy, 2016). The Survey Area extends across two IBRA bioregions and three IBRA subregions (Table 1; Figure 4). The majority of the Survey Area occurs within the Pilbara region.

**Table 1: IBRA regions and subregions within the Survey Area**

IBRA Region	Subregion (code)	Description
Carnarvon	Cape Range (CAR01)	“The Carnarvon bioregion is composed of quaternary alluvial, aeolian and marine sediments overlying Cretaceous strata. A mosaic of saline alluvial plains with samphire and saltbush low shrublands, Bowgada low woodland on sandy ridges and plains, Snakewood scrub on clay flats, and tree to shrub steppe over hummock grasslands on and between red sand dune fields. Limestone strata with <i>Acacia stuartii</i> or <i>A. bivenosa</i> shrubland outcrop in the north, where extensive tidal flats in sheltered embayments support mangal.” (Kendrick and Mau, 2002).
Pilbara	Hamersley (PIL03)	“PIL3 is the Southern section of the Pilbara Craton. Mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale, and dolerite). Mulga low woodland over bunch grasses on fine textured soils in valley floors, and <i>Eucalyptus leucophloia</i> over <i>Triodia brizoides</i> on skeletal soils of the ranges. The climate is Semi-desert tropical, average 300mm rainfall, usually in summer cyclonic or thunderstorm events. Winter rain is not uncommon. Drainage into either the Fortescue (to the north), the Ashburton to the south, or the Robe to the west. Subregional area is 6,215,092ha.” (Kendrick, 2001).
	Roebourne (PIL04)	“Quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of <i>Acacia stellaticeps</i> or <i>A. pyrifolia</i> and <i>A. inaequilatera</i> . Uplands are dominated by <i>Triodia</i> hummock grasslands. Ephemeral drainage lines support <i>Eucalyptus victrix</i> or <i>Corymbia hamersleyana</i> woodlands. Samphire, <i>Sporobolus</i> and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite. Islands are either Quaternary sand accumulations, or composed of basalt or limestone, or combinations of any of these three. Climate is arid (semi-desert) tropical with highly variable rainfall, falling mainly in summer. Cyclonic activity is significant, with several systems affecting the coast and hinterland annually. Subregional area is 2,008,983ha.” (Kendrick and Stanley, 2001).

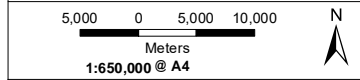


- Legend**
- Survey Area
  - Roads
  - IBRA Regions
- IBRA Subregions**
- Cape Range
  - Chichester
  - Hamersley
  - Roebourne

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**Figure 4**  
**IBRA Subregions**



### 2.2.3 Soil Landscapes and Land Systems

Soil landscapes and land system mapping of WA described broad soil and landscape characteristics from regional to local scales, ranging from 1:20,000 to 1:250,000 (Department of Agriculture and Food WA, 2012). The Survey Area intercepts sixteen land systems (Table 2; Figure 5), including a small area of tidal flats near the coast, extending eastwards across sandy plains and stony plains, to inland hills at the eastern end.

**Table 2: Land systems within the Survey Area**

Land System		Description (Department of Agriculture and Food WA, 2012)
Name	Code	
Cane System	202Cn	Alluvial plains and flood plains supporting snakewood shrublands, soft and hard spinifex grasslands and tussock grasslands.
Capricorn System	296Cp	Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs.
Dune System	201Du	Dune fields supporting soft spinifex and minor hard spinifex grasslands.
Giralia System	203Gi	Sandy plains with linear dunes and broad sandy swales supporting hummock grasslands of hard and soft spinifex with scattered acacia shrubs.
Houndstooth System	296Ht	Rough shale hills, stony plains and broad drainage floors supporting hard spinifex grasslands and sparse shrubs.
Littoral System	201Li	Bare coastal mudflats (unvegetated), samphire flats, sandy islands, coastal dunes, and beaches, supporting samphire low shrublands, sparse acacia shrublands and mangrove forests.
Nanutarra System	296Nn	Low mesas and hills of sedimentary rocks supporting soft and hard spinifex shrubby grasslands.
Newman System	285Ne	Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.
Onslow System	201On	Undulating sandplains, dunes and level clay plains supporting soft spinifex grasslands and minor tussock grasslands.
Peedamulla System	202Pe	Gravelly plains supporting hard spinifex grasslands and minor snakewood shrublands.
Robe System	296Ro	Low plateaux, mesas and buttes of limonite supporting soft spinifex and occasionally hard spinifex grasslands.
Sherlock System	296Sk	Stony alluvial plains supporting snakewood shrublands with patchy tussock grasses and spinifex grasslands.
Stuart System	296St	Gently undulating stony plains supporting hard and soft spinifex grasslands and snakewood shrublands.
Tanpool System	202Tp	Stony plains and low ridges of sandstone and other sedimentary rocks supporting hard spinifex grasslands and snakewood shrublands.
Uaroo System	202Ua	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.

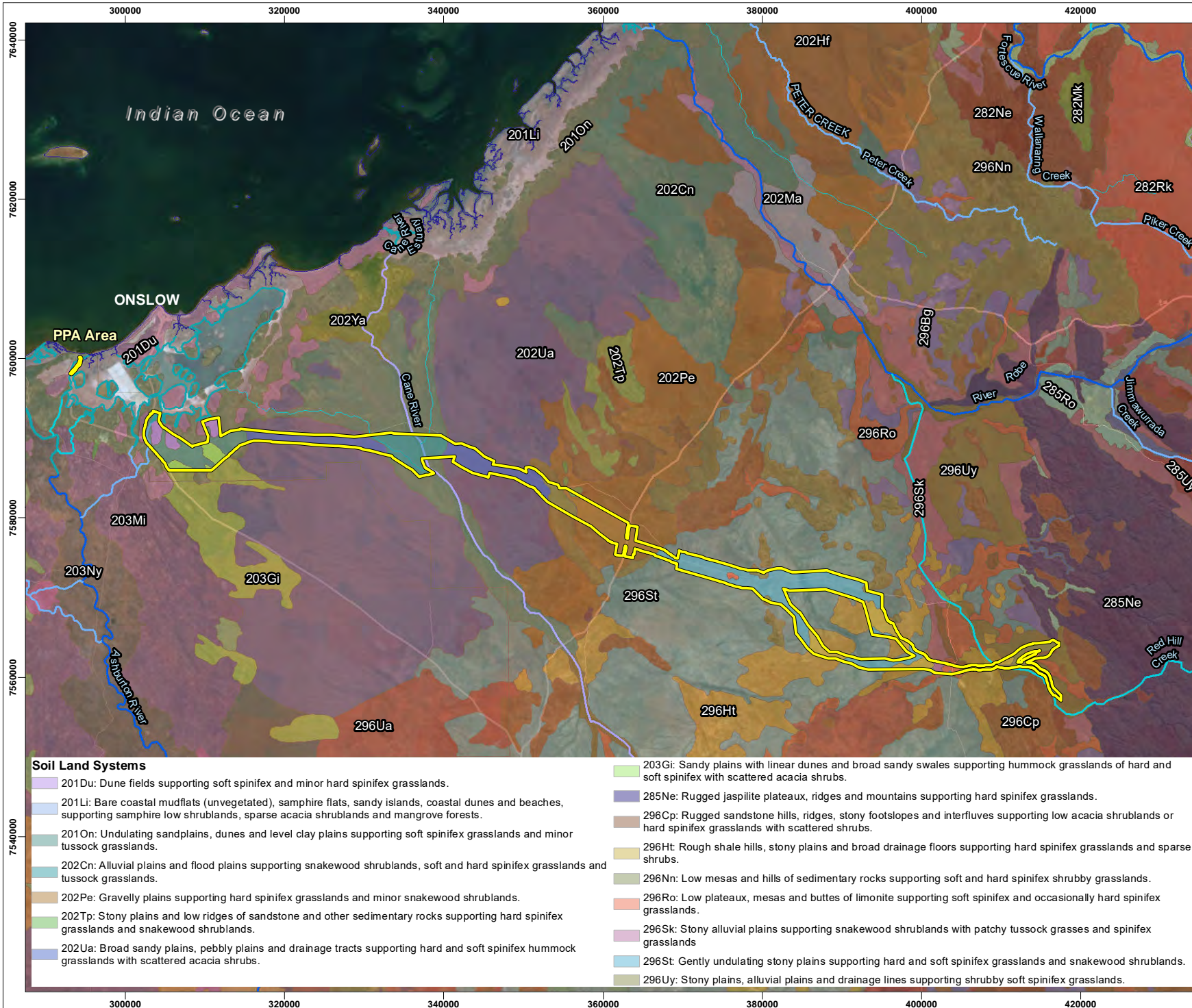
Land System		Description (Department of Agriculture and Food WA, 2012)
Name	Code	
Urandy System	296Uy	Stony plains, alluvial plains and drainage lines supporting shrubby soft spinifex grasslands.

#### 2.2.4 Hydrography

Hydrographic features intersecting and within the vicinity of the Survey Area have been identified using linear hydrography GIS data (Department of Water and Environmental Regulation, 2016). These features are described in Table 3 and shown in Figure 5.

**Table 3: Hydrographical features in the vicinity of the Survey Area**

Hydrographical Feature	Description
Cane River	Major river flowing north-westerly from its source located west of the Hamersley Range, through the Cane River Conservation Park and the Onslow Coastal plain, before discharging into the Indian Ocean at Yardie Landing approximately 35 km northeast of Onslow.
Red Hill Creek	Major tributary merging with Mungarathoona Creek and joining the Robe River. The Red Hill Creek is 37.9 km long, and its elevation varies from 215 m to 116 m over its length.
Minor Tributary of the Cane River	A minor tributary that traverses the Survey Area and flows between the Cane River and the Onslow Estuarine Tidal Flat.
Minor Tributary of the Cane River	A minor tributary that traverses the Survey Area. The minor tributary flows parallel to the Cane River before joining it.
Significant Stream	A significant stream that traverses the western end of the Survey Area and flows into the Onslow estuarine tidal flat.
Onslow Estuarine Tidal Flat	Estuarine tidal flat subject to tidal inundation. The isolated north-western portion of the Survey Area, located within Pilbara Port Authority (PPA area) tenure is less than one kilometre south of the coastline within this hydrographic feature. Regular seasonal flooding is a natural part of the ecosystem in this location, triggered by the passage of tropical cyclones and storms within the region.



### Legend

- Survey
- Roads

### Hydrography

- Coastal Waterline
- Estuarine
- Mainstream
- Major River
- Minor River
- Significant Stream
- Major Tributary
- Minor Tributary

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**Figure 5**  
**Soil Land Systems and Hydrography**

**Soil Land Systems**

- 201Du: Dune fields supporting soft spinifex and minor hard spinifex grasslands.
- 201Li: Bare coastal mudflats (unvegetated), samphire flats, sandy islands, coastal dunes and beaches, supporting samphire low shrublands, sparse acacia shrublands and mangrove forests.
- 201On: Undulating sandplains, dunes and level clay plains supporting soft spinifex grasslands and minor tussock grasslands.
- 202Cn: Alluvial plains and flood plains supporting snakewood shrublands, soft and hard spinifex grasslands and tussock grasslands.
- 202Pe: Gravelly plains supporting hard spinifex grasslands and minor snakewood shrublands.
- 202Tp: Stony plains and low ridges of sandstone and other sedimentary rocks supporting hard spinifex grasslands and snakewood shrublands.
- 202Ua: Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.
- 203Gi: Sandy plains with linear dunes and broad sandy swales supporting hummock grasslands of hard and soft spinifex with scattered acacia shrubs.
- 285Ne: Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex grasslands.
- 296Cp: Rugged sandstone hills, ridges, stony footslopes and interflues supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs.
- 296Ht: Rough shale hills, stony plains and broad drainage floors supporting hard spinifex grasslands and sparse shrubs.
- 296Nn: Low mesas and hills of sedimentary rocks supporting soft and hard spinifex shrubby grasslands.
- 296Ro: Low plateaux, mesas and buttes of limonite supporting soft spinifex and occasionally hard spinifex grasslands.
- 296Sk: Stony alluvial plains supporting snakewood shrublands with patchy tussock grasses and spinifex grasslands.
- 296St: Gently undulating stony plains supporting hard and soft spinifex grasslands and snakewood shrublands.
- 296Uy: Stony plains, alluvial plains and drainage lines supporting shrubby soft spinifex grasslands.

### 2.2.5 Broad Vegetation Associations

Mapping of pre-European broad vegetation within WA was completed on a broad scale (1:1,000,000) by Beard (1976). These vegetation types were later re-assessed by Shepherd *et al.* (2002), resulting in 819 vegetation associations within WA.

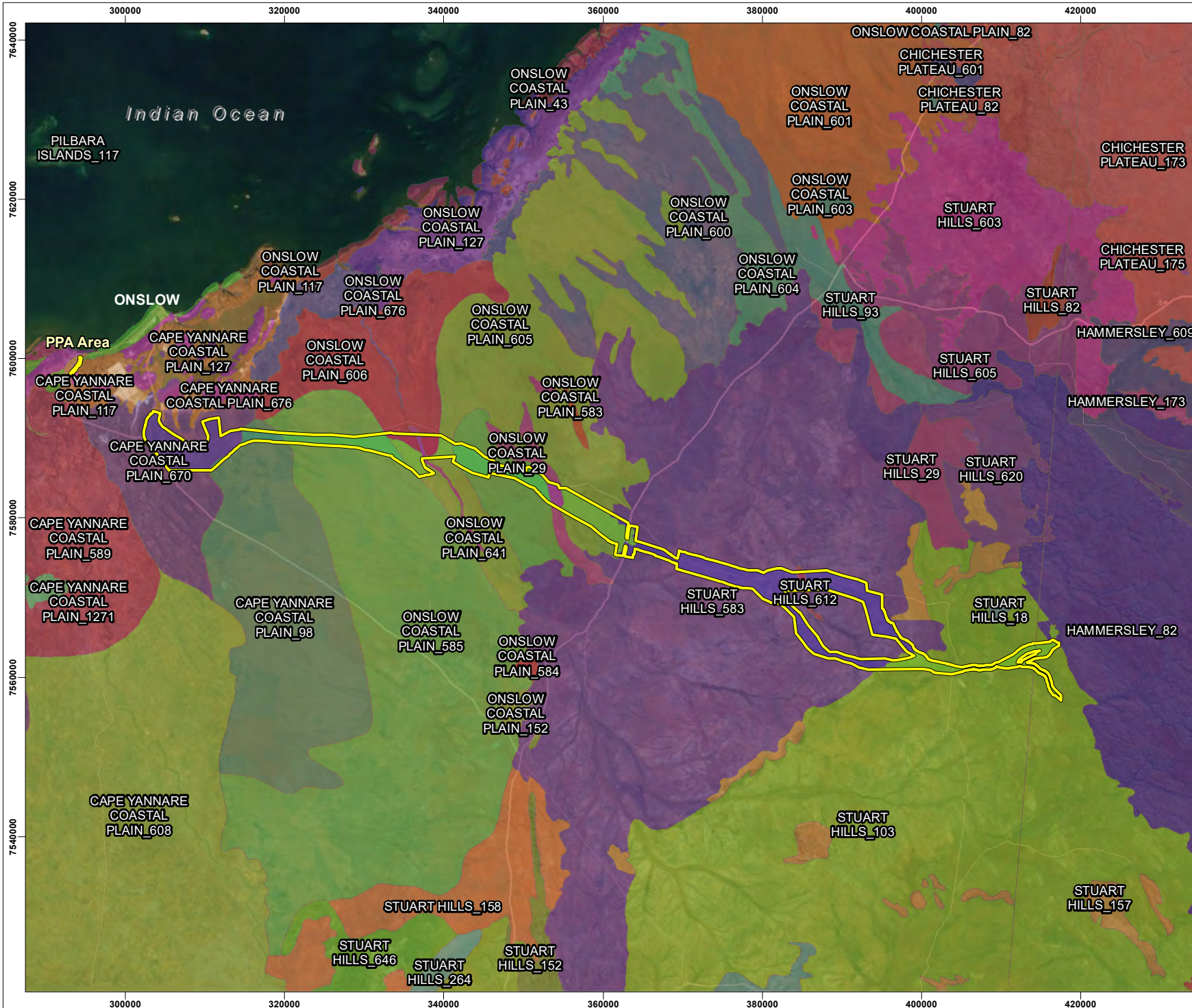
Thirteen vegetation systems associations are mapped within the Survey Area (Table 4; Figure 6). Descriptions of these vegetation systems associations and their representation on a sub-regional scale are provided in Table 4.

**Table 4: Representation of broad vegetation types within the relevant subregion (Department of Biodiversity Conservation and Attractions, 2019a)**

System and Vegetation Association	Description	Extent				
		Pre-European (ha)	Current (ha)	Remaining (%)	Current Extent Managed in DBCA Lands (%) *	Within Survey Area (ha)
<b>Representation across the Cape Range (CAR01) sub-region</b>						
Cape Yannare Coastal Plain 127	Tidal mud flat	100,987.52	99,790.74	98.81	0.42	39.88
Cape Yannare Coastal Plain 670	Shrub-steppe. Hummock grassland with scattered shrubs or mallee ( <i>Triodia</i> spp., <i>Acacia</i> spp., <i>Grevillea</i> spp., <i>Eucalyptus</i> spp.)	147,808.61	147,792.06	99.99	11.67	4717.37
Cape Yannare Coastal Plain 98	Shrub-steppe. Hummock grassland with scattered shrubs or mallee ( <i>Triodia</i> spp., <i>Acacia</i> spp., <i>Grevillea</i> spp., <i>Eucalyptus</i> spp.)	221,820.23	221,812.78	100.00	25.04	831.31
Cape Yannare Coastal Plain 676	Tecticornia spp. communities in saline areas	29,193.60	28,442.66	97.43	15.87	13.59
<b>Representation across the Hamersley (PIL03) sub-region</b>						
Hamersley 82	Hummock grassland with scattered bloodwoods and snappy gum ( <i>Triodia</i> spp., <i>Corymbia dichromophloia</i> , <i>Eucalyptus leucophloia</i> )	2,177,573.90	2,165,224.21	99.43	13.57	3.40
Onslow Coastal Plain 605	Shrub-steppe. Hummock grassland with scattered shrubs or mallee ( <i>Triodia</i> spp., <i>Acacia</i> spp., <i>Grevillea</i> spp., <i>Eucalyptus</i> spp.)	26,057.99	26,057.99	100.00	0.01	4310.13
Stuart Hills 103	Shrub-steppe. Hummock grassland with scattered shrubs or mallee ( <i>Triodia</i> spp., <i>Acacia</i> spp., <i>Grevillea</i> spp., <i>Eucalyptus</i> spp.)	614,056.46	613,923.76	99.98	4.99	3094.31
Stuart Hills 583	Sparse shrub-steppe. Hummock grassland with sparse shrubs ( <i>Triodia</i> spp., <i>Acacia</i> spp.)	240,724.25	240,724.25	100.00	41.16	10624.14

System and Vegetation Association	Description	Extent				
		Pre-European (ha)	Current (ha)	Remaining (%)	Current Extent Managed in DBCA Lands (%) *	Within Survey Area (ha)
Stuart Hills 612	Low woodland or open low woodland. Other acacia, banksia, peppermint, cypress pine, casuarina, York gum, <i>Acacia</i> spp., <i>Banksia</i> spp., <i>Agonis flexuosa</i> , <i>Callitris</i> spp., <i>Allocasuarina</i> spp., <i>Eucalyptus loxophleba</i> .	476.16	476.16	100.00	N/A	186.76
<b>Representation across the Roebourne (PIL04) sub-region</b>						
Onslow Coastal Plain 29	Low woodland, open low woodland, or sparse woodland. Mulga ( <i>Acacia aneura</i> ) and associated species	5,235.61	5,235.61	100.00	N/A	479.9
Onslow Coastal Plain 585	Scrub or very open scrub / Grass-steppe	144,781.51	144,769.91	99.99	62.89	4870.21
Onslow Coastal Plain 606	Shrub-steppe. Hummock grassland with scattered shrubs or mallee ( <i>Triodia</i> spp., <i>Acacia</i> spp., <i>Grevillea</i> spp., <i>Eucalyptus</i> spp.)	32,103.70	32,103.70	100.00	N/A	936.80
Onslow Coastal Plain 641	Woodland other. Wheatbelt; York gum, salmon gum etc. ( <i>Eucalyptus loxophleba</i> , <i>E. salmonophloia</i> ). Goldfields; gimlet, redwood etc. ( <i>E. salubris</i> , <i>E. oleosa</i> ). Riverine; rivergum ( <i>E. camaldulensis</i> ). Tropical; messmate, woolybush	2,117.88	2,117.83	100.00	10.23	130.49

\*As a portion of the current extent



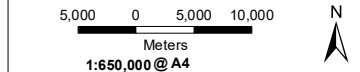
**Legend**

- Survey Area
- Broad Vegetation Types**
- CAPE YANNARE COASTAL PLAIN\_127: Tidal mud flat
- CAPE YANNARE COASTAL PLAIN\_670: Shrub-steppe
- CAPE YANNARE COASTAL PLAIN\_676: Samphire
- CAPE YANNARE COASTAL PLAIN\_98: Shrub-steppe
- HAMMERSLEY\_82: Low tree-steppe
- ONslow COASTAL PLAIN\_29: Low woodland, open low woodland or sparse woodland
- ONslow COASTAL PLAIN\_585: Scrub or very open scrub / Grass-steppe
- ONslow COASTAL PLAIN\_605: Shrub-steppe
- ONslow COASTAL PLAIN\_606: Shrub-steppe
- ONslow COASTAL PLAIN\_641: Woodland other
- STUART HILLS\_103: Shrub-steppe
- STUART HILLS\_583: Sparse shrub-steppe
- STUART HILLS\_612: Low woodland or open low woodland

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**Figure 6**  
 Broad Vegetation Types

## 2.2.6 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands (Western Australian Government, 2005). The Western Australian Government (2005) defines ESAs as:

- (a) A declared World Heritage property as defined in section 13 of the Environment Protection and Biodiversity Conservation Act 1999 of the Commonwealth
- (b) An area that is included on the Register of the National Estate, because of its natural heritage value, under the Australian Heritage Council Act 2003 of the Commonwealth
- (c) A defined wetland and the area within 50 m of the wetland
- (d) The area covered by vegetation within 50 m of rare flora, to the extent to which the vegetation is continuous with the vegetation in which the rare flora is located
- (e) The area covered by a threatened ecological community
- (f) A Bush Forever site listed in 'Bush Forever' Volumes 1 and 2 (2000), published by the Western Australia Planning Commission, except to the extent to which the site is approved to be developed by the Western Australia Planning Commission, as described in subclause (3)
- (g) The areas covered by the following policies:
  - (i) The Environmental Protection (Gnangara Mound Crown Land) Policy 1992
  - (ii) The Environmental Protection (Western Swamp Tortoise) Policy 2002.
- (h) The areas covered by the lakes to which the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 applies
- (i) Protected wetlands as defined in the Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998
- (j) Areas of fringing native vegetation in the policy area as defined in the Environmental Protection (Swan and Canning Rivers) Policy 1998.

No ESAs occur within the Survey Area (Figure 7). The nearest ESAs are:

- A series of offshore island, the closest being Ashburton Island, approximately 13 km north of the PPA portion of the Survey Area.
- A 96.9 km stretch of coastline on the eastern side of the Exmouth Gulf. The ESA is located approximately 30.0 km west of the western portion of the Survey Area, and 25.4 km southwest of the PPA portion of the Survey Area.
- A series of wetlands surrounding the Fortescue River, which are located approximately 97.8 km northeast of the eastern end of the Survey Area.
- A defined area north of Millstream Chichester National Park, which is located approximately 106.9 km northeast of the eastern end of the Survey Area.



- A defined area located 102.4 km south of the eastern end of the Survey Area.

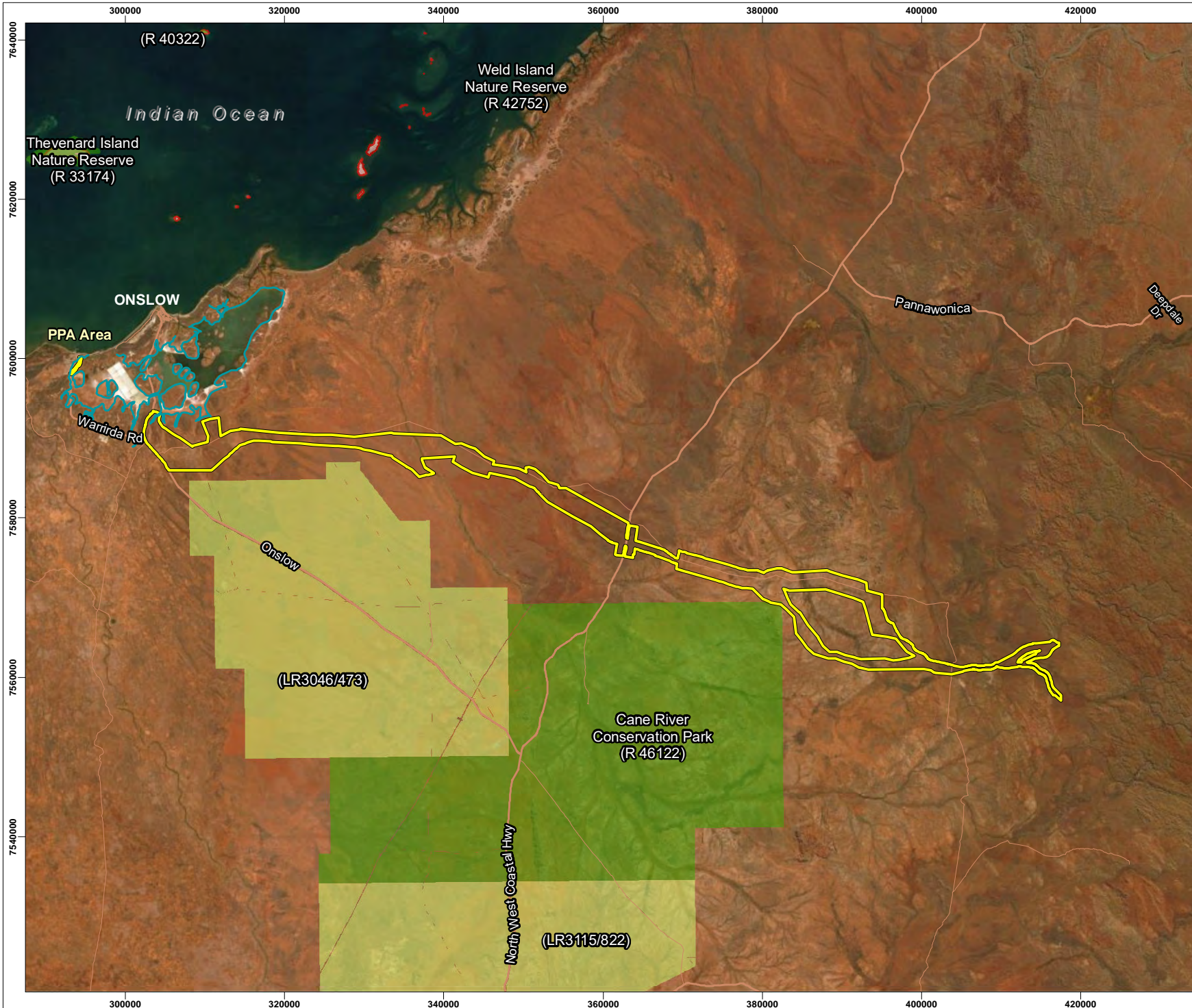
### 2.2.7 Conservation Areas

A small portion of the Survey Area (approximately 19 ha) overlaps the north-eastern portion of the Cane River Conservation Park, which is vested under the Conservation Commission of Western Australia (Figure 7).

Other conservation areas near the Survey Area are (Department of Biodiversity Conservation and Attractions, 2019):

- Unallocated Crown Land (LR3046/473), vested under the department of Planning, Lands and Heritage – located approximately 1 km south of the Survey Area
- Unallocated Crown Land (LR3115/822), vested under the department of Planning, Lands and Heritage – located approximately 40 km south of the Survey Area
- Barlee Range Nature Reserve (R 26808), vested under the Conservation Commission of Western Australia – located 104 km south of the Survey Area
- Millstream Chichester National Park (R 30071), vested under the Conservation Commission of Western Australia – located 98 km northeast of the eastern end of the Survey Area.

In addition, the Onslow estuarine tidal flat, which overlaps the northwestern portion of the Survey Area, is listed in the EPA Redbook as a Recommended Conservation Reserve.



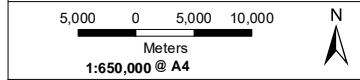
**Legend**

- Survey Area
- Roads
- Onslow Estuarine Tidal Flat
- Environmentally Sensitive Areas
- DBCA Managed Land
- Unallocated Crown Land

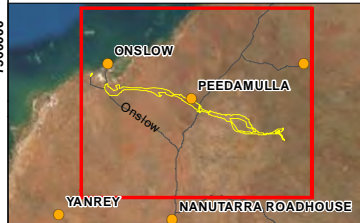
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**Figure 7**  
**Conservation and**  
**Environmentally Sensitive Areas**

## 3 Methods

The basic and detailed terrestrial vertebrate fauna and SRE surveys documented within this report were undertaken in accordance with the *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2020) and the *Technical Guidance - Sampling of short range endemic invertebrate fauna* (Environmental Protection Authority, 2016) and with consideration for the relevant EPBC guidelines discussed within Section 2.1.

### 3.1 Desktop Assessment

#### 3.1.1 Literature Review

Background information regarding the existing environment within the Survey Area and surrounds was compiled prior to the field surveys (see Section 2.2). Previous studies were sourced from the EPA Consultation Hub, the Index of Biodiversity Surveys for Assessments (IBSA) website, internet search engine, or provided directly by MRL, were reviewed and summarised:

- *2011 Targeted Surveys for Populations of the Northern Quoll on the West Pilbara Iron Ore Project* (Rapallo Environmental, 2012b)
- *A Level 1 Vertebrate Fauna Assessment of the Proposed Tubridgi to Wheatstone Gas Pipeline, Western Australia* (Ninox Wildlife Consulting, 2011)
- *Annual Monitoring Survey of the WPIOP Stage 1 for API Management* (Rapallo Environmental, 2013)
- *Biological Assessment of the Conservation Focus Area for API Management* (Rapallo Environmental, 2012a)
- *Echolocation Survey of Bat Activity* (Bat Call WA, 2015)
- *Flora and vegetation survey and terrestrial fauna survey for the Pilbara Regional Waste Management Facility* (Phoenix Environmental Sciences, 2017)
- *Flora, Vegetation and Fauna Habitat Assessment at Bourne Highway* (Rio Tinto Iron Ore, 2018)
- *Pilbara Olive Python Reconnaissance Survey of the West Pilbara Iron Ore Project* (Rapallo Environmental, 2011)
- *Solomon Hub Vertebrate Fauna Assessment* (ecologia Environment, 2015)
- *West Pilbara Iron Ore Project Activity Assessment for Bats of Conservation Significance* (Astron Environmental Services, 2012)
- *West Pilbara Iron Ore Project Habitat Assessment for Terrestrial Fauna of National Environmental Significance* (Astron Environmental Services, 2011a)
- *West Pilbara Iron Ore Project MNES Fauna Species Habitat Assessment* (Biota Environmental Sciences, 2015a)

- *West Pilbara Iron Ore Project Onslow Rail Corridor – Level 1 Fauna Assessment* (Biota Environmental Sciences, 2008)
- *West Pilbara Iron Ore Project Onslow Rail Corridor Terrestrial Fauna Survey* (Biota Environmental Sciences, 2009)
- *West Pilbara Iron Ore Project Pilbara Leaf-nosed Bat Habitat Assessment* (Astron Environmental Services, 2011b)
- *West Pilbara Iron Ore Project Red Hill Creek Terrestrial Fauna Assessment: Phase 1* (Biota Environmental Sciences, 2015b)
- *West Pilbara Iron Ore Project Stage 1 Extension Terrestrial Fauna Assessment: Phase 1* (Biota Environmental Sciences, 2015c).

### 3.1.2 Database Searches

Database searches were undertaken to compile a list of potential fauna and identify potential conservation significant fauna within or surrounding the Survey Area (Table 5). The search area for each parameter was varied to reflect distances recommended by DBCA.

**Table 5: Database searches**

Database Name	Date Received	Search Area
NatureMap (including Birdata) (Department of Biodiversity Conservation and Attractions, 2020a)	2 June 2020	Search by line with a 20 km buffer (coordinates provided in Appendix A)
Threatened and Priority Fauna Search (Department of Biodiversity Conservation and Attractions, 2020b)	27 May 2020	30 km buffer applied to the Survey Area polygon
Protected Matters Search Tool (Department of Agriculture Water and the Environment, 2020)	3 June 2020	Search by line with a 50 km buffer (coordinates provided in Appendix A)
WAM database search for Arachnids, Crustacea, and Molluscs (Western Australian Museum, 2021a, 2021c, 2021d)	March 2021	1,400,000 ha area bounded by the northwest corner (21.545137°S, 114.726345°E) and the southeast corner (22.256384°S, 116.539467°E)

### 3.1.3 Conservation Significant Vertebrate Fauna Likelihood of Occurrence

Terrestrial vertebrate fauna taxa of conservation significance<sup>2</sup> identified by the database searches were assessed to determine their expected likelihood of occurrence within the Survey Area prior to the field surveys. The likelihood of occurrence for each taxon was then confirmed or revised post-field survey.

The assessment was completed based on the criteria presented in Table 6. Taxa recorded within the Survey Area or considered to have a high or medium likelihood of occurrence are discussed in detail. Taxa with a low likelihood of occurrence are not discussed unless justification for the classification is required.

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<sup>2</sup> Species listed as Marine under the EPBC Act were not included as conservation significant as the Marine listing only applies within Commonwealth marine areas.

**Table 6: Vertebrate fauna likelihood of occurrence criteria**

Likelihood	Criteria
<b>Confirmed</b>	Recorded during the field surveys.
<b>High</b>	Preferred habitat is present within the Survey Area, the Survey Area is within the taxon's known distribution, and the taxon has been recorded near the Survey Area in the last 15 years. The Survey Area and surrounding habitat is expected to support individuals or populations of the taxon.
<b>Medium</b>	The high likelihood of occurrence criteria has not been met, however suitable (not necessarily preferred) habitat occurs within the Survey Area and the Survey Area is within or near the taxon's known distribution. The Survey Area and surrounding habitat may support individuals or populations of the taxon.
<b>Low</b>	No suitable habitat is present within the Survey Area, or the Survey Area is well outside the taxon's known distribution, or the taxon is considered locally or regionally extinct. The Survey Area and surrounding habitat are unlikely to support individuals or populations of the taxon, however individuals may rarely occur as transients or vagrants.

### 3.1.4 SRE Invertebrate Fauna Likelihood of Occurrence

Based on the analysis of all available information, potential SRE invertebrate taxa were assigned a level of likelihood to be present within habitats contained in the Survey Area. In the absence of universally recognised criteria, these criteria have been developed by highly experienced SRE practitioner Dr Timothy Moulds from Invertebrate Solutions Pty Ltd (Invertebrate Solutions). These levels of likelihood are described in Table 7.

**Table 7: SRE taxa likelihood of occurrence criteria**

Likelihood	Definition
Definite	The taxon is confirmed to occur within the Survey Area.
High	Habitat for the taxon is known to occur within the Survey Area and known records of the taxon are within 20 km.
Moderate	Habitat for the taxon is known to occur within the Survey Area and known records of the taxon are within 50 km.
Low	The taxon has been recorded from within 50 km, however, no habitat is present for the taxon within the Survey Area.
Very low	No habitat exists for the taxon within the Survey Area and no records of the taxon are within 50 km or the distribution of the taxon is known well enough to exclude its presence within the Survey Area.

## 3.2 Field Surveys

A basic terrestrial vertebrate fauna survey was undertaken in June 2020 followed by detailed and targeted conservation significant terrestrial vertebrate fauna surveys, which were undertaken in October 2020, April 2021, and June 2021. Dry pitfall trapping for SRE taxa was undertaken in October 2020 in conjunction with the detailed terrestrial vertebrate fauna survey and a detailed SRE survey was undertaken in June 2021. This is outside the optimal time period for SRE surveys (Environmental Protection Authority, 2016), however a 68.8 mm rainfall event was recorded in the four days prior to the survey. Furthermore, active searching is effective

outside the optimal survey period because detection of SRE invertebrates does not depend on invertebrate activity levels. Table 8 outlines the scope and dates of the four relevant field trips<sup>3</sup>.

**Table 8: Field trip scope and schedule**

Trip	Scope	Date	Personnel	Person Field Days
1 (Vertebrate)	Basic terrestrial vertebrate fauna survey, preliminary identification of potential trap sites and habitat descriptions.	5 – 15 June 2020	Evan Webb Lukas Geidans	18
3 (Vertebrate and SRE)	Baseline detailed terrestrial vertebrate fauna survey, comprehensive trapping program and active searches, SRE pitfall trapping.	7 – 20 October 2020	Evan Webb Lukas Geidans Ed Swinhoe Mike Brown	48
5 (Vertebrate)	Targeted conservation significant terrestrial vertebrate fauna survey and infill baseline detailed terrestrial vertebrate fauna survey, comprehensive trapping program and active searches.	16 – 27 April 2021	Evan Webb Poppy Walker Ed Swinhoe	30
10 (Vertebrate and SRE)	Infill targeted conservation significant terrestrial vertebrate fauna survey and active searches in additional Survey Area added to the Project April 2021.	31 May – 5 June 2021	Evan Webb Poppy Walker	10
	Detailed SRE survey. Active searches and habitat assessments.	3 – 9 June 2021	Lukas Geidans Dale Carter (MRL)	12

### 3.2.1 Field Personnel

The fauna and SRE field surveys were undertaken by a team with a combined 39 years of experience conducting surveys of similar scope throughout WA, in particular the Pilbara region. Table 9 outlines the team members, their relevant experience conducting similarly scoped work and the relevant survey. The SRE field survey was supported by MRL representative, Dale Carter and SRE specimen identification and data curation was managed by Dr Timothy Moulds.

**Table 9: Field Team Members**

Personnel	Role	Trips	Years of Experience
Evan Webb	Zoologist	Trips 1, 3, 5 and 10	4 Years
Lukas Geidans	Ecologist	Trips 1 and 3 and 10 (SRE)	4 Years
Edward Swinhoe	Senior Zoologist	Trips 3 and 5	15 Years
Michael Brown	Senior Zoologist	Trip 3 only	15 Years

<sup>3</sup> Field trips 2, 4, 6, 7, 8, and 9 were flora and vegetation surveys

Personnel	Role	Trips	Years of Experience
Christina (Poppy) Walker	Zoologist	Trips 5 and 10	1 Year

### 3.2.2 Licence and Authorisation

Both the detailed terrestrial vertebrate fauna and the SRE invertebrate fauna survey were completed under Fauna Taking (Biological Assessment) Licence – Regulation 27 (BA27000324 and BA27000324-2) and an authorisation to take or disturb threatened species under Section 40 of the BC Act (TFA2020-0104 and TFA2020-0104-02) (Appendix B).

### 3.2.3 Weather Conditions

#### 3.2.3.1 Trip 3 – Baseline Detailed Fauna Survey

Weather conditions for the baseline detailed fauna survey (Trip 3) are presented in Table 10. Temperature data is from Mardie (Station 5008) and rainfall data is from Red Hill (Station 5022) (Bureau of Meteorology, 2021). Temperatures during the survey were similar to the long-term average minimum temperature (17.6°C) and maximum temperature (35.0°C) for October. A total of 0.0 mm of rainfall was recorded during October 2020, which is similar to the long-term average of 1.6 mm.

**Table 10: Baseline detailed fauna survey (Trip 3) weather conditions**

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
07/10/2020	12.0	29.1	0
08/10/2020	14.0	32.9	0
09/10/2020	13.0	29.7	0
10/10/2020	17.9	30.8	0
11/10/2020	19.4	33.3	0
12/10/2020	20.7	36.1	0
13/10/2020	19.9	39.8	0
14/10/2020	20.8	41.0	0
15/10/2020	22.3	39.4	0
16/10/2020	19.8	32.4	0
17/10/2020	18.6	28.8	0
18/10/2020	17.5	28.6	0
19/10/2020	17.7	29.0	0
20/10/2020	18.2	31.1	0

#### 3.2.3.2 Trip 5 – Targeted and Infill Baseline Detailed Fauna Survey

Weather conditions for the targeted and infill baseline detailed fauna survey (Trip 5) are presented in Table 11. Temperature data is from Mardie (Station 5008) and rainfall data is from

Red Hill (Station 5022) (Bureau of Meteorology, 2021). Temperatures during the survey were similar to the long-term average minimum temperature (21.2°C) and maximum temperature (35.9°C) for April. A total of 93.9 mm of rainfall was recorded during April 2021, which is above the long-term average of 21.9 mm.

**Table 11: Targeted and infill baseline detailed fauna survey (Trip 5) weather conditions**

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
16/04/2021	23.1	34.4	0
17/04/2021	22.2	35.9	0
18/04/2021	22.2	36.3	0
19/04/2021	21.6	34	0
20/04/2021	19.6	33.3	0
21/04/2021	20.1	33.5	0
22/04/2021	20.5	35.7	0
23/04/2021	18.4	35.6	0
24/04/2021	17	36.1	0
25/04/2021	19.2	36.3	0
26/04/2021	19.2	35.5	0
27/04/2021	17.7	35.7	0

### 3.2.3.3 Trip 10 – Infill Targeted Fauna Survey

Weather conditions for the infill targeted fauna survey (Trip 10) are presented in Table 12. Temperature data is from Mardie (Station 5008) and rainfall data is from Red Hill (Station 5022) (Bureau of Meteorology, 2021). Temperatures during the survey were similar to the long-term average minimum temperature (14.0°C) and maximum temperature (28.2°C) for June. A total of 16.2 mm of rainfall was recorded during June 2021, which is below the long-term average for June (36.7 mm). Above average rainfall was recorded in the month preceding the survey; a total of 129.4 mm of rainfall was recorded during May 2021, compared to the long-term average of 33.7 mm.

**Table 12: Infill targeted fauna survey (Trip 10) weather conditions**

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
31/05/2021	15.8	26.6	0
01/06/2021	13.4	28.8	0
02/06/2021	17.2	23.6	0
03/06/2021	17.3	23.2	0
04/06/2021	16.9	24.1	1
05/06/2021	15.2	28.8	0



### 3.2.3.4 Trip 10 – SRE Survey

Weather conditions for the SRE survey are presented in Table 13. Temperature data is from Mardie (Station 5008) and rainfall data is from Red Hill (Station 5022) (Bureau of Meteorology, 2021). Temperatures during the survey were similar to the long-term average minimum temperature (14.0°C) and maximum temperature (28.2°C) for June. A total of 16.2 mm of rainfall was recorded during June 2021, which is below the long-term average for June (36.7 mm). Above average rainfall was recorded in the month preceding the survey; a total of 129.4 mm of rainfall was recorded during May 2021, compared to the long-term average of 33.7 mm.

**Table 13: SRE survey (Trip 10) weather conditions**

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
03/06/2021	17.3	23.2	0
04/06/2021	16.9	24.1	1
05/06/2021	15.2	28.8	0
06/06/2021	19.1	28.2	0
07/06/2021	20.2	30.4	0
08/06/2021	20.6	29	0
09/06/2021	22.4	25.6	0

### 3.2.4 Vertebrate Fauna

#### 3.2.4.1 Fauna Habitat

Fauna habitat assessments were undertaken throughout the Survey Area to identify fauna habitat (Figure 9). The following information, which has been adapted from the habitat attributes listed in the Technical Guidance (Environmental Protection Authority, 2020), was collected at each habitat assessment site using Fulcrum, a mobile data collection app:

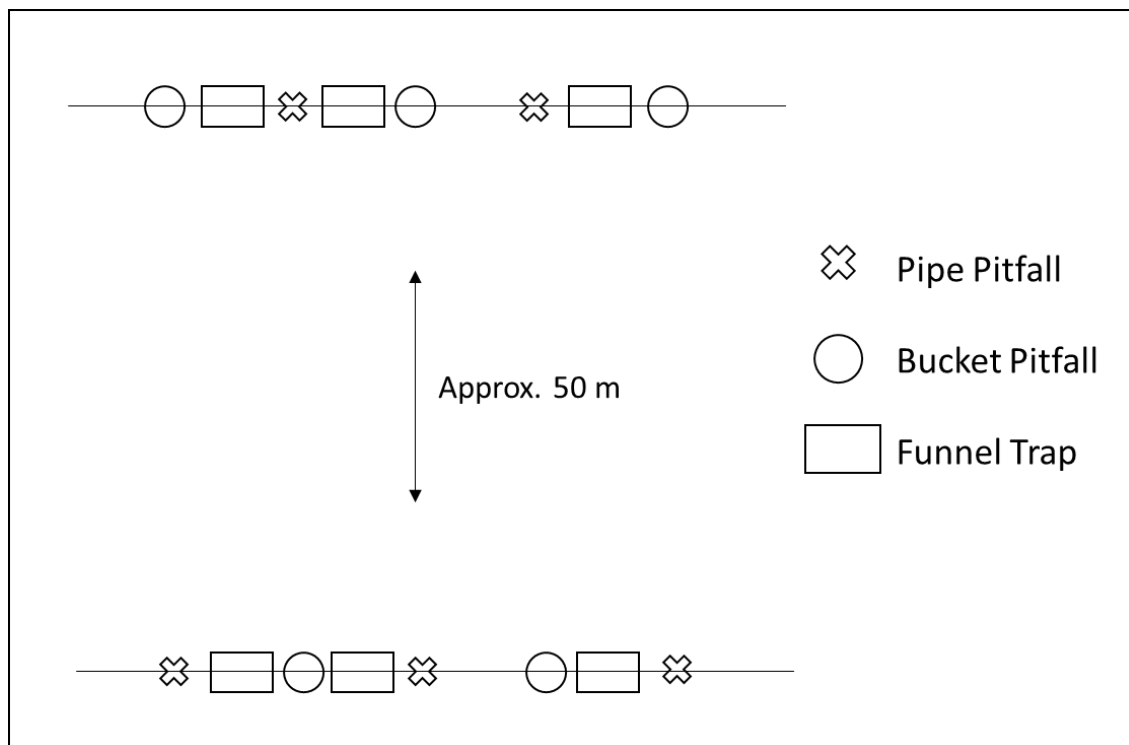
- Site photo
- Landform
- Soil type and colour
- Rock types, surface stone cover and size classes
- Microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, water sources
- Habitat quality, fire history and evidence of disturbance
- General description of vegetation structure.

Fauna habitat mapping boundaries were delineated over aerial photography at a scale of 1:5,000 based on field observations, fauna habitat assessment data and vegetation mapping undertaken by 360 Environmental. Polygons were digitised and produced as electronic mapping data using GIS software.

### 3.2.4.2 Baseline Trap Sites

Eleven trap sites were installed in the Survey Area within areas of suitable and representative habitat. All trap sites occur within the Survey Area except for site KBB09, which is just outside the current Survey Area boundary following adjustments that were made following trip 3. Each trap site consisted of two trap lines spaced roughly 50 m apart to account for the possibility that fauna assemblages can be distributed unevenly within a given habitat. Individual trap lines were roughly 30 m long and comprised a 30 cm tall flywire drift fence passing over five pitfall traps (20 L buckets and 150 mm PVC pipes) with six funnel traps attached to the drift fence in pairs. Elliott traps were omitted from trap sites during trip 3 due to high temperatures and animal welfare considerations, however ten small Elliott aluminium box traps were set at trap sites KBB11 and KBB12 during trip 5. Elliott traps were positioned adjacent the pitfall trap line, each approximately 10 m away from each pitfall trap. Table 14 shows the total trapping effort for each trap site. Trap sites were numbered in the order in which they were set up. Trap site locations are shown in Figure 9.

A diagram of the trap site layout is provided in Figure 8.



**Figure 8: Baseline Trap Site Layout**

**Table 14: Baseline trap site trapping effort**

Fauna Habitat	Site Name	Trip <sup>4</sup>	Number of Nights Open	Total Pitfall Trap Nights	Total Funnel Trap Nights <sup>5</sup>	Total Small Elliott Trap Nights
Sand dunes and swales	KBB01	3	11	110	96	0
Tidal flats	KBB02	3	11	110	96	0
Plain	KBB03	3	11	110	96	0
Mulga woodland	KBB04	3	11	110	84	0
Stony plain	KBB05	3	10	100	96	0
Stony hills and slopes (adjacent mesas and breakaways)	KBB06	3	10	100	96	0
Stony hills and slopes (adjacent mesas and breakaways)	KBB08	3	9	90	120	0
Drainage line/creek/river (minor)	KBB09	3	9	90	84	0
Drainage line/creek/river (Major)	KBB10	3	8	80	84	0
Stony plain (adjacent drainage line/creek/river and mesas and breakaways)	KBB11	5	7	70	84	70
Drainage line/creek/river (Minor)	KBB12	5	7	70	84	70
<b>Total</b>			<b>104</b>	<b>1,040</b>	<b>1,020</b>	<b>140</b>

### 3.2.4.3 Baseline Camera Trapping

Motion sensitive camera traps were deployed during the trip 3 detailed field survey as part of the baseline fauna survey. Cameras were baited with universal bait (rolled oats and peanut butter) and sardines. Table 15 shows the trapping effort for baseline camera traps, and locations are shown in Figure 9.

<sup>4</sup> Trip 3 – October 2020, Trip 5 – April 2021

<sup>5</sup> Funnel traps were not always set up on the same day as the pitfall traps

**Table 15: Baseline camera trapping effort**

Fauna Habitat	Nearest Trap Site	Number of Camera Traps	Total Camera Trap Days and Nights
Tidal flats	KBB02	1	7
Plain	KBB03	1	7
Mulga woodland	KBB04	1	7
Stony plain	KBB05	2	16
Drainage line/river/creek (Major)	KBB10	2	14
<b>Total</b>		<b>7</b>	<b>51</b>

#### 3.2.4.4 Opportunistic Observations and Active Searches

Opportunistic observations of fauna were recorded throughout the Survey Area. Observations of primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings etc.) were recorded. Untimed active searches were undertaken opportunistically in microhabitats likely to contain fauna, involving raking of leaf litter, peeling bark, and splitting dead wood.

#### 3.2.4.5 Bird Surveys

Where possible, unbounded bird surveys were undertaken at each habitat assessment and trap site for a minimum duration of 10 minutes. One habitat assessment, KBH33, was accessed by helicopter without powering down, therefore a bird survey was not undertaken.

#### 3.2.4.6 Nocturnal Spotlighting

One night of spotlighting was undertaken. The spotlighting was undertaken from a vehicle and involved driving at a slow pace from Onslow to Ken's Bore via Onslow-Peedamulla Road and Red Hill Road.

#### 3.2.4.7 Identification and Taxonomy

Terrestrial vertebrate fauna taxa were identified in the field and released on site. Taxonomy and nomenclature in this report follows the WA Museum checklist 2021 (Western Australian Museum, 2021b) where relevant.

#### 3.2.4.8 Targeted Northern Quoll Trap Sites

Three cage trap sites (KBT01 - KBT03) were installed in preferred Northern Quoll (*Dasyurus hallucatus*) habitat during trip 3. Each trap line consisted of eight Sheffield wire cage traps spaced 10 – 20 m apart. KBT01 occurs just outside the current Survey Area boundary and KBT03 extends partially outside the current Survey Area boundary due to minor changes made to the Survey Area following trip 3. Traps were closed each morning and reopened in the evening. The traps were covered with hessian bags and baited with universal bait and sardines which was replenished as necessary. Two camera traps baited with universal bait and sardines were deployed at each of the three cage trap sites during trip 3.

Lines of camera traps were used to target Northern Quolls at sites KBT02 – KBT05 during trips 5 and 10. Each trap line consisted of camera traps, baited with universal bait and sardines or sardines on their own, spaced approximately 100 m apart along linear Northern Quoll habitat.

KBT01 was excluded from trips 5 and 10 as it was no longer within the current Survey Area boundary due to minor changes following trip 3.

Spot pattern analysis was undertaken following trips 5 and 10. The unique spot patterns of Northern Quolls captured by camera trap at sites KBT02 – KBT05 were analysed to quantify the number of individuals detected at each site.

Table 16 shows the total trapping effort for targeted Northern Quoll trap sites, and locations are shown in Figure 9.

**Table 16: Targeted Northern Quoll trapping effort**

Fauna Habitat	Site Name	Trip <sup>6</sup>	Number of Cages	Total Cage Trap Nights	Number of Camera Traps	Total Camera Trap Days and Nights
Drainage line/creek/river (minor) (adjacent mesas and breakaways)	KBT01	3	8	56	2	16
Mesas and breakaways	KBT02	3, 5, 10	8	56	9	42
Mesas and breakaways	KBT03	3, 5	8	56	7	31
Mesas and breakaways	KBT04	5	0	0	5	20
Mesas and breakaways	KBT05	5, 10	0	0	19	44
<b>Total</b>			<b>21</b>	<b>168</b>	<b>42</b>	<b>153</b>

#### 3.2.4.9 Acoustic Bat Surveys

Song Meter SM4BAT ultrasonic autonomous recording units (ARUs) were used to target bats during trips 3, 5 and 10. During trip 5, ultrasonic ARUs were located near trap sites or areas easily accessed by road and were moved periodically around the Survey Area. During trips 5 and 10, ultrasonic ARUs were deployed near habitat likely to be used by bats, such as water sources or rocky areas that contain caves or rocky overhangs, for a minimum of four nights at each location. Data captured by ARUs was analysed by Robert Bullen from Bat Call WA.

Table 17 shows the total survey effort for ultrasonic ARUs, and locations are shown in Figure 9.

**Table 17: Ultrasonic call ARU trapping effort**

Fauna Habitat	Nearest Trap Site	Trip	Ultrasonic ARU Recording Nights
Sand dunes and swales	KBB01	3	1
Plain (cattle watering hole)	Between KBB04 and KBB10	3	3
Stony plain	KBB05	3	1
Drainage line/river/creek (major)	KBB10	3	3
Stony plain (adjacent drainage line/creek/river and mesas and breakaways)	KBB11	5	4

<sup>6</sup>Trip 3 – October 2020, Trip 5 – April 2021, Trip 10 – June 2021

Fauna Habitat	Nearest Trap Site	Trip	Ultrasonic ARU Recording Nights
Drainage line/river/creek (minor)	KBT01	3	3
Mesas and breakaways	KBT02	3, 5, 10	13
Mesas and breakaways	KBT03	3, 5	7
Mesas and breakaways	KBT04	5	4
Mesas and breakaways	KBT05	10	12
Drainage line/river/creek (minor) (with open water)	East of KBT05	10	4
<b>Total</b>			<b>55</b>

#### 3.2.4.10 Acoustic Night Parrot Surveys

Song Meter SM4 acoustic ARUs were used to target the Night Parrot (*Pezoporus occidentalis*). Acoustic ARUs were placed in habitats that have potential to be used by Night Parrot, such as water sources or old growth spinifex. Acoustic ARUs were positioned within the Survey Area except for one acoustic ARU which was positioned 9 km southeast of the Survey Area at a nearby open water source, as there were limited water sources within the Survey Area at the time. Data captured by ARUs were analysed by Robert Bullen from Bat Call WA.

Table 18 shows the total survey effort for acoustic ARUs, and locations are shown in Figure 9.

**Table 18: Audible call ARU trapping effort**

Fauna Habitat	Nearest Trap Site	Trip	Audible ARU Recording Nights
Tidal flats (inundated claypan)	Southwest of KBB01	5	5
Plain (cattle watering hole)	KBB04 and KBB10	3	3
Stony Plain	KBB05	3	8
Stony hills and slopes	KBB06	3	1
Stony Plain	KBB08	3	1
Drainage line/river/creek (minor) (with open water)	Southeast of KBB09	3	2
Drainage line/river/creek (major)	KBB10	3	7
Stony plain	KBB11	5	6
Drainage line/river/creek (minor)	KBT01	3	3
<b>Total</b>			<b>36</b>

#### 3.2.4.11 Targeted Active Searches

Targeted active searches were undertaken at targeted trap sites KBT02 – KBT05 and baseline trap site KBB10 for a minimum duration of two person hours. These searches targeted evidence of conservation significant fauna such as scat, sloughed skin, remains, evidence of roosting in caves or overhangs, raking of leaf litter, peeling bark, and splitting dead wood.

### 3.2.5 SRE Invertebrate Fauna

A dual season SRE invertebrate fauna assessment was undertaken within the Survey Area in October 2020 (dry pitfall trapping) and June 2021 (active searching and leaf litter sampling). This comprised 30 sites throughout the Survey Area that were actively sampled for SRE invertebrates including leaf litter sifting and hand searching of appropriate microhabitats and 10 pitfall trap sites (KBB01-KBB10). Sites were chosen to maximise SRE habitat including south-facing slopes, gullies, rocky outcrops, dense patches of trees and permanent water bodies.

Locations of the SRE sampling sites are shown in Figure 9.

#### 3.2.5.1 Active Searches

Active searching was undertaken at 30 sites within the Survey Area, focussing on areas more likely to contain SRE fauna. Active searching consisted of sifting of soil and/or leaf litter from suitable habitat areas within each site (millipedes and land snails); the raking of leaf litter (millipedes, land snails, centipedes, mygalomorph burrows); examination of vegetative material below logs and bark (pseudoscorpions, centipedes, millipedes), and an examination of (if present) areas of rock outcrops and associated rock piles.

A minimum of one-person hour of active searching was undertaken at each site.

#### 3.2.5.2 Leaf Litter Collection

Leaf litter was collected from each site surveyed and processed in Tullgren funnels for potential SRE fauna. Approximately 3 L of leaf litter was collected from each site and stored in sealed ziplock bags.

#### 3.2.5.3 Pitfall traps

Dry pitfall trapping for SRE invertebrates was undertaken in conjunction with the vertebrate fauna survey at sites KBB01 – KBB10 during trip 3. Each site comprised two replicate lines of 5 pitfall traps (20 L buckets and 150 mm PVC pipes) buried in a line approximately 30 m in length with a drift fence of flywire placed along the centre line to direct invertebrates (and vertebrate fauna) into the pitfall traps. The pitfall traps were open for seven nights at each site. These traps were checked once a day for invertebrates and more often for vertebrate fauna. Potential SRE invertebrates were collected using forceps, placing specimens in 80% ethanol.

#### 3.2.5.4 Opportunistic Collection

Various areas that may provide habitat for SRE invertebrates was opportunistically sampled whilst undertaking other surveys in the area Survey Area. This included searching for burrows of mygalomorph spiders and searching under tree bark and logs for potential SRE taxa.

#### 3.2.5.5 SRE Habitat

Potential SRE habitat suitability was assessed and delineated over aerial photography at a scale of 1:5,000 based on fauna habitat mapping and vegetation condition mapping undertaken by 360 Environmental. Polygons were digitised and produced as electronic mapping data using GIS software.

The likelihood that a particular vegetation unit/habitat type contains or supports SRE taxa is defined in Table 19. In the absence of universally recognised definitions, these definitions have

been developed by highly experienced SRE practitioner Dr Timothy Moulds from Invertebrate Solutions.

**Table 19: SRE habitat suitability definitions**

SRE Habitat Suitability	Definition
<b>High</b>	The habitat has a high likelihood of containing SRE taxa as it has at least three microhabitat factors that support the presence of SRE taxa such as: southeast facing slopes, moisture, rocky areas, habitat isolates, deep leaf litter, mountainous areas, deep gullies or gorges, riparian vegetation, or habitats known to contain SRE taxa.
<b>Moderate</b>	The habitat has a moderate likelihood of containing SRE taxa as it has at least two microhabitat factors that support the presence of SRE taxa such as: southeast facing slopes, moisture, rocky areas, habitat isolates, deep leaf litter, mountainous areas, deep gullies or gorges, riparian vegetation or habitats known to contain SRE taxa.
<b>Low</b>	The habitat has a low likelihood of containing SRE taxa as it has only a single microhabitat factor that support the presence of SRE taxa such as: southeast facing slopes, moisture, rocky areas, habitat isolates, deep leaf litter, mountainous areas, deep gullies or gorges, riparian vegetation or habitats known to contain SRE taxa.
<b>Nil</b>	No potential habitat exists for SRE taxa within the vegetation type / condition area. This includes areas that are totally cleared, completely degraded or urbanised. This also includes areas that are dominated by weeds or exotic vegetation taxa.

#### 3.2.5.6 Sorting and Curation

Sorting for all SRE samples occurred in the Invertebrate Solutions laboratory using a Leica M125 100x dissecting microscope and was undertaken by Dr Timothy Moulds. In the laboratory, fauna was extracted from SRE leaf litter samples using Tullgren funnels and preserved in 100% ethanol. Each taxon was identified to the lowest practical taxonomic rank using published keys and descriptions, and the numbers of each taxon recorded. Each identified taxon was kept in a separate labelled vial and assigned a specimen tracking code. Specimen and site collection data were recorded in an Excel spreadsheet. At the conclusion of the study, all specimens will be lodged at the Western Australian Museum (WAM).

#### 3.2.5.7 Taxonomy and Nomenclature

Identification of the isopod specimens undertaken by Dr Simon Judd, and identification of all other collected invertebrate material was undertaken by Dr Timothy Moulds from Invertebrate Solutions. Invertebrate groups collected that have no SRE representatives such as ants and flying insects were not identified or reported. The presence of winged adults in most insect groups suggests that they are more capable dispersers and, therefore, less likely to have a restricted range.

The level of specimen identification achievable is dependent on the level of taxonomic knowledge and expertise available. Most of the taxonomic expertise relating to SRE taxa resides with the staff of the WAM, while some groups are also worked on by researchers within other government departments and academic institutions. Taxonomic treatments are available for some invertebrate groups, but not all. The EPA expects that invertebrates collected for identification will be identified to the lowest taxonomic level possible. Ideally, this is to the species level, but there will be limits due to the nature of specimens and the availability of



taxonomic keys. Specimens identified to genus level only were excluded from the analysis as it is impossible to determine if they represent a SRE taxon.

### 3.2.5.8 SRE Status

Taxonomic groups known to contain SRE representatives were examined in more detail to determine if the specimens collected are potentially restricted forms. SRE status was assigned using the categories described in Table 20 after comparison with the morphology of other close relatives in the group and current knowledge on their distribution and ecology, where known. The definition for confirmed SRE status is based on that used by Harvey (2002), however no other recognised definitions exist, therefore the definitions for possible SRE taxa have been adapted from unpublished WAM guidelines by highly experienced SRE practitioner Dr Timothy Moulds from Invertebrate Solutions.

**Table 20: Short range endemic status of taxa**

SRE Status	Definition
Confirmed	A confirmed SRE taxon. A known distribution of < 10,000 km <sup>2</sup> (Harvey, 2002). Taxonomy of the group is well known. The group is well represented in collections, or via comprehensive sampling.
Likely	Likely to be a SRE taxon based upon knowledge of the family/genus, where other closely related taxa show evidence of short-range endemism. Where habitats containing the specimens show discontinuity within the landscape.
Possible	Based upon existing knowledge of the family/genus there is a possibility that the taxon may have a restricted range. Where habitats containing the specimens may show discontinuity within the landscape, possible SRE taxon may be assigned one of the subcategories below; <ul style="list-style-type: none"> <li>A. Data deficient. i.e. new species, lack of distribution, taxonomic or collecting knowledge, juvenile specimens, wrong sex for identification</li> <li>B. Habitat indicators</li> <li>C. Morphology indicators</li> <li>D. Molecular evidence</li> <li>E. Research and expertise of WAM staff/taxonomic specialists.</li> </ul>
Widespread	Not an SRE, a wide-ranging distribution of >10,000 km <sup>2</sup>

## 3.3 Extrapolation Area

A 6,663 ha section of the Survey Area was included in the desktop assessment but could not be assessed during field surveys due to access limitations. Fauna habitat mapping has been extrapolated over a 3,418 ha portion of the area that could not be assessed to provide indicative fauna habitat mapping. Fauna habitat mapping was extrapolated with boundaries delineated over aerial photography at a scale of 1:5,000. Information gathered from the accessible portions of the Survey Area during field surveys undertaken by 360 Environmental was used in conjunction with background information such as broad scale vegetation and land systems mapping to estimate fauna habitats present with the Extrapolation Area. Polygons were digitised and produced as electronic mapping data using GIS software.

### 3.4 Survey Adequacy

Species accumulation curves for vertebrate fauna groups were plotted using the open source software R (R Core Team, 2020) to determine the adequacy of the survey. The treatments comprised Sobs (Mao Tao), to reflect the number of species observed (based on the total number of species recorded), and richness estimators (Chao, Jackknife 1, Jackknife 2 and Bootstrap) to predict the total number of fauna taxa that could potentially be recorded (Clarke and Gorley, 2006).

### 3.5 Limitations

Limitations and constraints of the fauna surveys are detailed in Table 21.

**Table 21: Survey limitations**

Variable	Constraint (Yes/Partial/No)	Potential Constraints on Survey Outcomes
<b>Survey scope</b>	Partial	<p>The detailed vertebrate fauna and SRE surveys were undertaken in accordance with the <i>Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment</i> (Environmental Protection Authority, 2020) and <i>Technical Guidance - Sampling of short range endemic invertebrate fauna</i> (Environmental Protection Authority, 2016) where possible and practicable.</p> <p>The scope of the detailed vertebrate fauna survey was limited to a single season. Trip 3 (initial detailed survey) and Trip 5 (infill detailed survey) were undertaken in different seasons, however trap sites established during these trips were not resampled across dual seasons. Information was available from many similar surveys previously undertaken nearby, as shown in Section 3.1.1 and below in Section 4.1.1, therefore it is unlikely that a second season survey will yield taxa that have not been identified in the desktop assessment.</p> <p>Targeted surveys for fauna of conservation significance were undertaken in habitat suitable for Threatened and Priority fauna.</p>
<b>Availability of data and information</b>	No	<p>All data required to complete the scope of works including regional and local contextual information was available. Information was available from many similar surveys previously undertaken nearby, as shown in Section 3.1.1 and below in Section 4.1.1.</p>
<b>Site Access</b>	Yes	<p>Most of the Survey Area was accessed by helicopter, vehicle and on foot.</p> <p>One section of the Survey Area could not be accessed due to pastoral leaseholder restrictions. This area was included in the background information and desktop assessment compiled for this report, but no field surveys or associated results have been assessed as part of this report. Additional surveys will be undertaken in this area in future, the outcomes of which will be documented in a separate report.</p>
<b>Adequacy of survey intensity</b>	No	<p>Twelve baseline terrestrial vertebrate fauna trap sites and five trap sites targeting conservation significant terrestrial vertebrate fauna were sampled across the Survey Area. A variety of vertebrate fauna detection methods were utilised, including:</p>

Variable	Constraint (Yes/Partial/No)	Potential Constraints on Survey Outcomes
		<ul style="list-style-type: none"> <li>• 1,140 pitfall trap nights</li> <li>• 1,020 funnel trap nights</li> <li>• 140 small Elliott trap nights</li> <li>• 168 cage trap nights</li> <li>• 204 camera trap days and nights</li> <li>• 55 ultrasonic call ARU recording nights</li> <li>• 36 audible call ARU recording nights.</li> </ul> <p>The SRE surveys included over 30 person hours of active searching, 30 leaf litter samples extracted in Tullgren funnels and 900 pitfall trap nights to provide a high degree of certainty that the majority of potential SRE invertebrates present at the time of surveys were recorded from the Survey Area.</p> <p>Given the size of the Survey Area it was not feasible to systematically survey the entire Survey Area. Additional fauna taxa would likely be recorded with additional survey effort.</p> <p>Access across the Survey Area was sufficient to describe fauna habitats and their extents given the use of a helicopter. Sufficient time was allocated to the fauna surveys, given the size and complexity of the Survey Area, the expected level of survey intensity and that a portion of the Survey Area could not be accessed.</p> <p>The survey effort was considered adequate to assess the fauna values of the Survey Area and provide the information required to support approvals applications.</p>
<b>Competency and experience</b>	No	<p>The fauna field surveys were undertaken by a team with extensive experience in undertaking similar scopes of work within the bioregion:</p> <ul style="list-style-type: none"> <li>• Senior Zoologist Edward Swinhoe – 15 years’ experience</li> <li>• Senior Zoologist Michael Brown – 15 years’ experience</li> <li>• Zoologist Evan Webb – 4 years’ experience</li> <li>• Ecologist Lukas Geidans – 4 years’ experience</li> <li>• Zoologist Poppy Walker – 1 year experience.</li> </ul> <p>ARU data analysis was undertaken by specialist Robert Bullen of Bat Call WA. SRE specimen identification and data curation was managed by specialist Dr Timothy Moulds of Invertebrate Solutions and Dr Simon Judd.</p>
<b>Timing, Weather and Season</b>	No	<p>Five fauna field surveys were undertaken across the broader Survey Area during 2020 and 2021. These included surveys undertaken during the recommended primary survey periods for the Eremaean Climatic Region as per the Technical Guidance:</p> <ul style="list-style-type: none"> <li>• Reptiles – September to April</li> <li>• Mammals – no preferred time</li> <li>• Amphibians and birds – immediately after rain events.</li> <li>• SRE – November to April or timed to coincide with rainfall.</li> </ul> <p>The SRE survey was undertaken outside the optimal time period for SRE surveys, however a 68.8 mm rainfall event was recorded in the four days prior to the survey. Furthermore, active searching is effective outside the optimal survey period because detection of SRE invertebrates does not depend on invertebrate activity levels.</p>

Variable	Constraint (Yes/Partial/No)	Potential Constraints on Survey Outcomes
		Species diversity during the initial baseline detailed survey (Trip 3) was lower than expected, which may have been due to a prolonged period of low rainfall, however trips 5 and 10 were undertaken after rain events, therefore this is not a constraint on the results of the survey.
<b>Proportion of fauna identified, recorded and/or collected</b>	No	<p>All vertebrate fauna taxa recorded during the survey were able to be identified with a high level of confidence.</p> <p>Invertebrate taxa were identified to the lowest practical taxonomic level, taking into consideration that the taxonomic framework of many invertebrate groups is incomplete and often in need of substantial revision to enable accurate identification.</p> <p>Short Range Endemic status was assigned using the available information from the WAM database and discussion with appropriate taxonomic authorities for various invertebrate groups. Insufficient information exists for many invertebrate taxa due to specimens being juvenile, the wrong sex to allow identification, damaged, or inadequate taxonomic frameworks, precluding the assignment of SRE status.</p>
<b>Disturbances</b>	No	Areas of disturbance associated with old borrow pits, access tracks, cattle grazing, and trampling, weeds and frequent fire were recorded but were not a constraint on the results of the survey.
<b>Problems with data and analysis</b>	No	There were no constraints on the results of the survey due to problems with data and analysis.

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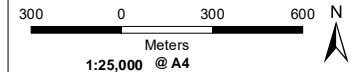
**Legend**

- Roads
- Survey Area
- Fauna GPS Tracks

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**LOCALITY MAP**



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HORIZONTAL DATUM AND PROJECTION  
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LFV	EW	SW	03

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**Figure 9a**  
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### Legend

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- Survey
- Fauna GPS Tracks
- SRE GPS Tracks

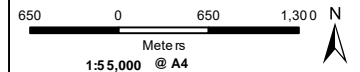
### Fauna Survey Sites

- ◆ ARU - audible calls
- ◆ ARU - ultrasonic calls
- Baseline trap site
- Camera trap
- ▲ Habitat assessment
- SRE Survey Sites

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**LOCALITY MAP**



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**Figure 9b**  
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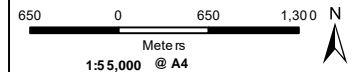


- ### Legend
- Roads
  - Survey Area
  - Fauna GPS Tracks
  - SRE GPS Tracks
- ### Fauna Survey Sites
- Baseline trap site
  - Camera trap
  - Habitat assessment
  - SRE Survey Sites

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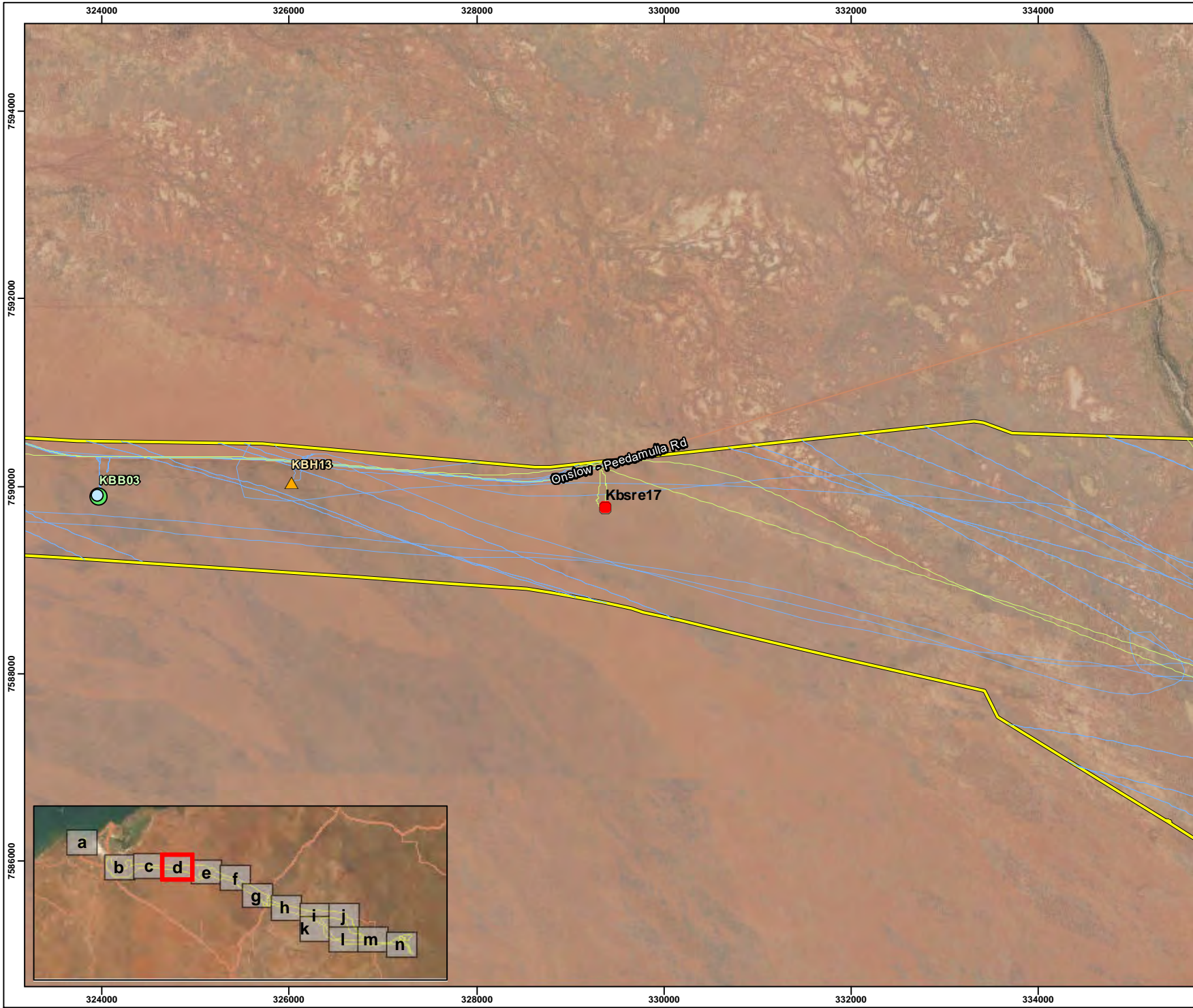
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 GDA 1994 MGA Zone 50

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**Figure 9c**  
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**Legend**

- Roads
- Survey Area
- Fauna GPS Tracks
- SRE GPS Tracks

**Fauna Survey Sites**

- Baseline trap site
- Camera trap
- ▲ Habitat assessment
- SRE Survey Sites

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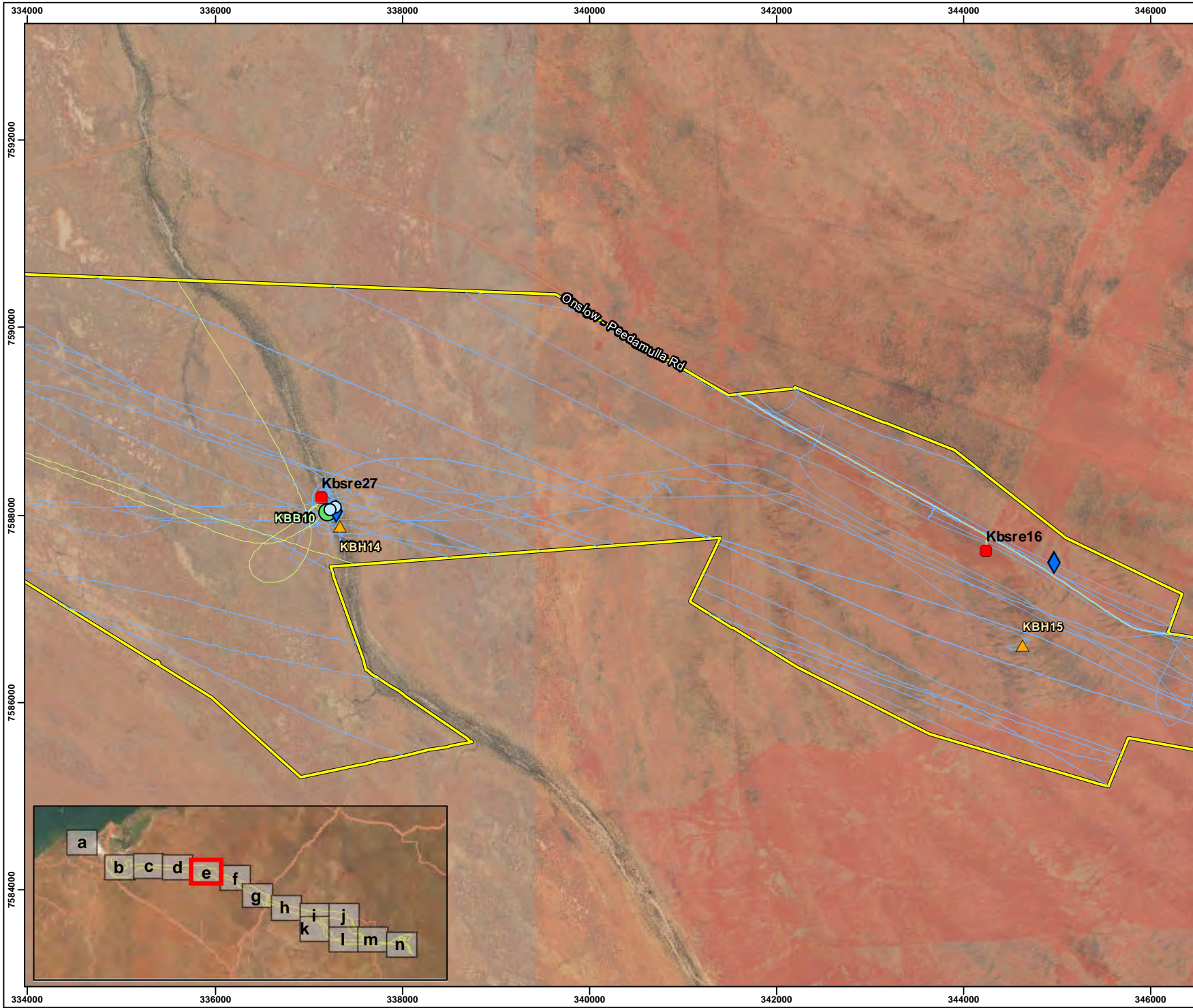
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### Legend

- Roads
- Survey Area
- Fauna GPS Tracks
- SRE GPS Tracks

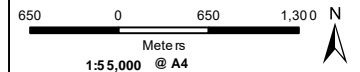
### Fauna Survey Sites

- ◆ ARU - audible calls
- ◆ ARU - ultrasonic calls
- Baseline trap site
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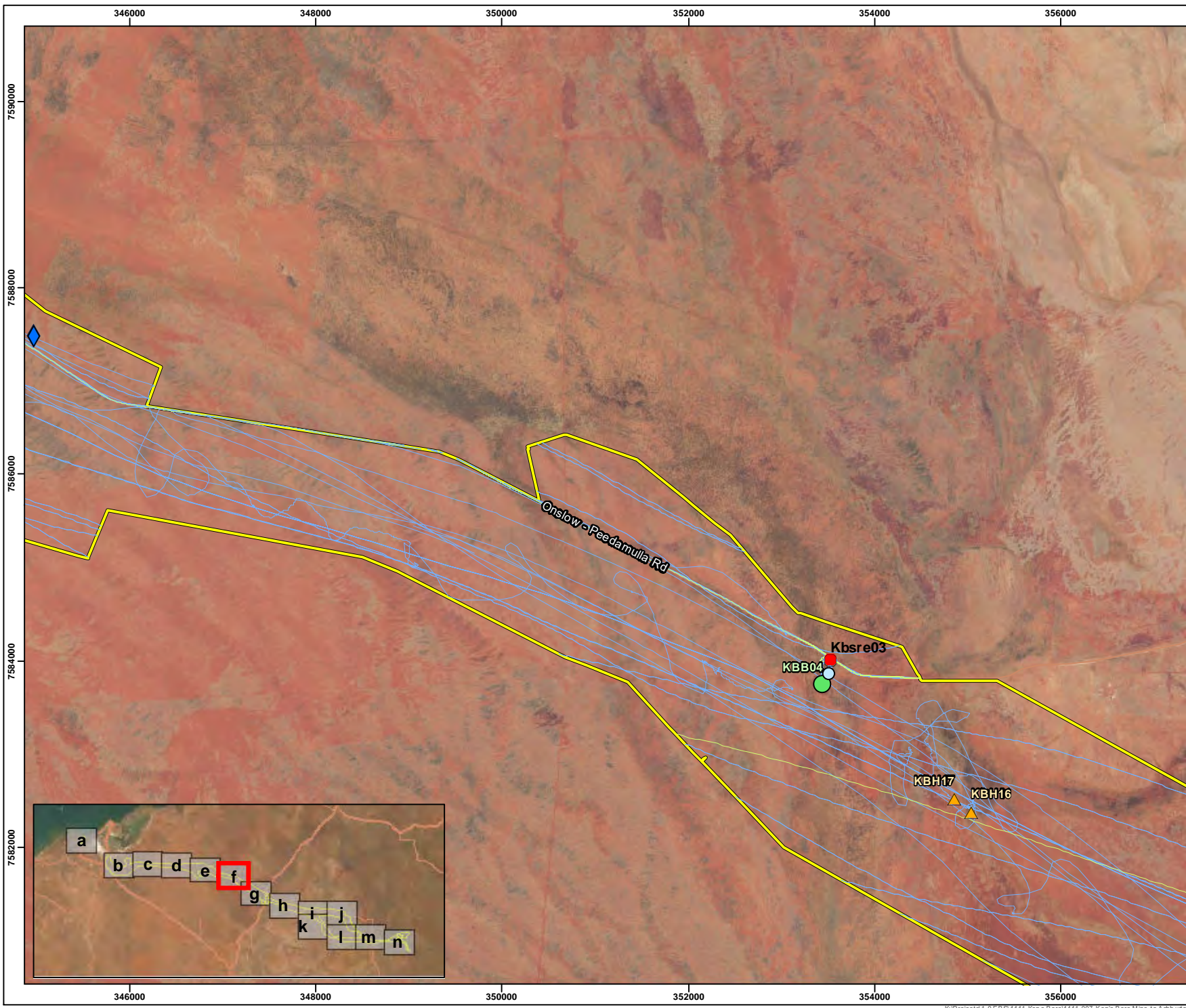


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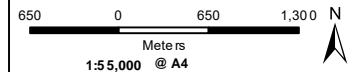


- ### Legend
- Roads
  - Survey Area
  - Fauna GPS Tracks
  - SRE GPS Tracks
- ### Fauna Survey Sites
- ARU - audible calls
  - ARU - ultrasonic calls
  - Baseline trap site
  - Camera trap
  - Habitat assessment
  - SRE Survey Sites

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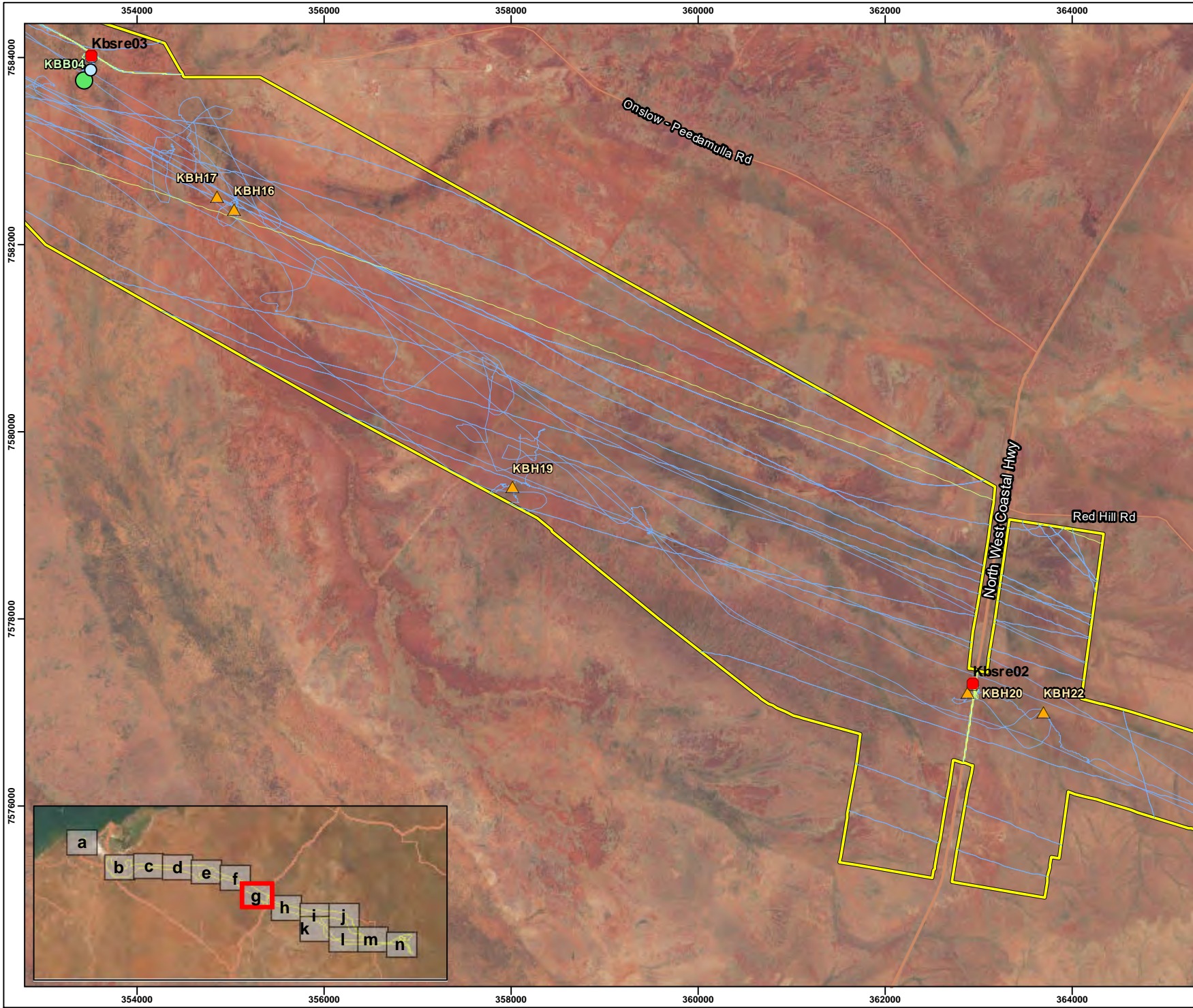


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**Legend**

- Roads
- Survey Area
- Fauna GPS Tracks
- SRE GPS Tracks

**Fauna Survey Sites**

- Baseline trap site
- Camera trap
- Habitat assessment
- SRE Survey Sites

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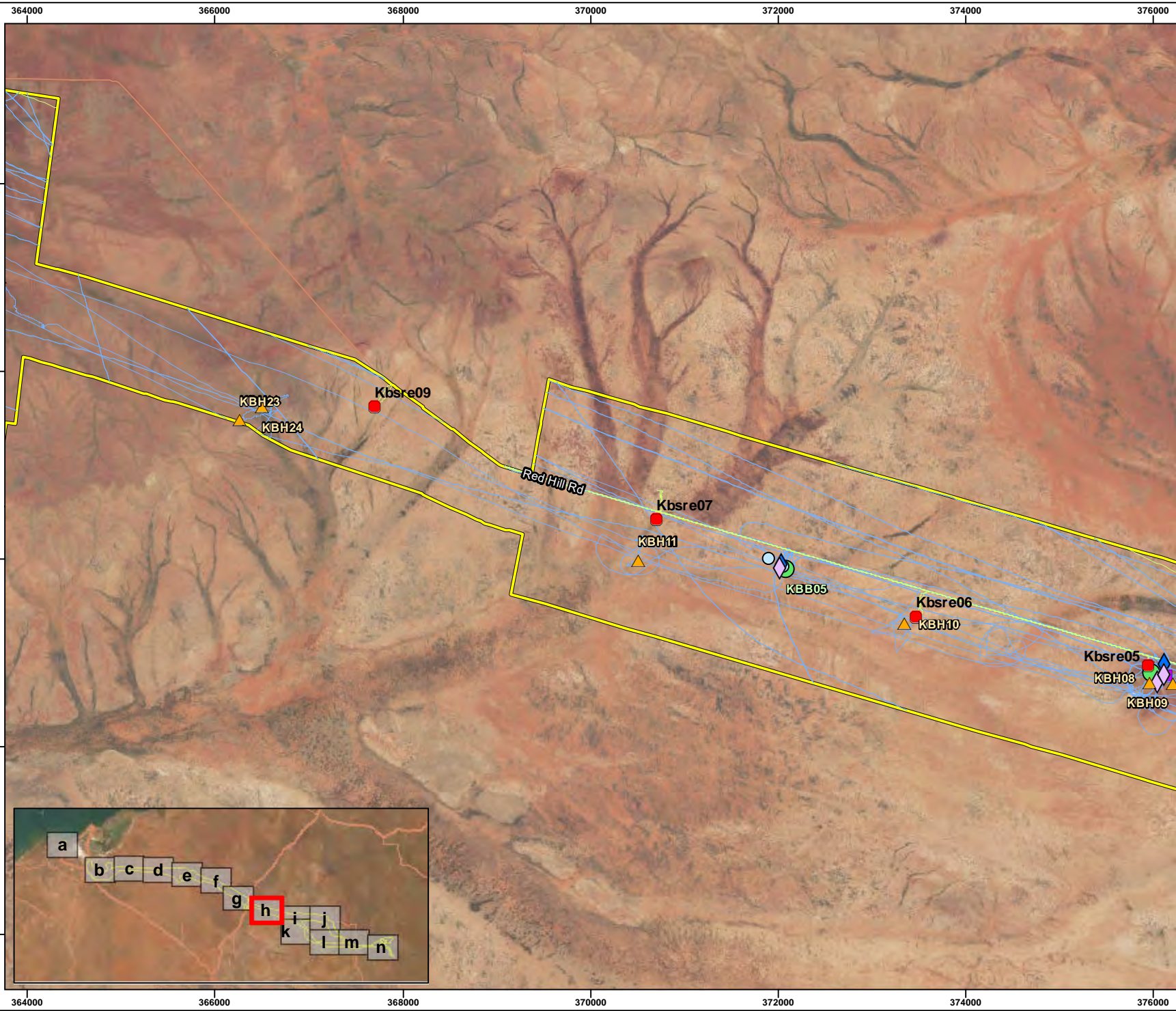
**LOCALITY MAP**

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**Legend**

- Roads
- Survey Area
- Fauna GPS Tracks
- SRE GPS Tracks

**Fauna Survey Sites**

- ◆ ARU - audible calls
- ◆ ARU - ultrasonic calls
- Baseline trap site
- Camera trap
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- Targeted trap site
- SRE Survey Sites

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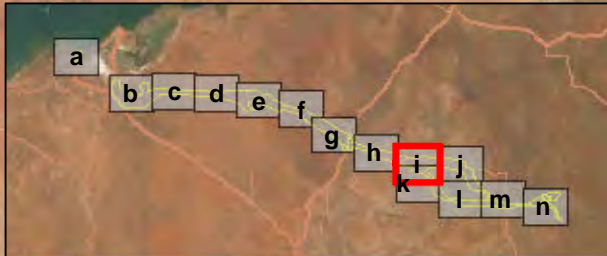
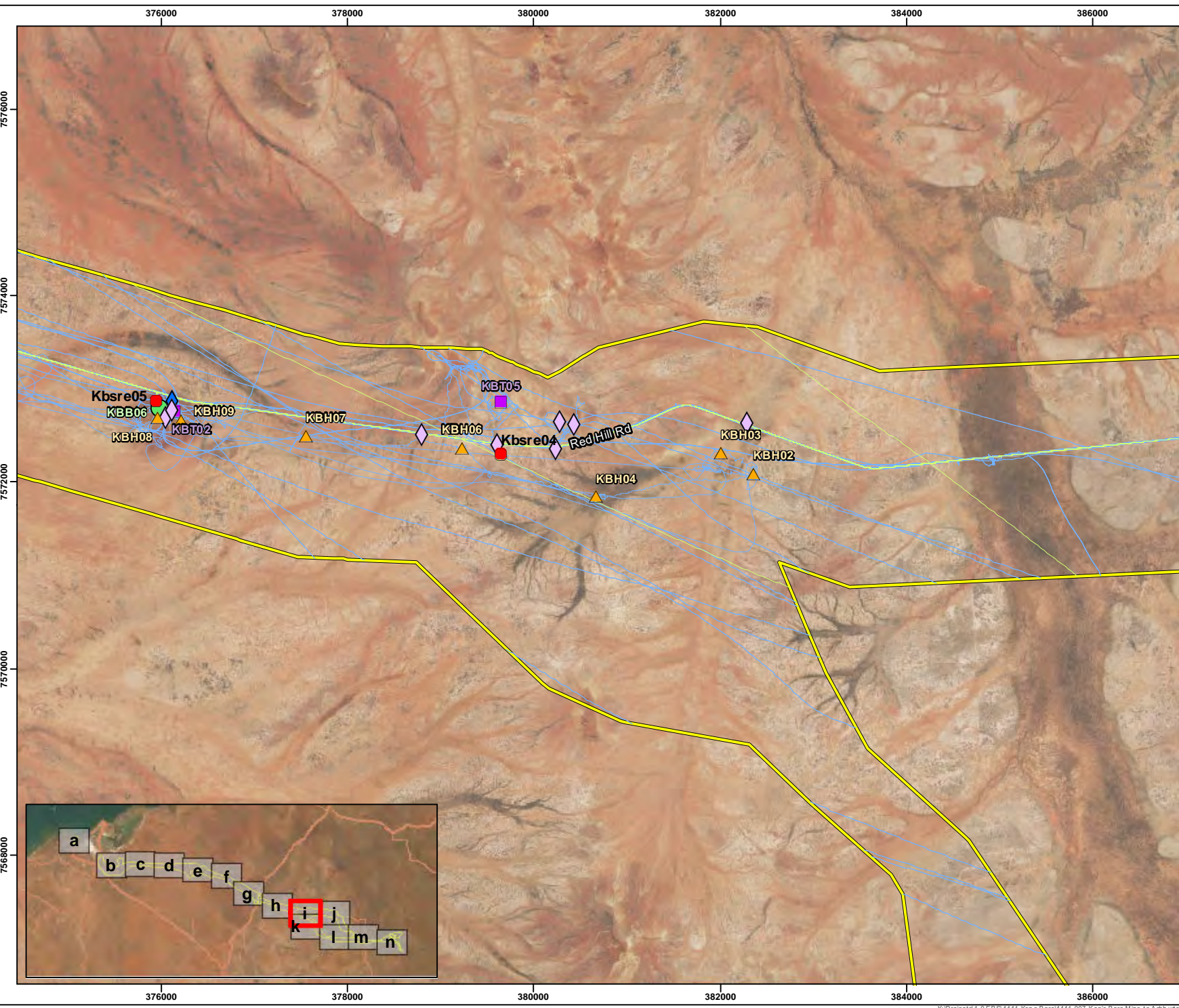
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**Legend**

- Roads
- Survey Area
- Fauna GPS Tracks
- SRE GPS Tracks

**Fauna Survey Sites**

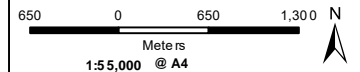
- ◆ ARU - audible calls
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**Legend**

- Roads
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- Fauna GPS Tracks
- SRE GPS Tracks

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**LOCALITY MAP**

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HORIZONTAL DATUM AND PROJECTION GDA 1994 MGA Zone 50			
CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03

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**SRE Assessment**

**Figure 9j**  
**Survey Effort**

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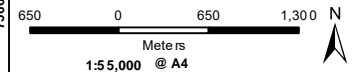


- Legend**
- Roads
  - Survey Area
  - Fauna GPS Tracks
  - SRE GPS Tracks
- Fauna Survey Sites**
- ▲ Habitat assessment

- NOTE THAT POSITION ERRORS CAN BE >5m IN SOME AREAS  
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**LOCALITY MAP**



PROJECT ID 4441 007	DATE 26/08/2021
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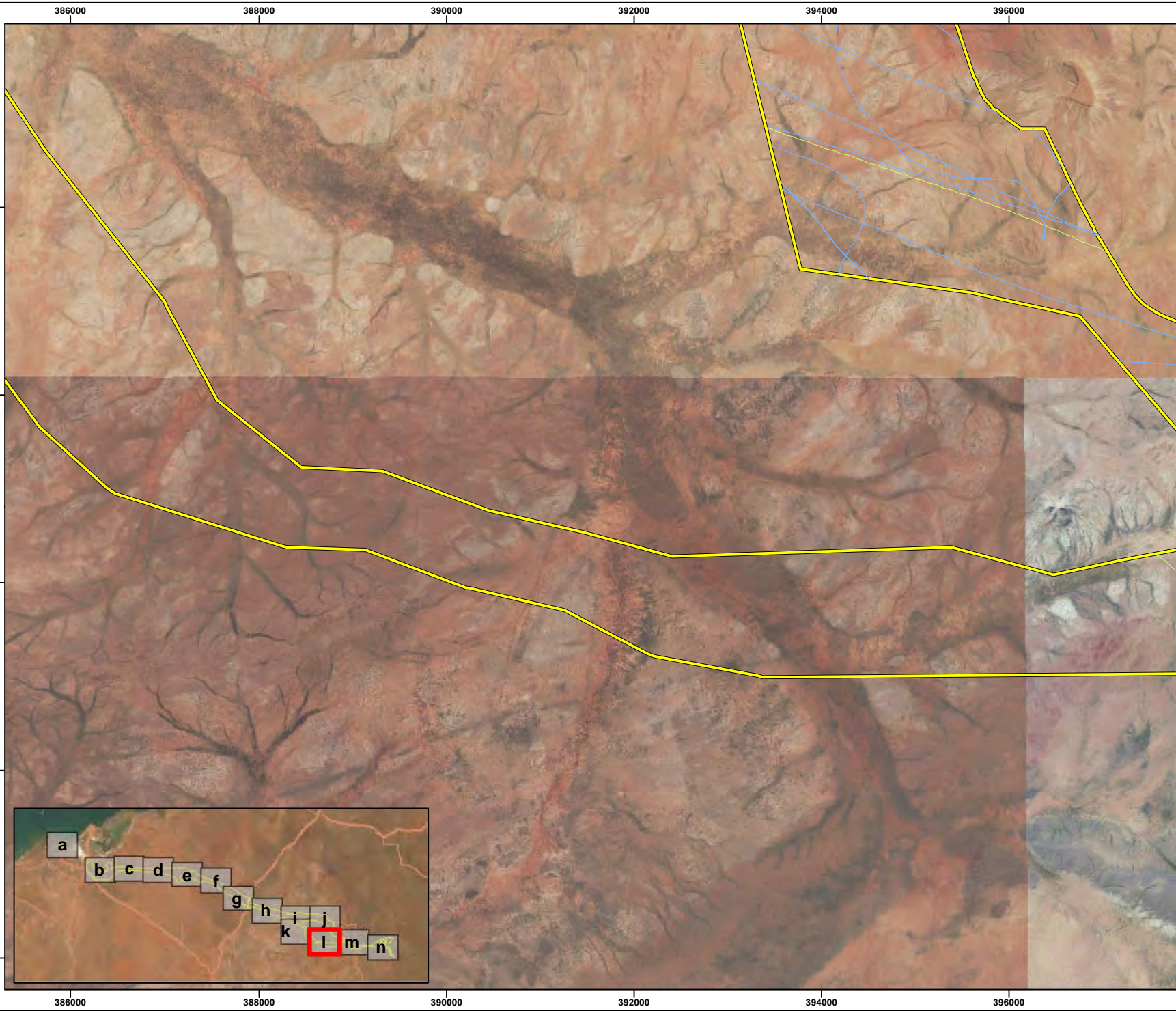
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### Legend

- Roads
- Survey Area
- Fauna GPS Tracks
- SRE GPS Tracks

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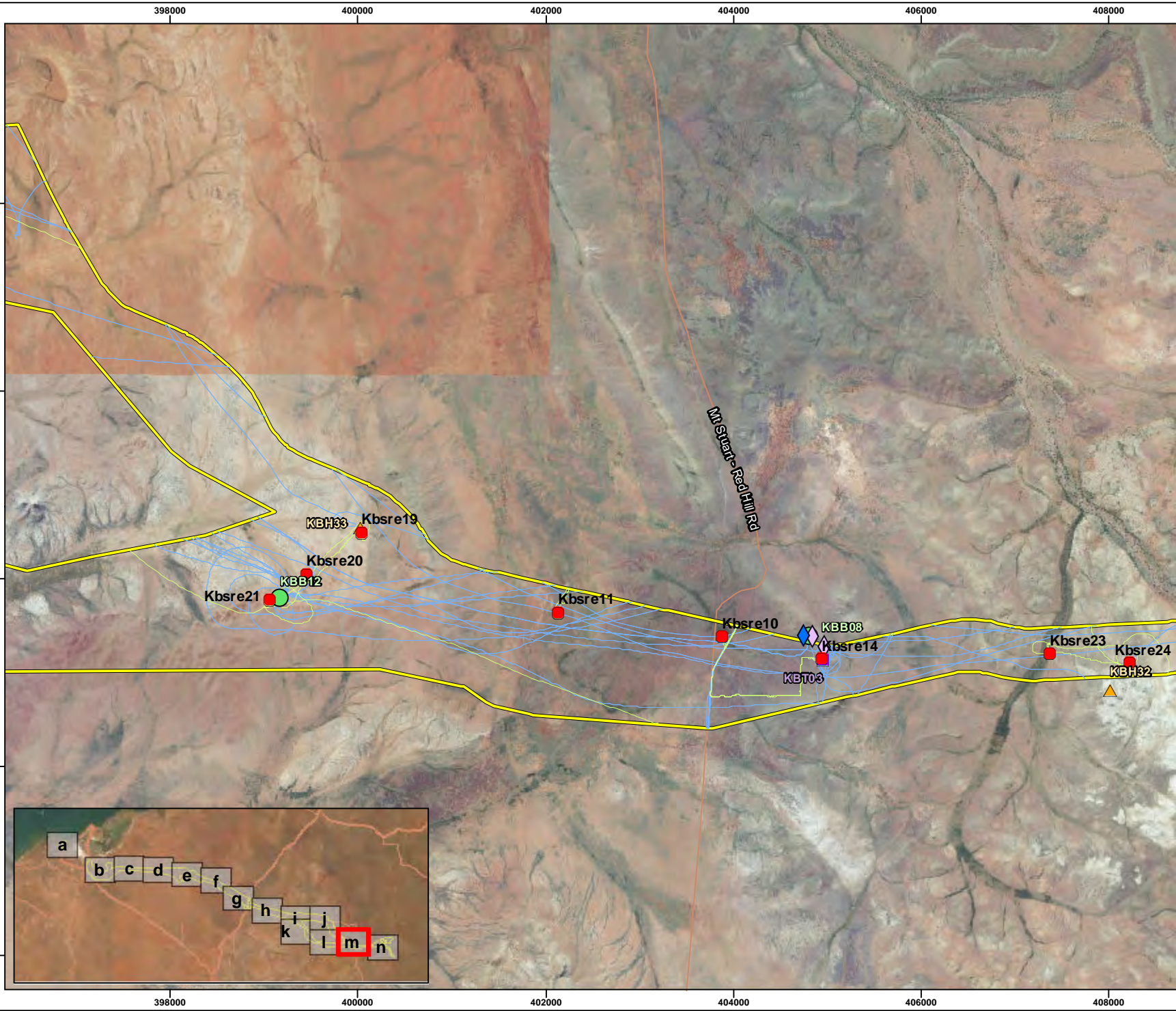
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HORIZONTAL DATUM AND PROJECTION GDA 1994 MGA Zone 50			
CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03

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### Legend

- Roads
- Survey
- Fauna GPS Tracks
- SRE GPS Tracks

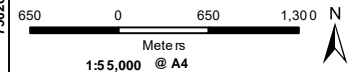
### Fauna Survey Sites

- ◆ ARU - audible calls
- ◆ ARU - ultrasonic calls
- Baseline trap site
- ▲ Habitat assessment
- Targeted trap site
- SRE Survey Sites

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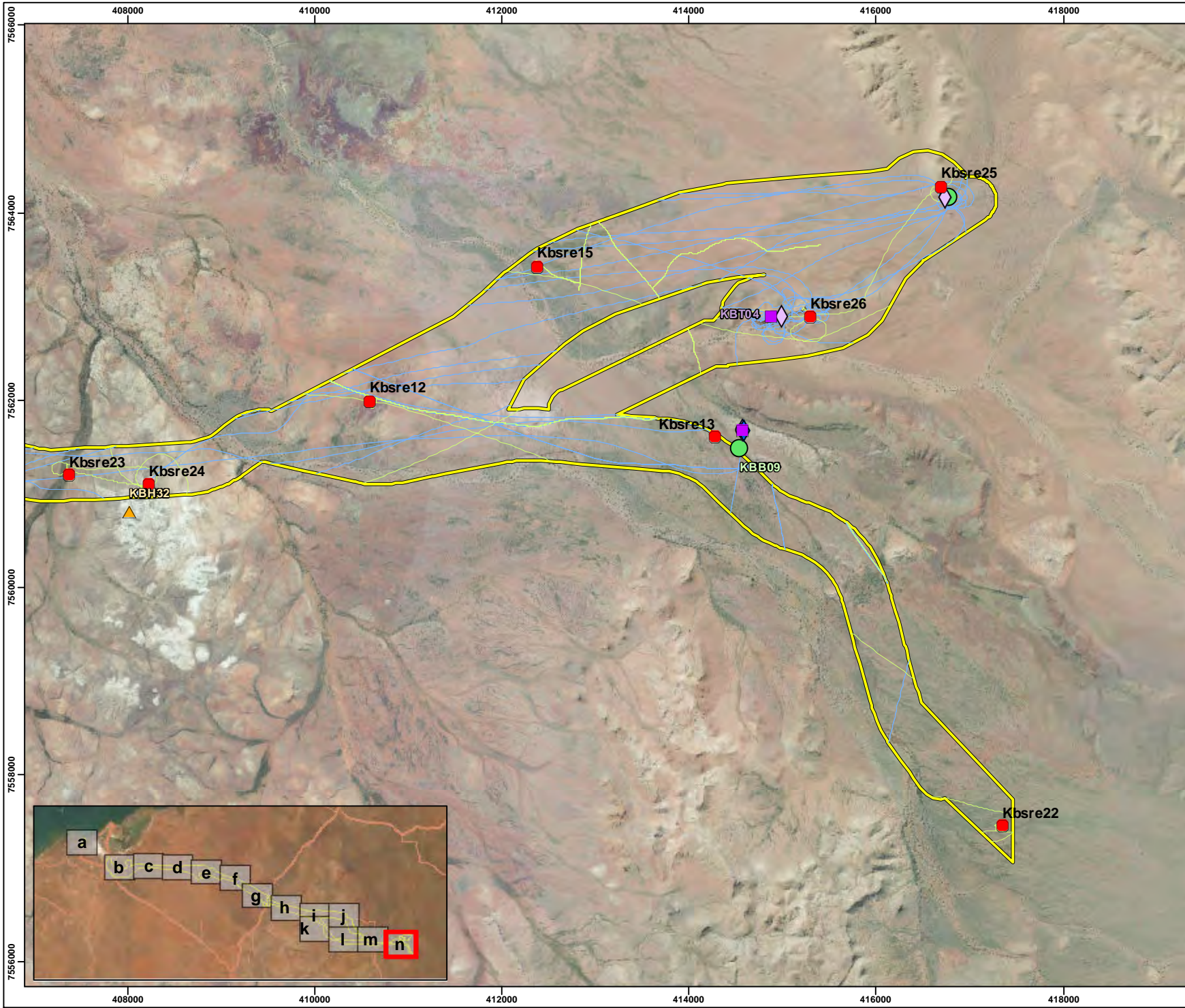
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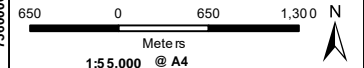
### Legend

- Roads
- Survey Area
- Fauna GPS Tracks
- SRE GPS Tracks
- Fauna Survey Sites**
- ◆ ARU - audible calls
- ◆ ARU - ultrasonic calls
- Baseline trap site
- Camera trap
- ▲ Habitat assessment
- Targeted trap site
- SRE Survey Sites

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### LOCALITY MAP



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HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

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**Figure 9n**  
 Survey Effort

## 4 Results

### 4.1 Vertebrate Fauna

#### 4.1.1 Desktop Assessment

##### 4.1.1.1 Literature Review and Database Searches

The literature review and database searches identified 441 terrestrial vertebrate fauna taxa, of which 58 are conservation significant, comprising:

- A total of 247 birds, of which 46 are conservation significant
- A total of 52 mammals, of which seven are conservation significant (excluding marine mammals)
- A total of 132 reptiles, of which five are conservation significant (excluding marine reptiles)
- Ten amphibians, none of which are conservation significant.

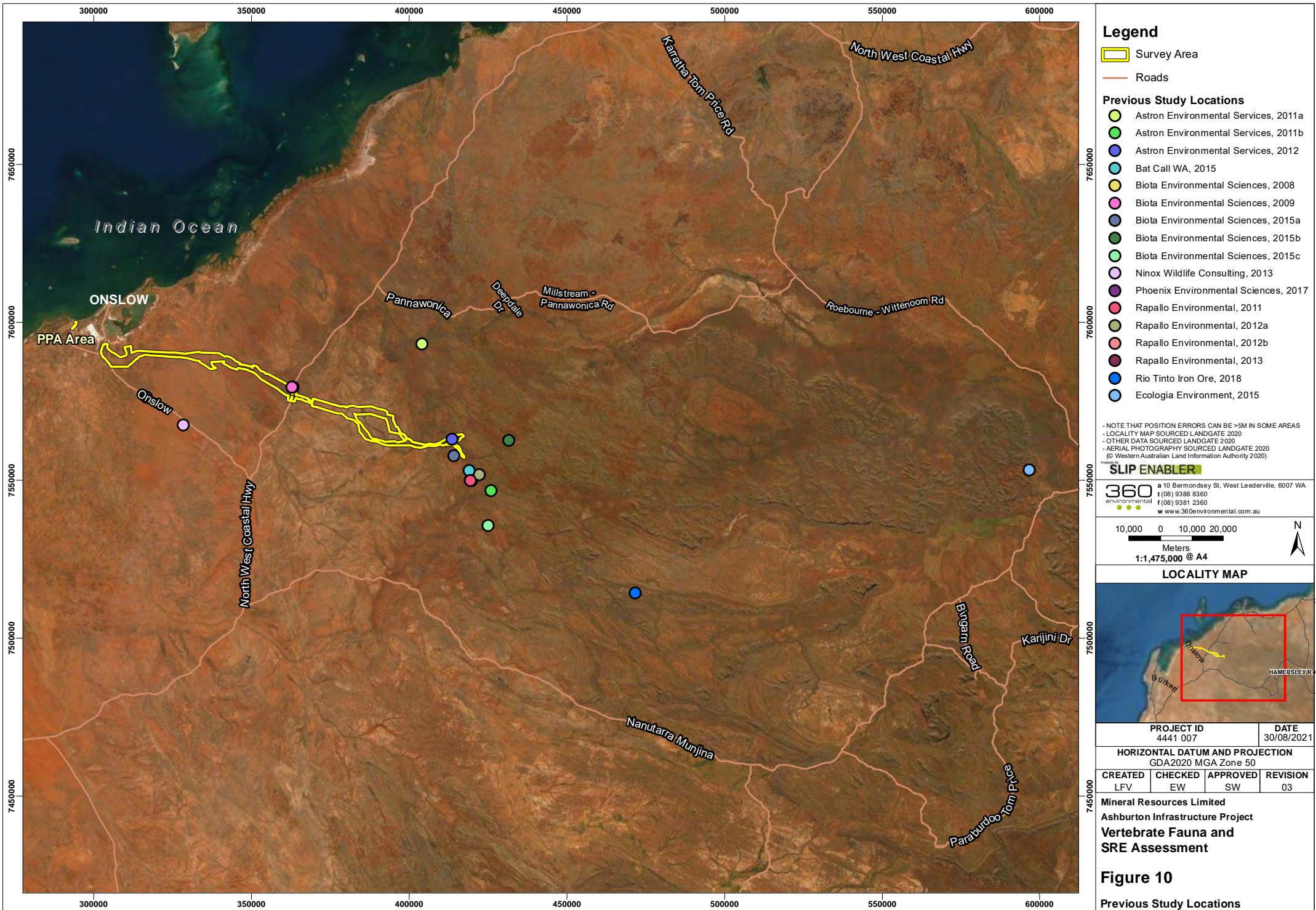
The locations of the previous studies reviewed are shown in Figure 10 and key findings of the literature review are summarised in Table 22. The results of the DBCA Threatened and Priority Fauna database search are mapped in Figure 11 and database searches are displayed in their entirety in Appendix A. A full inventory of fauna identified during the desktop assessment is presented in Appendix C.

##### 4.1.1.2 Conservation Significant Vertebrate Fauna Likelihood of Occurrence

The likelihood of occurrence assessment for conservation significant vertebrate fauna taxa is summarised below and presented in its entirety in Table 23:

- Twenty-one taxa were assessed as having a high likelihood of occurrence within the Survey Area (of which four were later confirmed to occur during field surveys), comprising:
  - Grey Falcon (*Falco hypoleucos*) – Vulnerable under BC Act
  - Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected Fauna under BC Act
  - Northern Quoll (*Dasyurus hallucatus*) (confirmed) – Endangered under BC Act and EPBC Act
  - Ghost Bat (*Macroderma gigas*) (confirmed) – Vulnerable under BC Act and EPBC Act
  - Short-tailed Mouse (*Leggadina lakedownensis*) – Priority 4 under BC Act
  - Pilbara Leaf-nosed Bat (*Rhinioncteris aurantia* Pilbara form) (confirmed) – Vulnerable under BC Act and EPBC Act
  - Western Pebble-mound Mouse (*Pseudomys chapmani*) (confirmed) – Priority 4 under BC Act
  - Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable under BC Act and EPBC Act
  - Thirteen wetland/shorebirds.

- Eighteen taxa were assessed as having a medium likelihood of occurrence within the Survey Area, comprising:
  - Pacific Swift (Fork-tailed Swift) (*Apus pacificus*) – Migratory under BC Act and EPBC Act
  - Barn Swallow (*Hirundo rustica*) – Migratory under BC Act and EPBC Act
  - Common Brushtail Possum (*Trichosurus vulpecula*) – Locally significant due to rarity in the Pilbara and taxonomic doubt surrounding the Pilbara population
  - Maryan's Keeled Slider (*Lerista planiventralis maryani*) – Priority 1 under BC Act
  - Fourteen wetland/shorebirds.
- Eighteen taxa have a low likelihood of occurrence within the Survey Area.

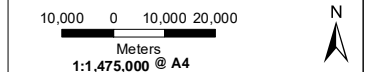


- ### Legend
- Survey Area
  - Roads
- #### Previous Study Locations
- Astron Environmental Services, 2011a
  - Astron Environmental Services, 2011b
  - Astron Environmental Services, 2012
  - Bat Call WA, 2015
  - Biota Environmental Sciences, 2008
  - Biota Environmental Sciences, 2009
  - Biota Environmental Sciences, 2015a
  - Biota Environmental Sciences, 2015b
  - Biota Environmental Sciences, 2015c
  - Ninox Wildlife Consulting, 2013
  - Phoenix Environmental Sciences, 2017
  - Rapallo Environmental, 2011
  - Rapallo Environmental, 2012a
  - Rapallo Environmental, 2012b
  - Rapallo Environmental, 2013
  - Rio Tinto Iron Ore, 2018
  - Ecologia Environment, 2015

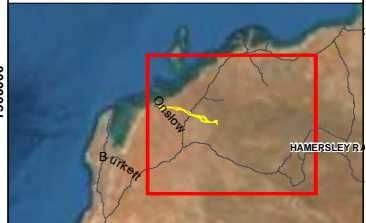
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<b>CREATED</b> LFV	<b>CHECKED</b> EW	<b>APPROVED</b> SW	<b>REVISION</b> 03

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**Figure 10**  
**Previous Study Locations**

Table 22: Literature review summary

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>2011 Targeted Surveys for Populations of the Northern Quoll on the West Pilbara Iron Ore Project</i> (Rapallo Environmental, 2012b)	Overlaps Survey Area	June, July, August, and October 2011	164 motion cameras deployed for a minimum of five nights  Eight trap sites with 20 cage traps at each.	<ul style="list-style-type: none"> <li>• 116 Northern Quoll (<i>Dasyurus hallucatus</i>) identified with motion cameras</li> <li>• 41 Northern Quoll (<i>Dasyurus hallucatus</i>) captured within cage traps</li> <li>• Pilbara Olive Python (<i>Liasis olivaceus barroni</i>)</li> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonictoris aurantia</i> Pilbara form)</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>)</li> <li>• Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>).</li> </ul>	<p>Four habitats were identified.</p> <ul style="list-style-type: none"> <li>• Potential denning habitat (Areas with caves, crevices, and tunnels)</li> <li>• Potential forage and dispersal habitats (Areas that border denning habitat)</li> <li>• Adjacent to medium suitable habitats (Areas with sparse vegetation or no caves, crevices, or tunnels)</li> <li>• Other (Areas with no suitable Northern Quoll habitat).</li> </ul>
<i>A Level 1 Vertebrate Fauna Assessment of the Proposed Tubridgi to Wheatstone Gas Pipeline, Western Australia</i> (Ninox Wildlife Consulting, 2011)	Overlaps Survey Area	April 2013	Reconnaissance survey	<ul style="list-style-type: none"> <li>• Eastern Great Egret (<i>Ardea alba modesta</i>) (no longer listed)</li> <li>• Rainbow Bee-eater (<i>Merops ornatus</i>) (no longer listed)</li> <li>• Australian Bustard (<i>Ardeotis australis</i>) (no longer listed).</li> </ul>	Mangrove habitat was identified.
<i>Annual Monitoring Survey of the WPIOP Stage 1 for API Management</i> (Rapallo Environmental, 2013)	Overlaps Survey Area	June/July 2012	150 cage traps over eight trapping sites	<ul style="list-style-type: none"> <li>• 75 Northern Quoll (<i>Dasyurus hallucatus</i>) captured within cage traps.</li> </ul>	NA

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>Biological Assessment of the Conservation Focus Area for API Management (Rapallo Environmental, 2012a)</i>	Red Hill Creek and Cane River, east of central MSAs	June 2011 and May 2012	Reconnaissance Survey: <ul style="list-style-type: none"> <li>• 24 motion cameras deployed for between 19 and 22 days</li> <li>• 10 SM2+ echolocation recording units</li> <li>• Trapping Survey:</li> <li>• 100 cage traps over five trapping sites.</li> </ul>	<ul style="list-style-type: none"> <li>• 13 Northern Quoll (<i>Dasyurus hallucatus</i>) captured on motion camera</li> <li>• 23 Northern Quoll (<i>Dasyurus hallucatus</i>) captured within cage traps</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>)</li> <li>• Rainbow Bee-eater (<i>Merops ornatus</i>)</li> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonictes aurantia</i> Pilbara form)</li> <li>• Pilbara Olive Python (<i>Liasis olivaceus barroni</i>)</li> <li>• Australian Bustard (<i>Ardeotis australis</i>).</li> </ul>	Eight habitats were identified. <ul style="list-style-type: none"> <li>• Gorge</li> <li>• Hill/Plateau</li> <li>• Mesa/Outcrop</li> <li>• Major Riparian (incised drainage)</li> <li>• Major Riparian (open drainage)</li> <li>• Minor Riparian (incised drainage)</li> <li>• Minor Riparian (open drainage)</li> <li>• Plains.</li> </ul> 37 caves recorded and assessed.
<i>Echolocation Survey of Bat Activity, API Management Pty Ltd West Pilbara Iron Ore Project: Kens Bore East -Red Hill Creek (Bat Call WA, 2015)</i>	Overlaps eastern portion of Survey Area	August 2015	20 survey sites	<ul style="list-style-type: none"> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonictes aurantia</i> Pilbara form)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>).</li> </ul>	Two broad bat habitats identified <ul style="list-style-type: none"> <li>• Regional Bat Habitat 2: Hamersley Range – Productive watercourse, waterholes, and riparian sites'</li> <li>• Regional Bat Habitat 3: Hamersley Range – Deep shelters and caves.</li> </ul>

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>Flora and vegetation survey and terrestrial fauna survey for the Pilbara Regional Waste Management Facility (Phoenix Environmental Sciences, 2017)</i>	10 km south of the Survey Area	September 2017	Desktop review Targeted terrestrial fauna survey	<ul style="list-style-type: none"> <li>• Rainbow Bee-eater (<i>Merops ornatus</i>).</li> </ul>	Two habitats were identified <ul style="list-style-type: none"> <li>• Mosaic of hummock grassland and shrubland on plain (85.9%)</li> <li>• Shrubland on sand dune (14.1%).</li> </ul>
<i>Flora, Vegetation and Fauna Habitat Assessment at Bourne Highway (Rio Tinto Iron Ore, 2018)</i>	40 km east of the Survey Area	June – July 2017	Desktop Assessment Reconnaissance field survey Targeted bat survey	<ul style="list-style-type: none"> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantia</i> Pilbara form)</li> <li>• Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>).</li> </ul>	Five habitats were identified. <ul style="list-style-type: none"> <li>• Rocky slopes (89.2%)</li> <li>• Rocky breakaways and cliffs (1.16%)</li> <li>• Gullies (0.97%)</li> <li>• Drainage lines (6.95%)</li> <li>• Plains (0.99%).</li> </ul>
<i>Pilbara Olive Python Reconnaissance Survey of the West Pilbara Iron Ore Project (Rapallo Environmental, 2011)</i>	Overlaps Survey Area	August 2010	176 survey sites assessed	<ul style="list-style-type: none"> <li>• Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>)</li> <li>• Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>)</li> <li>• Rainbow Bee-eater (<i>Merops ornatus</i>)</li> <li>• Australian Bustard (<i>Ardeotis australis</i>).</li> </ul>	NA



Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>Solomon Hub Vertebrate Fauna Assessment (ecologia Environment, 2015)</i>	160 km east of the Survey Area	April 2014	Detailed fauna survey	<ul style="list-style-type: none"> <li>Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantia</i> Pilbara form)</li> <li>Long-tailed Dunnart (<i>Sminthopsis longicaudata</i>)</li> <li>Ghost Bat (<i>Macroderma gigas</i>)</li> <li>Short-tailed Mouse (<i>Leggadina lakedownensis</i>)</li> <li>Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>)</li> <li>Fork-tailed Swift (<i>Apus pacificus</i>)</li> <li>Rainbow Bee-eater (<i>Merops ornatus</i>)</li> <li>Eastern Great Egret (<i>Ardea alba modesta</i>)</li> <li>Peregrine Falcon (<i>Falco peregrinus</i>)</li> <li>Australian Bustard (<i>Ardeotis australis</i>)</li> <li>Flock Bronzewing (<i>Phaps histrionica</i>)</li> <li>Pilbara Olive Python (<i>Liasis olivaceus barroni</i>)</li> <li>Gane's blind snake (<i>Anilius ganei</i>)</li> <li>Pilbara Barking Gecko (<i>Underwoodisaurus seorsus</i>)</li> <li>Lined Soil-crevice Skink (<i>Notoscincus butleri</i>).</li> </ul>	Eleven habitats were identified. <ul style="list-style-type: none"> <li>Plain (stony gibber) (45.4%)</li> <li>Hilltops/ridges/plateaux (12.5%)</li> <li>Plain (Alluvial) (11.3%)</li> <li>Plain (Cracking clay) (10.3%)</li> <li>Hummock grassland (6.0%)</li> <li>Shrubland (Open) (5.0%)</li> <li>Woodland (Open Eucalypt) (3.3%)</li> <li>Plain (stony calcrete) (3.0%)</li> <li>Drainage line/River/Creek (Major) (2.2%)</li> <li>Gorges and Gullies (1.0%)</li> <li>Tussock grassland (on loam/clay) (&lt;0.1%).</li> </ul>
<i>West Pilbara Iron Ore Project Activity Assessment for Bats of Conservation Significance (Astron Environmental Services, 2012)</i>	Overlaps Survey Area	March, July, and October 2011	16 field survey days 18 recording sites	<ul style="list-style-type: none"> <li>Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantia</i> Pilbara form)</li> <li>Ghost Bat (<i>Macroderma gigas</i>).</li> </ul>	NA
<i>West Pilbara Iron Ore Project Habitat Assessment for Terrestrial Fauna of National Environmental Significance (Astron Environmental Services, 2011a)</i>	Overlaps Survey Area	May 2011	Desktop Assessment		Five broad habitat types

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>West Pilbara Iron Ore Project MNES Fauna Species Habitat Assessment (Biota Environmental Sciences, 2015a)</i>	Overlaps Survey Area	September / October 2015	36 representative habitat assessment sites selected with 21 sites ground truthed	<ul style="list-style-type: none"> <li>Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>Ghost Bat (<i>Macroderma gigas</i>).</li> </ul>	NA
<i>West Pilbara Iron Ore Project Onslow Rail Corridor – Level 1 Fauna Assessment (Biota Environmental Sciences, 2008)</i>	Overlaps Survey Area	2008	Desktop Assessment	Desktop Assessment	Five habitats were identified. <ul style="list-style-type: none"> <li>Mudflats</li> <li>Alluvial Plains</li> <li>Sandy Plains</li> <li>Stony Plains</li> <li>Mesas and Hills.</li> </ul>
<i>West Pilbara Iron Ore Project Onslow Rail Corridor Terrestrial Fauna Survey (Biota Environmental Sciences, 2009)</i>	Overlaps Survey Area	October 2008	Detailed fauna survey	<ul style="list-style-type: none"> <li>Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>Australian Bustard (<i>Ardeotis australis</i>).</li> </ul>	Six habitats were identified. <ul style="list-style-type: none"> <li>Buffel grass (<i>Cenchrus ciliaris</i>) and <i>Triodia</i> sp. on red silty loam</li> <li><i>Triodia</i> sp. on red sand dune</li> <li>Samphire flat</li> <li><i>Acacia</i> sp. and <i>Triodia</i> sp. on stony loam alongside drainage line</li> <li><i>Acacia</i> sp. and <i>Triodia</i> sp. on loam</li> <li><i>Triodia</i> sp. on stony loam scree slope.</li> </ul>
<i>West Pilbara Iron Ore Project Pilbara Leaf-nosed Bat Habitat Assessment (Astron Environmental Services, 2011b)</i>	Overlaps Survey Area	October 2011	Habitat assessment of 113 locations	NA	NA

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>West Pilbara Iron Ore Project Red Hill Creek Terrestrial Fauna Assessment: Phase 1</i> (Biota Environmental Sciences, 2015b)	7 km east of the Survey Area	May 2015	708 trapping nights 6.5 hours avifauna censuses 14 recording nights (SM2BAT SongMeter) 15 camera trap nights 78 person hours SRE searches.	<ul style="list-style-type: none"> <li>Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantia</i> Pilbara form)</li> <li>Pilbara Olive Python (<i>Liasis olivaceus barroni</i>)</li> <li>Grey Falcon (<i>Falco hypoleucos</i>)</li> <li>Rainbow Bee-eater (<i>Merops ornatus</i>)</li> <li>Ghost Bat (<i>Macroderma gigas</i>)</li> <li>Australian Bustard (<i>Ardeotis australis</i>).</li> </ul>	Ten habitats were identified: <ul style="list-style-type: none"> <li>Gorge</li> <li>Free face</li> <li>Breakaway</li> <li>Pediment</li> <li>Hill slope</li> <li>Plateau</li> <li>Minor drainage line</li> <li>Flood plain</li> <li>Alluvial plain</li> <li>Major drainage line.</li> </ul>
<i>West Pilbara Iron Ore Project Stage 1 Extension Terrestrial Fauna Assessment: Phase 1</i> (Biota Environmental Sciences, 2015c)	4 km east of the Survey Area	May 2015	1,633 trapping nights 15 hours avifauna censuses 14 recording nights (SM2BAT SongMeter) 12 camera trap nights 39 person hours SRE searches	<ul style="list-style-type: none"> <li>Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantia</i> Pilbara form)</li> <li>Ghost Bat (<i>Macroderma gigas</i>)</li> <li>Grey Falcon (<i>Falco hypoleucos</i>)</li> <li>Gane's blind snake (<i>Anilius ganei</i>)</li> <li>Australian Bustard (<i>Ardeotis australis</i>)</li> <li>Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>)</li> <li>Rainbow Bee-eater (<i>Merops ornatus</i>).</li> </ul>	Six habitats were identified. <ul style="list-style-type: none"> <li>Flood plain/Alluvial plain</li> <li>Goerge/Freeface/Breakaway</li> <li>Hill plateau/Mesa plateau</li> <li>Major drainage</li> <li>Minor drainage</li> <li>Pediment/Hillslope.</li> </ul>

Table 23: Conservation Significant Vertebrate Fauna Likelihood of Occurrence

Family	Scientific Name	Common Name	Conservation Status		Database Search			Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA		
<b>Birds</b>									
<b>Apodidae</b>	<i>Apus pacificus</i>	Pacific Swift (Fork-tailed Swift)	MI	MI & MA	x		x	Medium	Recent nearby records. May use habitats in Survey Area for foraging (particularly airspace where insects are abundant).
<b>Charadriidae</b>	<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU & MI	VU, MI & MA	x		x	High	Recent nearby records. Suitable habitats occur primarily in the PPA Area (tidal flats, sandy substrates).
	<i>Charadrius mongolus</i>	Lesser Sand Plover	EN & MI	EN, MI & MA	x		x	High	Nearby records. Suitable habitats occur primarily in the PPA Area (tidal flats, muddy substrates).
	<i>Charadrius veredus</i>	Oriental Plover	MI	MI & MA	x		x	High	Nearby records, abundant suitable habitat (grasslands, sparsely vegetated plains).
	<i>Pluvialis squatarola</i>	Grey Plover	MI	MI & MA	x		x	High	Recent nearby records. Suitable habitats occur primarily in the PPA Area (tidal flats).
<b>Falconidae</b>	<i>Falco hypoleucos</i>	Grey Falcon	VU	-			x	High	Recent nearby records. Preferred nesting habitat occurs within drainage line/river/creek habitat (arid inland, open plains). May use all habitats within Survey Area for hunting.

Family	Scientific Name	Common Name	Conservation Status		Database Search			Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA		
<b>Falconidae</b>	<i>Falco peregrinus</i>	Peregrine Falcon	OS	-	x		x	High	Recent nearby records. Preferred nesting habitat occurs within rocky hills/mesa habitat. May use all habitats within Survey Area for hunting.
<b>Fregatidae</b>	<i>Fregata ariel</i>	Lesser Frigatebird	MI	MI & MA	x			Low	No nearby records. Primarily oceanic, may use coastal areas.
<b>Glareolidae</b>	<i>Glareola maldivarum</i>	Oriental Pratincole	MI	MI & MA	x		x	High	Recent nearby records. Suitable habitats occur in the PPA Area (tidal flats). May use areas that become seasonally inundated (tidal flats/claypan habitat).
<b>Hirundinidae</b>	<i>Hirundo rustica</i>	Barn Swallow	MI	MI & MA	x		x	Medium	May use any habitats within Survey Area for foraging (particularly airspace where insects are abundant) (Near coastal areas).
<b>Laridae</b>	<i>Anous stolidus</i>	Common Noddy (Brown Noddy)	MI	MI & MA	x			Low	No suitable habitat (oceanic).
	<i>Chlidonias leucopterus</i>	White-winged Black Tern	MI	MI & MA	x			High	Recent nearby records. Suitable habitats occur in the PPA Area (coastal areas). May use areas that become seasonally inundated (tidal flats/claypan habitat).

Family	Scientific Name	Common Name	Conservation Status		Database Search			Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA		
Laridae	<i>Hydroprogne caspia</i>	Caspian Tern	MI	MI & MA	x	x		High	Recent nearby records. Suitable habitats occur in the PPA Area (coastal areas, fresh to saline lakes, temporary wetlands). May use areas that become seasonally inundated (tidal flats/claypan habitat).
	<i>Onychoprion anaethetus</i>	Bridled Tern	MI	MI & MA	x			Low	No suitable habitat (oceanic).
	<i>Sterna dougallii</i>	Roseate Tern	MI	MI & MA	x	x	x	Medium	Nearby records. May use habitats in the PPA Area (coastal areas).
	<i>Sterna hirundo</i>	Common Tern	MI	MI & MA		x	x	Medium	Nearby records. May use habitats in the PPA Area (coastal areas, sandflats).
	<i>Sternula albifrons</i>	White-shafted Little Tern (Little Tern)	MI	MI & MA		x	x	High	Recent nearby records. Suitable habitats occur primarily in the PPA Area (coastal areas, lakes, estuaries, river mouths and deltas).
	<i>Thalasseus bergii</i>	Crested Tern (Greater Crested Tern)	MI	MI & MA	x	x	x	High	Recent nearby records. Suitable habitats occur primarily in the PPA Area (coastal areas, saline lakes, coastal salt ponds).
Motacillidae	<i>Motacilla cinerea</i>	Grey Wagtail	MI	MI & MA	x			Low	Most WA records are from the Kimberley region, no suitable habitat (banks of fast running freshwater habitats).

Family	Scientific Name	Common Name	Conservation Status		Database Search			Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA		
<b>Motacillidae</b>	<i>Motacilla tschutschensis</i>	Yellow Wagtail	MI	MI & MA		x		Low	Most WA records are from the Kimberley region, unlikely to occur this far south (usually found in damp grasslands).
<b>Oceanitidae</b>	<i>Oceanites oceanicus</i>	Wilson's Storm Petrel	MI	MI & MA	x		x	Low	No suitable habitat (oceanic).
<b>Procellariidae</b>	<i>Ardenna carneipes</i>	Flesh-footed Shearwater	VU & MI	MI & MA	x			Low	No suitable habitat (oceanic).
	<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	MI	MI & MA	x	x	x	Low	Recent nearby records, however, no suitable habitat (oceanic).
	<i>Calonectris leucomelas</i>	Streaked Shearwater	MI	MI & MA	x			Low	No suitable habitat (oceanic).
	<i>Macronectes giganteus</i>	Southern Giant Petrel	MI	EN & MI	x			Low	No suitable habitat (oceanic).
<b>Psittacidae</b>	<i>Pezoporus occidentalis</i>	Night Parrot	CR	EN	x		x	Low	Outside known areas likely to occur, however cannot be ruled out due to cryptic nature and lack of certainty surrounding current distribution (spinifex, samphire).
<b>Rostratulidae</b>	<i>Rostratula australis</i>	Australian Painted Snipe	EN	EN & MA	x			Low	Outside known distribution
<b>Scolopacidae</b>	<i>Actitis hypoleucos</i>	Common Sandpiper	MI	MI & MA	x			High	Recent nearby records. May use habitats in the PPA Area (mangroves, coastal wetlands). May use areas that become seasonally inundated (tidal flats/claypan habitat).

Family	Scientific Name	Common Name	Conservation Status		Database Search			Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA		
Scolopacidae	<i>Arenaria interpres</i>	Ruddy Turnstone	MI	MI & MA	x		x	Medium	Records >10 km from Survey Area. May use habitats in the PPA Area (coastal habitats, tidal flats).
	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MI	MI & MA	x		x	Medium	Records >10 km from Survey Area. May use habitats in the PPA Area (lagoons, fresh to saline wetlands). May use areas that become seasonally inundated (tidal flats/claypan habitat).
	<i>Calidris alba</i>	Sanderling	MI	MI & MA	x		x	Medium	Records >10 km from Survey Area. May use habitats in the PPA Area (tidal flats, ocean beaches).
	<i>Calidris canutus</i>	Red Knot	EN & MI	EN, MI & MA	x	x	x	Low	No nearby records. Small potential to occur within PPA Area, although unlikely (tidal flats).
	<i>Calidris ferruginea</i>	Curlew Sandpiper	CR & MI	CR, MI, & MA	x		x	Medium	No nearby records. May use habitats in the PPA Area (intertidal mudflats) and areas that become seasonally inundated (tidal flats/claypan habitat).

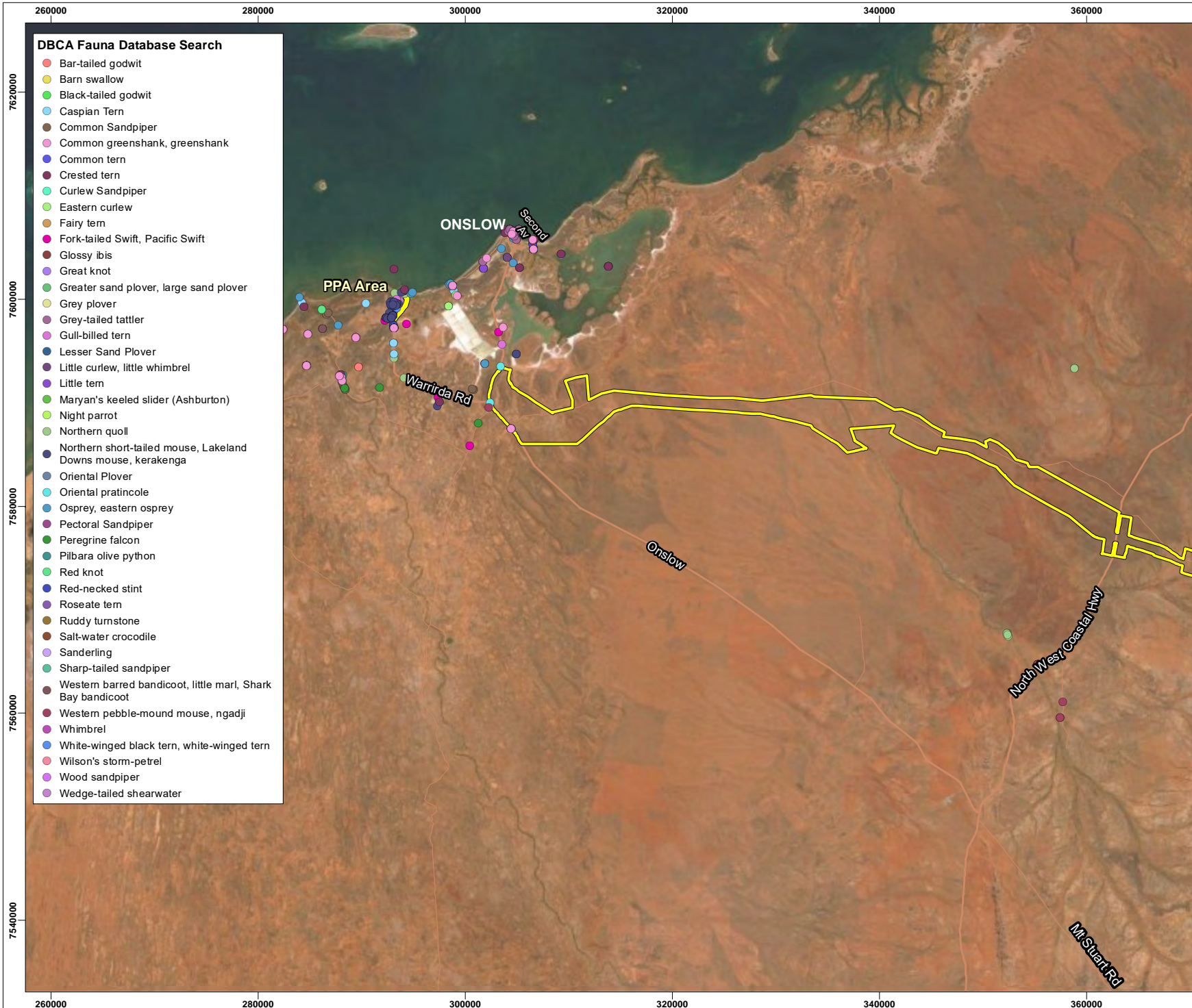


Family	Scientific Name	Common Name	Conservation Status		Database Search			Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA		
Scolopacidae	<i>Calidris melanotos</i>	Pectoral Sandpiper	MI	MI & MA	x	x	x	High	Recent nearby records. Suitable habitats occur primarily in the PPA Area (mudflats, fresh to saline wetlands). May use areas that become seasonally inundated (tidal flats/claypan habitat).
	<i>Calidris ruficollis</i>	Red-necked Stint	MI	MI & MA	x		x	Medium	Nearby records. May use habitats in the PPA Area (tidal mudflats, salt marshes, beaches) and areas that become seasonally inundated (tidal flats/claypan habitat).
	<i>Calidris tenuirostris</i>	Great Knot	CR & MI	CR, MI, & MA	x		x	Low	No nearby records. Small potential to occur within PPA Area, although unlikely (tidal flats).
	<i>Limosa lapponica</i>	Bar-tailed Godwit	MI (CR at subsp. level)	MI & MA (CR at subsp. level)	x	x	x	Medium	Nearby records. May use habitats in the PPA Area (tidal flats).
	<i>Limosa limosa</i>	Black-tailed Godwit	MI	MI & MA			x	Medium	Nearby records. May use habitats in the PPA Area (Shallow coastal wetlands, muddy substrates).
	<i>Numenius madagascariensis</i>	Far Eastern Curlew (Eastern Curlew)	CR & MI	CR, MI, & MA	x		x	Medium	Nearby records. May use habitats in the PPA Area (tidal flats).

Family	Scientific Name	Common Name	Conservation Status		Database Search			Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA		
<b>Scolopacidae</b>	<i>Numenius minutus</i>	Little Curlew	MI	MI & MA	x		x	Medium	Records >10 km. May use habitats in the PPA Area (tidal mudflats). May use areas that become seasonally inundated (tidal flats/claypan habitat).
	<i>Numenius phaeopus</i>	Whimbrel	MI	MI & MA	x		x	Medium	Records >10 km. May use habitats in the PPA Area (tidal flats, mangroves).
	<i>Tringa brevipes</i>	Grey-tailed Tattler	MI & P4	MI	x		x	Medium	Nearby records. May use habitats in the PPA Area (tidal flats).
	<i>Tringa glareola</i>	Wood Sandpiper	MI	MI & MA	x		x	High	Recent nearby records, likely to occur in tidal plan habitat (often freshwater wetlands, usually near shorelines with mud or shallow water).
	<i>Tringa nebularia</i>	Common Greenshank	MI	MI & MA	x	x	x	High	Recent nearby records. May use habitats in the PPA Area (mangroves, mudflats, clay, and muddy substrates). May use areas that become seasonally inundated (tidal flats/claypan habitat).
<b>Threskiornithidae</b>	<i>Plegadis falcinellus</i>	Glossy Ibis	MI	MI & MA	x		x	Medium	May use areas that become seasonally inundated (tidal flats/claypan habitat, drainage lines).

Family	Scientific Name	Common Name	Conservation Status		Database Search			Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA		
<b>Mammals</b>									
<b>Dasyuridae</b>	<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN	x		x	High	Recent nearby records. Suitable habitats occur in the Survey Area (rocky ranges).
<b>Megadermatidae</b>	<i>Macroderma gigas</i>	Ghost Bat	VU	VU	x		x	High	Recent nearby records. Suitable habitats occur in the Survey Area (rocky ranges). May use all habitats within Survey Area for hunting.
<b>Muridae</b>	<i>Leggadina lakedownensis</i>	Short-tailed Mouse	P4	-	x		x	High	Recent nearby records. Preferred habitat occurs primarily within tidal flats/claypan habitat (typically hummock grasslands, known to occur in fringing vegetation of claypans).
<b>Muridae</b>	<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	P4	-	x		x	High	Recent nearby records. Suitable habitats occur in the Survey Area (rocky ranges).
<b>Peramelidae</b>	<i>Perameles bougainville</i>	Shark Bay Bandicoot or Little Marl	EN	EN	x		x	Low	Outside known distribution
<b>Phalangeridae</b>	<i>Trichosurus vulpecula</i>	Common Brushtail Possum	-	-	x			Medium	Locally significant due to rarity in Pilbara and taxonomic doubt surrounding Pilbara population. Recent records in similar habitat. Drainage lines constitute preferred habitat (open Eucalyptus woodland).

Family	Scientific Name	Common Name	Conservation Status		Database Search			Likelihood of Occurrence	Justification
			State	Federal	NM	PMST	DBCA		
<b>Rhinonycteridae</b>	<i>Rhinonycteris aurantia</i> Pilbara form	Pilbara Leaf-nosed Bat	VU	VU	x	x	x	High	Recent nearby records. Suitable habitats occur in the Survey Area (gorges, grasslands).
<b>Reptiles</b>									
<b>Carphodactylidae</b>	<i>Underwoodisaurus seorsus</i>	Pilbara Barking Gecko	P2	-				Low	Outside known distribution
<b>Pythonidae</b>	<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	VU	x	x	x	High	Recent nearby records. Suitable habitats occur in the Survey Area (watercourses through rocky areas).
<b>Scincidae</b>	<i>Lerista planiventralis maryani</i>	Maryan's Keeled Slider	P1	-	x		x	Medium	Historical nearby record. May use habitats in the PPA Area (coastal sandy areas between Onslow and Barradale).
	<i>Notoscincus butleri</i>	Lined Soil-crevice Skink	P4	-			x	Low	Outside known distribution.
<b>Typhlopidae</b>	<i>Anilius ganei</i>	Gane's Blind Snake	P1	-				Low	No nearby records. Known from areas between Newman and Pannawonica. May be associated with moist gorges and gullies.



**DBCFA Fauna Database Search**

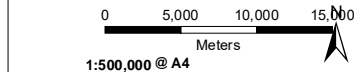
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- Barn swallow
- Black-tailed godwit
- Caspian Tern
- Common Sandpiper
- Common greenshank, greenshank
- Common tern
- Crested tern
- Curlew Sandpiper
- Eastern curlew
- Fairy tern
- Fork-tailed Swift, Pacific Swift
- Glossy ibis
- Great knot
- Greater sand plover, large sand plover
- Grey plover
- Grey-tailed tattler
- Gull-billed tern
- Lesser Sand Plover
- Little curlew, little whimbrel
- Little tern
- Maryan's keeled slider (Ashburton)
- Night parrot
- Northern quoll
- Northern short-tailed mouse, Lakeland Downs mouse, kerakenga
- Oriental Plover
- Oriental pratincole
- Osprey, eastern osprey
- Pectoral Sandpiper
- Peregrine falcon
- Pilbara olive python
- Red knot
- Red-necked stint
- Roseate tern
- Ruddy turnstone
- Salt-water crocodile
- Sanderling
- Sharp-tailed sandpiper
- Western barred bandicoot, little marl, Shark Bay bandicoot
- Western pebble-mound mouse, ngadji
- Whimbrel
- White-winged black tern, white-winged tern
- Wilson's storm-petrel
- Wood sandpiper
- Wedge-tailed shearwater

**Legend**

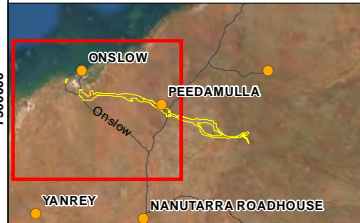
- State Road
- Local Roads
- ▭ Survey Area

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
 - LOCALITY MAP SOURCED LANDGATE 2020  
 - OTHER DATA SOURCED LANDGATE 2020  
 - AERIAL PHOTOGRAPHY SOURCED LANDGATE 2020  
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**LOCALITY MAP**



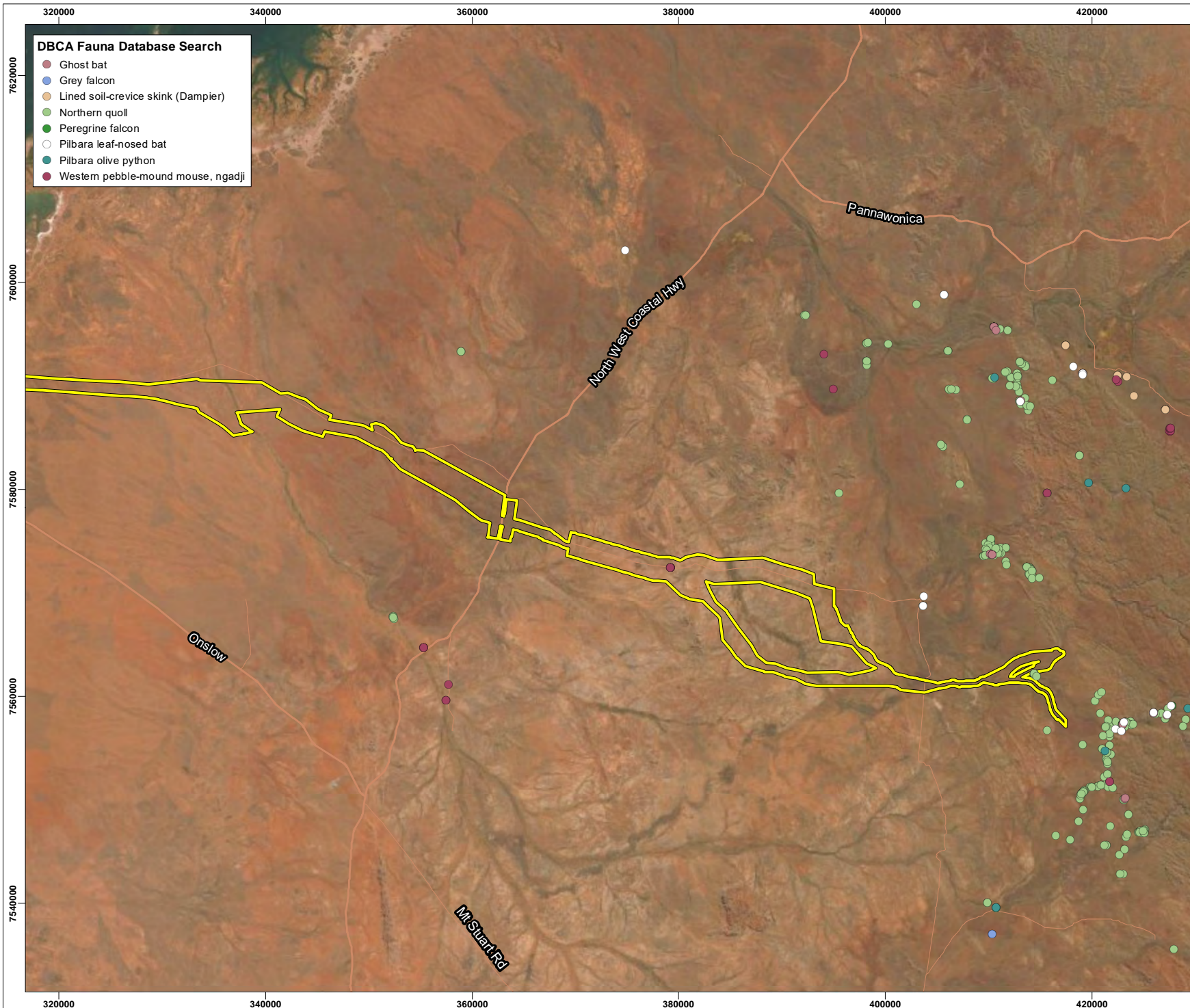
<b>PROJECT ID</b> 4441 007	<b>DATE</b> 27/08/2021
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA2020 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LFV	EW	MS	03

**Mineral Resources Limited**  
**Ashburton Infrastructure Project**  
**Vertebrate Fauna and SRE Assessment**

**Figure 11a**  
**DBCFA Threatened and Priority Fauna**



**DBCA Fauna Database Search**

- Ghost bat
- Grey falcon
- Lined soil-crevice skink (Dampier)
- Northern quoll
- Peregrine falcon
- Pilbara leaf-nosed bat
- Pilbara olive python
- Western pebble-mound mouse, ngadji

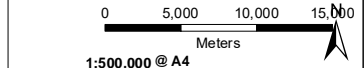
**Legend**

- State Road
- Local Roads
- ▭ Survey Area

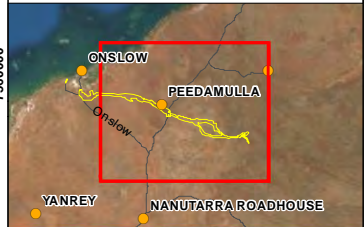
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 - LOCALITY MAP SOURCED LANDGATE 2020  
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**LOCALITY MAP**



<b>PROJECT ID</b> 4441 007	<b>DATE</b> 27/08/2021
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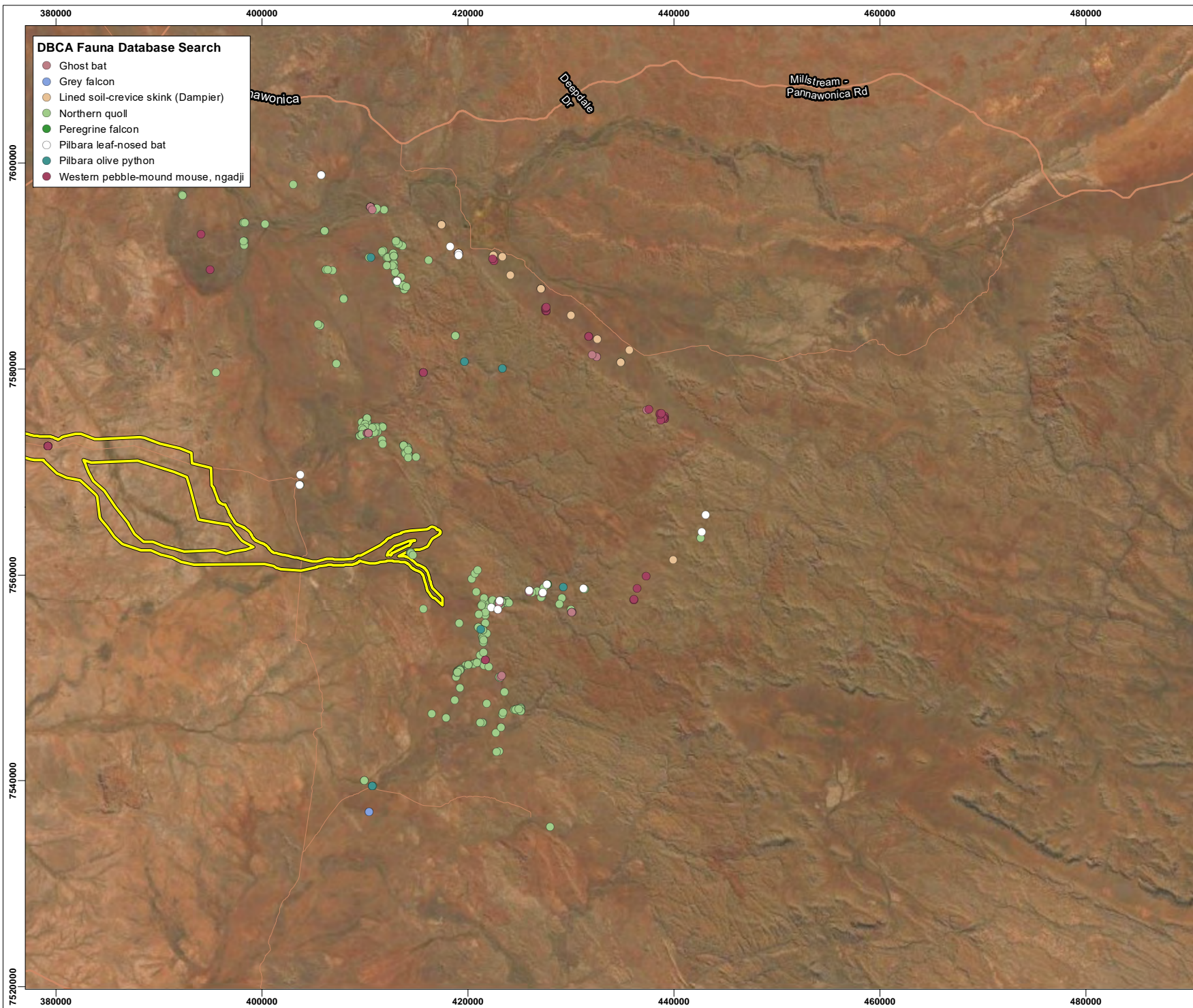
<b>HORIZONTAL DATUM AND PROJECTION</b> GDA2020 MGA Zone 50	
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<b>CREATED</b> LFV	<b>CHECKED</b> EW	<b>APPROVED</b> MS	<b>REVISION</b> 03
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**Mineral Resources Limited**  
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**Vertebrate Fauna and**  
**SRE Assessment**

**Figure 11b**

**DBCA Threatened and Priority Fauna**



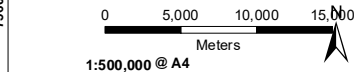
- DBCA Fauna Database Search**
- Ghost bat
  - Grey falcon
  - Lined soil-crevice skink (Dampier)
  - Northern quoll
  - Peregrine falcon
  - Pilbara leaf-nosed bat
  - Pilbara olive python
  - Western pebble-mound mouse, ngadji

- Legend**
- State Road
  - Local Roads
  - ▭ Survey Area

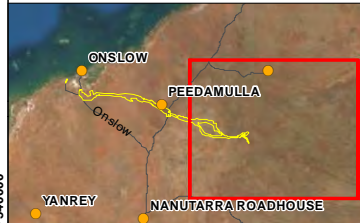
- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS  
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**LOCALITY MAP**



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**HORIZONTAL DATUM AND PROJECTION**  
 GDA2020 MGA Zone 50

<b>CREATED</b> LFV	<b>CHECKED</b> EW	<b>APPROVED</b> MS	<b>REVISION</b> 03
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**Mineral Resources Limited**  
**Ashburton Infrastructure Project**  
**Vertebrate Fauna and**  
**SRE Assessment**

**Figure 11c**  
**DBCA Threatened and Priority Fauna**

#### 4.1.2 Field Surveys

##### 4.1.2.1 Fauna Habitat

Ten broad fauna habitats (excluding cleared areas) were identified and mapped within the Survey Area.

Habitat condition varied throughout the Survey Area, with the most prolific disturbance being cattle grazing and trampling. Other disturbances included historical clearing for roads, infrastructure and access tracks, weeds, frequent burning, and rubbish.

A description, extent within the Survey Area, and a representative photo is provided for each fauna habitat (Table 24). Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding. Fauna habitat mapping is presented in Figure 12 and site sheets for each habitat assessment are shown in Appendix D.





**Table 24: Fauna habitat extents and descriptions**



Habitat	Extent within Survey Area		Habitat description	Representative photo
	Area (ha)	Fauna %		
Plain	8,224	27.20	<p><i>Triodia</i> hummock grassland on primarily sandy loam and sandy clay plain with a sparse overstorey of mixed shrubs dominated by <i>Acacia</i> spp. and scattered <i>Corymbia</i> sp. Abundant <i>Triodia</i> hummocks found within this habitat type provide an important source of shelter, refuge and nesting opportunities for small fauna taxa including birds, mammals, and reptiles. The sandy substrate is suitable for digging and burrowing. Cattle degradation was observed, with the highest levels of degradation occurring towards the west of the Survey Area near Onslow Road. Conservation significant fauna taxa are not likely to rely on this habitat type within the Survey Area.</p>	

Habitat	Extent within Survey Area		Habitat description	Representative photo
	Area (ha)	Fauna %		
Stony plain	6,624	21.91	<p><i>Triodia</i> hummock grassland on stony plain with a sparse overstorey of mixed shrubs dominated by <i>Acacia</i> spp. with occasional <i>Corymbia</i> sp. Abundant <i>Triodia</i> hummocks found within this habitat type provide an important source of shelter, refuge and nesting opportunities for small fauna taxa including birds, mammals, and reptiles. The stony substrate is not as suitable for burrowing taxa as the sandy substrates of the plain habitat type described above. Some areas were undulating, forming small hills and gentle slopes. Cattle degradation was observed, with the highest levels of degradation occurring near Red Hill Station towards the west of the Survey Area. The conservation significant Western Pebble-mound Mouse may rely on this habitat type.</p>	
Sand dunes and swales	3,149	10.42	<p>Open <i>Triodia</i> grasslands and low, open <i>Acacia</i> shrublands on a soft sandy substrate which is preferred habitat for many burrowing taxa. Landform is comprised of alternating dunes and swales. Key microhabitats include termite mounds and hummocks. Cattle degradation was observed.</p>	

Habitat	Extent within Survey Area		Habitat description	Representative photo
	Area (ha)	Fauna %		
Drainage line/river/creek (minor)	1,911	6.32	Dense overstorey vegetation made up primarily of tall <i>Acacia</i> spp., occasionally with <i>Eucalyptus</i> sp. and <i>Corymbia</i> sp. Ground cover is typically <i>Triodia</i> hummock grassland or tussock grassland on substrates ranging from sand to sandy clay, with an assortment of river stones. Minor drainage lines have a lower presence of gullying and water erosion, permanent or semi-permanent pooling of water and typically have smaller trees than major drainage lines. The overstorey vegetation provides valuable nesting and foraging habitat for birds, including conservation significant taxa such as the Grey Falcon and Peregrine Falcon, albeit less value than major drainage lines due to the lower density of large trees. Key microhabitats include woody debris, leaf litter, peeling bark, hollow trees and logs, and hummock grasslands provide refuge, shelter, and foraging opportunities for a wide variety of fauna taxa. Minor drainage lines may be seasonally inundated. This habitat was extensively degraded by cattle in many areas.	

Habitat	Extent within Survey Area		Habitat description	Representative photo
	Area (ha)	Fauna %		
Tidal flats	1,716	5.68	Sparse, low <i>Tecticornia</i> shrubland and <i>Triodia</i> grassland. Sparse vegetation is of limited value as shelter for fauna taxa, however abundant large termite mounds provide shelter for a range of fauna taxa. The PPA area contains scattered Grey Mangroves <i>Avicennia marina</i> , which were not present elsewhere in the Survey Area. This section of the Survey Area lacked termite mounds or other suitable refuge for small mammals and reptiles. The conservation significant Short-tailed Mouse is known to use these habitats.	
Stony hills and slopes	1,140	3.79	Stony hills and slopes, often with thin soils over shallow bedrock. Vegetation consists of sparse <i>Triodia</i> hummock grasslands with scattered <i>Corymbia</i> sp., and <i>Acacia</i> sp. Microhabitats include <i>Triodia</i> hummocks which provide shelter for a variety of taxa. The conservation significant Western Pebble-mound mouse may rely on this habitat type. When adjacent mesas and breakaway habitat, stony hills and slopes will provide important foraging and dispersal habitat for conservation significant taxa such as the Northern Quoll and, towards the east of the Survey Area near water sources, the Pilbara Olive Python.	

Habitat	Extent within Survey Area		Habitat description	Representative photo
	Area (ha)	Fauna %		
Mulga woodland	369	1.22	Mulga ( <i>Acacia aptaneura</i> ) woodland over a sparse <i>Triodia</i> grassland on a sandy clay plain with crabholes (holes formed by swelling and contracting clay soils). The most abundant microhabitats in addition to crabholes were woody debris and peeling bark, which provide important shelter and refuge primarily for small reptiles. Cattle degradation was observed. Conservation significant vertebrate fauna taxa are not likely to depend on this habitat type within the Survey Area.	
Drainage line/river/creek (major)	176	0.58	Dense overstorey vegetation made up primarily of <i>Eucalyptus</i> sp. and <i>Corymbia</i> sp., and tall <i>Acacia</i> spp. Ground cover is typically <i>Triodia</i> hummock grassland or tussock grassland on substrates ranging from sand to sandy clay, with an assortment of river stones. Major drainage lines had a greater presence of gullying and water erosion, permanent or semi-permanent pooling of water, and more large, hollow-bearing Eucalypts. The overstorey vegetation provides valuable nesting and foraging habitat for birds, including conservation significant taxa such as the Grey Falcon and Peregrine Falcon. Key microhabitats include woody debris, leaf litter, peeling bark, hollow trees and logs, and hummocks grasslands provide refuge, shelter, and foraging opportunities for a wide variety for fauna taxa. Major drainage lines, rivers and creeks will usually be seasonally inundated. This habitat was extensively degraded by cattle in many areas.	

Habitat	Extent within Survey Area		Habitat description	Representative photo
	Area (ha)	Fauna %		
Mesas and Breakaways	48	0.13	Mesas and breakaways are primarily made up of ironstone outcropping with sparse <i>Triodia</i> hummocks and scattered <i>Corymbia</i> sp., <i>Acacia</i> sp. and <i>Ficus</i> sp. Breakaways and ridges contain important microhabitats including rock crevices and overhangs. Margins of habitat are characterised by scree slopes leading into stony plains. Habitat is in excellent condition. Several conservation significant fauna taxa may rely on this habitat type, including Northern Quolls and, towards the east of the Survey Area where water sources were present, Pilbara Olive Pythons. Rock overhangs and crevices may also be used by Ghost Bats and Pilbara Leaf-nosed Bats, however deep, humid caves required for maternity roosts were not observed within the Survey Area.	
Claypan	42	0.14	Claypans are seasonally inundated after rainfall events and will provide seasonal habitat for wetland-dependent taxa, including migratory birds. This habitat was extensively degraded by cattle in many areas. The conservation significant Short-tailed Mouse is known to use the fringes of these habitats.	

Habitat	Extent within Survey Area		Habitat description	Representative photo
	Area (ha)	Fauna %		
Cleared	176	0.58	Areas that have been cleared and do not contain vegetation. These areas generally do not provide substantial habitat value to fauna taxa.	N/A
Not assessed	6,662	22.03	Not assessed due to access limitations	N/A
<b>Total Area</b>	<b>30,237</b>	<b>100.00</b>		

292000 294000 296000

292000 294000 296000



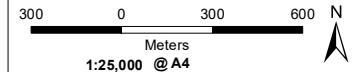
**Legend**

- Roads
- Survey Area

**Fauna Habitat**

- Sand dunes and swales
- Tidal flats (with scattered mangroves)
- Cleared

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**LOCALITY MAP**



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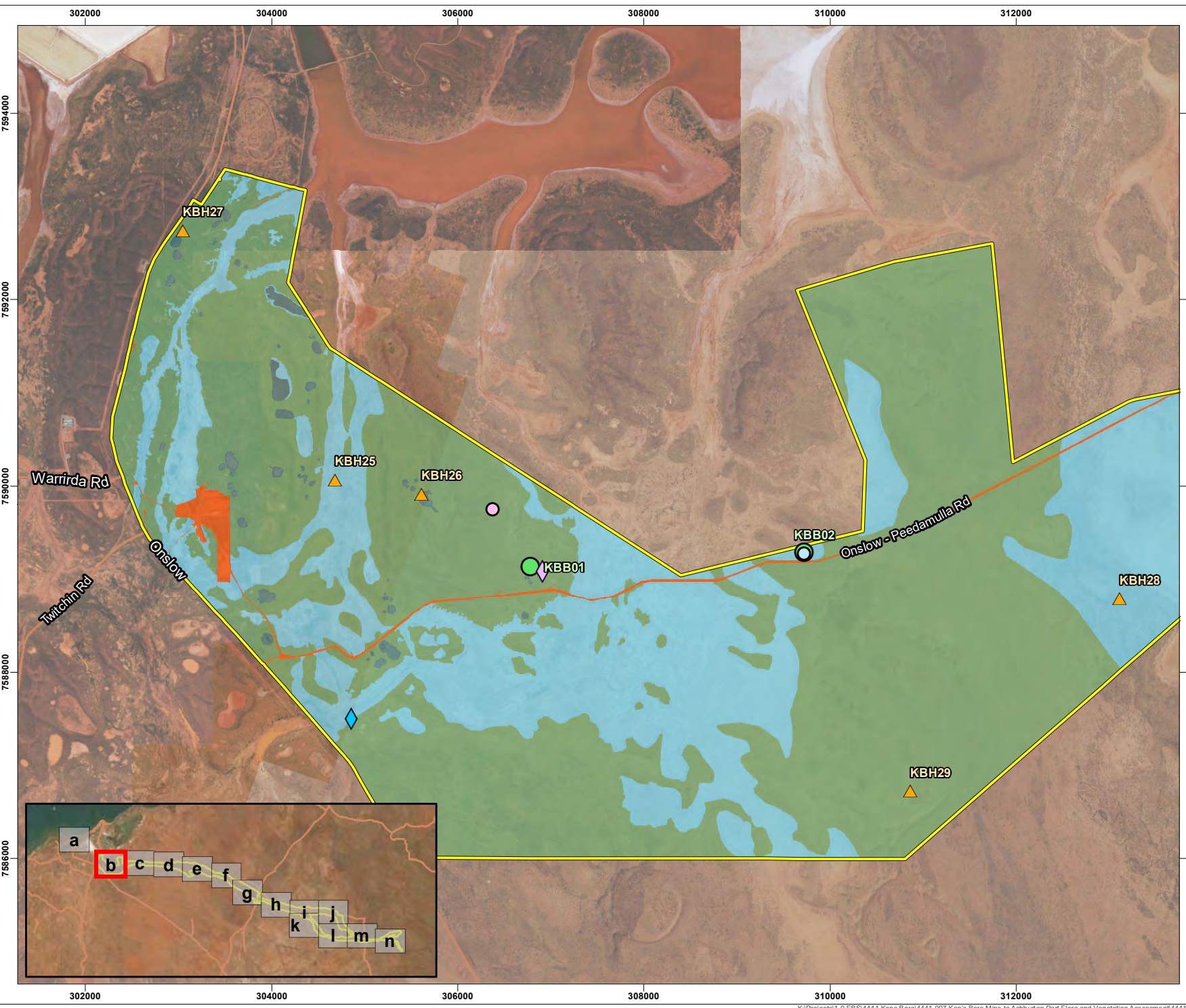
HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LFV	EW	SW	03

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**Vertebrate Fauna and**  
**SRE Assessment**  
**Figure 12a**  
**Fauna Habitats and**  
**Conservation Significant Fauna**



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### Legend

- Roads
- Survey Area

#### Fauna Survey Sites

- ◆ ARU - audible calls
- ◆ ARU - ultrasonic calls
- Baseline trap site
- Camera trap
- ▲ Habitat assessment

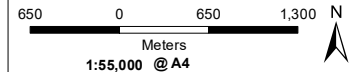
#### Conservation Significant Fauna

- Possible Northern Quoll

#### Fauna Habitat

- Claypan
- Sand dunes and swales
- Tidal flats
- Cleared

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CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03

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**Vertebrate Fauna and**  
**SRE Assessment**  
**Figure 12b**  
**Fauna Habitats and**  
**Conservation Significant Fauna**

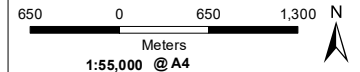
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### Legend

- Roads
- Survey Area
- Fauna Survey Sites**
- Baseline trap site
- Camera trap
- ▲ Habitat assessment
- Fauna Habitat**
- Plain
- Sand dunes and swales
- Tidal flats
- Cleared

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**LOCALITY MAP**



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**HORIZONTAL DATUM AND PROJECTION**  
GDA 1994 MGA Zone 50

<b>CREATED</b> LFV	<b>CHECKED</b> EW	<b>APPROVED</b> SW	<b>REVISION</b> 03
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**Vertebrate Fauna and**  
**SRE Assessment**  
**Figure 12c**  
**Fauna Habitats and**  
**Conservation Significant Fauna**

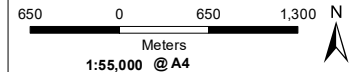
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**Legend**

- Roads
- Survey Area
- Fauna Survey Sites**
  - Baseline trap site
  - Camera trap
  - Habitat assessment
- Fauna Habitat**
  - Drainage line/river/creek - minor
  - Plain
  - Cleared

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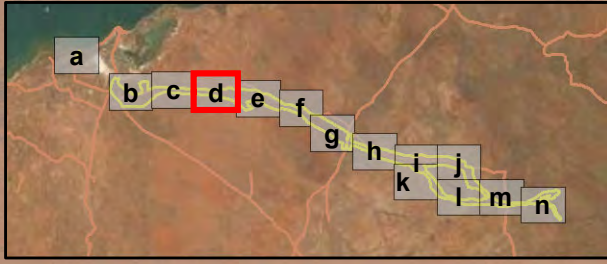


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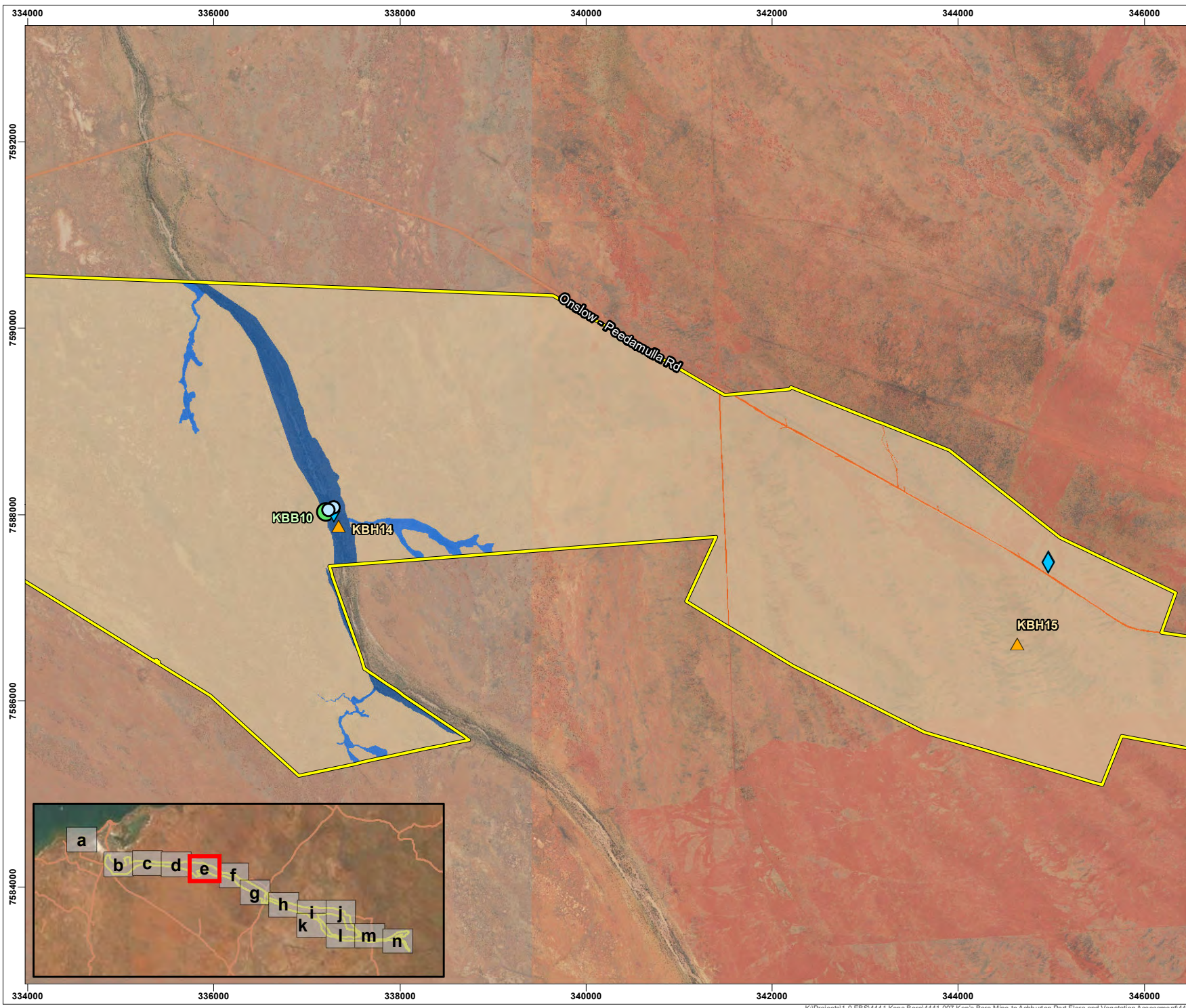


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HORIZONTAL DATUM AND PROJECTION GDA 1994 MGA Zone 50			
CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03

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**SRE Assessment**  
**Figure 12d**  
**Fauna Habitats and**  
**Conservation Significant Fauna**

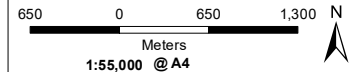


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- Legend**
- Roads
  - ▭ Survey Area
  - Fauna Survey Sites**
  - ◆ ARU - audible calls
  - ◇ ARU - ultrasonic calls
  - Baseline trap site
  - Camera trap
  - ▲ Habitat assessment
  - Fauna Habitat**
  - Drainage line/river/creek - major
  - Drainage line/river/creek - minor
  - Plain
  - Cleared

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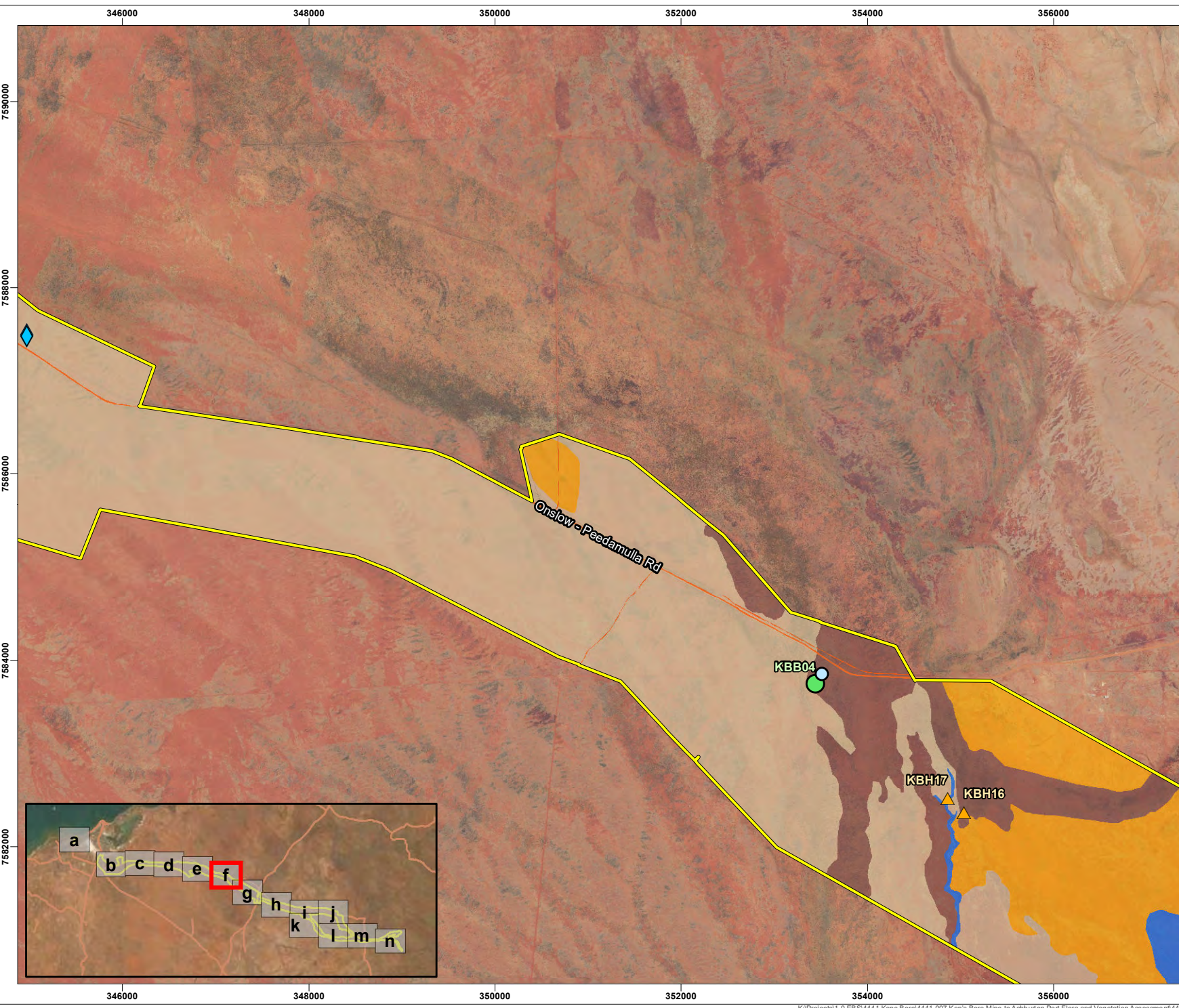
**LOCALITY MAP**



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HORIZONTAL DATUM AND PROJECTION GDA 1994 MGA Zone 50			
CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03

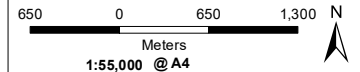
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**Vertebrate Fauna and  
 SRE Assessment**  
**Figure 12e**  
**Fauna Habitats and  
 Conservation Significant Fauna**

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- ### Legend
- Roads
  - Survey Area
  - Fauna Survey Sites**
  - ARU - audible calls
  - ARU - ultrasonic calls
  - Baseline trap site
  - Camera trap
  - Habitat assessment
  - Fauna Habitat**
  - Drainage line/river/creek - minor
  - Mulga woodland
  - Plain
  - Stony plain
  - Cleared

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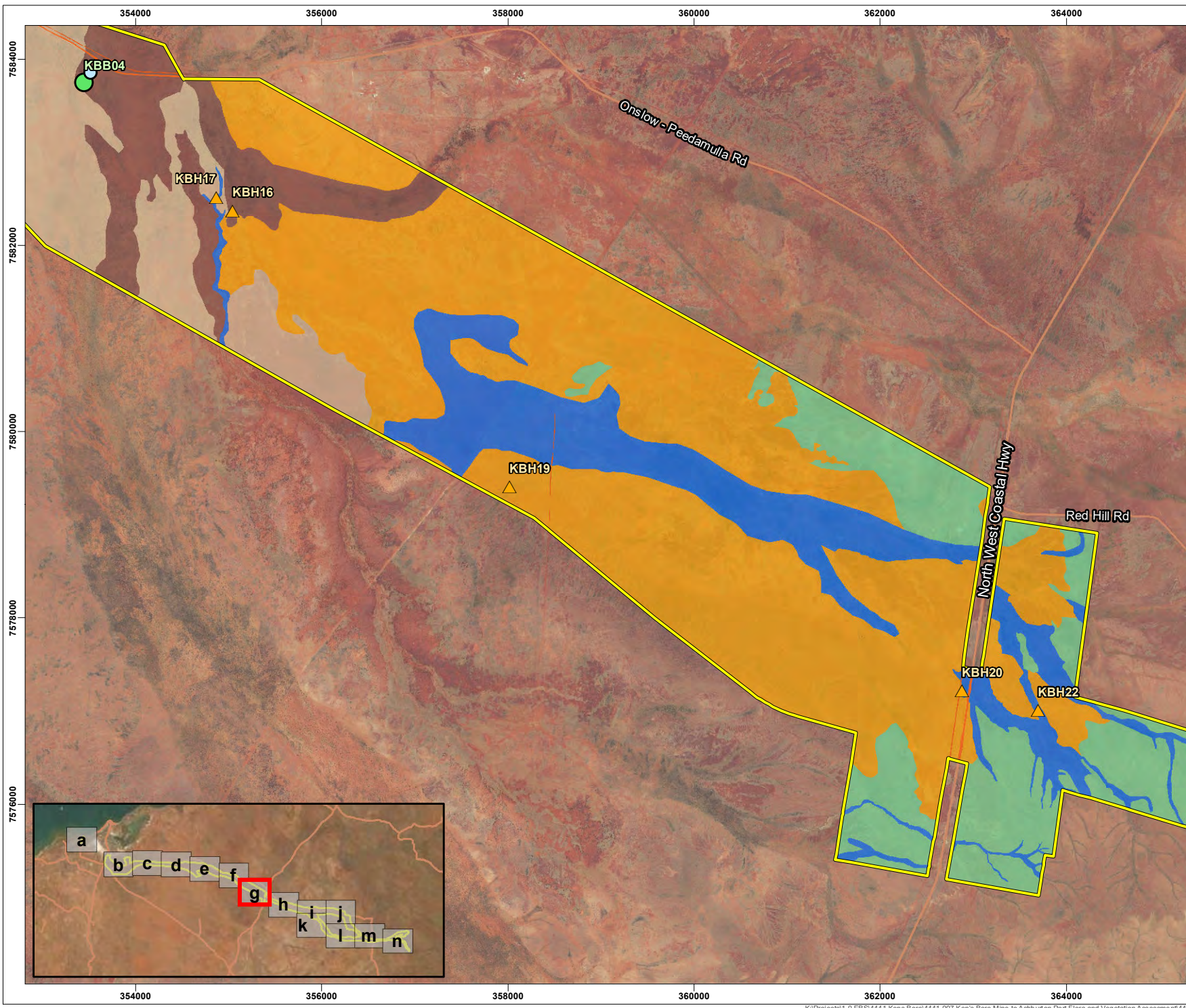
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CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03

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 SRE Assessment  
**Figure 12f**  
 Fauna Habitats and  
 Conservation Significant Fauna

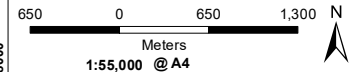
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**Legend**

- Roads
- Survey Area
- Fauna Survey Sites**
  - Baseline trap site
  - Camera trap
  - Habitat assessment
- Fauna Habitat**
  - Drainage line/river/creek - minor
  - Mulga woodland
  - Plain
  - Stony hills and slopes
  - Stony plain
  - Cleared

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**LOCALITY MAP**



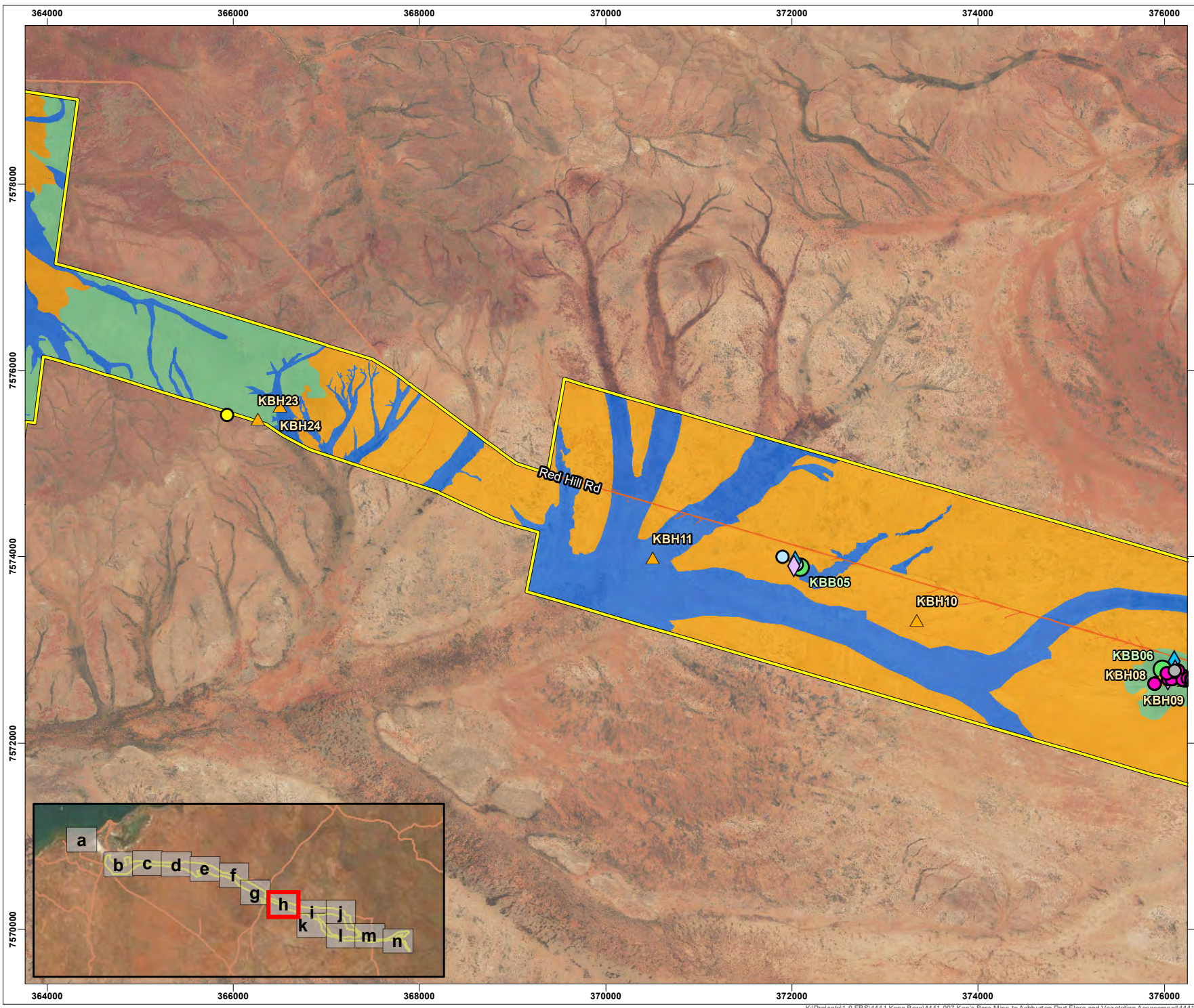
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HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LFV	EW	SW	03

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 Vertebrate Fauna and  
 SRE Assessment  
**Figure 12g**  
 Fauna Habitats and  
 Conservation Significant Fauna

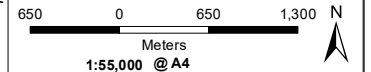
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### Legend

- Roads
- Survey Area
- Fauna Survey Sites**
- ARU - audible calls
- ARU - ultrasonic calls
- Baseline trap site
- Camera trap
- Habitat assessment
- Targeted trap site
- Conservation Significant Fauna**
- Possible Ghost Bat
- Northern Quoll
- Western Pebble-mound Mouse
- Fauna Habitat**
- Drainage line/river/creek - minor
- Mesas and breakaways (confirmed Northern Quoll habitat)
- Stony hills and slopes
- Stony plain
- Cleared

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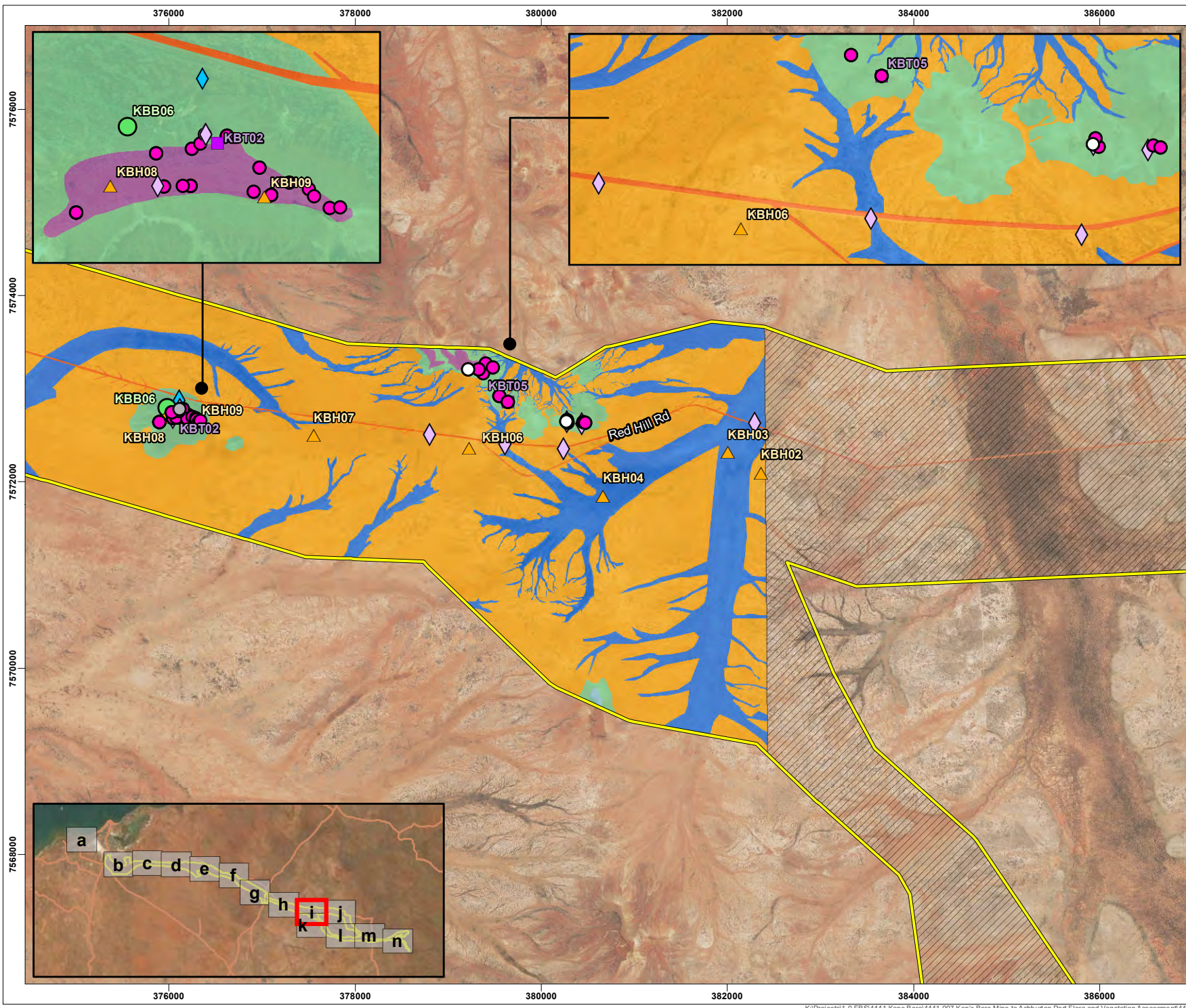
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HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LFV	EW	SW	03

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**Vertebrate Fauna and SRE Assessment**  
**Figure 12h**  
**Fauna Habitats and Conservation Significant Fauna**

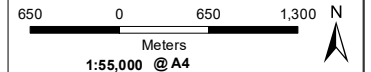
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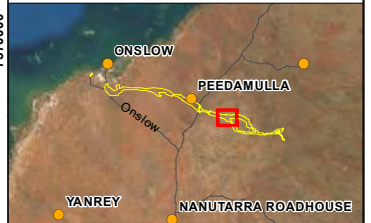
### Legend

- Roads
- Survey Area
- Fauna Survey Sites**
  - ARU - audible calls
  - ARU - ultrasonic calls
  - Baseline trap site
  - Habitat assessment
  - Targeted trap site
- Conservation Significant Fauna**
  - Ghost Bat
  - Possible Ghost Bat
  - Northern Quoll
  - Pilbara Leaf-nosed bat
- Fauna Habitat**
  - Drainage line/river/creek - minor
  - Mesas and breakaways (confirmed Northern Quoll habitat)
  - Mesas and breakaways (potential Northern Quoll habitat)
  - Stony hills and slopes
  - Stony plain
  - Cleared
  - Not assessed

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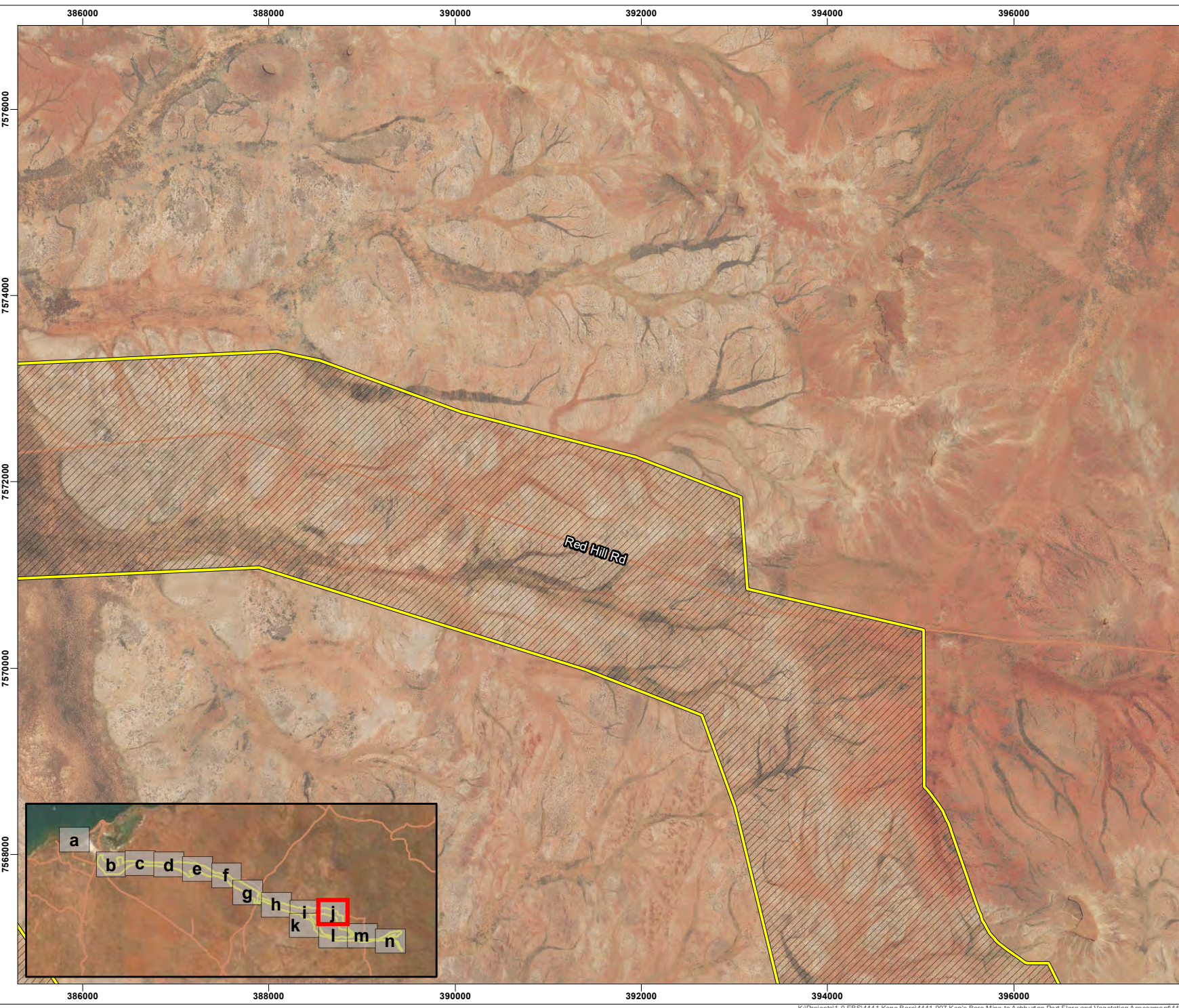


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CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03

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**Vertebrate Fauna and**  
**SRE Assessment**  
**Figure 12i**  
**Fauna Habitats and**  
**Conservation Significant Fauna**



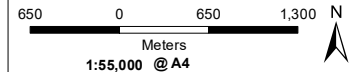
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**Legend**

- Roads
- Survey Area
- Fauna Habitat
  - Not assessed

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GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LFV	EW	SW	03

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**Vertebrate Fauna and  
SRE Assessment**  
**Figure 12j**  
Fauna Habitats and  
Conservation Significant Fauna

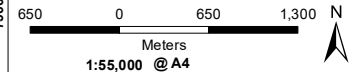
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**Legend**

- Roads
- Survey Area
- Fauna Survey Sites**
- Habitat assessment
- Fauna Habitat**
- Drainage line/river/creek - minor
- Mesas and breakaways (potential Northern Quoll habitat)
- Stony hills and slopes
- Stony plain
- Not assessed

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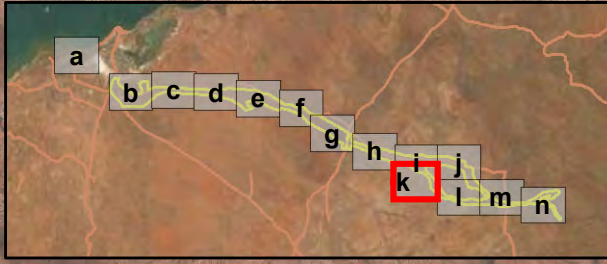


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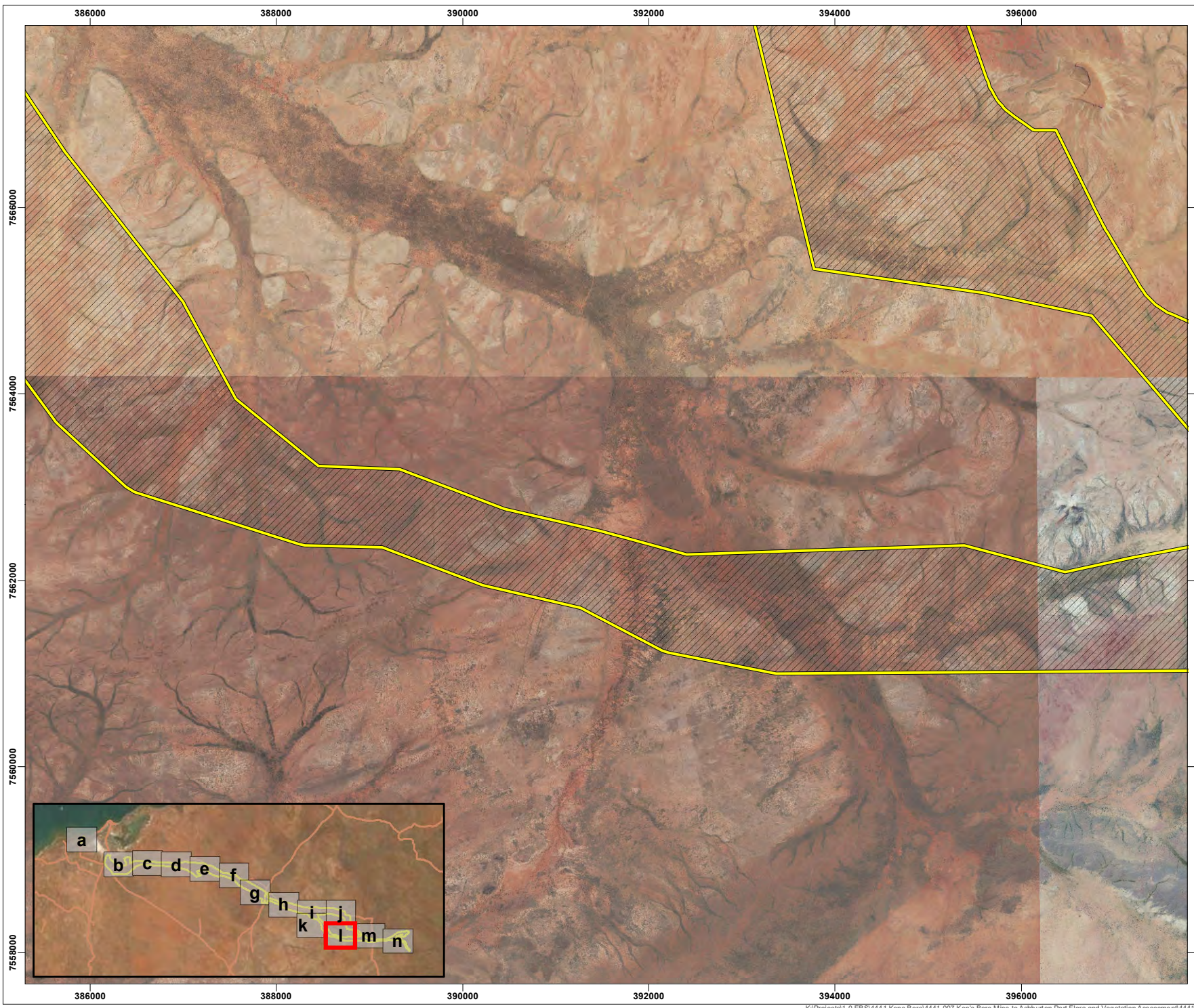
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 GDA 1994 MGA Zone 50

CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03
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**Vertebrate Fauna and**  
**SRE Assessment**  
**Figure 12k**  
**Fauna Habitats and**  
**Conservation Significant Fauna**



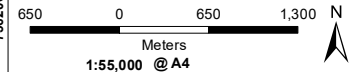
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**Legend**

- Roads
- Survey Area
- Fauna Habitat**
- Not assessed

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**LOCALITY MAP**



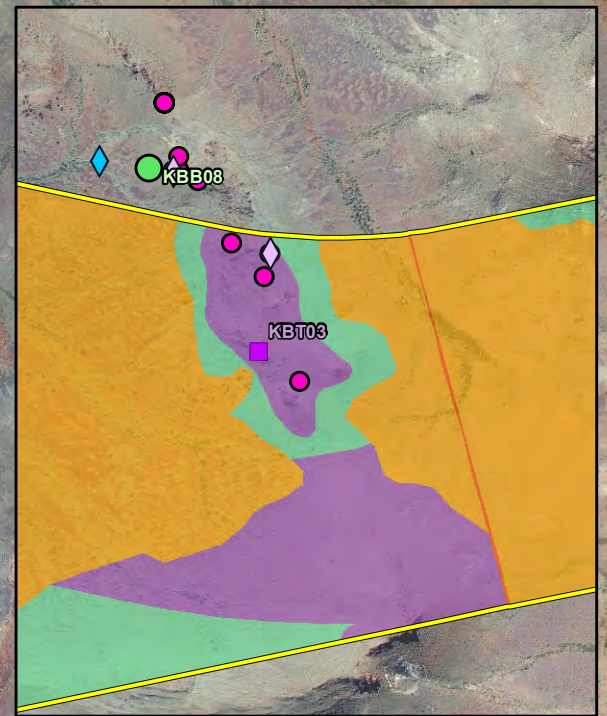
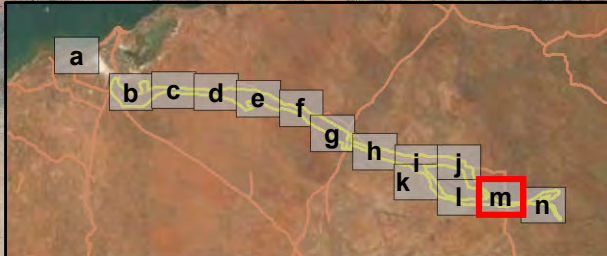
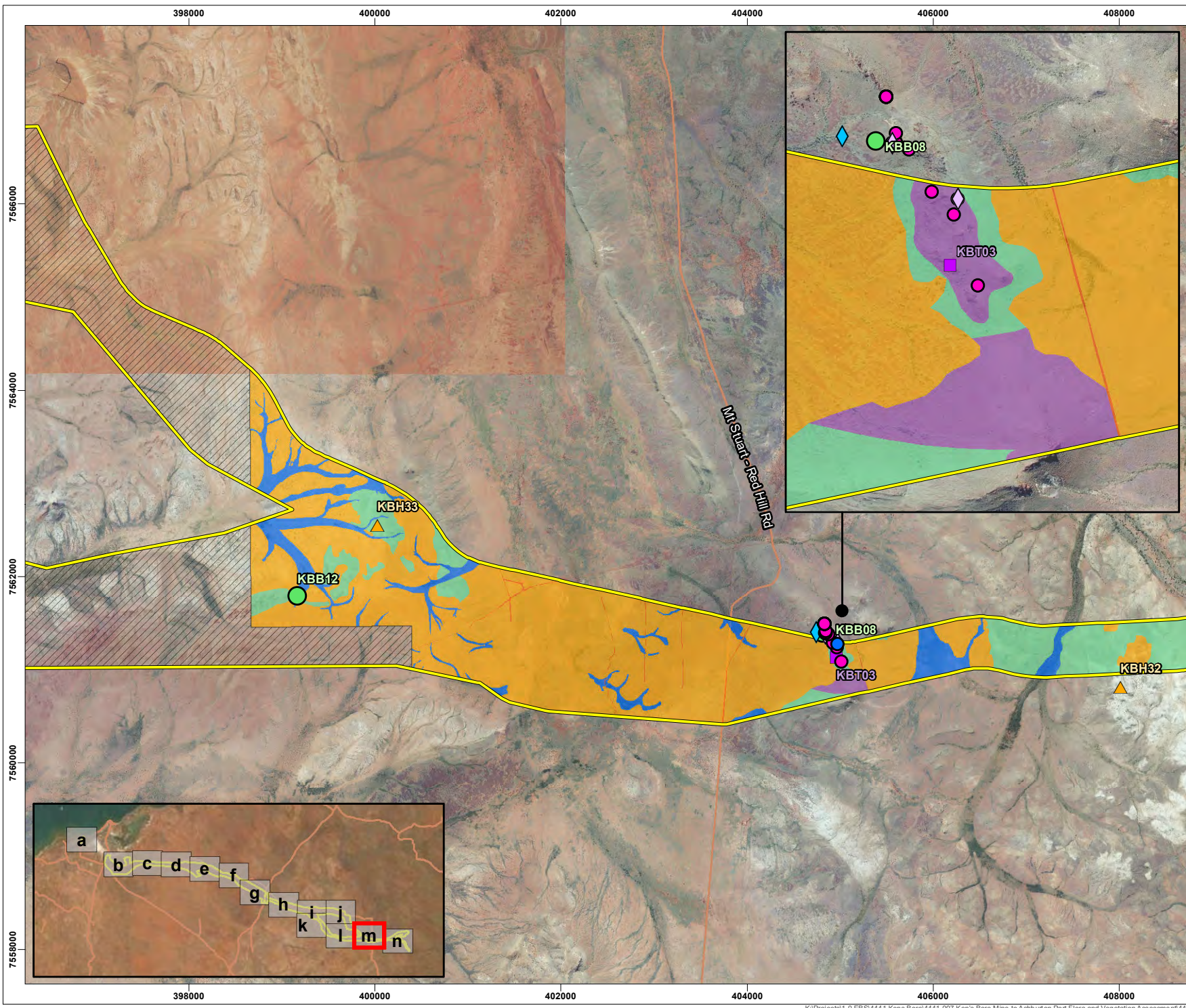
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HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03
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 SRE Assessment  
**Figure 121**  
 Fauna Habitats and  
 Conservation Significant Fauna

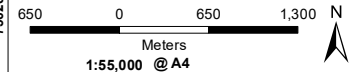
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### Legend

- Roads
- Survey Area
- Fauna Survey Sites**
  - ARU - audible calls
  - ARU - ultrasonic calls
  - Baseline trap site
  - Habitat assessment
  - Targeted trap site
- Conservation Significant Fauna**
  - Northern Quoll
  - Pilbara Leaf-nosed bat
- Fauna Habitat**
  - Drainage line/river/creek - minor
  - Mesas and breakaways (confirmed Northern Quoll habitat)
  - Stony hills and slopes
  - Stony plain
  - Cleared
  - Not assessed

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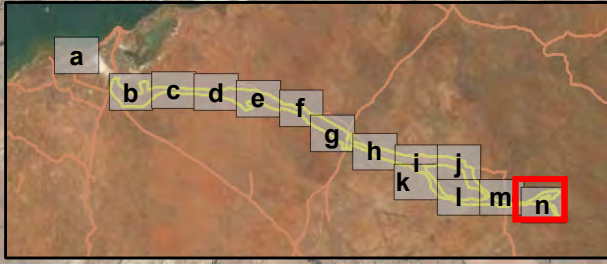
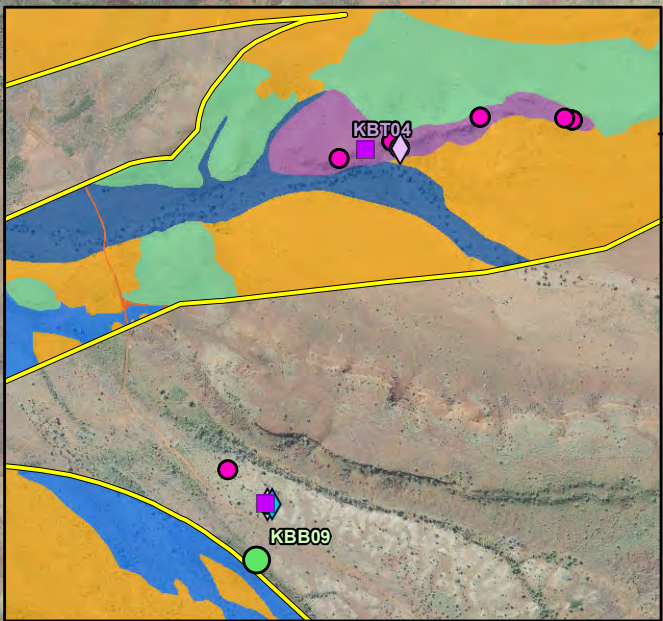
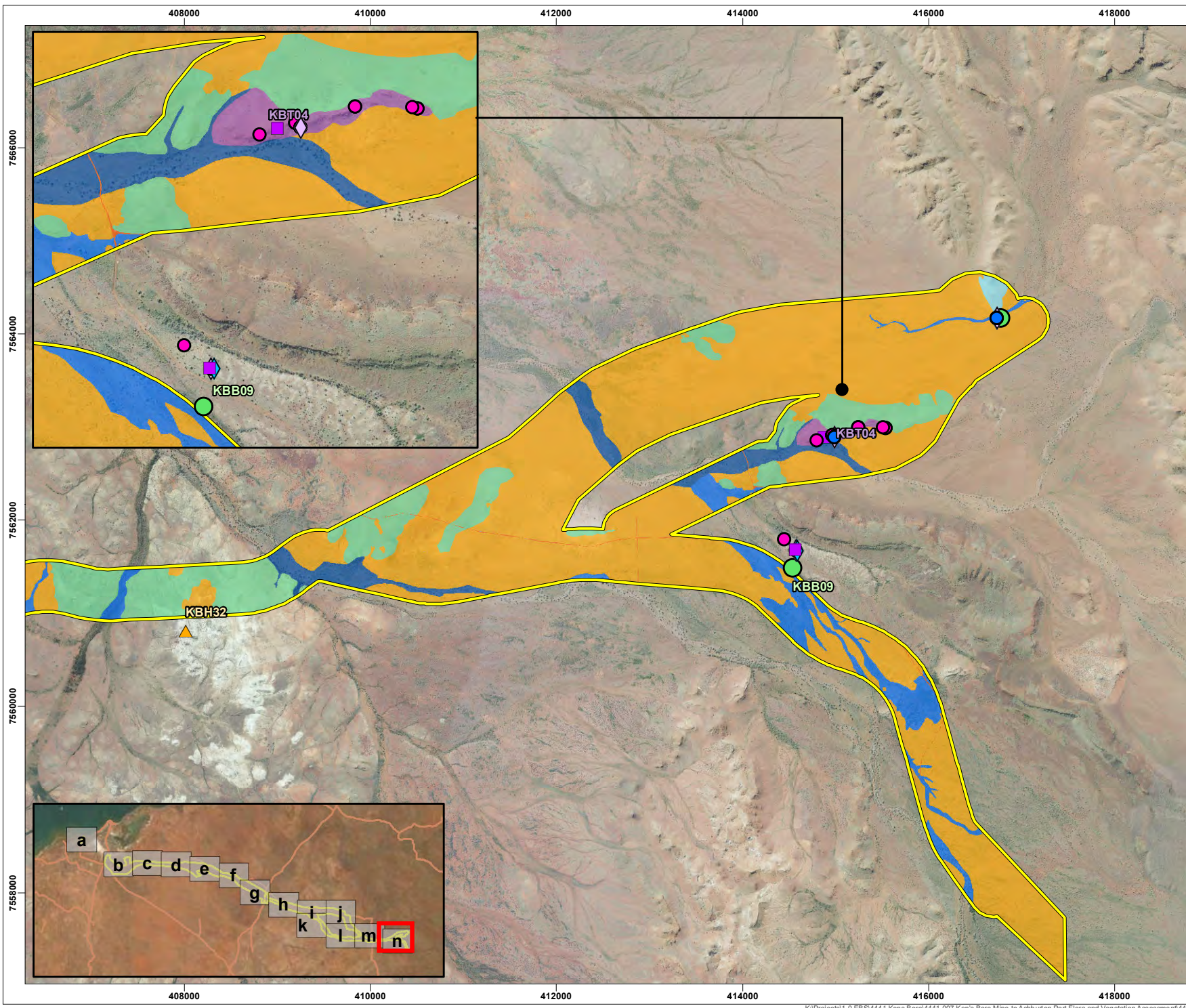
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**Vertebrate Fauna and  
 SRE Assessment**  
**Figure 12m**  
**Fauna Habitats and  
 Conservation Significant Fauna**

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### Legend

- Roads
- Survey Area

#### Fauna Survey Sites

- ARU - audible calls
- ARU - ultrasonic calls
- Baseline trap site
- Camera trap
- Habitat assessment
- Targeted trap site

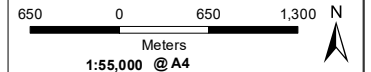
#### Conservation Significant Fauna

- Northern Quoll
- Pilbara Leaf-nosed bat

#### Fauna Habitat

- Drainage line/river/creek - major
- Drainage line/river/creek - minor
- Mesas and breakaways (confirmed Northern Quoll habitat)
- Mesas and breakaways (potential Northern Quoll habitat)
- Stony hills and slopes
- Stony plain
- Cleared

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**Vertebrate Fauna and  
 SRE Assessment**  
**Figure 12n**  
**Fauna Habitats and  
 Conservation Significant Fauna**

#### 4.1.2.2 Vertebrate Fauna Assemblage

The terrestrial vertebrate fauna surveys yielded 144 fauna species from 59 families, summarised in Table 25. A full inventory of fauna taxa recorded during the field surveys is provided in Appendix E.

**Table 25: Overview of vertebrate fauna taxa recorded**

Fauna Group	Number of Species	Number of Families
Birds	62	34
Mammals	25	11
Reptiles	53	10
Amphibians	3	2
<b>Total</b>	<b>144</b>	<b>59</b>

##### 4.1.2.2.1 Birds

A total of 62 avian species from 34 families were recorded throughout the Survey Area. The most recorded taxa were the Singing Honeyeater (*Gavicalis virescens*), Crested Bellbird (*Oreoica gutturalis*), and Willie Wagtail (*Rhipidura leucophrys*). The most diverse families were Meliphagidae with six taxa recorded, and Accipitridae and Columbidae each with four taxa recorded.

##### 4.1.2.2.2 Mammals

A total of eleven native non-volant (non-flying) mammal species from three families were recorded throughout the Survey Area. The most recorded native mammal taxon was the Northern Quoll (*Dasyurus hallucatus*) (likely due to survey techniques targeting this species). The most diverse non-volant mammal family was Dasyuridae, comprising six taxa.

A total of eleven volant mammal taxa (bats) from five families were recorded throughout the Survey Area. The most frequently recorded taxa were the Finlayson's Cave Bat (*Vespadelus finlaysoni*), Common Sheath-tailed Bat (*Taphozous georgianus*) and Gould's Wattled Bat (*Chalinolobus gouldii*)<sup>7</sup>. The most diverse family was Vespertilionidae, comprising four taxa.

Two introduced mammal taxa were recorded. Direct sightings and evidence of European Cattle (*Bos taurus*) were recorded throughout the Survey Area, while Cat (*Felis catus*) tracks and scat were observed at one location in the plain habitat. One potentially introduced taxa was also recorded, Dog/Dingo (*Canis familiaris ?dingo*). Differentiation between Dog and Dingo would require genetic analysis. Tracks were observed at two locations along the Cane River.

##### 4.1.2.2.3 Reptiles and Amphibians

A total of 53 reptile species from ten families were recorded throughout the Survey Area. The most recorded taxon was the Leopard Ctenotus (*Ctenotus pantherinus*), followed by the North-

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<sup>7</sup> Conservation significant bat calls were analysed in detail, therefore precise numbers of calls per night are known, whereas non-conservation significant bat species were simply recorded as present/absent at each location, therefore abundance counts may not provide an accurate reflection of abundance.

western Sandslider (*Lerista bipes*). The most diverse reptile family was Scincidae with 20 taxa, followed by Elapidae and Varanidae with six taxa each.

Three amphibian species from two families were recorded throughout the Survey Area. These were the Desert Spadefoot (*Notaden nichollsi*), Little Red Tree Frog (*Litoria rubella*) and the Sheep Frog (*Cyclorana maini*), of which the Sheep Frog was the most abundant.

#### 4.1.2.3 Conservation Significant Vertebrate Fauna

Four conservation significant fauna taxa were recorded within or directly adjacent the Survey Area during the field surveys (Figure 12):

- Northern Quoll (*Dasyurus hallucatus*) – Endangered under the BC Act and EPBC Act
- Ghost Bat (*Macroderma gigas*) – Vulnerable under the BC Act and EPBC Act
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4
- Pilbara Leaf-nosed Bat (*Rhinoicteris aurantia* Pilbara form) – Vulnerable under the BC Act and EPBC Act.

Northern Quolls were detected by camera traps at every targeted trap site (KBT01 – KBT05) and two individuals were captured in cage traps, one at site KBT02 and one at site KBT03 (Figure 12). One photo captured at KBT03 shows an adult and juvenile together (Plate 1). Spot pattern analysis identified five individuals at KBT02, three individuals at KBT03, five individuals at KBT04, and four individuals at KBT05. A photo of a Northern Quoll active during daylight, potentially lured out by the scent of bait, is shown in Plate 2. Northern Quolls were primarily recorded in the mesas and breakaways habitat; however, a possible Northern Quoll track was identified in sand dunes and swales habitat. The footprint, shown in Plate 3, was not distinct enough to identify with certainty and only one pawprint was found so gait could not be used to aid identification. Plate 3 also shows Spotted-tail Quoll (*Dasyurus maculatus*) tracks for comparison, as their track patterns are alike (Triggs, 2004).

A Ghost Bat was detected by camera trap and six Ghost Bat calls were recorded by ARU at site KBT05 (Plate 4; Figure 12) in mesas and breakaway habitat. An additional possible Ghost Bat call was recorded at site KBT02; however, this call was not clear enough to be identified with certainty.

A Western Pebble-mound Mouse mound was recorded in stony hills and slopes habitat (Plate 5; Figure 12). The mound had a clear undulating/conical structure. No access hole was visible, but the mound had been recently occupied. The record occurs 30 m outside the current Survey Area boundary due to minor changes made by MRL based on the haul road design.

Pilbara Leaf-nosed Bats were recorded by ARU at four sites, with fifteen calls recorded across four nights at site KBB11, five calls recorded over two nights at site KBT03, 95 calls recorded over four nights at site KBT04, and one call recorded on one night at site KBT05 (Figure 12).

A fifth conservation significant fauna taxon, the Pilbara Olive Python (*Liasis olivaceus barroni*), listed as Vulnerable under the BC Act and EPBC Act, was opportunistically recorded in a cattle trough approximately 20 km south of the Survey Area near Cardo Camp (Plate 6; Figure 12).



**Plate 1: Adult and juvenile Northern Quoll detected by camera trap at site KBT03**



**Plate 2: Northern Quoll detected by camera trap at site KBT04**





**Plate 3: Possible Northern Quoll track (left), Spotted-Tail Quoll tracks (Triggs, 2004) (right)**



**Plate 4: Ghost Bat detected via camera trap at site KBT05**



**Plate 5: Inactive Western Pebble-mound Mouse mound**



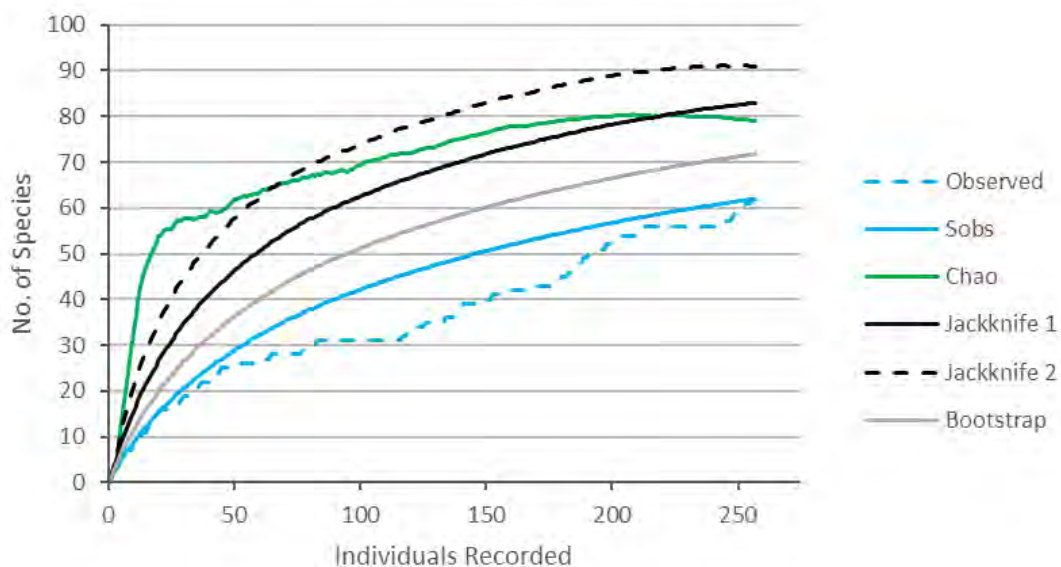
**Plate 6: Pilbara Olive Python opportunistically recorded in a cattle trough at Cardo Camp**

### 4.1.3 Survey Adequacy

#### 4.1.3.1 Birds

The species accumulation curve for birds in the Survey Area was based on birds observed across trips 1, 3, 5 and 10. The Sobs curve steadily increased with captures and does not appear to reach an asymptote (Figure 13), indicating that additional taxa may be recorded with increased trapping effort. All richness curves were greater than the Sobs curve, indicating that the observed species richness was lower than predicted by the analysis.

Estimated species richness for the Survey Area ranged from 72 to 91, with an observed value of 62 taxa. Richness estimators indicated that the surveys were approximately 72% (Jackknife 2) to 91% (Bootstrap) adequate in recording the full complement of bird taxa within the Survey Area.

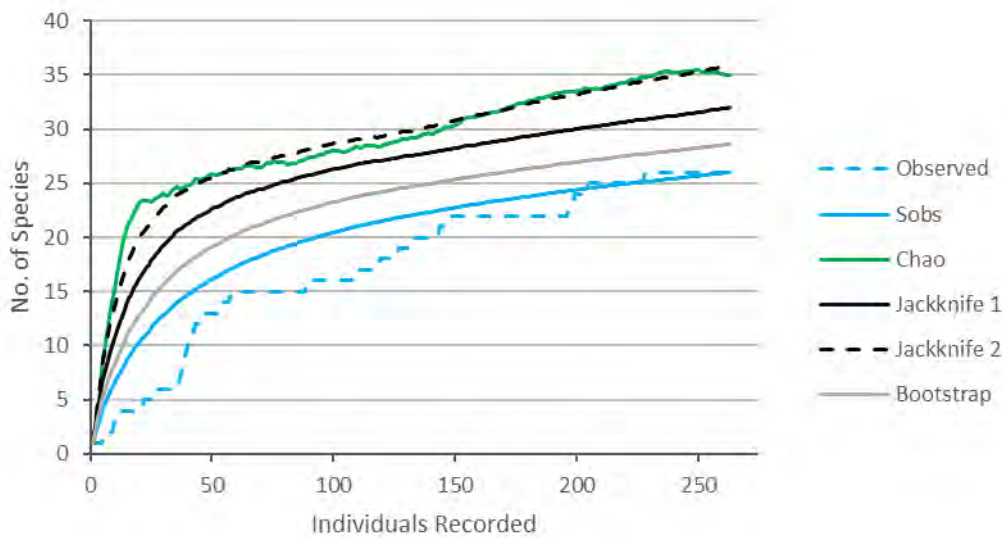


**Figure 13: Bird Species Accumulation Curve**

#### 4.1.3.2 Mammals

The species accumulation curve for mammals in the Survey Area was based on mammals observed across trips 1, 3, 5 and 10. The Sobs curve steadily increased with captures and does not appear to reach an asymptote (Figure 14), indicating that additional taxa may be recorded with increased trapping effort. All richness curves were greater than the Sobs curve, indicating that the observed species richness was lower than predicted by the analysis.

Estimated species richness for the Survey Area ranged from 29 to 36, with an observed value of 26 taxa. Richness estimators indicated that the surveys were approximately 68% (Jackknife 2) to 86% (Bootstrap) adequate in recording the full complement of bird taxa within the Survey Area.

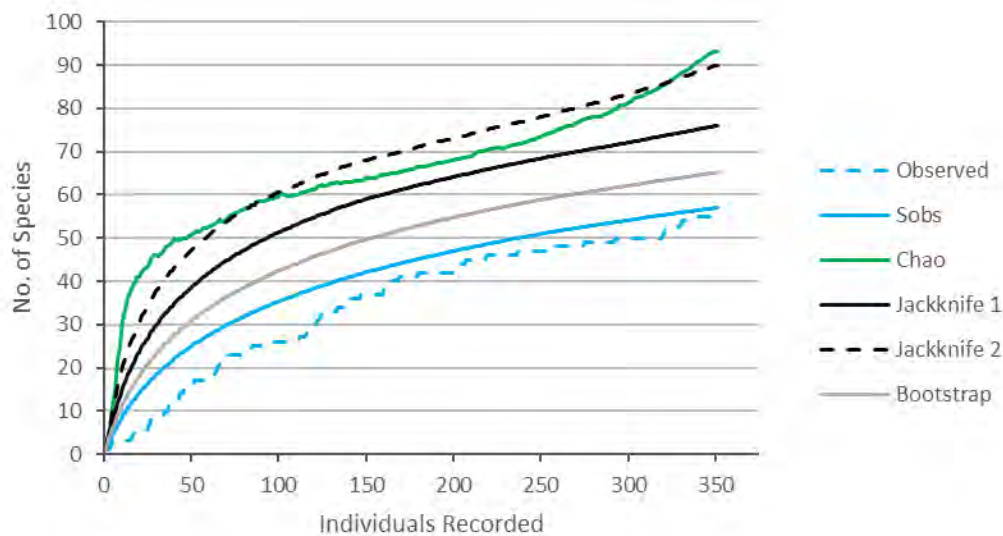


**Figure 14: Mammal Species Accumulation Curve**

4.1.3.3 Reptiles and Amphibians

The species accumulation curve for reptiles and amphibians in the Survey Area was based on reptile captures and observations across trips 1, 3, 5 and 10. The Sobs curve steadily increased with trap nights and does not appear to reach an asymptote (Figure 15), indicating that additional taxa may be recorded with increased trapping effort. All richness curves were greater than the Sobs curve, indicating that the observed species richness was lower than predicted by the analysis.

Estimated species richness for the Survey Area ranged from 65 to 93, with an observed value of 57 taxa. Richness estimators indicated that the surveys were approximately 61% (Chao) to 88% (Bootstrap) adequate in recording the full complement of bird taxa within the Survey Area.



**Figure 15: Reptile and Amphibian Species Accumulation Curve**

## 4.2 SRE Invertebrate Fauna

### 4.2.1 Desktop Assessment

The desktop assessment identified two possible SRE taxa and no confirmed or likely SRE taxa. The taxa are summarised below and shown in Table 26 along with their conservation code:

- Land snail, *Quistrachia* cf. 'Barlee Range' n. sp.
- Land snail, cf. *Stenomelania denisoniensis*.

The remaining taxa identified from desktop resources were found to be widespread.

No conservation significant invertebrate taxa were identified during the desktop assessment (excluding troglofauna and stygofauna, which are not included in this assessment).

**Table 26: SRE invertebrate fauna likelihood of occurrence within the Survey Area**

Higher Order	Taxon	SRE status	Conservation Status		Likely Habitat Present	Desktop Likelihood
			State	Federal		
<b>Gastropoda:</b>						
Camaenidae	<i>Quistrachia</i> cf. 'Barlee Range' n. sp.	Possible	-	-	Not Present	Low
Thiraidae	cf. <i>Stenomelania denisoniensis</i>	Possible	-	-		Very Low

### 4.2.2 SRE Habitat

Most of the habitats identified within the Survey Area (sand dunes, plains and stony hills and slopes) are widespread across the region and are unlikely to provide habitat isolates which may give rise to SRE invertebrates. These habitats are therefore considered to provide low SRE habitat suitability. The drainage line/river/creek habitats and mesas and breakaways habitats are considered to provide moderate SRE habitat suitability, as the western edges of drainage lines and the southeast slopes of mesas and breakaways provide some protection from afternoon sun and may contain greater moisture within leaf litter accumulations. SRE habitat suitability is shown in Table 27 and Figure 16. SRE site locations and photos are shown in Appendix F.

**Table 27: Habitat suitability for SRE invertebrates**

Fauna Habitat	SRE Sites	Extent within the Survey Area		SRE Habitat Suitability
		Area (ha)	%	
Plain	KBSRE15, KBSRE16, KBSRE17, KBSRE28	8,224	27.2	Low
Stony plain	KBSRE06, KBSRE08, KBSRE11, KBSRE12, KBSRE22, KBSRE24, KBSRE26	6,624	21.91	Low

Fauna Habitat	SRE Sites	Extent within the Survey Area		SRE Habitat Suitability
		Area (ha)	%	
Sand dunes and swales	KBSRE18	3,149	10.42	Low
Drainage line/river/creek (minor)	KBSRE02, KBSRE04, KBSRE07, KBSRE09, KBSRE10, KBSRE13, KBSRE23	176	0.58	Moderate
Drainage line/river/creek (major)	KBSRE27	1,911	6.32	Moderate
Tidal flats	KBSRE01, KBSRE29, KBSRE30	1,758	5.82	Low
Mulga woodland	KBSRE03	369	1.22	Low
Stony hills and slopes	KBSRE05, KBSRE19, KBSRE20, KBSRE21	1,140	3.79	Moderate
Mesas and breakaways	KBSRE14, KBSRE25	48	0.13	Moderate
Cleared		176	0.58	Nil
Not Assessed				Nil

292000 294000 296000

7600000  
7598000



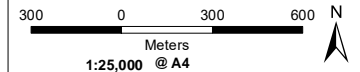
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- Legend**
- Roads
  - Survey Area
- SRE Habitat Suitability**
- Low Suitability
  - Cleared

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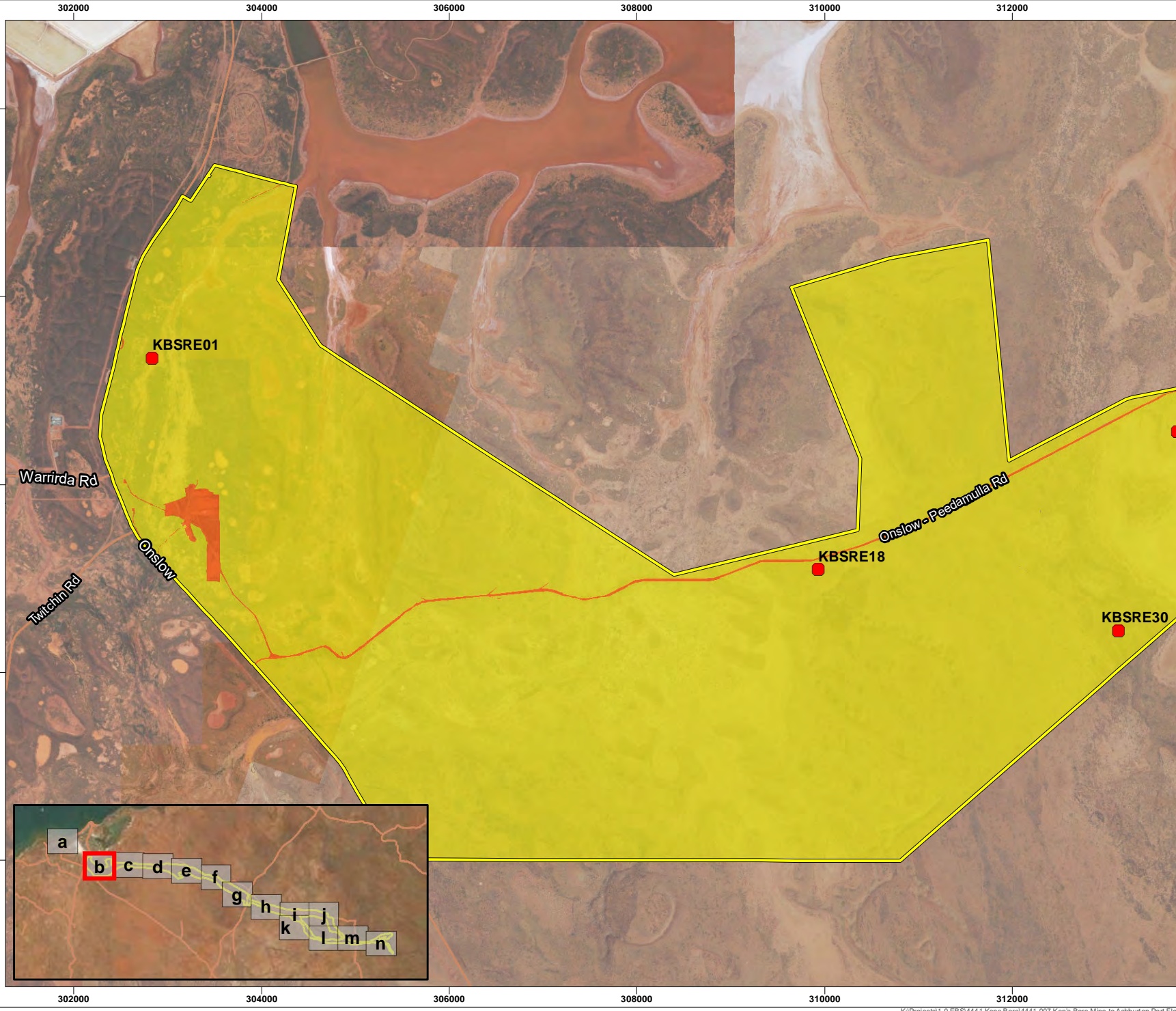
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**Figure 16a**  
**SRE Habitat Suitability**

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**Legend**

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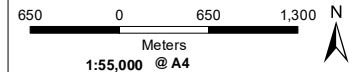
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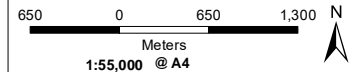
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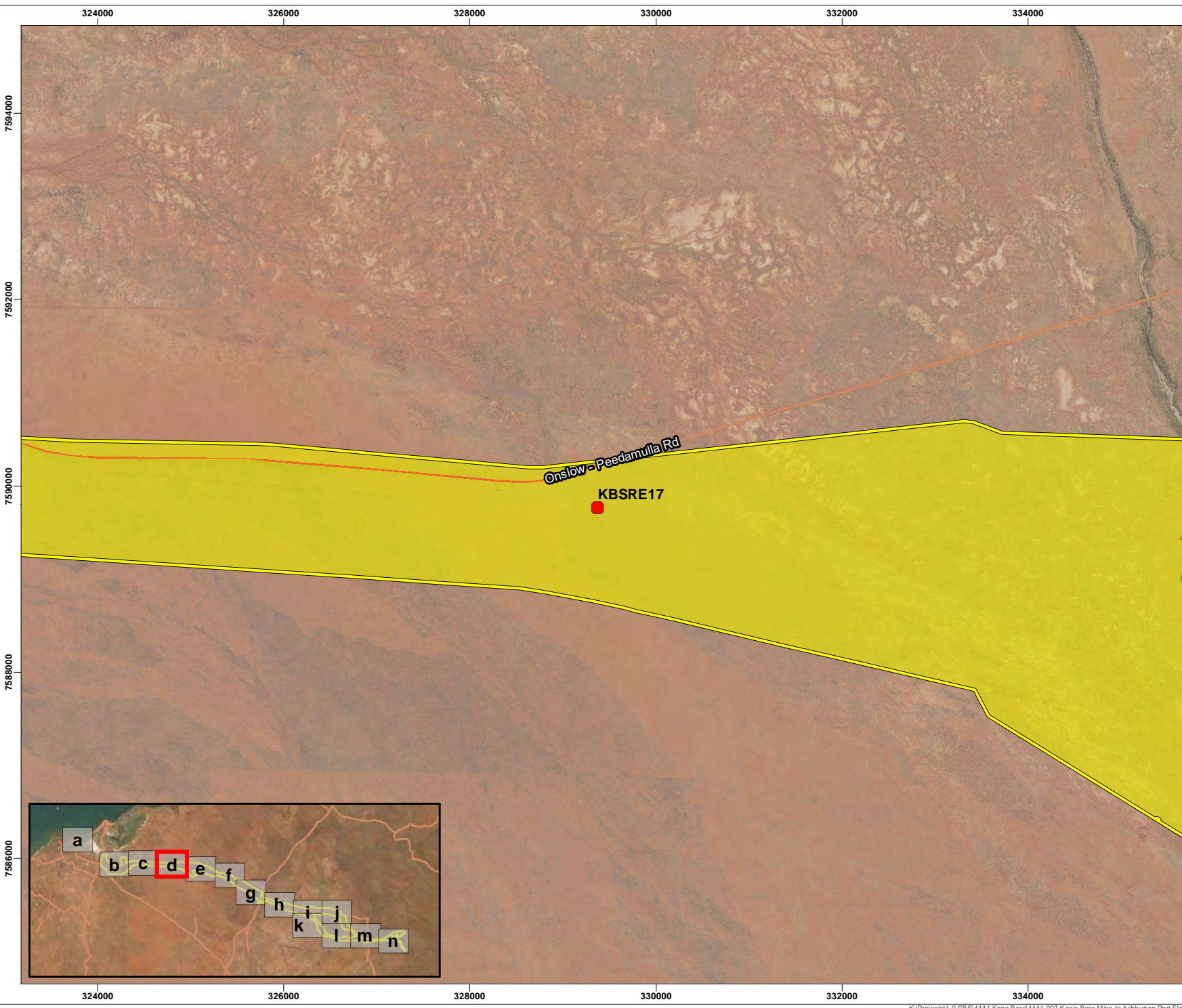
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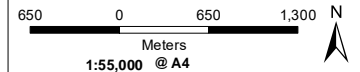
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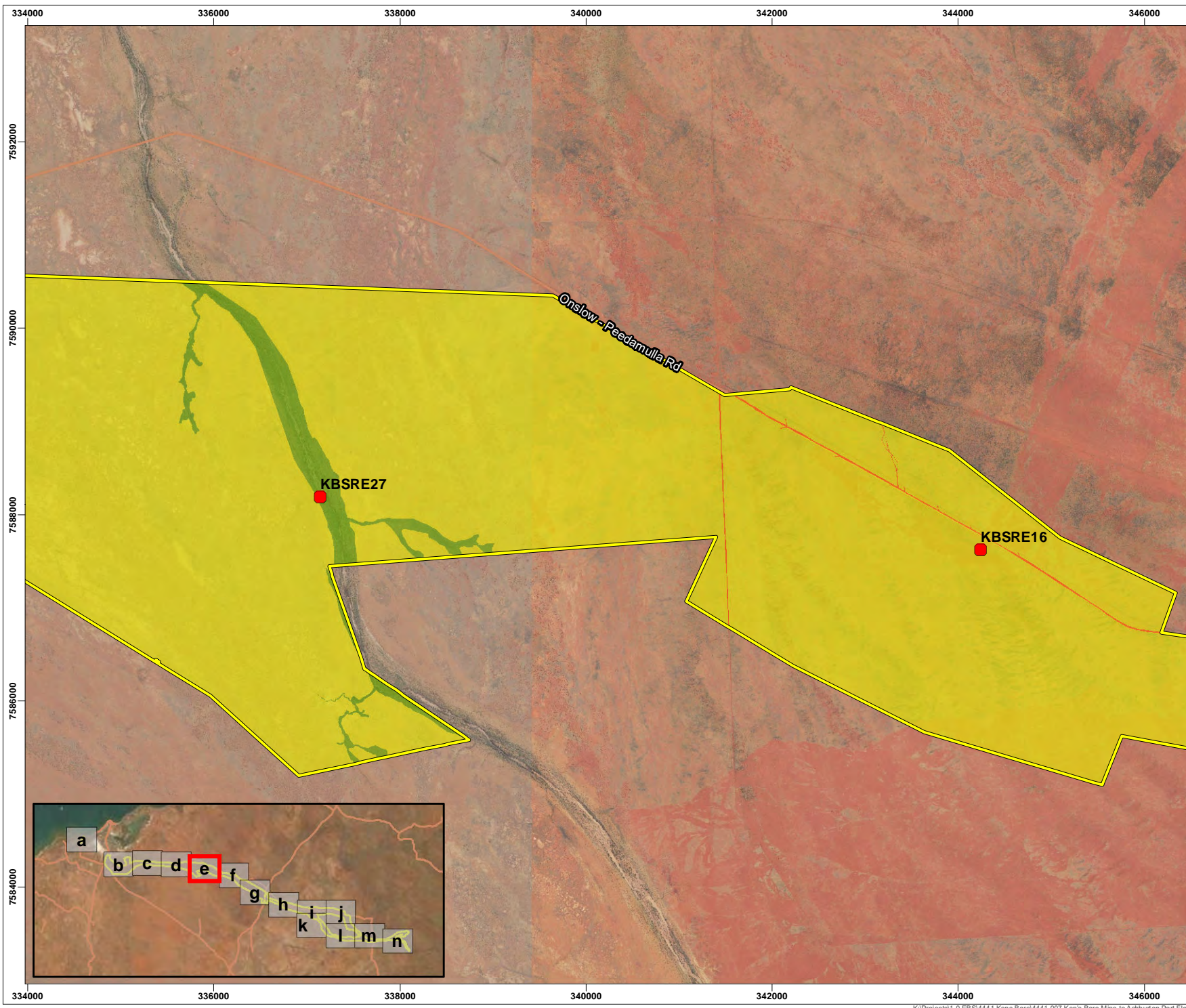


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**Figure 16d**  
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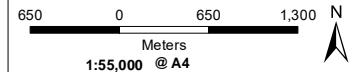
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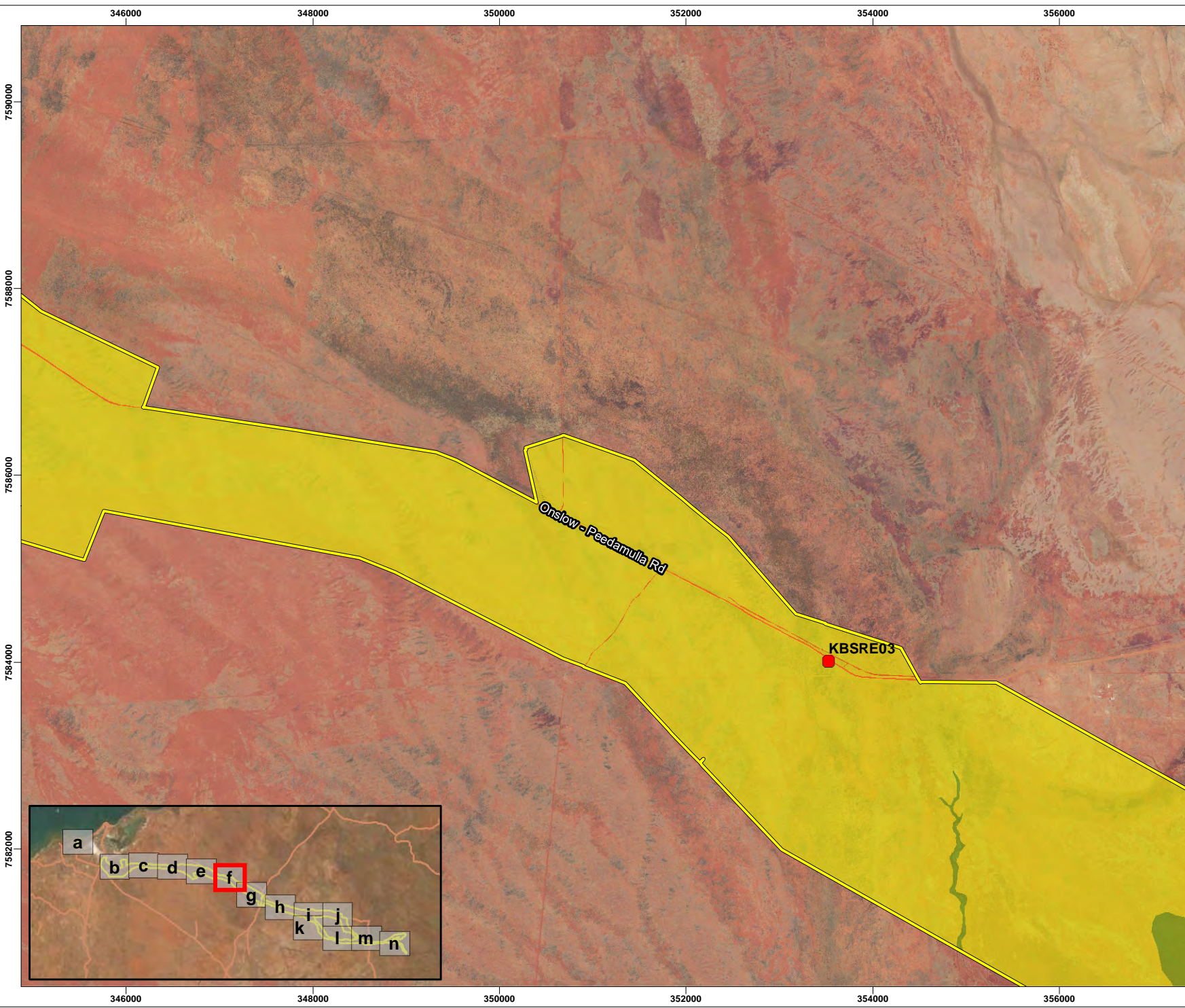
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**Figure 16e**  
**SRE Habitat Suitability**

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**Legend**

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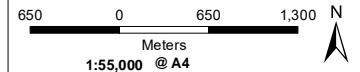
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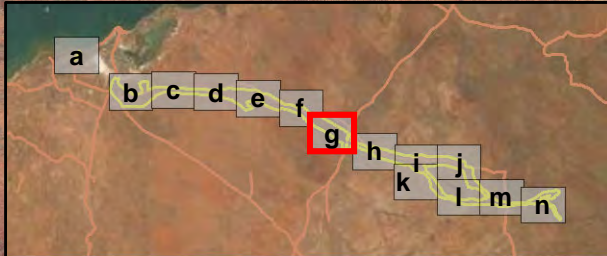
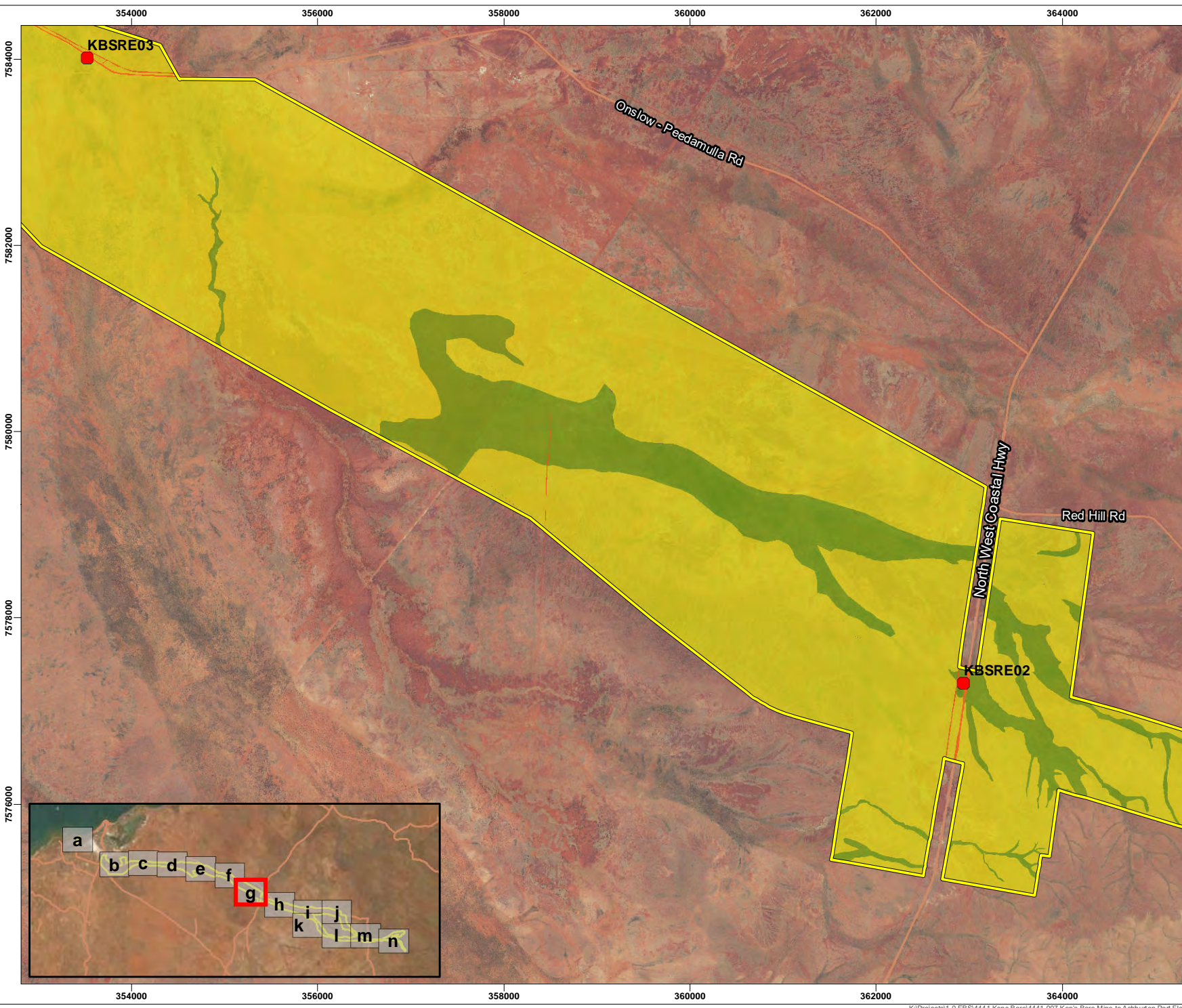
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**Figure 16f**  
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**Legend**

- Roads
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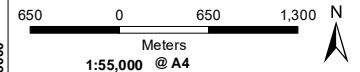
**SRE Habitat Suitability**

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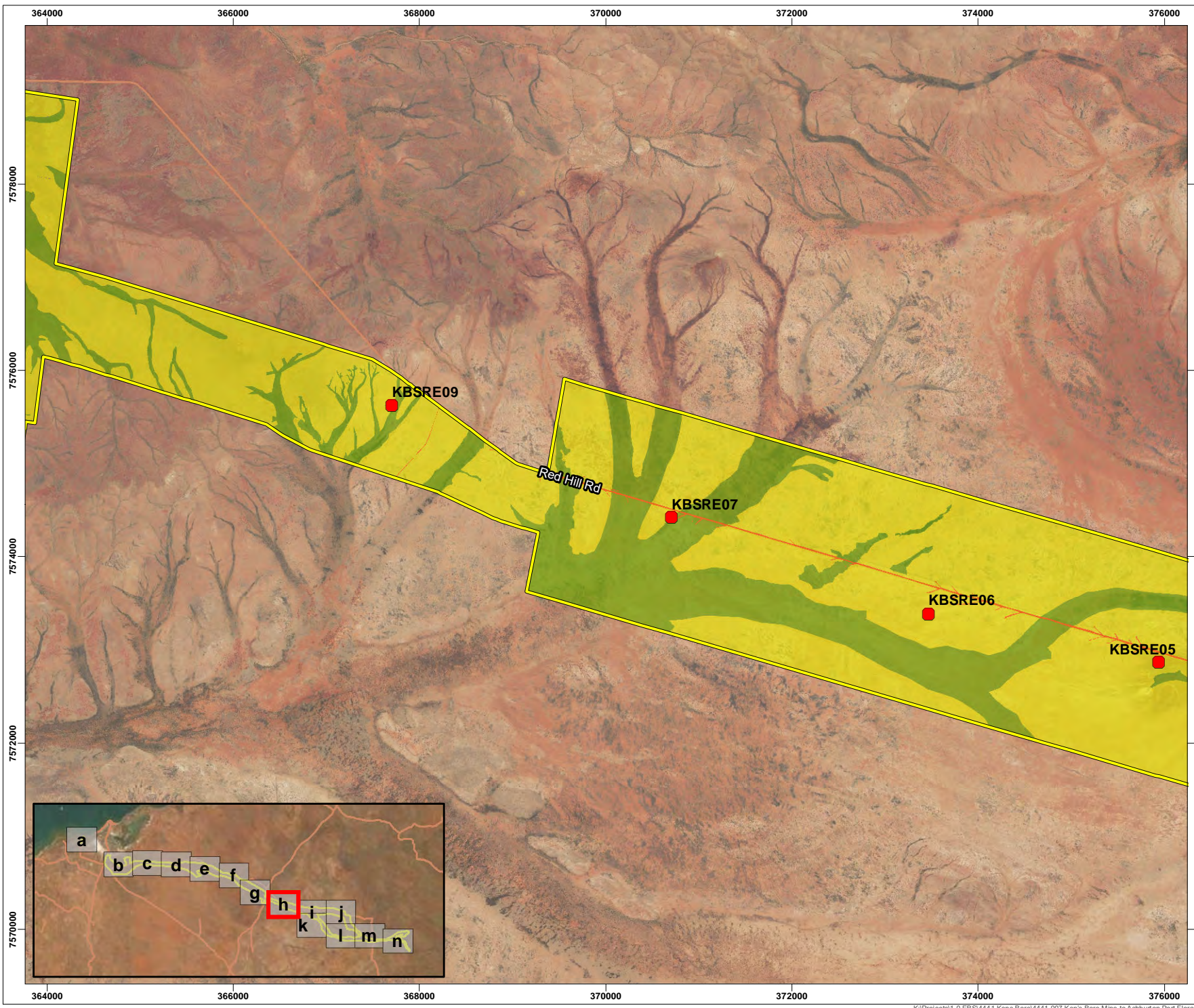
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**Figure 16g**  
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**Legend**

- Roads
- Survey Area
- SRE Survey Sites

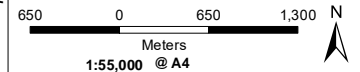
**SRE Habitat Suitability**

- Moderate Suitability
- Low Suitability
- Cleared

- NOTE THAT POSITION ERRORS CAN BE >5m IN SOME AREAS  
 - LOCALITY MAP SOURCED LANDGATE 2020  
 - OTHER DATA SOURCED LANDGATE 2020  
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**LOCALITY MAP**



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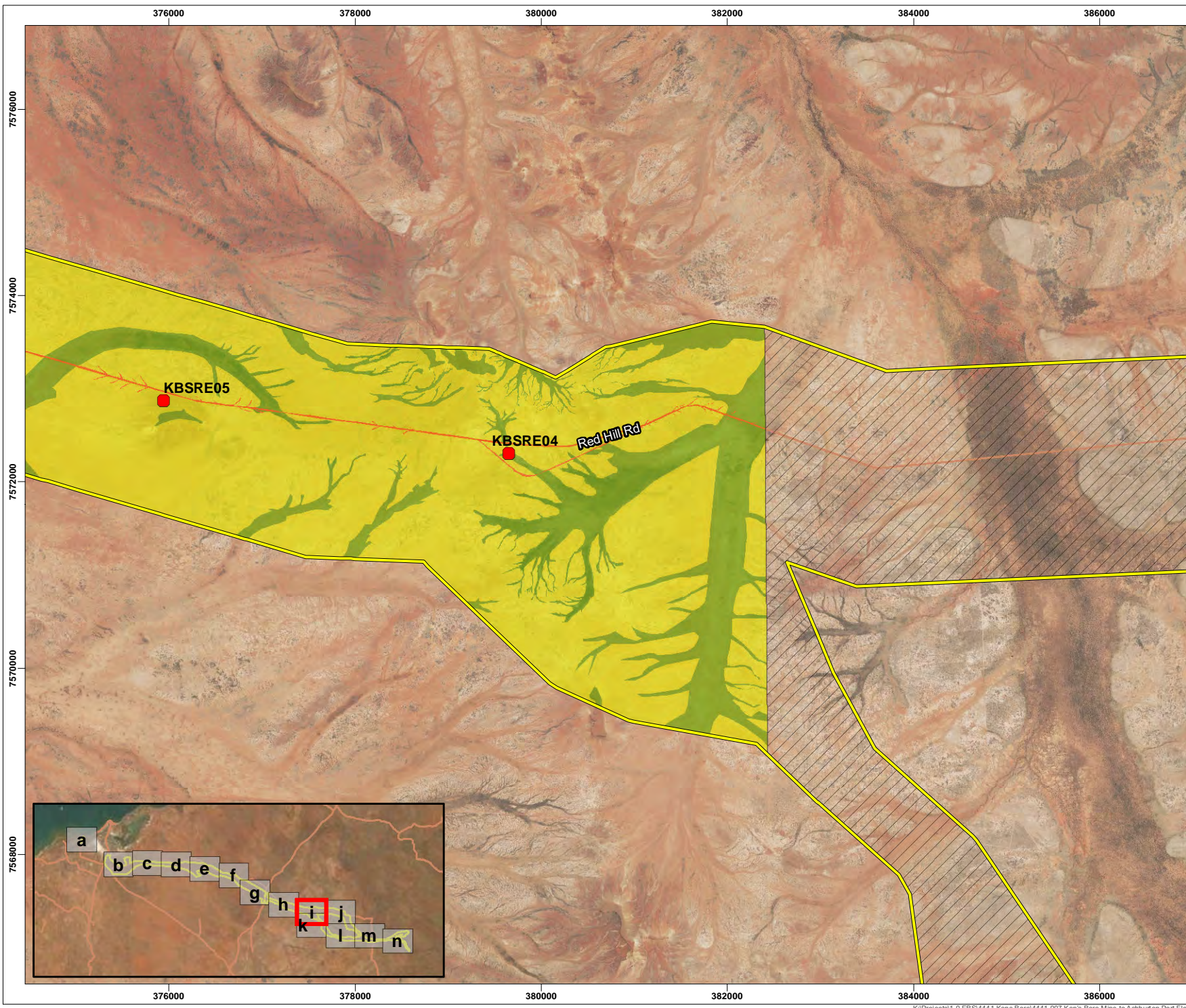
**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LFV	EW	SW	03

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**Figure 16h**  
 SRE Habitat Suitability

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**Legend**

- Roads
- Survey Area
- SRE Survey Sites

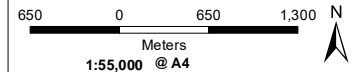
**SRE Habitat Suitability**

- Moderate Suitability
- Low Suitability
- Cleared
- Not Assessed

- NOTE THAT POSITION ERRORS CAN BE >5m IN SOME AREAS  
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**LOCALITY MAP**



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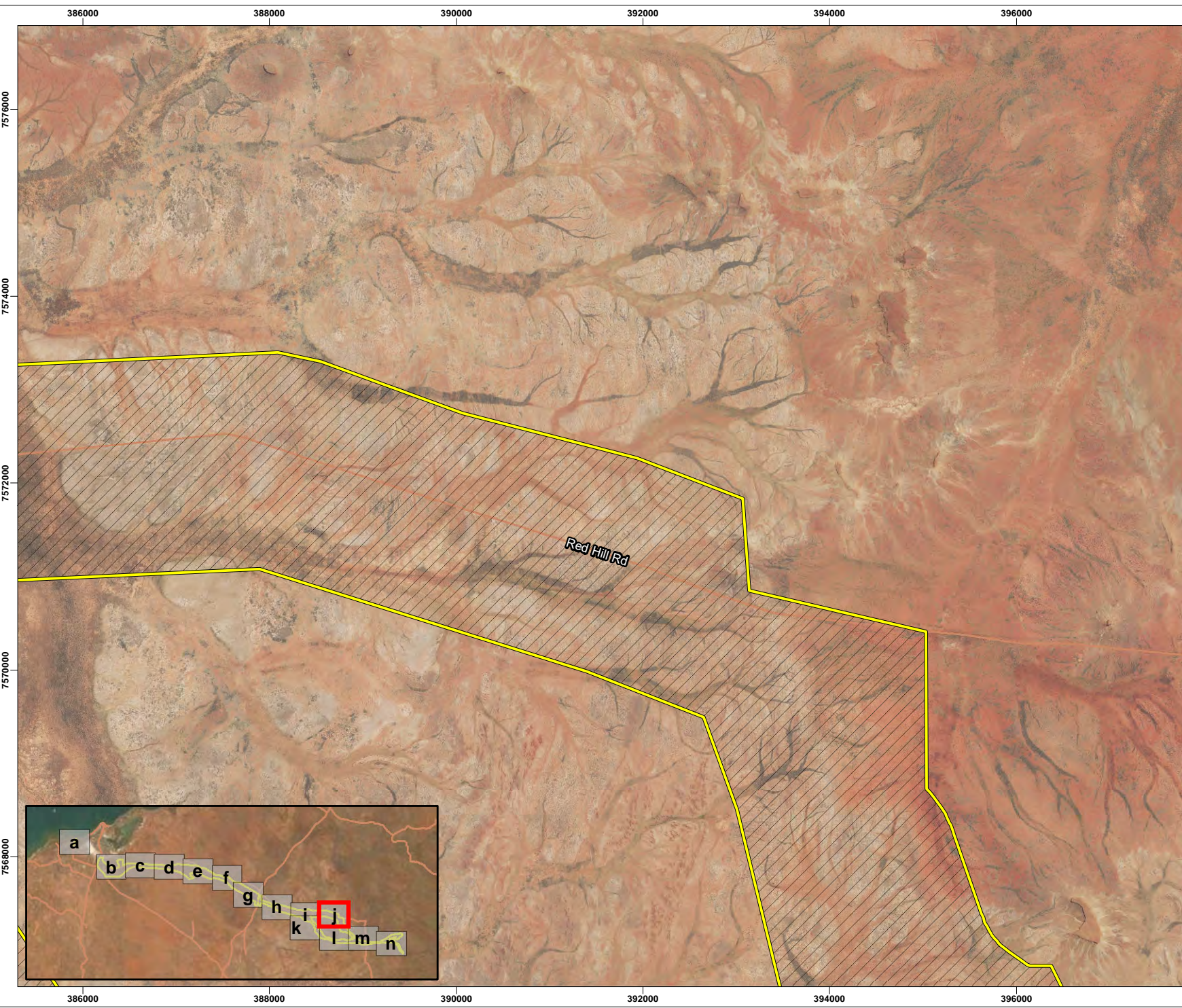
**HORIZONTAL DATUM AND PROJECTION**  
GDA 1994 MGA Zone 50

<b>CREATED</b> LFV	<b>CHECKED</b> EW	<b>APPROVED</b> SW	<b>REVISION</b> 03
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**Figure 16i**  
**SRE Habitat Suitability**

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**Legend**

- Roads
- Survey Area

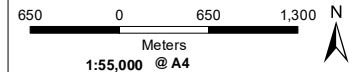
**SRE Habitat Suitability**

- Not Assessed

- NOTE THAT POSITION ERRORS CAN BE >5m IN SOME AREAS  
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**Figure 16j**  
**SRE Habitat Suitability**



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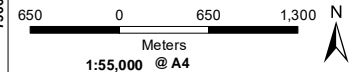
**Legend**

- Roads
- Survey Area
- SRE Habitat Suitability**
- Moderate Suitability
- Low Suitability
- Not Assessed

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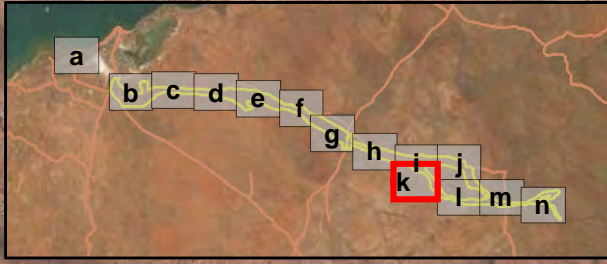
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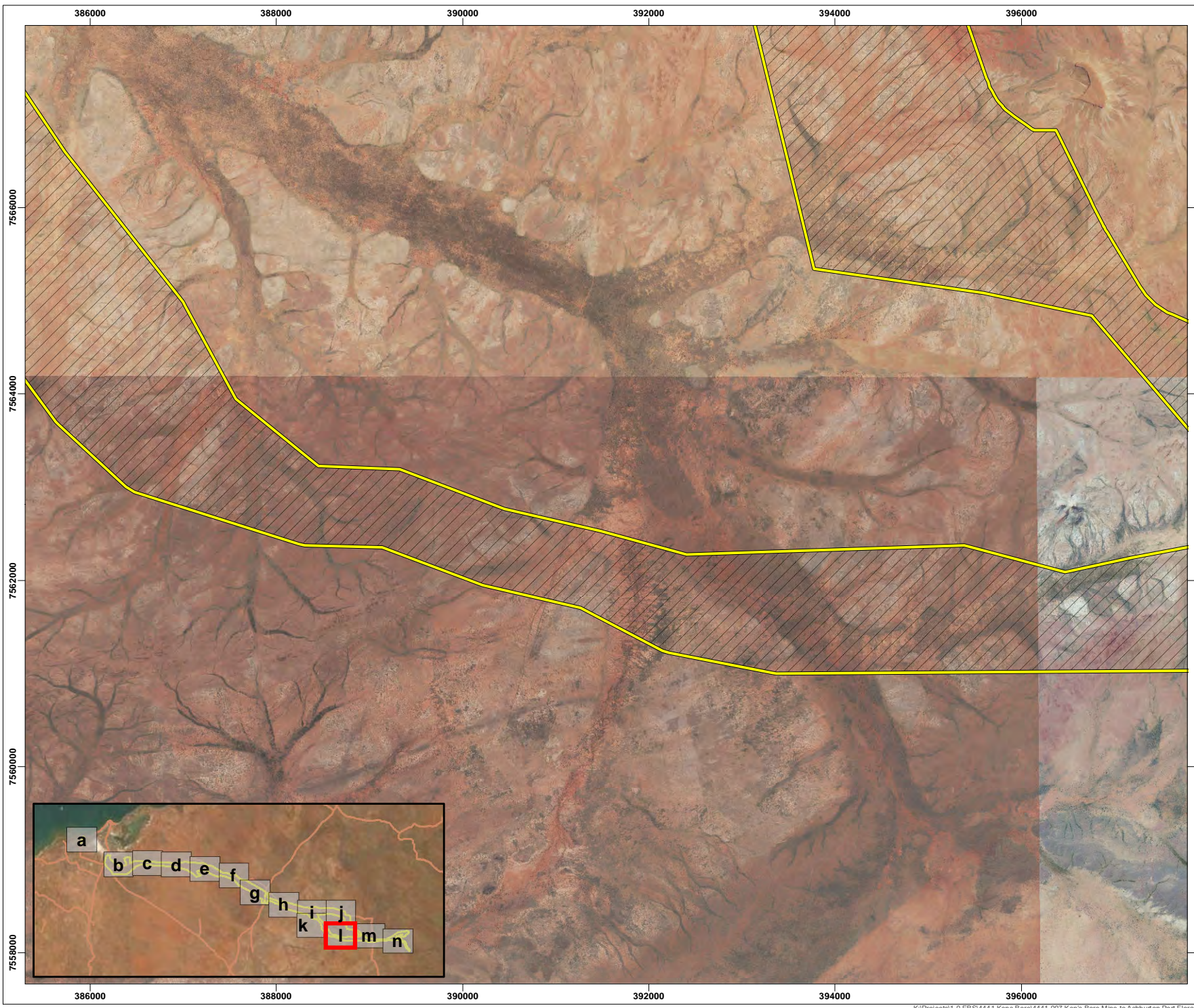
CREATED	CHECKED	APPROVED	REVISION
LFV	EW	SW	03

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**Figure 16k**  
**SRE Habitat Suitability**



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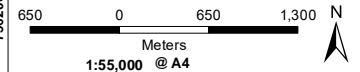
**Legend**

- Roads
- Survey Area
- SRE Habitat Suitability**
- Not Assessed

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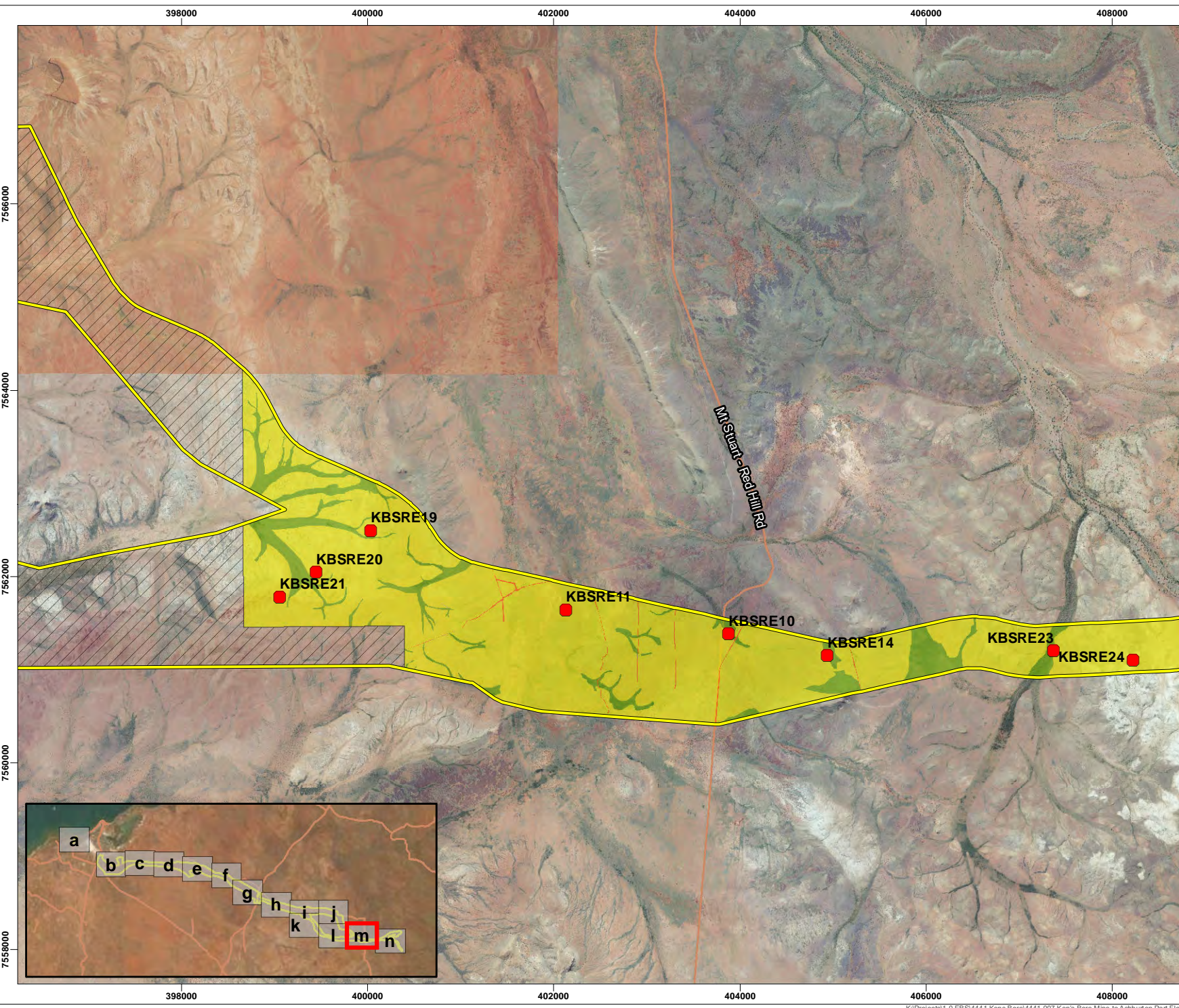
HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

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**Figure 16I**  
 SRE Habitat Suitability

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### Legend

- Roads
- Survey Area
- SRE Survey Sites

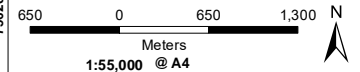
#### SRE Habitat Suitability

- Moderate Suitability
- Low Suitability
- Cleared
- Not Assessed

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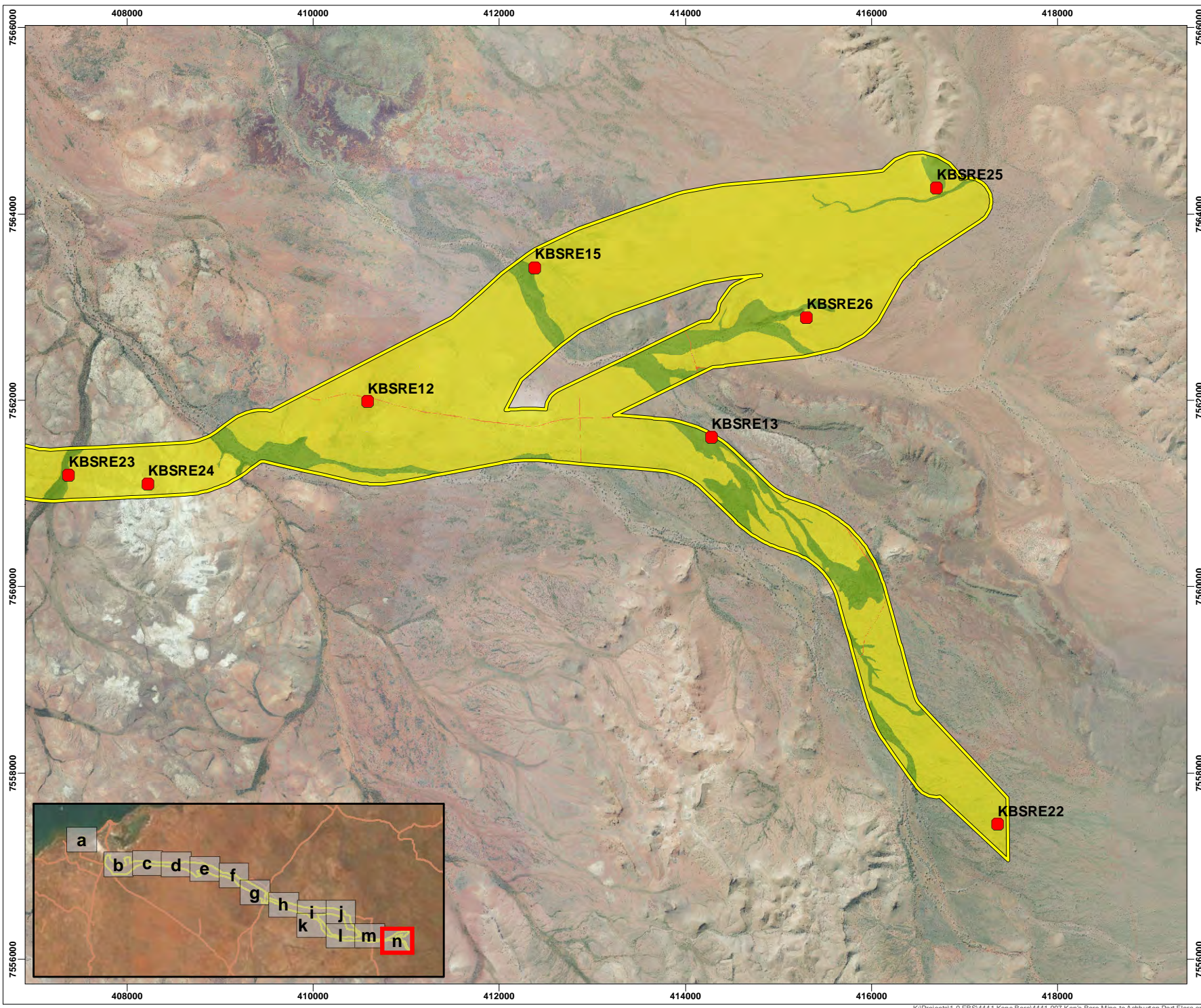
HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

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**Figure 16m**  
 SRE Habitat Suitability

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**Legend**

- Roads
- Survey Area
- SRE Survey Sites

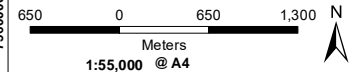
**SRE Habitat Suitability**

- Moderate Suitability
- Low Suitability
- Cleared

- NOTE THAT POSITION ERRORS CAN BE >5m IN SOME AREAS  
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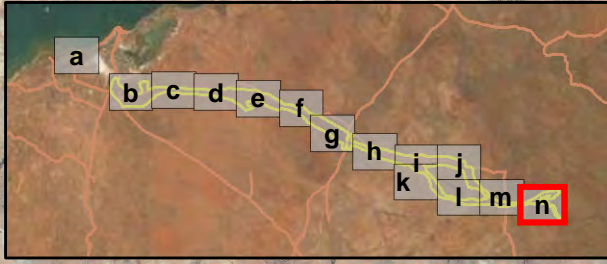
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 GDA 1994 MGA Zone 50

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**Figure 16n**  
**SRE Habitat Suitability**



#### 4.2.3 SRE Field Survey

The SRE field surveys recorded 307 individual specimens representing 24 taxa of invertebrates from five classes, ten orders and 13 families that have the potential to contain SRE taxa (Appendix G). Taxa that are considered to be SRE are summarised in Table 28.

No Confirmed SRE or conservation significant taxa were recorded during the field survey.

Two likely SRE taxa were recorded at single locations:

- One Philoscid isopod Philoscidae sp. indet. 'Onslow'
- One Polydesmid millipede *Antichiropus?* Juvenile.

Four possible SRE taxa were recorded primarily due to the groups being considered data deficient:

- One armadillid isopod *Buddelundia* sp. '35/36'
- One centipede *Cryptops* sp. 'Onslow'
- Two Olpid pseudoscorpions *Beierolpium* sp., and *Indolpium* sp.

The details of all specimens recorded during the surveys including abundance data and individual specimen tracking numbers is shown in Appendix G.

**Table 28: SRE invertebrates recorded during the field surveys**

Higher Order	Taxon	SRE Site Recorded	SRE Status	SRE Habitat
<b>Gastropoda:</b>				
Camaenidae	<i>Rhagada convicta</i>	KBSRE04, KBSRE05, KBSRE06, KBSRE07, KBSRE08, KBSRE09, KBSRE10, KBSRE11, KBSRE12, KBSRE13, KBSRE24, KBSRE27	Widespread	Drainage (minor and major), stony hills and slopes and stony plain
	<i>Rhagada cf. radleyi</i>	KBSRE24	Widespread	Stony plain
<b>Crustacea: Isopoda:</b>				
Armadillidae	<i>Buddelundia</i> sp. '10bf'	KBSRE04, KBSRE05, KBSRE12, KBSRE13, KBSRE16, KBSRE19, KBSRE25, KBSRE29, KBSRE30, KBT02, KBT03, KBT06, KBT08, KBT09	Widespread	Drainage (minor), mesas and breakaways, plain, stony hills and slopes, stony plain, tidal flats
	<i>Buddelundia</i> sp. '14re'	KBSRE02, KBSRE03, KBSRE04, KBSRE07, KBSRE10, KBSRE15, KBSRE27, KBSRE28, KBT04	Widespread	Drainage (major and minor), mulga woodland, plain

Higher Order	Taxon	SRE Site Recorded	SRE Status	SRE Habitat
Armadillidae	<i>Buddelundia</i> sp. '35/36'	KBSRE02, KBSRE03, KBSRE08, KBSRE13, KBSRE15, KBSRE22, KBSRE24	Possible	Drainage (minor), mulga woodland, plain, stony plain
	<i>Buddelundia</i> sp. indet. juvenile/damaged	KBSRE03, KBSRE07, KBSRE11, KBSRE13, KBSRE17, KBSRE18, KBSRE22, KBSRE24, KBSRE25	Unknown	drainage (minor), mesas and breakaways, mulga woodland, plain, sand dunes and swales, stony plain
Philosciidae	Philosciidae sp. indet. 'Onslow'	KBSRE15	Likely	Plain
<b>Arachnida:</b>				
<b>Araneae, Mygalomorphae</b>				
Anamidae	<i>Aname ellanae</i>	KBT01, KBT03	Widespread	Sand dunes and swales
<b>Pseudoscorpiones</b>				
Chthoniidae	<i>Austrochthonius australis</i>	KBSRE07, KBSRE27	Widespread	Drainage (minor and major)
Olpidae	<i>Beierolpium</i> sp.	KBSRE14, KBSRE22, KBSRE25, KBSRE26	Possible	Mesas and breakaways, stony plain
	<i>Indolpium</i> sp.	KBSRE01, KBSRE26, KBT08	Possible	Stony plain, tidal flats, stony hills, and slopes
<b>Scorpionida</b>				
Buthidae	<i>Lychas</i> sp. 'hairytail'	KBT02, KBT03, KBT04, KBT07, KBT08	Widespread	Drainage (minor), mulga woodland, stony hills, and slopes
	<i>Lychas</i> sp. 'harveyi'	KBSRE02, KBSRE16, KBT03, KBT06, KBT08, KBT09	Widespread	Drainage (minor), plain, stony hills and slopes
	<i>Lychas</i> sp. 'multipunctatus'	KBSRE23	Widespread	Drainage (minor)
Urodacidae	<i>Urodacus megamastigmus</i>	KBT09	Widespread	Drainage (minor)

Higher Order	Taxon	SRE Site Recorded	SRE Status	SRE Habitat
<b>Chilopoda:</b>				
<b>Geophilomorpha</b>				
Mescitocephalidae	<i>Mescitocephalus</i> sp. 'IS06'	KBSRE10	Widespread	Drainage (minor)
<b>Scolopendromorpha</b>				
Scolopendridae	<i>Arthrorhabdus mjobergi</i>	KBSRE02, KBSRE10, KBSRE12, KBSRE13, KBT10	Widespread	Drainage (minor and major), Stony plain
Scolopendridae	<i>Cormocephalus turneri</i>	KBSRE24, KBT04	Widespread	Stony plain, mulga woodlands
	<i>Cryptops</i> sp. 'Onslow'	KBSRE02, KBSRE05, KBSRE08, KBSRE10, KBSRE12, KBSRE13	Possible	Drainage (minor), Stony hills and slopes and stony plain
	<i>Ethmostigmus curtipes</i>	KBT08	Widespread	Stony plain and hills
	<i>Scolopendra morsitans</i>	KBSRE29, KBSRE30, KBT06	Widespread	Tidal flats, stony hills, and slopes
<b>Scutigermorpha</b>				
Scutigeridae	<i>Pilbarascutigera incola</i>	KBSRE03, KBSRE14, KBSRE22, KBSRE25, KBSRE26, KBSRE29, KBT04, KBT06, KBT08	Widespread	Mesas and breakaways, mulga woodland, stony plain, tidal flats, stony hills, and slopes
<b>Diplopoda:</b>				
<b>Polydesmida</b>				
Paradoxosomatidae	<i>Antichiropus?</i> juvenile	KBSRE02	Likely	Drainage (minor)
<b>Polyxenida</b>				
Polyxenidae	<i>Unixenus</i> cf. <i>mjobergi</i>	KBSRE05, KBSRE06, KBSRE14, KBSRE15, KBSRE16, KBSRE24, KBSRE25, KBSRE26	Widespread	Mesas and breakaways, plain, stony hills and slopes, stony plain
	<i>Unixenus attemsi</i>	KBSRE04, KBSRE08, KBSRE15, KBSRE16, KBSRE25	Widespread	Drainage (minor), mesas and breakaways, plain, stony plain

### 4.3 Extrapolation Area

Fauna habitat mapping was extrapolated over a 3,418 ha portion of the area that could not be assessed during field surveys due to access limitations. Three indicative fauna habitats were mapped within the southern portion of the Extrapolation Area (Table 29; Figure 17) and four indicative fauna habitats (excluding cleared areas) were mapped within the northern portion of the Extrapolation Area (Table 30; Figure 18).

**Table 29: Indicative fauna habitats within the southern portion of the Extrapolation Area**

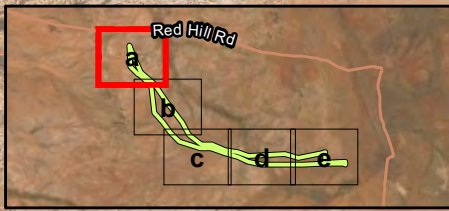
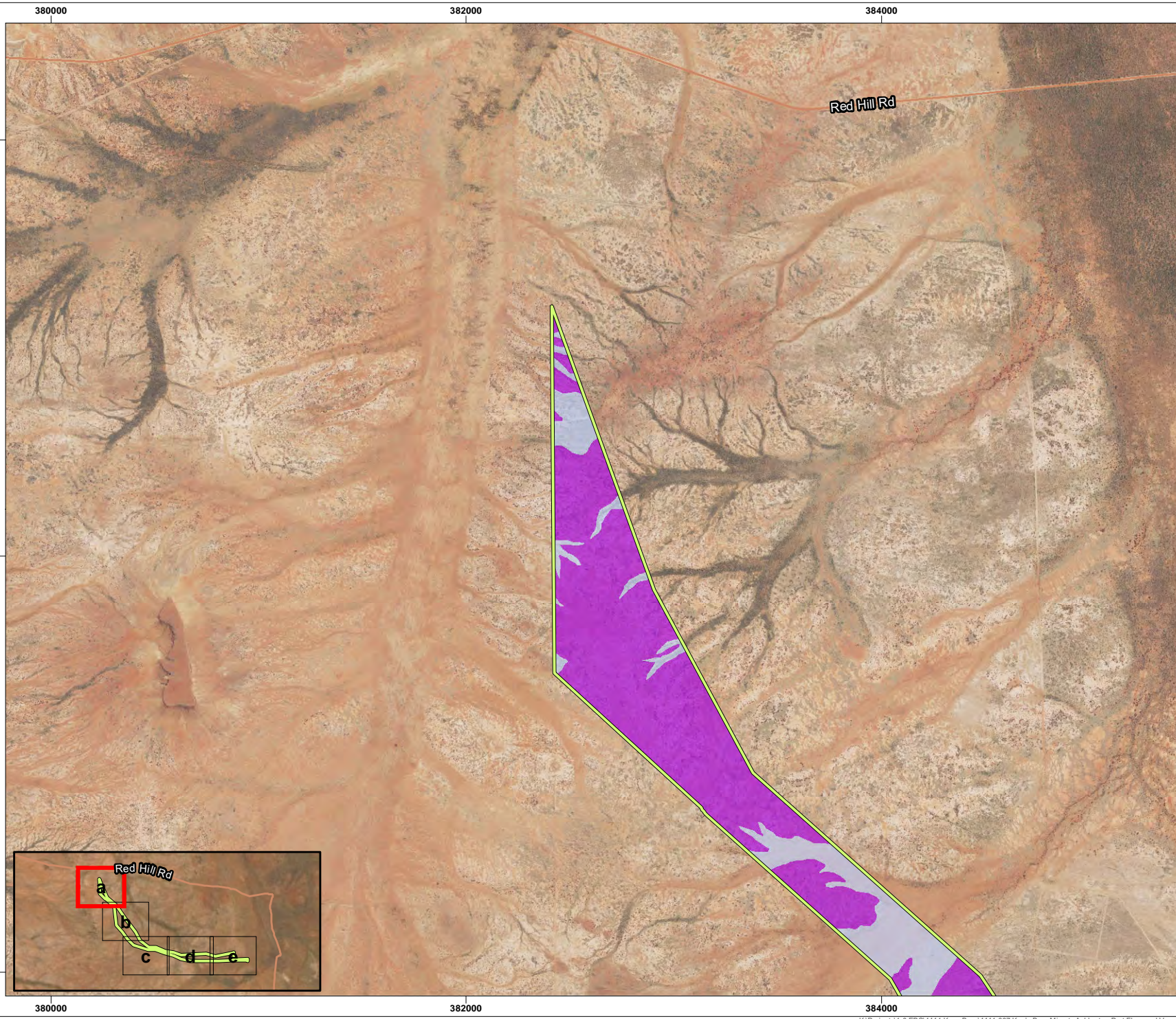
Fauna habitat	Extent within Extrapolation Area	
	Area (ha)	%
Stony plain	991	70.93
Drainage line/river/creek (minor)	248	17.78
Stony hills and slopes	158	11.29
<b>Total Area</b>	<b>1,397</b>	<b>100.00</b>

**Table 30: Indicative fauna habitats within the northern portion of the Extrapolation Area**

Fauna habitat	Extent within Extrapolation Area	
	Area (ha)	%
Stony plain	1,186	58.69
Drainage line/river/creek (minor)	492	24.35
Stony hills and slopes	194	9.59
Drainage line/river/creek (major)	124	6.13
Cleared	25	1.24
<b>Total Area</b>	<b>2,021</b>	<b>100</b>



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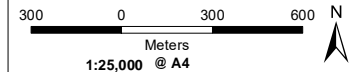
**Legend**

- Red Hill
- Extrapolation Survey Area

**Fauna Habitat - South Haul Route**

- Drainage line/river/creek (minor)
- Stony plain

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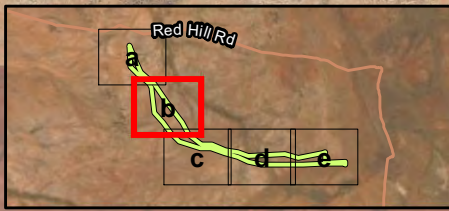
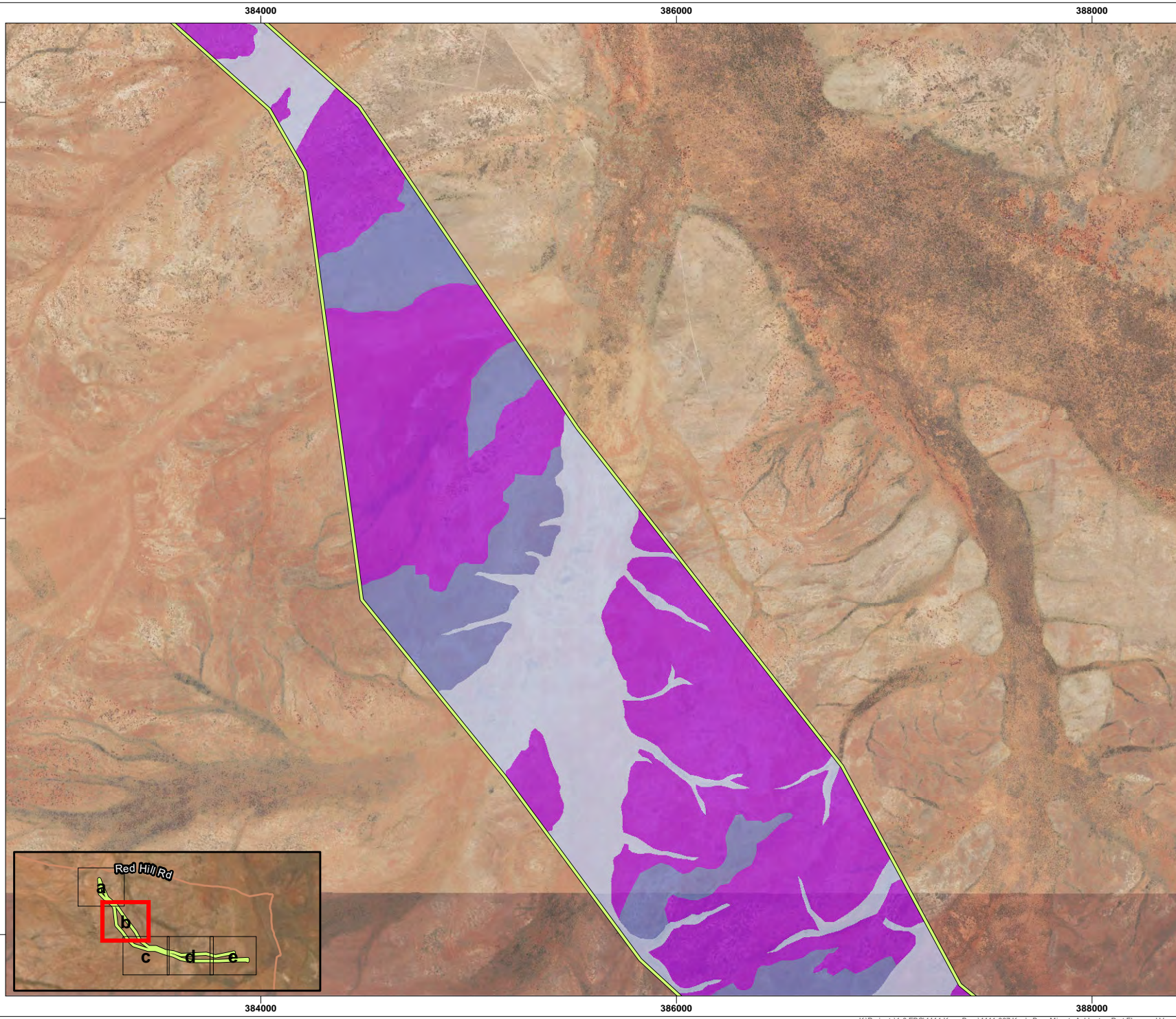
**HORIZONTAL DATUM AND PROJECTION**  
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**Figure 17a Southern Extrapolated Fauna Habitat**

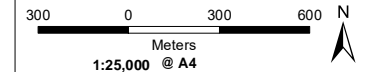
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**Legend**

- Red Hill Extrapolation Survey Area
- Fauna Habitat - South Haul Route**
- Drainage line/river/creek (minor)
- Stony hills and slopes
- Stony plain

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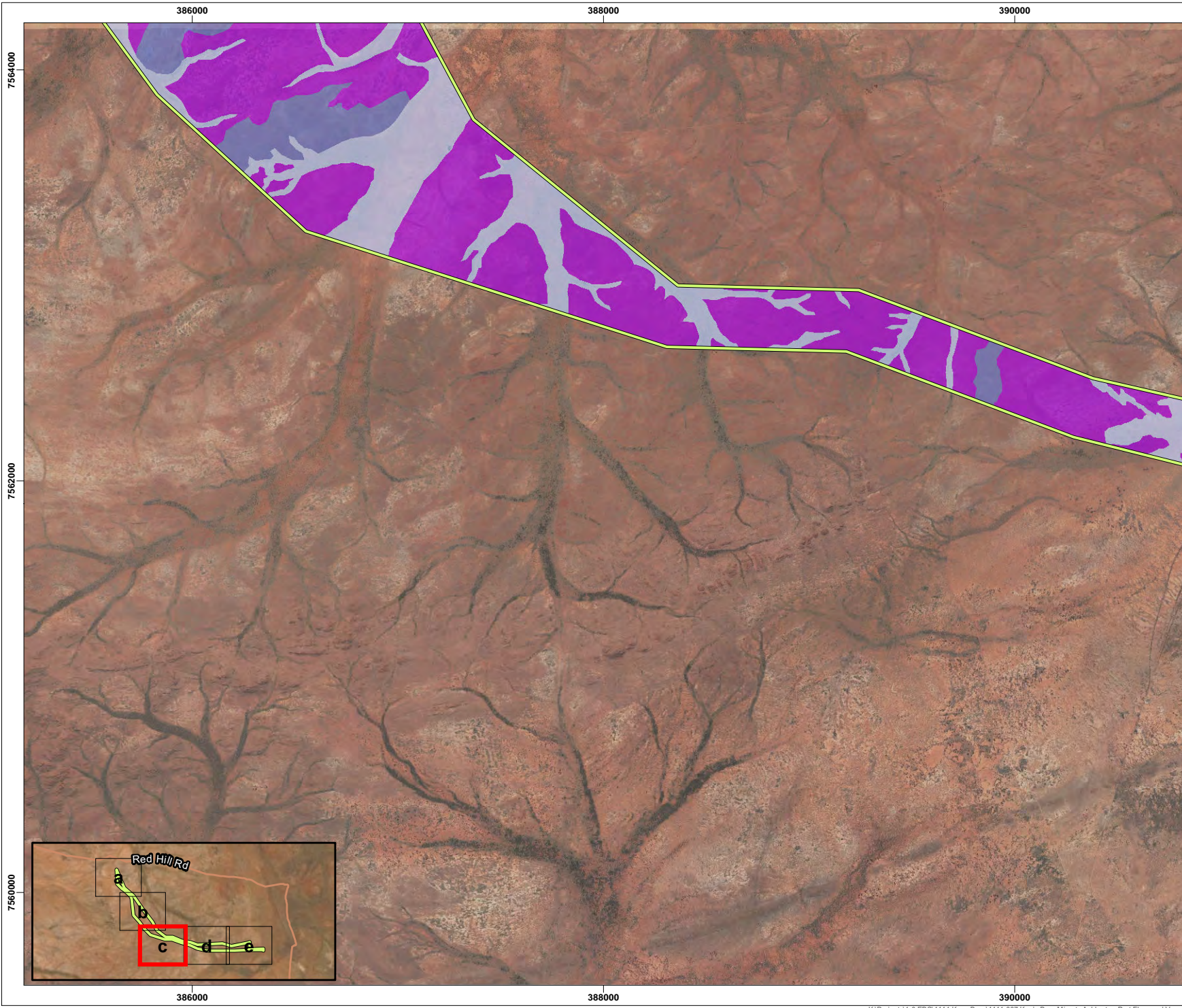
**HORIZONTAL DATUM AND PROJECTION**  
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<b>CREATED</b> LFV	<b>CHECKED</b> EW	<b>APPROVED</b> SW	<b>REVISION</b> 03
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**Figure 17b Southern Extrapolated Fauna Habitat**

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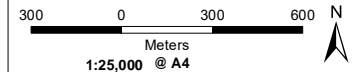
**Legend**

- Red Hill
- Extrapolation Survey Area

**Fauna Habitat - South Haul Route**

- Drainage line/river/creek (minor)
- Stony hills and slopes
- Stony plain

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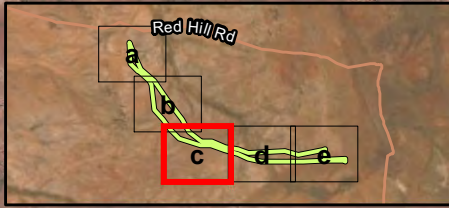
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**HORIZONTAL DATUM AND PROJECTION**  
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LFV	EW	SW	03

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**Figure 17c** Southern Extrapolated Fauna Habitat



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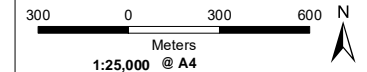
394000

396000

**Legend**

-  Red Hill Extrapolation Survey Area
- Fauna Habitat - South Haul Route**
-  Drainage line/river/creek (minor)
-  Stony plain

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**LOCALITY MAP**



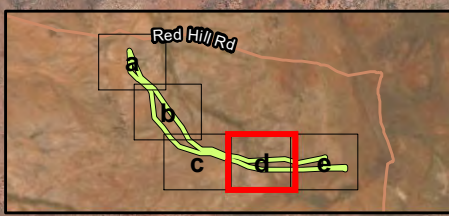
PROJECT ID 4441 019	DATE 02/09/2021
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HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED LFV	CHECKED EW	APPROVED SW	REVISION 03
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**Figure 17d Southern Extrapolated Fauna Habitat**



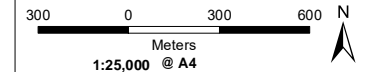
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**Legend**

- Red Hill Extrapolation Survey Area
- Drainage line/river/creek (minor)
- Stony hills and slopes
- Stony plain

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**LOCALITY MAP**



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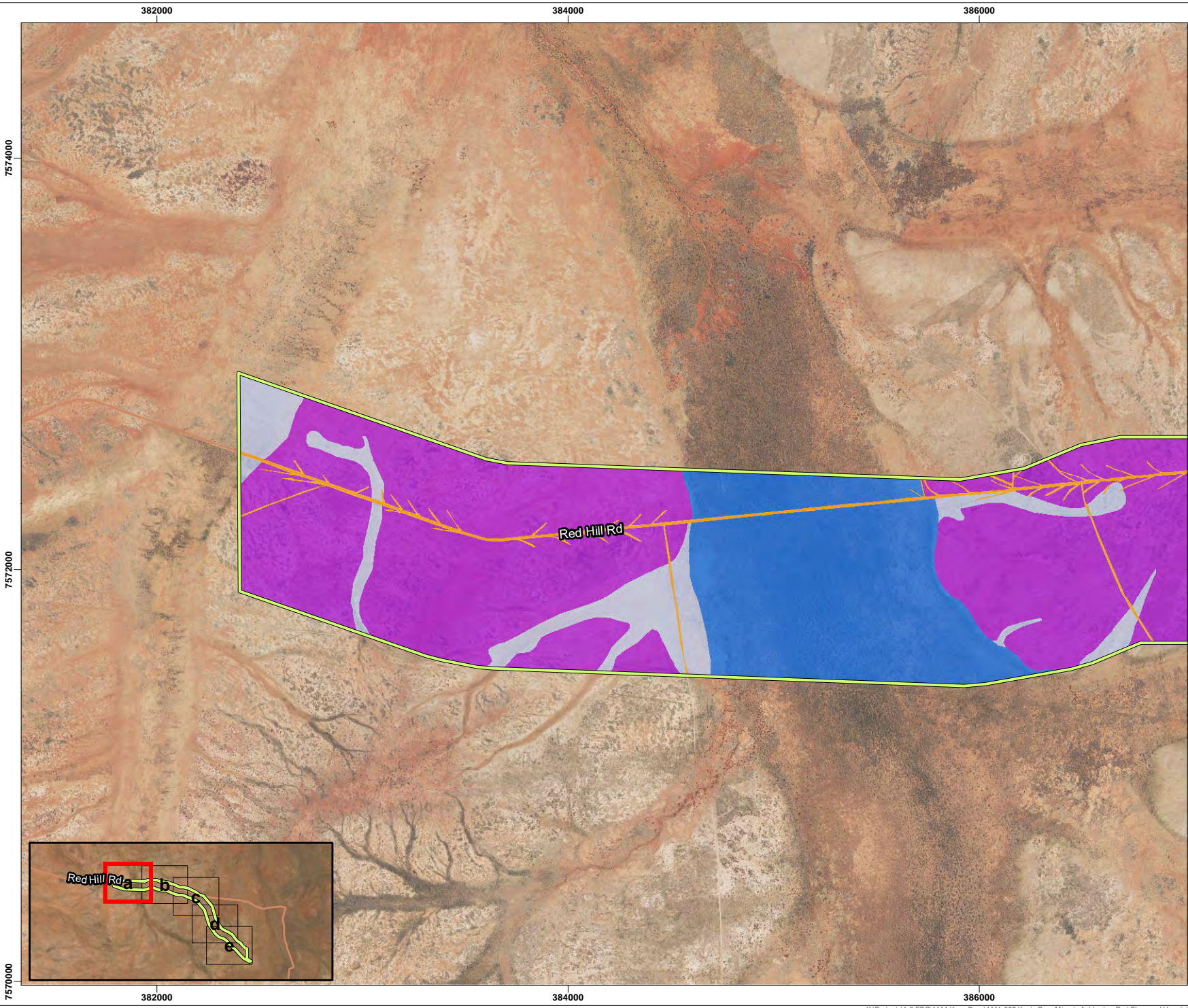
HORIZONTAL DATUM AND PROJECTION  
 GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
LFV	EW	SW	03

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**Figure 17e Southern Extrapolated Fauna Habitat**

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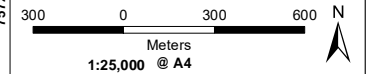
**Legend**

- Red Hill
- Northern Extrapolation Survey Area
- Fauna Habitat - North Haul Route**
- Drainage line/river/creek (major)
- Drainage line/river/creek (minor)
- Stony plain
- Cleared

- NOTE THAT POSITION ERRORS CAN BE >5m IN SOME AREAS  
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

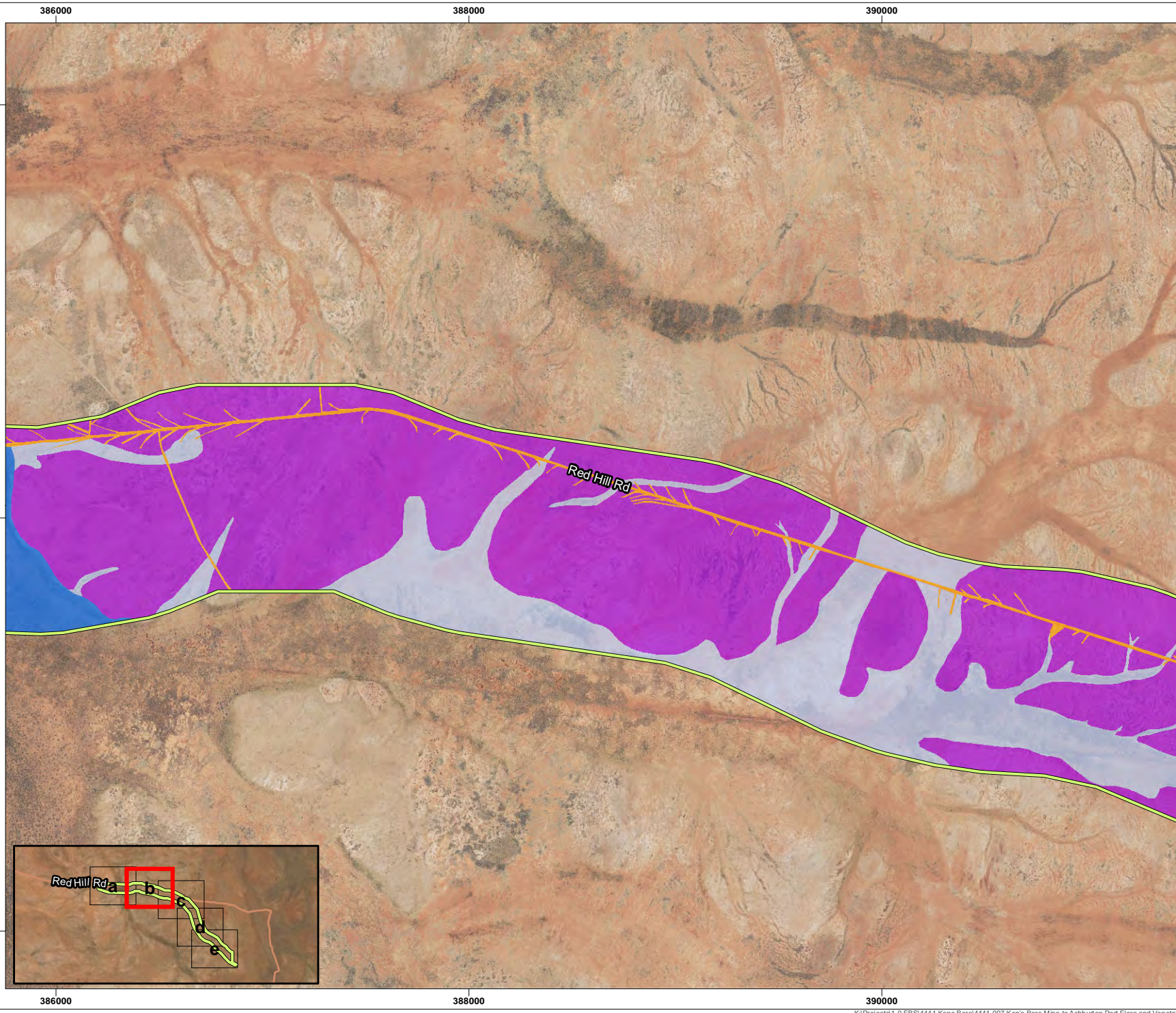
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**Flora and Vegetation Assessment**

**Figure 18a** Northern Extrapolated Fauna Habitat

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**Legend**

- Red Hill
- Northern Extrapolation Survey Area

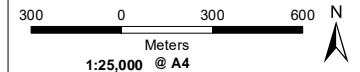
**Fauna Habitat - North Haul Route**

- Drainage line/river/creek (major)
- Drainage line/river/creek (minor)
- Stony plain
- Cleared

- NOTE THAT POSITION ERRORS CAN BE >5m IN SOME AREAS  
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

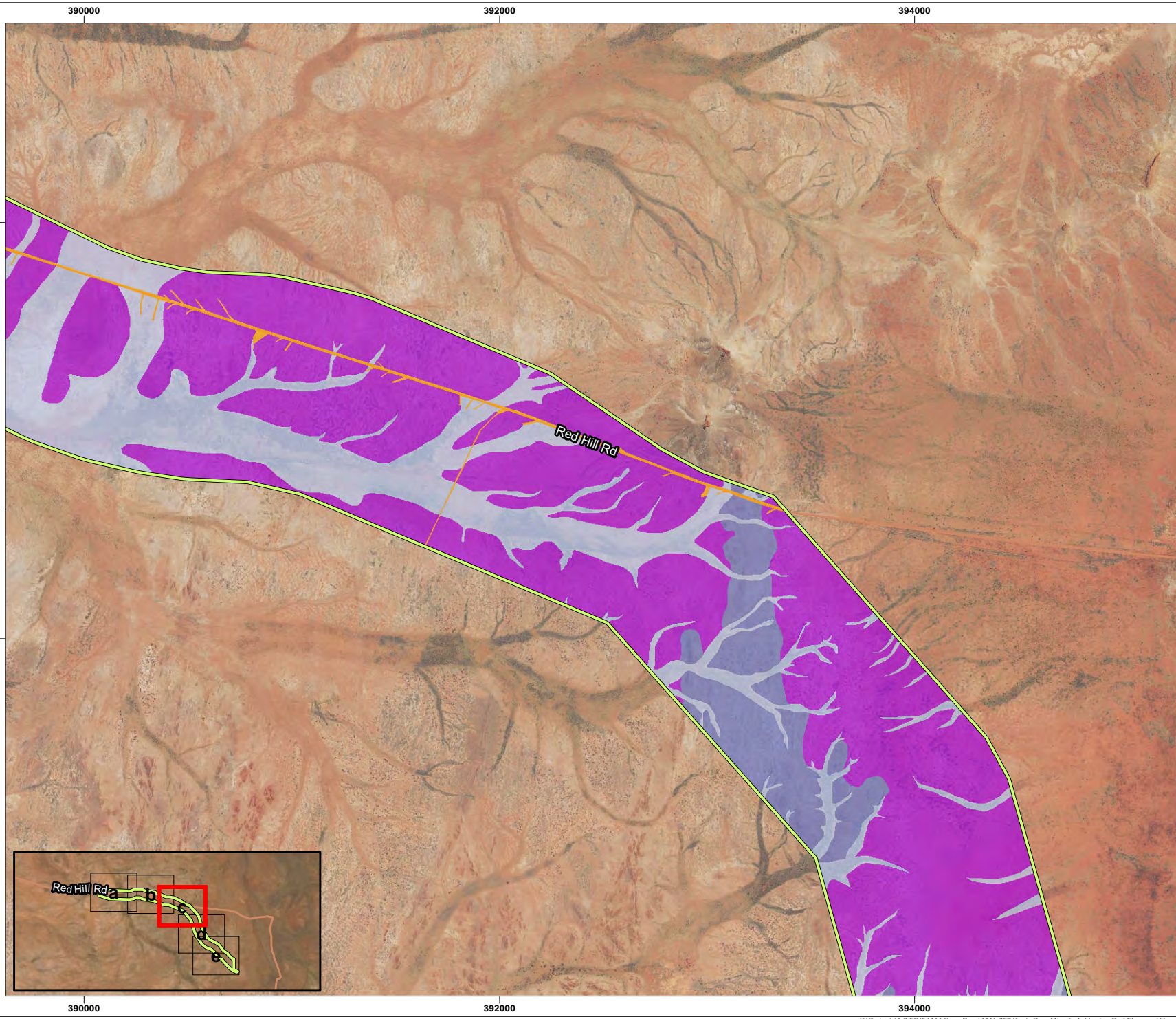
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**Flora and Vegetation Assessment**

**Figure 18b Northern Extrapolated Fauna Habitat**

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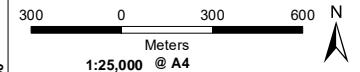


- Legend**
- Red Hill
  - Northern Extrapolation Survey Area
- Fauna Habitat - North Haul Route**
- Drainage line/river/creek (minor)
  - Stony hills and slopes
  - Stony plain
  - Cleared

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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b> LFV	<b>CHECKED</b> EW	<b>APPROVED</b> SW	<b>REVISION</b> 0
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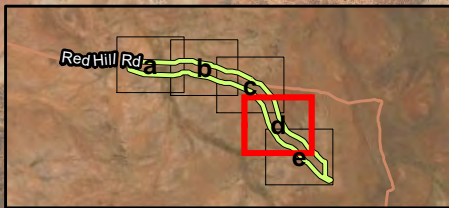
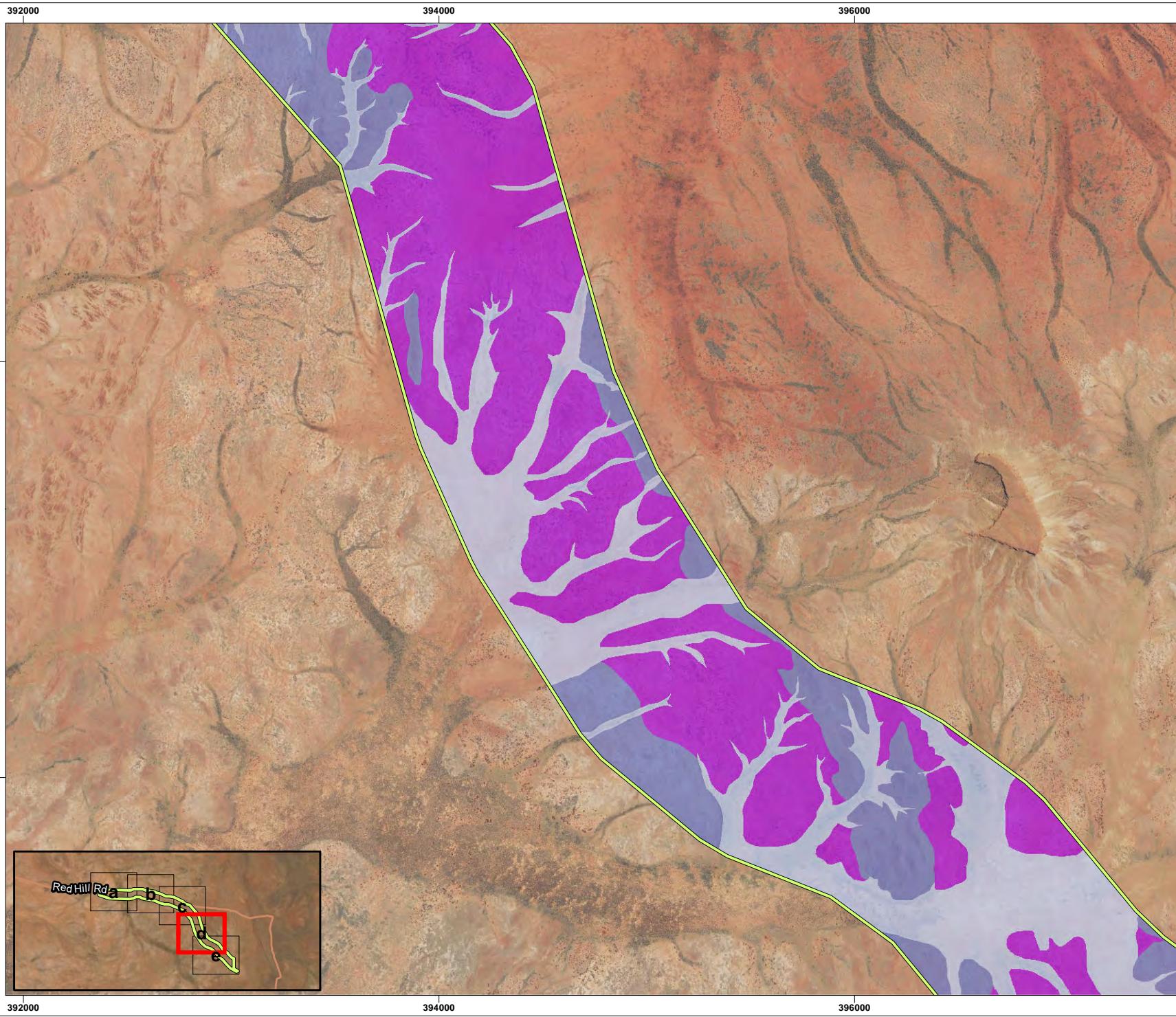
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**Figure 18c Northern Extrapolated Fauna Habitat**



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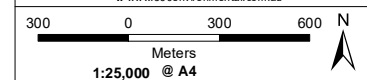


- Legend**
- Red Hill
  - Northern Extrapolation Survey Area
- Fauna Habitat - North Haul Route**
- Drainage line/river/creek (minor)
  - Stony hills and slopes
  - Stony plain

- NOTE THAT POSITION ERRORS CAN BE >5m IN SOME AREAS  
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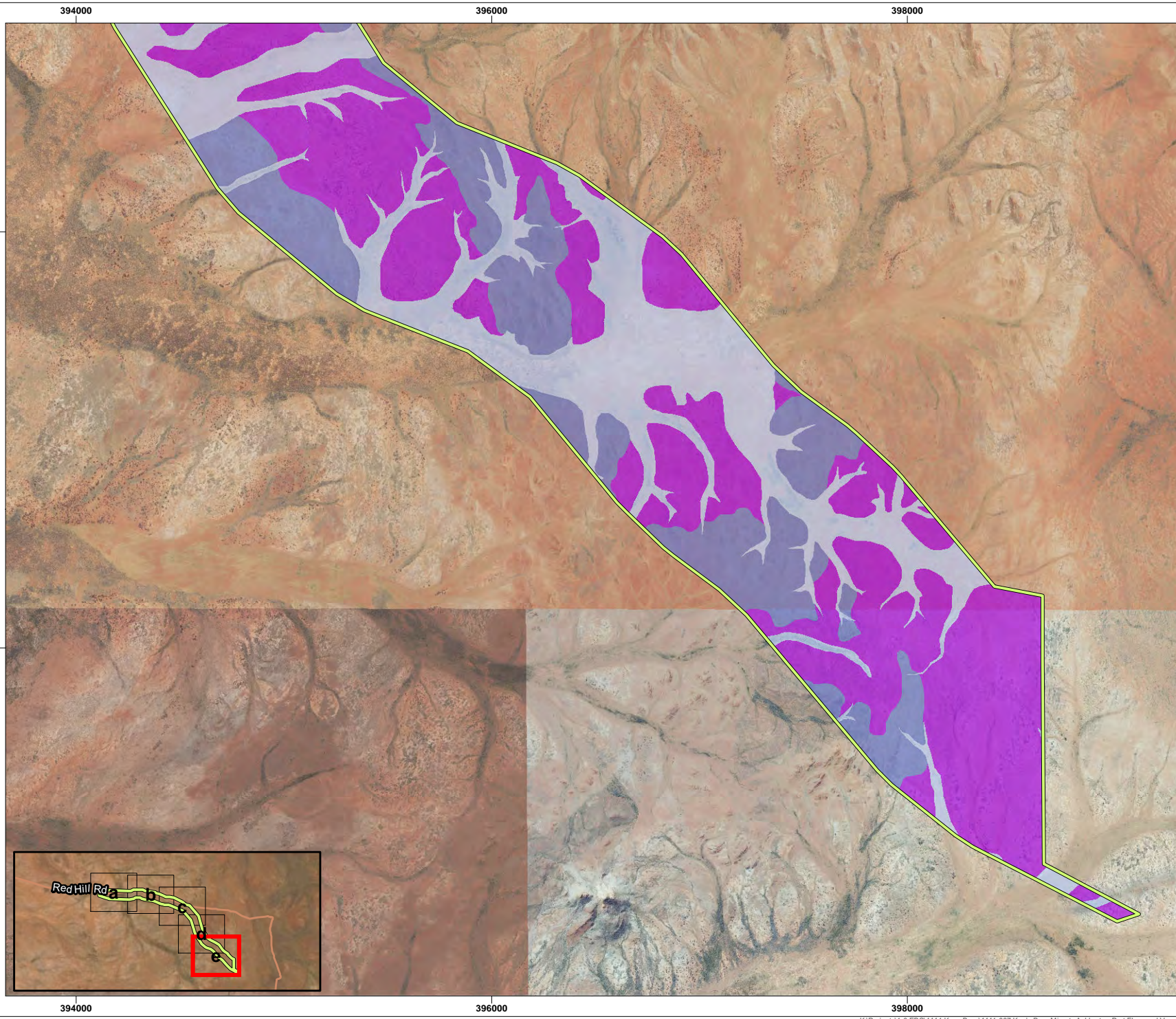
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**Figure 18d Northern Extrapolated Fauna Habitat**

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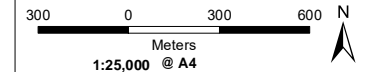


- Legend**
- Red Hill Northern Extrapolation Survey Area
  - Drainage line/river/creek (minor)
  - Stony hills and slopes
  - Stony plain

- NOTE THAT POSITION ERRORS CAN BE >5m IN SOME AREAS  
 - LOCALITY MAP SOURCED LANDGATE 2020  
 - OTHER DATA SOURCED LANDGATE 2020  
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b> LFV	<b>CHECKED</b> EW	<b>APPROVED</b> SW	<b>REVISION</b> 0
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**Flora and Vegetation Assessment**

**Figure 18e Northern Extrapolated Fauna Habitat**

The plains, stony plains, and sand dune habitats contain less microhabitat opportunities and provide less value to most conservation significant fauna taxa and overall fauna assemblages than the aforementioned habitats. The stony plains may be used by the Western Pebble-mound Mouse as they contain suitably sized pebbles, and sand dune habitats also contain large termite mounds which provide valuable shelter for a wide range of taxa. These habitat types occur extensively both within and outside the Survey Area.

The Mulga woodland habitat contains abundant peeling bark and woody debris, which is likely to provide ample habitat opportunities for small reptiles, however understory vegetation is very sparse. The field surveys did not record any taxa unique to the Mulga woodland habitat and most taxa that occur within it will also use the adjacent drainage line/river/creek habitat.

Habitat condition varied throughout the Survey Area, as would be expected given the large extent of the Survey Area. Mesas and breakaway habitats were consistently in excellent condition. All other habitats showed evidence of degradation caused by cattle grazing and trampling to varying degrees, with highest concentrations of cattle degradation occurring near water sources. Other disturbances, including historical clearing for roads, infrastructure and access tracks, weeds, frequent burning, and rubbish were recorded but were not likely to have major impacts on the fauna assemblage.

#### 5.1.2 Vertebrate Fauna Assemblage

The inventory of fauna taxa recorded during the field surveys is typical for the Pilbara bioregion and aligned with the database search results and previous studies conducted in the region (Biota Environmental Sciences, 2008, 2009, 2015c, 2015b; Astron Environmental Services, 2011a; Rapallo Environmental, 2012a, 2012b; Bat Call WA, 2015; ecologia Environment, 2015; Phoenix Environmental Sciences, 2017; Rio Tinto Iron Ore, 2018).

Species diversity during the initial baseline detailed survey (trip 3) was lower than expected, however this may have been due to a prolonged period of low rainfall prior to the survey. Rainfall was at or below the annual long term average from 2016 to 2020 and less than half the annual long-term average in the twelve months prior to the detailed fauna survey (Bureau of Meteorology, 2021). Species diversity and abundance of conservation significant taxa detected in the initial baseline detailed survey may also have been depressed by recent fires and increased grazing pressure since 2009. A comparison between the species diversity recorded in the current assessment and a selection of previous surveys within the region is provided in Table 31. While it is acknowledged that different surveys undertaken in different locations and years will not necessarily record similar levels of biodiversity, the comparison is provided to demonstrate that the diversity of taxa recorded during the current survey is within the range of what is to be expected within the region.

**Table 31: Comparison of species diversity recorded in previous surveys and current survey**

Fauna Group	Biota Environmental Sciences, 2009	Rapallo Environmental, 2012a	Biota Environmental Sciences, 2015b	Biota Environmental Sciences, 2015c	ecologia Environment, 2015	360 Environmental (2021)
Amphibians	0	2	3	2	3	3
Birds	75	43	48	55	81	62
Mammals	25	8	19	21	23	25
Reptiles	49	29	30	27	69	53
<b>Total</b>	<b>149</b>	<b>82</b>	<b>100</b>	<b>105</b>	<b>176</b>	<b>144</b>

The Survey Area is expansive and traverses a variety of fauna habitats, and therefore not expected to be surveyed in its entirety. The three species accumulation curves created for the major fauna groups, mammals, birds and herpetofauna (reptiles and amphibians) all indicate that additional species may be recorded with increased survey and trapping effort and the observed species richness was also lower than the estimated species richness as predicted by statistical analysis. Despite these results, the fauna assemblage recorded during the fauna surveys are similar to those recorded by other comparable studies and considered to be a representative subset occurring within the Survey Area.

### 5.1.3 Conservation Significant Birds

#### 5.1.3.1 Pacific Swift (*Apus pacificus*)

The Pacific Swift (also called Fork-tailed Swift) is a non-breeding visitor to all states and territories of Australia and is found throughout WA with a preference for coastal areas (Higgins, 1999). The Pacific Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. The Pacific Swift occupies a large airspace range over varied habitats, ranging from rainforests to semi-deserts (Morcombe, 2003). Although the taxon has the potential to occur in the airspace above the Survey Area, it will not be reliant on the habitats within the Survey Area.

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

The Grey Falcon is an elusive and endemic bird of the arid interior (Schoenjahn, Pavey and Walter, 2019). It is distributed sparsely over Australia's arid and semi-arid zones and is absent from Cape York Peninsula, south of the Great Dividing Range in Victoria, and south of 26°S in WA (Johnstone and Storr, 1998; BirdLife International, 2016). The Grey Falcon is restricted largely to areas with high average temperatures and average annual rainfall of less than 500 mm. It favours lightly timbered and untimbered lowland plains that are crossed by tree lined watercourses, but frequents other habitats, including grassland and sand dune habitats (Johnstone and Storr, 1998; BirdLife International, 2016).

The Grey Falcon typically uses refurbished nests built by other raptors or corvids in eucalypt lined drainage lines and waterholes (Pizzey and Knight, 2013) and may therefore use the drainage line/river/creek habitat for breeding, and all habitats for hunting. The regional

population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area. Grey Falcons were not recorded during the current assessment, however were recorded 4 km and 7 km east of the Survey Area in 2015 (Biota Environmental Sciences, 2015b, 2015c).

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

The Peregrine Falcon is an uncommon but wide-ranging bird across Australia (Barrett et al., 2003). It occurs mainly along rivers and ranges as well as wooded watercourses and lakes. It nests primarily on cliffs, granite outcrops and quarries, although is also known to occupy existing raptor and corvid stick nests (Menkhorst et al., 2017). The diet of the Peregrine Falcon has been well studied and primarily includes flocking birds such as parrots, pigeons and on the east coast, European Starlings (Olsen and Fuentes, 2008).

The Peregrine Falcon typically nests on cliff ledges or in refurbished nests built by other raptors or corvids (Pizzey and Knight, 2013) and may therefore use the mesas and breakaways and drainage line/river/creek habitats for breeding, and all habitats for hunting. The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area. Peregrine Falcons were not recorded during the current assessment, however were recorded 8 km south and 13 km southeast of the Survey Area in 2011 (Rapallo Environmental, 2012a, 2012b).

#### 5.1.3.4 Barn Swallow (*Hirundo rustica*)

The Barn Swallow is only a casual visitor primarily to coastal areas from the Gascoyne north, although the taxon may appear as a vagrant in inland areas on an irregular basis (Johnstone and Storr, 1998). After breeding in the temperate and subtropical regions of North America, Europe, northern Africa and Asia it migrates to the southern hemisphere where it spends the boreal winter (Johnstone and Storr, 1998). It is typically observed in the vicinity of urban water bodies and coastal wetlands. Although the taxon has the potential to occur in the airspace above the Survey Area, it will not be reliant on the habitats within the Survey Area.

#### 5.1.3.5 Waterbirds and Shorebirds

The tidal flats and claypans are intermittently important for waterbirds and shorebirds when seasonally inundated. Waterbirds and shorebirds may also use seasonally inundated drainage lines, rivers, and creeks. The *EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (Department of the Environment and Energy, 2017) provides the following definition for important habitats for migratory shorebirds:

- Important habitat includes areas recognised as internationally important if:
  - 1% of the individuals in the population of one species or
  - A total abundance of at least 20,000 waterbirds.
- Nationally important habitat is if it regularly supports:
  - 0.1% of the flyway population of a single shorebird species, or
  - 2,000 migratory shorebirds, or
  - Fifteen (or more) migratory shorebirds species.

Shorebird and waterbird surveys conducted for the Wheatstone Project (11 km northwest of the main Survey Area, directly adjacent the PPA Survey Area) and Macedon Project (13 km northwest of the main Survey Area, 3 km southwest of the PPA Survey Area) recorded low waterbird counts (e.g. 10s and occasional 100s), with most migratory species occurring at the Onslow Town Beach (Bancroft and Bamford, 2018). Shorebird and waterbird surveys undertaken for the Wheatstone Project in 2008 and 2009 found that overall numbers of waterbird species were well below any criterion for international significance with the exception of a single species, the Common Tern (*Sterna hirundo*), for which the population threshold for international significance was exceeded (Pendoley Environmental, 2021) This taxa typically forages in near-shore waters and roosts in coastal habitats such as beaches or rock platforms (Menkhorst *et al.*, 2017), which do not occur within the Survey Area.

The Onslow Salt evaporation facilities, located approximately 1 km north of the Survey Area, do not meet any criterion for international significance (BirdLife Australia, 2020), however exceed the threshold of national significance for a single species, the Red-necked Stint (*Calidris ruficollis*) (BirdLife Australia, 2020). It is possible that habitats within the Onslow Salt evaporation facilities have not yet been identified as internationally significant for several species of migratory shorebird due to a lack of structured monitoring data (BirdLife Australia, 2020).

While waterbirds and shorebirds are likely to use habitats within the Survey Area, higher quality habitats occur closer to the coast in locations such as the Onslow Town Beach and Onslow Salt evaporation facilities. Furthermore, tidal flats, claypans and drainage lines, rivers, and creeks occur more widely in the region outside the Survey Area, therefore populations of waterbirds and shorebirds that use habitats within the region are unlikely to be dependent on habitats within the Survey Area.

#### 5.1.4 Conservation Significant Mammals

##### 5.1.4.1 Northern Quoll (*Dasyurus hallucatus*)

The Northern Quoll is a medium-sized carnivorous, nocturnal marsupial that favours rocky areas, taking refuge in rock crevices and using gullies and drainage lines. They have a relatively large home-range size of up to 150 ha for males and 35 ha for females, and males can move up to 1.85 km between den sites in one night (Oakwood, 2000; Department of the Environment, 2016). Northern Quolls reproduce once a year, averaging seven young per litter (Department of the Environment, 2016). They have a short life span, with the females typically only surviving one or two years while the males die off annually following intense physical exertion during the breeding season (Department of the Environment, 2016). The taxon can be locally common, but its range has contracted considerably (Van Dyck and Strahan, 2008).

The mesas and breakaways habitats are likely to be most important for Northern Quolls as they provide denning, shelter, and foraging habitat, while drainage line/river/creek and stony hills and slopes habitats are primarily used for dispersal. These three habitats are considered to represent habitat critical for the survival of the taxon by the EPBC Referral Guidelines (Department of the Environment, 2016). All other habitats may be infrequently used for dispersal or foraging; however, the taxa will not depend on these habitats. Due to the topography of the landscape, it is likely that a population of Northern Quolls relies on mesas at sites KBT02 and KBT05. Individuals can disperse over long distances, but these habitat isolates

are likely to act as a stronghold for the population. Critical habitat is more widespread with greater connectivity towards the eastern end of the Survey Area, near sites KBT01, KBT03 and KBT04.

Spot pattern analysis identified at least 17 individual Northern Quolls within the Survey Area, at 11.11 individuals per 100 camera trap nights, which indicates that high density populations occur within the mesa and breakaways habitats. By comparison, monitoring undertaken by DBCA recorded an average of 3.61 individuals per 100 camera trap nights across fifteen locations throughout the Pilbara region, with only one location, Indee Station, exceeding 11.11 individuals per 100 camera trap nights (Dunlop, Birch and Moore, 2018). According to the EPBC Referral Guidelines, high density populations are important for the long-term survival of the taxon (Department of the Environment, 2016). Furthermore, an adult and juvenile photographed together at site KBT03 indicates that breeding and denning occurs within or directly adjacent the Survey Area. A possible track was also recorded within the sand dunes and swales habitat; however, if this was indeed a Northern Quoll then it was most likely a transient/dispersing individual.

#### 5.1.4.2 Ghost Bat (*Macroderma gigas*)

The Ghost Bat is patchily distributed in small colonies in northern Australia, including the Pilbara and Kimberley in WA, the Top End in the Northern Territory and northeast Queensland. The taxon requires undisturbed roost caves or mineshafts, usually complex systems with several openings (Van Dyck and Strahan, 2008). The taxon eats large insects, geckoes, frogs, small birds, mammals including other bats. The kills are made on the ground or in the air and then taken to a feeding perch, which is usually a rocky overhang or small cave (Van Dyck and Strahan, 2008).

The most important habitat for Ghost Bats is the mesas and breakaways habitat, however all habitats within the Survey Area may be used for hunting. Six calls were detected at sites KBT02 and KBT05, which were consistent with the bats using the mesas for foraging and possibly roosting (R. Bullen, 2021, pers. comm., 19 July). Suitable night roost sites, such as shallow caves or overhangs, were identified throughout the mesas and breakaways habitat type. Most of these shallow caves or overhangs will be lit up with sunlight during the day, however some may be suitable for daytime roosting. No deep, complex caves required for maternity roosts were observed.

#### 5.1.4.3 Short-tailed Mouse (*Leggadina lakedownensis*)

The Short-tailed Mouse has a broad distribution across much of northern Australia and occurs in a range of habitat types. This includes spinifex and *Acacia* on seasonally inundated sandy-clay soils as well as sandy soils and cracking clays to build burrows which they shelter in during the day (Van Dyck and Strahan, 2008). It is generally rare with scattered populations, and very little is known of its biology. According to Van Dyck and Strahan (2008), Pilbara populations occur in stony hummock grassland, however the DBCA Threatened and Priority Fauna database search results show the species recorded in tidal flats and claypan habitats, with 56 records occurring within 1 km of the PPA area and two records near the western end of the main Survey Area, one 1.6 km north and one 5 km west (Figure 11).

The taxon was not detected during the field surveys, however given that it occurs in small, scattered populations it can be difficult to detect without intensive survey effort. Lack of

detection does not rule out its presence. Suitable habitats are widespread and abundant within the Survey Area, including tidal flats, claypans, plains and stony plains. Previous records indicate that the species is most likely to use the vegetation fringing claypans. The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area.

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

The Western Pebble-mound Mouse is endemic to the Pilbara, where it builds pebble mounds from small stones. Pebble mounds are restricted to suitable-class stones and are usually found on gentle slopes and spurs that are often vegetated by hard spinifex (Ford and Johnson, 2007; Van Dyck and Strahan, 2008). Active mounds are characterised by the conical shape of the mound with clear, distinct entrance holes (Anstee, 1996). Pebble mounds constructed by the Western Pebble-mound Mouse are found throughout the Pilbara, however studies have shown that not all mounds in an area are occupied by a Pebble-mound Mouse at any one time (Anstee, 1996).

The Western Pebble-mound Mouse mound that was recorded at the boundary of the Survey Area had a clear undulating/conical structure. This suggests that the mound had recently been occupied and maintained. No access hole was visible; therefore, the mound is probably not currently active, however the evidence of recent activity indicates that the taxon currently occupies stony hills and slopes habitat within the Survey Area. The taxon is also likely to inhabit stony plains habitats within the Survey Area, however other habitats within the Survey Area are not suitable because they lack abundant pebbles of the size required to build mounds. The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area.

#### 5.1.4.5 Common Brushtail Possum (*Trichosurus vulpecula*)

The Common Brushtail Possum uses a wide variety of habitats provided there is sufficient refuge on the ground and tree hollows available (Van Dyck and Strahan, 2008). Suitable habitat is present within the Survey Area, primarily in the drainage line/river/creek habitats. The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area, particularly to the east of the Survey Area. Most other habitats within the Survey Area do not contain suitable tree hollows or refuge and are therefore unlikely to be used by the species. Overhangs or small caves may be used for refuge in mesa and breakaway habitat.

The taxon was recorded 37 km south of the Survey Area in 2015 (Biota Environmental Sciences, 2015c). This was originally reported as the southernmost record of the Northern Brushtail Possum in WA, (*T. vulpecula arnhemensis*), which is listed as Vulnerable under the BC Act at a subspecies level. Given doubt surrounding the taxonomic status of the Pilbara population of *T. vulpecula*, this report has referred to the taxon at the species level.

#### 5.1.4.6 Pilbara Leaf-nosed Bat (*Rhinonictis aurantia* Pilbara form)

The Pilbara Leaf-nosed Bat was originally considered to be the same species as the Orange Leaf-nosed Bat, which occurs in the Kimberley, Northern Territory, and northwest Queensland, however it is now considered to be a separate form based on morphology. Formal reclassification has been difficult due to the small Pilbara population size (Van Dyck and Strahan,



2008). During the dry season the taxon roosts in deep, warm humid caves or mines and forages nearby; in the wet season the taxon is more widespread and may not require caves for roosting (Menkhorst and Knight, 2004).

Pilbara Leaf-nosed Bats were recorded at four sites within the Survey Area, all of which were within or adjacent mesas and breakaway habitat, which is the most important habitat for the taxon, however other habitats may be used for hunting. Most of the recordings were of low numbers of individual foraging calls. Higher numbers of calls were recorded at the eastern end of the Survey Area at site KBT04, which is consistent with a large roost site is used by many thousands of Pilbara Leaf-nosed Bats at Cane River, approximately 11.5 km southeast of the Survey Area (Bat Call WA, 2015; Biota Environmental Sciences, 2015c). Pilbara Leaf-nosed Bats may also access the Survey Area from an inferred roost at Mungarathoona Creek, approximately 15 km north of the eastern end of the Survey Area (Bat Call WA, 2015; Biota Environmental Sciences, 2015c). Given that deep caves with a suitable microclimate for the taxon were not observed during the field survey, it is unlikely that Pilbara Leaf-nosed Bat maternity roosts occur within the Survey Area, however it is possible that shallow caves or overhangs within the mesa and breakaway habitat could be used for roosting by individuals or small groups during the wet season, when the taxon is not reliant on deep, humid caves.

#### 5.1.5 Conservation Significant Reptiles

##### 5.1.5.1 Pilbara Olive Python (*Liasis olivaceus barroni*)

The Pilbara Olive Python is a large python that occurs in the ranges of the Pilbara, typically in escarpments and gorges where water is present. It generally shelters under rock piles, or under spinifex and often basks on top of rocks (Pearson, 1993, 2003). It is threatened due to its relatively small distribution, low population densities and may be affected by habitat disturbance such as grazing and fire. This taxon is known to frequent water bodies where it ambushes prey (Pearson, 1993). The taxon is extremely difficult to detect. During a systematic survey of a large series of quadrats in the Pilbara, the taxon was only recorded in one quadrat (Doughty *et al.*, 2011). The taxon is known to have large home ranges, particularly for an ambush predator; Pearson *et al.* (2004) recorded an individual with a home range of roughly 450 ha.

An individual Pilbara Olive Python was observed during the field survey in a cattle trough approximately 20 km south of the Survey Area near the Cardo Camp. The cattle trough was adjacent a section of drainage line/river/creek habitat that maintains connectivity with a major drainage line that intersects the Survey Area, therefore it is highly likely that the taxon occurs within the eastern end of the Survey Area where drainage lines are in close proximity to mesas and breakaway habitats, which are the most important habitats for the species. Other habitats within the Survey Area may be used by dispersing or transient individuals but will not be relied upon. While preferred habitats are restricted within the Survey Area, they are widespread and abundant east of the Survey Area towards the Hamersley Range where Pilbara Olive Python records occur. Previous surveys have recorded Pilbara Olive Pythons 6 km east, 7 km east and 8 km south of the Survey Area (Biota Environmental Sciences, 2015b; Rapallo Environmental, 2012a; Rapallo Environmental, 2012b). Given the extent of suitable habitat and occurrence of records in regional areas, the Pilbara Olive Python is highly likely to occur within the Survey Area but is most likely widely distributed in the region.

### 5.1.5.2 Maryan's Keeled Slider (*Lerista planiventralis maryani*)

Maryan's Keeled Slider is found in coastal consolidated dunes and low shrubland on the upper west coast of WA between Onslow and Barradale (Cogger, 2014). Suitable habitat is present within the Survey Area in the sand dunes and swales habitat within the western end of the Survey Area. The species is unlikely to use other habitats within the Survey Area. The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area.

## 5.2 SRE Invertebrate Fauna

The desktop assessment identified two possible SRE land snail species, however these species are considered to have a low and very low likelihood of occurrence within the Survey Area respectively due to a lack of suitable habitat. Neither of these species were recorded during the SRE survey.

No confirmed SRE or conservation significant species were recorded during the field survey. Six potential SRE invertebrate taxa were recorded, comprising two likely SRE taxa and four possible SRE taxa. The potential SRE species, two isopods (one likely and one possible SRE), two Oligopoda pseudoscorpions (possible SRE), one *Cryptops* centipede (possible SRE) and one *Antichiropus* millipede (likely SRE) and are considered in depth in Sections 5.2.1.1 to 5.2.1.4.

### 5.2.1.1 Crustacea: Isopoda:

#### **Armadillidae: *Buddelundia* sp. '35/36' – Possible SRE**

The armadillid isopod genus *Buddelundia* is abundant in the Pilbara bioregion and contains multiple species including the morphospecies *Buddelundia* sp. '35/46' that part of a species complex including *Buddelundia* 20, 33, 35 and 36. These specimens are morphologically similar to those found in the Hamersley Range (*Buddelundia* 36) and Barrow Island (*Buddelundia* 35). There was insufficient material recorded in the survey, especially large adults, to allow determination beyond *Buddelundia* 35/36, indicating that it could be either of these morphospecies or that *Buddelundia* 35 and 36 and these species are all conspecific (Judd, 2021).

This morphospecies complex has some distinctive characters not found in other *Buddelundia* species and all the morphospecies listed above need further taxonomic work. All show some degree of morphological variation within specimens from the same site, particularly in relation to pigmentation and dorsal setae (Judd, 2021). The morphospecies recorded during the surveys was relatively widely distributed along the Survey Area indicating that is relatively widespread in multiple habitats and unlikely to be restricted to the Survey Area, however given the taxonomic uncertainty it is considered a possible SRE species.

#### **Philosciidae: *Philosciidae* sp. indet. 'Onslow' – Likely SRE**

The specimens collected from a single site (KBSRE15), recorded in plans habitat, are unusual as they do not belong to the most common and widespread Western Australian genus *Laevophiloscia*. They have small dorsal scale-setae which is not commonly encountered in *Philosciidae* from WA (Judd, 2021). These are an undescribed species from an unknown genus. As such and because *Philosciidae* are not common in the Pilbara the morphospecies is considered a likely SRE species.

#### 5.2.1.2 Arachnida: Pseudoscorpionida:

##### **Olpiidae spp. – Possible SRE**

The taxonomy of the Pseudoscorpion family Olpiidae is poorly known and, until further taxonomic resolution has been obtained, all species are considered to be possible SRE species in WA due to a deficiency in data. Molecular sequencing of Pilbara and other Western Australian specimens is currently being undertaken by the WAM and these data will be used in the future to determine if species are widespread or restricted in distribution. It must be stated, however, there is considerable difference between molecular and morphological data, with generic and species boundaries highly uncertain making meaningful results unlikely, except in the medium to long term. Due to the unreliable existing taxonomic framework Olpiid specimens are not accurately identified beyond family level. The specimens recorded during the SRE surveys were recorded at multiple locations during the surveys indicating that their distributions are likely to be wider than the current surveys could determine.

#### 5.2.1.3 Myriapoda: Chilopoda:

##### **Scolopendromorpha: Cryptopidae: *Cryptops* sp. 'Onslow' – Possible SRE**

*Cryptops* is the most speciose genus of the scolopendrid centipede family Cryptopidae, with nearly 200 species described worldwide from both surface and subterranean habitats. All species are blind and often lacking in pigmentation. The genus *Cryptops* currently has five recognised species in Australia (*C. australis*, *C. haasei*, *C. hortensis*, *C. megalopora* and *C. spinipes*) and a single troglomorphic member of the subgenus *Trigonocryptops roeplainsensis* Edgecombe from a cave on the Nullarbor Plain. The taxonomy of Australian species is poorly known and until further taxonomic resolution has been obtained, all species are considered to be possible SRE species in Western Australia due to a deficiency in data. Preliminary molecular data show some wide ranging taxa and some with possible restricted distributions, however, the molecular data is largely incomplete for the state and no conclusive determinations can currently be made (Moulds *et al.*, no date). The specimens recorded during the SRE surveys were recorded at multiple locations during the surveys indicating that their distributions are likely to be wider than the current surveys could determine.

#### 5.2.1.4 Myriapoda: Diplopoda:

##### **Paradoxosmatidae: *Antichiropus*? juvenile – Likely SRE**

Millipedes from the genus *Antichiropus* all have limited powers of dispersal and conservative ecological requirements (Car, Wojcieszek and Harvey, 2013). In addition, the above-ground activity of most *Antichiropus* species are limited to a very small window of opportunity when there is sufficient moisture for them to forage and mate during wetter winter months (Car, Wojcieszek and Harvey, 2013). *Antichiropus* species are, consequently, short range endemics with very small distributions sensu Harvey (2002).

The *Antichiropus* millipede fauna of the Pilbara was revised by Car *et al.* (2019), however, the area near Onslow was excluded from this paper and no records of this genus have previously been recorded from the Survey Area. Two juvenile specimens that are considered to be *Antichiropus* were recorded from a single site (KBSRE02), however, due to their juvenile status further identification is not possible. The specimens were recorded in riparian vegetation on a

major drainage line and as such the morphospecies is anticipated to occur widely throughout the local region especially to the north and south of the Survey Area.

## 6 Conclusion

The key findings of the terrestrial vertebrate fauna and SRE invertebrate fauna surveys were:

- Ten fauna habitats were mapped, of which the mesas and breakaways (0.13% of the Survey Area) and drainage line/river/creek habitats (6.90% of the Survey Area) and represent the most value to conservation significant fauna and overall fauna assemblages. Conservation significant fauna species that are confirmed or most likely to use these habitats are:
  - Grey Falcon (*Falco hypoleucos*) – Vulnerable under BC Act
  - Peregrine Falcon (*Falco peregrinus*) – Other Specially Protected Fauna under BC Act
  - Northern Quoll (*Dasyurus hallucatus*) (confirmed) – Endangered under BC Act and EPBC Act
  - Ghost Bat (*Macroderma gigas*) (confirmed) – Vulnerable under BC Act and EPBC Act
  - Pilbara Leaf-nosed Bat (*Rhinonictis aurantia* Pilbara form) (confirmed) – Vulnerable under BC Act and EPBC Act
  - Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable under BC Act and EPBC Act
- Stony hills and slopes (3.79% of the Survey Area) provide important dispersal and foraging habitat, particularly when adjacent the mesas and breakaways, and are also likely to be used by the Western Pebble-mound Mouse (*Pseudomys chapmani*), which is Priority 4 under BC Act.
- The tidal flats and claypans (5.82% of the Survey Area) provide important seasonal habitat for a large number of conservation significant waterbirds and shorebirds, and the Short-tailed Mouse (*Leggadina lakedownensis*), which is Priority 4 under BC Act, which is known to use the fringes of claypans.
- The plains, stony plains, and sand dune habitats contain less microhabitat opportunities and provide less value to most conservation significant fauna taxa and overall fauna assemblages than the aforementioned habitats.
- Four conservation significant fauna taxa were recorded confirmed to use the Survey Area during the fauna surveys:
  - High density Northern Quoll populations were recorded in the stony hills and slopes and the mesas and breakaway habitats within the Survey Area. A population of Northern Quolls uses mesas within the Survey Area.
  - Ghost Bat records consistent with foraging, potential night roosting and possible day roosting were recorded within mesas and breakaways. No deep, complex caves suitable for maternity roosts were identified.
  - A recently active Western Pebble-mound Mouse mound was recorded on the boundary of the Survey Area in stony hills and slopes habitat.

- Pilbara Leaf-nosed Bat records consistent with foraging were recorded within or adjacent to mesas and breakaways. These records were consistent with known roost sites outside the Survey Area. No roosting was recorded within the Survey Area.
- A fifth conservation significant fauna taxon, the Pilbara Olive Python, was opportunistically recorded approximately 20 km south of the Survey Area. The taxon is therefore likely to occur within the Survey Area, where it will use drainage line/river/creek habitats and mesas and breakaway habitats but is most likely widely distributed in the region.
- The drainage line/river/creek habitats (6.90% of the Survey Area) and mesas and breakaways habitats (0.16% of the Survey Area) are considered to provide moderate SRE habitat suitability. The remaining habitats identified within the Survey Area are considered to provide low SRE habitat suitability.
- No confirmed SRE or conservation significant invertebrate taxa were recorded within the Survey Area.
- Two likely SRE taxa (taxa known to have closely related taxa that show evidence of short-range endemism) were recorded at single locations within the Survey Area:
  - One Philosciid isopod Philosciidae sp. indet. 'Onslow', found in plains habitat.
  - One Polydesmid millipede *Antichiropus?* Juvenile, found in minor drainage line/river/creek habitat.
- Four possible SRE taxa (primarily due to the groups being considered data deficient) were recorded within the Survey Area:
  - One armadillid isopod *Buddelundia* sp. '35/36', found in minor drainage line/river/creek, Mulga woodland, and stony plain habitat.
  - One centipede *Cryptops* sp. 'Onslow', found in minor drainage line/river/creek, stony hills and slopes, and stony plain habitat.
  - Two Oligiid pseudoscorpions *Beierolpium* sp., and *Indolpium* sp., found in mesas and breakaways and stony plain habitat, and stony plain, tidal flats, and stony hills and slopes habitat respectively.

## 7 References

- Anstee, S. (1996) 'Use of External Mound Structures as Indicators of the Presence of the Pebble-Mound Mouse', *Wildlife Research*, 23(4), pp. 429–434.
- Astron Environmental Services (2011a) *West Pilbara Iron Ore Project Habitat Assessment for Terrestrial Fauna of National Environmental Significance*.
- Astron Environmental Services (2011b) *West Pilbara Iron Ore Project Pilbara Leaf-nosed Bat (Rhinonictis aurantia) Habitat Assessment*.
- Astron Environmental Services (2012) *West Pilbara Iron Ore Project Activity Assessment for Bats of Conservation Significance*.
- Bancroft, W. and Bamford, M. (2018) *ANSIA Stage 2 Fauna Assessment*.
- Barrett, G. et al. (2003) *The new atlas of Australian birds*. Melbourne, Australia: Royal Australasian Ornithologists Union.
- Bat Call WA (2015) *West Pilbara Iron Ore Project Kens Bore East - Red Hill Creek - Echolocation Survey of Bat Activity*.
- Beard, J. S. (1976) *Vegetation survey of Western Australia. Western Australia 1: 1 000 000 vegetation series. Design and cartography by Dept. of Geography, University of W.A.*
- Biota Environmental Sciences (2008) *West Pilbara Iron Ore Project Onslow Rail Corridor – Level 1 Fauna Assessment*.
- Biota Environmental Sciences (2009) *West Pilbara Iron Ore Project Onslow Rail Corridor Terrestrial Fauna Survey*.
- Biota Environmental Sciences (2015a) *West Pilbara Iron Ore Project MNES Fauna Species Habitat Assessment*.
- Biota Environmental Sciences (2015b) *West Pilbara Iron Ore Project Red Hill Creek Terrestrial Fauna Assessment: Phase 1*.
- Biota Environmental Sciences (2015c) *West Pilbara Iron Ore Project Stage 1 Extension Terrestrial Fauna Assessment: Phase 1*.
- BirdLife Australia (2020) *Australian National Directory of Important Shorebird Habitat Chapter Eight: Western Australia*. Perth, Australia. Available at: <https://birdlife.org.au/projects/shorebirds/national-directory-ms-habitat>.
- BirdLife International (2016) *Falco hypoleucos*. *The IUCN Red List of Threatened Species 2016*. Available at: <https://www.iucnredlist.org/species/22696479/93566768#text-fields> (Accessed: 24 February 2020).
- Bureau of Meteorology (2021) *Monthly climate data statistics*. Available at: [www.bom.gov.au/climate/data](http://www.bom.gov.au/climate/data).
- Car, C. A. et al. (2019) *The millipede genus Antichiropus (Diplopoda: Polydesmida: Paradoxosomatidae), Part 3: Species of the Pilbara bioregion of Western Australia, Zootaxa*. doi: 10.11646/zootaxa.4617.1.1.
- Car, C. A., Wojcieszek, J. M. and Harvey, M. S. (2013) 'The millipede genus Antichiropus (Diplopoda: Polydesmida: Paradoxosomatidae), part 1: redefinition of the genus and redescriptions of existing species.', *Records of the Western Australian Museum*, 28, pp. 83–118. doi: 10.18195/issn.0312-3162.28(2).2013.083-118.

Clarke, K. R. and Gorley, R. N. (2006) 'Primer-E v6'. Plymouth, United Kingdom, United Kingdom.

Cogger, H. G. (2014) *Reptiles and amphibians of Australia*. 7th edn. Melbourne, Australia: CSIRO Publishing.

Department of Agriculture and Food WA (2012) *Soil-landscape systems of Western Australia (GIS dataset)*. Perth, Australia.

Department of Agriculture Water and the Environment (2020) *Protected Matters Search Tool*. Canberra, Australia. Available at: <http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf>.

Department of Biodiversity Conservation and Attractions (2019) *DBCA - Legislated lands and waters (GIS dataset)*. Perth, Australia. Available at: <https://catalogue.data.wa.gov.au/dataset/dbca-legislated-lands-and-waters>.

Department of Biodiversity Conservation and Attractions (2020a) *NatureMap*. Perth, Australia. Available at: <https://naturemap.dpaw.wa.gov.au/>.

Department of Biodiversity Conservation and Attractions (2020b) *Threatened and Priority Ecological Communities database request (custom search)*. Perth, Western Australia.

Department of Parks and Wildlife (2017) *Interim Guideline for Preliminary Surveys of Night Parrot (*Pezoporus occidentalis*) in Western Australia*. Perth, Australia, Australia. Available at: [https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/interim\\_guideline\\_for\\_night\\_parrot\\_survey.pdf](https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/interim_guideline_for_night_parrot_survey.pdf).

Department of Sustainability Environment Population and Communities (1999) *Survey Guidelines for Australia's Threatened Mammals*. Canberra, Australia. Available at: <http://www.environment.gov.au/system/files/resources/b1c6b237-12d9-4071-a26e-ee816caa2b39/files/survey-guidelines-mammals.pdf>.

Department of Sustainability Environment Water Population and Communities (2011) *Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act*. Canberra, Australia. Available at: <http://www.environment.gov.au/resource/survey-guidelines-australias-threatened-reptiles-guidelines-detecting-reptiles-listed>.

Department of the Environment (2013) *Matters of National Environmental Significance: Significant impact guidelines 1.1*. Canberra, Australia. Available at: [http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines\\_1.pdf](http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf).

Department of the Environment (2016) *EPBC Act Referral Guidelines for the endangered northern quoll *Dasyurus hallucatus**. EPBC Act Policy Statement.

Department of the Environment and Energy (2016) *Interim Biogeographic Regionalisation for Australia, Version 7*. Canberra, Australia. Available at: [www.environment.gov.au/land/nrs/science/ibra/](http://www.environment.gov.au/land/nrs/science/ibra/).

Department of the Environment and Energy (2017) *EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species*. Canberra, Australia. Available at: <http://www.environment.gov.au/system/files/resources/67d7eab4-95a5-4c13-a35e-e74cca47c376/files/bio4190517-shorebirds-guidelines.pdf>.



Department of the Environment Water Heritage and the Arts (1999) 'Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999', pp. 1–73.

Department of the Environment Water Heritage and the Arts (2010) *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act*. Canberra, Australia. Available at:  
<http://www.environment.gov.au/system/files/resources/107052eb-2041-45b9-9296-b5f514493ae0/files/survey-guidelines-birds-april-2017.pdf> (Accessed: 24 July 2018).

Department of Water and Environmental Regulation (2016) *Hydrography Linear (Heirarchy) (GIS dataset)*. Perth, Australia: Landgate.

Doughty, P. *et al.* (2011) 'Herpetological assemblages of the Pilbara biogeographic region, Western Australia: ecological associations, biogeographic patterns and conservation.', *Records of the Western Australian Museum Supplement*, 78, pp. 315–341.

Dunlop, J., Birch, N. and Moore, H. (2018) *Pilbara Northern Quoll Research Program 2018 Annual Report*. Perth, Australia. Available at:  
<https://library.dbca.wa.gov.au/static/FullTextFiles/072380.pdf>.

Van Dyck, S. and Strahan, R. (2008) *The mammals of Australia*. 3rd edn. Sydney, Australia: New Holland Publishers.

ecologia Environment (2015) *Solomon Hub Vertebrate Fauna Assessment*.

Environmental Protection Authority (2016) *Technical Guidance - Sampling of short range endemic invertebrate fauna*. Perth, Australia. Available at:  
[http://epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/Tech guidance- Sampling-SREs-Dec-2016.pdf](http://epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-Sampling-SREs-Dec-2016.pdf).

Environmental Protection Authority (2020) *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Perth, Australia. Available at:  
<https://www.epa.wa.gov.au/policies-guidance/technical-guidance-terrestrial-vertebrate-fauna-surveys-environmental-impact>.

Ford, F. and Johnson, C. (2007) 'Eroding abodes and vanished bridges: historical biogeography of the substrate specialist pebble-mound mice (*Pseudomys*)', *Journal of Biogeography*, 34(3), pp. 514–523.

Harvey, M. S. (2002) 'Short-range endemism among the Australian fauna: some examples from non-marine environments', *Invertebrate Systematics*, 16, pp. 555–570.

Higgins, P. J. (1999) *Handbook of Australian, New Zealand and Antarctic Birds. Volume Four - Parrots to Dollarbird, Handbook of Australian, New Zealand & Antarctic Birds*.

Johnstone, R. E. and Storr, G. M. (1998) *Handbook of Western Australian birds*. Edited by D. Louise. Perth, Australia: Western Australian Museum.

Judd, S. (2021) *Isopod identification report from the Kens Bore Project area. Unpublished report to invertebrate Solutions Pty Ltd*.

Kendrick, P. (2001) *Pilbara 3 (PIL3 - Hamersley subregion)*.

Kendrick, P. and Mau, R. (2002) *Carnarvon 1 (CAR1 - Cape Range subregion)*.

Kendrick, P. and Stanley, F. (2001) *Pilbara 4 (PIL4 - Roebourne)*.

Menkhorst, P. *et al.* (2017) *The Australian bird guide*. Australia: CSIRO Publishing.

- Menkhorst, P. and Knight, F. (2004) *A Field Guide to the Mammals of Australia*. Edited by D. Meagher. Melbourne, Australia: Oxford University Press.
- Morcombe, M. (2003) *Field Guide to Australian Birds*. Archerfield: Steve Parish Publishing Pty Ltd.
- Moulds, T. A. *et al.* (no date) 'Subterranean and surface cryptopid centipede diversity in Western Australia. Manuscript in preparation.'
- Ninox Wildlife Consulting (2011) *A Level 1 Vertebrate Fauna Assessment of A Proposed Rail Siding Near Menzies, Western Australia. Prepared for Macarthur Minerals Limited*.
- Oakwood, M. (2000) 'Reproduction and demography of the northern quoll, *Dasyurus hallucatus*, in the lowland savanna of northern Australia', *Australian Journal of Zoology*. doi: 10.1071/ZO00028.
- Olsen, J. and Fuentes, E. (2008) 'Dietary shifts based upon prey availability in Peregrine Falcons and Australian Hobbies breeding near Canberra, Australia', *Journal of Raptor Research*, 42, pp. 125–137.
- Pearson, D. (1993) "Distribution, status and conservation of pythons in Western Australia", in D Lunney, & D Ayers, (Eds), *Herpetology in Australia: a Diverse Discipline*, *Royal Zoological Society of NSW, Sydney*, pp. 383–395.
- Pearson, D. (2003) 'Giant Pythons of the Pilbara', *Landscape*, pp. 32–39.
- Pearson, D. *et al.* (2004) *Unravelling the Mysteries of Pilbara Olive Python Ecology*. Karratha, Australia.
- Pendoley Environmental (2021) *Draft Ashburton Infrastructure Project: Artificial light impact assessment and management plan. Unpublished report prepared for Mineral Resources Limited*. Perth, Australia.
- Phoenix Environmental Sciences (2017) *Flora and vegetation survey and terrestrial fauna survey for the Pilbara Regional Waste Management Facility*.
- Pizzey and Knight (2013) *Birds of Australia, Digital Edition*. Melbourne, Australia: Gibbon Multimedia.
- R Core Team (2020) 'R: A language and environment for statistical computing'. R Foundation for Statistical Computing, Vienna, Austria. Available at: <https://www.r-project.org/>.
- Rapallo Environmental (2011) *Pilbara Olive Python Reconnaissance Survey of the West Pilbara Iron Ore Project*.
- Rapallo Environmental (2012a) *Biological Assessment of the Conservation Focus Area for API Management*.
- Rapallo Environmental (2012b) *Targeted Surveys for Populations of the Northern Quoll (Dasyurus hallucatus) on the West Pilbara Iron Ore Project*.
- Rapallo Environmental (2013) *Northern Quoll Annual Monitoring Survey of the West Pilbara Iron Ore Projects Stage 1 for API Management*.
- Rio Tinto Iron Ore (2018) *Flora, Vegetation and Fauna Habitat Assessment at Bourne Highway*.
- Schoenjahn, J., Pavey, C. R. and Walter, G. H. (2019) 'Ecology of the Grey Falcon *Falco hypoleucos*—current and required knowledge', *Emu*. doi: 10.1080/01584197.2019.1654393.
- Shepherd, D. P., Beeston, G. R. and Hopkins, A. J. M. (2002) *Native Vegetation in Western*

*Australia Technical Report 249*. Perth, Australia.

Triggs, B. (2004) *Tracks, scats, and other traces: a field guide to Australian mammals*. 2nd edn. Melbourne, Australia: Oxford University Press.

Western Australian Government (2005) *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*.

Western Australian Museum (2021a) *Arachnida and Myriapoda database search March 2021*.

Western Australian Museum (2021b) *Checklist of the Terrestrial Vertebrate Fauna of Western Australia*. Available at: <http://museum.wa.gov.au/research/departments/terrestrial-zoology/checklist-terrestrial-vertebrate-fauna-western-australia>.

Western Australian Museum (2021c) *Crustacea database search March 2021*.

Western Australian Museum (2021d) *Mollusc database search March 2021*.

## 8 Disclaimer of this Report

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Aspects of this report, including the opinions, conclusions, and recommendations it contains, are based on the results of the investigation, sampling and testing set out in the contract and otherwise in accordance with normal practices and standards. The investigation, sampling and testing are designed to produce results that represent a reasonable interpretation of the general conditions of the site that is the subject of this report. However, due to the characteristics of the site, including natural variations in site conditions, the results of the investigation, sampling and testing may not accurately represent the actual state of the whole site at all points.

It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions, and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

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# Appendices

# **Appendix A**

## **Database Searches**

DBCAs Threatened and Priority Fauna Database Search Results

NAME_SCI	NAME_COM	CLASS	CONS CODE	Date	SOURCE	CERTAINTY	METHOD	TYPE	COUNT	NAME ID
Actitis hypoleucos	Common Sandpiper	BIRD	IA	16/10/2007	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	23/08/2012	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	15/10/2012	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	15/10/2012	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	30/01/2013	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	26/07/2013	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	27/09/2013	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	27/09/2013	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	28/10/2013	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	04/03/2014	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	20/10/2014	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	20/10/2014	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	02/12/2014	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	22/10/2015	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	20/10/2016	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	08/08/2017	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	05/10/2017	BIRDATA				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	23/09/1998	BIRDATLAS2				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	28/12/2000	BIRDATLAS2				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	12/09/2001	BIRDATLAS2				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	14/10/2001	BIRDATLAS2				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	19/01/2004	BIRDATLAS2				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	05/12/2005	BIRDATLAS2				0	41323
Actitis hypoleucos	Common Sandpiper	BIRD	IA	22/10/2007	BIRDATLAS2				0	41323
Apus pacificus	Fork-tailed swift	BIRD	IA	11/03/2007	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25554
Arenaria interpres	Ruddy turnstone	BIRD	IA	15/10/2012	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	15/10/2012	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	30/01/2013	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	26/07/2013	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	27/09/2013	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	27/09/2013	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	14/10/2013	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	17/10/2013	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	18/10/2013	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	28/10/2013	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	04/03/2014	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	25/09/2014	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	20/10/2014	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	20/10/2014	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	20/10/2014	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	27/11/2014	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	02/12/2014	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	10/06/2015	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	22/10/2015	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	20/10/2016	BIRDATA				0	25736

DBCA Threatened and Priority Fauna Database Search Results

Arenaria interpres	Ruddy turnstone	BIRD	IA	05/10/2017	BIRDATA				0	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	08/04/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	21/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	06/08/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	11/07/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	02/08/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	19/09/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	22/10/2007	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	29/04/2008	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	25/10/2010	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	30/01/2013	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25736
Arenaria interpres	Ruddy turnstone	BIRD	IA	17/07/2011	TFAUNA	Certain	Survey	Day sighting	1	25736
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	15/10/2012	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	15/10/2012	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	30/01/2013	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	27/09/2013	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	28/10/2013	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	04/03/2014	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	01/09/2014	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	20/10/2014	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	20/10/2014	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	20/10/2014	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	25/11/2014	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	22/10/2015	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	20/10/2016	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	05/10/2017	BIRDATA				0	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	19/02/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	16/02/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	29/04/2008	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	30/01/2013	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24779
Calidris acuminata	Sharp-tailed sandpiper	BIRD	IA	01/01/2008	TFAUNA	Certain	Targeted survey	Day sighting	20000	24779
Calidris alba	Sanderling	BIRD	IA	15/10/2012	BIRDATA				0	24780
Calidris alba	Sanderling	BIRD	IA	15/10/2012	BIRDATA				0	24780
Calidris alba	Sanderling	BIRD	IA	27/09/2013	BIRDATA				0	24780
Calidris alba	Sanderling	BIRD	IA	14/10/2013	BIRDATA				0	24780
Calidris alba	Sanderling	BIRD	IA	28/10/2013	BIRDATA				0	24780



DBCA Threatened and Priority Fauna Database Search Results

Calidris alba	Sanderling	BIRD	IA	04/03/2014	BIRDATA				0	24780
Calidris alba	Sanderling	BIRD	IA	20/10/2014	BIRDATA				0	24780
Calidris alba	Sanderling	BIRD	IA	20/10/2014	BIRDATA				0	24780
Calidris alba	Sanderling	BIRD	IA	20/10/2014	BIRDATA				0	24780
Calidris alba	Sanderling	BIRD	IA	22/10/2015	BIRDATA				0	24780
Calidris alba	Sanderling	BIRD	IA	05/10/2017	BIRDATA				0	24780
Calidris alba	sanderling	BIRD	IA	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24780
Calidris alba	sanderling	BIRD	IA	12/09/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24780
Calidris alba	sanderling	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24780
Calidris alba	sanderling	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24780
Calidris alba	sanderling	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24780
Calidris alba	sanderling	BIRD	IA	29/04/2008	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24780
Calidris alba	sanderling	BIRD	IA	25/10/2010	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24780
Calidris alba	sanderling	BIRD	IA	16/11/1981	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24780
Calidris alba	Sanderling	BIRD	IA	16/11/1981	WAM_BIRDS				0	24780
Calidris canutus	Red knot	BIRD	EN	27/09/2013	BIRDATA				0	25738
Calidris canutus	Red knot	BIRD	EN	04/03/2014	BIRDATA				0	25738
Calidris canutus	Red knot	BIRD	EN	20/10/2014	BIRDATA				0	25738
Calidris canutus	Red knot	BIRD	EN	20/10/2014	BIRDATA				0	25738
Calidris canutus	Red knot	BIRD	EN	27/11/2014	BIRDATA				0	25738
Calidris canutus	Red knot	BIRD	EN	02/12/2014	BIRDATA				0	25738
Calidris canutus	Red knot	BIRD	EN	22/10/2015	BIRDATA				0	25738
Calidris canutus	Red knot	BIRD	EN	20/10/2016	BIRDATA				0	25738
Calidris canutus	Red knot	BIRD	EN	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	25738
Calidris canutus	Red knot	BIRD	EN	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25738
Calidris canutus	Red knot	BIRD	EN	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25738
Calidris canutus	Red knot	BIRD	EN	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25738
Calidris canutus	Red knot	BIRD	EN	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25738
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	15/10/2012	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	15/10/2012	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	14/10/2013	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	17/10/2013	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	28/10/2013	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	25/09/2014	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	20/10/2014	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	20/10/2014	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	20/10/2014	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	27/11/2014	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	02/12/2014	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	22/10/2015	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	20/10/2016	BIRDATA				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	05/10/2017	BIRDATA				0	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	11/07/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784

DBCA Threatened and Priority Fauna Database Search Results

Calidris ferruginea	curlew sandpiper	BIRD	CR	16/02/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	08/06/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	01/10/1980	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	01/10/1980	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	01/10/1980	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	01/10/1980	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	01/10/1980	WAM_BIRDS				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	01/10/1980	WAM_BIRDS				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	01/10/1980	WAM_BIRDS				0	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	01/10/1980	WAM_BIRDS				0	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	16/11/1981	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24784
Calidris ferruginea	Curlew Sandpiper	BIRD	CR	16/11/1981	WAM_BIRDS				0	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	01/01/2008	TFAUNA	Certain	Targeted survey	Day sighting	25000	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	01/01/2008	TFAUNA	Certain	Targeted survey	Day sighting	25000	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	01/01/2008	TFAUNA	Certain	Targeted survey	Day sighting	25000	24784
Calidris ferruginea	curlew sandpiper	BIRD	CR	01/01/2008	TFAUNA	Certain	Targeted survey	Day sighting	25000	24784
Calidris melanotos	Pectoral Sandpiper	BIRD	IA	02/12/2014	BIRDATA				0	24786
Calidris melanotos	pectoral sandpiper	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24786
Calidris ruficollis	Red-necked stint	BIRD	IA	15/10/2012	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	15/10/2012	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	30/01/2013	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	27/09/2013	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	14/10/2013	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	17/10/2013	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	18/10/2013	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	28/10/2013	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	04/03/2014	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	20/10/2014	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	20/10/2014	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	20/10/2014	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	25/11/2014	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	27/11/2014	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	02/12/2014	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	02/12/2014	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	10/06/2015	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	22/10/2015	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	20/10/2016	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	05/10/2017	BIRDATA				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	21/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	11/07/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	11/07/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	19/09/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	19/02/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788

DBCFA Threatened and Priority Fauna Database Search Results

Calidris ruficollis	Red-necked stint	BIRD	IA	16/02/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	19/01/2004	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	08/11/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	29/04/2008	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	25/10/2010	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	30/01/2013	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	16/11/1981	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	16/11/1981	WAM_BIRDS				0	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	17/07/2011	TFAUNA	Certain	Survey	Day sighting	1	24788
Calidris ruficollis	Red-necked stint	BIRD	IA	01/01/2008	TFAUNA	Certain	Targeted survey	Day sighting	23000	24788
Calidris subminuta	Long-toed Stint	BIRD	IA	20/10/2014	BIRDATA				0	24789
Calidris subminuta	Long-toed Stint	BIRD	IA	25/11/2014	BIRDATA				0	24789
Calidris subminuta	Long-toed Stint	BIRD	IA	22/10/2015	BIRDATA				0	24789
Calidris subminuta	Long-toed Stint	BIRD	IA	25/08/1981	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24789
Calidris tenuirostris	Great knot	BIRD	CR	15/10/2012	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	15/10/2012	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	27/09/2013	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	14/10/2013	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	17/10/2013	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	18/10/2013	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	28/10/2013	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	04/03/2014	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	25/09/2014	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	20/10/2014	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	27/11/2014	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	02/12/2014	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	22/10/2015	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	20/10/2016	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	05/10/2017	BIRDATA				0	24790
Calidris tenuirostris	Great knot	BIRD	CR	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24790
Calidris tenuirostris	Great knot	BIRD	CR	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24790
Calidris tenuirostris	Great knot	BIRD	CR	19/09/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24790
Calidris tenuirostris	Great knot	BIRD	CR	12/09/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24790
Calidris tenuirostris	Great knot	BIRD	CR	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24790
Calidris tenuirostris	Great knot	BIRD	CR	19/01/2004	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24790
Calidris tenuirostris	Great knot	BIRD	CR	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24790
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	16/10/2007	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	15/10/2012	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	15/10/2012	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	30/01/2013	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	27/09/2013	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	17/10/2013	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	18/10/2013	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	28/10/2013	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	20/10/2014	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	27/11/2014	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	02/12/2014	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	10/06/2015	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	22/10/2015	BIRDATA				0	25575

DBCA Threatened and Priority Fauna Database Search Results

Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	20/10/2016	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	05/10/2017	BIRDATA				0	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	19/09/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	05/02/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	22/10/2007	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	29/04/2008	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	25/10/2010	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius leschenaultii	Greater sand plover, large sand plover	BIRD	VU	30/01/2013	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25575
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	15/10/2012	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	15/10/2012	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	30/01/2013	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	14/10/2013	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	28/10/2013	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	20/10/2014	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	27/11/2014	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	02/12/2014	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	10/06/2015	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	22/10/2015	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	20/10/2016	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	05/10/2017	BIRDATA				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	05/07/1981	BIRDATLAS1	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	21/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	12/09/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	19/01/2004	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	30/01/2013	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	26/03/1982	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	04/04/1982	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	26/03/1982	WAM_BIRDS				0	25576
Charadrius mongolus	Lesser Sand Plover	BIRD	EN	04/04/1982	WAM_BIRDS				0	25576
Charadrius veredus	Oriental Plover	BIRD	IA	15/10/2012	BIRDATA				0	24378
Charadrius veredus	Oriental Plover	BIRD	IA	15/10/2012	BIRDATA				0	24378
Charadrius veredus	Oriental Plover	BIRD	IA	28/10/2013	BIRDATA				0	24378
Charadrius veredus	Oriental Plover	BIRD	IA	20/10/2014	BIRDATA				0	24378
Charadrius veredus	Oriental Plover	BIRD	IA	22/10/2015	BIRDATA				0	24378
Charadrius veredus	oriental plover	BIRD	IA	04/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24378
Charadrius veredus	oriental plover	BIRD	IA	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24378

DBCA Threatened and Priority Fauna Database Search Results

Charadrius veredus	oriental plover	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24378
Charadrius veredus	oriental plover	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24378
Charadrius veredus	oriental plover	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24378
Charadrius veredus	oriental plover	BIRD	IA	01/01/2008	TFAUNA	Certain	Targeted survey	Day sighting	29900	24378
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	16/10/2007	BIRDATA				0	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	28/10/2013	BIRDATA				0	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	20/10/2014	BIRDATA				0	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	22/10/2015	BIRDATA				0	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	20/10/2016	BIRDATA				0	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	19/02/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	18/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	29/04/2008	BIRDATLAS2	Moderately certain	Observational	Sighting	1	41332
Chlidonias leucopterus	White-winged black tern, white-winged tern	BIRD	IA	25/10/2010	BIRDATLAS2	Moderately certain	Observational	Sighting	1	41332
Ctenotus angusticeps	Airlie Island Ctenotus, Northwestern coastal Ctenotus	REPTILE	P3	02/05/2012	FAUNASURVEY	Certain	Survey	Unknown	1	25024
Ctenotus angusticeps	Airlie Island Ctenotus, Northwestern coastal Ctenotus	REPTILE	P3	03/05/2012	FAUNASURVEY	Certain	Survey	Unknown	1	25024
Ctenotus angusticeps	Airlie Island Ctenotus, Northwestern coastal Ctenotus	REPTILE	P3	03/11/2010	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	25024
Ctenotus angusticeps	Airlie Island Ctenotus, Northwestern coastal Ctenotus	REPTILE	P3	03/11/2010	WAM_REPTILES				0	25024
Ctenotus angusticeps	Airlie Island Ctenotus, Northwestern coastal Ctenotus	REPTILE	P3	03/05/2012	WAM_REPTILES	WAM Vouchered	Collection	Specimen	1	25024
Ctenotus angusticeps	Airlie Island Ctenotus, Northwestern coastal Ctenotus	REPTILE	P3	03/05/2012	WAM_REPTILES				0	25024
Ctenotus angusticeps	Airlie Island Ctenotus, Northwestern coastal Ctenotus	REPTILE	P3	15/12/2011	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	25024
Ctenotus angusticeps	Airlie Island Ctenotus, Northwestern coastal Ctenotus	REPTILE	P3	15/12/2011	TFAUNA	Certain	Opportunistic sighting	Day sighting	1	25024
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	17/02/2012	FAUNASURVEY	Moderately certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	17/02/2012	FAUNASURVEY	Moderately certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	06/05/2012	FAUNASURVEY	Moderately certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	06/05/2012	FAUNASURVEY	Moderately certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2012	FAUNASURVEY	Moderately certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2012	FAUNASURVEY	Moderately certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2012	FAUNASURVEY	Moderately certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	31/05/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	01/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	01/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	01/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	02/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	02/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	03/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	04/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	04/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	04/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	04/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	05/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	05/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	05/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903
Dasycercus blythi	Brush-tailed mulgara	MAMMAL	P4	05/06/2014	FAUNASURVEY	Certain	Survey	Unknown	1	30903





















DBCAs Threatened and Priority Fauna Database Search Results

Dasyurus hallucatus	Northern quoll	MAMMAL	EN	21/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	21/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	21/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	21/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	22/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	22/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	23/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	23/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	23/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	23/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	24/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	24/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	24/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	24/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	25/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	25/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	25/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	25/07/2015	FAUNASURVEY	Certain	Survey	Unknown	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	01/06/2010	PILBTFAUNA	Very certain	Targeted survey	Caught or trapped	36	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	09/06/2010	PILBTFAUNA	Very certain	Opportunistic sighting	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	21/06/2010	PILBTFAUNA	Not defined	Opportunistic sighting	Sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	02/07/2010	PILBTFAUNA	Not Sure	Opportunistic sighting	Secondary sign	0	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	15/07/2010	PILBTFAUNA	Not defined	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	01/05/2011	PILBTFAUNA	Very certain	Targeted survey	Caught or trapped	2	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	18/05/2011	PILBTFAUNA	Not defined	Unknown	Sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	29/06/2011	PILBTFAUNA	Not defined	Opportunistic sighting	Sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	04/07/2011	PILBTFAUNA	Not defined	Opportunistic sighting	Sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	01/08/2011	PILBTFAUNA	Very certain	Targeted survey	Caught or trapped	2	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	13/08/2011	PILBTFAUNA	Not defined	Opportunistic sighting	Sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	07/09/2011	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	14/01/2012	PILBTFAUNA	Not defined	Opportunistic sighting	Sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	19/01/2012	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	04/04/2012	PILBTFAUNA	Certain	Opportunistic sighting		1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	01/05/2012	PILBTFAUNA	Very certain	Targeted survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	09/05/2012	PILBTFAUNA	Very certain	Targeted survey	Remote camera	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	09/05/2012	PILBTFAUNA	Very certain	Targeted survey	Remote camera	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	09/05/2012	PILBTFAUNA	Very certain	Targeted survey	Remote camera	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	10/05/2012	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	10/05/2012	PILBTFAUNA	Very certain	Targeted survey	Remote camera	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	11/05/2012	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093

DBCFA Threatened and Priority Fauna Database Search Results

Dasyurus hallucatus	Northern quoll	MAMMAL	EN	06/08/2012	PILBTFAUNA	Not defined	Opportunistic sighting	Sighting	2	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	29/08/2012	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	26/09/2012	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	27/09/2012	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	28/09/2012	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	30/09/2012	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	25/10/2012	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	05/01/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	05/01/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Night sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	14/01/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Night sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	18/01/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Sighting	2	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	19/01/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	25/04/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	27/04/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	01/05/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	19/05/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	16/06/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Dawn sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	08/07/2013	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	25/07/2013	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	10/10/2013	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	11/10/2013	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	28/10/2013	PILBTFAUNA	Very certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	06/12/2013	PILBTFAUNA	Not defined	Opportunistic sighting	Night sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	09/03/2014	PILBTFAUNA	Not defined	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	12/03/2014	PILBTFAUNA	Not defined	Opportunistic sighting	Dawn sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	14/03/2014	PILBTFAUNA	Not defined	Opportunistic sighting	Sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	14/03/2014	PILBTFAUNA	Not defined	Opportunistic sighting	Night sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	10/05/2014	PILBTFAUNA	Very certain	Targeted survey	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	18/07/2014	PILBTFAUNA	Certain	Targeted survey	Secondary sign	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	19/08/2014	PILBTFAUNA	Very certain	Targeted survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	21/08/2014	PILBTFAUNA	Very certain	Targeted survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	22/08/2014	PILBTFAUNA	Very certain	Targeted survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	24/02/2015	PILBTFAUNA	Certain	Targeted survey	Secondary sign	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	24/02/2015	PILBTFAUNA	Certain	Targeted survey	Secondary sign	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	24/02/2015	PILBTFAUNA	Certain	Targeted survey	Secondary sign	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	24/02/2015	PILBTFAUNA	Certain	Targeted survey	Secondary sign	1	24093





DBCAs Threatened and Priority Fauna Database Search Results

Dasyurus hallucatus	Northern quoll	MAMMAL	EN	20/08/2018	WL_REG17		Survey		0	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	30/09/2018	WL_REG17		Survey		0	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	01/11/2018	WL_REG17		Survey		0	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	11/09/2018	WL_REG17		Survey		0	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	18/10/2018	WL_REG17		Survey		0	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	07/09/2018	WL_REG17		Survey		0	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	01/01/2007	TFAUNA	Certain	Survey	Day sighting	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	09/03/2014	TFAUNA	Moderately certain	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	17/05/2012	TFAUNA	Certain	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	09/07/2012	TFAUNA	Certain	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	07/05/2012	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	07/05/2012	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	07/05/2012	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	07/05/2012	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	13/05/2011	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	13/05/2011	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	13/05/2011	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	09/05/2012	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	13/05/2011	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	13/05/2011	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	15/05/2011	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	15/05/2011	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	10/06/2011	TFAUNA	Certain	Survey	Caught or trapped	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	14/09/2012	TFAUNA	Certain	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	19/11/2012	TFAUNA	Certain	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	19/01/2013	TFAUNA	Certain	Opportunistic sighting	Dead	2	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	01/05/2013	TFAUNA	Certain	Opportunistic sighting	Dead	3	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	19/05/2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	20/05/2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	24093
Dasyurus hallucatus	Northern quoll	MAMMAL	EN	29/08/2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	24093
Falco hypoleucos	Grey falcon	BIRD	VU	23/06/2013	BIRDATA				0	24473
Falco hypoleucos	Grey falcon	BIRD	VU	23/06/2013	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24473
Falco hypoleucos	Grey falcon	BIRD	VU	24/05/2016	FAUNASURVEY	Certain	Survey	Unknown	1	24473
Fregata ariel	Lesser frigatebird	BIRD	IA	19/10/2016	BIRDATA				0	24478
Fregata ariel	Lesser frigatebird	BIRD	IA	20/10/2016	BIRDATA				0	24478
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	05/10/2017	BIRDATA				0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	05/09/1978	BIRDATLAS1				0	47954

DBCA Threatened and Priority Fauna Database Search Results

Gelochelidon nilotica	Gull-billed tern	BIRD	IA	23/09/1998	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	20/07/1999	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	11/07/2000	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	12/09/2001	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	14/10/2001	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	19/10/2001	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	16/02/2002	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	19/01/2004	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	06/06/2004	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	08/11/2005	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	05/12/2005	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	29/04/2008	BIRDATLAS2					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	17/11/1981	WAM_BIRDS					0	47954
Gelochelidon nilotica	Gull-billed tern	BIRD	IA	17/11/1981	WAM_BIRDS					0	47954
Glareola maldivarum	Oriental pratincole	BIRD	IA	15/10/2012	BIRDATA					0	24481
Glareola maldivarum	Oriental pratincole	BIRD	IA	30/01/2013	BIRDATA					0	24481
Glareola maldivarum	Oriental pratincole	BIRD	IA	02/02/2015	BIRDATA					0	24481
Glareola maldivarum	Oriental pratincole	BIRD	IA	05/02/2001	BIRDATLAS2	Moderately certain	Observational	Sighting		1	24481
Glareola maldivarum	Oriental pratincole	BIRD	IA	19/02/2001	BIRDATLAS2	Moderately certain	Observational	Sighting		1	24481
Glareola maldivarum	Oriental pratincole	BIRD	IA	16/02/2002	BIRDATLAS2	Moderately certain	Observational	Sighting		1	24481
Glareola maldivarum	Oriental pratincole	BIRD	IA	15/02/2004	BIRDATLAS2	Moderately certain	Observational	Sighting		1	24481
Glareola maldivarum	Oriental pratincole	BIRD	IA	15/02/2004	BIRDATLAS2	Moderately certain	Observational	Sighting		1	24481
Glareola maldivarum	Oriental pratincole	BIRD	IA	16/02/2004	BIRDATLAS2	Moderately certain	Observational	Sighting		1	24481
Glareola maldivarum	Oriental pratincole	BIRD	IA	11/03/2007	BIRDATLAS2	Moderately certain	Observational	Sighting		1	24481
Hirundo rustica	Barn swallow	BIRD	IA	30/01/2013	BIRDATA					0	25630
Hirundo rustica	Barn swallow	BIRD	IA	01/09/2014	BIRDATA					0	25630
Hirundo rustica	Barn swallow	BIRD	IA	20/10/2014	BIRDATA					0	25630
Hirundo rustica	Barn swallow	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting		1	25630
Hirundo rustica	Barn swallow	BIRD	IA	25/10/2010	BIRDATLAS2	Moderately certain	Observational	Sighting		1	25630
Hirundo rustica	Barn swallow	BIRD	IA	30/01/2013	BIRDATLAS2	Moderately certain	Observational	Sighting		1	25630
Hydroprogne caspia	Caspian Tern	BIRD	IA	15/10/2012	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	15/10/2012	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	30/01/2013	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	29/05/2013	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	14/10/2013	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	17/10/2013	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	28/10/2013	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	20/10/2014	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	20/10/2014	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	20/10/2014	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	02/12/2014	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	10/06/2015	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	22/10/2015	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	20/10/2016	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	05/10/2017	BIRDATA					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	05/09/1978	BIRDATLAS1					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	05/07/1981	BIRDATLAS1					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	23/09/1998	BIRDATLAS2					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	20/07/1999	BIRDATLAS2					0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	20/07/1999	BIRDATLAS2					0	48587

DBCA Threatened and Priority Fauna Database Search Results

Hydroprogne caspia	Caspian Tern	BIRD	IA	21/07/1999	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	11/07/2000	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	11/07/2000	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	19/09/2000	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	19/02/2001	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	14/10/2001	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	19/10/2001	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	19/10/2001	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	16/02/2002	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	29/04/2008	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	30/07/2008	BIRDATLAS2				0	48587
Hydroprogne caspia	Caspian Tern	BIRD	IA	15/03/2013	FAUNASURVEY	Certain	Survey	Unknown	1	48587
Lagostrophus fasciatus fasciatus	Banded hare-wallaby, mernine	MAMMAL	VU		TFAUNA	Moderately certain	Historical (written)	Day sighting	0	24128
Liasis olivaceus barroni	Pilbara olive python	REPTILE	VU	01/01/2007	TFAUNA	Certain	Survey	Day sighting	1	25238
Liasis olivaceus barroni	Pilbara olive python	REPTILE	VU	01/01/2007	TFAUNA	Certain	Translocation	Released	1	25238
Liasis olivaceus barroni	Pilbara olive python	REPTILE	VU	25/01/2013	TFAUNA	Certain	Opportunistic sighting	Dead	1	25238
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	15/10/2012	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	15/10/2012	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	27/09/2013	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	28/10/2013	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	20/10/2014	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	27/11/2014	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	02/12/2014	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	22/10/2015	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	20/10/2016	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	05/10/2017	BIRDATA				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	05/02/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	26/03/1982	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	26/03/1982	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	03/04/1982	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	04/04/1982	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	04/04/1982	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	26/03/1982	WAM_BIRDS				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	26/03/1982	WAM_BIRDS				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	03/04/1982	WAM_BIRDS				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	04/04/1982	WAM_BIRDS				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	04/04/1982	WAM_BIRDS				0	25739
Limicola falcinellus	Broad-billed sandpiper	BIRD	IA	01/01/2008	TFAUNA	Certain	Targeted survey	Day sighting	6000	25739
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	15/10/2012	BIRDATA				0	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	15/10/2012	BIRDATA				0	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	28/10/2013	BIRDATA				0	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	20/10/2014	BIRDATA				0	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	22/10/2015	BIRDATA				0	24795

DBCA Threatened and Priority Fauna Database Search Results

Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	20/10/2016	BIRDATA				0	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	05/10/2017	BIRDATA				0	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	03/04/1982	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	03/04/1982	WAM_BIRDS				0	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	04/04/1982	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24795
Limnodromus semipalmatus	Asian dowitcher	BIRD	IA	04/04/1982	WAM_BIRDS				0	24795
Limosa lapponica	Bar-tailed godwit	BIRD	IA	15/10/2012	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	15/10/2012	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	30/01/2013	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	27/09/2013	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	14/10/2013	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	17/10/2013	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	28/10/2013	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	04/03/2014	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	25/09/2014	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	20/10/2014	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	20/10/2014	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	20/10/2014	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	27/11/2014	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	02/12/2014	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	10/06/2015	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	22/10/2015	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	20/10/2016	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	05/10/2017	BIRDATA				0	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	21/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	22/10/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	11/07/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	19/09/2000	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	05/02/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	12/09/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	16/02/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	19/01/2004	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	22/10/2007	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	29/04/2008	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica	Bar-tailed godwit	BIRD	IA	30/01/2013	BIRDATLAS2	Moderately certain	Observational	Sighting	1	30932
Limosa lapponica menzbieri	Bar-tailed godwit (northern Siberian)	BIRD	CR	17/07/2011	TFAUNA	Certain	Survey	Day sighting	1	24796
Limosa limosa	Black-tailed godwit	BIRD	IA	15/10/2012	BIRDATA				0	25741



DBCFA Threatened and Priority Fauna Database Search Results

Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	13/05/2013	FAUNASURVEY	Certain	Survey	Unknown	1	24180
Macroderma gigas	Ghost bat	MAMMAL	VU	02/05/2017	WL_REG17		Survey		0	24180
Macrotis lagotis	Bilby, dalgyte, ninu	MAMMAL	VU	06/08/2013	PILBTFUNA	Not Sure	Opportunistic sighting	Sighting	1	24168
Mormopterus cobourgianus	North-western free-tailed bat	MAMMAL	P1	17/09/2005	TFAUNA	Certain	Survey	Secondary sign	0	48003
Mormopterus cobourgianus	North-western free-tailed bat	MAMMAL	P1	17/09/2005	TFAUNA	Certain	Survey	Secondary sign	0	48003
Natator depressus	Flatback turtle	REPTILE	VU	27/01/2009	FAUNASURVEY	Certain	Survey	Unknown	3	25344
Natator depressus	Flatback turtle	REPTILE	VU	28/01/2009	FAUNASURVEY	Certain	Survey	Unknown	3	25344
Natator depressus	Flatback turtle	REPTILE	VU	11/11/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	11/11/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	02/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	03/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	03/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	06/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	08/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	08/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	09/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	09/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	10/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	10/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	12/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	21/12/2011	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	02/01/2012	FAUNASURVEY	WAM Vouchered	Survey	Specimen	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	17/10/2012	FAUNASURVEY	Certain	Survey	Secondary sign	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	14/11/2012	FAUNASURVEY	Certain	Survey	Secondary sign	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	16/11/2012	FAUNASURVEY	Certain	Survey	Secondary sign	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	16/11/2012	FAUNASURVEY	Certain	Survey	Secondary sign	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	21/11/2012	FAUNASURVEY	Certain	Survey	Secondary sign	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	21/11/2012	FAUNASURVEY	Certain	Survey	Secondary sign	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	23/11/2012	FAUNASURVEY	Certain	Survey	Secondary sign	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	23/11/2012	FAUNASURVEY	Certain	Survey	Secondary sign	1	25344
Natator depressus	Flatback turtle	REPTILE	VU	23/11/2012	FAUNASURVEY	Certain	Survey	Secondary sign	1	25344





DBCA Threatened and Priority Fauna Database Search Results

Numenius madagascariensis	Eastern curlew	BIRD	CR	20/10/2014	BIRDATA				0	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	20/10/2014	BIRDATA				0	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	20/10/2014	BIRDATA				0	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	02/12/2014	BIRDATA				0	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	10/06/2015	BIRDATA				0	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	22/10/2015	BIRDATA				0	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	20/10/2016	BIRDATA				0	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	08/08/2017	BIRDATA				0	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	05/10/2017	BIRDATA				0	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	05/02/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	08/06/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	19/01/2004	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius madagascariensis	Eastern curlew	BIRD	CR	08/11/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24798
Numenius minutus	Little curlew, little whimbrel	BIRD	IA	15/10/2012	BIRDATA				0	24799
Numenius minutus	Little curlew, little whimbrel	BIRD	IA	15/10/2012	BIRDATA				0	24799
Numenius minutus	Little curlew, little whimbrel	BIRD	IA	20/10/2014	BIRDATA				0	24799
Numenius minutus	Little curlew, little whimbrel	BIRD	IA	20/10/2014	BIRDATA				0	24799
Numenius minutus	Little curlew, little whimbrel	BIRD	IA	25/11/2014	BIRDATA				0	24799
Numenius phaeopus	Whimbrel	BIRD	IA	15/10/2012	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	15/10/2012	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	29/05/2013	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	26/07/2013	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	27/09/2013	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	27/09/2013	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	14/10/2013	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	17/10/2013	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	18/10/2013	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	28/10/2013	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	04/03/2014	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	25/09/2014	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	20/10/2014	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	20/10/2014	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	27/11/2014	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	02/12/2014	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	10/06/2015	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	22/10/2015	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	20/10/2016	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	08/08/2017	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	05/10/2017	BIRDATA				0	25742
Numenius phaeopus	Whimbrel	BIRD	IA	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	21/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	12/09/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742

DBCA Threatened and Priority Fauna Database Search Results

Numenius phaeopus	Whimbrel	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	16/02/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	08/06/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	19/01/2004	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	22/10/2007	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	29/04/2008	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25742
Numenius phaeopus	Whimbrel	BIRD	IA	17/07/2011	TFAUNA	Certain	Survey	Day sighting	1	25742
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	23/08/2012	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	15/10/2012	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	30/01/2013	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	23/06/2013	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	26/07/2013	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	14/10/2013	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	28/10/2013	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	04/03/2014	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	25/09/2014	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	20/10/2014	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	20/10/2014	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	27/11/2014	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	20/05/2015	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	19/10/2016	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	20/10/2016	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	05/10/2017	BIRDATA				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	23/09/1998	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	22/10/1999	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	11/07/2000	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	19/02/2001	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	14/10/2001	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	19/10/2001	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	19/10/2001	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	19/10/2001	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	16/02/2002	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	08/06/2002	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	29/04/2008	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	30/07/2008	BIRDATLAS2				0	48591
Pandion cristatus	Osprey, eastern osprey	BIRD	IA	15/03/2013	FAUNASURVEY	Certain	Survey	Unknown	1	48591
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	28/10/2013	BIRDATA				0	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	20/10/2014	BIRDATA				0	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	05/10/2017	BIRDATA				0	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	16/11/1981	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	16/11/1981	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	16/11/1981	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24801

DBCA Threatened and Priority Fauna Database Search Results

Phalaropus lobatus	Red-necked phalarope	BIRD	IA	16/11/1981	WAM_BIRDS	WAM Vouchered	Collection	Specimen	1	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	16/11/1981	WAM_BIRDS				0	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	16/11/1981	WAM_BIRDS				0	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	16/11/1981	WAM_BIRDS				0	24801
Phalaropus lobatus	Red-necked phalarope	BIRD	IA	16/11/1981	WAM_BIRDS				0	24801
Philomachus pugnax	Ruff (reeve)	BIRD	IA	05/10/2017	BIRDATA				0	24802
Plegadis falcinellus	Glossy ibis	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24843
Pluvialis fulva	Pacific golden plover	BIRD	IA	15/10/2012	BIRDATA				0	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	15/10/2012	BIRDATA				0	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	28/10/2013	BIRDATA				0	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	20/10/2014	BIRDATA				0	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	27/11/2014	BIRDATA				0	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	22/10/2015	BIRDATA				0	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	20/10/2016	BIRDATA				0	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	05/10/2017	BIRDATA				0	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24382
Pluvialis fulva	Pacific golden plover	BIRD	IA	16/02/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24382
Pluvialis squatarola	Grey plover	BIRD	IA	15/10/2012	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	15/10/2012	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	14/10/2013	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	17/10/2013	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	28/10/2013	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	04/03/2014	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	20/10/2014	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	27/11/2014	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	02/12/2014	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	22/10/2015	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	20/10/2016	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	05/10/2017	BIRDATA				0	24383
Pluvialis squatarola	Grey plover	BIRD	IA	05/09/1978	BIRDATLAS1	Moderately certain	Observational	Sighting	1	24383
Pluvialis squatarola	Grey plover	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24383
Pluvialis squatarola	Grey plover	BIRD	IA	21/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24383
Pluvialis squatarola	Grey plover	BIRD	IA	12/09/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24383
Pluvialis squatarola	Grey plover	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24383
Pluvialis squatarola	Grey plover	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24383
Pluvialis squatarola	Grey plover	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24383
Pluvialis squatarola	Grey plover	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24383
Pluvialis squatarola	Grey plover	BIRD	IA	05/12/2005	BIRDATLAS2	Moderately certain	Observational	Sighting	1	24383
Pluvialis squatarola	Grey plover	BIRD	IA	17/07/2011	TFAUNA	Certain	Survey	Day sighting	1	24383
Pseudomys chapmani	Western pebble-mound mouse, ngadji	MAMMAL	P4	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24233
Pseudomys chapmani	Western pebble-mound mouse, ngadji	MAMMAL	P4	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24233
Pseudomys chapmani	Western pebble-mound mouse, ngadji	MAMMAL	P4	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24233
Pseudomys chapmani	Western pebble-mound mouse, ngadji	MAMMAL	P4	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	24233
Pseudomys chapmani	Western pebble-mound mouse, ngadji	MAMMAL	P4	01/01/2007	TFAUNA	Certain	Survey	Day sighting	1	24233
Rhinonictis aurantia (Pilbara)	Pilbara leaf-nosed bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	48095
Rhinonictis aurantia (Pilbara)	Pilbara leaf-nosed bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	48095
Rhinonictis aurantia (Pilbara)	Pilbara leaf-nosed bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	48095

DBCA Threatened and Priority Fauna Database Search Results

Rhinonictoris aurantia (Pilbara)	Pilbara leaf-nosed bat	MAMMAL	VU	28/07/2009	FAUNASURVEY	Certain	Survey	Unknown	1	48095
Rhinonictoris aurantia (Pilbara)	Pilbara leaf-nosed bat	MAMMAL	VU	13/05/2013	FAUNASURVEY	Certain	Survey	Unknown	1	48095
Sterna hirundo	Common tern	BIRD	IA	28/10/2013	BIRDATA				0	25642
Sterna hirundo	Common tern	BIRD	IA	22/10/2015	BIRDATA				0	25642
Sterna hirundo	Common tern	BIRD	IA	14/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25642
Sterna hirundo	Common tern	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25642
Sterna hirundo	Common tern	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25642
Sterna hirundo	Common tern	BIRD	IA	22/10/2007	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25642
Sterna hirundo	Common tern	BIRD	IA	25/10/2010	BIRDATLAS2	Moderately certain	Observational	Sighting	1	25642
Sternula albifrons	Little tern	BIRD	IA	15/10/2012	BIRDATA				0	48593
Sternula albifrons	Little tern	BIRD	IA	15/10/2012	BIRDATA				0	48593
Sternula albifrons	Little tern	BIRD	IA	28/10/2013	BIRDATA				0	48593
Sternula albifrons	Little tern	BIRD	IA	20/10/2014	BIRDATA				0	48593
Sternula albifrons	Little tern	BIRD	IA	20/10/2014	BIRDATA				0	48593
Sternula albifrons	Little tern	BIRD	IA	20/10/2014	BIRDATA				0	48593
Sternula albifrons	Little tern	BIRD	IA	22/10/2015	BIRDATA				0	48593
Sternula albifrons	Little tern	BIRD	IA	20/10/2016	BIRDATA				0	48593
Sternula albifrons	Little tern	BIRD	IA	05/10/2017	BIRDATA				0	48593
Sternula albifrons	Little tern	BIRD	IA	23/09/1998	BIRDATLAS2				0	48593
Sternula albifrons	Little tern	BIRD	IA	05/02/2001	BIRDATLAS2				0	48593
Sternula albifrons	Little tern	BIRD	IA	14/10/2001	BIRDATLAS2				0	48593
Sternula albifrons	Little tern	BIRD	IA	19/10/2001	BIRDATLAS2				0	48593
Sternula albifrons	Little tern	BIRD	IA	19/10/2001	BIRDATLAS2				0	48593
Sternula albifrons	Little tern	BIRD	IA	19/10/2001	BIRDATLAS2				0	48593
Sternula albifrons	Little tern	BIRD	IA	19/10/2001	BIRDATLAS2				0	48593
Sternula albifrons	Little tern	BIRD	IA	22/10/2007	BIRDATLAS2				0	48593
Sternula albifrons	Little tern	BIRD	IA	16/11/1981	WAM_BIRDS				0	48593
Thalasseus bergii	Crested tern	BIRD	IA	16/10/2007	BIRDATA				0	48597
Thalasseus bergii	Crested tern	BIRD	IA	15/10/2012	BIRDATA				0	48597
Thalasseus bergii	Crested tern	BIRD	IA	18/10/2013	BIRDATA				0	48597
Thalasseus bergii	Crested tern	BIRD	IA	20/10/2014	BIRDATA				0	48597
Thalasseus bergii	Crested tern	BIRD	IA	20/10/2016	BIRDATA				0	48597
Thalasseus bergii	Crested tern	BIRD	IA	05/10/2017	BIRDATA				0	48597
Thalasseus bergii	Crested tern	BIRD	IA	20/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	48597
Thalasseus bergii	Crested tern	BIRD	IA	21/07/1999	BIRDATLAS2	Moderately certain	Observational	Sighting	1	48597
Thalasseus bergii	Crested tern	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting	1	48597
Thalasseus bergii	Crested tern	BIRD	IA	16/02/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	48597
Thalasseus bergii	Crested tern	BIRD	IA	08/06/2002	BIRDATLAS2	Moderately certain	Observational	Sighting	1	48597
Thalasseus bergii	Crested tern	BIRD	IA	11/03/2007	BIRDATLAS2	Moderately certain	Observational	Sighting	1	48597
Tringa brevipes	Grey-tailed tattler	BIRD	IA	16/10/2007	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	15/10/2012	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	15/10/2012	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	30/01/2013	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	29/05/2013	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	26/07/2013	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	27/09/2013	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	14/10/2013	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	17/10/2013	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	18/10/2013	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	28/10/2013	BIRDATA				0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	04/03/2014	BIRDATA				0	24803

DBCA Threatened and Priority Fauna Database Search Results

Tringa brevipes	Grey-tailed tattler	BIRD	IA	25/09/2014	BIRDATA					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	20/10/2014	BIRDATA					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	27/11/2014	BIRDATA					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	02/12/2014	BIRDATA					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	10/06/2015	BIRDATA					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	22/10/2015	BIRDATA					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	20/10/2016	BIRDATA					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	05/10/2017	BIRDATA					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	23/09/1998	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	20/07/1999	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	21/07/1999	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	02/08/2000	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	19/09/2000	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	14/10/2001	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	19/10/2001	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	19/10/2001	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	19/10/2001	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	08/11/2005	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	05/12/2005	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	22/10/2007	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	29/04/2008	BIRDATLAS2					0	24803
Tringa brevipes	Grey-tailed tattler	BIRD	IA	01/08/1981	WAM_BIRDS					0	24803
Tringa glareola	Wood sandpiper	BIRD	IA	04/03/2014	BIRDATA					0	24806
Tringa glareola	Wood sandpiper	BIRD	IA	01/09/2014	BIRDATA					0	24806
Tringa glareola	Wood sandpiper	BIRD	IA	20/10/2014	BIRDATA					0	24806
Tringa glareola	Wood sandpiper	BIRD	IA	25/11/2014	BIRDATA					0	24806
Tringa glareola	Wood sandpiper	BIRD	IA	02/12/2014	BIRDATA					0	24806
Tringa glareola	Wood sandpiper	BIRD	IA	25/08/1981	BIRDATLAS1	Moderately certain	Observational	Sighting		1	24806
Tringa glareola	Wood sandpiper	BIRD	IA	23/09/1998	BIRDATLAS2	Moderately certain	Observational	Sighting		1	24806
Tringa glareola	Wood sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2	Moderately certain	Observational	Sighting		1	24806
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	16/10/2007	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	15/10/2012	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	15/10/2012	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	30/01/2013	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	30/01/2013	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	27/09/2013	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	14/10/2013	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	17/10/2013	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	28/10/2013	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	04/03/2014	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	01/09/2014	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	20/10/2014	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	20/10/2014	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	20/10/2014	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	20/10/2014	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	27/11/2014	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	02/12/2014	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	10/06/2015	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	22/10/2015	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	20/10/2016	BIRDATA					0	24808
Tringa nebularia	Common greenshank, greenshank	BIRD	IA	05/10/2017	BIRDATA					0	24808



DBCA Threatened and Priority Fauna Database Search Results

Xenus cinereus	Terek sandpiper	BIRD	IA	05/09/1978	BIRDATLAS1				0	41351
Xenus cinereus	Terek sandpiper	BIRD	IA	08/04/1999	BIRDATLAS2				0	41351
Xenus cinereus	Terek sandpiper	BIRD	IA	05/02/2001	BIRDATLAS2				0	41351
Xenus cinereus	Terek sandpiper	BIRD	IA	12/09/2001	BIRDATLAS2				0	41351
Xenus cinereus	Terek sandpiper	BIRD	IA	14/10/2001	BIRDATLAS2				0	41351
Xenus cinereus	Terek sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2				0	41351
Xenus cinereus	Terek sandpiper	BIRD	IA	19/10/2001	BIRDATLAS2				0	41351
Xenus cinereus	Terek sandpiper	BIRD	IA	19/01/2004	BIRDATLAS2				0	41351
Xenus cinereus	Terek sandpiper	BIRD	IA	05/12/2005	BIRDATLAS2				0	41351



# EPBC Act Protected Matters Report

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

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

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

Report created: 03/06/20 21:45:15

## [Summary](#)

### [Details](#)

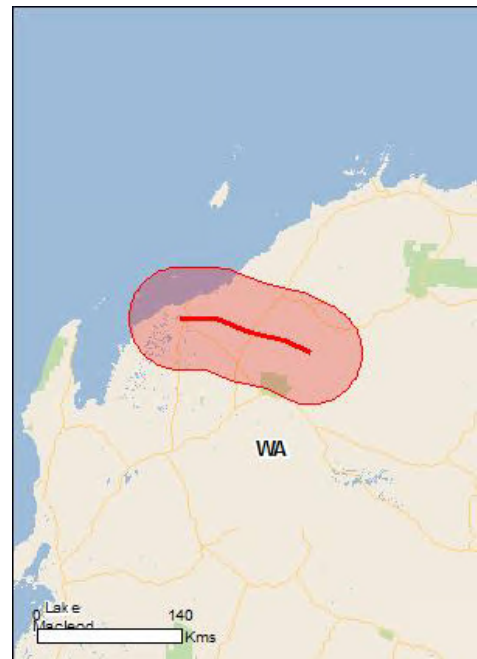
[Matters of NES](#)

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

[Extra Information](#)

### [Caveat](#)

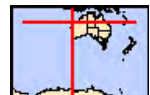
### [Acknowledgements](#)



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# Summary

## Matters of National Environmental Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	1
<a href="#">Listed Threatened Ecological Communities:</a>	None
<a href="#">Listed Threatened Species:</a>	29
<a href="#">Listed Migratory Species:</a>	47

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Land:</a>	1
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	86
<a href="#">Whales and Other Cetaceans:</a>	15
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	9
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	12
<a href="#">Nationally Important Wetlands:</a>	1
<a href="#">Key Ecological Features (Marine)</a>	None

# Details

## Matters of National Environmental Significance

### Commonwealth Marine Area

[\[ Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

#### Name

EEZ and Territorial Sea

### Marine Regions

[\[ Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

#### Name

[North-west](#)

### Listed Threatened Species

[\[ Resource Information \]](#)

Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Limosa lapponica baueri</a> Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pezoporus occidentalis</a> Night Parrot [59350]	Endangered	Species or species habitat may occur within area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area

Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera borealis</a> Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Balaenoptera physalus</a> Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Dasyurus hallucatus</a> Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
<a href="#">Macroderma gigas</a> Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Breeding known to occur within area
<a href="#">Rhinonictis aurantia (Pilbara form)</a> Pilbara Leaf-nosed Bat [82790]	Vulnerable	Roosting known to occur within area
<b>Reptiles</b>		
<a href="#">Aipysurus apraefrontalis</a> Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
<a href="#">Liasis olivaceus barroni</a> Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<b>Sharks</b>		
<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Pristis clavata</a> Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pristis zijsron</a> Green Sawfish, Dindagubba, Narrowsnout Sawfish	Vulnerable	Species or species

Name	Status	Type of Presence
[68442]		habitat known to occur within area
<a href="#">Rhincodon typus</a>		
Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

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

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

Name	Threatened	Type of Presence
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Migratory Marine Birds

<a href="#">Anous stolidus</a>		
Common Noddy [825]		Species or species habitat may occur within area

<a href="#">Apus pacificus</a>		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area

<a href="#">Ardenna carneipes</a>		
Flesh-footed Shearwater, Fleishy-footed Shearwater [82404]		Species or species habitat may occur within area

<a href="#">Ardenna pacifica</a>		
Wedge-tailed Shearwater [84292]		Breeding known to occur within area

<a href="#">Calonectris leucomelas</a>		
Streaked Shearwater [1077]		Species or species habitat likely to occur within area

<a href="#">Fregata ariel</a>		
Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area

<a href="#">Hydroprogne caspia</a>		
Caspian Tern [808]		Breeding known to occur within area

<a href="#">Macronectes giganteus</a>		
Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area

<a href="#">Onychoprion anaethetus</a>		
Bridled Tern [82845]		Breeding known to occur within area

<a href="#">Sterna dougallii</a>		
Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area

Migratory Marine Species

<a href="#">Anoxypristis cuspidata</a>		
Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area

<a href="#">Balaena glacialis australis</a>		
Southern Right Whale [75529]	Endangered*	Species or species habitat may occur within area

<a href="#">Balaenoptera borealis</a>		
Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area

<a href="#">Balaenoptera edeni</a>		
Bryde's Whale [35]		Species or species habitat may occur within area

<a href="#">Balaenoptera musculus</a>		
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area

<a href="#">Balaenoptera physalus</a>		
Fin Whale [37]	Vulnerable	Species or species habitat likely to occur

Name	Threatened	Type of Presence
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
<a href="#">Dugong dugon</a> Dugong [28]		Breeding known to occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
<a href="#">Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat known to occur within area
<a href="#">Manta birostris</a> Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat known to occur within area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Breeding known to occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Pristis clavata</a> Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Pristis zijsron</a> Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
<a href="#">Tursiops aduncus (Arafura/Timor Sea populations)</a> Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<b>Migratory Wetlands Species</b>		
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Species or species habitat may occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Thalasseus bergii</a> Crested Tern [83000]		Breeding known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

## Other Matters Protected by the EPBC Act

### Commonwealth Land [\[ Resource Information \]](#)

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.

#### Name

Commonwealth Land -

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

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

Name	Threatened	Type of Presence
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#### Birds

<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area
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<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat may occur within
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Name	Threatened	Type of Presence area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Breeding known to occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat likely to occur within area
<a href="#">Calonectris leucomelas</a> Streaked Shearwater [1077]		Species or species habitat likely to occur within area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
<a href="#">Chrysococcyx osculans</a> Black-eared Cuckoo [705]		Species or species habitat known to occur within area
<a href="#">Fregata ariel</a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Species or species habitat may occur within area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat may occur within area
<a href="#">Larus novaehollandiae</a> Silver Gull [810]		Breeding known to occur within area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species

Name	Threatened	Type of Presence
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		habitat may occur within area  Species or species habitat may occur within area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding known to occur within area
<a href="#">Puffinus carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat may occur within area
<a href="#">Puffinus pacificus</a> Wedge-tailed Shearwater [1027]		Breeding known to occur within area
<a href="#">Rostratula benghalensis (sensu lato)</a> Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
<a href="#">Sterna anaethetus</a> Bridled Tern [814]		Breeding known to occur within area
<a href="#">Sterna bengalensis</a> Lesser Crested Tern [815]		Breeding known to occur within area
<a href="#">Sterna bergii</a> Crested Tern [816]		Breeding known to occur within area
<a href="#">Sterna caspia</a> Caspian Tern [59467]		Breeding known to occur within area
<a href="#">Sterna dougallii</a> Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
<a href="#">Sterna fuscata</a> Sooty Tern [794]		Breeding known to occur within area
<a href="#">Sterna nereis</a> Fairy Tern [796]		Breeding known to occur within area
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
<b>Fish</b>		
<a href="#">Acentronura larsonae</a> Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area
<a href="#">Bulbonaricus brauni</a> Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
<a href="#">Campichthys tricarinatus</a> Three-keel Pipefish [66192]		Species or species habitat may occur within area
<a href="#">Choeroichthys brachysoma</a> Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
<a href="#">Choeroichthys latispinosus</a> Muiron Island Pipefish [66196]		Species or species habitat may occur within area



Name	Threatened	Type of Presence
<a href="#">Choeroichthys suillus</a> Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
<a href="#">Doryrhamphus dactyliophorus</a> Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
<a href="#">Doryrhamphus janssi</a> Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
<a href="#">Doryrhamphus multiannulatus</a> Many-banded Pipefish [66717]		Species or species habitat may occur within area
<a href="#">Doryrhamphus negrosensis</a> Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
<a href="#">Festucalex scalaris</a> Ladder Pipefish [66216]		Species or species habitat may occur within area
<a href="#">Filicampus tigris</a> Tiger Pipefish [66217]		Species or species habitat may occur within area
<a href="#">Halicampus brocki</a> Brock's Pipefish [66219]		Species or species habitat may occur within area
<a href="#">Halicampus grayi</a> Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
<a href="#">Halicampus nitidus</a> Glittering Pipefish [66224]		Species or species habitat may occur within area
<a href="#">Halicampus spinirostris</a> Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
<a href="#">Haliichthys taeniophorus</a> Ribbioned Pipehorse, Ribbioned Seadragon [66226]		Species or species habitat may occur within area
<a href="#">Hippichthys penicillus</a> Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
<a href="#">Hippocampus angustus</a> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
<a href="#">Hippocampus histrix</a> Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
<a href="#">Hippocampus kuda</a> Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
<a href="#">Hippocampus planifrons</a> Flat-face Seahorse [66238]		Species or species habitat may occur within area
<a href="#">Hippocampus trimaculatus</a> Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<a href="#">Micrognathus micronotopterus</a> Tidepool Pipefish [66255]		Species or species habitat may occur within area
<a href="#">Phoxocampus belcheri</a> Black Rock Pipefish [66719]		Species or species habitat may occur within area
<a href="#">Solegnathus hardwickii</a> Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
<a href="#">Solegnathus lettiensis</a> Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
<a href="#">Solenostomus cyanopterus</a> Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
<a href="#">Syngnathoides biaculeatus</a> Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus bicoarctatus</a> Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
<a href="#">Trachyrhamphus longirostris</a> Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
<b>Mammals</b>		
<a href="#">Dugong dugon</a> Dugong [28]		Breeding known to occur within area
<b>Reptiles</b>		
<a href="#">Acalyptophis peronii</a> Horned Seasnake [1114]		Species or species habitat may occur within area
<a href="#">Aipysurus apraefrontalis</a> Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat likely to occur within area
<a href="#">Aipysurus duboisii</a> Dubois' Seasnake [1116]		Species or species habitat may occur within area
<a href="#">Aipysurus eydouxii</a> Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
<a href="#">Aipysurus laevis</a> Olive Seasnake [1120]		Species or species habitat may occur within area
<a href="#">Astrotia stokesii</a> Stokes' Seasnake [1122]		Species or species habitat may occur within area
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Breeding known to occur within area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
<a href="#">Disteira kingii</a> Spectacled Seasnake [1123]		Species or species habitat may occur within area
<a href="#">Disteira major</a> Olive-headed Seasnake [1124]		Species or species habitat may occur within area
<a href="#">Emydocephalus annulatus</a> Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
<a href="#">Ephalophis greyi</a> North-western Mangrove Seasnake [1127]		Species or species habitat may occur within area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
<a href="#">Hydrophis czebukovi</a> Fine-spined Seasnake [59233]		Species or species habitat may occur within area
<a href="#">Hydrophis elegans</a> Elegant Seasnake [1104]		Species or species habitat may occur within area
<a href="#">Hydrophis ornatus</a> Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
<a href="#">Pelamis platurus</a> Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

## Whales and other Cetaceans [ [Resource Information](#) ]

Name	Status	Type of Presence
<b>Mammals</b>		
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area
<a href="#">Balaenoptera borealis</a> Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
<a href="#">Balaenoptera physalus</a> Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Delphinus delphis</a> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within

Name	Status	Type of Presence area
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Vulnerable	Breeding known to occur within area
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area
<a href="#">Sousa chinensis</a> Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
<a href="#">Tursiops aduncus (Arafura/Timor Sea populations)</a> Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area

## Extra Information

State and Territory Reserves	[ Resource Information ]
Name	State
Bessieres Island	WA
Cane River	WA
Cane River (Mount Minnie and Nanutarra)	WA
Little Rocky Island	WA
Locker Island	WA
Round Island	WA
Serrurier Island	WA
Unnamed WA44665	WA
Weld Island	WA

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

Name	Status	Type of Presence
<b>Birds</b>		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<b>Mammals</b>		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Equus asinus Donkey, Ass [4]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area

#### Plants

Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area

#### Reptiles

Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area
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#### Nationally Important Wetlands

Name	State
<a href="#">Exmouth Gulf East</a>	WA

[ [Resource Information](#) ]

# Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

## Coordinates

-21.787829 115.047473,-21.795001 115.357851,-21.900694 115.65433,-21.964174 115.954181,-22.067211 116.184602

# 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.

# NatureMap Fauna Species Report

Created By Colleen McDonald on 02/06/2020

Kingdom Animalia  
Current Names Only Yes  
Core Datasets Only Yes  
Method 'By Line'  
Vertices 21° 47' 16" S, 115° 02' 51" E 21° 47' 42" S, 115° 21' 28" E 21° 54' 02" S, 115° 39' 16" E  
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	749	36083
Other specially protected fauna	4	107
Priority 1	1	1
Priority 4	4	402
Protected under international agreement	27	557
Rare or likely to become extinct	17	376
<b>TOTAL</b>	<b>802</b>	<b>37526</b>

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
<b>Rare or likely to become extinct</b>				
1.	24783 <i>Calidris canutus subsp. rogersi</i> (Red Knot (north-eastern Siberia))		T	
2.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
3.	24790 <i>Calidris tenuirostris</i> (Great Knot)		T	
4.	25335 <i>Caretta caretta</i> (Loggerhead Turtle)		T	
5.	25575 <i>Charadrius leschenaultii</i> (Greater Sand Plover)		T	
6.	24372 <i>Charadrius leschenaultii subsp. leschenaultii</i> (Greater Sand Plover (Mongolian))		T	
7.	25576 <i>Charadrius mongolus</i> (Lesser Sand Plover)		T	
8.	25336 <i>Chelonia mydas</i> (Green Turtle)		T	
9.	24093 <i>Dasyurus hallucatus</i> (Northern Quoll)		T	
10.	25473 <i>Eretmochelys imbricata</i> (Hawksbill Turtle)		T	
11.	25238 <i>Liasis olivaceus subsp. barroni</i> (Pilbara Olive Python)		T	
12.	24796 <i>Limosa lapponica subsp. menzbieri</i> (Bar-tailed Godwit (northern Siberian))		T	
13.	25344 <i>Natator depressus</i> (Flatback Turtle)		T	
14.	24798 <i>Numenius madagascariensis</i> (Eastern Curlew)		T	
15.	25504 <i>Perameles bougainville</i> (Western Barred Bandicoot, Little Marl, Shark Bay Bandicoot)		T	
16.	24743 <i>Pezoporus occidentalis</i> (Night Parrot)		T	
17.	34037 <i>Pristis zijsron</i> (Green Sawfish)		T	
<b>Protected under international agreement</b>				
18.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
19.	25554 <i>Apus pacificus</i> (Fork-tailed Swift, Pacific Swift)		IA	
20.	25736 <i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
21.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
22.	24780 <i>Calidris alba</i> (Sanderling)		IA	
23.	24786 <i>Calidris melanotos</i> (Pectoral Sandpiper)		IA	
24.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
25.	24378 <i>Charadrius veredus</i> (Oriental Plover)		IA	
26.	41332 <i>Chlidonias leucopterus</i> (White-winged Black Tern, white-winged tern)		IA	
27.	47954 <i>Gelochelidon nilotica</i> (Gull-billed Tern)		IA	
28.	24481 <i>Glareola maldivarum</i> (Oriental Pratincole)		IA	
29.	25630 <i>Hirundo rustica</i> (Barn Swallow)		IA	
30.	48587 <i>Hydroprogne caspia</i> (Caspian Tern)		IA	
31.	30932 <i>Limosa lapponica</i> (Bar-tailed Godwit)		IA	
32.	24799 <i>Numenius minutus</i> (Little Curlew, Little Whimbrel)		IA	
33.	25742 <i>Numenius phaeopus</i> (Whimbrel)		IA	
34.	24497 <i>Oceanites oceanicus</i> (Wilson's Storm-petrel)		IA	
35.	48591 <i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
36.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
37.	24383 <i>Pluvialis squatarola</i> (Grey Plover)		IA	
38.	24716 <i>Puffinus pacificus</i> (Wedge-tailed Shearwater)		IA	
39.	25640 <i>Sterna dougallii</i> (Roseate Tern)		IA	
40.	25642 <i>Sterna hirundo</i> (Common Tern)		IA	



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
41.	48593 <i>Sternula albifrons</i> (Little Tern)		IA	
42.	48597 <i>Thalasseus bergii</i> (Crested Tern)		IA	
43.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
44.	24808 <i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
<b>Other specially protected fauna</b>				
45.	24859 <i>Crocodylus porosus</i> (Salt-water Crocodile)		S	
46.	24084 <i>Dugong dugon</i> (Dugong)		S	
47.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
48.	24051 <i>Megaptera novaeangliae</i> (Humpback Whale)		S	
<b>Priority 1</b>				
49.	25164 <i>Lerista planiventralis</i> subsp. <i>maryani</i> (Maryan's keeled slider (Ashburton), Keeled Slider (NW coast Onslow to Barradale))		P1	
<b>Priority 4</b>				
50.	24217 <i>Leggadina lakedownensis</i> (Northern Short-tailed Mouse, Lakeland Downs Mouse, Kerakenga)		P4	
51.	24233 <i>Pseudomys chapmani</i> (Western Pebble-mound Mouse, Ngadjji)		P4	
52.	48107 <i>Sousa sahulensis</i> (Australian humpback dolphin)		P4	
53.	24803 <i>Tringa brevipes</i> (Grey-tailed Tattler)		P4	
<b>Non-conservation taxon</b>				
54.	??			
55.	<i>Ablennes hians</i>			
56.	<i>Abudefduf bengalensis</i>			
57.	24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
58.	<i>Acanthocephala abbreviata</i>			
59.	<i>Acanthopagrus latus</i>			
60.	<i>Acanthopagrus palmaris</i>			
61.	25243 <i>Acanthophis pyrrhus</i> (Desert Death Adder)			
62.	<i>Acanthophis</i> sp.			
63.	25332 <i>Acanthophis wellsi</i> (Pilbara Death Adder)			
64.	<i>Acariformes</i> sp.			
65.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
66.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
67.	<i>Acentrogobius viridipunctatus</i>			
68.	<i>Achnanthydium minutissima</i> (Kütz.) Czarnecki			
69.	25751 <i>Acridotheres tristis</i> (Common Myna)	Y		
70.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
71.	<i>Adventor elongatus</i>			
72.	<i>Adversaeschna brevistyla</i>			
73.	25544 <i>Aegotheles cristatus</i> (Australian Owllet-nightjar)			
74.	<i>Aeolosoma</i> sp. 1 (PSS)			
75.	<i>Agraptocorixa parvipunctata</i>			
76.	<i>Agraptocorixa</i> sp.			
77.	25355 <i>Aipysurus laevis</i> (Olive Seasnake)			
78.	<i>Alectis indica</i>			
79.	<i>Allodessus bistrigatus</i>			
80.	<i>Alona</i> cf. <i>rectangula</i> (but may be > 1 spp.)			
81.	<i>Alona rectangula novaezealandiae</i>			
82.	<i>Ambassis agassizi</i>			
83.	<i>Ambassis gymnocephalus</i>			
84.	<i>Amniataba caudavittata</i>			
85.	<i>Amniataba percoides</i>			
86.	<i>Amniataba percoides?</i>			Y
87.	30831 <i>Amphibolurus gilberti</i> (Ta-ta, Gilbert's Dragon)			
88.	30833 <i>Amphibolurus longirostris</i> (Long-nosed Dragon)			
89.	<i>Aname ellenae</i>			
90.	24312 <i>Anas gracilis</i> (Grey Teal)			
91.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
92.	<i>Anax papuensis</i>			
93.	<i>Ancylidae</i> sp.			
94.	47414 <i>Anhinga novaeollandiae</i> (Australasian Darter)			
95.	<i>Anisops canaliculatus</i>			
96.	<i>Anisops nasutus</i>			
97.	<i>Anisops paraexigerus</i>			
98.	<i>Anisops</i> sp.			
99.	<i>Anisops stali</i>			
100.	<i>Anisops thienemanni</i>			
101.	<i>Anomoeoneis brachysira</i> (Bréb.) Grun.			
102.	<i>Anopheles annulipes</i> s.l.			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
103.	25318 <i>Antaresia perthensis</i> (Pygmy Python)			
104.	25448 <i>Antaresia stimsoni</i> (Stimson's Python)			
105.	25241 <i>Antaresia stimsoni</i> subsp. <i>stimsoni</i> (Stimson's Python)			
106.	25670 <i>Anthus australis</i> (Australian Pipit)			
107.	<i>Antichiropus</i> sp.			
108.	<i>Apistus carinatus</i>			
109.	<i>Apogon rueppellii</i>			
110.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
111.	<i>Arcella</i> sp. P1			
112.	25557 <i>Ardea garzetta</i> (Little Egret)			
113.	24337 <i>Ardea garzetta</i> subsp. <i>nigripes</i> (Little Egret)			
114.	25558 <i>Ardea ibis</i> (Cattle Egret)			
115.	25559 <i>Ardea intermedia</i> (Intermediate Egret)			
116.	41324 <i>Ardea modesta</i> (great egret, white egret)			
117.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
118.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
119.	25560 <i>Ardea sacra</i> (Eastern Reef Egret, Eastern Reef Heron)			
120.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
121.	<i>Areacandona 'undulata'</i> (PSS)			Y
122.	<i>Areacandona</i> sp. 6' (PSS)			Y
123.	<i>Argiocnemis rubescens</i>			
124.	<i>Arothron manilensis</i>			
125.	<i>Arrenurus</i> ( <i>Arrenurus</i> ) <i>balladoniensis</i>			
126.	<i>Arrhamphus sclerolepis</i>			
127.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
128.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
129.	25567 <i>Artamus leucorhynchus</i> (White-breasted Woodswallow)			
130.	24354 <i>Artamus leucorhynchus</i> subsp. <i>leucopygialis</i> (White-breasted Woodswallow)			
131.	24355 <i>Artamus minor</i> (Little Woodswallow)			
132.	24356 <i>Artamus personatus</i> (Masked Woodswallow)			
133.	<i>Artema atlanta</i>			
134.	<i>Asadipus yundamindra</i>			
135.	25320 <i>Aspidites melanocephalus</i> (Black-headed Python)			
136.	<i>Assiculus punctatus</i>			
137.	<i>Atelomycterus fasciatus</i>			
138.	<i>Atherinid</i> sp.			
139.	<i>Atherinomorus endrachtensis</i>			
140.	<i>Atherinomorus vaigiensis</i>			
141.	<i>Aulacoseira ambigua</i>			
142.	<i>Aulacoseira granulata</i> (Ehr.) Simonsen			
143.	<i>Aulopus purpurissatus</i>			
144.	<i>Australobolbus pseudobscurius</i>			
145.	<i>Australocyclops</i> sp.			
146.	<i>Austrolestes aridus</i>			
147.	<i>Austronibea oedegenys?</i>			Y
148.	<i>Austropeplea lessoni</i>			
149.	24318 <i>Aythya australis</i> (Hardhead)			
150.	<i>Baetidae</i> sp.			
151.	<i>Barnardius zonarius</i>			
152.	<i>Bathygobius cocosensis</i>			
153.	<i>Bathygobius fuscus</i>			
154.	<i>Bathynella</i> sp.			
155.	<i>Bdelloidea</i> sp. 2:2			
156.	<i>Bdelloidea</i> sp. 3:3			
157.	<i>Bennelongia australis</i> OrdX (PSW)			
158.	<i>Bennelongia cb</i>			Y
159.	<i>Bennelongia minimus</i>			
160.	<i>Bennelongia nimala</i>			
161.	<i>Bennelongia triangulata</i> (ex sp 414 /460 (CB)			
162.	<i>Berosus nutans</i>			
163.	<i>Berosus pulchellus</i>			
164.	<i>Berosus</i> sp.			
165.	<i>Blennodesmus scapularis</i>			
166.	<i>Bodianus frenchii</i>			
167.	<i>Boeckella triarticulata</i>			
168.	<i>Bolboleaus truncatus</i>			
169.	24251 <i>Bos taurus</i> (European Cattle)	Y		
170.	<i>Brachionus dichotomus</i>			
171.	<i>Brachionus falcatus</i>			
172.	<i>Brachionus leydigii</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
173.	<i>Brachionus quadridentatus</i>			
174.	<i>Branchinella halsei</i>			
175.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
176.	<i>Butis amboinensis</i>			
177.	47897 <i>Butorides striata</i> (Striated Heron, Mangrove Heron)			
178.	25715 <i>Cacatua roseicapilla</i> (Galah)			
179.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
180.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
181.	<i>Caenidae</i> sp.			
182.	24269 <i>Calamanthus campestris</i> (Rufous Fieldwren)			
183.	<i>Calamoecia baylyi</i> (Cue form) (ex nr lucasi CB)			
184.	<i>Canthigaster coronata</i>			
185.	<i>Caranx ignobilis</i>			
186.	<i>Caranx sexfasciatus</i>			
187.	<i>Carenum pulchrum</i>			
188.	<i>Carenum venustum</i>			
189.	25015 <i>Carlia munda</i> (Shaded-litter Rainbow Skink)			
190.	<i>Cavisternum clavatum</i>			
191.	25600 <i>Centropus phasianinus</i> (Pheasant Coucal)			
192.	<i>Ceratopogonidae</i> sp.			
193.	<i>Ceriodaphnia cornuta</i>			
194.	24564 <i>Certhionyx variegatus</i> (Pied Honeyeater)			
195.	24181 <i>Chaerephon jobensis</i> (Greater Northern Freetail-bat, Northern Mastiff Bat)			
196.	<i>Chaetodontoplus duboulayi</i>			
197.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
198.	<i>Chanos chanos</i>			
199.	<i>Chaoboridae</i> sp.			
200.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
201.	<i>Chelonodon patoca</i>			
202.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
203.	47909 <i>Cheramoeca leucosterna</i> (White-backed Swallow)			
204.	<i>Chimarra</i> sp AV17 (PSW)			
205.	<i>Chirocentrus dorab</i>			
206.	<i>Chironominae</i> sp.			
207.	<i>Chlaenius australis</i>			
208.	<i>Choerodon cyanodus</i>			
209.	<i>Chroicocephalus novaehollandiae</i>			
210.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
211.	24434 <i>Chrysococcyx osculans</i> (Black-eared Cuckoo)			
212.	24288 <i>Circus approximans</i> (Swamp Harrier)			
213.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
214.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
215.	<i>Cloeon</i> sp.			
216.	<i>Cloeon</i> sp. P1 (PSW)			
217.	<i>Cocconeis placentula</i> var. <i>euglypta</i> ehr.			
218.	<i>Coenagrionidae</i> sp.			
219.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
220.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
221.	<i>Colurodontis paxmani</i>			
222.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
223.	<i>Coradion chrysozonus</i>			
224.	<i>Corduliidae</i> sp.			
225.	<i>Coris aygula</i>			
226.	<i>Corixidae</i> sp.			
227.	24416 <i>Corvus bennetti</i> (Little Crow)			
228.	25593 <i>Corvus orru</i> (Torresian Crow)			
229.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
230.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
231.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
232.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
233.	<i>Cracticus tibicen</i> subsp. <i>longirostris</i>			Y
234.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
235.	<i>Craterocephalus capreoli</i>			
236.	<i>Craticula cuspidata</i> (Grun. ex. Van Heurck) Mann			
237.	<i>Craticula halophila</i> (Grun. ex. Van Heurck) Mann			
238.	<i>Cryptochironomus griseidorsum</i>			
239.	<i>Cryptodus caviceps</i>			
240.	<i>Cryptoerithus occultus</i>			
241.	25458 <i>Ctenophorus caudicinctus</i> (Ring-tailed Dragon)			
242.	24865 <i>Ctenophorus caudicinctus</i> subsp. <i>caudicinctus</i> (Ring-tailed Dragon)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
243.	24872 <i>Ctenophorus femoralis</i> (Dune Dragon)			
244.	25459 <i>Ctenophorus isolepis</i> (Crested Dragon, Military Dragon)			
245.	24875 <i>Ctenophorus isolepis</i> subsp. <i>gularis</i> (Central Military Dragon)			
246.	24876 <i>Ctenophorus isolepis</i> subsp. <i>isolepis</i> (Crested Dragon, Military Dragon)			
247.	24882 <i>Ctenophorus nuchalis</i> (Central Netted Dragon)			
248.	24886 <i>Ctenophorus reticulatus</i> (Western Netted Dragon)			
249.	24885 <i>Ctenophorus rubens</i> (Red Dragon)			
250.	24887 <i>Ctenophorus rufescens</i> (Red Rock Dragon)			
251.	<i>Ctenotrypauchen microcephalus</i>			
252.	25032 <i>Ctenotus calurus</i>			
253.	25036 <i>Ctenotus duricola</i>			
254.	25462 <i>Ctenotus grandis</i>			
255.	25043 <i>Ctenotus grandis</i> subsp. <i>titan</i>			
256.	25044 <i>Ctenotus hanloni</i>			
257.	25045 <i>Ctenotus helenae</i>			
258.	25046 <i>Ctenotus iapetus</i>			
259.	25053 <i>Ctenotus maryani</i>			
260.	25463 <i>Ctenotus pantherinus</i> (Leopard Ctenotus)			
261.	25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus)			
262.	25066 <i>Ctenotus quattuordecimlineatus</i>			
263.	25069 <i>Ctenotus rufescens</i>			
264.	25073 <i>Ctenotus saxatilis</i> (Rock Ctenotus)			
265.	25074 <i>Ctenotus schomburgkii</i>			
266.	<i>Culicidae</i> sp.			
267.	<i>Culicoides</i> sp.			
268.	<i>Cybister tripunctatus</i>			
269.	25466 <i>Cyclodomorphus melanops</i> (Slender Blue-tongue)			
270.	25090 <i>Cyclodomorphus melanops</i> subsp. <i>melanops</i> (Slender Blue-tongue)			
271.	25375 <i>Cyclorana maini</i> (Sheep Frog)			
272.	25376 <i>Cyclorana platycephala</i> (Water-holding Frog)			
273.	24322 <i>Cygnus atratus</i> (Black Swan)			
274.	<i>Cyrtella menghiniana</i> Kütz.			
275.	<i>Cymbacephalus staigeri</i> ?			
276.	<i>Cypretta 'triangulum'</i>			
277.	<i>Cypretta ?lutea</i>			
278.	<i>Cypretta baylyi</i>			
279.	<i>Cypricercus salinus</i>			
280.	<i>Cypricercus</i> sp. 422 (CB)			
281.	<i>Cypricercus</i> sp. 442 (CB)			
282.	25547 <i>Dacelo leachii</i> (Blue-winged Kookaburra)			
283.	24304 <i>Dacelo leachii</i> subsp. <i>leachii</i> (Blue-winged Kookaburra)			
284.	<i>Dactylopus dactylopus</i>			
285.	<i>Daphnia carinata</i>			
286.	24091 <i>Dasykaluta rosamondae</i> (Little Red Kaluta)			
287.	25000 <i>Delma haroldi</i>			
288.	25001 <i>Delma nasuta</i>			
289.	25002 <i>Delma pax</i>			
290.	25004 <i>Delma tincta</i>			
291.	25468 <i>Demansia psammophis</i> (Yellow-faced Whipsnake)			
292.	25295 <i>Demansia psammophis</i> subsp. <i>cupreiceps</i> (Yellow-faced Whipsnake)			
293.	<i>Deminiotiocandona 'atope'</i> (PSS)			Y
294.	24325 <i>Dendrocygna eytoni</i> (Plumed Whistling Duck)			
295.	<i>Diacyclops cockingi</i>			
296.	<i>Diacyclops humphreysi humphreysi</i>			
297.	<i>Dicranophorus epicharis</i>			
298.	<i>Dicrotendipes</i> sp P4 (PSW)			
299.	<i>Diffugia</i> sp. P1			
300.	<i>Dineutus australis</i>			
301.	<i>Diplacodes bipunctata</i>			
302.	<i>Diplacodes haematodes</i>			
303.	47932 <i>Diplodactylus bilybara</i> (Western Fat-tailed Gecko)			
304.	24926 <i>Diplodactylus conspicillatus</i> (Fat-tailed Gecko)			
305.	24940 <i>Diplodactylus pulcher</i>			
306.	42400 <i>Diporiphora adductus</i> (Carnarvon Dragon)			
307.	42401 <i>Diporiphora paraconvergans</i> (Grey-striped Western Desert Dragon)			
308.	<i>Dissotrocha</i> sp.			
309.	<i>Drepane punctata</i>			
310.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
311.	<i>Drombus triangularis</i>			
312.	<i>Dytiscidae</i> sp.			

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313.	<i>Echeneis naucrates</i>			
314.	<i>Ennomidae sp.</i>			
315.	<i>Egretta garzetta</i>			
316.	<i>Egretta novaehollandiae</i>			
317.	<i>Elanus axillaris</i>			
318.	25540 <i>Elanus caeruleus</i> (Black-shouldered Kite)			
319.	<i>Elops hawaiiensis</i>			
320.	47937 <i>Euseiornis melanops</i> (Black-fronted Dotterel)			
321.	24631 <i>Emblema pictum</i> (Painted Finch)			
322.	<i>Engraulis australis?</i>			Y
323.	<i>Enochrus deserticola</i>			
324.	<i>Eolophus roseicapillus</i>			
325.	25362 <i>Ephalophis greyae</i>			
326.	24387 <i>Ephippiorhynchus asiaticus subsp. australis</i> (Black-necked Stork)			
327.	<i>Ephydriidae sp.</i>			
328.	<i>Epinephelus amblycephalus</i>			
329.	<i>Epinephelus corallicola</i>			
330.	<i>Epinephelus lanceolatus</i>			
331.	<i>Epinephelus malabaricus</i>			
332.	<i>Epinephelus multinotatus</i>			
333.	<i>Epinephelus quoyanus</i>			
334.	<i>Epinephelus rankini</i> (invalid)			Y
335.	<i>Epinephelus rivulatus</i>			
336.	<i>Epinephelus sexfasciatus</i>			
337.	<i>Epinephelus sp.</i>			
338.	<i>Epinephelus tauvina</i>			
339.	<i>Epistylis sp.</i>			
340.	24568 <i>Epthianura aurifrons</i> (Orange Chat)			
341.	24570 <i>Epthianura tricolor</i> (Crimson Chat)			
342.	24258 <i>Equus caballus</i> (Horse)	Y		
343.	43381 <i>Eremiascincus pallidus</i> (Western Narrow-banded Skink, Narrow-banded Sand Swimmer)			
344.	24837 <i>Eremionis carteri</i> (Spinifex-bird)			
345.	<i>Eretes australis</i>			
346.	24379 <i>Erythrogonys cinctus</i> (Red-kneed Dotterel)			
347.	47938 <i>Esacus magnirostris</i> (Beach Stone-curlew, Beach Thick-knee)			
348.	<i>Escualosa thoracata</i>			Y
349.	<i>Euglypha sp.</i>			
350.	<i>Eunotia bilunaris</i> (Ehr.) Mills.			
351.	<i>Eunotia pectinatus</i> (Dillw.) Rabh.			
352.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
353.	<i>Eurypegasmus draconis</i>			
354.	<i>Eurysticta coolawanyah</i>			
355.	25621 <i>Falco berigora</i> (Brown Falcon)			
356.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
357.	24472 <i>Falco cenchroides subsp. cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
358.	25623 <i>Falco longipennis</i> (Australian Hobby)			
359.	24476 <i>Falco subniger</i> (Black Falcon)			
360.	24041 <i>Felis catus</i> (Cat)	Y		
361.	<i>Feroxodon multistriatus</i>			
362.	<i>Fistularia petimba</i>			
363.	25327 <i>Fordonia leucobalia</i> (White-bellied Mangrove Snake)			
364.	<i>Fragilaria ulna</i> (Nitz.) Lange Bertalot			
365.	25727 <i>Fulica atra</i> (Eurasian Coot)			
366.	25301 <i>Furina ornata</i> (Moon Snake)			
367.	25730 <i>Gallirallus philippensis</i> (Buff-banded Rail)			
368.	42314 <i>Gavicalis virescens</i> (Singing Honeyeater)			
369.	24952 <i>Gehyra australis</i>			
370.	24956 <i>Gehyra pilbara</i>			
371.	24958 <i>Gehyra punctata</i>			
372.	24957 <i>Gehyra purpurascens</i>			
373.	24959 <i>Gehyra variegata</i>			
374.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
375.	24402 <i>Geopelia humeralis</i> (Bar-shouldered Dove)			
376.	25585 <i>Geopelia striata</i> (Zebra Dove)			
377.	24403 <i>Geopelia striata subsp. placida</i> (Peaceful Dove)			
378.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
379.	<i>Gerres filamentosus</i>			
380.	<i>Gerres oyena</i>			
381.	<i>Gerres sp.</i>			

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382.	<i>Gerres subfasciatus</i>			
383.	<i>Gerridae sp.</i>			
384.	25531 <i>Gerygone levigaster</i> (Mangrove Gerygone)			
385.	24276 <i>Gerygone tenebrosa</i> (Dusky Gerygone)			
386.	<i>Gigadema bostocki</i>			
387.	<i>Gomphonema parvulum</i> (Kütz.) Kütz.			
388.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
389.	24484 <i>Grus rubicunda</i> (Brolga)			
390.	<i>Guineaxonopsis sp. S1</i> (PSS)			
391.	<i>Gymnocranius grandoculis</i>			
392.	<i>Gymnothorax undulatus</i>			
393.	25627 <i>Haematopus fuliginosus</i> (Sooty Oystercatcher)			
394.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
395.	<i>Halacaridae sp. 1</i> (PSS)			
396.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)			
397.	25541 <i>Haliastur indus</i> (Brahminy Kite)			
398.	24294 <i>Haliastur indus subsp. girrenera</i> (Brahminy Kite)			
399.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
400.	<i>Haliphus sp.</i>			
401.	<i>Halophryne diemensis</i>			
402.	<i>Halophryne ocellatus</i>			
403.	24297 <i>Hamirostra melanosternon</i> (Black-breasted Buzzard)			
404.	<i>Hantzschia amphioxys</i> (Ehr.) Grun.			
405.	<i>Hebridae sp.</i>			
406.	<i>Helluapterus niger</i>			
407.	<i>Hemicordulia tau</i>			
408.	<i>Hemicypris megalops</i>			
409.	25232 <i>Hemidactylus frenatus</i> (Asian House Gecko)	Y		
410.	<i>Hemigaleus australiensis</i>			
411.	<i>Hemigaleus sp.</i>			
412.	<i>Hemiramphus robustus</i>			
413.	<i>Herklotsichthys blackburni</i>			
414.	<i>Herklotsichthys collettei</i>			
415.	<i>Herklotsichthys collettei?</i>			Y
416.	<i>Herklotsichthys koningsbergeri</i>			
417.	<i>Herklotsichthys quadrimaculatus</i>			Y
418.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
419.	<i>Hexarthra mira</i>			
420.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
421.	<i>Hilsa kelee?</i>			Y
422.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
423.	24775 <i>Himantopus himantopus subsp. leucocephalus</i> (Black-winged Stilt)			
424.	<i>Hippocampus sp.</i>			
425.	<i>Hippocampus tuberculatus</i>			
426.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
427.	<i>Hoggicosa snelli</i>			
428.	<i>Holconia westralia</i>			
429.	<i>Hydrachna sp. 4/5</i> (PSW)			
430.	<i>Hydraenidae sp.</i>			
431.	<i>Hydrobiidae sp.</i>			
432.	<i>Hydroglyphus grammopterus (=trilineatus)</i>			
433.	<i>Hydroglyphus leai</i>			
434.	<i>Hydrophilidae sp.</i>			
435.	44656 <i>Hydrophis major</i> (Olive-headed seasnake, greater seasnake)			
436.	42410 <i>Hydrophis ornatus</i> (Ornate Reef Seasnake, Sea Snake)			
437.	43385 <i>Hydrophis stokesii</i> (Stoke's Seasnake, Sea Snake)			
438.	<i>Hydropsychidae sp.</i>			
439.	<i>Hyphydrus sp.</i>			
440.	<i>Hypopterus macropterus</i>			
441.	<i>Ilyocypris 'spiculata' (ms name)</i> (SAP)			
442.	<i>Ilyodromus sp. PB</i>			
443.	<i>Indolpium sp.</i>			
444.	<i>Inimicus sinensis</i>			
445.	<i>Ischnura aurora aurora</i>			
446.	<i>Isidorella egraria</i>			
447.	<i>Isocypris williamsi</i> (ex <i>Ilyodromus sp. 413</i> )			
448.	<i>Isopedella tindalei</i>			
449.	<i>Isostictidae sp.</i>			
450.	<i>Istiblennius meleagris</i>			
451.	<i>Keratella procurva</i>			

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452.	<i>Keratella tropica</i>			
453.	<i>Laccophilus sharpi</i>			
454.	<i>Lactoria cornuta</i>			
455.	<i>Lactoria diaphana</i>			
456.	24367 <i>Lalage tricolor</i> (White-winged Triller)			
457.	<i>Lampona ampeinna</i>			
458.	<i>Lamponina scutata</i>			
459.	25637 <i>Larus novaehollandiae</i> (Silver Gull)			
460.	<i>Latonopsis brehmi</i>			
461.	<i>Lecane cf. pertica</i>			Y
462.	<i>Lecane halsei</i>			
463.	<i>Lecane n. sp. psw031</i> (like <i>signifera</i> but tall)			Y
464.	<i>Leiognathus decorus</i>			
465.	<i>Leiognathus equulus</i>			
466.	<i>Leiopotherapon unicolor</i>			
467.	<i>Leptoceridae sp.</i>			
468.	25124 <i>Lerista baynesi</i>			
469.	25125 <i>Lerista bipes</i>			
470.	30928 <i>Lerista clara</i>			
471.	25133 <i>Lerista elegans</i>			
472.	25158 <i>Lerista onsloviana</i>			
473.	25176 <i>Lerista uniduo</i> (Spotted Broad-blazed Slider, skink)			
474.	<i>Lethocerus distinctifemur</i>			
475.	<i>Lethrinus sp.</i>			
476.	25005 <i>Lialis burtonis</i>			
477.	<i>Libellulidae sp.</i>			
478.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
479.	24582 <i>Lichmera indistincta subsp. indistincta</i> (Brown Honeyeater)			
480.	<i>Limnesia sp. 4</i> (PSW)			
481.	<i>Limnocytheridae n.gen. sp 419</i> (CB)			
482.	<i>Liparetrus sp.</i>			Y
483.	25380 <i>Litoria caerulea</i> (Green Tree Frog)			
484.	25392 <i>Litoria rubella</i> (Little Red Tree Frog)			
485.	<i>Liza melinoptera</i>			
486.	<i>Liza sp.</i>			
487.	<i>Liza subviridis</i>			
488.	<i>Liza vaigiensis</i>			
489.	<i>Lophiocharon trisignatus</i>			
490.	<i>Lophoicthinia isura</i>			
491.	<i>Loxandrus micantior</i>			
492.	30933 <i>Lucasium stenodactylum</i>			
493.	30934 <i>Lucasium wombeyi</i>			
494.	<i>Lutjanus argentimaculatus</i>			
495.	<i>Lutjanus erythropterus</i>			
496.	<i>Lutjanus fulviflamma</i>			
497.	<i>Lutjanus malabaricus</i>			
498.	<i>Lutjanus russellii</i>			
499.	<i>Lychas sp. 2</i>			
500.	<i>Lycidas sp. 1</i>			
501.	<i>Lymnaeidae sp.</i>			
502.	25489 <i>Macropus robustus</i> (Euro, Biggada)			
503.	24136 <i>Macropus rufus</i> (Red Kangaroo, Marlu)			
504.	<i>Macrothrix indistincta</i>			
505.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
506.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
507.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
508.	24549 <i>Malurus leucopterus subsp. leuconotus</i> (White-winged Fairy-wren)			
509.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
510.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
511.	<i>Masasteron gracilis</i>			
512.	<i>Masasteron tealei</i>			
513.	<i>Mastogloia smithii</i> Thwaites			
514.	<i>Meedo houstoni</i>			
515.	<i>Megacephala greyana</i>			
516.	<i>Megalaspis cordyla</i>			
517.	<i>Megalops cyprinoides</i>			
518.	47995 <i>Megalurus mathewsi</i> (Rufous Songlark)			
519.	<i>Megaporus sp.</i>			
520.	<i>Melanotaenia australis</i>			
521.	<i>Melitidae sp. 1</i> (PSS)			

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522.	24736 <i>Melopsittacus undulatus</i> (Budgerigar)			
523.	<i>Mene maculata</i>			
524.	25184 <i>Menetia greyii</i>			
525.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
526.	<i>Mesocyclops brooksi</i>			
527.	<i>Mesoveliidae</i> sp.			
528.	<i>Microcarbo melanoleucos</i>			
529.	<i>Microcyclops varicans</i>			
530.	<i>Micronecta gracilis</i>			
531.	<i>Micronecta</i> sp.			
532.	25542 <i>Milvus migrans</i> (Black Kite)			
533.	24298 <i>Milvus migrans</i> subsp. <i>affinis</i> (Black Kite)			
534.	<i>Minasteron minusculum</i>			
535.	25545 <i>Mirafra javanica</i> (Horsfield's Bushlark, Singing Bushlark)			
536.	24302 <i>Mirafra javanica</i> subsp. <i>horsfieldii</i> (Horsfield's Bushlark, Singing Bushlark)			
537.	<i>Mirafra javanica</i> subsp. <i>woodwardi</i>			Y
538.	<i>Missulena rutraspina</i>			
539.	<i>Moina</i> cf. <i>australiensis</i> (CB)			
540.	<i>Moina micrura</i> s.l.			
541.	25495 <i>Morethia ruficauda</i>			
542.	25193 <i>Morethia ruficauda</i> subsp. <i>exquisita</i>			
543.	25194 <i>Morethia ruficauda</i> subsp. <i>ruficauda</i>			
544.	<i>Mugil cephalus</i>			
545.	<i>Muraenesox cinereus</i>			
546.	24223 <i>Mus musculus</i> (House Mouse)	Y		
547.	<i>Navicula cryptonella</i> Lange-Bertalot			
548.	<i>Navicula molestiformis</i> Hust.			
549.	<i>Nematalosa come</i>			
550.	<i>Nematalosa erebi</i>			
551.	<i>Nematalosa</i> sp.			
552.	<i>Nematalosa vlaminghi</i>			
553.	<i>Nematoda</i> sp. 7 (PSS)			Y
554.	<i>Nematoda</i> sp. 8 (PSS)			Y
555.	<i>Nematoda</i> sp. P6 (PSW)			
556.	25422 <i>Neobatrachus aquilonius</i> (Northern Burrowing Frog)			
557.	25424 <i>Neobatrachus fulvus</i> (Tawny Trilling Frog)			
558.	25685 <i>Neochmia ruficauda</i> (Star Finch)			
559.	<i>Neopomacentrus filamentosus</i>			
560.	<i>Neothrix armata</i>			
561.	25497 <i>Nephtrurus levis</i>			
562.	24968 <i>Nephtrurus levis</i> subsp. <i>occidentalis</i>			
563.	24969 <i>Nephtrurus levis</i> subsp. <i>pilbarensis</i>			
564.	24972 <i>Nephtrurus wheeleri</i> subsp. <i>cinctus</i>			
565.	<i>Netuma thalassina</i>			Y
566.	<i>Nilobezzia</i> sp. P2 (PSW)			
567.	24095 <i>Ningai timealeyi</i> (Pilbara Ningai)			
568.	25747 <i>Ninox connivens</i> (Barking Owl)			
569.	<i>Nitzschia filiformis</i> (W. Sm.) Van Heurck			
570.	<i>Nitzschia frustulum</i> (Kütz.) Grun.			
571.	<i>Nitzschia palea</i> (Kütz.) W. Sm.			
572.	<i>Nitzschia sigma</i> (Kütz.) W. Sm.			
573.	<i>Nitzschia umbonata</i> (Ehr.) Lange-Bertalot			
574.	No invertebrates			
575.	25430 <i>Notaden nichollsi</i> (Desert Spadefoot)			
576.	<i>Notobathynella</i> sp.			
577.	24224 <i>Notomys alexis</i> (Spinifex Hopping-mouse)			
578.	<i>Notonectidae</i> sp.			
579.	<i>Notsodipus barlee</i>			
580.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
581.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
582.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
583.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
584.	<i>Oecetis</i> sp.			
585.	<i>Oecetis</i> sp. Pilbara 5 (PSW)			
586.	<i>Oligochaeta</i> sp.			
587.	<i>Omobranchus punctatus</i>			
588.	<i>Onthophagus margaretensis</i>			
589.	<i>Onthophagus nevoissi</i>			
590.	<i>Ophichthus cephalozona</i>			
591.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
592.	<i>Orthetrum caledonicum</i>			
593.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
594.	<i>Ostracoda</i> (unident.)			
595.	<i>Ozestheria packardi</i>			
596.	24620 <i>Pachycephala lanioides</i> (White-breasted Whistler)			
597.	24621 <i>Pachycephala melanura</i> subsp. <i>melanura</i> (Mangrove Golden Whistler)			
598.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
599.	<i>Pantala flavescens</i>			
600.	<i>Parachaeturichthys polynema</i>			
601.	<i>Paracymus spenceri</i>			
602.	<i>Paramecium</i> sp.			
603.	<i>Paramelitidae</i> sp.			
604.	<i>Paraplagusia bilineata</i>			
605.	<i>Paraplotosus albilabris</i>			
606.	<i>Parastenocarididae</i> sp.			
607.	<i>Parastenocaris jane</i>			
608.	<i>Parastromateus niger</i>			
609.	24627 <i>Pardalotus rubricatus</i> (Red-browed Pardalote)			
610.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
611.	24642 <i>Passer montanus</i> (Eurasian Tree Sparrow)	Y		
612.	<i>Pelates octolineatus</i>			
613.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
614.	<i>Pellona ditchela</i>			
615.	<i>Pentapodus vitta</i>			
616.	<i>Periophthalmus argentilineatus</i>			
617.	<i>Peristrominopus dolosus</i>			
618.	<i>Pescecyclus</i> sp. 442=462=465=CB2 (salinarum in Morton)			
619.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
620.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
621.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
622.	<i>Pezidae</i> sp.			
623.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
624.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
625.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
626.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
627.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
628.	24411 <i>Phaps histrionica</i> (Flock Bronzewing, Flock Pigeon)			
629.	<i>Phorticosomus gularis</i>			
630.	<i>Phreodrilid</i> with dissimilar ventral chaetae			
631.	<i>Phreodrilid</i> with similar ventral chaetae			
632.	<i>Phreodrilus</i> n. sp. WA32 (PSS)			
633.	<i>Pilbarus millsii</i>			
634.	<i>Pinnularia borealis</i>			
635.	<i>Pinnularia divergens</i> W. Sm.			
636.	<i>Pinnularia subrostrata</i> (A. Cl.) Cl.-Euler			
637.	<i>Pisodonophis cancrivorus</i>			
638.	24101 <i>Planigale ingrami</i> (Long-tailed Planigale)			
639.	<i>Planorbidae</i> sp.			
640.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
641.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
642.	<i>Platax teira</i>			
643.	<i>Platycephalus indicus</i>			
644.	<i>Platycephalus</i> sp.			
645.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
646.	24751 <i>Platycercus zonarius</i> subsp. <i>zonarius</i> (Port Lincoln Parrot)			
647.	<i>Platycoelus melliei</i>			
648.	<i>Plectorhinchus flavomaculatus</i>			
649.	<i>Plectorhinchus gibbosus</i>			
650.	<i>Plectorhinchus polytaenia</i>			
651.	<i>Pleidae</i> sp.			
652.	<i>Plotosus lineatus</i>			
653.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
654.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
655.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
656.	24681 <i>Poliiocephalus poliiocephalus</i> (Hoary-headed Grebe)			
657.	<i>Polyarthra dolichoptera</i>			
658.	<i>Polydactylus multiradiatus</i>			
659.	<i>Polydactylus plebius</i>			
660.	<i>Polypedilum leei</i>			
661.	<i>Pomadasyus argenteus</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
662.	<i>Pomadasys kaakan</i>			
663.	<i>Pomatomus saltatrix</i>			
664.	25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
665.	24684 <i>Pomatostomus temporalis</i> subsp. <i>rubeculus</i> (Grey-crowned Babbler)			
666.	24769 <i>Porzana fluminea</i> (Australian Spotted Crane)			
667.	25732 <i>Porzana pusilla</i> (Baillon's Crane)			
668.	<i>Procladius paludicola</i>			
669.	<i>Protonibea diacanthus</i>			
670.	<i>Psammoperca waigiensis</i>			
671.	<i>Psettodes erumei</i>			
672.	24105 <i>Pseudantechinus roryi</i> (Rory's Pseudantechinus)			
673.	25261 <i>Pseudechis australis</i> (Mulga Snake)			
674.	24235 <i>Pseudomys desertor</i> (Desert Mouse)			
675.	24237 <i>Pseudomys hermannsburgensis</i> (Sandy Inland Mouse)			
676.	42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake)			
677.	25263 <i>Pseudonaja modesta</i> (Ringed Brown Snake)			
678.	25264 <i>Pseudonaja nuchalis</i> (Gwardar, Northern Brown Snake)			
679.	<i>Pseudorhombus argus</i>			
680.	<i>Pseudorhombus arsius</i>			
681.	24390 <i>Psophodes occidentalis</i> (Western Wedgebill, Chiming Wedgebill)			
682.	<i>Pterois antennata</i>			
683.	<i>Pterois volitans</i>			
684.	24173 <i>Pteropus scapulatus</i> (Little Red Flying-fox)			
685.	25009 <i>Pygopus nigriceps</i>			
686.	24278 <i>Pyrrholaemus brunneus</i> (Redthroat)			
687.	<i>Rachycentron canadum</i>			
688.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
689.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
690.	<i>Rheotanytarsus juliae</i>			
691.	48096 <i>Rhipidura albiscapa</i> (Grey Fantail)			
692.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
693.	24457 <i>Rhipidura phasiana</i> (Mangrove Grey Fantail)			
694.	24982 <i>Rhynchoedura ornata</i> (Western Beaked Gecko)			
695.	<i>Sardinella albella</i>			Y
696.	<i>Sardinella gibbosa</i>			
697.	<i>Sargocentron prasinum</i>			
698.	<i>Sargocentron rubrum</i>			
699.	<i>Saurida nebulosa</i>			
700.	<i>Scolopendra laeta</i>			
701.	<i>Scomberoides commersonianus</i>			
702.	<i>Scomberoides lysan</i>			
703.	<i>Scomberoides lysan?</i>			Y
704.	<i>Scomberoides tol</i>			
705.	<i>Scomberomorus commerson</i>			
706.	<i>Scomberomorus queenslandicus</i>			
707.	<i>Scomberomorus semifasciatus</i>			
708.	<i>Selaroides leptolepis</i>			
709.	<i>Selenotoca multifasciata</i>			
710.	<i>Siganus fuscescens</i>			
711.	<i>Sillago analis</i>			
712.	<i>Sillago burrus</i>			
713.	<i>Sillago ingenua?</i>			Y
714.	<i>Sillago lutea</i>			
715.	<i>Sillago sihama</i>			
716.	25305 <i>Simoselaps anomalus</i> (Desert Banded Snake)			
717.	30948 <i>Smicromis brevirostris</i> (Weebill)			
718.	24116 <i>Sminthopsis macroura</i> (Stripe-faced Dunnart)			
719.	24120 <i>Sminthopsis youngsoni</i> (Lesser Hairy-footed Dunnart)			
720.	<i>Sphyræna barracuda</i>			
721.	<i>Stauroneis anceps</i> Ehr.			
722.	<i>Stausora construens</i> Ehr.			
723.	24521 <i>Sterna bengalensis</i> (Lesser Crested Tern)			
724.	24522 <i>Sterna bergii</i> (Crested Tern)			
725.	25643 <i>Sterna hybrida</i> (Whiskered Tern)			
726.	<i>Sternopriscus</i> sp.			
727.	48594 <i>Sternula nereis</i> (Fairy Tern)			
728.	24482 <i>Stiltia isabella</i> (Australian Pratincole)			
729.	25656 <i>Stipiturus ruficeps</i> (Rufous-crowned Emu-wren)			
730.	<i>Stolephorus carpentariae</i>			
731.	<i>Stolephorus commersonii</i>			

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732.	<i>Strongylura strongylura</i>			
733.	24927 <i>Strophurus elderi</i>			
734.	24932 <i>Strophurus jeanae</i>			
735.	24942 <i>Strophurus spinigerus</i> subsp. <i>spinigerus</i>			
736.	24946 <i>Strophurus strophurus</i>			
737.	<i>Stygonitocrella bispinosa</i>			
738.	<i>Supunna picta</i>			
739.	25269 <i>Suta fasciata</i> (Rosen's Snake)			
740.	25307 <i>Suta punctata</i> (Spotted Snake)			
741.	<i>Synanceia horrida</i>			
742.	<i>Tabanidae</i> sp.			
743.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
744.	24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
745.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
746.	<i>Tanypodinae</i> sp.			
747.	<i>Tasmanocoenis arcuata</i>			
748.	<i>Tasmanocoenis</i> sp. E (PSW)			
749.	<i>Tathicarpus butleri</i>			
750.	<i>Terapon jarbua</i>			
751.	<i>Terapon puta</i>			
752.	<i>Terapon thaeraps</i>			Y
753.	<i>Terapon theraps</i>			
754.	<i>Testudinella</i> cf <i>trilobata</i> (=sp P3 PSW)			
755.	<i>Testudinella patina</i>			
756.	<i>Thalasseus bengalensis</i>			
757.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
758.	<i>Thyssa mystax?</i>			
759.	<i>Thyssa scratchleyi?</i>			
760.	<i>Thyssa setirostris</i>			
761.	25202 <i>Tiliqua multifasciata</i> (Central Blue-tongue)			
762.	25548 <i>Todiramphus chloris</i> (Collared Kingfisher)			
763.	24306 <i>Todiramphus chloris</i> subsp. <i>pilbara</i> (Pilbara Collared Kingfisher)			
764.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
765.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
766.	<i>Trachinotus baillonii</i>			
767.	<i>Triacanthus biaculeatus</i>			
768.	48141 <i>Tribonyx ventralis</i> (Black-tailed Native-hen)			
769.	<i>Trichocarenum cylindricum</i>			
770.	<i>Trichocerca</i> cf. <i>tigris</i>			Y
771.	<i>Trichocerca similis</i>			
772.	<i>Trichocerca tigris</i>			
773.	<i>Trichocyclus nigropunctatus</i>			
774.	<i>Trichocyclus warianga</i>			
775.	<i>Triops australiensis australiensis</i>			
776.	<i>Triplectides australis</i>			
777.	<i>Turbellaria</i> sp.			
778.	24848 <i>Turnix pyrrhorostrax</i> (Red-chested Button-quail)			
779.	24851 <i>Turnix velox</i> (Little Button-quail)			
780.	30954 <i>Tursiops aduncus</i> (Indo-Pacific Bottlenose Dolphin)			
781.	25762 <i>Tyto alba</i> (Barn Owl)			
782.	<i>Urodacus varians</i>			
783.	25577 <i>Vanellus miles</i> (Masked Lapwing)			
784.	24386 <i>Vanellus tricolor</i> (Banded Lapwing)			
785.	25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor)			
786.	25210 <i>Varanus breviceauda</i> (Short-tailed Pygmy Monitor)			
787.	30825 <i>Varanus bushi</i> (Pilbara Mulga Monitor)			
788.	25211 <i>Varanus caudolineatus</i>			
789.	25212 <i>Varanus eremius</i> (Pygmy Desert Monitor)			
790.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
791.	25524 <i>Varanus panoptes</i> (Yellow-spotted Monitor)			
792.	25223 <i>Varanus panoptes</i> subsp. <i>rubidus</i>			
793.	25526 <i>Varanus tristis</i> (Racehorse Monitor)			
794.	<i>Veliidae</i> sp.			
795.	24040 <i>Vulpes vulpes</i> (Red Fox)	Y		
796.	<i>Wyndura kennedy</i>			
797.	<i>Xanthagrion erythroneurum</i>			
798.	<i>Xyrichtys</i> sp.			
799.	<i>Yongeichthys nebulosus</i>			
800.	<i>Zabidius novemaculeatus</i>			
801.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
802.	24857 <i>Zosterops luteus</i> (Yellow White-eye)			

**Conservation Codes**

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

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

# NatureMap Fauna Species Report

Created By Colleen McDonald on 02/06/2020

Kingdom Animalia  
Current Names Only Yes  
Core Datasets Only Yes  
Method 'By Line'  
Vertices 21° 54' 02" S, 115° 39' 16" E 21° 57' 51" S, 115° 57' 15" E 22° 04' 02" S, 116° 11' 05" E  
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	461	2322
Other specially protected fauna	1	1
Priority 4	2	17
Rare or likely to become extinct	5	244
<b>TOTAL</b>	<b>469</b>	<b>2584</b>

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Rare or likely to become extinct</b>				
1.	24093 <i>Dasyurus hallucatus</i> (Northern Quoll)		T	
2.	25238 <i>Liasis olivaceus</i> subsp. <i>barroni</i> (Pilbara Olive Python)		T	
3.	24180 <i>Macroderma gigas</i> (Ghost Bat)		T	
4.	48095 <i>Rhinonictis aurantia</i> (Pilbara) (Pilbara leaf-nosed bat)		T	
5.	24157 <i>Trichosurus vulpecula</i> subsp. <i>arnhemensis</i> (northern brushtail possum (Kimberley))		T	
<b>Other specially protected fauna</b>				
6.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
<b>Priority 4</b>				
7.	24233 <i>Pseudomys chapmani</i> (Western Pebble-mound Mouse, Ngadji)		P4	
8.	43368 <i>Rhinonictis aurantia</i> (Orange Leaf-nosed bat)		P4	
<b>Non-conservation taxon</b>				
9.	<i>Abnitocrella</i> sp. 3 (PSS)			
10.	24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
11.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
12.	<i>Acanthophis</i> sp.			
13.	25332 <i>Acanthophis wellsi</i> (Pilbara Death Adder)			
14.	<i>Acariformes</i> sp.			
15.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
16.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
17.	<i>Achnanthes exigua</i> Grun.			
18.	<i>Achnanthes exilis</i> Kütz.			
19.	<i>Achnanthidium minutissima</i> (Kütz.) Czarneci			
20.	<i>Achnanthidium minutissima</i> var. <i>affinis</i> (grun.) <i>lange-bertalot</i>			
21.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
22.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
23.	<i>Aeolosoma</i> sp. 1 (PSS)			
24.	<i>Allonais pectinata</i>			
25.	<i>Alluaudomyia</i> sp.			
26.	<i>Alona rigidicaudis</i>			
27.	30833 <i>Amphibolurus longirostris</i> (Long-nosed Dragon)			
28.	25647 <i>Amytornis striatus</i> (Striated Grasswren)			
29.	24312 <i>Anas gracilis</i> (Grey Teal)			
30.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
31.	<i>Anax papuensis</i>			
32.	<i>Ancylidae</i> sp.			
33.	47414 <i>Anhinga novaehollandiae</i> (Australasian Darter)			
34.	<i>Anomoeoneis styriaca</i> (Grun.) Hust.			
35.	<i>Anopheles annulipes</i> s.l.			
36.	25318 <i>Antaresia perthensis</i> (Pygmy Python)			
37.	25448 <i>Antaresia stimsoni</i> (Stimson's Python)			
38.	25670 <i>Anthus australis</i> (Australian Pipit)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
39.	<i>Antichiropus</i> sp.			
40.	<i>Antiporus bakewelli</i>			
41.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
42.	<i>Arcella</i> sp.			
43.	41324 <i>Ardea modesta</i> (great egret, white egret)			
44.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
45.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
46.	<i>Argiocnemis rubescens</i>			
47.	<i>Armatalona macrocopa</i>			
48.	<i>Arrenurus (Arrenurus) ensifer</i>			
49.	<i>Arrenurus (Arrenurus) liliaceus</i>			
50.	<i>Arrenurus (Micruracarus) purpureus</i>			
51.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
52.	25567 <i>Artamus leucorhynchus</i> (White-breasted Woodswallow)			
53.	24355 <i>Artamus minor</i> (Little Woodswallow)			
54.	24356 <i>Artamus personatus</i> (Masked Woodswallow)			
55.	<i>Asadipus yundamindra</i>			
56.	25320 <i>Aspidites melanocephalus</i> (Black-headed Python)			
57.	<i>Australiobates queenslandensis</i>			
58.	<i>Australobolbus pseudobscurius</i>			
59.	<i>Austroagrion pindrina/ischnura heterosticta</i>			
60.	<i>Austroepigomphus (Xerogomphus) gordonii</i>			
61.	<i>Austropeplea lessoni</i>			
62.	<i>Axonopsella nr truza</i> (PSW)			
63.	<i>Axonopsella</i> sp. P2 (PSW)			
64.	<i>Baetidae</i> sp.			
65.	<i>Barnardius zonarius</i>			
66.	<i>Bdelloidea</i> sp. 2:2			
67.	<i>Bolboleaus truncatus</i>			
68.	<i>Boongurrus occidentalis</i>			
69.	24251 <i>Bos taurus</i> (European Cattle)	Y		
70.	25715 <i>Cacatua roseicapilla</i> (Galah)			
71.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
72.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
73.	<i>Caenidae</i> sp.			
74.	<i>Calanoidea</i> sp.			
75.	<i>Caloneis silicula</i> (Ehr.) Cl.			
76.	<i>Carenum pulchrum</i>			
77.	<i>Carenum venustum</i>			
78.	25015 <i>Carlia munda</i> (Shaded-litter Rainbow Skink)			
79.	<i>Cavisternum clavatum</i>			
80.	25600 <i>Centropus phasianinus</i> (Pheasant Coucal)			
81.	<i>Ceratopogonidae</i> sp.			
82.	24181 <i>Chaerephon jobensis</i> (Greater Northern Freetail-bat, Northern Mastiff Bat)			
83.	<i>Chaetarthria nigerrimus</i>			
84.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
85.	<i>Chaoboridae</i> sp.			
86.	<i>Chironominae</i> sp.			
87.	<i>Chironomus aff. alternans</i> (V24) (CB)			
88.	<i>Chlaenius australis</i>			
89.	24431 <i>Chrysococcyx basalii</i> (Horsfield's Bronze Cuckoo)			
90.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
91.	<i>Cloeon</i> sp.			
92.	<i>Coelopynia pruinosa</i>			
93.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
94.	<i>Conochilus natans</i>			
95.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
96.	<i>Corixidae</i> sp.			
97.	24416 <i>Corvus bennetti</i> (Little Crow)			
98.	25593 <i>Corvus orru</i> (Torresian Crow)			
99.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
100.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
101.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
102.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
103.	30892 <i>Cryptoblepharus ustulatus</i>			
104.	<i>Cryptochironomus griseidorsum</i>			
105.	<i>Cryptodus caviceps</i>			
106.	25458 <i>Ctenophorus caudicinctus</i> (Ring-tailed Dragon)			
107.	24865 <i>Ctenophorus caudicinctus</i> subsp. <i>caudicinctus</i> (Ring-tailed Dragon)			
108.	25459 <i>Ctenophorus isolepis</i> (Crested Dragon, Military Dragon)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
109.	24876 <i>Ctenophorus isolepis</i> subsp. <i>isolepis</i> (Crested Dragon, Military Dragon)			
110.	24882 <i>Ctenophorus nuchalis</i> (Central Netted Dragon)			
111.	24886 <i>Ctenophorus reticulatus</i> (Western Netted Dragon)			
112.	25036 <i>Ctenotus duricola</i>			
113.	25462 <i>Ctenotus grandis</i>			
114.	25043 <i>Ctenotus grandis</i> subsp. <i>titan</i>			
115.	25044 <i>Ctenotus hanloni</i>			
116.	25045 <i>Ctenotus helenae</i>			
117.	25463 <i>Ctenotus pantherinus</i> (Leopard Ctenotus)			
118.	25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus)			
119.	25065 <i>Ctenotus pantherinus</i> subsp. <i>pantherinus</i> (Leopard Ctenotus)			
120.	25072 <i>Ctenotus rubicundus</i>			
121.	25071 <i>Ctenotus rutilans</i>			
122.	25073 <i>Ctenotus saxatilis</i> (Rock Ctenotus)			
123.	<i>Culicidae</i> sp.			
124.	<i>Cupelopagis vorax</i>			
125.	<i>Cybister tripunctatus</i>			
126.	25466 <i>Cyclodomorphus melanops</i> (Slender Blue-tongue)			
127.	25090 <i>Cyclodomorphus melanops</i> subsp. <i>melanops</i> (Slender Blue-tongue)			
128.	25375 <i>Cyclorana maini</i> (Sheep Frog)			
129.	<i>Cyrtella menghiniana</i> Kütz.			
130.	<i>Cymbella affinis</i> Kütz.			
131.	<i>Cymbella cistula</i> (Ehr.) Kirchner			
132.	<i>Cymbella cymbiformis</i> Ag.			
133.	<i>Cymbella delicatula</i> Kütz.			
134.	<i>Cymbella helvetica</i> Kütz.			Y
135.	<i>Cymbella microcephala</i> Grun.			
136.	<i>Cymbella silesiaca</i> Bleisch			
137.	<i>Cypretta seurati</i>			
138.	25547 <i>Dacelo leachii</i> (Blue-winged Kookaburra)			
139.	<i>Dasyheleinae</i> sp. P1 (PSW)			
140.	24091 <i>Dasykaluta rosamondae</i> (Little Red Kaluta)			
141.	25000 <i>Delma haroldi</i>			
142.	25001 <i>Delma nasuta</i>			
143.	25002 <i>Delma pax</i>			
144.	25004 <i>Delma tincta</i>			
145.	25468 <i>Demansia psammophis</i> (Yellow-faced Whipsnake)			
146.	25297 <i>Demansia rufescens</i> (Rufous Whipsnake)			
147.	<i>Dero nivea</i>			
148.	<i>Diacyclops humphreysi humphreysi</i>			
149.	<i>Diacyclops sobeprolatus</i>			
150.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
151.	<i>Dicrotendipes jobetus</i>			
152.	<i>Diffugia</i> sp. P1			
153.	<i>Diplacodes haematodes</i>			
154.	24926 <i>Diplodactylus conspicillatus</i> (Fat-tailed Gecko)			
155.	24944 <i>Diplodactylus savagei</i> (Southern Pilbara Beak-faced Gecko)			
156.	<i>Diploneis pseudovalis</i> Hust.			
157.	42401 <i>Diporiphora paraconvergens</i> (Grey-striped Western Desert Dragon)			
158.	24899 <i>Diporiphora valens</i> (Southern Pilbara Tree Dragon)			
159.	<i>Dolichopodidae</i> sp.			
160.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
161.	<i>Dunhevedia crassa</i>			
162.	<i>Dytiscidae</i> sp.			
163.	<i>Ecnomidae</i> sp.			
164.	<i>Ecnomus pilbarensis</i>			
165.	25094 <i>Egernia formosa</i>			
166.	<i>Egretta novaehollandiae</i>			
167.	<i>Elaphoidella</i> sp.			
168.	47937 <i>Elseyonis melanops</i> (Black-fronted Dotterel)			
169.	24631 <i>Emblema pictum</i> (Painted Finch)			
170.	<i>Encyonema minutum</i> (Hilse ex Rabh.) Mann			
171.	<i>Eodiaptomus lumholzi</i>			
172.	<i>Eolophus roseicapillus</i>			
173.	<i>Ephemeroporus barroisi</i> s.l.			
174.	<i>Ephydriidae</i> sp.			
175.	<i>Epithemia smithii</i> Carruthers			
176.	24570 <i>Epthianura tricolor</i> (Crimson Chat)			
177.	42404 <i>Eremiascincus isolepis</i>			
178.	43381 <i>Eremiascincus pallidus</i> (Western Narrow-banded Skink, Narrow-banded Sand)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
	<i>Swimmer</i>			
179.	24837 <i>Eremiornis carteri</i> (Spinifex-bird)			
180.	<i>Euchlanis dilatata</i>			
181.	<i>Euchlanis oropha</i>			
182.	<i>Eucyclops australiensis</i>			
183.	<i>Euglypha</i> sp.			
184.	<i>Eunotia bilunaris</i> (Ehr.) Mills.			
185.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
186.	<i>Eurysticta coolawanyah</i>			
187.	25621 <i>Falco berigora</i> (Brown Falcon)			
188.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
189.	24041 <i>Felis catus</i> (Cat)	Y		
190.	<i>Fragilaria capucina</i> Desm.			
191.	<i>Fragilaria tenera</i> (W. Sm.) Lange-Bertalot			
192.	<i>Fragilaria ulna</i> (Nitz.) Lange Bertalot			
193.	25301 <i>Furina ornata</i> (Moon Snake)			
194.	42314 <i>Gavicalis virescens</i> (Singing Honeyeater)			
195.	24958 <i>Gehyra punctata</i>			
196.	24959 <i>Gehyra variegata</i>			
197.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
198.	25585 <i>Geopelia striata</i> (Zebra Dove)			
199.	24403 <i>Geopelia striata</i> subsp. <i>placida</i> (Peaceful Dove)			
200.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
201.	<i>Gerridae</i> sp.			
202.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
203.	<i>Gretacarus</i> nsp. P1 (PSW)			
204.	<i>Gretacarus</i> sp.			
205.	<i>Gymnocranius grandoculis</i>			
206.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
207.	<i>Halosbaena tulki</i>			
208.	<i>Hantzschia amphioxys</i> (Ehr.) Grun.			
209.	<i>Hantzschia marina</i> (Donk.) Cl.			
210.	<i>Harpacticoida</i> sp.			
211.	<i>Helluapterus niger</i>			
212.	<i>Hellyethira</i> sp.			
213.	<i>Hemicordulia koomina</i>			
214.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
215.	24962 <i>Heteronotia spelea</i> (Desert Cave Gecko, Pilbara Cave Gecko)			
216.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
217.	<i>Hoggicosa snelli</i>			
218.	<i>Humphreyscandona 'akaina'</i> (PSS)			
219.	<i>Hydra</i> sp.			
220.	<i>Hydrachna</i> sp. 4/5 (PSW)			
221.	<i>Hydraena barbipes</i>			
222.	<i>Hydrochus eurypleuron</i>			
223.	<i>Hydrochus obscuroaeus</i>			
224.	<i>Hydrochus</i> sp. P1 (PSW)			
225.	<i>Hydrodroma</i> sp.			
226.	<i>Hydroglyphus grammopterus</i> (=trilineatus)			
227.	<i>Hydroglyphus leai</i>			
228.	<i>Hydrophilidae</i> sp.			
229.	<i>Hydrovatus weiri</i>			
230.	<i>Ictinogomphus dobsoni</i>			
231.	<i>Ilyocyptus raridentatus</i>			
232.	<i>Ilyodromus</i> sp BOS25			
233.	<i>Ilyodromus</i> sp.			
234.	<i>Indolpium</i> sp.			
235.	<i>Ischnura aurora aurora</i>			
236.	<i>Isostictidae</i> sp.			
237.	<i>Karaops martamarta</i>			
238.	24367 <i>Lalage tricolor</i> (White-winged Triller)			
239.	<i>Larsia albiceps</i>			
240.	<i>Lecane batillifer</i>			
241.	<i>Lecane bulla</i>			
242.	<i>Lecane crepida</i>			
243.	<i>Lecane hornemanni</i>			
244.	<i>Lecane luna</i>			
245.	<i>Lecane lunaris</i>			
246.	<i>Lecane papuana</i>			
247.	<i>Lecane unguitata</i>			



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248.	<i>Leiopotherapon unicolor</i>			
249.	<i>Lepadella (H.) ehrenbergii</i>			
250.	<i>Lepadella (H.) heterostyla</i>			
251.	<i>Lepadella triptera</i>			
252.	<i>Lepidiota squamulata</i>			
253.	<i>Leptoceridae sp.</i>			
254.	30928 <i>Lerista clara</i>			
255.	25135 <i>Lerista flammicauda</i>			
256.	25155 <i>Lerista muelleri</i>			
257.	<i>Lesquereusia spiralis</i>			
258.	<i>Lethocerus distinctifemur</i>			
259.	25005 <i>Lialis burtonis</i>			
260.	25661 <i>Lichmera indistincta (Brown Honeyeater)</i>			
261.	24582 <i>Lichmera indistincta subsp. indistincta (Brown Honeyeater)</i>			
262.	<i>Limnesia sp. 4 (PSW)</i>			
263.	25392 <i>Litoria rubella (Little Red Tree Frog)</i>			
264.	30933 <i>Lucasium stenodactylum</i>			
265.	30934 <i>Lucasium wombeyi</i>			
266.	<i>Lychas sp. 2</i>			
267.	<i>Lycidas sp. 1</i>			
268.	<i>Lycidas sp. 2</i>			
269.	<i>Lymnaeidae sp.</i>			
270.	25489 <i>Macropus robustus (Euro, Biggada)</i>			
271.	24135 <i>Macropus robustus subsp. erubescens (Euro, Biggada)</i>			
272.	25651 <i>Malurus lamberti (Variegated Fairy-wren)</i>			
273.	25652 <i>Malurus leucopterus (White-winged Fairy-wren)</i>			
274.	24549 <i>Malurus leucopterus subsp. leuconotus (White-winged Fairy-wren)</i>			
275.	24583 <i>Manorina flavigula (Yellow-throated Miner)</i>			
276.	<i>Mastogloia elliptica (Ag.) Cl.</i>			
277.	<i>Mastogloia elliptica var. danseii (thwaites) grun.</i>			
278.	<i>Mastogloia smithii Thwaites</i>			
279.	<i>Meedo houstoni</i>			
280.	<i>Megacephala greyana</i>			
281.	25665 <i>Melithreptus gularis (Black-chinned Honeyeater)</i>			
282.	<i>Melitidae sp. 1 (PSS)</i>			
283.	24736 <i>Melopsittacus undulatus (Budgerigar)</i>			
284.	25184 <i>Menetia greyii</i>			
285.	24598 <i>Merops ornatus (Rainbow Bee-eater)</i>			
286.	<i>Mesocyclops brooksi</i>			
287.	<i>Mesocyclops darwini</i>			
288.	<i>Mesovelia hungerfordi</i>			
289.	<i>Mesoveliidae sp.</i>			
290.	<i>Microcarbo melanoleucos</i>			
291.	<i>Microchironomus 'K1' (PSW)</i>			
292.	<i>Microcyclops varicans</i>			
293.	<i>Micronecta n. sp. P1 (PSW)</i>			
294.	25542 <i>Milvus migrans (Black Kite)</i>			
295.	<i>Minasteron minusculum</i>			
296.	25545 <i>Mirafra javanica (Horsfield's Bushlark, Singing Bushlark)</i>			
297.	<i>Missulena rutraspina</i>			
298.	<i>Monommata sp.</i>			
299.	25193 <i>Morethia ruficauda subsp. exquisita</i>			
300.	24183 <i>Mormopterus loriae (Little Northern Freetail-bat)</i>			
301.	24223 <i>Mus musculus (House Mouse)</i>	Y		
302.	<i>Mytilina ventralis macracantha</i>			
303.	<i>Navicula bryophila Petersen</i>			
304.	<i>Navicula cryptocephala Kütz.</i>			
305.	<i>Navicula cryptoneilla Lange-Bertalot</i>			
306.	<i>Navicula leptostriata Jørgensen</i>			
307.	<i>Navicula subrhynchocephala Hust.</i>			
308.	<i>Navicula veneta Kütz.</i>			
309.	<i>Necterosoma regulare</i>			
310.	<i>Nedsia sp.</i>			
311.	<i>Nematalosa erebi</i>			
312.	<i>Nematoda sp. P2/P4 (PSW)</i>			
313.	<i>Nematoda sp. P5 (PSW)</i>			
314.	<i>Nematoda sp. P8 (PSW)</i>			
315.	<i>Neohydrocoptus subfasciatus</i>			
316.	24972 <i>Nephrurus wheeleri subsp. cinctus</i>			
317.	<i>Nerthra luteovaria</i>			

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318.	<i>Nilobezzia</i> sp. P2 (PSW)			
319.	24095 <i>Ningauli timealeyi</i> (Pilbara Ningauli)			
320.	<i>Nitzschia amphibia</i> Grun.			
321.	<i>Nitzschia angustata</i> Grun.			
322.	<i>Nitzschia frustulum</i> (Kütz.) Grun.			
323.	<i>Nitzschia microcephala</i> Grun.			
324.	<i>Nitzschia obtusa</i> W. Sm			
325.	<i>Nitzschia palea</i> (Kütz.) W. Sm.			
326.	24224 <i>Notomys alexis</i> (Spinifex Hopping-mouse)			
327.	<i>Notonectidae</i> sp.			
328.	25499 <i>Notoscincus ornatus</i>			
329.	<i>Notsodipus barlee</i>			
330.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
331.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
332.	<i>Ochterus</i> sp.			
333.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
334.	<i>Oecetis</i> sp. Pilbara 4 (PSW)			
335.	<i>Oecetis</i> sp. Pilbara 5 (PSW)			
336.	24976 <i>Oedura marmorata</i> (Marbled Velvet Gecko)			
337.	<i>Oligochaeta</i> sp.			
338.	<i>Omoedus orbiculatus</i>			
339.	<i>Onthophagus margaretensis</i>			
340.	<i>Onthophagus nevoissi</i>			
341.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			
342.	<i>Oribatida</i> group 1 (PSS)			
343.	<i>Origocandona 'posteriorecta'</i> (PSS)			
344.	<i>Orthetrum caledonicum</i>			
345.	<i>Orthocladinae</i> sp. G (SAP)			
346.	<i>Oxus orientalis</i>			
347.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
348.	<i>Paracyclops</i> sp. 8 (PSW)			
349.	<i>Paracymus spenceri</i>			
350.	<i>Paramelitidae</i> sp.			
351.	<i>Paratanytarsus</i> sp. P3 (PSW)			
352.	<i>Paratendipes</i> sp. 'K1' (PSW)			
353.	24627 <i>Pardalotus rubricatus</i> (Red-browed Pardalote)			
354.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
355.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
356.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
357.	24144 <i>Petrogale rothschildi</i> (Rothschild's Rock-wallaby)			
358.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
359.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
360.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
361.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
362.	<i>Phorticosomus gularis</i>			
363.	<i>Phreodrilid</i> with dissimilar ventral chaetae			
364.	<i>Phreodrilidae</i> sp.			
365.	<i>Pilbarus millsii</i>			
366.	<i>Pinnularia divergens</i> W. Sm.			
367.	<i>Pinnularia gibba</i> Ehr.			
368.	<i>Piona cumberlandensis</i>			
369.	24101 <i>Planigale ingrami</i> (Long-tailed Planigale)			
370.	<i>Planorbidae</i> sp.			
371.	<i>Platinius patulus</i>			
372.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
373.	<i>Platycoelus melliei</i>			
374.	<i>Platyias quadricornis</i>			
375.	<i>Pleidae</i> sp.			
376.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
377.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
378.	<i>Polyarthra dolichoptera</i>			
379.	<i>Polypedilum leei</i>			
380.	<i>Polypedilum nubifer</i>			
381.	24683 <i>Pomatostomus superciliosus</i> (White-browed Babbler)			
382.	25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
383.	24684 <i>Pomatostomus temporalis</i> subsp. <i>rubeculus</i> (Grey-crowned Babbler)			
384.	<i>Pristina longiseta</i>			
385.	<i>Procladius paludicola</i>			
386.	<i>Pseudagrion aureofrons</i>			
387.	<i>Pseudagrion microcephalum</i>			

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388.	25261 <i>Pseudechis australis</i> (Mulga Snake)			
389.	<i>Pseudectinosoma galassiae</i>			
390.	<i>Pseudohydryphantes</i> sp. P1 (PSW)			
391.	24235 <i>Pseudomys desertor</i> (Desert Mouse)			
392.	24237 <i>Pseudomys hermannsburgensis</i> (Sandy Inland Mouse)			
393.	25263 <i>Pseudonaja modesta</i> (Ringed Brown Snake)			
394.	24757 <i>Ptilonorhynchus maculatus</i> subsp. <i>guttatus</i> (Western Bowerbird)			
395.	<i>Pygolabis</i> sp.			
396.	25009 <i>Pygopus nigriceps</i>			
397.	<i>Pyralidae</i> sp. 22 of JHH (PSW) (=Parapoynx stagnalis)			Y
398.	24278 <i>Pyrrholaemus brunneus</i> (Redthroat)			
399.	<i>Rhagada radleyi</i>			
400.	<i>Rheotanytarsus christinae</i>			
401.	<i>Rheotanytarsus trivittatus</i>			
402.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
403.	<i>Rhopalodia gibberula</i> (Ehr.) O. Müll.			
404.	24982 <i>Rhynchoedura ornata</i> (Western Beaked Gecko)			
405.	24174 <i>Saccolaimus flaviventris</i> (Yellow-bellied Sheath-tailed Bat)			
406.	<i>Sciomyzidae</i> sp.			
407.	<i>Scirtidae</i> sp.			
408.	<i>Scolopendra laeta</i>			
409.	24200 <i>Scotorepens greyii</i> (Little Broad-nosed Bat)			
410.	<i>Sellephora pupula</i> (Kütz) Mereschkowsky			
411.	30948 <i>Smicromis brevirostris</i> (Weebill)			
412.	24116 <i>Sminthopsis macroura</i> (Stripe-faced Dunnart)			
413.	<i>Sternopriscus pilbarensis</i>			
414.	24482 <i>Stiltia isabella</i> (Australian Pratincole)			
415.	25656 <i>Stipiturus ruficeps</i> (Rufous-crowned Emu-wren)			
416.	24556 <i>Stipiturus ruficeps</i> subsp. <i>ruficeps</i> (Rufous-crowned Emu-wren)			
417.	<i>Strandesia</i> sp.			
418.	<i>Strandesia</i> sp. 3 (PSS)			Y
419.	<i>Stratiomyidae</i> sp.			
420.	24927 <i>Strophurus elderi</i>			
421.	<i>Stygonitocrella unispinosa</i>			
422.	25269 <i>Suta fasciata</i> (Rosen's Snake)			
423.	<i>Tabanidae</i> sp.			
424.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
425.	24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
426.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
427.	<i>Tanypodinae</i> sp.			
428.	<i>Tanytarsus</i> sp. D (SAP)			
429.	24175 <i>Taphozous georgianus</i> (Common Sheath-tailed Bat)			
430.	<i>Tasmanocoenis arcuata</i>			
431.	<i>Tesserodon novaehollandiae</i>			
432.	<i>Tesserodon tenebroides</i>			
433.	<i>Testudinella amphora</i>			
434.	<i>Testudinella patina</i>			
435.	<i>Thermosbaenacea</i> sp.			
436.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
437.	<i>Tiporus lachlani</i>			
438.	<i>Tiporus tambreyi</i>			
439.	<i>Tipulidae</i> type D (SAP)			
440.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
441.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
442.	48141 <i>Tribonyx ventralis</i> (Black-tailed Native-hen)			
443.	<i>Trichocarenum cylindricum</i>			
444.	<i>Trichocerca pusilla</i>			
445.	<i>Trichocerca similis</i>			
446.	<i>Trichocycclus nigropunctatus</i>			
447.	<i>Trichocycclus warianga</i>			
448.	39407 <i>Triops australiensis</i> (Shield Shrimp)			
449.	<i>Turbellaria</i> sp.			
450.	24851 <i>Turnix velox</i> (Little Button-quail)			
451.	<i>Unionicola crassipalpis</i>			
452.	25445 <i>Uperoleia russelli</i> (Northwest Toadlet)			
453.	41428 <i>Uperoleia saxatilis</i> (Pilbara Toadlet)			
454.	25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor)			
455.	25210 <i>Varanus brevicauda</i> (Short-tailed Pygmy Monitor)			
456.	25212 <i>Varanus eremius</i> (Pygmy Desert Monitor)			
457.	25216 <i>Varanus giganteus</i> (Perentie)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
458.	25524 <i>Varanus panoptes</i> (Yellow-spotted Monitor)			
459.	25223 <i>Varanus panoptes subsp. rubidus</i>			
460.	25224 <i>Varanus pilbarensis</i> (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)			
461.	<i>Velesunio wilsoni</i>			
462.	<i>Velliidae sp.</i>			
463.	<i>Venatrix pullastra</i>			
464.	24205 <i>Vespadelus finlaysoni</i> (Finlayson's Cave Bat)			
465.	<i>Vestalenula marmonieri</i>			
466.	<i>Wyndra kennedy</i>			
467.	<i>Zenodorus orbiculatus</i>			
468.	<i>Zoothamnium sp.</i>			
469.	24248 <i>Zyzomys argurus</i> (Common Rock-rat)			

**Conservation Codes**

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

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

# **Appendix B**

## **Licence and Authorisation**



## **FAUNA TAKING (BIOLOGICAL ASSESSMENT) LICENCE**

### **Regulation 27, Biodiversity Conservation Regulations 2018**

Licence Number: BA27000324  
Licence Holder: Mr Lukas Geidans  
360 Environmental Services  
Unit 4 / 193 Oxford Street  
LEEDERVILLE WA 6007  
Date of Issue: 01/10/2020  
Date Valid From: 01/10/2020  
Date of Expiry: 31/10/2020

### **LICENSED ACTIVITIES**

Subject to the terms and conditions on this licence, the licence holder may –

1. Take and disturb fauna for biological fauna assessment of a proposed haul road footprint, spanning from Ken's Bore to the Onslow Port, to identify the faunal assemblages and fauna impacts from the construction using baited remote sensing cameras, ultrasonic bat detectors, visual observations, hand collecting techniques, large cage traps, Elliot (medium) traps, 10 pit traps (comprising 20 L buckets and five PVC pipes); and funnel traps.

### **LOCATIONS**

1. Ken's Bore to Onslow haul road survey area, Pilbara Region.

### **AUTHORISED PERSONS**

The following persons or persons of the specified class may assist in carrying out the licensed activities:

1. Lukas Geidans
2. Evan Webb
3. Edward Swinhoe
4. Michael Brown
5. Timothy Moulds

### **CONDITIONS**

1. Fauna must not be taken on CALM land, (as defined in the Conservation and Land Management Regulations 2002), unless authorised by a written notice of a lawful authority issued under regulations 4 and 8 of the Conservation and Land Management Regulations 2002.
2. If persons, other than the licence holder, are authorised to carry out/assist in carrying out the activities under the licence, the licence holder must ensure those persons have read and understand the licence terms and conditions.
3. The written authorisation of the person in possession or occupation of the land accessed and upon which fauna is taken, as required under regulation 101(2) and referred to in "Additional information" below, must:
  - a) state location details (including lot or location number, street/road, suburb and local government authority);



- b) state land owner or occupier name, and contact phone number;
  - c) specify the time period that the authorisation is valid for;
  - d) be signed and dated; and
  - e) be attached to this licence at all times.
4. This licence, and any written authorisation or lawful authority which authorises the take of fauna on specified locations must be carried at all times while conducting licensed activities and be produced on demand by a wildlife officer.
  5. If a species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* is inadvertently captured, that species is to be released immediately at the point of capture. If the fauna is injured or deceased, the licence holder shall contact the DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)) for advice on treatment or disposal. Details of any capture of threatened fauna must be included in the "Return of Fauna Taken."
  6. The licence holder must not:
    - a) release any fauna in any area where it does not naturally occur;
    - b) transfer fauna to any other person or authority (other than the Western Australian Museum) unless approved in writing by the CEO; or
    - c) dispose of the remains of fauna in any manner likely to interfere the natural or present day distribution of the species.
  7. The licence holder must not take and remove more than ten specimens of any one protected species of fauna from any location less than 20km apart. Where exceptional circumstances make it necessary to take a larger number of specimens from a particular location in order to obtain adequate statistical data, the collector must proceed with circumspection and justify their actions to the Director General in advance.
  8. All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this licence must be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range must be offered to the Western Australian Museum.
  9. All specimens and material retained under the authority of this licence must be offered to the Western Australian Museum for loan, for inclusion in its collection, or on request be made available to other persons involved in relevant scientific studies.
  10. The licence holder must create, compile and maintain records and information as required in a DBCA approved "Return of Fauna Taken" of all fauna taking activities as they occur.
  11. A DBCA approved "Return of Fauna Taken" must be completed in full (including nil taking details) and submitted to DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)) prior to the end of each annual period of the licence (from the valid from date) (refer to "Additional Information" section below).

A handwritten signature in blue ink, appearing to read "D. Stefoni".

Danny Stefoni  
LICENSING OFFICER  
WILDLIFE PROTECTION BRANCH

Delegate of CEO

## ADDITIONAL INFORMATION

1. It is an offence to take any species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* unless the person is authorised under Section 40. The penalty ranges between \$300 000 and \$500 000; Section 150 Biodiversity Conservation Act 2016.
2. Regulation 82 empowers the CEO to add, substitute or delete a term or condition of a licence or to correct errors. Such power may be exercised on application of a licence holder or by the CEO's own initiative. If an amendment to a licence term or condition is required, please contact the CEO or the Licensing Section on [wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au) in the first instance. The licence holder, if adversely affected by a condition imposed in this licence, may apply to the State Administrative Tribunal for review of the decision of the CEO to impose that condition on a licence: regulation 89(2) Biodiversity Conservation Regulations 2018.
3. A person must not contravene a condition of a licence. The penalty for an offence involving the contravention of a condition of a licence is a fine of \$10 000: regulation 84 of the Biodiversity Conservation Regulations 2018.
4. It is an offence for persons authorised by this licence to enter land that is not in their possession or under their control without first having the *prior* written authorisation of the current owner or occupier of the land to:
  - a) enter the land; and
  - b) carry out the activity authorised by this licence.The penalty for this offence is a fine of \$5 000: regulation 101(2) of the Biodiversity Conservation Regulations 2018.
5. The licence holder must be able to produce for inspection upon request any information or records required by regulation 85(2) of the Biodiversity Conservation Regulations 2018 Penalty \$10 000. It is an offence to knowingly include false or misleading information or make statements in records: regulation 85(3) of the Biodiversity Conservation Regulations 2018 Penalty \$10 000. It is an offence to include any information or make any statement in a return that the licence holder knows to be false or misleading in a material particular: regulation 86 (2) of the Biodiversity Conservation Regulations 2018 Penalty \$10 000.
6. The approved DBCA "Return of Fauna Taken" data file can be downloaded from the DBCA webpage (<https://www.dpaw.wa.gov.au/plants-and-animals/licences-and-authorities>).
7. The issuing of a licence under the Biodiversity Conservation Regulations 2018 does not constitute an animal ethics approval or a licence to use animals for scientific purposes as required under the *Animal Welfare Act 2002*, Animal Welfare (Scientific Purposes) Regulations 2003. It is the responsibility of a licence applicant / licence holder to ensure that they comply with the requirements of all applicable legislation. Enquiries relating to the Animal Welfare Act licences and animal ethics approvals are to be directed to the Department of Primary Industries and Regional Development (<https://www.agric.wa.gov.au/animalwelfare>).
8. Threatened fauna can only be taken under a *Biodiversity Conservation Act 2016* Section 40 authorisation, Occurrences of threatened species must be reported to the CEO. For more information please see <https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals>.
9. Any interaction involving Nationally Listed Threatened Fauna that may be invasive and/or harmful to the fauna may require approval from the Commonwealth Department of the Environment and Energy





<http://www.environment.gov.au/about-us/business-us/permits-assessments-licences>. Interaction with such species is controlled by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Environment Protection and Biodiversity Conservation Regulations 2000 as well as the *Biodiversity Conservation Act 2016* and Biodiversity Conservation Regulations 2018.



## AUTHORISATION TO TAKE OR DISTURB THREATENED SPECIES

*Section 40 of the Biodiversity Conservation Act 2016*

### AUTHORISATION DETAILS

**Authorisation type:** Fauna

**Authorisation number:** TFA 2020-0104

**Authorisation duration:** From date signed by Minister's delegate, below, until 31 October 2020.

### AUTHORISATION HOLDER

Lukas Geidans

360 Environmental

Unit 4 / 193 Oxford Street

Leederville WA 6007

### AREA TO WHICH THIS AUTHORISATION APPLIES

Ken's Bore to Onslow haul road survey area, Pilbara Region.

### AUTHORISED ACTIVITY

**Purpose of taking/disturbance:**

Biological assessment (comprehensive field survey) of a proposed haul road footprint, spanning from Ken's Bore to the Onslow Port, to identify the faunal assemblages and fauna impacts from the construction (Mineral Resources Limited).

**Threatened species authorised to be taken/disturbed (including conservation status):**

Northern quoll, *Dasyurus hallucatus* (Endangered)

Pilbara Olive Python, *Liasis olivaceus barroni* (Vulnerable)

**Quantity of threatened species authorised to be taken/disturbed:**

Any number of individual animals of the above listed threatened fauna species may potentially be captured and released during the trapping program and/or disturbed by the survey.

**Authorised taking/disturbance methodology:**

Take northern quolls using cage or Elliott traps (set for up to eight days/seven nights). Traps are to be covered with hessian, set in complete shade throughout the whole day and checked within three hours of sunrise. If temperatures are forecast >35 °C, traps will be closed within three hours of sunrise, remain closed during the day and be re-opened in the late afternoon. If any adverse events are observed related to temperature /heat exposure, regardless of forecast temperature, then traps will

.....<sup>93</sup>..... (Delegate's initials)

be closed during the day (adverse events will be reported as soon as possible). Traps will be baited with universal bait (rolled oats, peanut butter and sardines).

Captured quolls may have morphometric and condition/health details recorded and may be temporarily marked (using xylene free marker pen, to identify recaptures) prior to release near capture site.

Disturb northern quolls and Pilbara olive pythons using cameras traps deployed (up to seven nights at each location) with a consumable lure (universal bait - rolled oats, peanut butter and sardines, replenished as necessary or every two days). Pilbara olive pythons may be disturbed by opportunistic active searching.

All proposed activities will be conducted in accordance with DBCA Standard Operating Procedures (SOPs) for fauna survey and monitoring techniques.

### ADDITIONAL AUTHORISED PERSONS

Evan Webb

Michael Brown

Edward Swinhoe

Timothy Moulds

Additional personnel who are suitably qualified and experienced in the authorised activities working under the direction of the authorisation holder.

Field assistants assisting with the authorised activities working under the direct supervision of the authorisation holder or suitably qualified and experienced named additional authorised person.

### CONDITIONS

1. The written authorisation of the person in possession or occupation of the land accessed and upon which threatened fauna is taken or disturbed must:
  - a) state location details (including lot or location number, street/road, suburb and local government authority);
  - b) state land owner or occupier name, and contact phone number;
  - c) specify the time period that the authorisation is valid for;
  - d) be signed and dated; and
  - e) be attached to this Authorisation to take or disturb threatened species at all times.
2. This Authorisation to take or disturb threatened species, and any other written authorisation or lawful authority which authorises the take or disturbance of fauna on specified locations for the authorised activities must be carried at all times while conducting authorised activities and be produced on demand by a wildlife officer.
3. The authorisation holder and additional authorised persons who are not suitably qualified and experienced in the authorised activities, and volunteer field assistants assisting with the authorised activities, must be working under direct supervision of experienced and competent named authorised persons.
4. Any inadvertently captured species of non-target threatened fauna or non-threatened fauna (threatened fauna as defined in *Biodiversity Conservation Act 2016* Section 19) is to be released immediately at the point of capture. Details of such fauna must be included in the fauna taking return as required under this authorisation.

 (Delegate's initials)

5. The authorisation holder, unless specified in the authorised activities, must not:
  - a) release any threatened fauna in any area where it does not naturally occur;
  - b) transfer threatened fauna to any other person or authority (other than the Western Australian Museum) unless the fauna is injured or abandoned fauna (condition 6); or
  - c) dispose of the remains of threatened fauna in any manner likely to confuse the natural or present-day distribution of the species.
6. All threatened fauna injuries, unexpected deaths, unplanned euthanasia, and abandoned young or eggs, must be reported by the authorisation holder to the DBCA Wildlife Licensing Section (wildlifelicensing@dbca.wa.gov.au) to notify of the incident and for advice on treatment or disposal. All deceased threatened fauna must be offered to the Western Australian Museum.
7. All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this authorisation must be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range must be offered to the Western Australian Museum.
8. To prevent any unnecessary collecting in this State, all specimens and material taken and retained under this authorisation, that remain at the conclusion of the activities, must be offered to the Western Australian Museum for loan, for inclusion in its collection, or made available to other persons involved in relevant scientific studies if so required.
9. The authorisation holder must create, compile and maintain records and information as required in a DBCA approved "Return of Fauna Taken/Disturbed" of all fauna taking activities as they occur.
10. A DBCA approved "Return of Fauna Taken/Disturbed" must be completed in full (including nil taking details) and submitted to DBCA Wildlife Protection Branch, Wildlife Licensing Section (wildlifelicensing@dbca.wa.gov.au) prior to the end of the authorisation duration and, if the authorisation duration is greater than 12 months, prior to the end of each annual period of the authorisation (from the date signed by the Minister's delegate) (refer to "Additional Information" section below). Where a licence to take or disturb fauna is issued in conjunction with this Authorisation to take or disturb threatened species, a combined "Return of Fauna Taken/Disturbed" may be completed and submitted.
11. A written report detailing the undertaken authorised activities, outcome, unintended incidents, injuries and mortalities of threatened fauna, implemented monitoring, mitigation and management, and explaining the records and information as required in a DBCA approved "Return of Fauna Taken/Disturbed" must be submitted, in addition to a "Return of Fauna Taken/Disturbed" to DBCA Wildlife Licensing Section (wildlifelicensing@dbca.wa.gov.au).

## ADDITIONAL INFORMATION

1. Before undertaking the Authorised Activity, permission must be obtained from: (a) the owner or occupier of private land; or (b) the Department or Authority controlling Crown land, on which the Threatened Fauna occur. This includes obtaining the written endorsement from Department of Biodiversity, Conservation and Attractions (DBCA) if the authorised activity is proposed for land managed by DBCA.

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2. This Authorisation to take or disturb threatened species does not constitute lawful authority issued under regulations 4 and 8 of the *Conservation and Land Management Regulations 2002*. Contact the applicable Department District Officer for further information.
3. The approved DBCA "Return of Fauna Taken/Disturbed" template can be obtained from DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)).
4. Any interaction involving nationally listed threatened fauna that may be harmful to the fauna and/or invasive may require approval from the Commonwealth Department of the Environment and Energy (<http://www.environment.gov.au/biodiversity/threatened/permits>). Interaction with such species is controlled by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and *Environment Protection and Biodiversity Conservation Regulations 2000*.
5. It is the responsibility of the authorisation holder to ensure that they comply with the requirements of all applicable legislation.
6. An Authorisation to take or disturb threatened species does not constitute an animal ethics approval or a licence to use animals for scientific purposes as required under the *Animal Welfare Act 2002*, *Animal Welfare (Scientific Purposes) Regulations 2003*. Enquiries relating to the Animal Welfare Act licences and animal ethics approvals are to be directed to the Western Australian Department of Primary Industries and Regional Development (<https://www.agric.wa.gov.au/animalwelfare>).

.....  


Dr Margaret Byrne

Executive Director of Biodiversity and Conservation Science

AS DELEGATE OF THE MINISTER

DATE: ...25/.../...../2020



## **FAUNA TAKING (BIOLOGICAL ASSESSMENT) LICENCE**

### **Regulation 27, Biodiversity Conservation Regulations 2018**

Licence Number: BA27000324-2  
Licence Holder: Mr Lukas Geidans  
360 Environmental Services  
Unit 4 / 193 Oxford Street  
LEEDERVILLE WA 6007  
Date of Issue: 16/04/2021  
Date Valid From: 16/04/2021  
Date of Expiry: 01/04/2022

### **LICENSED ACTIVITIES**

Subject to the terms and conditions on this licence, the licence holder may –

1. Take and disturb fauna for biological fauna assessment of a proposed haul road footprint, spanning from Ken's Bore to the Onslow Port, to identify the faunal assemblages and fauna impacts from the construction using baited remote sensing cameras, ultrasonic bat detectors, visual observations, hand collecting techniques, large cage traps, Elliot (medium) traps, 10 pit traps (comprising 20 L buckets and five PVC pipes); and funnel traps.

### **LOCATIONS**

1. Ken's Bore to Onslow haul road survey area, Pilbara Region.

### **AUTHORISED PERSONS**

The following persons or persons of the specified class may assist in carrying out the licensed activities:

1. Lukas Geidans
2. Evan Webb
3. Edward Swinhoe
4. Michael Brown
5. Timothy Moulds
6. Christina Walker
7. Louis Masarei

### **CONDITIONS**

1. Fauna must not be taken on CALM land, (as defined in the Conservation and Land Management Regulations 2002), unless authorised by a written notice of a lawful authority issued under regulations 4 and 8 of the Conservation and Land Management Regulations 2002.
2. If persons, other than the licence holder, are authorised to carry out/assist in carrying out the activities under the licence, the licence holder must ensure those persons have read and understand the licence terms and conditions.
3. The written authorisation of the person in possession or occupation of the land accessed and upon which fauna is taken, as required under regulation 101(2) and referred to in "Additional information" below, must:



- a) state location details (including lot or location number, street/road, suburb and local government authority);
  - b) state land owner or occupier name, and contact phone number;
  - c) specify the time period that the authorisation is valid for;
  - d) be signed and dated; and
  - e) be attached to this licence at all times.
4. This licence, and any written authorisation or lawful authority which authorises the take of fauna on specified locations must be carried at all times while conducting licensed activities and be produced on demand by a wildlife officer.
  5. If a species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* is inadvertently captured, that species is to be released immediately at the point of capture. If the fauna is injured or deceased, the licence holder shall contact the DBCA Wildlife Licensing Section ([wildlifelicencing@dbca.wa.gov.au](mailto:wildlifelicencing@dbca.wa.gov.au)) for advice on treatment or disposal. Details of any capture of threatened fauna must be included in the "Return of Fauna Taken."
  6. The licence holder must not:
    - a) release any fauna in any area where it does not naturally occur;
    - b) transfer fauna to any other person or authority (other than the Western Australian Museum) unless approved in writing by the CEO; or
    - c) dispose of the remains of fauna in any manner likely to interfere the natural or present day distribution of the species.
  7. The licence holder must not take and remove more than ten specimens of any one protected species of fauna from any location less than 20km apart. Where exceptional circumstances make it necessary to take a larger number of specimens from a particular location in order to obtain adequate statistical data, the collector must proceed with circumspection and justify their actions to the Director General in advance.
  8. All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this licence must be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range must be offered to the Western Australian Museum.
  9. All specimens and material retained under the authority of this licence must be offered to the Western Australian Museum for loan, for inclusion in its collection, or on request be made available to other persons involved in relevant scientific studies.
  10. The licence holder must create, compile and maintain records and information as required in a DBCA approved "Return of Fauna Taken" of all fauna taking activities as they occur.
  11. A DBCA approved "Return of Fauna Taken" must be completed in full (including nil taking details) and submitted to DBCA Wildlife Licensing Section ([wildlifelicencing@dbca.wa.gov.au](mailto:wildlifelicencing@dbca.wa.gov.au)) prior to the end of each annual period of the licence (from the valid from date) (refer to "Additional Information" section below).

A handwritten signature in blue ink, appearing to read 'OP Stefoni'.

Danny Stefoni  
LICENSING OFFICER

## WILDLIFE PROTECTION BRANCH

*Delegate of CEO*

### ADDITIONAL INFORMATION

1. It is an offence to take any species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* unless the person is authorised under Section 40. The penalty ranges between \$300 000 and \$500 000; Section 150 Biodiversity Conservation Act 2016.
2. Regulation 82 empowers the CEO to add, substitute or delete a term or condition of a licence or to correct errors. Such power may be exercised on application of a licence holder or by the CEO's own initiative. If an amendment to a licence term or condition is required, please contact the CEO or the Licensing Section on [wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au) in the first instance. The licence holder, if adversely affected by a condition imposed in this licence, may apply to the State Administrative Tribunal for review of the decision of the CEO to impose that condition on a licence: regulation 89(2) Biodiversity Conservation Regulations 2018.
3. A person must not contravene a condition of a licence. The penalty for an offence involving the contravention of a condition of a licence is a fine of \$10 000: regulation 84 of the Biodiversity Conservation Regulations 2018.
4. It is an offence for persons authorised by this licence to enter land that is not in their possession or under their control without first having the *prior* written authorisation of the current owner or occupier of the land to:
  - a) enter the land; and
  - b) carry out the activity authorised by this licence.

The penalty for this offence is a fine of \$5 000: regulation 101(2) of the Biodiversity Conservation Regulations 2018.

5. The licence holder must be able to produce for inspection upon request any information or records required by regulation 85(2) of the Biodiversity Conservation Regulations 2018 Penalty \$10 000. It is an offence to knowingly include false or misleading information or make statements in records: regulation 85(3) of the Biodiversity Conservation Regulations 2018 Penalty \$10 000. It is an offence to include any information or make any statement in a return that the licence holder knows to be false or misleading in a material particular: regulation 86 (2) of the Biodiversity Conservation Regulations 2018 Penalty \$10 000.
6. The approved DBCA "Return of Fauna Taken" data file can be downloaded from the DBCA webpage (<https://www.dpaw.wa.gov.au/plants-and-animals/licences-and-authorities>).
7. The issuing of a licence under the Biodiversity Conservation Regulations 2018 does not constitute an animal ethics approval or a licence to use animals for scientific purposes as required under the *Animal Welfare Act 2002*, Animal Welfare (Scientific Purposes) Regulations 2003. It is the responsibility of a licence applicant / licence holder to ensure that they comply with the requirements of all applicable legislation. Enquiries relating to the Animal Welfare Act licences and animal ethics approvals are to be directed to the Department of Primary Industries and Regional Development (<https://www.agric.wa.gov.au/animalwelfare>).
8. Threatened fauna can only be taken under a *Biodiversity Conservation Act 2016* Section 40 authorisation, Occurrences of threatened species must be reported to the CEO. For more information please see <https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals>.





9. Any interaction involving Nationally Listed Threatened Fauna that may be invasive and/or harmful to the fauna may require approval from the Commonwealth Department of the Environment and Energy <http://www.environment.gov.au/about-us/business-us/permits-assessments-licences>. Interaction with such species is controlled by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Environment Protection and Biodiversity Conservation Regulations 2000 as well as the *Biodiversity Conservation Act 2016* and Biodiversity Conservation Regulations 2018.



## AUTHORISATION TO TAKE OR DISTURB THREATENED SPECIES

*Section 40 of the Biodiversity Conservation Act 2016*

### AUTHORISATION DETAILS

**Authorisation type:** Fauna

**Authorisation number:** TFA 2020-0104-2

**Authorisation duration:** From date signed by Minister's delegate, below, until 1 April 2022.

### AUTHORISATION HOLDER

Lukas Geidans

360 Environmental

Unit 4 / 193 Oxford Street

Leederville WA 6007

### AREA TO WHICH THIS AUTHORISATION APPLIES

Ken's Bore to Onslow haul road survey area (Pilbara Region).

### AUTHORISED ACTIVITY

**Purpose of taking/disturbance:**

Biological fauna assessment (comprehensive field survey) of a proposed haul road footprint, spanning from Ken's Bore to the Onslow Port, to identify the faunal assemblages and fauna impacts from the construction (Mineral Resources Limited).

**Threatened species authorised to be taken/disturbed (including conservation status):**

Northern quoll, *Dasyurus hallucatus* (Endangered)

Pilbara Olive Python, *Liasis olivaceus barroni* (Vulnerable)

**Quantity of threatened species authorised to be taken/disturbed:**

Any number of individual animals of the above listed threatened fauna species may potentially be captured and released during the trapping program and/or disturbed by the survey activities.

**Authorised taking/disturbance methodology:**

Take northern quolls using cage or Elliott traps (set for up to eight days/seven nights, consecutive, per trapping session). Traps are to be covered with hessian, set in complete shade throughout the whole day and checked within three hours of sunrise. If temperatures are forecast >35 °C, traps will be closed within three hours of sunrise, remain closed during the day and be re-opened in the late afternoon. If any adverse events are observed related to temperature /heat exposure, regardless of

forecast temperature, then traps will be closed during the day (adverse events will be reported as soon as possible). Traps will be baited with universal bait (rolled oats, peanut butter and sardines).

Captured quolls may have morphometric and condition/health details recorded and may be temporarily marked (using xylene free marker pen) to identify recaptures, prior to release near capture site.

Disturb northern quolls and Pilbara olive pythons using cameras traps deployed (up to seven nights at each location) with a consumable lure (universal bait - rolled oats, peanut butter and sardines, replenished as necessary or every two days). Pilbara olive pythons may be disturbed by opportunistic active searching.

All proposed activities will be conducted in accordance with DBCA Standard Operating Procedures (SOPs) for fauna survey and monitoring techniques.

### ADDITIONAL AUTHORISED PERSONS

Evan Webb	Timothy Moulds
Edward Swinhoe	Christina Walker
Michael Brown	Louis Masarei

Additional personnel who are suitably qualified and experienced in the authorised activities working under the direction of the authorisation holder.

Field assistants assisting with the authorised activities working under the direct supervision of the authorisation holder or suitably qualified and experienced named additional authorised person.

### CONDITIONS

1. The written authorisation of the person in possession or occupation of the land accessed and upon which threatened fauna is taken or disturbed must:
  - a) state location details (including lot or location number, street/road, suburb and local government authority);
  - b) state land owner or occupier name, and contact phone number;
  - c) specify the time period that the authorisation is valid for;
  - d) be signed and dated; and
  - e) be attached to this Authorisation to take or disturb threatened species at all times.
2. This Authorisation to take or disturb threatened species, and any other written authorisation or lawful authority which authorises the take or disturbance of fauna on specified locations for the authorised activities must be carried at all times while conducting authorised activities and be produced on demand by a wildlife officer.
3. The authorisation holder and additional authorised persons who are not suitably qualified and experienced in the authorised activities, and volunteer field assistants assisting with the authorised activities, must be working under direct supervision of experienced and competent named authorised persons.
4. Any inadvertently captured species of non-target threatened fauna or non-threatened fauna (threatened fauna as defined in *Biodiversity Conservation Act 2016* Section 19) is to be released

immediately at the point of capture. Details of such fauna must be included in the fauna taking return as required under this authorisation.

5. The authorisation holder, unless specified in the authorised activities, must not:
  - a) release any threatened fauna in any area where it does not naturally occur;
  - b) transfer threatened fauna to any other person or authority (other than the Western Australian Museum) unless the fauna is injured or abandoned fauna (condition 6); or
  - c) dispose of the remains of threatened fauna in any manner likely to confuse the natural or present-day distribution of the species.
6. All threatened fauna injuries, unexpected deaths, unplanned euthanasia, and abandoned young or eggs, must be reported by the authorisation holder to the DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)) to notify of the incident and for advice on treatment or disposal. All deceased threatened fauna must be offered to the Western Australian Museum.
7. All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this authorisation must be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range must be offered to the Western Australian Museum.
8. To prevent any unnecessary collecting in this State, all specimens and material taken and retained under this authorisation, that remain at the conclusion of the activities, must be offered to the Western Australian Museum for loan, for inclusion in its collection, or made available to other persons involved in relevant scientific studies if so required.
9. The authorisation holder must create, compile and maintain records and information as required in a DBCA approved "Return of Fauna Taken/Disturbed" of all fauna taking activities as they occur.
10. A DBCA approved "Return of Fauna Taken/Disturbed" must be completed in full (including nil taking details) and submitted to DBCA Wildlife Protection Branch, Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)) prior to the end of the authorisation duration and, if the authorisation duration is greater than 12 months, prior to the end of each annual period of the authorisation (from the date signed by the Minister's delegate) (refer to "Additional Information" section below). Where a licence to take or disturb fauna is issued in conjunction with this Authorisation to take or disturb threatened species, a combined "Return of Fauna Taken/Disturbed" may be completed and submitted.
11. A written report detailing the undertaken authorised activities, outcome, unintended incidents, injuries and mortalities of threatened fauna, implemented monitoring, mitigation and management, and explaining the records and information as required in a DBCA approved "Return of Fauna Taken/Disturbed" must be submitted, in addition to a "Return of Fauna Taken/Disturbed" to DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)).

## **ADDITIONAL INFORMATION**

1. Before undertaking the Authorised Activity, permission must be obtained from: (a) the owner or occupier of private land; or (b) the Department or Authority controlling Crown land, on which the Threatened Fauna occur. This includes obtaining the written endorsement from Department of Biodiversity, Conservation and Attractions (DBCA) if the authorised activity is proposed for land managed by DBCA.

2. This Authorisation to take or disturb threatened species does not constitute lawful authority issued under regulations 4 and 8 of the *Conservation and Land Management Regulations 2002*. Contact the applicable Department District Officer for further information.
3. The approved DBCA "Return of Fauna Taken/Disturbed" template can be obtained from DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)).
4. Any interaction involving nationally listed threatened fauna that may be harmful to the fauna and/or invasive may require approval from the Commonwealth Department of the Environment and Energy (<http://www.environment.gov.au/biodiversity/threatened/permits>). Interaction with such species is controlled by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and *Environment Protection and Biodiversity Conservation Regulations 2000*.
5. It is the responsibility of the authorisation holder to ensure that they comply with the requirements of all applicable legislation.
6. An Authorisation to take or disturb threatened species does not constitute an animal ethics approval or a licence to use animals for scientific purposes as required under the *Animal Welfare Act 2002*, *Animal Welfare (Scientific Purposes) Regulations 2003*. Enquiries relating to the Animal Welfare Act licences and animal ethics approvals are to be directed to the Western Australian Department of Primary Industries and Regional Development (<https://www.agric.wa.gov.au/animalwelfare>).

  
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Dr Margaret Byrne

Executive Director of Biodiversity and Conservation Science  
AS DELEGATE OF THE MINISTER

DATE: ..22.../..4...../2021

# **Appendix C**

## **Inventory of Vertebrate Fauna Identified by the Desktop Assessment**















Family	Scientific Name	Common Name	Conservation Status		Database Search			Field Survey	Literature														
			State	Federal	NM	PMST	DBC		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Scolopacidae	<i>Limosa lapponica</i>	Bar-tailed Godwit	MI (CR at subsp. level)	MI & MA (CR at subsp. level)	x		x																
Scolopacidae	<i>Limosa lapponica menzbieri</i>		CR (MI at sp. level)	CR (MI & MA at sp. level)	x	x	x																
Scolopacidae	<i>Limosa limosa</i>	Black-tailed Godwit	MI	MI & MA			x																
Scolopacidae	<i>Numenius madagascariensis</i>	Far Eastern Curlew (Eastern Curlew)	CR	CR, MI & MA	x		x																
Scolopacidae	<i>Numenius minutus</i>	Little Curlew	MI	MI & MA	x		x																
Scolopacidae	<i>Numenius phaeopus</i>	Whimbrel	MI	MI & MA	x		x																
Scolopacidae	<i>Tringa brevipes</i>	Grey-tailed Tattler	MI & P4	MI & MA	x		x																
Scolopacidae	<i>Tringa glareola</i>	Wood Sandpiper	MI	MI & MA	x		x															x	
Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	MI	MI & MA	x	x	x															x	
Strigidae	<i>Ninox boobook</i>	Boobook Owl								x			x										
Strigidae	<i>Ninox connivens</i>	Barking Owl			x																		
Sturnidae	<i>Acridotheres tristis</i>	Common Myna			x																		
Threskiornithidae	<i>Platalea flavipes</i>	Yellow-billed Spoonbill			x																		
Threskiornithidae	<i>Platalea regia</i>	Royal Spoonbill			x																		
Threskiornithidae	<i>Plegadis falcinellus</i>	Glossy Ibis	MI		x		x																
Threskiornithidae	<i>Threskiornis spinicollis</i>	Straw-necked Ibis					x		x														
Turnicidae	<i>Turnix pyrrhotorax</i>	Red-chested Buttonquail					x																
Turnicidae	<i>Turnix velox</i>	Little Buttonquail			x															x	x	x	x
Tytonidae	<i>Tyto javanica</i>	Barn Owl	NOT ON WA LIST		x																		
Zosteropidae	<i>Zosterops lateralis</i>	Grey-breasted White-eye (Silvereye)					x																
Zosteropidae	<i>Zosterops luteus</i>	Yellow White-eye (Canary White-eye)			x																		
<b>MAMMALS</b>																							
Balaenidae	<i>Eubalaena australis</i>	Southern Right Whale	VU	EN & MI	x																		
Balaenopteridae	<i>Balaenoptera borealis schlegelii</i>	Sei Whale	EN	VU & MI	x																		
Balaenopteridae	<i>Balaenoptera musculus</i>	Blue Whale	EN	EN & MI			x																
Balaenopteridae	<i>Balaenoptera physalus quoyi</i>	Fin Whale	EN	VU & MI			x																
Balaenopteridae	<i>Megaptera novaeangliae australis</i>	Humpback Whale	CD	VU & MI	x		x																
Bovidae	<i>Bos primigenius taurus*</i>	European Cattle			x				x											x	x		
Bovidae	<i>Capra aegagrus hircus*</i>	Goat					x																
Bovidae	<i>Ovis aries*</i>	Sheep																				x	
Camelidae	<i>Camelus dromedarius</i>	Dromedary, Camel																				x	
Canidae	<i>Canis familiaris dingo</i>	Dingo							x				x	x	x					x	x		x
Canidae	<i>Canis familiaris familiaris*</i>	Dog					x					x									x		
Canidae	<i>Vulpes vulpes*</i>	Red Fox			x																	x	
Dasyuridae	<i>Dasykaluta rosamondae</i>	Kaluta			x				x				x		x						x		x
Dasyuridae	<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN	x		x		x		x	x	x	x	x		x					x	
Dasyuridae	<i>Ningai timealeyi</i>	Pilbara Ningai			x				x				x	x							x		x
Dasyuridae	<i>Planigale ingrami</i>	Long-tailed Planigale			x								x	x									
Dasyuridae	<i>Planigale maculata</i>	Common Planigale							x												x		











Family	Scientific Name	Common Name	Conservation Status		Database Search			Field Survey	Literature																	
			State	Federal	NM	PMST	DBCA		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O			
Scincidae	<i>Morethia ruficauda ruficauda</i>				x																					
Scincidae	<i>Notoscincus butleri</i>		P4					x																		
Scincidae	<i>Notoscincus ornatus ornatus</i>				x			x													x					
Scincidae	<i>Proablepharus reginae</i>																				x					
Scincidae	<i>Tiliqua multifasciata</i>	Central Blue-tongue			x																x	x				
Typhlopidae	<i>Anilius ammodytes</i>							x																		x
Typhlopidae	<i>Anilius ganei</i>		P1											x							x					
Typhlopidae	<i>Anilius grypus</i>													x							x					x
Typhlopidae	<i>Anilius hamatus</i>																									x
Typhlopidae	<i>Indotyphlops braminus</i>				x																					
Varanidae	<i>Varanus acanthurus</i>	Spiny-tailed Goanna			x			x		x				x	x						x					
Varanidae	<i>Varanus brevicauda</i>	Short-tailed Pygmy Goanna			x			x													x					x
Varanidae	<i>Varanus bushi</i>	Pilbara Mulga Goanna			x																x					
Varanidae	<i>Varanus caudolineatus</i>				x																x					
Varanidae	<i>Varanus eremius</i>	Pygmy Desert Goanna			x			x													x					x
Varanidae	<i>Varanus giganteus</i>	Perentie			x			x		x			x													
Varanidae	<i>Varanus gouldii</i>	Bungarra or Sand Goanna			x																		x			x
Varanidae	<i>Varanus panoptes panoptes</i>				x																					
Varanidae	<i>Varanus panoptes rubidus</i>				x			x		x											x	x				
Varanidae	<i>Varanus pilbarensis</i>	Northern Pilbara Rock Goanna			x									x	x	x										
Varanidae	<i>Varanus tristis</i>	Racehorse Goanna			x			x		x				x	x						x					

# **Appendix D**

## **Habitat Assessments**

### KBH02 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	7/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	382362	<b>Northing</b>	7572097
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	Ironstone, Quartz
Soil type	Sandy clay	Surface stone cover	50 - 75%
Soil colour	Orange, Brown	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	High quality	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter
Disturbance			
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

74453d26-2021-4c2f-ada6-33ba2b7855a7

### KBH03 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	7/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	382005	<b>Northing</b>	7572317
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Drainage line	Rock type/s	
Soil type	Clay	Surface stone cover	<5%
Soil colour	Orange, Brown	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Tree hollows, Hummocks, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Corymbia
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	Acacia
Ground stratum	Mid (0.5-1 m)	Hummock grassland (50-80%)	Triodia



Fulcrum photo ID

02963f34-8266-4f46-9072-af7ec1a39c73

### KBH04 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	7/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	380664	<b>Northing</b>	7571847
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Drainage line	Rock type/s	
Soil type	Sandy loam	Surface stone cover	<5%
Soil colour	Orange,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Peeling bark,Termite mounds,Woody debris
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	Acacia
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

80bc6a08-a76e-4e01-bcd4-fd5a35c05414

### KBH06 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	7/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	379227	<b>Northing</b>	7572369
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	Ironstone,Quartz
Soil type	Sandy loam	Surface stone cover	25 - 50%
Soil colour	Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	High quality	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Termite mounds,Woody debris
Disturbance			
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

475d88ae-f9e5-48d5-95e7-900a2ab29a5b

### KBH07 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	7/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	377555	<b>Northing</b>	7572498
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	Ironstone, Quartz
Soil type	Sandy loam	Surface stone cover	25 - 50%
Soil colour	Brown	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	High quality	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter, Peeling bark, Woody debris
Disturbance			
Introduced fauna			
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

bec6fe00-eb55-4a0a-9837-a8255cfb566d

### KBH08 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	8/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	375959	<b>Northing</b>	7572686
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Mesa	Rock type/s	Ironstone
Soil type	Rock	Surface stone cover	75 - 100%
Soil colour	Red	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm), Outcropping
<b>Condition</b>		<b>Habitat Features</b>	
Quality	High quality	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris
Disturbance			
Introduced fauna			
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Ficus, Corymbia
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia
Ground stratum	Low (<0.5 m)	Sparse hummock grassland (0.25-20%)	Triodia



Fulcrum photo ID

ecc6d2fa-f7b6-4fb5-ae20-aad3513a0ba0

### KBH09 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	8/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	376215	<b>Northing</b>	7572669
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Breakaway	Rock type/s	Ironstone
Soil type	Sandy clay	Surface stone cover	75 - 100%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m),Boulders (>2 m),Outcropping
<b>Condition</b>		<b>Habitat Features</b>	
Quality	High quality	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Caves,Exfoliating rock,Hummocks,Leaf litter,Peeling bark,Rock crevices,Woody debris
Disturbance			
Introduced fauna			
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Ficus
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-50%)	
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)	Triodia



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### KBH10 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	8/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	373343	<b>Northing</b>	7573320
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	Ironstone,Quartz
Soil type	Sandy loam	Surface stone cover	5 - 25%
Soil colour	Orange	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia
Ground stratum	Mid (0.5-1 m)	Sparse hummock grassland (0.25-20%)	Triodia



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### KBH11 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	8/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	370510	<b>Northing</b>	7573994
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Drainage line	Rock type/s	
Soil type	Sandy clay	Surface stone cover	<5%
Soil colour	Orange,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Good	Water Source	Present
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Tree hollows,Hummocks,Leaf litter,Woody debris
Disturbance	Erosion,Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Corymbia and Eucalyptus
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

9de8827f-bd46-4995-b234-3130785dcc0e

### KBH13 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	9/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	326029	<b>Northing</b>	7590044
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	
Soil type	Sand	Surface stone cover	<5%
Soil colour	Orange,Brown	Surface stone size classes present	Pebbles (<0.6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Peeling bark,Termite mounds,Woody debris
Disturbance			
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open mallee woodland (0.25-20%)	Mallee Eucalyptus
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia and Hakea
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

2ebfb5e3-2de6-4366-ba5f-2e07995d65e9



### KBH14 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	9/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	337338	<b>Northing</b>	7587877
<b>Landform and soil</b>		<b>Rock</b>	
Landform	River	Rock type/s	
Soil type	Sandy clay	Surface stone cover	<5%
Soil colour	Brown	Surface stone size classes present	Pebbles (<0.6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Present
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Tree hollows, Hummocks, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	Eucalyptus and Corymbia
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	Acacia
Ground stratum	Low (<0.5 m)	Sparse tussock grassland (0.25-20%)	



Fulcrum photo ID

23a511c5-d02a-400d-91c5-167b3053ec2a

### KBH15 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	9/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	344636	<b>Northing</b>	7586615
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	
Soil type	Sandy clay	Surface stone cover	<5%
Soil colour	Red, Brown	Surface stone size classes present	Pebbles (<0.6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter, Peeling bark, Termite mounds, Woody debris
Disturbance			
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Corymbia
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	Acacia and Hakea
Ground stratum	Low (<0.5 m)	Hummock grassland (50-80%)	Triodia



Fulcrum photo ID

f8132006-576c-42ee-97a4-fcddb83ae15d

### KBH16 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	9/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	355040	<b>Northing</b>	7582374
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	
Soil type	Sandy clay	Surface stone cover	<5%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Erosion,Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Woodland (20-50%)	Mulga
Mid stratum	Absent		
Ground stratum	Low (<0.5 m)	Sparse hummock grassland (0.25-20%)	Triodia



Fulcrum photo ID

39002a8c-aa77-4678-a3d1-6f53ea18cd35

### KBH17 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	9/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	354863	<b>Northing</b>	7582518
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Drainage line	Rock type/s	
Soil type	Sandy clay	Surface stone cover	<5%
Soil colour	Orange,Red	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Disturbed	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Erosion,Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Eucalyptus and Corymbia
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia
Ground stratum	Low (<0.5 m)	Sparse hummock grassland (0.25-20%)	Triodia



Fulcrum photo ID

9fc15285-052a-4fdf-bb16-75d45cb025cc

### KBH19 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	10/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	358019	<b>Northing</b>	7579411
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	
Soil type	Sandy loam	Surface stone cover	<5%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Logs > 10 cm,Woody debris
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)	Acacia
Ground stratum	Mid (0.5-1 m)	Hummock grassland (50-80%)	Triodia



Fulcrum photo ID

98407a57-5356-4396-bb5b-904fec3c5290

### KBH20 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	10/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	362879	<b>Northing</b>	7577219
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	
Soil type	Sandy loam	Surface stone cover	<5%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Peeling bark,Termite mounds,Woody debris
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Woodland (20-50%)	Corymbia and Acacia
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia
Ground stratum	Mid (0.5-1 m)	Hummock grassland (50-80%)	Triodia



Fulcrum photo ID

5506bbd3-e04a-40e5-9369-ffe76944421b

### KBH22 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	10/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	363698	<b>Northing</b>	7577011
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Drainage line	Rock type/s	
Soil type	Sandy loam	Surface stone cover	5 - 25%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Good	Water Source	Present
Fire History	Recently burnt (<1 year)	Microhabitats	Tree hollows,Hummocks,Leaf litter,Logs > 10 cm,Peeling bark,Termite mounds,Woody debris
Disturbance			
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Eucalyptus and Corymbia
Mid stratum	Mid (1-2 m)	Open shrubland/heathland (20-50%)	Grevillea
Ground stratum	Mid (0.5-1 m)	Sparse hummock grassland (0.25-20%)	Triodia



Fulcrum photo ID

2c3cc457-fbee-405e-a3ae-b4db3e656b17

### KBH23 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	10/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	366268	<b>Northing</b>	7575480
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Outcrop/breakaway	Rock type/s	Ironstone
Soil type	Rock	Surface stone cover	50 - 75%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm),Rocks (20 - 60 cm),Big Rocks (60 cm - 2 m),Outcropping
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Recently burnt (<1 year)	Microhabitats	Hummocks,Leaf litter,Peeling bark,Rock crevices,Woody debris
Disturbance			
Introduced fauna			
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-50%)	Grevillea, Tephrosia and Acacia
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

c8fbc007-1270-4e38-b565-27e1bc24f3e2

### KBH24 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	10/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	366501	<b>Northing</b>	7575620
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Drainage line	Rock type/s	
Soil type	Sandy loam	Surface stone cover	5 - 25%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Good	Water Source	Absent
Fire History	Burnt (1-5 years)	Microhabitats	Tree hollows,Hummocks,Leaf litter,Logs > 10 cm,Peeling bark,Termite mounds,Woody debris
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Woodland (20-50%)	Corymbia
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia and Hakea
Ground stratum	Low (<0.5 m)	Sparse hummock grassland (0.25-20%)	Triodia



Fulcrum photo ID

46f10e81-a86a-4568-bc29-938102ff4e40

### KBH25 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	11/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	304680	<b>Northing</b>	7590073
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Alluvial plain	Rock type/s	
Soil type	Clay	Surface stone cover	<5%
Soil colour	Orange	Surface stone size classes present	Pebbles (<0.6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Disturbed	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Leaf litter,Woody debris
Disturbance	Erosion,Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Open samphire and/or chenopod shrubland (20-50%)	Tecticornia
Ground stratum	Low (<0.5 m)	Sparse tussock grassland (0.25-20%)	



Fulcrum photo ID

2deeda31-590d-4bc4-a1ac-074d0618df9c

### KBH26 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	11/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	305605	<b>Northing</b>	7589916
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Claypan	Rock type/s	
Soil type	Clay	Surface stone cover	<5%
Soil colour	Orange	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Highly degraded	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	
Disturbance	Erosion, Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (<0.5 m)	Sparse tussock grassland (0.25-20%)	



Fulcrum photo ID

20989e0a-e862-4162-932b-cf87ad9da316

### KBH27 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	14/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	303046	<b>Northing</b>	7592748
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Alluvial plain	Rock type/s	
Soil type	Sandy loam	Surface stone cover	<5%
Soil colour	Red, Brown	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Disturbed	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter, Peeling bark, Termite mounds, Woody debris
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia
Ground stratum	Low (<0.5 m)	Hummock grassland (50-80%)	Triodia and buffel grass



Fulcrum photo ID

377db7dc-c94d-47a0-99d6-5277d943ee98

### KBH28 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	14/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	313109	<b>Northing</b>	7588793
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Alluvial plain	Rock type/s	
Soil type	Sandy clay	Surface stone cover	<5%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Peeling bark,Termite mounds,Woody debris
Disturbance	Erosion,Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Open samphire and/or chenopod shrubland (20-50%)	Tecticornia
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

62bee856-dddb-4a19-8fc9-316b361e7d36

### KBH29 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	14/06/2020	<b>Personnel</b>	EW
<b>Easting</b>	310862	<b>Northing</b>	7586728
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Dune swale	Rock type/s	None
Soil type	Sandy clay	Surface stone cover	
Soil colour	Orange,Brown	Surface stone size classes present	
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Disturbed	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Woody debris
Disturbance	Erosion,Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Open samphire and/or chenopod shrubland (20-50%)	Tecticornia and Solanum
Ground stratum	Low (<0.5 m)	Sparse tussock grassland (0.25-20%)	Buffel grass



Fulcrum photo ID

3023ddc2-21cd-4fce-b3c7-8e321b110063

### KBH32 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	12/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	408018	<b>Northing</b>	7560815
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Upper slope	Rock type/s	Calcrete
Soil type	Clay	Surface stone cover	50 - 75%
Soil colour	Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	High quality	Water Source	Absent
Fire History	Burnt (1-5 years)	Microhabitats	Hummocks,Logs > 10 cm,Rock crevices,Woody debris
Disturbance	None observed		
Introduced fauna	None observed		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Eucalyptus, Corymbia
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	
Ground stratum	Low (<0.5 m)	Sparse hummock grassland (0.25-20%)	Triodia



Fulcrum photo ID

b1393af1-f1fe-452e-a29a-e7deb25de4c7

### KBH33 - Habitat assessment

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	12/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	400032	<b>Northing</b>	7562556
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Outcrop/breakaway	Rock type/s	Shale
Soil type	Clay	Surface stone cover	50 - 75%
Soil colour	Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Burnt (1-5 years)	Microhabitats	Hummocks,Rock crevices
Disturbance			
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Isolated shrubs and/or heath shrubs (<0.25%)	Acacia
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

842a0e13-7243-4eba-b5a9-554b69a51c40



### KBB01 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	15/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	306757	<b>Northing</b>	7589099
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Dune Crest	Rock type/s	None
Soil type	Sand	Surface stone cover	
Soil colour	Orange	Surface stone size classes present	
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Disturbed	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf Litter, Termite Mounds
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Isolated shrubs/heath shrubs (<0.25%)	
Ground stratum	Low (<0.5 m)	Hummock grassland (50-80%)	Triodia



Fulcrum photo ID

568495da-d155-4044-bedd-44f17f52b57f

### KBB02 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	16/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	309730	<b>Northing</b>	7589297
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Alluvial plain	Rock type/s	None
Soil type	Sandy Clay	Surface stone cover	
Soil colour	Red, Brown	Surface stone size classes present	
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Disturbed	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Termite mounds
Disturbance	Erosion, Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (<0.5 m)	Sparse hummock Grassland (0.25-20%)	Triodia



Fulcrum photo ID

489374b4-0fba-4b61-9758-b6e572bbae4a

### KBB03 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	16/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	323966	<b>Northing</b>	7589946
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	
Soil type	Sand	Surface stone cover	<5%
Soil colour	Orange,Brown	Surface stone size classes present	Pebbles (<0.6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Peeling bark,Termite mounds,Woody debris
Disturbance			
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open mallee woodland (0.25-20%)	Mallee Eucalyptus
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-50%)	Acacia and Hakea
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

3b0fd116-6075-45cc-b0bc-5758e5b4ee9e

### KBB04 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	15/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	353433	<b>Northing</b>	7583786
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	Ironstone
Soil type	Sandy loam	Surface stone cover	5 - 25%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Disturbed	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Peeling bark,Woody debris
Disturbance	Erosion,Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Woodland (20-50%)	Mulga
Mid stratum	Absent		
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

e48fc396-4654-4782-9051-219cff9cac67

### KBB05 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	13/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	372038	<b>Northing</b>	7573958
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Plain	Rock type/s	Quartz
Soil type	Sandy loam	Surface stone cover	50 - 75%
Soil colour	Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Peeling bark,Woody debris
Disturbance	Vehicle tracks		
Introduced fauna	Cat,Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Acacia
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	Acacia
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

246a389c-0333-4175-bc44-51af3ac01097

### KBB06 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	12/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	375967	<b>Northing</b>	7572789
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Lower slope	Rock type/s	Ironstone
Soil type	Sandy loam	Surface stone cover	75 - 100%
Soil colour	Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Rock crevices
Disturbance	Vehicle tracks		
Introduced fauna	None observed		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	Acacia
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

ee2c8815-2d29-4013-b200-c81d5a20c407

### KBB08 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	13/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	404812	<b>Northing</b>	7561392
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Mid slope	Rock type/s	Ironstone
Soil type	Sandy loam	Surface stone cover	75 - 100%
Soil colour	Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Exfoliating rock,Hummocks,Rock crevices
Disturbance			
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	Acacia
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

5753fbe2-aabd-44ad-95c9-8d7572fa41b7

### KBB09 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	12/10/2020	<b>Personnel</b>	EW
<b>Easting</b>	414547	<b>Northing</b>	7561496
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Drainage line	Rock type/s	Calcrete,Ironstone
Soil type	Sandy loam	Surface stone cover	5 - 25%
Soil colour	Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Woody debris
Disturbance			
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	Corymbia
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)	Acacia and Grevillea
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

185c7ba6-f635-48b2-8050-aedde910bd7a

### KBB10 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	11/10/2020	<b>Personnel</b>	LG
<b>Easting</b>	337208	<b>Northing</b>	7588026
<b>Landform and soil</b>		<b>Rock</b>	
Landform	River	Rock type/s	
Soil type	Sandy clay	Surface stone cover	<5%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Tree hollows,Hummocks,Leaf litter,Logs > 10 cm,Peeling bark,Woody debris
Disturbance	Overgrazing		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Mid (10-30 m)	Woodland (20-50%)	Eucalyptus and Corymbia
Mid stratum	Tall (>2 m)	Sparse shrubland and/or heathland (0.25-20%)	Acacia
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

afeaea86-ac54-4699-8610-90491fa5e0b6

### KBB11 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	21/04/2021	<b>Personnel</b>	EW
<b>Easting</b>	416724	<b>Northing</b>	7564153
<b>Landform and soil</b>		<b>Rock</b>	
Landform	Drainage line	Rock type/s	Ironstone
Soil type	Sandy clay	Surface stone cover	5 - 25%
Soil colour	Red,Brown	Surface stone size classes present	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm)
<b>Condition</b>		<b>Habitat Features</b>	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks,Leaf litter,Woody debris
Disturbance	Vehicle tracks		
Introduced fauna	Cattle		
<b>Vegetation</b>			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	Corymbia
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	Acacia
Ground stratum	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

N/A

### KBB12 - Baseline trap site

<b>Project:</b>	4441 Ken's Bore to Ashburton Fauna Survey		
<b>Date</b>	21/04/2021	<b>Personnel</b>	EW
<b>Easting</b>	399171	<b>Northing</b>	7561789
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Drainage line	<b>Rock type/s</b>	Ironstone
<b>Soil type</b>	Sandy clay	<b>Surface stone cover</b>	50 - 75%
<b>Soil colour</b>	Red,Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm),Small Stones (0.6 - 2 cm),Stones (2 - 6 cm),Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	High quality	<b>Water Source</b>	Absent
<b>Fire History</b>	Unknown	<b>Microhabitats</b>	Hummocks,Leaf litter,Woody debris
<b>Disturbance</b>	None observed		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Absent		
<b>Mid stratum</b>	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	Acacia
<b>Ground stratum</b>	Low (<0.5 m)	Open hummock grassland (20-50%)	Triodia



Fulcrum photo ID

N/A

# **Appendix E**

## **Inventory of Vertebrate Fauna Recorded within the Survey Area**











## Terrestrial Vertebrate Fauna Inventory: Records by Observation Method

State - Conservation status under BC Act or DBCA priority list, Federal - Conservation status under EPBC Act, EN - Endangered, VU - Vulnerable, P - Listed as priority by DBCA.

Family	Scientific Name	Common Name	Conservation Status		Capture Method													Grand Total	
			State	Federal	Bucket	Funnel	Pipe	Small Elliott Trap	Hand Capture	Cage Trap	Camera	ARU - Ultrasonic	Sighting	Call	Nest	Remains	Scat		Tracks
<b>Amphibians</b>																			
Limnodynastidae	<i>Notaden nichollsi</i>	Desert Spadefoot					3												3
Pelodyadidae	<i>Cyclorana maini</i>	Sheep Frog			36		31												67
	<i>Litoria rubella</i>	Little Red Tree Frog											5						5
<b>Birds</b>																			
Acanthizidae	<i>Smicrornis brevirostris</i>	Weebill												1					1
Accipitridae	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk											2						2
	<i>Aquila audax</i>	Wedge-tailed Eagle											1						1
	<i>Circus assimilis</i>	Spotted Harrier											3						3
	<i>Haliastur sphenurus</i>	Whistling Kite											3						3
Alcedinidae	<i>Dacelo leachii</i>	Blue-winged Kookaburra												2					2
Anatidae	<i>Chenonetta jubata</i>	Australian Wood Duck (Wood Duck, Maned Duck)											2						2
	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck											50						50
Ardeidae	<i>Ardea pacifica</i>	White-necked Heron											4						4
	<i>Egretta novaehollandiae</i>	White-faced Heron											2						2
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow											16						16
Cacatuidae	<i>Cacatua sanguinea</i>	Little Corella											10	1					11
	<i>Eolophus roseicapilla</i>	Galah											71	1					72
	<i>Nymphicus hollandicus</i>	Cockatiel											17	1					18
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike											8	2					10
	<i>Lalage tricolor</i>	White-winged Triller													1				1
Caprimulgidae	<i>Eurostopodus argus</i>	Spotted Nightjar											2						2
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu																1	1
Charadriidae	<i>Euseyonis melanops</i>	Black-fronted Dotterel											3						3
	<i>Vanellus tricolor</i>	Banded Lapwing											2						2
Columbidae	<i>Geopelia cuneata</i>	Diamond Dove											2	1					3
	<i>Geophaps plumifera</i>	Spinifex Pigeon											2						2
	<i>Ocyphaps lophotes</i>	Crested Pigeon											20	1					21
	<i>Phaps chalcoptera</i>	Common Bronzewing									2								2
Corvidae	<i>Corvus bennetti</i>	Little Crow											16	1					17
	<i>Corvus orru</i>	Torresian Crow									8		7	1					16
Cracticidae	<i>Cracticus nigrogularis</i>	Pied Butcherbird											4	3					7
Cuculidae	<i>Chalcites basalis</i>	Horsfield's Bronze Cuckoo											1						1
Estrildidae	<i>Emblema pictum</i>	Painted Finch									2		6						8
	<i>Taeniopygia guttata</i>	Zebra Finch											26						26
Falconidae	<i>Falco berigora</i>	Brown Falcon											4						4
















## **Appendix F SRE Sites**









SRE Sites




Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE01	Drainage line	Alluvial plain/claypan	Moderate	302833.4	7591350.0	50	
KBSRE02	Drainage line	Drainage line/ river/cree	High	362941.3	7577296.8	50	
KBSRE03	Drainage line	Mulga Woodland	Moderate	353525.4	7584009.5	50	

Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE04	Drainage line	Drainage line/ river/cree	High	379650.4	7572304.4	50	
KBSRE05	Lower slope	Rocky hills/mesa	High	375941.8	7572869.7	50	
KBSRE06	Plain	Stony Plain	Moderate	373469.9	7573392.1	50	

Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE07	Drainage line	Drainage line/ river/cree	High	370709.3	7574421.8	50	
KBSRE08	Plain	Stony Plain	Moderate	370735.1	7574531.6	50	
KBSRE09	Drainage line	Drainage line/ river/cree	High	367704.0	7575627.5	50	

Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE10	Drainage line	Drainage line/ river/cree	High	403876.9	7561383.0	50	
KBSRE11	Plain	Stony Plain	Moderate	402127.9	7561646.4	50	
KBSRE12	Plain	Stony Plain	Moderate	410588.1	7561986.5	50	




Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE13	Drainage line	Drainage line/ river/cree	High	414283.2	7561605.5	50	
KBSRE14	Mid slope	Rocky hills/mesa	High	404942.7	7561151.9	50	
KBSRE15	Drainage line	Plain	Moderate	412380.7	7563430.4	50	




Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE16	Plain	Plain	Moderate	344238.3	7587620.9	50	
KBSRE17	Plain	Plain	Moderate	329371.9	7589770.5	50	
KBSRE18	Dune crest	Sand dunes	Moderate	309931.4	7589097.5	50	

Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE19	Plain	Rocky hills/mesa	High	400034.3	7562494.5	50	
KBSRE20	Mid slope	Rocky hills/mesa	High	399450.3	7562048.0	50	
KBSRE21	Outcrop/breakaway	Rocky hills/mesa	High	399056.7	7561782.1	50	

Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE22	Plain	Stony Plain	Moderate	417359.0	7557451.7	50	
KBSRE23	Drainage line	Drainage line/ river/cree	High	407368.8	7561200.4	50	
KBSRE24	Plain	Stony Plain	Moderate	408221.5	7561102.7	50	



Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE25	Mid slope	Rocky hills/mesa	High	416700.6	7564282.1	50	
KBSRE26	Plain	Stony Plain	Moderate	415305.1	7562892.0	50	
KBSRE27	Drainage line	Drainage line/ river/cree	High	337145.3	7588194.0	50	

Site	Landform	Broard SRE Habitat	SRE Habitat Suitability	Easting	Northing	Zone	Photo
KBSRE28	Plain	Plain	Moderate	320659.2	7590253.9	50	
KBSRE29	Plain	Alluvial plain/claypan	Moderate	313758.9	7590561.3	50	
KBSRE30	Plain	Alluvial plain/claypan	Moderate	313132.2	7588448.1	50	

# **Appendix G**

## **SRE Specimen Abundance and Tracking Codes**

**SRE Specimen Abundance and Tracking Codes**

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
<b>Chelicerata</b>										
Arachnida	Mygalomorphae	Anamidae	<i>Aname ellanae</i>	Widespread	5	KBB01	15/10/20	Dry pitfall trapping	ISTN2621	Dr T Moulds
Arachnida	Mygalomorphae	Anamidae	<i>Aname ellanae</i>	Widespread	4	KBB03	15/10/20	Dry pitfall trapping	ISTN2637	Dr T Moulds
Arachnida	Pseudoscorpionida	Chthoniidae	<i>Austrochthonius australis</i>	Widespread	1	KBSRE05	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2588	Dr T Moulds
Arachnida	Pseudoscorpionida	Chthoniidae	<i>Austrochthonius australis</i>	Widespread	3	KBSRE27	8/07/21	Leaf litter extracted from tullgren funnel	ISTN2597	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>Beierolpium</i> sp.	Possible A	2	KBSRE14	5/06/21	Leaf litter extracted from tullgren funnel	ISTN2574	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>Beierolpium</i> sp.	Possible A	1	KBSRE22	7/06/21	Active searching and leaf litter sifting	ISTN2551	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>Beierolpium</i> sp.	Possible A	1	KBSRE25	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2596	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>Beierolpium</i> sp.	Possible A	2	KBSRE26	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2427	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>Indolpium</i> sp.	Possible A	1	KBSRE01	4/06/21	Leaf litter extracted from tullgren funnel	ISTN2580	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>Indolpium</i> sp.	Possible A	2	KBSRE26	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2592	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>Indolpium</i> sp.	Possible A	1	KBB08	15/10/20	Dry pitfall trapping	ISTN2653	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas</i> 'hairy tail'	Widespread	4	KBB02	15/10/20	Dry pitfall trapping	ISTN2635	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas</i> 'hairy tail'	Widespread	15	KBB03	15/10/20	Dry pitfall trapping	ISTN2639	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas</i> 'hairy tail'	Widespread	2	KBB04	15/10/20	Dry pitfall trapping	ISTN2642	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas</i> 'hairy tail'	Widespread	1	KBB08	15/10/20	Dry pitfall trapping	ISTN2650	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas</i> 'harveyi'	Widespread	1	KBSRE02	5/06/21	Leaf litter extracted from tullgren funnel	ISTN2582	Dr T Moulds

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
Arachnida	Scorpionida	Buthidae	<i>Lychas 'harveyi'</i>	Widespread	1	KBSRE16	6/06/21	Active searching and leaf litter sifting	ISTN2608	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas 'harveyi'</i>	Widespread	3	KBB03	15/10/20	Dry pitfall trapping	ISTN2638	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas 'harveyi'</i>	Widespread	1	KBB06	15/10/20	Dry pitfall trapping	ISTN2646	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas 'harveyi'</i>	Widespread	1	KBB08	15/10/20	Dry pitfall trapping	ISTN2651	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas 'harveyi'</i>	Widespread	7	KBB09	15/10/20	Dry pitfall trapping	ISTN2655	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas 'multipunctatus'</i>	Widespread	1	KBSRE23	7/06/21	Active searching and leaf litter sifting	ISTN2552	Dr T Moulds
Arachnida	Scorpionida	Urodacidae	<i>Urodacus megamastigmus</i>	Widespread	1	KBB09	15/10/20	Dry pitfall trapping	ISTN2654	Dr T Moulds
<b>Mollusca</b>										
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada cf. radleyi</i>	Widespread	1	KBSRE24	7/06/21	Active searching and leaf litter sifting	ISTN2605	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	3	KBSRE04	6/06/21	Active searching and leaf litter sifting	ISTN2511	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	2	KBSRE05	6/06/21	Active searching and leaf litter sifting	ISTN2540	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	2	KBSRE06	6/06/21	Active searching and leaf litter sifting	ISTN2547	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	KBSRE07	6/06/21	Active searching and leaf litter sifting	ISTN2519	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	KBSRE08	6/06/21	Active searching and leaf litter sifting	ISTN2548	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	2	KBSRE09	4/06/21	Active searching and leaf litter sifting	ISTN2492	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	KBSRE10	5/06/21	Active searching and leaf litter sifting	ISTN2541	Dr T Moulds

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	KBSRE11	5/06/21	Active searching and leaf litter sifting	ISTN2487	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	KBSRE12	5/06/21	Active searching and leaf litter sifting	ISTN2553	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	KBSRE13	7/06/21	Active searching and leaf litter sifting	ISTN2558	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	KBSRE24	7/06/21	Active searching and leaf litter sifting	ISTN2420	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	2	KBSRE27	8/07/21	Active searching and leaf litter sifting	ISTN2423	Dr T Moulds
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	4	KBSRE04	8/06/21	Active searching and leaf litter sifting	ISTN2612B	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	1	KBSRE05	9/06/21	Active searching and leaf litter sifting	ISTN2610	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	5	KBSRE12	5/06/21	Active searching and leaf litter sifting	ISTN2567	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	1	KBSRE12	5/06/21	Leaf litter extracted from tullgren funnel	ISTN2575	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	2	KBSRE13	7/06/21	Active searching and leaf litter sifting	ISTN2615A	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	1	KBSRE16	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2591	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	2	KBSRE16	6/06/21	Active searching and leaf litter sifting	ISTN2607	Dr S Judd

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	1	KBSRE19	7/06/21	Active searching and leaf litter sifting	ISTN2556	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	1	KBSRE25	7/06/21	Active searching and leaf litter sifting	ISTN2572A	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	9	KBSRE29	8/06/21	Active searching and leaf litter sifting	ISTN2603	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	12	KBSRE30	8/06/21	Active searching and leaf litter sifting	ISTN2559	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	10	KBSRE30	8/06/21	Active searching and leaf litter sifting	ISTN2618	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	1	KBB02	15/10/20	Dry pitfall trapping	ISTN2634	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	8	KBB03	15/10/20	Dry pitfall trapping	ISTN2636	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	1	KBB06	15/10/20	Dry pitfall trapping	ISTN2647	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	2	KBB08	15/10/20	Dry pitfall trapping	ISTN2652	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 10bf	Widespread	2	KBB09	15/10/20	Dry pitfall trapping	ISTN2656	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 14re	Widespread	1	KBSRE02	5/06/21	Active searching and leaf litter sifting	ISTN2564B	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 14re	Widespread	4	KBSRE03	6/06/21	Active searching and leaf litter sifting	ISTN2563B	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 14re	Widespread	2	KBSRE04	7/06/21	Active searching and leaf litter sifting	ISTN2612	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 14re	Widespread	8	KBSRE07	6/06/21	Active searching and leaf litter sifting	ISTN2614	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 14re	Widespread	5	KBSRE10	5/06/21	Active searching and leaf litter sifting	ISTN2571	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 14re	Widespread	1	KBSRE15	6/06/21	Active searching and leaf litter sifting	ISTN2561	Dr S Judd

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 14re	Widespread	3	KBSRE27	8/07/21	Active searching and leaf litter sifting	ISTN2613	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 14re	Widespread	1	KBSRE28	8/06/21	Active searching and leaf litter sifting	ISTN2417	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 14re	Widespread	2	KBB04	15/10/20	Dry pitfall trapping	ISTN2643	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	6	KBSRE02	5/06/21	Active searching and leaf litter sifting	ISTN2564A	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	2	KBSRE02	5/06/21	Leaf litter extracted from tullgren funnel	ISTN2630	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	1	KBSRE03	6/06/21	Active searching and leaf litter sifting	ISTN2563	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	1	KBSRE03	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2579	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	3	KBSRE08	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2584	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	14	KBSRE13	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2573	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	1	KBSRE13	7/06/21	Active searching and leaf litter sifting	ISTN2615B	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	2	KBSRE15	6/06/21	Active searching and leaf litter sifting	ISTN2560	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	1	KBSRE22	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2593	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia</i> 35/36	Possible A	1	KBSRE24	7/06/21	Active searching and leaf litter sifting	ISTN2604A	Dr S Judd



Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
Malacostraca	Isopoda	Armadillidae	indet. juvenile/ damaged	unknown	1	KBSRE07	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2587	Dr S Judd
Malacostraca	Isopoda	Armadillidae	indet. juvenile/ damaged	unknown	1	KBSRE11	5/06/21	Leaf litter extracted from tullgren funnel	ISTN2577	Dr S Judd
Malacostraca	Isopoda	Armadillidae	indet. juvenile/ damaged	unknown	4	KBSRE13	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2573B	Dr S Judd
Malacostraca	Isopoda	Armadillidae	indet. juvenile/ damaged	unknown	2	KBSRE17	6/06/21	Active searching and leaf litter sifting	ISTN2557	Dr S Judd
Malacostraca	Isopoda	Armadillidae	indet. juvenile/ damaged	unknown	4	KBSRE18	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2590	Dr S Judd
Malacostraca	Isopoda	Armadillidae	indet. juvenile/ damaged	unknown	2	KBSRE22	7/06/21	Active searching and leaf litter sifting	ISTN2611	Dr S Judd
Malacostraca	Isopoda	Armadillidae	indet. juvenile/ damaged	unknown	3	KBSRE24	7/06/21	Active searching and leaf litter sifting	ISTN2604B	Dr S Judd
Malacostraca	Isopoda	Armadillidae	indet. juvenile/ damaged	unknown	1	KBSRE25	7/06/21	Active searching and leaf litter sifting	ISTN2572B	Dr S Judd
Malacostraca	Isopoda	Armadillidae	indet. juvenile/ damaged	unknown	1	KBSRE25	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2626	Dr S Judd
Malacostraca	Isopoda	Armadillidae	indet. Juvenile/damaged	unknown	1	KBSRE03	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2579B	Dr S Judd
Malacostraca	Isopoda	Philosciidae	<i>Philosciidae</i> sp. indet. 'Onslow'	Likely	3	KBSRE15	6/06/21	Active searching and leaf litter sifting	ISTN2562	Dr S Judd
<b>Myriapoda</b>										
Chilopoda	Geophilomorpha	Mescitocephalidae	<i>Mescitocephalus</i> sp.'IS06'	Widespread	1	KBSRE10	5/06/21	Active searching and leaf litter sifting	ISTN2570	Dr T Moulds

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Arthrorhabdus mjobergi</i>	Widespread	1	KBSRE12	5/06/21	Active searching and leaf litter sifting	ISTN2554	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Arthrorhabdus mjobergi</i>	Widespread	1	KBSRE10	5/06/21	Active searching and leaf litter sifting	ISTN2568	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Arthrorhabdus mjobergi</i>	Widespread	1	KBSRE02	5/06/21	Active searching and leaf litter sifting	ISTN2542	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Arthrorhabdus mjobergi</i>	Widespread	1	KBSRE13	7/06/21	Active searching and leaf litter sifting	ISTN2617	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Arthrorhabdus mjobergi</i>	Widespread	1	KBB10	15/10/20	Dry pitfall trapping	ISTN2657	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Cormocephalus turneri</i>	Widespread	1	KBSRE24	7/06/21	Active searching and leaf litter sifting	ISTN2422	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Cormocephalus turneri</i>	Widespread	1	KBB04	15/10/20	Dry pitfall trapping	ISTN2641	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Cryptops</i> sp.'Onslow'	Possible A	1	KBSRE02	5/06/21	Active searching and leaf litter sifting	ISTN2565	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Cryptops</i> sp.'Onslow'	Possible A	1	KBSRE05	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2629	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Cryptops</i> sp.'Onslow'	Possible A	3	KBSRE08	6/06/21	Active searching and leaf litter sifting	ISTN2456	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Cryptops</i> sp.'Onslow'	Possible A	1	KBSRE10	5/06/21	Active searching and leaf litter sifting	ISTN2569	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Cryptops</i> sp.'Onslow'	Possible A	2	KBSRE12	5/06/21	Active searching and leaf litter sifting	ISTN2566	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Cryptops</i> sp.'Onslow'	Possible A	1	KBSRE13	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2622	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Cryptops</i> sp.'Onslow'	Possible A	1	KBSRE13	7/06/21	Active searching and leaf litter sifting	ISTN2616	Dr T Moulds

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Ethmostigmus curtipes</i>	Widespread	1	KBB08	15/10/20	Dry pitfall trapping	ISTN2648	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Scolopendra morsitans</i>	Widespread	2	KBSRE29	8/06/21	Active searching and leaf litter sifting	ISTN2421	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Scolopendra morsitans</i>	Widespread	10	KBSRE30	8/06/21	Active searching and leaf litter sifting	ISTN2419	Dr T Moulds
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Scolopendra morsitans</i>	Widespread	1	KBB06	15/10/20	Dry pitfall trapping	ISTN2645	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	1	KBSRE03	6/06/21	Active searching and leaf litter sifting	ISTN2502	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	1	KBSRE14	5/06/21	Active searching and leaf litter sifting	ISTN2424	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	1	KBSRE22	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2633	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	1	KBSRE25	7/06/21	Active searching and leaf litter sifting	ISTN2426	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	1	KBSRE26	7/06/21	Active searching and leaf litter sifting	ISTN2425	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	1	KBSRE29	8/06/21	Active searching and leaf litter sifting	ISTN2602	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	1	KBB04	15/10/20	Dry pitfall trapping	ISTN2640	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	2	KBB06	15/10/20	Dry pitfall trapping	ISTN2644	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	3	KBB08	15/10/20	Dry pitfall trapping	ISTN2649	Dr T Moulds
Diplopoda	Polydesmida	Paradoxosomatidae	<i>Antichiropus?</i> juvenile	Likely	2	KBSRE02	5/06/21	Leaf litter extracted from tullgren funnel	ISTN2631	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus attemsi</i>	Widespread	1	KBSRE15	6/06/21	Active searching and leaf litter sifting	ISTN2555	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus attemsi</i>	Widespread	1	KBSRE16	6/06/21	Active searching and leaf litter sifting	ISTN2418	Dr T Moulds

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus attemsi</i>	Widespread	1	KBSRE04	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2623	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus attemsi</i>	Widespread	1	KBSRE08	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2625	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus attemsi</i>	Widespread	3	KBSRE25	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2628	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	1	KBSRE15	6/06/21	Active searching and leaf litter sifting	ISTN2601	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	1	KBSRE16	6/06/21	Active searching and leaf litter sifting	ISTN2606	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	1	KBSRE05	6/06/21	Active searching and leaf litter sifting	ISTN2609	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	2	KBSRE26	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2619	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	4	KBSRE14	5/06/21	Leaf litter extracted from tullgren funnel	ISTN2624	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	4	KBSRE25	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2627	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	1	KBSRE06	6/06/21	Leaf litter extracted from tullgren funnel	ISTN2586	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	1	KBSRE24	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2589	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	7	KBSRE26	7/06/21	Leaf litter extracted from tullgren funnel	ISTN2632	Dr T Moulds

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● people ● planet ● professional



**Red Hill North and South Haul Road**

# **Vertebrate Fauna and Short-Range Endemic Invertebrate Fauna Assessment**

**Prepared for  
Mineral Resources Limited**

**April 2022**

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# Executive Summary

Mineral Resources Limited commissioned 360 Environmental part of SLR Consulting to undertake a terrestrial vertebrate and Short-Range Endemic (SRE) invertebrate fauna assessment on Red Hill Station to support the development of the Ashburton Infrastructure Project. The Ashburton Infrastructure Project Haul Road involves developing a fully sealed private haul road that will begin at the boundary of the approved Buckland mine (Bungaroo South), about 45 km southwest of Pannawonica, and continue for approximately 150 km westward towards Onslow. The Survey Area comprises the proposed haul road alignment through Red Hill Station and associated buffer (approximately 250 m), supporting infrastructure areas such as the borrow pits, and a small area adjacent Wheatstone LNG. The Survey Area is approximately 3419 ha.

This report presents the background, methods, results, discussion, and conclusions of the vertebrate fauna and SRE invertebrate fauna surveys undertaken in September/October 2021.

Information from database search results and 17 previous studies undertaken within the region were reviewed during the desktop assessment. The desktop assessment identified 274 terrestrial vertebrate fauna taxa, of which 30 are conservation significant and 22 are listed as Marine under the EPBC Act. An assessment of the likelihood of conservation significant vertebrate fauna occurring within the Survey Area was undertaken, which identified six taxa with a high likelihood of occurrence, two taxa with a medium likelihood of occurrence, and 22 taxa with a low likelihood of occurrence. The desktop assessment identified two possible SRE land snail species, however, these species are considered to have a low and very low likelihood of occurrence within the Survey Area.

The vertebrate fauna and SRE invertebrate fauna surveys followed the EPA (2020) *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* and the EPA (2016) *Technical Guidance for sampling of short-range endemic invertebrate fauna* where possible and practicable. A variety of fauna detection methods were utilised, including pitfall traps, funnel traps, camera traps, autonomous recording units, active searching, leaf litter sampling and opportunistic observations. The vertebrate fauna surveys recorded a total of 71 taxa, comprising 25 birds, 18 mammals, 27 reptiles and one amphibian. The SRE field survey recorded 72 individual specimens representing 14 taxa of invertebrates that have the potential to contain SRE species.



## Terrestrial vertebrate fauna

Fauna habitat mapping was based on a combination of field observations, fauna habitat assessment data and vegetation mapping undertaken by 360 Environmental botanists. Four fauna habitats were mapped, of which the stony hills and slopes (10.3% of the Survey Area) and drainage line/river/creek (major: 15.8% of the Survey Area, minor: 10.1% of the Survey Area) habitats represent the most value to conservation significant fauna and overall fauna assemblages, provide foraging and dispersal habitat for Northern Quoll (*Dasyurus hallucatus*), Ghost Bat (*Macroderma gigas*), Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia* Pilbara form) and Pilbara Olive Python (*Liasis olivaceus barroni*), denning habitat for Western Pebble-mound Mouse (*Pseudomys chapmani*), Long-tailed Dunnart (*Sminthopsis longicaudata*) and Common Brushtail Possum (*Trichosurus vulpecula*), and potential nesting habitat for the Peregrine Falcon (*Falco peregrinus*) and Grey Falcon (*Falco hypoleucos*). The stony plain (63.7% of the Survey Area) habitat was found to provide the lowest habitat value for conservation significant fauna and the overall fauna assemblage due to European Cattle degradation and comparatively fewer microhabitats.

Three conservation significant fauna taxa were recorded within the Survey Area during the fauna surveys:

- Northern Quoll (*Dasyurus hallucatus*), Endangered. Northern Quolls were recorded within the stony hills and slopes habitat in the Survey Area.
- Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia* Pilbara form), Vulnerable. One call was recorded by ARU within the drainage line/river/creek habitat in the Survey Area. This record is consistent with known roost sites outside the Survey Area. No roosting was recorded within the Survey Area.
- Long-tailed Dunnart (*Sminthopsis longicaudata*), Priority 4. An individual was recorded by camera trap within the stony hills and slopes habitat in the Survey Area.

The post survey results identified three additional conservation significant taxa as having a high likelihood of occurrence within the Survey Area:

- Ghost Bat (*Macroderma gigas*), Vulnerable
- Western Pebble-mound Mouse (*Pseudomys chapmani*), Priority 4
- Pilbara Olive Python (*Liasis olivaceus barroni*), Vulnerable.

Three taxa were assessed as having a medium likelihood of occurrence within the Survey Area, and 22 conservation significant taxa were assessed as having a low likelihood of occurrence within the Survey Area

### **Short-range endemic invertebrate fauna**

The drainage line/river/creek and Stony hills and slopes habitats are moderately suitable for SRE invertebrates. The remainder of the fauna habitats within the Survey Area have a low suitability for SRE invertebrates.

No Confirmed or Likely SRE taxa (taxa known to have closely related taxa that show evidence of short-range endemism) were recorded within the Survey Area.

Four Possible SRE taxa (primarily due to the groups being considered data deficient) were recorded within the Survey Area:

- Two *Aname* mygalomorph spiders (*Aname* sp. 'IS03' and *Aname* sp. 'IS04')
- Two Olpiid pseudoscorpions (Olpiidae sp. 1 and Olpiidae sp. 2).

## Table of Contents

<b>1</b>	<b>Introduction</b> .....	<b>1</b>
1.1	The Project.....	1
1.2	Scope and Objectives .....	1
<b>2</b>	<b>Background</b> .....	<b>3</b>
2.1	Protection of Fauna.....	3
2.2	Existing Environment .....	4
<b>3</b>	<b>Methods</b> .....	<b>9</b>
3.1	Desktop Assessment .....	9
3.2	Field Survey .....	12
3.3	Survey Adequacy .....	19
3.4	Limitations .....	19
<b>4</b>	<b>Results</b> .....	<b>23</b>
4.1	Vertebrate Fauna .....	23
4.2	Species Accumulation Curves .....	42
4.3	SRE Invertebrate Fauna .....	44
<b>5</b>	<b>Discussion</b> .....	<b>47</b>
5.1	Terrestrial Vertebrate Fauna.....	47
5.2	SRE Invertebrate Fauna .....	53
<b>6</b>	<b>Conclusion</b> .....	<b>54</b>
<b>7</b>	<b>References</b> .....	<b>56</b>
<b>8</b>	<b>Disclaimer of this Report</b> .....	<b>60</b>

## List of Tables

<b>Table 1: Land systems within the Survey Area</b> .....	<b>6</b>
<b>Table 2: Hydrographic features in the vicinity of the Survey Area</b> .....	<b>7</b>
<b>Table 3: Representation of broad vegetation types within the relevant subregion (Government of Western Australia 2019)</b> .....	<b>7</b>
<b>Table 4: Database Searches</b> .....	<b>10</b>
<b>Table 5: Vertebrate fauna likelihood of occurrence criteria</b> .....	<b>11</b>
<b>Table 6: SRE taxa likelihood of occurrence criteria</b> .....	<b>12</b>
<b>Table 7: Field personnel</b> .....	<b>12</b>
<b>Table 8: Fauna survey weather conditions</b> .....	<b>13</b>
<b>Table 9: Pitfall site trapping effort</b> .....	<b>14</b>
<b>Table 10: Targeted Northern Quoll camera trapping effort</b> .....	<b>15</b>
<b>Table 11: Ultrasonic call ARU trapping effort</b> .....	<b>15</b>
<b>Table 12: Audible call ARU trapping effort</b> .....	<b>16</b>
<b>Table 13: SRE habitat suitability definitions</b> .....	<b>17</b>
<b>Table 14: Short range endemic status of taxon</b> .....	<b>19</b>
<b>Table 15: Survey limitations</b> .....	<b>20</b>
<b>Table 16: Literature review summary</b> .....	<b>24</b>
<b>Table 17: Fauna habitat extents and descriptions</b> .....	<b>32</b>
<b>Table 18: Overview of vertebrate fauna taxa recorded</b> .....	<b>35</b>

<b>Table 19: Number fauna taxa and unique fauna taxa recorded within each habitat type</b>	<b>35</b>
<b>Table 20: Conservation significant vertebrate fauna likelihood of occurrence</b>	<b>39</b>
<b>Table 21: SRE invertebrate fauna likelihood of occurrence within the Survey Area</b>	<b>44</b>
<b>Table 22: Habitat suitability for SRE invertebrates</b>	<b>45</b>
<b>Table 23: SRE invertebrates recorded during the field survey</b>	<b>46</b>

## List of Plates

<b>Plate 1: Trap site layout</b>	<b>14</b>
<b>Plate 2: Northern Quoll captured by camera trap at Cam02 (-22.0106584, 115.9936732)</b>	<b>38</b>
<b>Plate 3: Long-tailed Dunnart captured by camera trap at Cam03 (-22.0469814, 116.0072247)</b>	<b>38</b>

## List of Graphs

<b>Graph 1: Long term and monthly total rainfall, maximum and minimum temperatures for Onslow Airport Weather Station (Station 5017) (Bureau of Meteorology, 2021)</b>	<b>5</b>
<b>Graph 2: Long term and monthly total rainfall, maximum and minimum temperatures for Pannawonica Weather Station (Station 5069) (Bureau of Meteorology, 2021)</b>	<b>5</b>
<b>Graph 4: Bird Species Accumulation Curve</b>	<b>42</b>
<b>Graph 5: Mammal Species Accumulation Curve</b>	<b>43</b>
<b>Graph 6: Reptile and Amphibian Species Accumulation Curve</b>	<b>44</b>

## List of Figures (Out of Text)

<b>Figure 1: Survey Area</b>
<b>Figure 2: IBRA Subregions</b>
<b>Figure 3: Soil Land Systems and Hydrography</b>
<b>Figure 4: Broad Vegetation Types</b>
<b>Figure 5: Conservation and Environmentally Sensitive Area</b>
<b>Figure 6: Survey Effort</b>
<b>Figure 7: Previous Study Locations</b>
<b>Figure 8: DBCA Threatened and Priority Fauna Locations</b>
<b>Figure 9: Fauna Habitats and Conservation Significant Fauna</b>
<b>Figure 10: SRE Habitat Suitability</b>

## List of Appendices

<b>Appendix A Database Searches</b>
<b>Appendix B Fauna Licence</b>
<b>Appendix C Database and Literature Fauna Inventory</b>
<b>Appendix D Fauna and SRE Habitat Assessments</b>
<b>Appendix E Fauna Inventory</b>
<b>Appendix F SRE Inventory</b>

# 1 Introduction

## 1.1 The Project

Mineral Resources Limited (MinRes) commissioned 360 Environmental Pty Ltd (360 Environmental) part of SLR Consulting (SLR) to undertake a terrestrial vertebrate and short-range endemic (SRE) invertebrate fauna assessment to support the development of the Ashburton Infrastructure Project (AIP). The AIP Haul Road involves developing a fully sealed private haul road that will begin at the boundary of the approved Buckland mine (Bungaroo South), about 45 km southwest of Pannawonica, and continue for approximately 150 km westward towards Onslow.

Previous terrestrial vertebrate and SRE invertebrate fauna surveys have been undertaken for the AIP Haul Road, however a portion of the proposed haul road located within the Red Hill Station pastoral lease was unable to be surveyed due to access restrictions during previous surveys. Access to the Red Hill portion (the Survey Area) was acquired in 2021 and a terrestrial vertebrate and SRE invertebrate fauna survey was undertaken in September - October 2021. The Survey Area is approximately 20 km in length and covers approximately 3,418 ha. It consists of two possible haul road routes (a north option and a south option) (Figure 1). This report supplements the *Ashburton Infrastructure Project vertebrate fauna and short-range endemic invertebrate fauna assessment* (360 Environmental Pty Ltd 2021).

## 1.2 Scope and Objectives

The purpose of the terrestrial vertebrate and SRE invertebrate fauna assessment was to inform the Environmental Impact Assessment (EIA) process by undertaking surveys as per the relevant Technical Guidance (Environmental Protection Authority 2016, 2020) and to provide baseline information for supporting documents as part of the approvals process required to develop the AIP. The specific objectives of the assessment were to:

- Undertake a desktop assessment including relevant database searches and a literature review to compile and summarise existing records of fauna within the vicinity of the Survey Area.
- Undertake a single season detailed terrestrial vertebrate fauna survey using a variety of fauna detection methods including cage traps, pitfall traps, funnel traps, camera traps, autonomous recording units (ARUs), active searching and opportunistic observations.
- Undertake a targeted conservation significant vertebrate fauna survey with a particular focus on the following species:
  - Ghost Bats (*Macroderma gigas*)
  - Night Parrot (*Pezoporus occidentalis*)
  - Northern Quolls (*Dasyurus hallucatus*)
  - Pilbara Leaf-nosed Bats (*Rhinonictis aurantia* Pilbara form)

- Pilbara Olive Pythons (*Liasis olivaceus barroni*).
- Compile an inventory of terrestrial vertebrate fauna based on the results of the desktop assessment and field surveys.
- Undertake a single season SRE survey comprising of active searching and leaf litter sampling in September/October 2021 (dry season). Troglifauna and stygofauna are outside the scope of this assessment.
- Extract, sort and identify potential SRE invertebrate specimens.
- Define and delineate the main fauna habitats present within the Survey Area.
- Produce a combined fauna and SRE assessment report based on the findings of the above.
- Supply a geospatial data package prepared in accordance with IBSA requirements.

This report supplements the *Ashburton Infrastructure Project vertebrate fauna and short-range endemic invertebrate fauna assessment* (360 Environmental Pty Ltd 2021) and presents the background, methods, results, discussion, and conclusions of the terrestrial vertebrate fauna and SRE surveys undertaken within the Red Hill Station pastoral lease Survey Area.

## 2 Background

### 2.1 Protection of Fauna

Western Australian fauna is formally protected by the following legislative measures:

- *WA Biodiversity Conservation Act 2016* (BC Act)
- *WA Environmental Protection Act 1986* (EP Act)
- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In addition to these legislative measures, the WA Department of Biodiversity, Conservation and Attractions (DBCA) priority fauna list provides a non-legislative list of possibly threatened, rare but not threatened or near threatened taxa.

In addition to these protection mechanisms, the EIA process is supported by various guidance documents published by the Environmental Protection Authority (EPA), DBCA and the Department of Agriculture Water and Environment (DAWE).

#### Western Australia

- *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (Environmental Protection Authority 2020)
- *Technical Guidance - Sampling of short range endemic invertebrate fauna* (Environmental Protection Authority 2016)
- *Interim guideline for preliminary surveys of Night Parrot (*Pezoporus occidentalis*) in Western Australia* (Department of Parks and Wildlife 2017).

#### Commonwealth

- *Matters of National Environmental Significance – Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment 2013)
- *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act* (Department of Sustainability Environment Population and Communities 1999)
- *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act* (Department of the Environment Water Heritage and the Arts 2010)
- *Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act* (Department of Sustainability Environment Water Population and Communities 2011)

- *Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act* (Department of the Environment Water Heritage and the Arts 1999)
- *EPBC Act referral guideline for the endangered Northern Quoll *Dasyurus hallucatus** (Department of the Environment 2016).

## 2.2 Existing Environment

### 2.2.1 Climate

Two Bureau of Meteorology (BoM) weather stations were consulted due to the location of the Survey Area. The closest long-term BoM weather stations with a complete dataset are Onslow Airport (Station 5017) and Pannawonica Station (Station 5069), located approximately 84 km north of the western end of the Survey Area and 54 km north of the Survey Area, respectively (Figure 1).

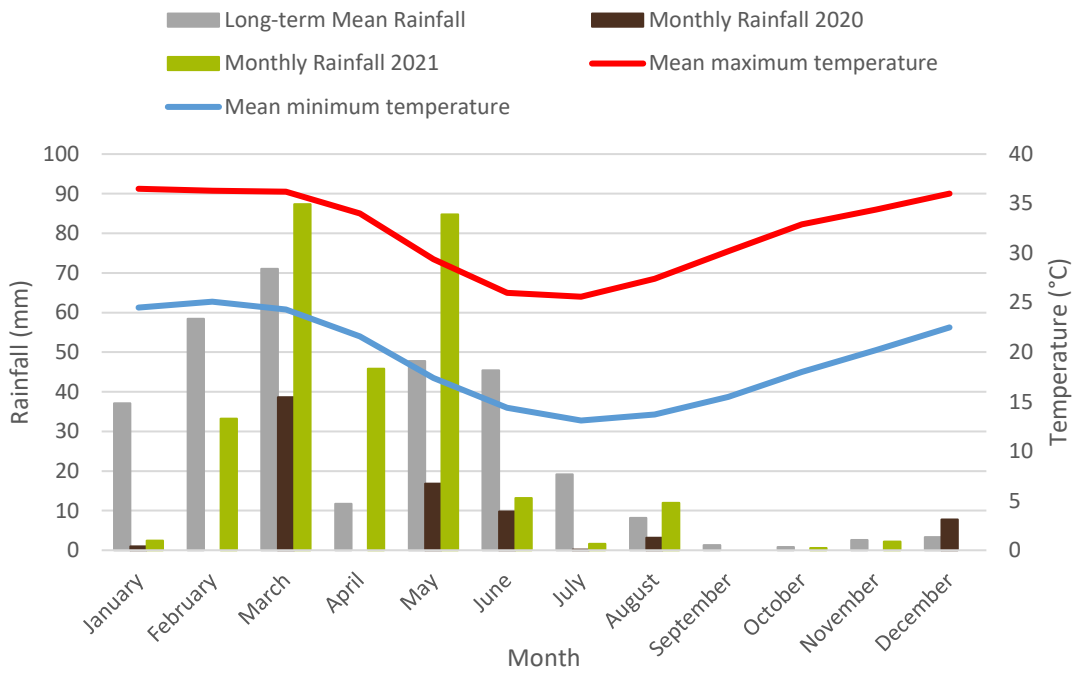
The long-term (1940 to 2021) mean minimum temperature for Onslow Airport ranges from 13.1°C (July) to 25.1°C (February) and the long-term mean maximum temperature ranges from 25.6°C (July) to 36.5°C (January) (**Error! Reference source not found.**) (Bureau of Meteorology 2021).

The long-term (1971 to 2005) mean minimum temperature for Pannawonica ranges from 12.6°C (July) to 25.2°C (January and February) and the long-term mean maximum temperature ranges from 26.7°C (July) to 41.0°C (January) (Graph 2) (Bureau of Meteorology 2021).

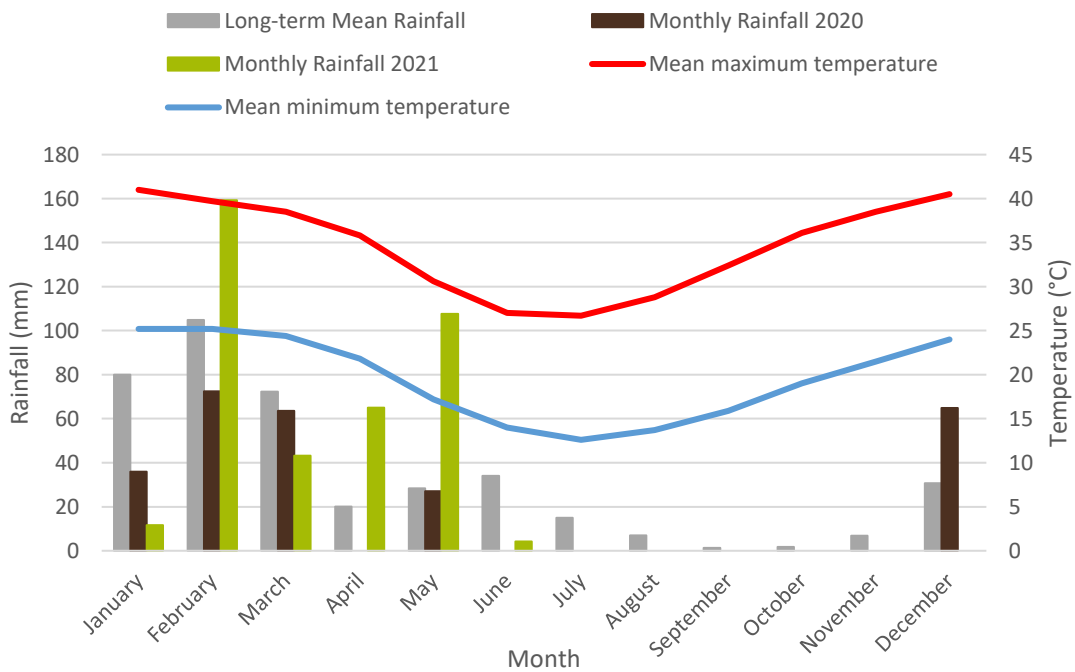
The long-term (1940 to 2021) annual average rainfall for Onslow Airport is 304.2 mm (Bureau of Meteorology 2021). From January to September 2021, the Onslow Airport weather station recorded 280.4 mm of rainfall, which is 19.7 mm below the long-term average of 300.1 mm. The station recorded 13.6 mm of rainfall in July to September 2021 (three months prior to the field survey), which is 15.1 mm below the long-term average of 28.7 mm for the same period (Bureau of Meteorology 2021).

The long-term (1971 to 2021) annual average rainfall for Pannawonica is 403.9 mm (Bureau of Meteorology 2021). In 2020, the Pannawonica weather station recorded 263.9 mm of rainfall, which is 140.0 mm below the long-term average of 403.9 mm. The station recorded 390.8 mm of rainfall in January to July 2021, which is 51.1 mm above the long-term average of 339.7 mm for the same period (Bureau of Meteorology 2021). Rainfall data for the three months prior to the field survey was not available.





**Graph 1: Long term and monthly total rainfall, maximum and minimum temperatures for Onslow Airport Weather Station (Station 5017) (Bureau of Meteorology, 2021).**



**Graph 2: Long term and monthly total rainfall, maximum and minimum temperatures for Pannawonica Weather Station (Station 5069) (Bureau of Meteorology, 2021).**

### 2.2.2 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical, and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework (Department of the Environment and Energy 2016). The Survey occurs within the Pilbara bioregion and the Hammersley (PIL03) subregion (Figure 2).

The Hammersley subregion (PIL03) is the Southern section of the Pilbara Craton. It is a mountainous area of Proterozoic sedimentary ranges and plateaux, dissected by gorges (basalt, shale, and dolerite). The subregion is dominated by Mulga low woodland over bunch grasses on fine textured soils in valley floors, and *Eucalyptus leucophloia* over *Triodia brizoides* on skeletal soils of the ranges. The climate is Semi-desert tropical, with an average annual rainfall of 300mm, which usually falls during summer cyclonic or thunderstorm events, however, winter rain is not uncommon. Drainage occurs into either the Fortescue to the north, the Ashburton to the south, or the Robe to the west (Kendrick 2001).

### 2.2.3 Soil Landscapes and Land Systems

Soil landscapes and land system mapping of WA described broad soil and landscape characteristics from regional to local scales, ranging from 1:20,000 to 1:250,000 (Department of Agriculture and Food WA 2012). The Survey Area intercepts three land systems (Table 1; Figure 3).

**Table 1: Land systems within the Survey Area**

Land System		Description (Department of Agriculture and Food WA 2012)
Name	Code	
Houndstooth System	296Ht	Rough shale hills, stony plains and broad drainage floors supporting hard spinifex grasslands and sparse shrubs.
Nanutarra System	296Nn	Low mesas and hills of sedimentary rocks supporting soft and hard spinifex shrubby grasslands.
Stuart System	296St	Gently undulating stony plains supporting hard and soft spinifex grasslands and snakewood shrublands.

### 2.2.4 Hydrography

Hydrographic features intersecting and within the vicinity of the Survey Area have been identified using linear hydrography GIS data (Department of Water and Environmental Regulation 2016). These features are described in Table 2 and shown in Figure 3.

**Table 2: Hydrographical features in the vicinity of the Survey Area**

Hydrographical Feature	Description
Cane River	Major river flowing north-westerly from its source located west of the Hamersley Range, through the Cane River Conservation Park and the Onslow Coastal plain, before discharging into the Indian Ocean at Yardie Landing approximately 35 km northeast of Onslow. (16.5 km south of the Survey Area).
Red Hill Creek	Major tributary merging with Mungarathoona Creek and joining the Robe River. The Red Hill Creek is 37.9 km long, and its elevation varies from 215 m to 116 m over its length. (8.5 km east of the Survey Area).

### 2.2.5 Broad Vegetation Associations

Mapping of pre-European broad vegetation within WA was completed on a broad scale (1:1,000,000) by Beard (1975). These vegetation types were later re-assessed by Shepherd et al. (2002), resulting in 819 vegetation types within WA. Three vegetation systems associations are mapped within the Survey Area (**Error! Reference source not found.**; Figure 4):

- **Stuart Hills 103:** Shrub-steppe. Hummock grassland with scattered shrubs or mallee (*Triodia* spp., *Acacia* spp., *Grevillea* spp., *Eucalyptus* spp.)
- **Stuart Hills 583:** Sparse shrub-steppe. Hummock grassland with sparse shrubs (*Triodia* spp., *Acacia* spp.)
- **Stuart Hills 612:** Low woodland or open low woodland. *Acacia* spp., *Banksia* spp., *Agonis flexuosa*, *Callitris* spp., *Allocasuarina* spp., *Eucalyptus loxophleba*.
- 

**Table 3: Representation of broad vegetation types within the relevant subregion (Government of Western Australia 2019)**

Broad Vegetation Type	Extent				
	Pre-European (ha)	Current (ha)	Remaining (%)	Current Extent Managed in DBCA Lands (%) *	Within Survey Area (ha)
<b>Representation across the Hamersley (PIL03) sub-region</b>					
103	614,056.46	613,923.76	99.98	4.99	3094.31
583	240,724.25	240,724.25	100.00	41.16	10624.14
612	476.16	476.16	100.00	N/A	186.76

### 2.2.6 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared by the Department of Water and Environmental Regulation (DWER) to prevent the degradation of important environmental values such as Threatened flora, Threatened Ecological Communities (TECs) or significant wetlands (Government 2005).

No ESAs occur within the Survey Area.

The nearest ESAs are (Figure 5):

- A series of offshore island, the closest being Ashburton Island, approximately 71 km northwest of the Survey Area.
- A 96.9 km stretch of coastline on the eastern side of the Exmouth Gulf. The ESA is located approximately 110 km west of the Survey Area
- A series of wetlands surrounding the Fortescue River, which are located approximately 114 km northeast of the Survey Area.
- A defined area north of Millstream Chichester National Park, which is located approximately 116 km northeast of the Survey Area.
- A defined area located approximately 128km south southeast of the Survey Area.

### 2.2.7 Conservation Areas

A small portion of the Survey Area (approximately 20 m<sup>2</sup>) overlaps the north-eastern portion of the Cane River Conservation Park (R 46122), which is vested under the Conservation Commission of Western Australia (Figure 5).

Other conservation areas near the Survey Area are (Department of Biodiversity Conservation and Attractions, 2019):

- Unallocated Crown Land (LR3046/473), vested under the department of Planning, Lands and Heritage – located approximately 30 km west of the Survey Area
- Unallocated Crown Land (LR3115/822), vested under the department of Planning, Lands and Heritage – located approximately 30 km southwest of the Survey Area
- Barlee Range Nature Reserve (R 26808), vested under the Conservation Commission of Western Australia – located approximately 100 km south of the Survey Area
- Millstream Chichester National Park (R 30071), vested under the Conservation Commission of Western Australia – located approximately 120 km northeast of the Survey Area.

## 3 Methods

The terrestrial vertebrate and SRE invertebrate fauna surveys documented within this report were undertaken in accordance with the *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (Environmental Protection Authority 2020) and the *Technical Guidance - Sampling of short range endemic invertebrate fauna* (Environmental Protection Authority 2016) and with consideration for the relevant EPBC guidelines discussed within Section 2.1.

### 3.1 Desktop Assessment

#### 3.1.1 Literature Review

Background information regarding the existing environment within the Survey Area and surrounds was compiled prior to the field surveys (see Section 2.2). Previous studies were sourced from the EPA Consultation Hub, the Index of Biodiversity Surveys for Assessments (IBSA) website, internet search engine, or provided directly by MinRes, were reviewed and summarised. These surveys are listed below and their locations in relation to the current Survey Area are shown in Figure 7:

- *2011 Targeted Surveys for Populations of the Northern Quoll on the West Pilbara Iron Ore Project* (Rapallo Environmental 2012a)
- *A Level 1 Vertebrate Fauna Assessment of the Proposed Tubridgi to Wheatstone Gas Pipeline, Western Australia* (Ninox Wildlife Consulting 2013)
- *Ashburton Infrastructure Project Vertebrate Fauna and Short-Range Endemic Invertebrate Fauna Assessment* (360 Environmental Pty Ltd 2021)
- *Biological Assessment of the Conservation Focus Area for API Management* (Rapallo Environmental 2012b)
- *Echolocation Survey of Bat Activity, API Management Pty Ltd West Pilbara Iron Ore Project: Kens Bore East - Red Hill Creek* (Bat Call WA 2015)
- *Flora and vegetation survey and terrestrial fauna survey for the Pilbara Regional Waste Management Facility* (Phoenix Environmental Sciences 2017)
- *Flora, Vegetation and Fauna Habitat Assessment at Bourne Highway* (Rio Tinto 2018)
- *Northern Quoll Annual Monitoring Survey of the WPIOP Stage 1 for API Management* (Rapallo Environmental 2013)
- *Pilbara Leaf-nosed Bat Monitoring Programme March 2012* (Biologic 2012)
- *Pilbara Olive Python Reconnaissance Survey of the West Pilbara Iron Ore Project* (Rapallo Environmental 2011)
- *West Pilbara Iron Ore Project Activity Assessment for Bats of Conservation Significance* (Astron Environmental Services 2012)

- *West Pilbara Iron Ore Project Habitat Assessment for Terrestrial Fauna of National Environmental Significance* (Astron Environmental Services 2011a)
- *West Pilbara Iron Ore Project MNES Fauna Species Habitat Assessment* (Biota Environmental Sciences 2015a)
- *West Pilbara Iron Ore Project Onslow Rail Corridor – Level 1 Fauna Assessment* (Biota Environmental Sciences 2008)
- *West Pilbara Iron Ore Project Onslow Rail Corridor Terrestrial Fauna Survey* (Biota Environmental Sciences 2009a)
- *West Pilbara Iron Ore Project Pilbara Leaf-nosed Bat Habitat Assessment* (Astron Environmental Services 2011b)
- *West Pilbara Iron Ore Project Red Hill Creek Terrestrial Fauna Assessment: Phase 1* (Biota Environmental Sciences 2015b)
- *West Pilbara Iron Ore Project Stage 1 Extension Terrestrial Fauna Assessment: Phase 1* (Biota Environmental Sciences 2015c).

### 3.1.2 Database Searches

Database searches were undertaken to compile a list of potential fauna and identify potential conservation significant fauna within or surrounding the Survey Area (Table 4). The search area for each parameter was varied to reflect distances recommended by DBCA.

**Table 4: Database Searches**

Database Name	Date Received	Search Area
NatureMap (including Birdata) (Department of Biodiversity Conservation and Attractions 2021)	16 December 2021	Search by line with a 20 km buffer (coordinates provided in Appendix A)
Threatened and Priority Fauna Search (Department of Biodiversity Conservation and Attractions 2020)	27 May 2020	30 km buffer applied to the Survey Area polygon
Protected Matters Search Tool (Department of Agriculture Water and the Environment 2021)	16 December 2021	Search by line with a 20 km buffer (coordinates provided in Appendix A)
WAM database search for Arachnids, Crustacea, and Molluscs (Western Australian Museum 2021a, 2021b, 2021c)	March 2021	1,400,000 ha area bounded by the northwest corner (21.545137°S, 114.726345°E) and the southeast corner (22.256384°S, 116.539467°E)

### 3.1.3 Conservation Significant Fauna Likelihood of Occurrence

Conservation significant fauna species identified from the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area prior to the field survey. The likelihood of occurrence for each taxon was then confirmed or revised post-field survey. The assessment was completed based on the criteria presented in Table 5.

Only species either recorded within the Survey Area or considered as having a high or medium likelihood of occurrence will be discussed in detail. Species classified as having a low likelihood of occurrence based on the above criteria will not be discussed unless further justification for this classification is required.

Species listed as Marine only under the EPBC Act were not included as conservation significant species because the Marine only listed species identified by the desktop assessment were common and widespread, species listed as Marine only do not constitute matters of national environmental significance (MNES) under the EPBC Act, and the Survey Area does not contain any marine habitat.

**Table 5: Vertebrate fauna likelihood of occurrence criteria**

Likelihood	Criteria
<b>Recorded</b>	Recorded during the field survey.
<b>High</b>	Preferred habitat is present within the Survey Area, the Survey Area is within the taxon’s known distribution, and the taxon has been recorded near the Survey Area in the last 15 years. The Survey Area and surrounding habitat is expected to support individuals or populations of the taxon.
<b>Medium</b>	The high likelihood of occurrence criteria has not been met; however, suitable (not necessarily preferred) habitat occurs within the Survey Area and the Survey Area is within or near the taxon’s known distribution. The Survey Area and surrounding habitat may support individuals or populations of the taxon.
<b>Low</b>	No suitable habitat is present within the Survey Area, or the Survey Area is well outside the taxon’s known distribution, or the taxon is considered locally or regionally extinct. The Survey Area and surrounding habitat are unlikely to support individuals or populations of the taxon, however, individuals may rarely occur as transients or vagrants.

### 3.1.4 SRE Invertebrate Fauna Likelihood of Occurrence

Based on the analysis of all available information, potential SRE invertebrate taxa were assigned a level of likelihood to be present within habitats contained in the Survey Area. In the absence of universally recognised criteria, these criteria have been developed by highly experienced SRE practitioner Dr Timothy Moulds from Invertebrate Solutions Pty Ltd (Invertebrate Solutions). These levels of likelihood are described in Table 6.

**Table 6: SRE taxa likelihood of occurrence criteria**

Likelihood	Definition
<b>Definite</b>	The taxon is confirmed to occur within the Survey Area.
<b>High</b>	Habitat for the taxon is known to occur within the Survey Area and known records of the taxon are within 20 km.
<b>Moderate</b>	Habitat for the taxon is known to occur within the Survey Area and known records of the taxon are within 50 km.
<b>Low</b>	The taxon has been recorded from within 50 km, however, no habitat is present for the taxon within the Survey Area.
<b>Very low</b>	No habitat exists for the taxon within the Survey Area and no records of the taxon are within 50 km or the distribution of the taxon is known well enough to exclude its presence within the Survey Area.

### 3.2 Field Survey

The single season detailed terrestrial vertebrate fauna, targeted conservation significant fauna and SRE invertebrate fauna survey was undertaken from 29 September to 8 October 2021.

The field survey was undertaken by a team with a combined 12 years of experience conducting surveys of similar scope throughout WA, in particular the Pilbara region. Table 7 outlines the team members and their relevant experience conducting similarly scoped work. SRE specimen identification and data curation was managed by Dr Timothy Moulds from Invertebrate Solutions.

**Table 7: Field personnel**

Personnel	Role	Years of Experience
Evan Webb	Senior Zoologist	5 Years
Lukas Geidans	Ecologist/Zoologist	4 Years
Lachlan Crossley	Ecologist/Zoologist	3 Years

#### 3.2.1 Licence and Authorisation

The terrestrial vertebrate and SRE invertebrate fauna survey was completed under Fauna Taking (Biological Assessment) Licence – Regulation 27 (BA27000324-3) and an authorisation to take or disturb threatened species under Section 40 of the BC Act (TFA2020-0104-02) (Appendix B).

#### 3.2.2 Weather Conditions

Weather conditions during the field survey are presented in Table 8. Temperature data is from Mardie (Station 5008, 84 km north of the Survey Area) and rainfall data is from Red Hill (Station 5022, 6 km east of the Survey Area) (Bureau of Meteorology 2021). Temperatures during the survey were similar to the long-term average minimum temperature (16.1°C) and maximum temperature (33.7°C) for September/October. A total of 0.0 mm of rainfall was recorded during September/October 2021, which is equal to the long-term median of 0.0 mm.



**Table 8: Fauna survey weather conditions**

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
29/09/2021	13.5	36.2	0
30/09/2021	15.5	37.7	0
01/10/2021	19.5	33.9	0
02/10/2021	17.8	30.7	0
03/10/2021	13.5	31.3	0
04/10/2021	14.5	32.2	0
05/10/2021	15	32.4	0
06/10/2021	17.3	35.9	0
07/10/2021	14.7	36.5	0
08/10/2021	15.3	32	0

### 3.2.3 Vertebrate Fauna

#### 3.2.3.1 Fauna Habitat

Fauna habitat assessments were undertaken throughout the Survey Area to identify fauna habitat (Figure 6). The following information, which has been adapted from the habitat attributes listed in the Technical Guidance (Environmental Protection Authority 2020), was collected at each habitat assessment site using Fulcrum, a mobile data collection app:

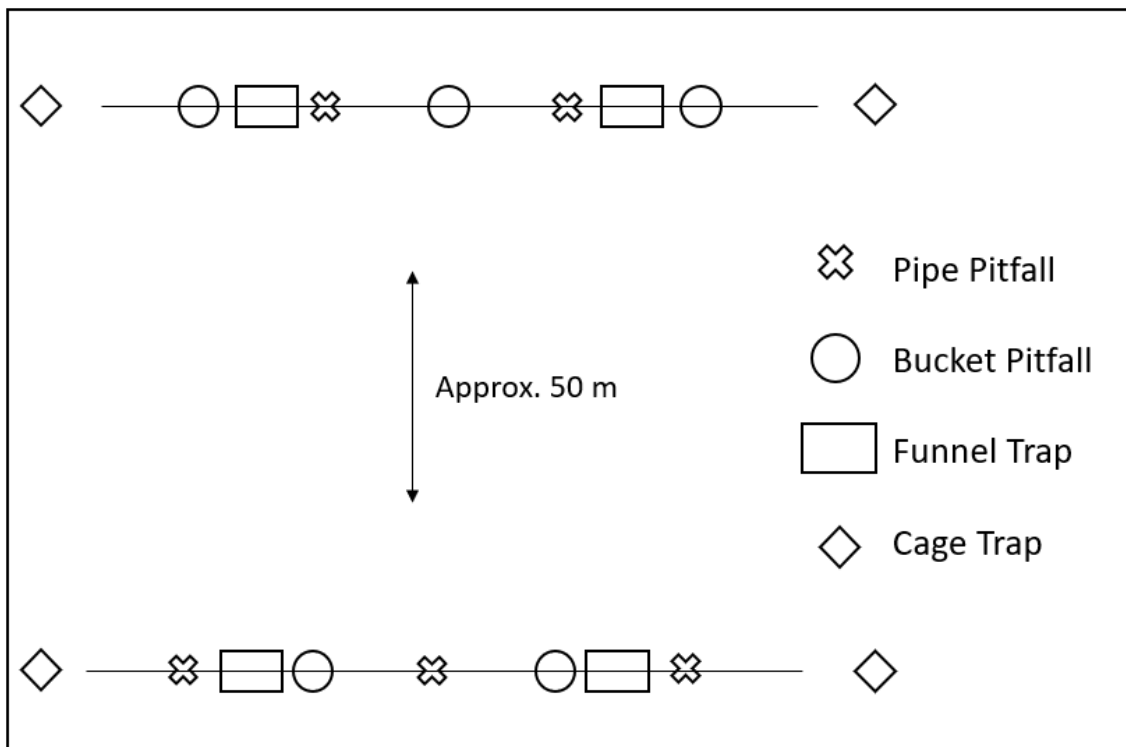
- Site photo
- Landform
- Soil type and colour
- Rock types, surface stone cover and size classes
- Microhabitat features including leaf litter, logs, burrows, rocky outcrops, rock crevices, hollows, water sources
- Habitat quality, fire history and evidence of disturbance
- General description of vegetation structure.

Fauna habitat mapping boundaries were delineated over aerial photography at a scale of 1:5,000 based on field observations, fauna habitat assessment data and vegetation mapping undertaken by 360 Environmental. Polygons were digitised and produced as electronic mapping data using GIS software.

### 3.2.3.2 Trap Sites

Two trap sites were installed in the Survey Area within areas of suitable and representative habitat. Each pitfall site consisted of two trap lines spaced roughly 50 m apart. Individual trap lines were roughly 30 m long and comprised a 30 cm tall flywire drift fence passing over five pitfall traps (20 L buckets and 150 mm PVC pipes) with four funnel traps attached to each drift fence in pairs (eight funnel traps per site). A cage trap was installed at either end of the pitfall trap lines (four cage traps per site). Elliott traps were omitted from trap sites due to high temperatures and animal welfare considerations. Table 9 shows the trapping effort for detailed trap sites, and locations are shown in Figure 6.

A diagram of the pitfall site layout is provided in Plate 1.



**Plate 1: Trap site layout**

**Table 9: Pitfall site trapping effort**

Fauna Habitat	Site Name	Number of Nights Open	Total Pitfall Trap Nights	Total Funnel Trap Nights
Drainage line/river/creek	Trap01	7	70	56
Drainage line/river/creek	Trap02	7	70	56
<b>Total</b>			<b>140</b>	<b>112</b>

### 3.2.3.3 Targeted Northern Quoll Camera Trap Sites

Lines of camera traps were used to target Northern Quolls at three sites. Each trap line consisted of five camera traps, baited with universal bait and sardines or sardines on their own, spaced approximately 100 m apart along linear Northern Quoll habitat.

Spot pattern analysis was undertaken following camera trap retrieval. The unique spot patterns of Northern Quolls captured by camera traps were analysed to quantify the number of individuals detected at each site.

Table 10 shows the total trapping effort for targeted Northern Quoll trap sites, and locations are shown in Figure 6.

**Table 10: Targeted Northern Quoll camera trapping effort**

Fauna Habitat	Site Name	Number of Nights	Number of Camera Traps	Total Camera Trap Days and Nights
Stony hills and slopes (adjacent to drainage line/river/creek)	Cam01	4	5	20
Stony hills and slopes	Cam02	5	5	25
Stony hills and slopes (adjacent to stony plain)	Cam03	5	5	25
<b>Total</b>			<b>15</b>	<b>70</b>

### 3.2.3.4 Acoustic Bat Surveys

Song Meter SM4BAT ultrasonic autonomous recording units (ARUs) were used to target bats. Ultrasonic ARUs were deployed in suitable habitat near pitfall sites. Data captured by ARUs was analysed by Robert Bullen from Bat Call WA.

Table 11 shows the total survey effort for ultrasonic ARUs, and locations are shown in Figure 6.

**Table 11: Ultrasonic call ARU trapping effort**

Fauna Habitat	Nearest Trap Site	Ultrasonic ARU Recording Nights
Drainage line/river/creek	Trap02	7
<b>Total</b>		<b>7</b>

### 3.2.3.5 Acoustic Night Parrot Surveys

Song Meter SM4 acoustic ARUs were used to target the Night Parrot (*Pezoporus occidentalis*). Acoustic ARUs were deployed in suitable habitat near pitfall sites. Data captured by ARUs were analysed by Robert Bullen from Bat Call WA.

Table 12 shows the total survey effort for acoustic ARUs, and locations are shown in Figure 6.

**Table 12: Audible call ARU trapping effort**

Fauna Habitat	Nearest Trap Site	Audible ARU Recording Nights
Drainage line/river/creek	Trap01	7
Drainage line/river/creek	Trap02	7
<b>Total</b>		<b>14</b>

### 3.2.3.6 Targeted Active Searches

Targeted active searches were undertaken at pitfall and SRE sites for a minimum duration of one person hour. These searches targeted evidence of conservation significant fauna such as scat, sloughed skin, remains, evidence of roosting in caves or overhangs, raking of leaf litter, peeling bark, and splitting dead wood.

### 3.2.3.7 Opportunistic Observations and Active Searches

Opportunistic observations of fauna were recorded throughout the Survey Area. Observations of primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings etc.) were recorded. Untimed active searches were undertaken opportunistically in microhabitats likely to contain fauna, involving raking of leaf litter, peeling bark, and splitting dead wood.

### 3.2.3.8 Bird Surveys

Unbounded bird surveys were undertaken at each terrestrial vertebrate fauna trap site and SRE site for a minimum duration of one person hour.

### 3.2.3.9 Identification and Taxonomy

Terrestrial vertebrate fauna taxa were identified in the field and released on site. Data captured by ARUs was analysed by bat specialist Robert Bullen from Bat Call WA. Taxonomy and nomenclature in this report follows the WA Museum checklist 2021 (Western Australian Museum 2021d) where relevant.

## 3.2.4 SRE Invertebrate Fauna

A single season SRE survey was undertaken within the Survey Area in September/October 2021 (active searching and leaf litter sampling). This comprised 15 sites throughout the Survey Area that were actively sampled for SRE invertebrates including leaf litter sifting and hand searching of appropriate microhabitats. Sites were chosen to maximise SRE habitat including south-facing slopes, gullies, rocky outcrops, dense patches of trees and permanent water bodies.

Locations of the SRE sampling sites are shown in Figure 6.

### 3.2.4.1 Active Searches and Leaf Litter Collection

Active searching was undertaken at 15 sites within the Survey Area, focusing on areas more likely to contain SRE fauna. Active searching consisted of sifting of soil and/or leaf litter from suitable habitat areas within each site (millipedes and land snails); the raking of leaf litter (millipedes, land snails, centipedes, mygalomorph burrows); examination of vegetative material below logs and bark (pseudoscorpions, centipedes, millipedes), and an examination of (if present) areas of rock outcrops and associated rock piles.

A minimum of one person hour of active searching was undertaken at each site.

### 3.2.4.2 Opportunistic Collection

Various areas that may provide habitat for SRE invertebrates was opportunistically sampled whilst undertaking other surveys in the area Survey Area. This included searching for burrows of mygalomorph spiders and searching under tree bark and logs for potential SRE taxa.

### 3.2.4.3 SRE Habitat

Potential SRE habitat suitability was assessed and delineated over aerial photography at a scale of 1:5,000 based on fauna habitat mapping and vegetation condition mapping undertaken by 360 Environmental. Polygons were digitised and produced as electronic mapping data using GIS software.

The likelihood that a particular vegetation unit/habitat type contains or supports SRE taxa is defined in Table 13. In the absence of universally recognised definitions, these definitions have been developed by highly experienced SRE practitioner Dr Timothy Moulds from Invertebrate Solutions.

**Table 13: SRE habitat suitability definitions**

SRE Habitat Suitability	Definition
<b>High</b>	The habitat has a high likelihood of containing SRE taxa as it has at least three microhabitat factors that support the presence of SRE taxa such as: southeast facing slopes, moisture, rocky areas, habitat isolates, deep leaf litter, mountainous areas, deep gullies or gorges, riparian vegetation, or habitats known to contain SRE taxa.
<b>Moderate</b>	The habitat has a moderate likelihood of containing SRE taxa as it has at least two microhabitat factors that support the presence of SRE taxa such as: southeast facing slopes, moisture, rocky areas, habitat isolates, deep leaf litter, mountainous areas, deep gullies or gorges, riparian vegetation or habitats known to contain SRE taxa.
<b>Low</b>	The habitat has a low likelihood of containing SRE taxa as it has only a single microhabitat factor that support the presence of SRE taxa such as: southeast facing slopes, moisture, rocky areas, habitat isolates, deep leaf litter, mountainous areas, deep gullies or gorges, riparian vegetation or habitats known to contain SRE taxa.
<b>Nil</b>	No potential habitat exists for SRE taxa within the vegetation type / condition area. This includes areas that are totally cleared, completely degraded or urbanised. This also includes areas that are dominated by weeds or exotic vegetation taxa.

#### 3.2.4.4 Sorting and Curation

Sorting for all SRE samples occurred in the Invertebrate Solutions laboratory using a Leica M125 100x dissecting microscope and was undertaken by Dr Timothy Moulds. In the laboratory, fauna was extracted from SRE leaf litter samples using Tullgren funnels and preserved in 100% ethanol. Each taxon was identified to the lowest practical taxonomic rank using published keys and descriptions, and the numbers of each taxon recorded. Each identified taxon was kept in a separate labelled vial and assigned a specimen tracking code. Specimen and site collection data were recorded in an Excel spreadsheet. At the conclusion of the study, all specimens will be lodged at the Western Australian Museum (WAM).

#### 3.2.4.5 Taxonomy and Nomenclature

Identification of the isopod specimens undertaken by Dr Simon Judd, and identification of all other collected invertebrate material was undertaken by Dr Timothy Moulds from Invertebrate Solutions. Invertebrate groups collected that have no SRE representatives such as ants and flying insects were not identified or reported. The presence of winged adults in most insect groups suggests that they are more capable dispersers and, therefore, less likely to have a restricted range.

The level of specimen identification achievable is dependent on the level of taxonomic knowledge and expertise available. Most of the taxonomic expertise relating to SRE taxa resides with the staff of the WAM, while some groups are also worked on by researchers within other government departments and academic institutions. Taxonomic treatments are available for some invertebrate groups, but not all. The EPA expects that invertebrates collected for identification will be identified to the lowest taxonomic level possible. Ideally, this is to the species level, but there will be limits due to the nature of specimens and the availability of taxonomic keys. Specimens identified to genus level only were excluded from the analysis as it is impossible to determine if they represent a SRE taxon.

#### 3.2.4.6 SRE Status

Taxonomic groups known to contain SRE representatives were examined in more detail to determine if the specimens collected are potentially restricted forms. SRE status was assigned using the categories described in Table 14 after comparison with the morphology of other close relatives in the group and current knowledge on their distribution and ecology, where known. The definition for confirmed SRE status is based on that used by Harvey (2002), however, no other recognised definitions exist, therefore the definitions for possible SRE taxa have been adapted from unpublished WAM guidelines by highly experienced SRE practitioner Dr Timothy Moulds from Invertebrate Solutions.

**Table 14: Short range endemic status of taxon**

SRE Status	Definition
<b>Confirmed</b>	A confirmed SRE taxon. A known distribution of < 10,000 km <sup>2</sup> (Harvey 2002). Taxonomy of the group is well known. The group is well represented in collections, or via comprehensive sampling.
<b>Likely</b>	Likely to be a SRE taxon based upon knowledge of the family/genus, where other closely related taxa show evidence of short-range endemism. Where habitats containing the specimens show discontinuity within the landscape.
<b>Possible</b>	Based upon existing knowledge of the family/genus there is a possibility that the taxon may have a restricted range. Where habitats containing the specimens may show discontinuity within the landscape, possible SRE taxon may be assigned one of the subcategories below: <ol style="list-style-type: none"> <li>1. Data deficient. i.e. new species, lack of distribution, taxonomic or collecting knowledge, juvenile specimens, wrong sex for identification</li> <li>2. Habitat indicators</li> <li>3. Morphology indicators</li> <li>4. Molecular evidence</li> <li>5. Research and expertise of WAM staff/taxonomic specialists.</li> </ol>
<b>Widespread</b>	Not an SRE, a wide-ranging distribution of >10,000 km <sup>2</sup>

### 3.3 Survey Adequacy

Species accumulation curves for vertebrate fauna groups were plotted using the open source software R (R Core Team 2020) to demonstrate the adequacy of survey effort at sampling locations within the Survey Area. The treatments comprised Sobs (Mao Tao), to reflect the observed number of species (based on the total number of species recorded), and richness estimators (Chao, Jackknife 1, Jackknife 2 and Bootstrap) to predict the total number of fauna taxa that could potentially be recorded (Clarke & Gorley 2006).

### 3.4 Limitations

Limitations and constraints of the fauna surveys are detailed in Table 15.

**Table 15: Survey limitations**

Variable	Constraint (Yes/Partial/No)	Potential Constraints on Survey Outcomes
<b>Survey scope</b>	Partial	<p>The single season detailed terrestrial vertebrate fauna, targeted conservation significant vertebrate fauna and single season SRE surveys were undertaken in accordance with the <i>Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment</i> (Environmental Protection Authority 2020) and <i>Technical Guidance - Sampling of short range endemic invertebrate fauna</i> (Environmental Protection Authority 2016) where possible and practicable.</p> <p>The scope of the detailed terrestrial vertebrate fauna survey was limited to a single season. Information was available from many similar surveys previously undertaken nearby, as shown in Section 3.1.1 and below in Section 4.1.1, therefore it is unlikely that a second season survey will yield taxa that have not been identified in the desktop assessment.</p> <p>Targeted surveys for fauna of conservation significance were undertaken in habitat suitable for Threatened and Priority fauna.</p>
<b>Availability of data and information</b>	No	<p>All data required to complete the scope of works including regional and local contextual information was available. Information was available from many similar surveys previously undertaken nearby, as shown in Section 3.1.1 and below in Section 4.1.1.</p>
<b>Site Access</b>	No	<p>The Survey Area was accessed by helicopter, vehicle and on foot.</p>
<b>Adequacy of survey intensity</b>	No	<p>The <i>Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment</i> (Environmental Protection Authority, 2020) recommends two trap sites per habitat type. The current Survey Area is a portion of the larger AIP Haul Road Survey Area. While two trap sites were not placed within each habitat type during the current survey, all habitat types occurring within the current Survey Area have been sampled during other fauna surveys as part of the AIP fauna surveys.</p> <p>Two terrestrial vertebrate fauna pitfall sites and three camera trap sites targeting conservation significant terrestrial vertebrate fauna were sampled across the Survey Area. A variety of vertebrate fauna detection methods were utilised, including:</p> <ul style="list-style-type: none"> <li>• 135 pitfall trap nights</li> <li>• 78 funnel trap nights</li> <li>• 70 camera trap days and nights</li> <li>• 7 ultrasonic call ARU recording nights</li> <li>• 14 audible call ARU recording nights.</li> </ul>



Variable	Constraint (Yes/Partial/No)	Potential Constraints on Survey Outcomes
		<p>The SRE surveys included over 30 person hours of active searching, 15 leaf litter samples extracted in Tullgren funnels and 135 pitfall trap nights to provide a high degree of certainty that the majority of potential SRE invertebrates present at the time of surveys were recorded from the Survey Area.</p> <p>Given the size of the Survey Area it was not feasible to systematically survey the entire Survey Area. Additional fauna taxa would likely be recorded with additional survey effort.</p> <p>Access across the Survey Area was sufficient to describe fauna habitats and their extents given the use of a helicopter. Sufficient time was allocated to the fauna surveys, given the size and complexity of the Survey Area and the expected level of survey intensity.</p> <p>The survey effort was considered adequate to assess the fauna values of the Survey Area and provide the information required to support approvals applications.</p>
<b>Competency and experience</b>	No	<p>The fauna field survey was undertaken by a team with extensive experience in undertaking similar scopes of work within the bioregion:</p> <ul style="list-style-type: none"> <li>• Senior Zoologist Evan Webb – 5 years’ experience</li> <li>• Ecologist Lukas Geidans – 4 years’ experience</li> <li>• Ecologist Lachlan Crossley – 3 years’ experience.</li> </ul> <p>ARU data analysis was undertaken by specialist Robert Bullen of Bat Call WA. SRE specimen identification and data curation was managed by specialist Dr Timothy Moulds of Invertebrate Solutions and Dr Simon Judd.</p>
<b>Timing, Weather and Season</b>	Partial	<p>The fauna field survey was undertaken during September/October 2021. The survey was undertaken during the recommended primary survey periods for the Eremaean Climatic Region as per the Technical Guidance for reptiles (September to April) and mammals (no preferred time), but outside the recommended primary survey periods for amphibians and birds (immediately after rain events) and SREs (November to April or timed to coincide with rainfall). However, active searching for SREs is effective outside the optimal survey period because detection of SRE invertebrates does not depend on invertebrate activity levels.</p>

Variable	Constraint (Yes/Partial/No)	Potential Constraints on Survey Outcomes
<b>Proportion of fauna identified, recorded and/or collected</b>	No	<p>All vertebrate fauna taxa recorded during the survey were able to be identified with a high level of confidence.</p> <p>Invertebrate taxa were identified to the lowest practical taxonomic level, taking into consideration that the taxonomic framework of many invertebrate groups is incomplete and often in need of substantial revision to enable accurate identification.</p> <p>Short Range Endemic status was assigned using the available information from the WAM database and discussion with appropriate taxonomic authorities for various invertebrate groups. Insufficient information exists for many invertebrate taxa due to specimens being juvenile, the wrong sex to allow identification, damaged, or inadequate taxonomic frameworks, precluding the assignment of SRE status.</p>
<b>Disturbances</b>	No	<p>Areas of disturbance associated with old borrow pits, access tracks, cattle grazing, and trampling, weeds and frequent fire were recorded but were not a constraint on the results of the survey.</p>
<b>Problems with data and analysis</b>	No	<p>There were no constraints on the results of the survey due to problems with data and analysis.</p>

## 4 Results

### 4.1 Vertebrate Fauna

#### 4.1.1 Desktop Assessment

The literature review and database searches identified 274 terrestrial vertebrate fauna taxa, of which 30 are conservation significant, comprising:

- A total of 140 birds, of which 23 are conservation significant
- A total of 40 mammals, of which five are conservation significant (excluding marine mammals)
- A total of 89 reptiles, of which two are conservation significant (excluding marine reptiles)
- Five amphibians, none of which are conservation significant.

The locations of the previous studies reviewed are shown in Figure 7 and key findings of the literature review are summarised below in Table 16. The results of the DBCA Threatened and Priority Fauna database search are mapped in Figure 8 and database searches are displayed in Appendix A. A full inventory of fauna identified during the desktop assessment is presented in Appendix C.

**Table 16: Literature review summary**

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>2011 Targeted Surveys for Populations of the Northern Quoll on the West Pilbara Iron Ore Project (Rapallo Environmental 2012a)</i>	11 km east of the Survey Area	June, July, August, October 2011	<ul style="list-style-type: none"> <li>• 164 camera traps, five nights</li> <li>• 160 cage traps, eight trapping sites</li> </ul>	<ul style="list-style-type: none"> <li>• 41 Northern Quoll (<i>Dasyurus hallucatus</i>) captured with cage traps</li> <li>• Pilbara Olive Python (<i>Liasis olivaceus barroni</i>)</li> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonicteris aurantia</i> Pilbara form)</li> <li>• Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>)</li> <li>• Peregrine Falcon (<i>Falco peregrinus</i>).</li> </ul>	<p>Four habitats were identified:</p> <ul style="list-style-type: none"> <li>• Potential denning habitat (Areas with caves, crevices, and tunnels)</li> <li>• Potential forage and dispersal habitats (Areas that border denning habitat)</li> <li>• Adjacent to medium suitable habitats (Areas with sparse vegetation or no caves, crevices, or tunnels)</li> <li>• Other (Areas with no suitable Northern Quoll habitat).</li> </ul>
<i>Ashburton Infrastructure Project Vertebrate Fauna and Short-Range Endemic Invertebrate Fauna Assessment (360 Environmental Pty Ltd 2021)</i>	Adjacent to the Survey Area	June 2020 October 2020, April, May, June 2021	<p>Basic Fauna Survey</p> <p>Detailed Fauna Survey</p> <p>Detailed SRE Survey</p> <p>Targeted ConSig Fauna Survey</p>	<ul style="list-style-type: none"> <li>• 17 Northern Quoll (<i>Dasyurus hallucatus</i>) identified with motion cameras</li> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonicteris aurantia</i> Pilbara form)</li> <li>• Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>).</li> </ul>	<p>Ten habitats were identified:</p> <ul style="list-style-type: none"> <li>• Plain (27.2%)</li> <li>• Stony Plain (21.9%)</li> <li>• Sand dunes and swales (10.4%)</li> <li>• Drainage line/river/creek (major) (0.5%)</li> <li>• Drainage line/river/creek (minor) (6.3%)</li> <li>• Tidal flats (5.7%)</li> <li>• Claypan (0.1%)</li> <li>• Mulga woodland (1.2%)</li> <li>• Stony hills and slopes (3.8%)</li> <li>• Mesas and breakaways (0.2%)</li> </ul>

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>A Level 1 Vertebrate Fauna Assessment of the Proposed Tubridgi to Wheatstone Gas Pipeline, Western Australia (Ninox Wildlife Consulting 2013)</i>	54 km west of the Survey Area	April 2013	Reconnaissance Survey	<ul style="list-style-type: none"> <li>None</li> </ul>	Mangrove habitat was identified.
<i>Biological Assessment of the Conservation Focus Area for API Management (Rapallo Environmental 2012b)</i>	22 km east of the Survey Area Red Hill Creek and Cane River	June 2011 and May 2012	Reconnaissance Survey: <ul style="list-style-type: none"> <li>24 camera traps, 19-22 days</li> <li>10 SM2+ echolocation recording units</li> </ul> Trapping Survey: <ul style="list-style-type: none"> <li>100 cage traps, five trapping sites</li> </ul>	<ul style="list-style-type: none"> <li>13 Northern Quoll (<i>Dasyurus hallucatus</i>) captured on motion camera</li> <li>23 Northern Quoll (<i>Dasyurus hallucatus</i>) captured within cage traps</li> <li>Ghost Bat (<i>Macroderma gigas</i>)</li> <li>Pilbara Leaf-nosed Bat (<i>Rhinonicteris aurantia</i> Pilbara form)</li> <li>Pilbara Olive Python (<i>Liasis olivaceus barroni</i>)</li> <li>Peregrine Falcon (<i>Falco peregrinus</i>).</li> </ul>	Eight habitats were identified: <ul style="list-style-type: none"> <li>Gorge</li> <li>Hill/Plateau</li> <li>Mesa/Outcrop</li> <li>Major Riparian (incised drainage)</li> <li>Major Riparian (open drainage)</li> <li>Minor Riparian (incised drainage)</li> <li>Minor Riparian (open drainage)</li> <li>Plains</li> <li>37 caves recorded and assessed.</li> </ul>

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>Echolocation Survey of Bat Activity, API Management Pty Ltd West Pilbara Iron Ore Project: Kens Bore East -Red Hill Creek (Bat Call WA 2015)</i>	23 km east of the Survey Area	August 2015	<ul style="list-style-type: none"> <li>• 20 survey sites</li> </ul>	<ul style="list-style-type: none"> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonictoris aurantia</i> Pilbara form)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>).</li> </ul>	Two broad bat habitats identified: <ul style="list-style-type: none"> <li>• Regional Bat Habitat 2: Hamersley Range – Productive watercourse, waterholes, and riparian sites’</li> <li>• Regional Bat Habitat 3: Hamersley Range – Deep shelters and caves.</li> </ul>
<i>Flora and vegetation survey and terrestrial fauna survey for the Pilbara Regional Waste Management Facility (Phoenix Environmental Sciences 2017)</i>	66 km west of the Survey Area	September 2017	Desktop Review Targeted Terrestrial Fauna Survey	<ul style="list-style-type: none"> <li>• None</li> </ul>	Two habitats were identified: <ul style="list-style-type: none"> <li>• Mosaic of hummock grassland and shrubland on plain (85.9%)</li> <li>• Shrubland on sand dune (14.1%).</li> </ul>
<i>Flora, Vegetation and Fauna Habitat Assessment at Bourne Highway (Rio Tinto 2018)</i>	85 km southeast of the Survey Area	June – July 2017	Desktop Assessment Reconnaissance Field Survey Targeted Bat Survey	<ul style="list-style-type: none"> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonictoris aurantia</i> Pilbara form)</li> <li>• Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>).</li> </ul>	Five habitats were identified: <ul style="list-style-type: none"> <li>• Rocky slopes (89.2%)</li> <li>• Rocky breakaways and cliffs (1.16%)</li> <li>• Gullies (0.97%)</li> <li>• Drainage lines (6.95%)</li> <li>• Plains (0.99%).</li> </ul>

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>Northern Quoll Annual Monitoring Survey of the WPIOP Stage 1 for API Management</i> (Rapallo Environmental 2013)	11 km east of the Survey Area	June/July 2012	<ul style="list-style-type: none"> <li>• 150 cage traps, eight trapping sites</li> </ul>	<ul style="list-style-type: none"> <li>• 75 Northern Quoll (<i>Dasyurus hallucatus</i>) captured within cage taps.</li> </ul>	NA
<i>Pilbara Leaf-nosed Bat Monitoring Programme March 2012</i> (Biologic 2012)	15 km east of the Survey Area	March 2012	<ul style="list-style-type: none"> <li>• 13 bat monitoring sites</li> </ul>	<ul style="list-style-type: none"> <li>• Pilbara Leaf-nosed Bat (<i>Rhinionictoris aurantia</i> Pilbara form)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>).</li> </ul>	NA
<i>Pilbara Olive Python Reconnaissance Survey of the West Pilbara Iron Ore Project</i> (Rapallo Environmental 2011)	23 km southeast of the Survey Area	August 2010	<ul style="list-style-type: none"> <li>• 176 survey sites</li> </ul>	<ul style="list-style-type: none"> <li>• Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>)</li> <li>• Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>).</li> </ul>	NA

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>West Pilbara Iron Ore Project Activity Assessment for Bats of Conservation Significance</i> (Astron Environmental Services 2012)	8 km east of the Survey Area	March, July, and October 2011	<ul style="list-style-type: none"> <li>• 16 field survey days</li> <li>• 18 recording sites</li> </ul>	<ul style="list-style-type: none"> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantia</i> Pilbara form).</li> </ul>	NA
<i>West Pilbara Iron Ore Project Habitat Assessment for Terrestrial Fauna of National Environmental Significance</i> (Astron Environmental Services 2011a)	8 km east of the Survey Area	May 2011	Desktop Assessment	NA	Five broad habitat types.
<i>West Pilbara Iron Ore Project MNES Fauna Species Habitat Assessment</i> (Biota Environmental Sciences 2015a)	11 km east of the Survey Area	September / October 2015	<ul style="list-style-type: none"> <li>• 36 representative habitat assessment sites, 21 sites ground truthed</li> </ul>	<ul style="list-style-type: none"> <li>• Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>).</li> </ul>	NA



Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<i>West Pilbara Iron Ore Project Onslow Rail Corridor – Level 1 Fauna Assessment</i> (Biota Environmental Sciences 2008)	Overlaps Survey Area	2008	Desktop Assessment	NA	Five habitats were identified: <ul style="list-style-type: none"> <li>• Mudflats</li> <li>• Alluvial Plains</li> <li>• Sandy Plains</li> <li>• Stony Plains</li> <li>• Mesas and Hills.</li> </ul>
<i>West Pilbara Iron Ore Project Onslow Rail Corridor Terrestrial Fauna Survey</i> (Biota Environmental Sciences 2009a)	Overlaps Survey Area	October 2008	Detailed Fauna Survey	<ul style="list-style-type: none"> <li>• Northern Quoll (<i>Dasyurus hallucatus</i>).</li> </ul>	Six habitats were identified: <ul style="list-style-type: none"> <li>• Buffel grass (<i>Cenchrus ciliaris</i>) and <i>Triodia</i> sp. on red silty loam</li> <li>• <i>Triodia</i> sp. on red sand dune</li> <li>• Samphire flat</li> <li>• <i>Acacia</i> sp. and <i>Triodia</i> sp. on stony loam alongside drainage line</li> <li>• <i>Acacia</i> sp. and <i>Triodia</i> sp. on loam</li> <li>• <i>Triodia</i> sp. on stony loam scree slope.</li> </ul>
<i>West Pilbara Iron Ore Project Pilbara Leaf-nosed Bat Habitat Assessment</i> (Astron Environmental Services 2011b)	8 km east of the Survey Area	October 2011	<ul style="list-style-type: none"> <li>• 113 habitat assessments</li> </ul>	<ul style="list-style-type: none"> <li>• None</li> </ul>	NA

Report	Distance to current Survey Area	Survey timing	Survey effort	Recorded conservation significant fauna	Fauna habitats
<p><i>West Pilbara Iron Ore Project Red Hill Creek Terrestrial Fauna Assessment: Phase 1 (Biota Environmental Sciences 2015b)</i></p>	25 km east of the Survey Area	May 2015	<ul style="list-style-type: none"> <li>• 708 trap nights</li> <li>• 6.5 hrs avifauna censuses</li> <li>• 14 recording nights (SM2BAT SongMeter)</li> <li>• 15 camera trap nights</li> <li>• 78 person hrs SRE searches.</li> </ul>	<ul style="list-style-type: none"> <li>• Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantia</i> Pilbara form)</li> <li>• Pilbara Olive Python (<i>Liasis olivaceus barroni</i>)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>)</li> <li>• Grey Falcon (<i>Falco hypoleucos</i>).</li> </ul>	<p>Ten habitats were identified:</p> <ul style="list-style-type: none"> <li>• Gorge</li> <li>• Free face</li> <li>• Breakaway</li> <li>• Pediment</li> <li>• Hill slope</li> <li>• Plateau</li> <li>• Minor drainage line</li> <li>• Flood plain</li> <li>• Alluvial plain</li> <li>• Major drainage line.</li> </ul>
<p><i>West Pilbara Iron Ore Project Stage 1 Extension Terrestrial Fauna Assessment: Phase 1 (Biota Environmental Sciences 2015c)</i></p>	23 km east of the Survey Area	May 2015	<ul style="list-style-type: none"> <li>• 1,633 trap nights</li> <li>• 15 hrs avifauna censuses</li> <li>• 14 recording nights (SM2BAT SongMeter)</li> <li>• 12 camera trap nights</li> <li>• 39 person hrs SRE searches</li> </ul>	<ul style="list-style-type: none"> <li>• Northern Quoll (<i>Dasyurus hallucatus</i>)</li> <li>• Pilbara Leaf-nosed Bat (<i>Rhinonictis aurantia</i> Pilbara form)</li> <li>• Ghost Bat (<i>Macroderma gigas</i>)</li> <li>• Gane's blind snake (<i>Anilius ganei</i>)</li> <li>• Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>)</li> <li>• Grey Falcon (<i>Falco hypoleucos</i>).</li> </ul>	<p>Six habitats were identified:</p> <ul style="list-style-type: none"> <li>• Flood plain/Alluvial plain</li> <li>• Goerge/Freeface/Breakaway</li> <li>• Hill plateau/Mesa plateau</li> <li>• Major drainage</li> <li>• Minor drainage</li> <li>• Pediment/Hillslope.</li> </ul>

#### 4.1.2 Field Survey



##### 4.1.2.1 Fauna Habitat


Four broad fauna habitats (excluding cleared areas) were identified and mapped within the Survey Area.


Habitat condition varied throughout the Survey Area, with the most prolific disturbance being cattle grazing and trampling. Other disturbances included historical clearing for roads, infrastructure and access tracks, weeds, burning, and rubbish.

Descriptions, extents, and representative photos for fauna habitats within the Survey Area are provided below in Table 17. Fauna habitat extents have been rounded to the nearest hectare. Fauna habitat mapping is displayed in Figure 9 and habitat assessment site sheets are presented in Appendix D.

**Table 17: Fauna habitat extents and descriptions**

Habitat	Extent within Survey Area	Habitat description	Conservation significant fauna value	Representative photo
Stony plain	2,178 ha 63.7%	<p><i>Triodia</i> hummock grassland on stony plain with a sparse overstorey of mixed shrubs dominated by <i>Acacia</i> spp. with occasional <i>Corymbia</i> sp.</p> <p>Abundant <i>Triodia</i> hummocks found within this habitat type provide an important source of shelter, refuge and nesting opportunities for small fauna taxa including birds, mammals, and reptiles. The stony substrate is not as suitable for burrowing taxa as plains with sandy substrates. Some areas were undulating, forming small hills and gentle slopes. Cattle degradation was observed throughout the Survey Area. The conservation significant Western Pebble-mound Mouse may rely on this habitat type.</p>	Low value overall for MNES.	
Stony hills and slopes	352 ha 10.3%	<p>Stony hills and slopes, often with thin soils over shallow bedrock. Vegetation consists of sparse <i>Triodia</i> hummock grasslands with scattered <i>Corymbia</i> sp., and <i>Acacia</i> sp.</p> <p>Microhabitats include <i>Triodia</i> hummocks which provide shelter for a variety of taxa. The conservation significant Western Pebble-mound mouse may rely on this habitat type. When adjacent mesas and breakaway habitat, stony hills and slopes will provide important foraging and dispersal habitat for conservation significant taxa such as the Northern Quoll and, when near water sources, the Pilbara Olive Python.</p>	High quality for Northern Quoll and Pilbara Olive Python, foraging and dispersal habitat.	

Habitat	Extent within Survey Area	Habitat description	Conservation significant fauna value	Representative photo
Drainage line/river/creek (minor)	345 ha 10.1%	<p>Dense overstorey vegetation made up primarily of tall <i>Acacia</i> spp., occasionally with <i>Eucalyptus</i> sp. and <i>Corymbia</i> sp. Ground cover is typically <i>Triodia</i> hummock grassland or tussock grassland on substrates ranging from sand to sandy clay, with an assortment of river stones. Minor drainage lines have a lower presence of gullying and water erosion, permanent or semi-permanent pooling of water and typically have smaller trees than major drainage lines.</p> <p>The overstorey vegetation provides valuable nesting and foraging habitat for birds, including conservation significant taxa such as the Grey Falcon and Peregrine Falcon, albeit less value than major drainage lines due to the lower density of large trees. Key microhabitats include woody debris, leaf litter, peeling bark, hollow trees and logs, and hummock grasslands provide refuge, shelter, and foraging opportunities for a wide variety of fauna taxa. Minor drainage lines may be seasonally inundated. This habitat was extensively degraded by cattle in many areas.</p>	<p>Moderate quality for Northern Quoll, Ghost Bat, Pilbara Leaf-nosed Bat, and Pilbara Olive Python foraging and dispersal habitat.</p> <p>Moderate quality nesting and foraging for the Grey Falcon.</p>	

Habitat	Extent within Survey Area	Habitat description	Conservation significant fauna value	Representative photo
Drainage line/river/creek (major)	519 ha 15.2%	<p>Dense overstorey vegetation made up primarily of <i>Eucalyptus</i> sp. and <i>Corymbia</i> sp., and tall <i>Acacia</i> spp. Ground cover is typically <i>Triodia</i> hummock grassland or tussock grassland on substrates ranging from sand to sandy clay, with an assortment of river stones. Major drainage lines had a greater presence permanent or semi-permanent pooling of water, and more large, hollow-bearing Eucalypts than minor drainage lines. Some major drainage within the Survey Area appeared to consist of ephemeral sheet flow without clear channels and signs of erosion that are usually present in major drainage lines.</p> <p>The overstorey vegetation provides valuable nesting and foraging habitat for birds, including conservation significant taxa such as the Grey Falcon and Peregrine Falcon. Key microhabitats include woody debris, leaf litter, peeling bark, hollow trees and logs, and hummocks grasslands provide refuge, shelter, and foraging opportunities for a wide variety for fauna taxa. Major drainage lines, rivers and creeks will usually be seasonally inundated. This habitat was extensively degraded by cattle in many areas.</p>	High quality for Northern Quoll, Ghost Bat, Pilbara Leaf-nosed Bat, and Pilbara Olive Python foraging and dispersal habitat. High quality nesting and foraging for the Grey Falcon.	
Cleared	25 ha 0.7%	Areas that have been cleared and do not contain vegetation. These areas generally do not provide substantial habitat value to fauna taxa.		N/A
<b>Total Area</b>	<b>3,419 ha</b>			

#### 4.1.2.2 Vertebrate Fauna Assemblage

The terrestrial vertebrate fauna surveys yielded 71 fauna species from 33 families, summarised in Table 18. A full inventory of fauna taxa recorded during the field survey is provided in Appendix E.

**Table 18: Overview of vertebrate fauna taxa recorded**

Fauna Group	Number of Taxa	Number of Families
Birds	25	16
Mammals	18	8
Reptiles	27	8
Amphibians	1	1
<b>Total</b>	<b>71</b>	<b>33</b>

An overview of the number of fauna taxa and unique fauna taxa recorded within each habitat type is provided in Table 19. Survey effort was not consistent within each habitat type, therefore a comparison of species diversity between habitat types may not reflect actual comparative species diversity within habitat types.

**Table 19: Number fauna taxa and unique<sup>1</sup> fauna taxa recorded within each habitat type**

Fauna Habitat	Birds (Unique Birds)	Mammals (Unique Mammals)	Reptiles (Unique Reptiles)	Amphibians (Unique Amphibians)	Total Species
Stony plain	12 (5)	2 (1)	10 (6)	0 (0)	25
Stony hills and slopes	11 (3)	8 (5)	12 (6)	0 (0)	31
Drainage line/river/creek (major)	8 (3)	11 (9)	16 (11)	1 (1)	36
Drainage line/river/creek (minor)	3 (0)	0 (0)	2 (0)	0 (0)	5
Cleared	10 (5)	0 (0)	0 (0)	0 (0)	10

<sup>1</sup> Fauna taxa that were only recorded within one habitat type

#### 4.1.2.2.1 Birds

A total of 25 avian taxa from 16 families were recorded throughout the Survey Area. The most recorded taxa were the Cockatiel (*Nymphicus hollandicus*), Singing Honeyeater (*Gavicalis virescens*), Galah (*Eolophus roseicapilla*), and Crested Pigeon (*Ocyphaps lophotes*). The most diverse families were Cacatuidae, Columbidae, and Meliphagidae each with three taxa recorded.

#### 4.1.2.2.2 Mammals

A total of ten native non-volant (non-flying) mammal taxa from three families were recorded throughout the Survey Area. The most recorded native mammal taxon was the Stripe Faced Dunnart (*Sminthopsis macroura*) and Kaluta (*Dasykaluta rosamondae*). The most diverse non-volant mammal family was Dasyuridae, comprising six taxa.

A total of seven volant mammal taxa (bats) from four families were recorded throughout the Survey Area. The most frequently recorded taxa were Gould's Wattled Bat (*Chalinolobus gouldii*) and the Little Broad-nosed Bat (*Scotorepens greyii*)<sup>2</sup>. The most diverse family was Vespertilionidae, comprising three taxa.

One introduced mammal taxon was recorded. Evidence of European Cattle (*Bos taurus*) was recorded throughout the Survey Area.

#### 4.1.2.2.3 Reptiles and Amphibians

A total of 27 reptile taxa from eight families were recorded throughout the Survey Area. The most recorded taxon was the Western Ring-tailed Dragon (*Ctenophorus caudicinctus*), followed by the Central Military Dragon (*Ctenophorus isolepis*) and the Grand Ctenotus (*Ctenotus grandis*). The most diverse reptile family was Scincidae with nine taxa, followed by Gekkonidae with five taxa.

One amphibian taxon was recorded within the Survey Area. The Sheep Frog (*Cyclorana maini*) was recorded at Trap02.

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<sup>2</sup> Conservation significant bat calls were analysed in detail, therefore precise numbers of calls per night are known, whereas non-conservation significant bat species were simply recorded as present/absent at each location, therefore abundance counts are indicative only.



#### 4.1.2.3 Conservation Significant Vertebrate Fauna

Three conservation significant fauna taxa were recorded within the Survey Area during the field survey (Figure 9):

- Northern Quoll (*Dasyurus hallucatus*), Endangered under the BC Act and EPBC Act – Northern Quolls were detected by three camera traps at one camera trap site within stony hills and slopes habitat (Cam02; Figure 9). Spot pattern analysis identified one individual across two cameras at Cam02 (Plate 2). A third camera at Cam02 also captured images of a Northern Quoll, however, these images were not clear enough to establish if this was the same or a different individual.
- Pilbara Leaf-nosed Bat (*Rhinonictis aurantia* Pilbara form), Vulnerable under the BC Act and EPBC Act – A single Pilbara Leaf-nosed Bat call was recorded by ARU at Trap02 within drainage line/river/creek (major) habitat (Figure 9).
- Long-tailed Dunnart (*Sminthopsis longicaudata*), Priority 4 under the BC Act – A Long-tailed Dunnart was detected by one camera trap at Cam03 within stony hills and slopes habitat (Plate 3; Figure 9).

The post survey results identified three additional conservation significant taxa as having a high likelihood of occurrence within the Survey Area:

- Ghost Bat (*Macroderma gigas*), Vulnerable under the BC Act and EPBC Act
- Western Pebble-mound Mouse (*Pseudomys chapmani*), Priority 4 under the BC Act
- Pilbara Olive Python (*Liasis olivaceus barroni*), Vulnerable under the BC Act and EPBC Act.

Three taxa were assessed as having a medium likelihood of occurrence within the Survey Area:

- Grey Falcon (*Falco hypoleucos*), Vulnerable under the BC Act and EPBC Act
- Peregrine Falcon (*Falco peregrinus*), Other Specially Protected Fauna by DBCA
- Common Brushtail Possum (*Trichosurus vulpecula*), locally significant due to rarity in the Pilbara and taxonomic doubt surrounding the Pilbara population.

Twenty-two taxa were assessed as having a low likelihood of occurrence within the Survey Area. Further details regarding recorded and potential conservation significant fauna is provided below in Table 20.



**Plate 2: Northern Quoll captured by camera trap at Cam02 (-22.0106584, 115.9936732).**



**Plate 3: Long-tailed Dunnart captured by camera trap at Cam03 (-22.0469814, 116.0072247).**

**Table 20: Conservation significant vertebrate fauna likelihood of occurrence**

Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation List, Federal - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, IA/MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Priority.

Family	Scientific Name	Common Name	Conservation Status		Likelihood of Occurrence	Justification
			State	Federal		
<b>AVIAN</b>						
<b>Apodidae</b>	<i>Apus pacificus</i>	Pacific Swift	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. May use habitats in Survey Area for foraging (any low to very high airspace over varied habitat). <sup>1</sup>
<b>Charadriidae</b>	<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU, IA	VU, MI, MA	Low	Opportunistically recorded within 30 km of the Survey Area in 2008. <sup>2</sup> No preferred habitat within the Survey Area (tidal flats, beaches). <sup>1</sup>
<b>Charadriidae</b>	<i>Charadrius veredus</i>	Oriental Plover	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. Abundant suitable habitat present within the Survey Area (grasslands and thinly vegetated plains, preferring open areas). <sup>1</sup>
<b>Falconidae</b>	<i>Falco hypoleucos</i>	Grey Falcon	VU	VU	Medium	The DBCA database search shows 2 records, including one 26 km south southeast of the Survey Area from 2015. Suitable habitat present within the Survey Area (open plains with treed watercourses). <sup>1</sup> May use all habitats within Survey Area for hunting.
<b>Falconidae</b>	<i>Falco peregrinus</i>	Peregrine Falcon	OS	-	Medium	The DBCA database search shows 1 record located 27 km east of the Survey Area from 2015. Suitable habitat present within the Survey Area (cliff faces preferred for nesting, commonly uses stick nests built by other birds). <sup>1</sup> May use all habitats within Survey Area for hunting.
<b>Glareolidae</b>	<i>Glareola maldivarum</i>	Oriental Pratincole	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. Suitable habitat present within the Survey Area (open plains, tidal flats, wetlands).
<b>Hirundinidae</b>	<i>Hirundo rustica</i>	Barn Swallow	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. No preferred habitat within the Survey Area (generally coastal, wetlands). <sup>1</sup>
<b>Laridae</b>	<i>Gelochelidon nilotica</i>	Gull-billed Tern	IA	MI, MA	Low	Recorded 94 km west of the Survey Area in 2008. <sup>2</sup> No preferred habitat within the Survey Area (strictly coastal). <sup>1</sup>
<b>Laridae</b>	<i>Hydroprogne caspia</i>	Caspian Tern	IA	MI, MA	Low	Opportunistically recorded within 30 km of the Survey Area in 2008. <sup>2,3</sup> No preferred habitat within the Survey Area (sheltered coastal waters, large rivers, fresh to saline lakes, temporary wetlands). <sup>1</sup>
<b>Laridae</b>	<i>Sternula albifrons</i>	White-shafted Little Tern	IA	MI, MA	Low	Opportunistically recorded within 30 km of the Survey Area in 2013. <sup>3</sup> No preferred habitat within the Survey Area (coastal, sheltered waters, beaches). <sup>1</sup>

Family	Scientific Name	Common Name	Conservation Status		Likelihood of Occurrence	Justification
			State	Federal		
<b>Motacillidae</b>	<i>Motacilla cinerea</i>	Grey Wagtail	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. Suitable habitat is limited within the Survey Area (fresh sandy or rocky streams) and general occurrence is between Broome-Darwin. <sup>4</sup>
<b>Motacillidae</b>	<i>Motacilla tshutschensis</i>	Yellow Wagtail	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. No preferred habitat within the Survey Area (swamp margins, saltmarshes, ploughed land). <sup>1</sup>
<b>Procellariidae</b>	<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. No preferred habitat within the Survey Area (oceanic). <sup>1</sup>
<b>Psittaculidae</b>	<i>Pezoporus occidentalis</i>	Night Parrot	CR	EN	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. Outside known areas likely to occur, however, cannot be ruled out due to cryptic nature and lack of certainty surrounding current distribution (long unburnt spinifex and samphire shrublands bordering salt lakes). <sup>5</sup>
<b>Rostratulidae</b>	<i>Rostratula australis</i>	Australian Painted Snipe	EN	EN, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. No preferred habitat within the Survey Area (well vegetated wetlands). <sup>1</sup>
<b>Scolopacidae</b>	<i>Actitis hypoleucos</i>	Common Sandpiper	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. Suitable habitat present within the Survey Area after rainfall (mangroves, wetlands, river pools). <sup>1</sup>
<b>Scolopacidae</b>	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. Suitable habitat present within the Survey Area after rainfall (fresh to saline wetlands, swamps, lakes, floodwaters). <sup>1</sup>
<b>Scolopacidae</b>	<i>Calidris ferruginea</i>	Curlew Sandpiper	CR, IA	CR, MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. Suitable habitat present within the Survey Area after rainfall (mudflats, floodwaters, flooded saltbush surrounds of inland lakes). <sup>1</sup>
<b>Scolopacidae</b>	<i>Calidris melanotos</i>	Pectoral Sandpiper	IA	MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. Suitable habitat present within the Survey Area after rainfall (fresh to saline permanent and temporary wetlands with fringing vegetation). <sup>1</sup>
<b>Scolopacidae</b>	<i>Calidris ruficollis</i>	Red-necked Stint	IA	MI, MA	Low	Opportunistically recorded in 2008. <sup>2</sup> Suitable habitat present within the Survey Area after rainfall (mudflats, salt-marshes, beaches, temporary floodwaters). <sup>1</sup>

Family	Scientific Name	Common Name	Conservation Status		Likelihood of Occurrence	Justification
			State	Federal		
<b>Scolopacidae</b>	<i>Numenius madagascariensis</i>	Eastern Curlew	CR, IA	CR, MI, MA	Low	No nearby records identified from the database searches or literature. Only returned by PMST which searches by modelled distribution, not actual records. No preferred habitat within the Survey Area (tidal flats). <sup>1</sup>
<b>Scolopacidae</b>	<i>Tringa glareola</i>	Wood Sandpiper	IA	MI, MA	Low	Opportunistically recorded in 2008. <sup>2</sup> No preferred habitat within the Survey Area (fresh wetlands with fringing vegetation). <sup>1</sup>
<b>Scolopacidae</b>	<i>Tringa nebularia</i>	Common Greenshank	IA	MI, MA	Low	Opportunistically recorded in 2008. <sup>2</sup> Suitable habitat present within the Survey Area after rainfall (wetlands, lakes, floodplains, mudflats, mangroves). <sup>1</sup>
<b>MAMMALIAN</b>						
<b>Dasyuridae</b>	<i>Dasyurus hallucatus</i>	Northern Quoll	EN	EN	Recorded	This taxa was recorded during the field survey. Suitable habitat present within the Survey Area (rocky escarpments, ranges, gorges). <sup>6</sup>
<b>Dasyuridae</b>	<i>Sminthopsis longicaudata</i>	Long-tailed Dunnart	P4	-	Recorded	This taxa was recorded during the field survey. Suitable habitat present within the Survey Area (scree slopes, stony plateaus, stony plains with shrubs over spinifex hummock grasslands). <sup>6</sup>
<b>Megadermatidae</b>	<i>Macroderma gigas</i>	Ghost Bat	VU	VU	High	The DBCA database search shows 21 records, including one 15 km north east of the Survey Area from 2016. Suitable habitat present within the Survey Area (rocky ranges, roost caves, old mine shafts). <sup>6</sup> May use all habitats within Survey Area for hunting.
<b>Muridae</b>	<i>Pseudomys chapmani</i>	Western Pebble-mound Mouse	P4	-	High	The DBCA database search shows 17 records, including one 3 km west of the Survey Area from 2006, 19 km north 2013. Suitable habitat present within the Survey Area (stony hillsides with stony mulch and hummock grasslands). <sup>6</sup>
<b>Phalangeridae</b>	<i>Trichosurus vulpecula</i>	Common Brushtail Possum	VU	VU	Medium	Locally significant due to rarity in Pilbara and taxonomic doubt surrounding Pilbara population. Recent records in similar habitat. Drainage lines constitute preferred habitat (open Eucalyptus woodland).
<b>Rhinycteridae</b>	<i>Rhinycteris aurantia</i> Pilbara form	Pilbara Leaf-nosed Bat	-	-	Recorded	This taxa was recorded during the field survey. Suitable habitat present within the Survey Area (rocky escarpments, ranges, gorges). May use all habitats within Survey Area for hunting. <sup>6</sup>
<b>REPTILIAN</b>						
<b>Pythonidae</b>	<i>Liasis olivaceus barroni</i>	Pilbara Olive Python	VU	VU	High	The DBCA database search shows 7 records, including one 22 km east southeast of the Survey Area from 2012. Suitable habitats found within the Survey Area (watercourses associated with rocky areas). <sup>7</sup>
<b>Typhlopidae</b>	<i>Anilius ganei</i>	Gane's Blind Snake	P1	-	Low	One record 50 km southeast from 2015. <sup>8</sup> Potentially suitable habitat present (possibly associated with moist gorges and gullies). <sup>7</sup>

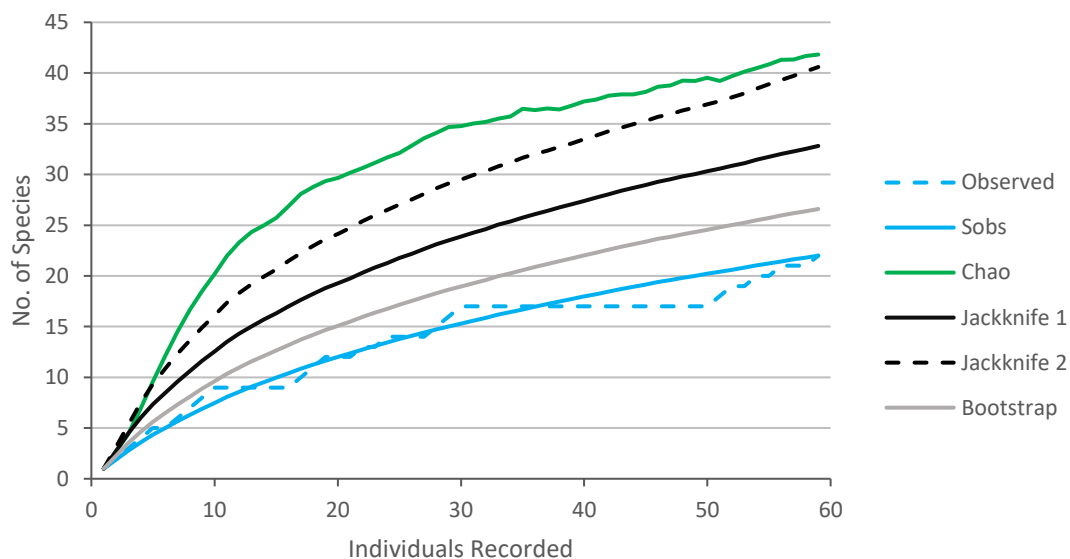
<sup>1</sup> (Pizzey & Knight 2013), <sup>2</sup> (Biota Environmental Sciences 2009b), <sup>3</sup> (Ninox Wildlife Consulting 2013), <sup>4</sup> (Menkhorst et al. 2017), <sup>5</sup> (Morcombe 2017), <sup>6</sup> (Dyck, Gynther & Baker 2013), <sup>7</sup> (Wilson & Swan 2017), <sup>8</sup> (Biota Environmental Sciences 2015c)

## 4.2 Species Accumulation Curves

### 4.2.1.1 Birds

The species accumulation curve for birds in the Survey Area was based on birds observed at survey sites. The Sobs curve steadily increased with captures and does not appear to reach an asymptote (Graph 3), indicating that additional taxa may be recorded with increased trapping effort. All richness curves were greater than the Sobs curve, indicating that the observed species richness was lower than predicted by the analysis.

Estimated species richness for the Survey Area ranged from 27 to 42, with an observed value of 22 taxa. Richness estimators indicated that the surveys were approximately 52.6% (Chao) to 82.7% (Bootstrap) adequate in recording the full complement of bird taxa present at sampling locations within the Survey Area at the time of the survey.

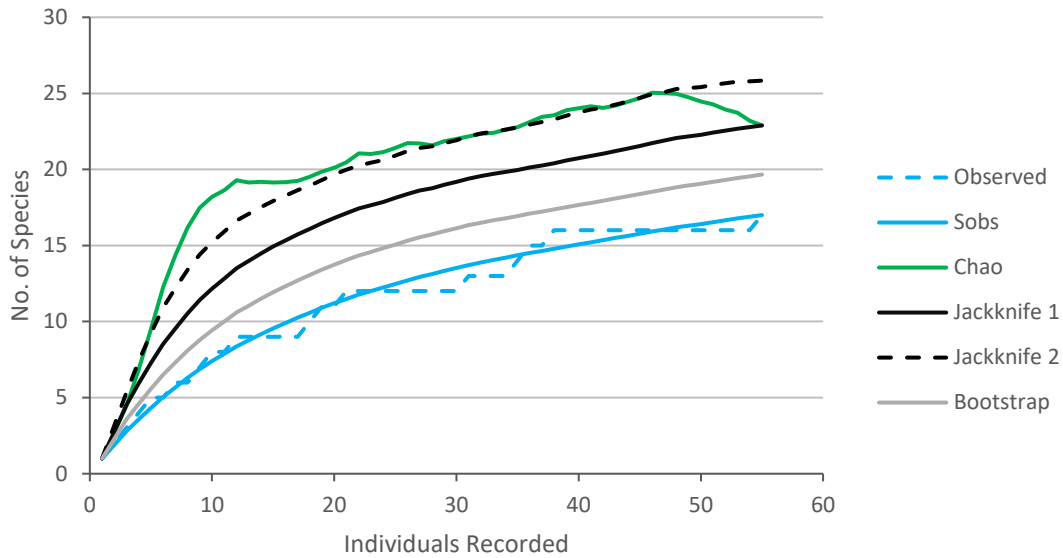


**Graph 3: Bird Species Accumulation Curve**

### 4.2.1.2 Mammals

The species accumulation curve for mammals in the Survey Area was based on mammals observed at survey sites (Trap, Camera and SRE sites). The Sobs curve steadily increased with captures and does not appear to reach an asymptote (Graph 4), indicating that additional taxa may be recorded with increased trapping effort. All richness curves were greater than the Sobs curve, indicating that the observed species richness was lower than predicted by the analysis.

Estimated species richness for the Survey Area ranged from 20 to 26, with an observed value of 17 taxa. Richness estimators indicated that the surveys were approximately 65.8% (Jackknife 2) to 86.4% (Bootstrap) adequate in recording the full complement of mammal taxa present at sampling locations within the Survey Area at the time of the survey.

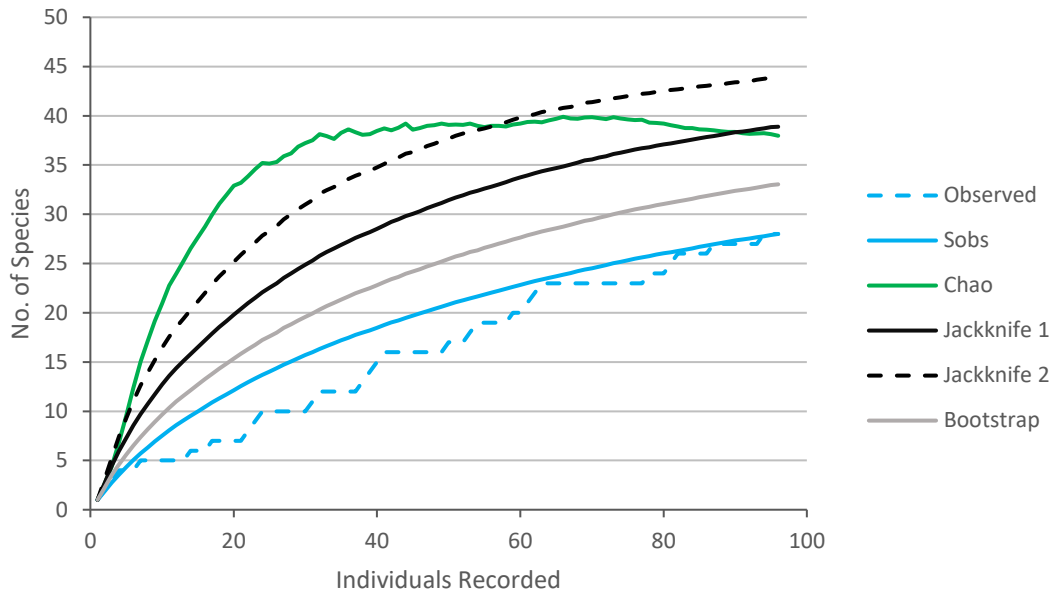


**Graph 4: Mammal Species Accumulation Curve**

#### 4.2.1.3 Reptiles and Amphibians

The species accumulation curve for reptiles and amphibians in the Survey Area was based on reptile observed at survey sites (Trap, Camera and SRE sites). The Sobs curve steadily increased with trap nights and does not appear to reach an asymptote (Graph 5), indicating that additional taxa may be recorded with increased trapping effort. All richness curves were greater than the Sobs curve, indicating that the observed species richness was lower than predicted by the analysis.

Estimated species richness for the Survey Area ranged from 34 to 44, with an observed value of 28 taxa. Richness estimators indicated that the surveys were approximately 63.8% (Jackknife 2) to 84.8% (Bootstrap) adequate in recording the full complement of reptile and amphibian taxa present at sampling locations within the Survey Area at the time of the survey.



**Graph 5: Reptile and Amphibian Species Accumulation Curve**

### 4.3 SRE Invertebrate Fauna

#### 4.3.1 Desktop Assessment

The desktop assessment identified two possible SRE taxa and no confirmed or likely SRE taxa. The taxa are summarised below and shown in Table 21 along with their conservation code:

- Land snail, *Quistrachia* cf. 'Barlee Range' n. sp.
- Land snail, cf. *Stenomelania denisoniensis*.

The remaining taxa identified from desktop resources were found to be widespread.

No conservation significant invertebrate taxa were identified during the desktop assessment (excluding troglifauna and stygofauna, which are not included in this assessment).

**Table 21: SRE invertebrate fauna likelihood of occurrence within the Survey Area**

Higher Order	Taxon	SRE status	Conservation Status		Likely Habitat Present	Desktop Likelihood
			State	Federal		
<b>Gastropoda</b>						
Camaenidae	<i>Quistrachia</i> cf. 'Barlee Range' n. sp.	Possible	-	-	Present	Low
Thiraidae	cf. <i>Stenomelania denisoniensis</i>	Possible	-	-	Not Present	Very Low



#### 4.3.2 SRE Habitat

Most of the habitats identified within the Survey Area (stony plain, and stony hills and slopes) are widespread across the region and are unlikely to provide habitat isolates which may give rise to SRE invertebrates. These habitats are therefore considered to provide low SRE habitat suitability. The drainage line/river/creek habitats are considered to provide moderate SRE habitat suitability, as the western edges of drainage lines provide some protection from afternoon sun and may contain greater moisture within leaf litter accumulations. SRE habitat suitability is shown in Table 22 and Figure 10. SRE site locations and photos are shown in Appendix D.

**Table 22: Habitat suitability for SRE invertebrates**

Fauna Habitat	SRE Sites	Extent within the Survey Area	SRE Habitat Suitability
Stony plain	SRE04, SRE05, SRE06, SRE09, SRE11	2,178 ha 63.7%	Low
Stony hills and slopes	SRE01, SRE02, SRE03	352 ha 10.3%	Moderate
Drainage line/river/creek (minor)		345 ha 10.1%	Moderate
Drainage line/river/creek (major)	SRE07, SRE08, SRE10, SRE12, SRE13, Trap01, Trap02	519 ha 15.2%	Moderate
Cleared		25 ha 0.7%	Nil

#### 4.3.3 SRE Field Survey

The SRE field survey recorded 72 individual specimens representing 14 taxa of invertebrates from five classes, eight orders and ten families that have the potential to contain SRE taxa (Appendix F). Taxa that are considered to be SRE are summarised in Table 23.

No Confirmed or Likely SRE or conservation significant taxa were recorded during the field survey.

Four Possible SRE taxa were recorded primarily due to the groups being considered data deficient:

- Two Aname mygalomorph spiders (*Aname* sp. 'IS03' and *Aname* sp. 'IS04')
- Two Olpiid pseudoscorpions (Olpiidae sp. 1 and Olpiidae sp. 2).

The details of all specimens recorded during the surveys including abundance data and individual specimen tracking numbers is shown in Appendix F.

**Table 23: SRE invertebrates recorded during the field survey**

Higher Order	Taxon	SRE Site Recorded	SRE Status	SRE Habitat
<b>Gastropoda</b>				
Camaenidae	<i>Rhagada convicta</i>	SRE03, SRE06, SRE08, SRE13, Trap02	Widespread	Stony plain, Stony hills and slopes, Drainage line/river/creek (major),
Pupillidae	<i>Pupoides adelaidae</i>	SRE04, SRE05	Widespread	Stony plain
<b>Crustacea</b>				
<b>Isopoda</b>				
Armadillidae	<i>Buddelundia</i> sp. '10bf'	SRE13, Trap02	Widespread	Drainage line/river/creek (major)
	<i>Buddelundia</i> sp. '14re'	SRE01	Widespread	Stony hills and slopes
<b>Arachnida</b>				
<b>Araneae, Mygalomorphae</b>				
Anamidae	<i>Aname</i> sp.'IS03'	SRE08	Possible (A)	Drainage line/river/creek (major)
	<i>Aname</i> sp.'IS04'	SRE09	Possible (A)	Stony plain
<b>Pseudoscorpiones</b>				
Olpiidae	Olpiidae sp.1	SRE05, SRE09	Possible (A)	Stony plain
	Olpiidae sp.2	SRE04	Possible (A)	Stony plain
<b>Scorpionida</b>				
Buthidae	<i>Lychas</i> sp.'harveyi'	SRE05, Trap02	Widespread	Stony plain, Drainage line/river/creek (major)
<b>Chilopoda</b>				
<b>Scolopendromorpha</b>				
Scolopendridae	<i>Arthrorhabdus mjobergi</i>	SRE13	Widespread	Drainage line/river/creek (major)
<b>Scutigermorpha</b>				
Scutigeridae	<i>Pilbarascutigera incola</i>	SRE01, SRE07	Widespread	Stony hills and slopes, Drainage line/river/creek (major)
<b>Diplopoda</b>				
<b>Polyxenida</b>				
Polyxenidae	<i>Unixenus</i> cf. <i>mjobergi</i>	SRE04, SRE09	Widespread	Stony plain
	<i>Unixenus attemsi</i>	SRE11	Widespread	Stony plain

## 5 Discussion

### 5.1 Terrestrial Vertebrate Fauna

#### 5.1.1 Fauna Habitat

The four broad fauna habitats identified within the Survey Area are typical of the Pilbara bioregion and consistent with habitats identified by previous studies in the region (360 Environmental Pty Ltd 2021; Astron Environmental Services 2011a; Bat Call WA 2015; Biota Environmental Sciences 2015c, 2008, 2009a, 2015b; Phoenix Environmental Sciences 2017; Rapallo Environmental 2012b, 2012a; Rio Tinto 2018). Trap sites were placed in drainage line/river/creek habitat, however all habitat types occurring within the current Survey Area have been sampled during other fauna surveys as part of the AIP fauna surveys (360 Environmental Pty Ltd 2021). All identified fauna habitats extend outside the Survey Area to form larger ecosystems.

The stony hills and slopes are likely to be used for foraging and dispersal by fauna taxa, including conservation significant fauna taxa, such as Northern Quolls and the Long-tailed Dunnart. Stony hills and slopes frequently connect the mesas and breakaway habitat to the drainage line/river/creeks habitat. This habitat is also suitable for the Western Pebble-mound mouse as it contains suitably sized pebbles for mound-building.

The drainage line/river/creek habitat is valuable for its role as an ecological linkage. The habitat provides continuous corridors of vegetation cover that allow fauna to traverse large distances. Seasonal water sources will occur within this habitat; however, open water was absent from these habitats during the fauna survey. This habitat is likely to support the Pilbara Olive Python and act as foraging and dispersal habitat for the Northern Quoll. Conservation significant bat taxa (Pilbara Leaf-nosed Bat and Ghost Bat) are also likely to use this habitat for foraging. Grey Falcons and Peregrine Falcons may nest in the tall overstorey.

The stony plain habitat contains less microhabitat opportunities and provide less value to most conservation significant fauna taxa and overall fauna assemblages than the aforementioned habitats. The stony plain may be used by the Long-tailed Dunnart and the Western Pebble-mound Mouse. This habitat types occur extensively both within and outside the Survey Area.

Habitat condition varied throughout the Survey Area, as would be expected given the large extent of the Survey Area. The stony plain, and drainage line/river/creeks habitats showed evidence of degradation caused by cattle grazing and trampling to varying degrees, with highest concentrations of cattle degradation occurring near water sources. Other disturbances, including historical clearing for roads, infrastructure and access tracks, weeds, frequent burning, and rubbish were recorded but were not likely to have major impacts on the fauna assemblage.

### 5.1.2 Vertebrate Fauna Assemblage

The inventory of fauna taxa recorded during the field survey is typical for the Pilbara bioregion and aligned with the database search results and previous studies conducted in the region (360 Environmental Pty Ltd 2021; Astron Environmental Services 2012; Bat Call WA 2015; Biologic 2012; Biota Environmental Sciences 2015c, 2015a, 2015b, 2009a; Ninox Wildlife Consulting 2013; Phoenix Environmental Sciences 2017; Rapallo Environmental 2011, 2012b, 2012a; Rio Tinto 2018).

Species diversity was lower than previous surveys, however this is to be expected given the comparatively small extent of the current Survey Area, with relatively few trap sites and low habitat diversity compared to larger survey areas. Species diversity and abundance of conservation significant taxa detected may have been depressed by low rainfall, recent fires and increased grazing pressure since 2009. The three species accumulation curves created for the major fauna groups, mammals, birds and herpetofauna (reptiles and amphibians) all indicate that additional species may be recorded with increased survey effort and that observed species richness was lower than estimated species richness as predicted by the statistical analysis.

### 5.1.3 Conservation Significant Fauna

#### 5.1.3.1 High Likelihood

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

The Northern Quoll is a medium-sized carnivorous, nocturnal marsupial that favours rocky areas, taking refuge in rock crevices and using gullies and drainage lines. They have a relatively large home-range size of up to 150 ha for males and 35 ha for females, and males can move up to 1.85 km between den sites in one night (Department of the Environment 2016; Oakwood 2000). Northern Quolls reproduce once a year, averaging seven young per litter (Department of the Environment 2016). They have a short life span, with the females typically only surviving one or two years while the males die off annually following intense physical exertion during the breeding season (Department of the Environment 2016). The taxon can be locally common, but its range has contracted considerably (Van Dyck & Strahan 2008). It is likely that the individual(s) identified during the field survey was transient as the habitat within the survey area does not contain suitable denning habitat.

The species is known to occur within the region; a total of 286 records have occurred within 30 km of the Survey Area, the majority of which were recorded in rocky habitats to the northeast and east of the Survey Area, near Red Hill Creek, however, no previous records occurred within the Survey Area itself (Department of Biodiversity Conservation and Attractions 2020). Nearby mesas and breakaway habitat is the most important Northern Quoll habitat within the vicinity of the Survey Area as it provides denning, shelter, and foraging habitat, however this habitat does not occur within the Survey Area itself. Drainage line/river/creek habitat and stony hills and slopes habitat are primarily used for dispersal. All three of the aforementioned habitats are considered to represent habitat critical for the survival of the taxon by the EPBC Referral

Guidelines (Department of the Environment 2016). All other habitats may be infrequently used for dispersal or foraging; however, the taxa will not depend on these habitats.

Spot pattern analysis identified at least one individual Northern Quoll within the Survey Area. Previous targeted Northern Quoll surveys in areas adjacent to the current Survey Area identified 17 individual Northern Quolls (360 Environmental Pty Ltd 2021). This previous survey returned a capture rate of 11.11 individuals per 100 camera trap nights, which indicates that high density populations occur within the mesa and breakaways habitats adjacent the current Survey Area. By comparison, monitoring undertaken by DBCA recorded an average of 3.61 individuals per 100 camera trap nights across fifteen locations throughout the Pilbara region, with only one location, Indee Station, exceeding 11.11 individuals per 100 camera trap nights (Dunlop, Birch & Moore 2018). According to the EPBC Referral Guidelines, high density populations are important for the long-term survival of the taxon (Department of the Environment 2016).

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

The Ghost Bat is patchily distributed in small colonies in northern Australia, including the Pilbara and Kimberley in WA, the Top End in the Northern Territory and northeast Queensland. The taxon requires undisturbed roost caves or mineshafts, usually complex systems with several openings (Van Dyck & Strahan 2008). The taxon eats large insects, geckoes, frogs, small birds, mammals including other bats. The kills are made on the ground or in the air and then taken to a feeding perch, which is usually a rocky overhang or small cave (Van Dyck & Strahan 2008).

All habitats within the Survey Area may be used by Ghost Bats for hunting. No Ghost Bat calls were recorded during the survey, but several calls have been recorded between 2 and 6 km west of the Survey Area (360 Environmental Pty Ltd 2021). No deep, complex caves required for maternity roosts were observed.

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

The Western Pebble-mound Mouse is endemic to the Pilbara, where it builds pebble mounds from small stones. Pebble mounds are restricted to suitable-class stones and are usually found on gentle slopes and spurs that are often vegetated by hard spinifex (Van Dyck & Strahan 2008; Ford & Johnson 2007). Active mounds are characterised by the conical shape of the mound with clear, distinct entrance holes (Anstee 1996). Pebble mounds constructed by the Western Pebble-mound Mouse are found throughout the Pilbara, however, studies have shown that not all mounds in an area are occupied by a Pebble-mound Mouse at any one time (Anstee 1996).

No Western Pebble-mound Mice were recorded within the Survey Area, but a mound was recorded 17 km west in October 2020 (360 Environmental Pty Ltd 2021). The taxon is likely to inhabit stony hills and slopes and stony plain habitats within the Survey Area. The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area.

### **Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia* Pilbara form)**

The Pilbara Leaf-nosed Bat was originally considered to be the same species as the Orange Leaf-nosed Bat, which occurs in the Kimberley, Northern Territory, and northwest Queensland, however, it is now considered to be a separate form based on morphology. Formal reclassification has been difficult due to the small Pilbara population size (Van Dyck & Strahan 2008). During the dry season the taxon roosts in deep, warm humid caves or mines and forages nearby; in the wet season the taxon is more widespread and may not require caves for roosting (Menkhorst & Knight 2004).

Pilbara Leaf-nosed Bats were recorded at one location within the Survey Area, which was within drainage line/river/creek habitat. All habitats within the Survey Area may be used for hunting. Numerous Pilbara Leaf-nosed Bats were recorded during 2020 and 2021, 2 km east and 4 km west of the Survey Area (360 Environmental Pty Ltd 2021). The nearest known roost site is approximately 27 km southeast of the Survey Area at Cane River, and is a large roost site used by many thousands of Pilbara Leaf-nosed Bats, (Bat Call WA 2015; Biota Environmental Sciences 2015c; Rapallo Environmental 2012b). Pilbara Leaf-nosed Bats may also access the Survey Area from an inferred roost at Mungarathoona Creek, approximately 23 km northeast of the Survey Area (Bat Call WA 2015; Biota Environmental Sciences 2015c). Given that deep caves with a suitable microclimate for the taxon were not observed during the field survey, Pilbara Leaf-nosed Bat maternity roosts will not occur within the Survey Area.

### **Long-tailed Dunnart (*Sminthopsis longicaudata*)**

The Long-tailed Dunnart is a nocturnal marsupial that is endemic to Australia, typically found in rocky, rugged habitats from the Pilbara and adjacent upper Gascoyne Region east to the central Northern Territory and South Australia (Burbidge, McKenzie & Fuller 1983; McKenzie, Woinarski & Burbidge 2016). This species favours rocky scree, plateaus with breakaways, and rugged boulder-strewn scree slopes, generally with spinifex hummock grassland, shrubs and open woodland. This species was once considered to be rare and possibly threatened, however, research has shown that it is relatively common and widespread but is restricted to a specific habitat (McKenzie, Woinarski & Burbidge 2016).

A Long-tailed Dunnart was recorded by camera trap within stony hills and slopes habitat, adjacent to stony plain habitat. A single Long-tailed Dunnart was previously recorded 48 km southeast of the Survey Area on a gravely loam slope with *Triodia* sp. hummock grassland (Biota Environmental Sciences 2009b). Long-tailed Dunnarts are likely to use the stony hills and slopes habitat for shelter and foraging.

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

The Pilbara Olive Python is a large python that occurs in the ranges of the Pilbara, typically in escarpments and gorges where water is present. It generally shelters under rock piles, or under spinifex and often basks on top of rocks (Pearson 1993, 2003). It is threatened due to its relatively small distribution, low population densities and may be affected by habitat disturbance such as grazing and fire. This taxon is known to frequent water bodies where it ambushes prey (Pearson 1993). The taxon is extremely difficult to detect. During a systematic survey of a large series of quadrats in the Pilbara, the taxon was only recorded in one quadrat (Doughty et al. 2011). The taxon is known to have large home ranges, particularly for an ambush predator; Pearson *et al.* (2004) recorded an individual with a home range of roughly 450 ha.

An individual Pilbara Olive Python was observed in a cattle trough approximately 24 km south southeast of the Survey Area near the Cardo Camp in October 2020 (360 Environmental Pty Ltd 2021). It is unlikely that this individual may utilise the Survey Area given its distance and poor connectivity of suitable habitat. However, the Survey Area does contain habitat that may be suitable for this species, and given this nearby record, it is possible that the taxon may occur within the drainage line/river/creek habitats. Other habitats within the Survey Area may be used by dispersing or transient individuals but will not be relied upon. While preferred habitats are restricted within the Survey Area, they are widespread and abundant east of the Survey Area towards the Hamersley Range where Pilbara Olive Python records occur. Previous surveys have recorded Pilbara Olive Pythons 23 km east southeast, 24 km east and 29 km east of the Survey Area (Biota Environmental Sciences 2015b; Rapallo Environmental 2012b, 2012a). Given the extent of suitable habitat and occurrence of records in regional areas, the Pilbara Olive Python is highly likely to occur within the Survey Area but is most likely widely distributed in the region.

#### 5.1.3.2 Medium Likelihood

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

The Grey Falcon is an elusive and endemic bird of the arid interior (Schoenjahn, Pavey & Walter 2019). It is distributed sparsely over Australia's arid and semi-arid zones and is absent from Cape York Peninsula, south of the Great Dividing Range in Victoria, and south of 26°S in WA (BirdLife International 2016; Johnstone & Storr 1998). The Grey Falcon is restricted largely to areas with high average temperatures and average annual rainfall of less than 500 mm. It favours lightly timbered and untimbered lowland plains that are crossed by tree lined watercourses, but frequents other habitats, including grassland and sand dune habitats (BirdLife International 2016; Johnstone & Storr 1998).

The Grey Falcon typically uses refurbished nests built by other raptors or corvids in eucalypt lined drainage lines and waterholes (Pizzey & Knight 2013) and may therefore use the drainage line/river/creek habitat for breeding, and all habitats for hunting. The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area. Grey Falcons were not recorded during the current assessment, however, were recorded 19 km east and 26 km southeast of the Survey Area in 2009 and 2015, respectively (Biota Environmental Sciences 2015b, 2009b).

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

The Peregrine Falcon is an uncommon but wide-ranging bird across Australia (Barrett et al. 2003). It occurs mainly along rivers and ranges as well as wooded watercourses and lakes. It nests primarily on cliffs, granite outcrops and quarries, although is also known to occupy existing raptor and corvid stick nests (Menkhorst et al. 2017). The diet of the Peregrine Falcon has been well studied and primarily includes flocking birds such as parrots, pigeons and on the east coast, European Starlings (Olsen & Fuentes 2008).

The Peregrine Falcon typically nests on cliff ledges or in refurbished nests built by other raptors or corvids (Pizzey & Knight 2013) and may therefore use the mesas and breakaways and drainage line/river/creek habitats for breeding, and all habitats for hunting. The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area. Peregrine Falcons were not recorded during the current assessment, however, were recorded 23 km east southeast and 29 km southeast of the Survey Area in 2011 (Rapallo Environmental 2012b, 2012a).

### **Common Brushtail Possum (*Trichosurus vulpecula*)**

The Common Brushtail Possum uses a wide variety of habitats provided there is sufficient refuge on the ground and tree hollows available (Van Dyck & Strahan 2008). Suitable habitat is present within the Survey Area, primarily in the drainage line/river/creek habitats. The regional population is unlikely to be dependent on habitats within the Survey Area as these habitats occur more widely in the region outside the Survey Area, particularly to the east of the Survey Area. Most other habitats within the Survey Area do not contain suitable tree hollows or refuge and are therefore unlikely to be used by the species. Overhangs or small caves may be used for refuge in mesa and breakaway habitat.

The taxon was recorded 49 km southeast of the Survey Area in 2015 (Biota Environmental Sciences 2015c). This was originally reported as the southernmost record of the Northern Brushtail Possum in WA, (*T. vulpecula arnhemensis*), which is listed as Vulnerable under the BC Act at a subspecies level. Given doubt surrounding the taxonomic status of the Pilbara population of *T. vulpecula*, this report has simply referred to the taxon at the species rather than subspecies level.



## 5.2 SRE Invertebrate Fauna

The desktop assessment identified two possible SRE land snail species, however, these species are considered to have a low and very low likelihood of occurrence within the Survey Area respectively due to a lack of suitable habitat. Neither of these species were recorded during the SRE survey.

No confirmed SRE or conservation significant species were recorded during the field survey. Four Possible SRE invertebrate taxa were recorded. The Possible SRE taxa (two Oligid pseudoscorpions and two mygalomorph spiders) are due to incomplete taxonomy and corresponding unknown species distributions, and are considered in depth in Sections 5.2.1.1 to 5.2.1.2.

### 5.2.1.1 Arachnida: Mygalomorphae: Anamidae:

#### ***Aname* sp. 'IS03', *Aname* sp. 'IS04' – Possible SRE**

The mygalomorph spiders are female specimens and unable to be formally identified beyond genus, however, they are morphologically different from each other enabling allocation of morphospecies codes to distinguish them from each other. Both the mygalomorph spiders were recorded from drainage lines that are laterally extensive in the landscape and unlikely to be habitat isolates that support local endemism.

### 5.2.1.2 Arachnida: Pseudoscorpionida: Oligidae:

#### **Oligidae sp. 1, Oligidae sp. 2 – Possible SRE**

The taxonomy of the Pseudoscorpion family Oligidae is poorly known and, until further taxonomic resolution has been obtained, all species are considered to be possible SRE species in WA due to a deficiency in data. Molecular sequencing of Pilbara and other Western Australian specimens is currently being undertaken by the WAM and these data will be used in the future to determine if species are widespread or restricted in distribution. It must be stated, however, there is considerable difference between molecular and morphological data, with generic and species boundaries highly uncertain making meaningful results unlikely, except in the medium to long term. Due to the unreliable existing taxonomic framework Oligid specimens are not accurately identified beyond family level. The specimens recorded during the SRE surveys were recorded at multiple locations during the surveys indicating that their distributions are likely to be wider than the current surveys could determine.

## 6 Conclusion

### Terrestrial vertebrate fauna

- Four fauna habitats were mapped, of which the stony hills and slopes (10.3% of the Survey Area) and drainage line/river/creek (25.3% of the Survey Area) habitats and represent the most value to conservation significant fauna and overall fauna assemblages. Conservation significant fauna species that are confirmed or most likely to use these habitats are:
  - Grey Falcon (*Falco hypoleucos*), Vulnerable under BC Act
  - Peregrine Falcon (*Falco peregrinus*), Other Specially Protected Fauna under BC Act
  - Northern Quoll (*Dasyurus hallucatus*) (confirmed), Endangered under BC Act and EPBC Act
  - Ghost Bat (*Macroderma gigas*), Vulnerable under BC Act and EPBC Act
  - Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia* Pilbara form) (confirmed), Vulnerable under BC Act and EPBC Act
  - Pilbara Olive Python (*Liasis olivaceus barroni*), Vulnerable under BC Act and EPBC Act
  - Western Pebble-mound Mouse (*Pseudomys chapmani*), Priority 4 under BC Act
  - Long-tailed Dunnart (*Sminthopsis longicaudata*) (confirmed), Priority 4 under the BC Act.
- The stony plain (63.7% of the Survey Area) habitat contains less microhabitat opportunities and provide less value to most conservation significant fauna taxa and overall fauna assemblages than the aforementioned habitats.
- Three conservation significant fauna taxa were recorded within the Survey Area during the fauna survey:
  - Northern Quoll (*Dasyurus hallucatus*), Endangered. Northern Quolls were recorded by camera trap within the stony hills and slopes habitat in the Survey Area.
  - Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia* Pilbara form), Vulnerable. One call was recorded by ARU within the drainage line/river/creek habitat in the Survey Area. This record is consistent with known roost sites outside the Survey Area. No roosting was recorded within the Survey Area.
  - Long-tailed Dunnart (*Sminthopsis longicaudata*), Priority 4. An individual was recorded by camera trap within the stony hills and slopes habitat in the Survey Area.
- The post survey results identified three additional conservation significant taxa as having a high likelihood of occurrence within the Survey Area:
  - Ghost Bat (*Macroderma gigas*), Vulnerable
  - Western Pebble-mound Mouse (*Pseudomys chapmani*), Priority 4
  - Pilbara Olive Python (*Liasis olivaceus barroni*), Vulnerable.

- Three taxa were assessed as having a medium likelihood of occurrence within the Survey Area and 22 conservation significant taxa were assessed as having a low likelihood of occurrence within the Survey Area.

#### **SRE invertebrate fauna**

- The drainage line/river/creek (25.3% of the Survey Area) and stony hills and slopes (10.3% of the Survey Area) habitats are considered to provide moderate SRE habitat suitability. The remaining habitats identified within the Survey Area are considered to provide low SRE habitat suitability.
- No Confirmed or Likely SRE or conservation significant invertebrate taxa were recorded within the Survey Area.
- Four Possible SRE taxa (primarily due to the groups being considered data deficient) were recorded within the Survey Area:
  - Two *Aname* mygalomorph spiders (*Aname* sp. 'IS03' and *Aname* sp. 'IS04')
  - Two Olpiid pseudoscorpions (Olpiidae sp. 1 and Olpiidae sp. 2).

## 7 References

- 360 Environmental Pty Ltd 2021, *Ashburton Infrastructure Project Vertebrate Fauna and Short-Range Endemic Invertebrate Fauna Assessment. Unpublished report prepared for Mineral Resources Limited.* , Perth, Australia.
- Anstee, S 1996, 'Use of External Mound Structures as Indicators of the Presence of the Pebble-Mound Mouse', *Wildlife Research*, vol. 23, no. 4, pp.429–434.
- Astron Environmental Services 2011a, *West Pilbara Iron Ore Project Habitat Assessment for Terrestrial Fauna of National Environmental Significance.*
- Astron Environmental Services 2011b, *West Pilbara Iron Ore Project Pilbara Leaf-nosed Bat (Rhinonictoris aurantia) Habitat Assessment.*
- Astron Environmental Services 2012, *West Pilbara Iron Ore Project Activity Assessment for Bats of Conservation Significance.*
- Barrett, G, Silcocks, A, Barry, S, Cunningham, R & Poulter, R 2003, *The new atlas of Australian birds* , Royal Australasian Ornithologists Union, Melbourne, Australia.
- Bat Call WA 2015, *West Pilbara Iron Ore Project Kens Bore East - Red Hill Creek - Echolocation Survey of Bat Activity.*
- Beard, JS 1975, *Pilbara, 1:1 000,000 vegetation series: explanatory notes to sheet 5* , University of Western Australia Press, Perth, Australia.
- Biologic 2012, *Pilbara Leaf-nosed Bat Monitoring Programme.*
- Biota Environmental Sciences 2008, *West Pilbara Iron Ore Project Onslow Rail Corridor – Level 1 Fauna Assessment.*
- Biota Environmental Sciences 2009a, *West Pilbara Iron Ore Project Onslow Rail Corridor Terrestrial Fauna Survey.*
- Biota Environmental Sciences 2009b, *West Pilbara Iron Ore Project Mine Areas Seasonal Fauna Survey.*, no. April.
- Biota Environmental Sciences 2015a, *West Pilbara Iron Ore Project MNES Fauna Species Habitat Assessment.*
- Biota Environmental Sciences 2015b, *West Pilbara Iron Ore Project Red Hill Creek Terrestrial Fauna Assessment: Phase 1.*
- Biota Environmental Sciences 2015c, *West Pilbara Iron Ore Project Stage 1 Extension Terrestrial Fauna Assessment: Phase 1.*
- BirdLife International 2016, *Falco hypoleucos. The IUCN Red List of Threatened Species 2016.* Available from: <https://www.iucnredlist.org/species/22696479/93566768#text-fields>. [24 February 2020].
- Burbidge, AA, McKenzie, NL & Fuller, PJ 1983, "Long-tailed Dunnart Sminthopsis longicaudata." in *The Australian Museum Complete Book of Australian Mammals.*
- Bureau of Meteorology 2021, *Monthly climate data statistics.* Available from: [www.bom.gov.au/climate/data](http://www.bom.gov.au/climate/data).
- Clarke, KR & Gorley, RN 2006, *Primer-E v6.*
- Department of Agriculture and Food WA 2012, *Soil-landscape systems of Western Australia - GIS dataset* , Perth, Australia.

- Department of Agriculture Water and the Environment 2021, *Protected Matters Search Tool*, Canberra, Australia. Available from: <http://www.environment.gov.au/webgis-framework/apps/pmst/pmst.jsf>.
- Department of Biodiversity Conservation and Attractions 2020, *Threatened and Priority Fauna database request (custom search)*, Perth, Australia.
- Department of Biodiversity Conservation and Attractions 2021, *NatureMap*, Perth, Western Australia.. Available from: <https://naturemap.dpaw.wa.gov.au/>.
- Department of Parks and Wildlife 2017, *Interim Guideline for Preliminary Surveys of Night Parrot (Pezoporus occidentalis) in Western Australia*, Perth, Australia, Australia. Available from: [https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/interim\\_guideline\\_for\\_night\\_parrot\\_survey.pdf](https://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/interim_guideline_for_night_parrot_survey.pdf).
- Department of Sustainability Environment Population and Communities 1999, *Survey Guidelines for Australia's Threatened Mammals*, Canberra, Australia. Available from: <http://www.environment.gov.au/system/files/resources/b1c6b237-12d9-4071-a26e-ee816caa2b39/files/survey-guidelines-mammals.pdf>.
- Department of Sustainability Environment Water Population and Communities 2011, *Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act*, Canberra, Australia. Available from: <http://www.environment.gov.au/resource/survey-guidelines-australias-threatened-reptiles-guidelines-detecting-reptiles-listed>.
- Department of the Environment 2013, *Matters of National Environmental Significance: Significant impact guidelines 1.1*, Canberra, Australia. Available from: [http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines\\_1.pdf](http://www.environment.gov.au/system/files/resources/42f84df4-720b-4dcf-b262-48679a3aba58/files/nes-guidelines_1.pdf). [24 July 2018].
- Department of the Environment 2016, *EPBC Act referral guideline for the endangered northern quoll *Dasyurus hallucatus*: EPBC Act Policy Statement*. Available from: <http://www.environment.gov.au/system/files/resources/d7e011a7-bf59-40ed-9387-9afcb8d590f8/files/referral-guideline-northern-quoll.pdf>.
- Department of the Environment and Energy 2016, *Interim Biogeographic Regionalisation for Australia, Version 7*, Canberra, Australia. Available from: [www.environment.gov.au/land/nrs/science/ibra/](http://www.environment.gov.au/land/nrs/science/ibra/).
- Department of the Environment Water Heritage and the Arts 1999, *Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*.
- Department of the Environment Water Heritage and the Arts 2010, *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act*, Canberra, Australia. Available from: <http://www.environment.gov.au/system/files/resources/107052eb-2041-45b9-9296-b5f514493ae0/files/survey-guidelines-birds-april-2017.pdf>. [24 July 2018].
- Department of Water and Environmental Regulation 2016, *Hydrography Linear (Hierarchy) GIS dataset*, Landgate, Perth, Australia.
- Doughty, P, Rolfe, J, Burbidge, A, Pearson, D & Kendrick, P 2011, 'Herpetological assemblages of the Pilbara biogeographic region, Western Australia: ecological associations, biogeographic patterns and conservation.', *Records of the Western Australian Museum Supplement*, vol. 78, pp.315–341.

- Dunlop, J, Birch, N & Moore, H 2018, *Pilbara Northern Quoll Research Program 2018 Annual Report*, Perth, Australia, Australia. Available from:  
<https://library.dbca.wa.gov.au/static/FullTextFiles/072380.pdf>.
- Dyck, S Van, Gynther, I & Baker, A 2013, *Field companion to the mammals of Australia*, New Holland Publishers, Queensland, Australia.
- Van Dyck, S & Strahan, R 2008, *The mammals of Australia*, 3rd edn, New Holland Publishers, Sydney, Australia.
- Environmental Protection Authority 2016, *Technical Guidance - Sampling of short range endemic invertebrate fauna*, Perth, Australia. Available from:  
[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/Tech\\_guidance-Sampling-SREs-Dec-2016.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech_guidance-Sampling-SREs-Dec-2016.pdf). [12 April 2019].
- Environmental Protection Authority 2020, *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*, Perth, Australia. Available from:  
<https://www.epa.wa.gov.au/policies-guidance/technical-guidance-terrestrial-vertebrate-fauna-surveys-environmental-impact>.
- Ford, F & Johnson, C 2007, 'Eroding abodes and vanished bridges: historical biogeography of the substrate specialist pebble-mound mice (*Pseudomys*)', *Journal of Biogeography*, vol. 34, no. 3, pp.514–523.
- Government of Western Australia 2019, *2018 Statewide Vegetation Statistics - Full Report*. Available from: <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics/resource/b7bd60c2-bff6-4637-b213-ae4706412c7>.
- Government, WA 2005, *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, Government of western Australia.
- Harvey, MS 2002, 'Short-range endemism among the Australian fauna: some examples from non-marine environments', *Invertebrate Systematics*, vol. 16, pp.555–570.
- Johnstone, RE & Storr, GM 1998, *Handbook of Western Australian birds*, ed.D Louise, Western Australian Museum, Perth, Australia.
- Kendrick, P 2001, *Pilbara 3 (PIL3 - Hamersley subregion)*.
- McKenzie, N, Woinarski, J & Burbidge, A 2016, 'Sminthopsis longicaudata' *The IUCN Red List of Threatened Species*. Available from: <http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T40545A21948982.en>.
- Menkhorst, P & Knight, F 2004, *A Field Guide to the Mammals of Australia*, ed.D Meagher, Oxford University Press, Melbourne, Australia.
- Menkhorst, P, Rogers, D, Clarke, R, Davies, J, Marsack, P & Franklin, K 2017, *The Australian bird guide*, CSIRO Publishing, Australia.
- Morcombe, M 2017, *Pocket Field Guide to Birdlife of Western Australia*, 1st edn, Pascal Press, Australia.
- Ninox Wildlife Consulting 2013, *A Level 1 Vertebrate Fauna Assessment of the Proposed Tubridgi to Wheatstone Gas Pipeline, Western Australia*.
- Oakwood, M 2000, 'Reproduction and demography of the northern quoll, *Dasyurus hallucatus*, in the lowland savanna of northern Australia', *Australian Journal of Zoology*.
- Olsen, J & Fuentes, E 2008, 'Dietary shifts based upon prey availability in Peregrine Falcons and Australian Hobbies breeding near Canberra, Australia', *Journal of Raptor Research*, vol.

- 42, pp.125–137.
- Pearson, D 1993, “Distribution, status and conservation of pythons in Western Australia”, in D Lunney, & D Ayers, (Eds), *Herpetology in Australia: a Diverse Discipline’.*, Royal Zoological Society of NSW, Sydney, pp.383–395.
- Pearson, D 2003, ‘Giant Pythons of the Pilbara’., *Landscape*, pp.32–39.
- Pearson, D, Tutt, M, Fekete, S, Mitchel, S & Brace, P 2004, *Unravelling the Mysteries of Pilbara Olive Python Ecology* , Karratha, Australia.
- Phoenix Environmental Sciences 2017, *Flora and vegetation survey and terrestrial fauna survey for the Pilbara Regional Waste Management Facility*.
- Pizzey & Knight 2013, *Birds of Australia, Digital Edition* , Gibbon Multimedia, Melbourne, Australia.
- R Core Team 2020, *R: A language and environment for statistical computing*. Available from: <https://www.r-project.org/>.
- Rapallo Environmental 2011, *Pilbara Olive Python Reconnaissance Survey of the West Pilbara Iron Ore Project*.
- Rapallo Environmental 2012a, *2011 Targeted Surveys for Populations of the Northern Quoll (Dasyurus hallucatus) on the West Pilbara Iron Ore Project*.
- Rapallo Environmental 2012b, *Biological Assessment of the Conservation Focus Area for API Management*.
- Rapallo Environmental 2013, *Northern Quoll Annual Monitoring Survey of the West Pilbara Iron Ore Projects Stage 1 for API Management*.
- Rio Tinto 2018, *Flora, Vegetation and Fauna Habitat Assessment at Bourne Highway*.
- Schoenjahn, J, Pavey, CR & Walter, GH 2019, ‘Ecology of the Grey Falcon Falco hypoleucos—current and required knowledge’., *Emu*.
- Shepherd, DP, Beeston, GR & Hopkins, AJM 2002, *Native Vegetation in Western Australia Technical Report 249* , Perth, Australia.
- Western Australian Museum 2021a, *Arachnida and Myriapoda database search March 2021*. .
- Western Australian Museum 2021b, *Crustacea database search March 2021*. .
- Western Australian Museum 2021c, *Mollusc database search March 2021*. .
- Western Australian Museum 2021d, *Checklist of the Terrestrial Vertebrate Fauna of Western Australia*. Available from: <http://museum.wa.gov.au/research/departments/terrestrial-zoology/checklist-terrestrial-vertebrate-fauna-western-australia>.
- Wilson, S & Swan, G 2017, ‘A complete guide to reptiles of Australia’ , 5th edn , New Holland Publishers, Australia.

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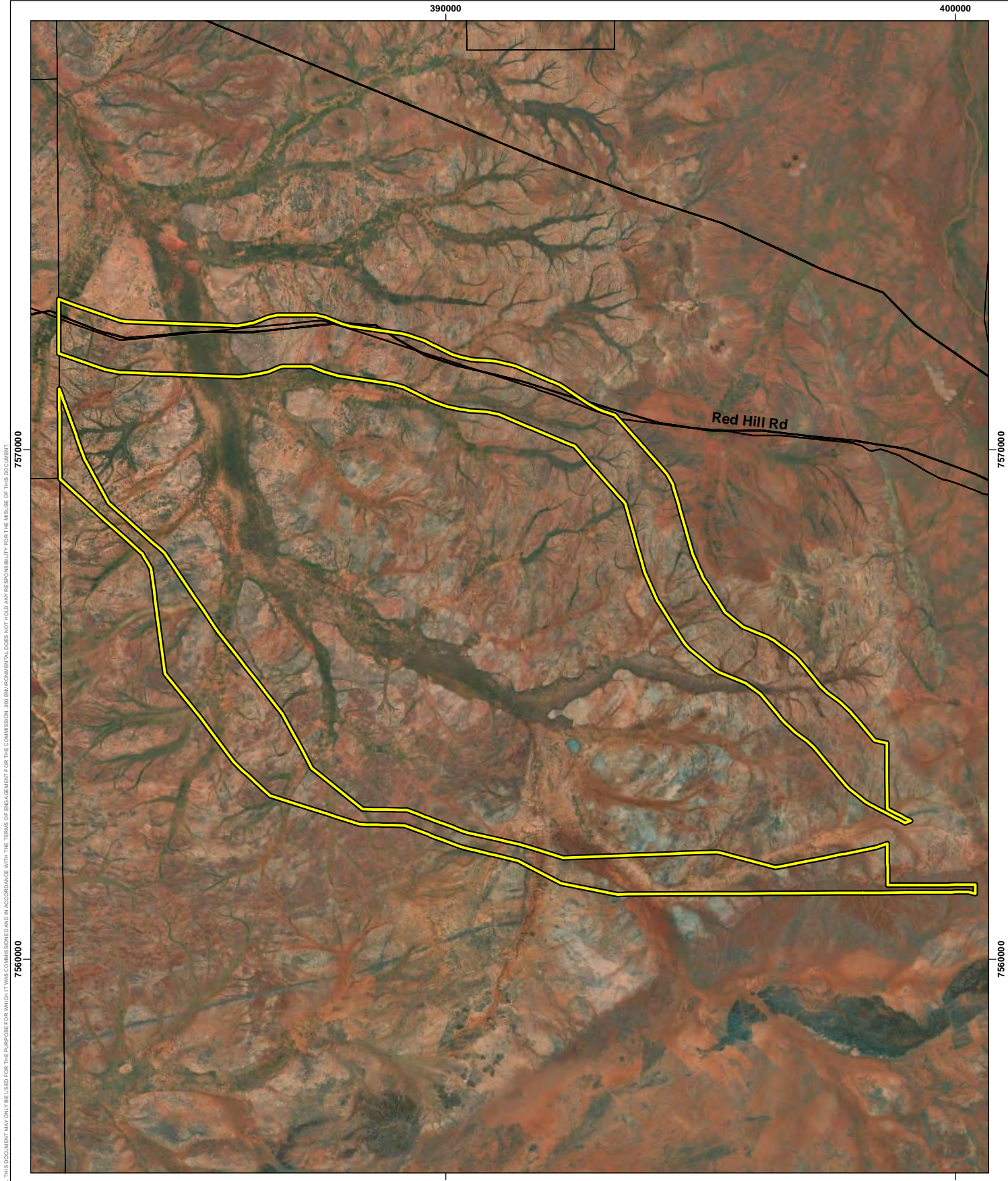
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# Figures



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- Legend**
- Survey Area
  - Cadastre

0 0.5 1 2  
km  
Scale: 1:100,000 @ A4

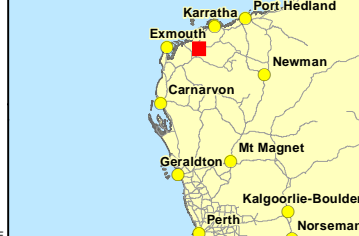
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**LOCALITY MAP**

**HORIZONTAL DATUM AND PROJECTION**  
GDA 1994 MGA Zone 50



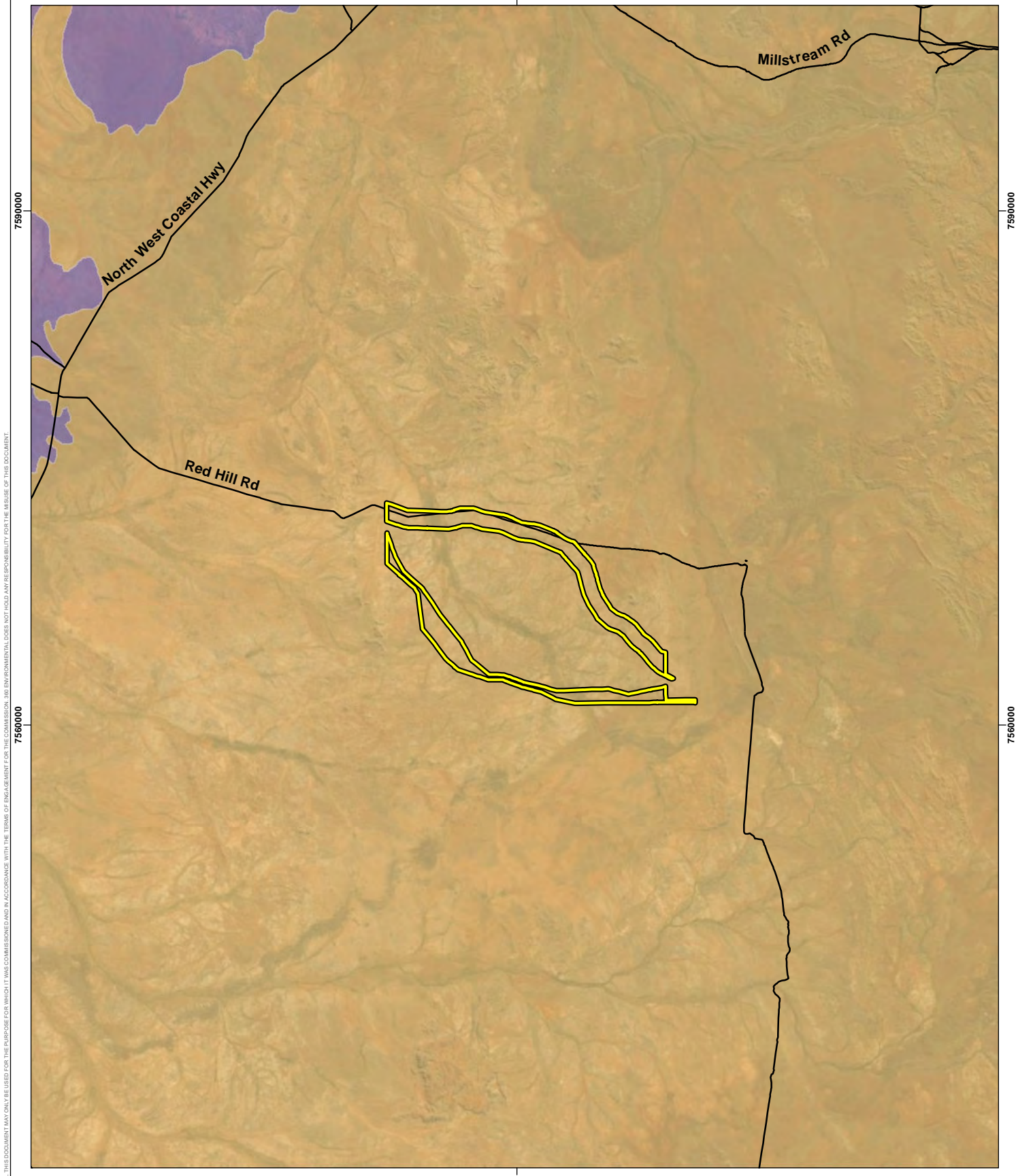
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**MINERAL RESOURCES LTD**  
**Red Hill North and South Haul Road**

**Vertebrate Fauna and SRE  
Invertebrate Fauna Assessment**

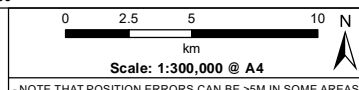
**Figure 1**  
**Survey Area**

- AERIAL PHOTOGRAPHY SOURCED LANDGATE

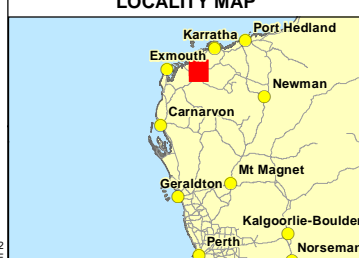


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- Legend**
- Survey Area
  - IBRA V7 Subregions
    - PIL03, Hamersley
    - PIL04, Roebourne



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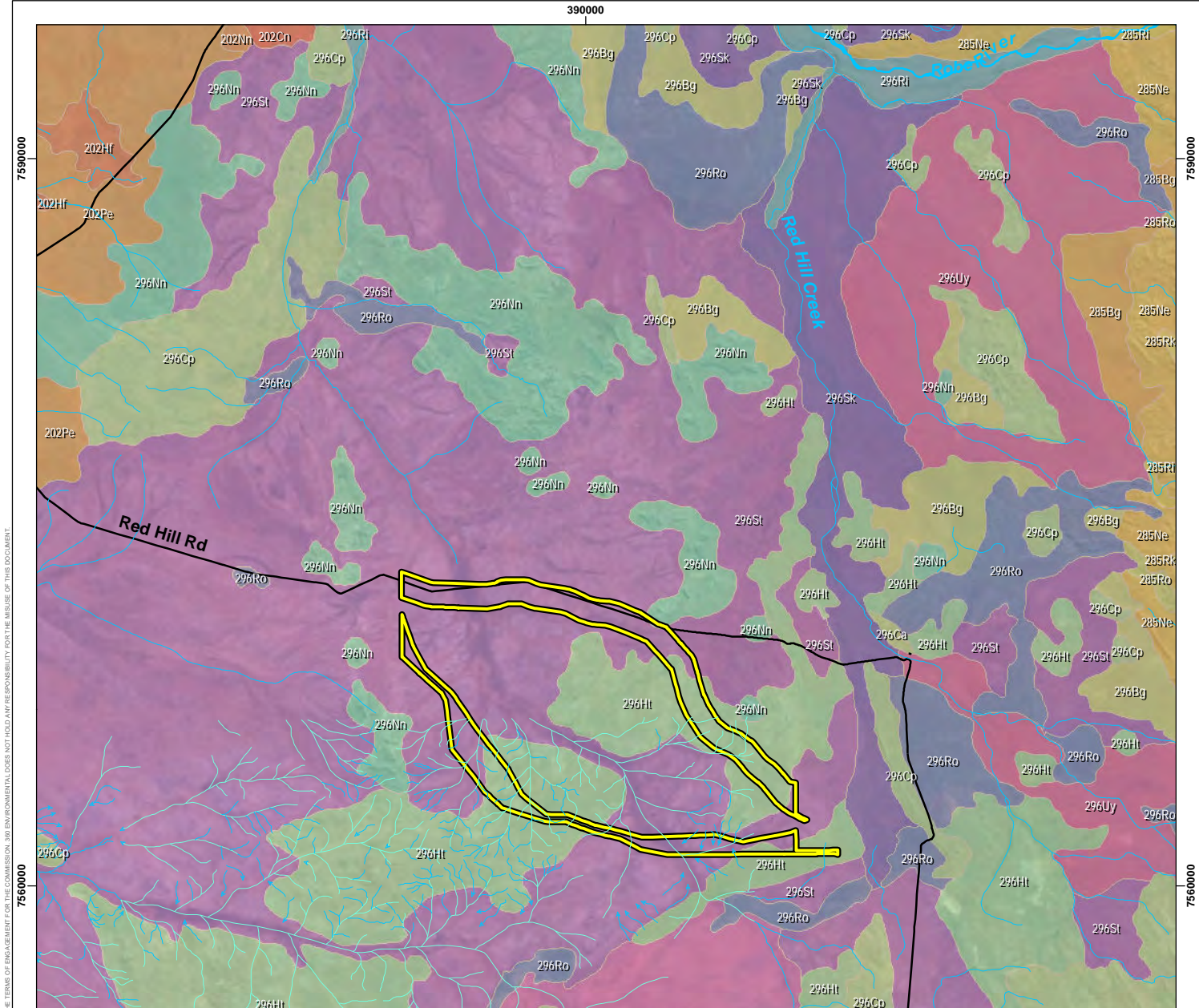
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ENVIRONMAPS	EW	EW	0

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**Invertebrate Fauna Assessment**

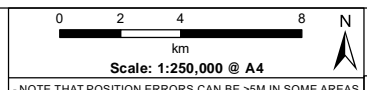
**Figure 2**  
**IBRA Subregions**



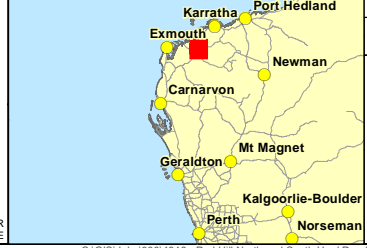
Soil Land Systems	
202Cn: Alluvial plains and flood plains supporting snakewood shrublands, soft and hard spinifex grasslands and tussock grasslands.	296Ca: Low calccrete platforms and plains supporting shrubby hard spinifex
202Hf: Gilgaied clay plains supporting Roebourne Plains grass grasslands and minor grassy snakewood shrublands.	296Cp: Rugged sandstone hills, ridges, stony footslopes and interfluvies supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs.
202Nn: Low mesas and hills of sedimentary rocks supporting soft and hard spinifex shrubby grasslands.	296Ht: Rough shale hills, stony plains and broad drainage floors supporting hard spinifex grasslands and sparse shrubs.
202Pe: Gravelly plains supporting hard spinifex grasslands and minor snakewood	296Nn: Low mesas and hills of sedimentary rocks supporting soft and hard spinifex shrubby grasslands.
285Bg: Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.	296Ri: Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex.
285Ne: Rugged jaspilite plateaux, ridges and mountains supporting hard spinifex	296Ro: Low plateaux, mesas and buttes of limonite supporting soft spinifex and occasionally hard spinifex grasslands.
285Ri: Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of acacias and fringing communities of eucalypts sometimes with tussock grasses or spinifex.	296Sk: Stony alluvial plains supporting snakewood shrublands with patchy tussock grasses and spinifex grasslands
285Rk: Basalt hills, plateaux, lower slopes and minor stony plains supporting hard spinifex and occasionally soft spinifex grasslands with scattered shrubs.	296St: Gently undulating stony plains supporting hard and soft spinifex grasslands and snakewood shrublands.
285Ro: Low plateaux, mesas and buttes of limonite supporting soft spinifex and occasionally hard spinifex grasslands.	296Ua: Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.
296Bg: Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.	296Uy: Stony plains, alluvial plains and drainage lines supporting shrubby soft spinifex grasslands.

**Legend**

- Survey Area
- Watercourse - major, non-perennial
- Watercourse - minor, non-perennial
- Watercourse - indefinite



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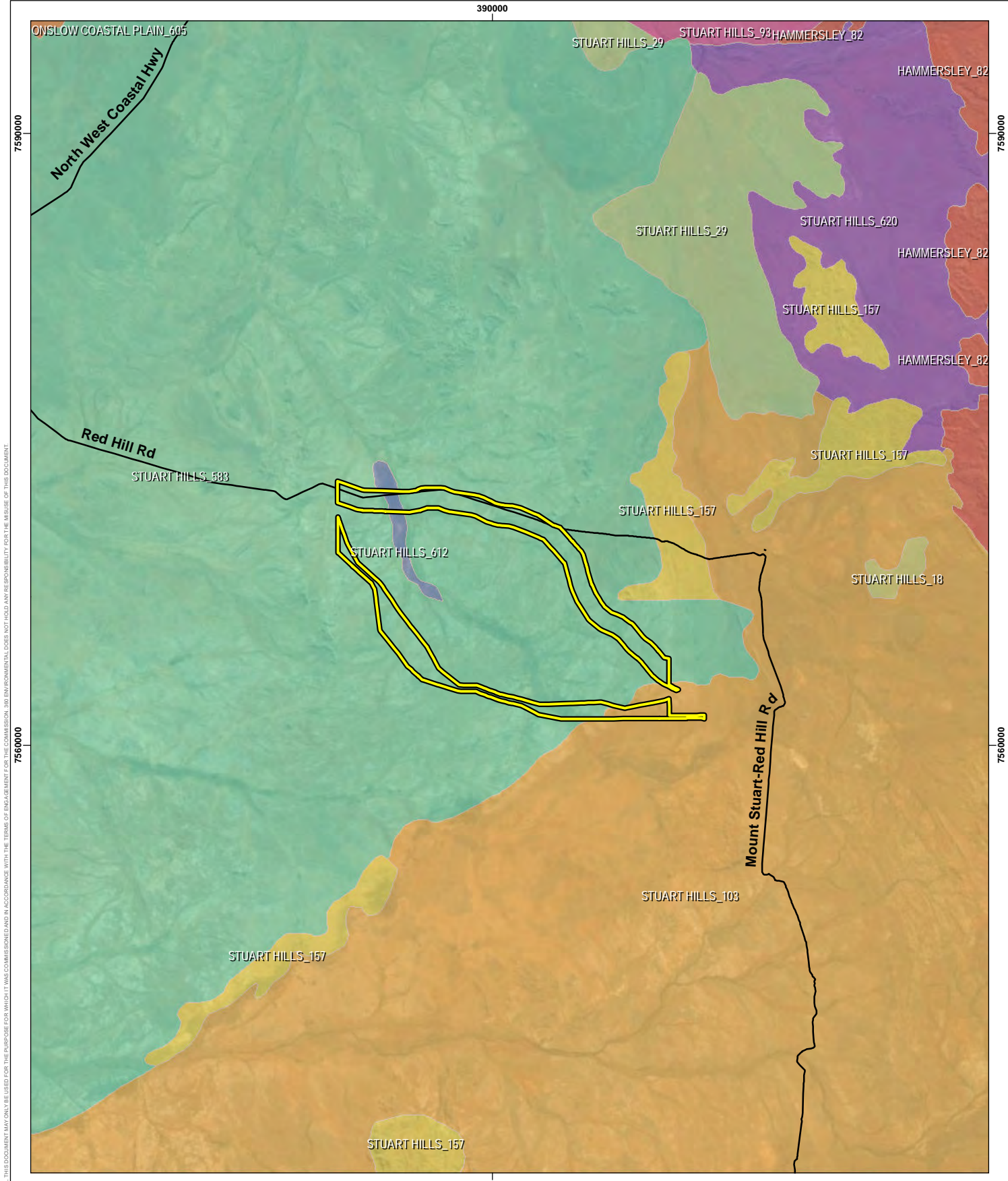
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**Vertebrate Fauna and SRE**  
**Invertebrate Fauna Assessment**  
**Figure 3**  
**Soil Land Systems**  
**and Hydrography**

- SOILS SOURCED DPIRD WATERCOURSE DWER  
 - AERIAL PHOTOGRAPHY SOURCED LANDGATE

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**Legend**

Survey Area

**Broad Vegetation Types**

- HAMMERSLEY\_82: Low tree-steppe
- ONSLOW COASTAL PLAIN\_605: Shrub-steppe
- STUART HILLS\_103: Shrub-steppe
- STUART HILLS\_157: Grass-steppe
- STUART HILLS\_18: Low woodland, open low woodland or sparse woodland
- STUART HILLS\_29: Low woodland, open low woodland or sparse woodland
- STUART HILLS\_583: Sparse shrub-steppe
- STUART HILLS\_612: Low woodland or open low woodland
- STUART HILLS\_620: Shrub-steppe
- STUART HILLS\_93: Shrub-steppe

- VEGETATION TYPES SOURCED DPIRD  
- AERIAL PHOTOGRAPHY SOURCED LANDGATE

0 2 4 8 km  
Scale: 1:250,000 @ A4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

**LOCALITY MAP**

The locality map shows the project area in Western Australia, near Geraldton and Perth. Key locations marked include Karratha, Port Hedland, Exmouth, Newman, Carnarvon, Mt Magnet, Kalgoorlie-Boulder, Perth, and Norseman.

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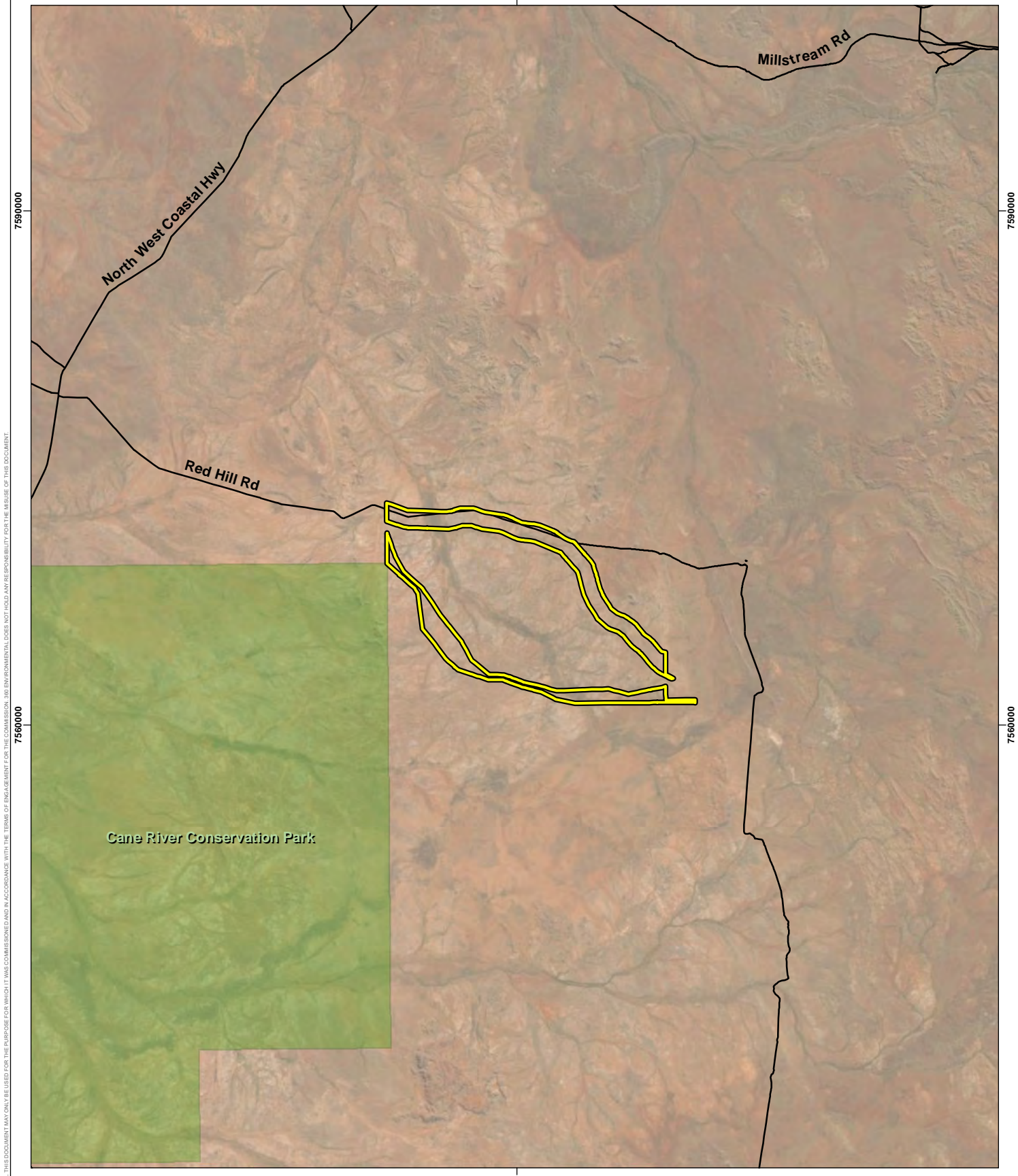
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**Vertebrate Fauna and SRE Invertebrate Fauna Assessment**

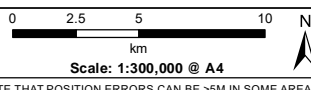
**Figure 4**  
**Broad Vegetation Types**

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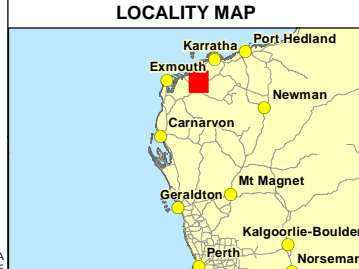
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- Legend**
- Survey Area
  - Cane River Conservation Park



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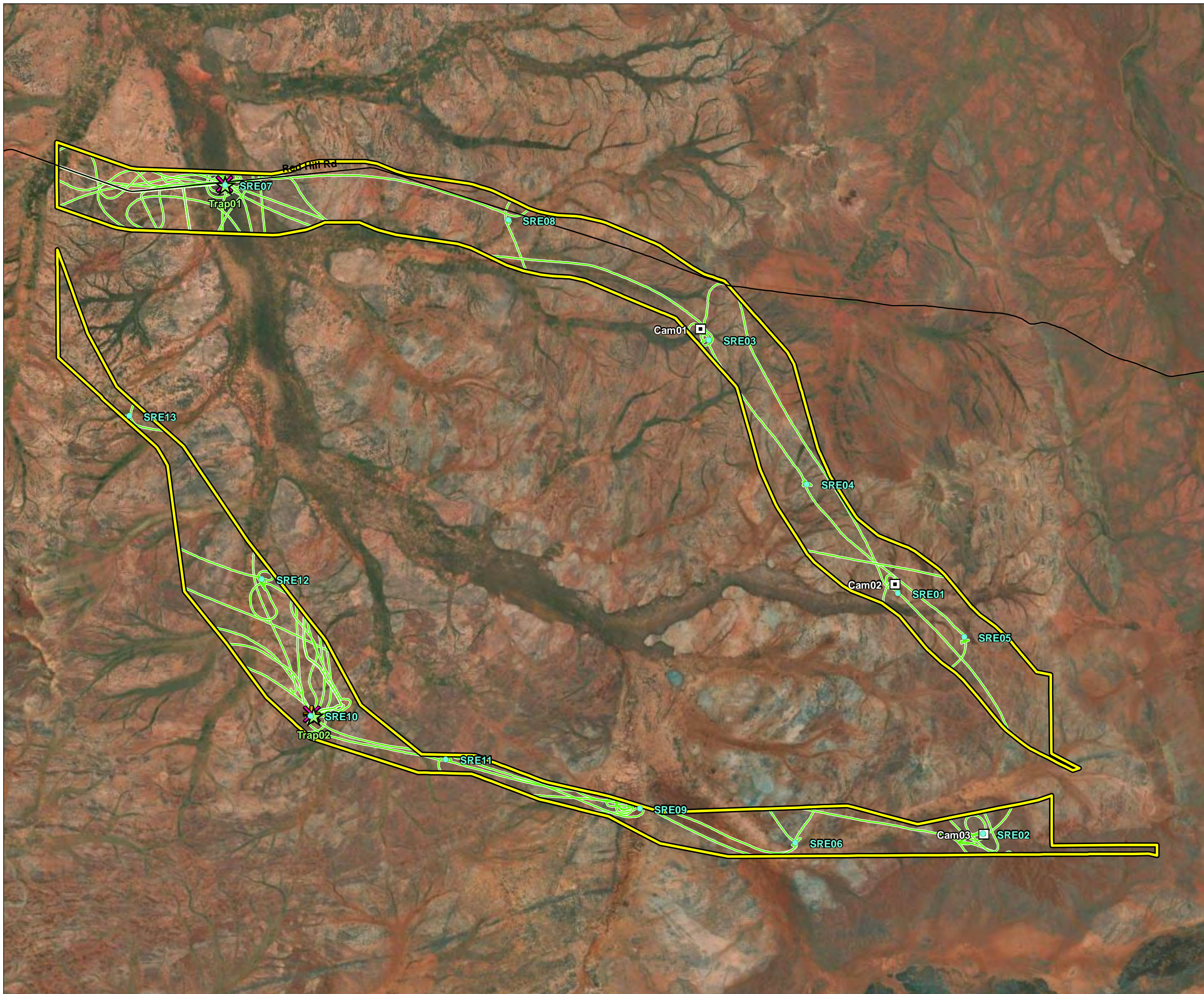
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ENVIRONMAPS	EW	EW	0

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**Vertebrate Fauna and SRE**  
**Invertebrate Fauna Assessment**

**Figure 5**  
**Conservation Areas**

- CONSERVATION AREAS SOURCED DBCA  
- AERIAL PHOTOGRAPHY SOURCED LANDGATE

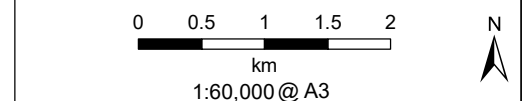


- Legend**
- Site Boundary
  - Survey Tracks
  - Fauna Survey Site**
  - ARU - audible calls
  - ARU - ultrasonic calls
  - Active search
  - Camera trap line
  - Trap site

- AERIAL PHOTOGRAPHY OPEN SOURCED

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

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**LOCALITY MAP**



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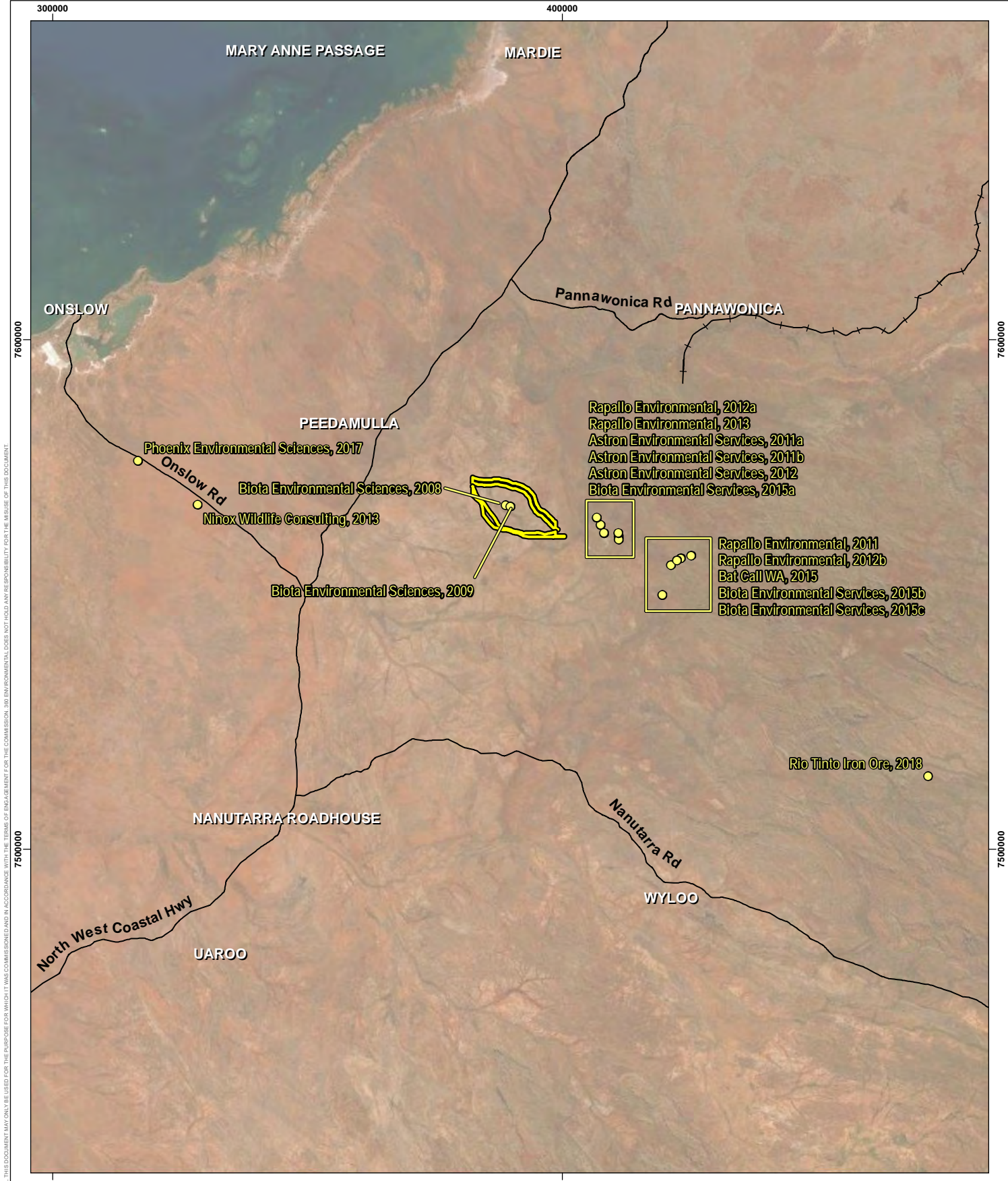
**HORIZONTAL DATUM AND PROJECTION**  
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<b>CREATED</b> ENVIRONMAPS	<b>CHECKED</b> EW	<b>APPROVED</b> EW	<b>REVISION</b> 0
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**Vertebrate Fauna and SRE Invertebrate Fauna Assessment**

**Figure 6**  
 Survey Effort

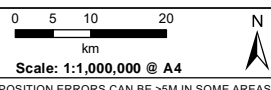


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- Legend**
- Survey Area
  - Previous Study Locations

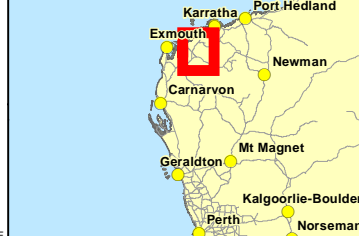
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  - Rapallo Environmental, 2013
  - Astron Environmental Services, 2011a
  - Astron Environmental Services, 2011b
  - Astron Environmental Services, 2012
  - Biota Environmental Services, 2015a
- - 
  -
- - 
  -
- Rapallo Environmental, 2011
  - Rapallo Environmental, 2012b
  - Bat Call WA, 2015
  - Biota Environmental Services, 2015b
  - Biota Environmental Services, 2015c

Rio Tinto Iron Ore, 2018



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**LOCALITY MAP**



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**HORIZONTAL DATUM AND PROJECTION**  
GDA 1994 MGA Zone 50

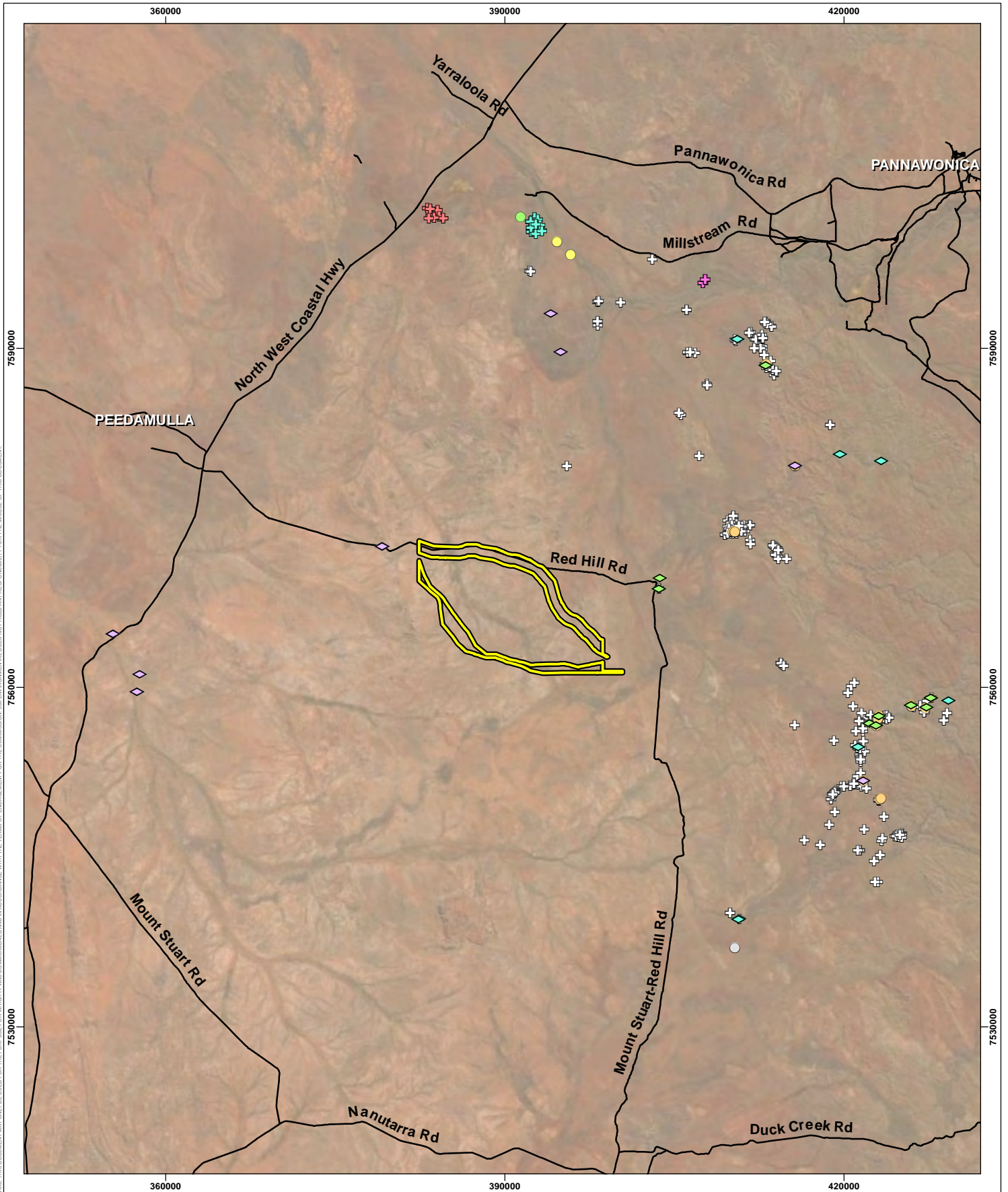
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**Vertebrate Fauna and SRE  
Invertebrate Fauna Assessment**

**Figure 7**  
Previous Study Locations





**Legend**

Survey Area

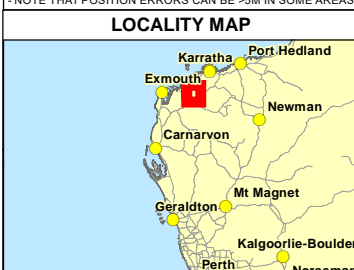
DBCA Threatened and Priority Fauna Locations

- Flatback turtle
- Fortescue grunter
- Ghost bat
- Grey falcon
- Mesa A paradraculoides
- Mesa B/C paradraculoides
- Mesa G paradraculoides
- Northern quoll
- Orange leaf-nosed bat
- Peregrine falcon
- Pilbara leaf-nosed bat
- Pilbara olive python
- Western pebble-mound mouse, ngadji

0 3.75 7.5 15 km

Scale: 1:450,000 @ A4

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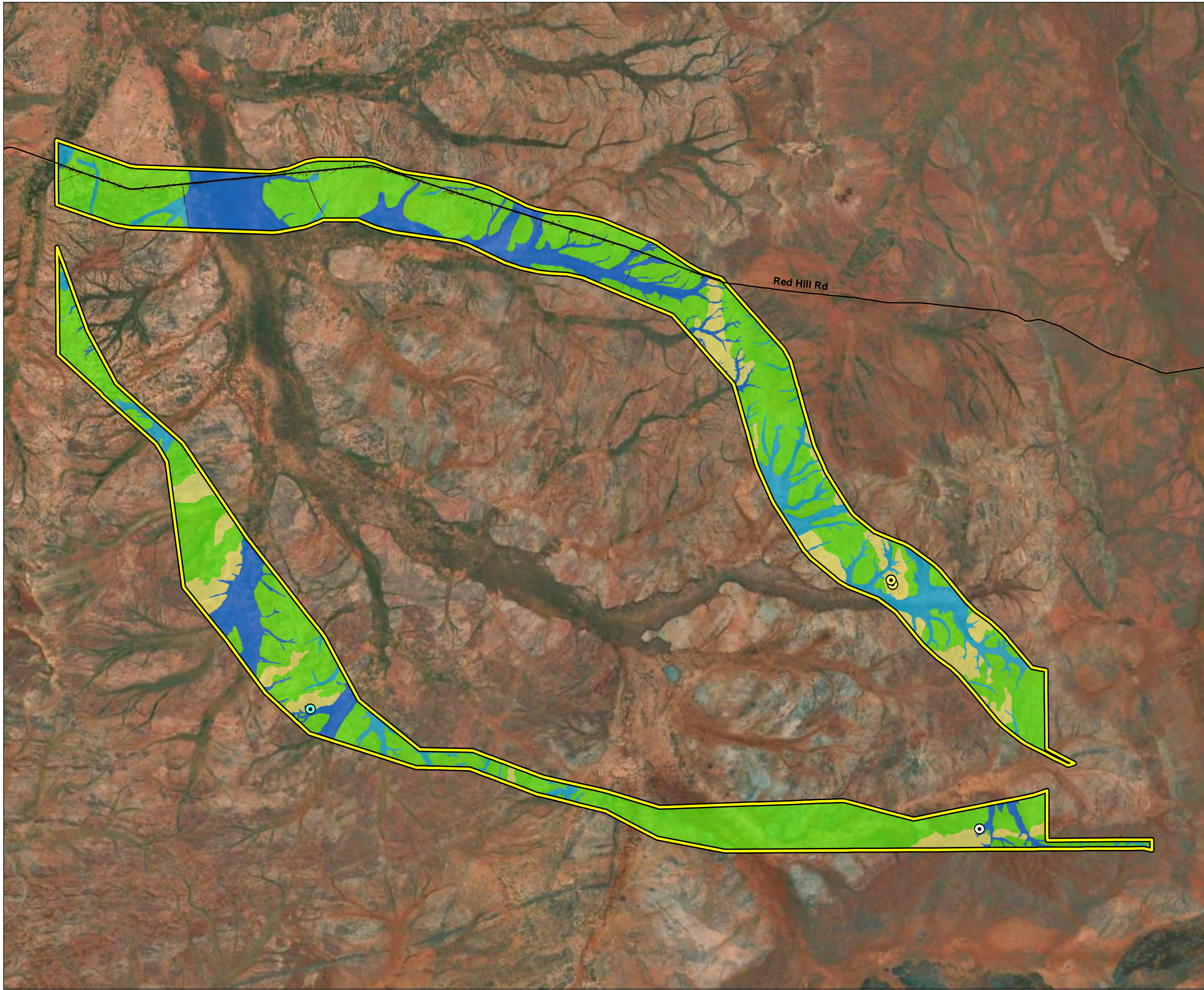
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ENVIRONMAPS	EW	EW	0

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**Vertebrate Fauna and SRE**  
**Invertebrate Fauna Assessment**

**Figure 8**  
**DBCA Threatened and**  
**Priority Fauna Locations**

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- CONSERVATION AREAS SOURCED DBCA  
 - AERIAL PHOTOGRAPHY SOURCED LANDGATE

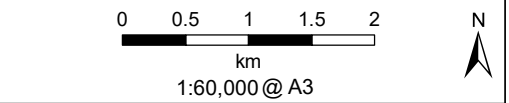


- Legend**
- Site Boundary
  - Conservation Significant Fauna
    - Long-tailed Dunnart
    - Northern Quoll
    - Pilbara Leaf-nosed Bat
  - Fauna Habitat
    - Stony hills and slopes
    - Stony plain
    - Drainage line/river/creek (major)
    - Drainage line/river/creek (minor)
    - Cleared

- AERIAL PHOTOGRAPHY OPEN SOURCED

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

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**LOCALITY MAP**



<b>PROJECT NO</b> 4846	<b>DATE</b> 5/04/2022
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**HORIZONTAL DATUM AND PROJECTION**  
 GDA 1994 MGA Zone 50

<b>CREATED</b> ENVIRONMAPS	<b>CHECKED</b> EW	<b>APPROVED</b> EW	<b>REVISION</b> 0
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**MINERAL RESOURCES LTD**  
 Red Hill North and South Haul Road

**Vertebrate Fauna and SRE Invertebrate Fauna Assessment**

**Figure 9**  
 Fauna Habitats and Conservation Significant Fauna

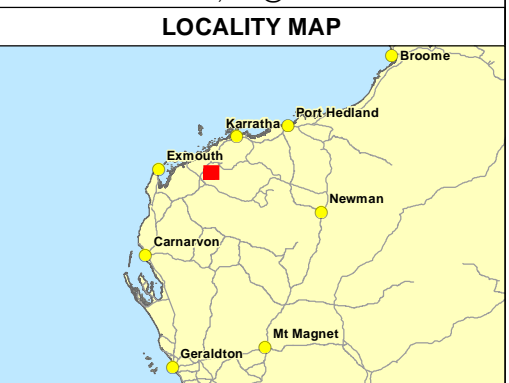
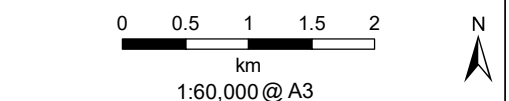


- Legend**
- Site Boundary
  - SRE Habitat Suitability
    - Moderate suitability
    - Low suitability
    - Cleared

- AERIAL PHOTOGRAPHY OPEN SOURCED

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

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<b>PROJECT NO</b> 4846		<b>DATE</b> 5/04/2022	
<b>HORIZONTAL DATUM AND PROJECTION</b> GDA 1994 MGA Zone 50			
<b>CREATED</b> ENVIRONMAPS	<b>CHECKED</b> EW	<b>APPROVED</b> EW	<b>REVISION</b> 0

**MINERAL RESOURCES LTD**  
**Red Hill North and South Haul Road**

**Vertebrate Fauna and SRE Invertebrate Fauna Assessment**

**Figure 10**  
**SRE Habitat Suitability**

# Appendices

# Appendix A

## Database Searches

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
BIRD	<i>Falco hypoleucos</i>	VU	20/05/2015	Certain	Survey	1	CANE	Red Hill, RHSOpp
BIRD	<i>Falco hypoleucos</i>	VU	20/05/2015	Certain	Survey	1	CANE	Red Hill, RHSOpp
BIRD	<i>Falco peregrinus</i>	OS	19/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHS06E
FISH	<i>Leiopotherapon aheneus</i>	P4	07/04/2018		Survey			
FISH	<i>Leiopotherapon aheneus</i>	P4	09/04/2018		Survey			
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005					
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005					
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005					
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005					
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005					
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	25/07/2005	Certain	Survey	1	Fortescue	
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	06/02/2007	Certain	Survey	1	Fortescue	
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	07/10/2010	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides anachoretus</i>	VU	07/10/2010					
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	03/05/2005	Certain	Survey	3	Fortescue	
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	28/05/2008	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	28/05/2008					
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	Certain	Survey	1	FORTESCUE	Robe Valley, DD11MEC0003
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	Certain	Survey	1	FORTESCUE	Robe Valley, DD11MEC0003
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	Certain	Survey	1	FORTESCUE	Robe Valley, DD11MEC0003
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	Certain	Survey	1	FORTESCUE	Robe Valley, DD11MEC0003
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	Certain	Survey	1	FORTESCUE	Robe Valley, MERC0114
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, DD11MEC0003
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, DD11MEC0003
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, DD11MEC0003
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, DD11MEC0003
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, DD11MEC0003
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	10/08/2015	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, MERC0114
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	29/09/2015	Certain	Survey	1	FORTESCUE	Robe Valley, DD14MEC0002
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	29/09/2015	Certain	Survey	1	FORTESCUE	Robe Valley, DD14MEC0002
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	29/09/2015	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, DD14MEC0002
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	29/09/2015	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, DD14MEC0002
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	15/09/2016	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, GR15MEC0018

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	15/09/2016	WAM Vouchered	Survey	1	FORTESCUE	Mesa C, RC16MEC0058
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	27/05/2017	WAM Vouchered		1	Mesa C	RC15MEC0084
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	27/05/2017		Survey			
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	RC15MEC0186
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	GR15MEC0014
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	GR15MEC0014
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	GR15MEC0014
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	GR15MEC0017
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	GR15MEC0017
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	GR15MEC0016
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	GR15MEC0016
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	GR15MEC0016
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	RC16MEC0037
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	RC16MEC0037
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	RC16MEC0037
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	RC15MEC0084
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	RC15MEC0084
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	RC15MEC0084
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	RC15MEC0084
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017	WAM Vouchered		1	Mesa C	RC15MEC0084
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	12/07/2017		Survey			
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	08/04/2018		Survey			
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	25/05/2018		Survey			
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU	17/07/2018		Survey			
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU		WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU		WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU		WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU						
INVERTEBRATE	<i>Paradraculoides bythius</i>	VU						
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	21/12/2004	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	21/12/2004	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	21/12/2004					
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	21/12/2004					
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	01/06/2005	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	01/06/2005	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	01/06/2005					
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	01/06/2005					
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	16/04/2008	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	16/04/2008					
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	22/10/2011	WAM Vouchered	Collection	1	FORTESCUE	FORTESCUE
INVERTEBRATE	<i>Paradraculoides gnophicola</i>	VU	22/10/2011					
MAMMAL	<i>Macroderma gigas</i>	VU	24/06/2009	Certain	Survey		CANE	Pannawonica, AQMHARPO5
MAMMAL	<i>Macroderma gigas</i>	VU	26/05/2012	Certain	Survey	2	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Macroderma gigas</i>	VU	26/05/2012	Certain	Survey	3	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Macroderma gigas</i>	VU	27/05/2012	Certain	Survey	2	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Macroderma gigas</i>	VU	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Macroderma gigas</i>	VU	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Macroderma gigas</i>	VU	19/05/2015	Certain	Survey	8	HAMERSLEY RANGE	Red Hill, RHSBat06
MAMMAL	<i>Macroderma gigas</i>	VU	19/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHSOpp - Scat
MAMMAL	<i>Macroderma gigas</i>	VU	21/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHSBat06 - SM2 Recording
MAMMAL	<i>Macroderma gigas</i>	VU	22/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHSBat02
MAMMAL	<i>Macroderma gigas</i>	VU	11/05/2016	Certain	Survey	1	HAMERSLEY RANGE	Cave APIgbRH-01
MAMMAL	<i>Macroderma gigas</i>	VU	12/05/2016	Certain	Survey	1	CANE	Cave APIgbJE-01
MAMMAL	<i>Macroderma gigas</i>	VU	12/05/2016	Certain		1	Pilbara	Central Pilbara
MAMMAL	<i>Macroderma gigas</i>	VU	12/05/2016	Certain		1	Pilbara	Central Pilbara
MAMMAL	<i>Macroderma gigas</i>	VU	12/05/2016	Certain		1	Pilbara	Central Pilbara
MAMMAL	<i>Macroderma gigas</i>	VU	12/05/2016		Survey			
MAMMAL	<i>Macroderma gigas</i>	VU	26/05/2016	Certain		1	Pilbara	Central Pilbara
MAMMAL	<i>Macroderma gigas</i>	VU	26/05/2016	Certain		1	Pilbara	Central Pilbara
MAMMAL	<i>Macroderma gigas</i>	VU	26/05/2016	Certain		1	Pilbara	Central Pilbara
MAMMAL	<i>Macroderma gigas</i>	VU	26/05/2016		Survey			
MAMMAL	<i>Macroderma gigas</i>	VU	05/10/2016		Survey			
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/06/2009	Certain	Survey	1	CANE	Pannawonica, AQA19E
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2011	WAM Vouchered	Survey	1	HAMERSLEY RANGE	CARDO, F13
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2011	WAM Vouchered	Survey	1	HAMERSLEY RANGE	CARDO, E7
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2011	WAM Vouchered	Survey	1	HAMERSLEY RANGE	CARDO, E13
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2011	WAM Vouchered	Survey	1	HAMERSLEY RANGE	CARDO, F9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2011	WAM Vouchered	Survey	1	HAMERSLEY RANGE	CARDO, F12
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A15
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, A2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A8
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A11
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, A1
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, B6
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, B7
MAMMAL	<i>Dasyurus hallucatus</i>	EN	09/07/2011	WAM Vouchered	Survey	1	HAMERSLEY RANGE	CARDO, E12



CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
MAMMAL	<i>Dasyurus hallucatus</i>	EN	09/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A8
MAMMAL	<i>Dasyurus hallucatus</i>	EN	09/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, B7
MAMMAL	<i>Dasyurus hallucatus</i>	EN	09/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, B14
MAMMAL	<i>Dasyurus hallucatus</i>	EN	09/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, C12
MAMMAL	<i>Dasyurus hallucatus</i>	EN	10/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A10
MAMMAL	<i>Dasyurus hallucatus</i>	EN	10/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, B12
MAMMAL	<i>Dasyurus hallucatus</i>	EN	10/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, B15
MAMMAL	<i>Dasyurus hallucatus</i>	EN	11/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A14
MAMMAL	<i>Dasyurus hallucatus</i>	EN	11/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A15
MAMMAL	<i>Dasyurus hallucatus</i>	EN	11/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A8
MAMMAL	<i>Dasyurus hallucatus</i>	EN	11/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A11
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/07/2011	WAM Vouchered	Survey	1	HAMERSLEY RANGE	CARDO, E13
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, A10
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, A1
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, B10
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/07/2011	WAM Vouchered	Survey	1	FORTESCUE	CARDO, B15
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/07/2011	WAM Vouchered	Survey	1	CANE	CARDO, C11
MAMMAL	<i>Dasyurus hallucatus</i>	EN	13/07/2011	WAM Vouchered	Survey	1	HAMERSLEY RANGE	CARDO, G5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/05/2012	Certain	Survey	1	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/05/2012	Certain	Survey	1	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/05/2012	Certain	Survey	1	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/05/2012	Certain	Survey	1	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Dasyurus hallucatus</i>	EN	25/05/2012	Certain	Survey	1	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Dasyurus hallucatus</i>	EN	26/05/2012	Certain	Survey	5	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Dasyurus hallucatus</i>	EN	26/05/2012	Certain	Survey	1	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Dasyurus hallucatus</i>	EN	28/06/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHC5b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	28/06/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHC4b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/06/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHCA5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/06/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHC2a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/06/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHC8a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/06/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHC4b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/06/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHC10b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/06/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, CZa06
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/06/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, CZa01
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/07/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHC2b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	02/07/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHC10b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	02/07/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, CZ9b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	03/07/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, CZ6a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	03/07/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, CZ10b

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/07/2012	Certain	Survey	1	CANE	CARDO, JNC1b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/07/2012	Certain	Survey	1	CANE	CARDO, JNC10b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/07/2012	Certain	Survey	1	FORTESCUE	CARDO, JSC2b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/07/2012	Certain	Survey	1	CANE	CARDO, JNC6a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/07/2012	Certain	Survey	1	CANE	CARDO, JNC4a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/07/2012	Certain	Survey	1	CANE	CARDO, JNC3a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/07/2012	Certain	Survey	1	CANE	CARDO, JNC1a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/07/2012	Certain	Survey	1	CANE	CARDO, JNC7a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/07/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, CZ6a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC1b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC2b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	FORTESCUE	CARDO, JSC9b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC3b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC5b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC6b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, CC9a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	CANE	CARDO, CC8a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	CANE	CARDO, CC5a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	FORTESCUE	CARDO, JSC8b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	FORTESCUE	CARDO, JSC2b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	FORTESCUE	CARDO, JSC9a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	05/07/2012	Certain	Survey	1	CANE	CARDO, JNC8a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	06/07/2012	Certain	Survey	1	CANE	CARDO, JNC10a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	06/07/2012	Certain	Survey	1	CANE	CARDO, JNC5a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	06/07/2012	Certain	Survey	1	CANE	CARDO, CC8a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	06/07/2012	Certain	Survey	1	FORTESCUE	CARDO, JSC7b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	06/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC1b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	06/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC3b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	06/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC4b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	CANE	CARDO, JWC2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	CANE	CARDO, JWC3
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	CANE	CARDO, JWC5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	CANE	CARDO, JNC10a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	CANE	CARDO, JNC8b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC4b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	CANE	CARDO, CC7a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC2b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	CANE	CARDO, JWC02
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	CANE	CARDO, JWC03

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/07/2012	Certain	Survey	1	CANE	CARDO, JWC05
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC5b
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2012	Certain	Survey	1	CANE	CARDO, CC7a
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2012	Certain	Survey	1	CANE	CARDO, JNC2B
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2012	Certain	Survey	1	CANE	CARDO, JWC9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2012	Certain	Survey	1	CANE	CARDO, JWC02
MAMMAL	<i>Dasyurus hallucatus</i>	EN	08/07/2012	Certain	Survey	1	HAMERSLEY RANGE	CARDO, CC9A
MAMMAL	<i>Dasyurus hallucatus</i>	EN	09/07/2012	Certain	Survey	1	CANE	CARDO, JWC7
MAMMAL	<i>Dasyurus hallucatus</i>	EN	09/07/2012	Certain	Survey	1	FORTESCUE	CARDO, CC1B
MAMMAL	<i>Dasyurus hallucatus</i>	EN	13/05/2013	Certain	Survey	1	FORTESCUE	RED HILL, 9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/05/2013	Certain	Survey	1	FORTESCUE	RED HILL, 13
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/05/2013	Certain	Survey	1	FORTESCUE	RED HILL, 16
MAMMAL	<i>Dasyurus hallucatus</i>	EN	15/05/2013	Certain	Survey	1	FORTESCUE	RED HILL, 20
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	CANE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/04/2014	Certain	Targeted survey		HAMERSLEY RANGE	Red Hill Station - Ken?s Bore
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/04/2014	Certain	Targeted survey		HAMERSLEY RANGE	Red Hill Station - Red Hill Gorge
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/04/2014	Certain	Targeted survey		HAMERSLEY RANGE	Red Hill Station - Flowerdew Creek
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/04/2014	Certain	Targeted survey		HAMERSLEY RANGE	Red Hill Station - Fig Ridge
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/04/2014	Certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station - Ken?s Bore
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/05/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station - Ken?s Bore
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/05/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/05/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/05/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/05/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/05/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	02/05/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	03/05/2014	Certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	21/09/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	22/09/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
MAMMAL	<i>Dasyurus hallucatus</i>	EN	22/09/2014	Certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	22/09/2014	Certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	22/09/2014	Certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/09/2014	Certain	Opportunistic sighting	1	CANE	Red Hill Station - Cardo
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/09/2014	Certain	Targeted survey	1	CANE	Red Hill Station - Cardo
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/09/2014	Certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/09/2014	Certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/09/2014	Certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/09/2014	Certain	Targeted survey	1	CANE	Red Hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/09/2014	Very certain	Targeted survey	1	HAMERSLEY RANGE	Red Hill Station
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/10/2014	WAM Vouchered	Survey	1	HAMERSLEY RANGE	Buckland Hills, BUHOpp - Scat
MAMMAL	<i>Dasyurus hallucatus</i>	EN	19/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHSOpp - Remains
MAMMAL	<i>Dasyurus hallucatus</i>	EN	19/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHSOpp - Scat
MAMMAL	<i>Dasyurus hallucatus</i>	EN	19/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHSOpp - Scat
MAMMAL	<i>Dasyurus hallucatus</i>	EN	19/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHS02E
MAMMAL	<i>Dasyurus hallucatus</i>	EN	19/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHS03F - Scat
MAMMAL	<i>Dasyurus hallucatus</i>	EN	20/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHS05E
MAMMAL	<i>Dasyurus hallucatus</i>	EN	20/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHS06E - Scat
MAMMAL	<i>Dasyurus hallucatus</i>	EN	20/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHS02E
MAMMAL	<i>Dasyurus hallucatus</i>	EN	20/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	1
MAMMAL	<i>Dasyurus hallucatus</i>	EN	20/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	1
MAMMAL	<i>Dasyurus hallucatus</i>	EN	20/05/2015	Very certain	Targeted survey	1	FORTESCUE	1
MAMMAL	<i>Dasyurus hallucatus</i>	EN	20/05/2015	Certain	Opportunistic sighting	1	FORTESCUE	Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	21/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHSOpp - Track
MAMMAL	<i>Dasyurus hallucatus</i>	EN	21/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHS02E
MAMMAL	<i>Dasyurus hallucatus</i>	EN	21/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHS02E
MAMMAL	<i>Dasyurus hallucatus</i>	EN	21/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	1
MAMMAL	<i>Dasyurus hallucatus</i>	EN	21/05/2015	Certain	Targeted survey	1	FORTESCUE	Yarraloola - site 1
MAMMAL	<i>Dasyurus hallucatus</i>	EN	22/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHS02E
MAMMAL	<i>Dasyurus hallucatus</i>	EN	22/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	1
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHS02E
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHSOpp - Track
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/05/2015	Certain	Survey		HAMERSLEY RANGE	Red Hill, RHSOpp - Scat
MAMMAL	<i>Dasyurus hallucatus</i>	EN	25/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	25/05/2015	Very certain	Targeted survey	1	FORTESCUE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	27/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	27/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	27/05/2015	Very certain	Targeted survey	1	FORTESCUE	3
MAMMAL	<i>Dasyurus hallucatus</i>	EN	27/05/2015	Very certain	Targeted survey	1	FORTESCUE	4

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/05/2015	Very certain	Targeted survey	1	CANE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	4
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/05/2015	Very certain	Targeted survey	1	FORTESCUE	4
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/05/2015	Very certain	Targeted survey	1	FORTESCUE	4
MAMMAL	<i>Dasyurus hallucatus</i>	EN	30/05/2015	Very certain	Targeted survey	1	CANE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	31/05/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	31/05/2015	Very certain	Targeted survey	1	CANE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	31/05/2015	Very certain	Targeted survey	1	CANE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	31/05/2015	Very certain	Targeted survey	1	CANE	2
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/06/2015	Very certain	Targeted survey	1	FORTESCUE	6
MAMMAL	<i>Dasyurus hallucatus</i>	EN	02/06/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	02/06/2015	Very certain	Targeted survey	1	FORTESCUE	5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	03/06/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	03/06/2015	Very certain	Targeted survey	1	FORTESCUE	7
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/06/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/06/2015	Very certain	Targeted survey	1	FORTESCUE	8
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/06/2015	Very certain	Targeted survey	1	FORTESCUE	8
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/06/2015	Very certain	Targeted survey	1	FORTESCUE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	18/06/2015	Very certain	Targeted survey	1	FORTESCUE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	18/06/2015	Very certain	Targeted survey	1	FORTESCUE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	19/06/2015	Very certain	Targeted survey	1	FORTESCUE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	22/06/2015	Very certain	Targeted survey	1	FORTESCUE	19
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/06/2015	Very certain	Targeted survey	1	FORTESCUE	17
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/06/2015	Very certain	Targeted survey	1	FORTESCUE	18
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/06/2015	Very certain	Targeted survey	1	FORTESCUE	18
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/06/2015	Very certain	Targeted survey	1	FORTESCUE	21
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/06/2015	Certain	Targeted survey	1	FORTESCUE	Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	25/06/2015	Very certain	Targeted survey	1	FORTESCUE	21
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/07/2015	Very certain	Targeted survey	1	FORTESCUE	23
MAMMAL	<i>Dasyurus hallucatus</i>	EN	03/08/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/08/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	04/08/2015	Certain	Targeted survey	1	FORTESCUE	Yarraloola
MAMMAL	<i>Dasyurus hallucatus</i>	EN	19/08/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	5
MAMMAL	<i>Dasyurus hallucatus</i>	EN	21/08/2015	Very certain	Targeted survey	1	FORTESCUE	31
MAMMAL	<i>Dasyurus hallucatus</i>	EN	22/08/2015	Very certain	Targeted survey	1	FORTESCUE	30
MAMMAL	<i>Dasyurus hallucatus</i>	EN	22/08/2015	Very certain	Targeted survey	1	FORTESCUE	Yarraloola - camera site number C15

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/08/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	8
MAMMAL	<i>Dasyurus hallucatus</i>	EN	23/08/2015	Very certain	Targeted survey	1	FORTESCUE	32
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/08/2015	Very certain	Targeted survey	1	CANE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/08/2015	Very certain	Targeted survey	1	CANE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/08/2015	Very certain	Targeted survey	1	CANE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/08/2015	Very certain	Targeted survey	1	CANE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/08/2015	Very certain	Targeted survey	1	CANE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/08/2015	Very certain	Targeted survey	1	FORTESCUE	30
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/08/2015	Very certain	Targeted survey	1	FORTESCUE	32
MAMMAL	<i>Dasyurus hallucatus</i>	EN	25/08/2015	Very certain	Targeted survey	1	CANE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	27/08/2015	Very certain	Targeted survey	1	CANE	9
MAMMAL	<i>Dasyurus hallucatus</i>	EN	27/08/2015	Very certain	Targeted survey	1	FORTESCUE	32
MAMMAL	<i>Dasyurus hallucatus</i>	EN	09/09/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	11
MAMMAL	<i>Dasyurus hallucatus</i>	EN	10/09/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	12
MAMMAL	<i>Dasyurus hallucatus</i>	EN	10/09/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	12
MAMMAL	<i>Dasyurus hallucatus</i>	EN	11/09/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	12
MAMMAL	<i>Dasyurus hallucatus</i>	EN	13/09/2015	Certain	Targeted survey	1	FORTESCUE	Yarraloola - Mesa F
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/09/2015	Very certain	Targeted survey	1	FORTESCUE	20
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/09/2015	Very certain	Targeted survey	1	FORTESCUE	20
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/09/2015	Very certain	Targeted survey	1	HAMERSLEY RANGE	14
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/09/2015	Very certain	Targeted survey	1	FORTESCUE	40
MAMMAL	<i>Dasyurus hallucatus</i>	EN	14/09/2015	Very certain	Targeted survey	1	FORTESCUE	41
MAMMAL	<i>Dasyurus hallucatus</i>	EN	17/09/2015	Very certain	Targeted survey	1	FORTESCUE	39
MAMMAL	<i>Dasyurus hallucatus</i>	EN	17/09/2015	Very certain	Targeted survey	1	FORTESCUE	41
MAMMAL	<i>Dasyurus hallucatus</i>	EN	07/10/2015	Very certain	Targeted survey	1	FORTESCUE	43
MAMMAL	<i>Dasyurus hallucatus</i>	EN	09/10/2015	Very certain	Targeted survey	1	FORTESCUE	42
MAMMAL	<i>Dasyurus hallucatus</i>	EN	10/10/2015	Very certain	Targeted survey	1	FORTESCUE	42
MAMMAL	<i>Dasyurus hallucatus</i>	EN	11/10/2015	Very certain	Targeted survey	1	FORTESCUE	50
MAMMAL	<i>Dasyurus hallucatus</i>	EN	13/10/2015	Certain	Targeted survey	1	FORTESCUE	FORTESCUE
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/04/2017	Certain		1	Yarraloola	B
MAMMAL	<i>Dasyurus hallucatus</i>	EN	24/04/2017	Certain		1	Yarraloola	C
MAMMAL	<i>Dasyurus hallucatus</i>	EN	25/04/2017	Certain		1	Yarraloola	B
MAMMAL	<i>Dasyurus hallucatus</i>	EN	25/04/2017	Certain		1	Yarraloola	B
MAMMAL	<i>Dasyurus hallucatus</i>	EN	25/04/2017	Certain		1	Yarraloola	C
MAMMAL	<i>Dasyurus hallucatus</i>	EN	26/04/2017	Certain		1	Yarraloola	T
MAMMAL	<i>Dasyurus hallucatus</i>	EN	26/04/2017	Certain		1	Yarraloola	T
MAMMAL	<i>Dasyurus hallucatus</i>	EN	26/04/2017	Certain		1	Yarraloola	H
MAMMAL	<i>Dasyurus hallucatus</i>	EN	27/04/2017	Certain		1	Yarraloola	T
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/04/2017	Certain		1	Red Hill	CBN

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/04/2017	Certain		1	Red Hill	CBN
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/04/2017	Certain		1	Red Hill	CBN
MAMMAL	<i>Dasyurus hallucatus</i>	EN	29/04/2017	Certain		1	Red Hill	CRG
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/05/2017	Certain		1	Red Hill	Swearengen
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/05/2017	Certain		1	Red Hill	Swearengen
MAMMAL	<i>Dasyurus hallucatus</i>	EN	01/05/2017	Certain		1	Red Hill	Jewel
MAMMAL	<i>Dasyurus hallucatus</i>	EN	02/05/2017	Certain		1	Red Hill	Cardo Bore East
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CEC002
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CEC003
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	CANE	CARDO, CEC007
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CNC001
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CNC002
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CNC003
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CNC004
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CNC005
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CNC006
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CNC007
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, CNC008
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	FORTESCUE	CARDO, JC001
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	FORTESCUE	CARDO, JC002
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	CANE	CARDO, JC003
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, JC004
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, JC005
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	FORTESCUE	CARDO, JC006
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, KBC001
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, KBC002
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, KBC003
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, KBC004
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	CANE	CARDO, R240CB
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, RHCC01
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	CANE	CARDO, RHCC03
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	CANE	CARDO, RHC002
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	CANE	CARDO, UCC001
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, UCC003
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	HAMERSLEY RANGE	CARDO, UCC005
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	CANE	CARDO, URC002
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Survey	1	CANE	CARDO, URC003
MAMMAL	<i>Dasyurus hallucatus</i>	EN		WAM Vouchered	Collection	1	CANE	CANE
MAMMAL	<i>Dasyurus hallucatus</i>	EN						

CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
MAMMAL	<i>Dasyurus hallucatus</i>	EN		Certain	Historical (written)	1	CANE	
MAMMAL	<i>Rhinonictes aurantia</i>	P4						
MAMMAL	<i>Rhinonictes aurantia (Pilbara)</i>	VU	01/01/1925	Certain	Historical (written)		Red Hill	
MAMMAL	<i>Rhinonictes aurantia (Pilbara)</i>	VU	24/06/2009	Certain	Survey	1	HAMERSLEY RANGE	Pannawonica, AQMHARP03
MAMMAL	<i>Rhinonictes aurantia (Pilbara)</i>	VU	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
MAMMAL	<i>Rhinonictes aurantia (Pilbara)</i>	VU	19/05/2015	Certain	Survey	5	HAMERSLEY RANGE	Red Hill, RHSBat07 - SM2 Recording
MAMMAL	<i>Rhinonictes aurantia (Pilbara)</i>	VU	20/05/2015	Certain	Survey	29	HAMERSLEY RANGE	Red Hill, RHSBat08 - SM2 Recording
MAMMAL	<i>Rhinonictes aurantia (Pilbara)</i>	VU	21/05/2015	Certain	Survey	275	HAMERSLEY RANGE	Red Hill, RHSBat06 - SM2 Recording
MAMMAL	<i>Rhinonictes aurantia (Pilbara)</i>	VU	22/05/2015	Certain	Survey	27	HAMERSLEY RANGE	Red Hill, RHSBat03 - SM2 Recording
MAMMAL	<i>Rhinonictes aurantia (Pilbara)</i>	VU	22/05/2015	Certain	Survey	18	HAMERSLEY RANGE	Red Hill, RHSBat02 - SM2 Recording
MAMMAL	<i>Rhinonictes aurantia (Pilbara)</i>	VU		WAM Vouchered	Collection	1	CANE	CANE
MAMMAL	<i>Pseudomys chapmani</i>	P4	08/09/1996	Moderately certain	Survey		Cane River	
MAMMAL	<i>Pseudomys chapmani</i>	P4	29/06/2000	WAM Vouchered	Collection	1	CANE	CANE
MAMMAL	<i>Pseudomys chapmani</i>	P4	29/06/2000	WAM Vouchered	Collection	1	CANE	CANE
MAMMAL	<i>Pseudomys chapmani</i>	P4	29/06/2000					
MAMMAL	<i>Pseudomys chapmani</i>	P4	29/06/2000					
MAMMAL	<i>Pseudomys chapmani</i>	P4	12/05/2002	WAM Vouchered	Collection	1	CANE	SITE CR2
MAMMAL	<i>Pseudomys chapmani</i>	P4	12/05/2002					SITE CR2
MAMMAL	<i>Pseudomys chapmani</i>	P4	11/05/2006					
MAMMAL	<i>Pseudomys chapmani</i>	P4	11/05/2006	WAM Vouchered	Collection	1	PEEDAMULLA	24KM ESE PEEDAMULLA HOMESTEAD
MAMMAL	<i>Pseudomys chapmani</i>	P4	11/05/2006					24KM ESE PEEDAMULLA HOMESTEAD
MAMMAL	<i>Pseudomys chapmani</i>	P4	12/05/2006					
MAMMAL	<i>Pseudomys chapmani</i>	P4	12/05/2006	WAM Vouchered	Collection	1	PEEDAMULLA	24KM ESE PEEDAMULLA HOMESTEAD
MAMMAL	<i>Pseudomys chapmani</i>	P4	12/05/2006					24KM ESE PEEDAMULLA HOMESTEAD
MAMMAL	<i>Pseudomys chapmani</i>	P4	24/05/2012	Certain	Survey	1	HAMERSLEY RANGE	API Cons. Zone, Cardo
MAMMAL	<i>Pseudomys chapmani</i>	P4	26/09/2013	Certain	Survey	1	FORTESCUE	Pannawonica, Mesa F Western
MAMMAL	<i>Pseudomys chapmani</i>	P4	26/09/2013	Certain	Survey	1	FORTESCUE	Pannawonica, Mesa D and F
MAMMAL	<i>Pseudomys chapmani</i>	P4	12/12/2013	Certain	Survey	1	FORTESCUE	Pilbara, Yarraloola
REPTILE	<i>Natator depressus</i>	VU	10/02/2017	Not Sure		1	Ashburton River Delta	Ashburton River Delta - Nest Fan



CLASS	NAME_SCI	CONS_CODE	Date	CERTAINTY	METHOD	COUNT	LOCALITY	SITE
REPTILE	<i>Liasis olivaceus barroni</i>	VU	05/03/2012	WAM Vouchered	Survey	1	HAMERSLEY RANGE	40km S/SE Pannawonica, JC-opp4-03052012
REPTILE	<i>Liasis olivaceus barroni</i>	VU	25/05/2012	Certain	Survey	1	HAMERSLEY RANGE	API Cons. Zone, Cardo
REPTILE	<i>Liasis olivaceus barroni</i>	VU	05/08/2012	WAM Vouchered	Survey	1	HAMERSLEY RANGE	40km S/SE Pannawonica, JC-opp2-03052012
REPTILE	<i>Liasis olivaceus barroni</i>	VU	21/10/2012	Certain	Survey	1	CANE	Red Hill Pilbara, Cardo Outcamp Red Hill Station
REPTILE	<i>Liasis olivaceus barroni</i>	VU	30/03/2013	Certain	Survey	1	CANE	Red Hill Pilbara, Cardo Outcamp Red Hill Station
REPTILE	<i>Liasis olivaceus barroni</i>	VU	14/05/2013	Certain	Survey	1	FORTESCUE	RED HILL, 16
REPTILE	<i>Liasis olivaceus barroni</i>	VU	20/05/2015	Certain	Survey	1	HAMERSLEY RANGE	Red Hill, RHSOpp

# NatureMap Species Report

Created By Guest user on 16/12/2021

**Kingdom** Animalia

**Current Names Only** Yes

**Core Datasets Only** Yes

**Method** 'By Line'

**Vertices** 21° 57' 08" S, 115° 51' 36" E 21° 57' 13" S, 115° 53' 45" E 21° 57' 25" S, 115° 56' 55" E 21° 58' 12" S, 115° 58' 36" E 22° 00' 01" S, 115° 59' 09" E 22° 00' 28" S, 115° 59' 51" E 22° 01' 15" S, 116° 00' 45" E 22° 01' 57" S, 116° 01' 02" E 22° 02' 52" S, 116° 01' 29" E 22° 02' 52" S, 116° 00' 28" E 22° 02' 52" S, 115° 58' 27" E 22° 02' 49" S, 115° 58' 12" E 22° 02' 44" S, 115° 56' 58" E 22° 02' 25" S, 115° 56' 16" E 22° 01' 45" S, 115° 54' 24" E 22° 00' 28" S, 115° 53' 20" E 21° 59' 51" S, 115° 52' 58" E 21° 58' 54" S, 115° 52' 28" E 21° 58' 30" S, 115° 51' 54" E 21° 58' 10" S, 115° 51' 36" E

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
1.	<i>Abnitocrella</i> sp. 3 (PSS)			
2.	24559 <i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
3.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
4.	25332 <i>Acanthophs wellsii</i> (Pilbara Death Adder)			
5.	<i>Acariformes</i> sp.			
6.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
7.	<i>Achnanthes exigua</i> Grun.			
8.	<i>Achnanthes exilis</i> Kütz.			
9.	<i>Achnantheidium minutissima</i> (Kütz.) Czarniecki			
10.	<i>Achnantheidium minutissima</i> var. <i>affinis</i> (grun.) lange-bertalot			
11.	<i>Adversaeschna brevistyla</i>			
12.	25544 <i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
13.	<i>Aeolosoma</i> sp. 1 (PSS)			
14.	<i>Albia</i> sp.			
15.	<i>Allodessus bistrigatus</i>			
16.	<i>Allonais pectinata</i>			
17.	<i>Alluaudomyia</i> sp.			
18.	<i>Alona rigidicaudis</i>			
19.	<i>Amphora coffeaeiformis</i> (Ag.) Kütz.			
20.	<i>Amphora veneta</i> Kütz.			
21.	25647 <i>Amytornis striatus</i> (Striated Grasswren)			
22.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
23.	<i>Anax papuensis</i>			
24.	<i>Anisops canaliculatus</i>			
25.	<i>Anisops hackeri</i>			
26.	<i>Anomoeoneis styriaca</i> (Grun.) Hust.			
27.	<i>Anopheles annulipes</i> s.l.			
28.	25670 <i>Anthus australis</i> (Australian Pipit)			
29.	<i>Antiporus bakewelli</i>			
30.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
31.	<i>Arcella</i> sp.			
32.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
33.	24610 <i>Ardeotis australis</i> (Australian Bustard)			
34.	<i>Argiocnemis rubescens</i>			
35.	<i>Armatalona macrocopa</i>			
36.	<i>Arrenurus (Arrenurus) ensifer</i>			
37.	<i>Arrenurus (Arrenurus) liliaceus</i>			
38.	<i>Arrenurus (Micruracarus) purpureus</i>			
39.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
40.	24356 <i>Artamus personatus</i> (Masked Woodswallow)			
41.	25320 <i>Aspidites melanocephalus</i> (Black-headed Python)			
42.	<i>Australibates queenslandensis</i>			
43.	<i>Australobolbus pseudobscurius</i>			
44.	<i>Austroagrimon pindrina/Ischnura heterosticta</i>			
45.	<i>Austroepigomphus (Xerogomphus) gordonii</i>			
46.	<i>Austropeplea lessoni</i>			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
47.	<i>Axonopsella nr truza</i> (PSW)			
48.	<i>Axonopsella</i> sp. P2 (PSW)			
49.	<i>Backobourkia collina</i>			
50.	<i>Baetidae</i> sp.			
51.	<i>Barnardius zonarius</i>			
52.	<i>Bdelloidea</i> sp. 2:2			
53.	<i>Berosus dallasae</i>			
54.	<i>Boeckella triarticulata</i>			
55.	<i>Bolboleaus truncatus</i>			
56.	<i>Boongurrus occidentalis</i>			
57.	24251 <i>Bos taurus</i> (European Cattle)	Y		
58.	<i>Brachionus angularis</i>			
59.	<i>Brachionus urceolaris</i> s.l.			
60.	25715 <i>Cacatua roseicapilla</i> (Galah)			
61.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
62.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
63.	<i>Calanoida</i> sp.			
64.	<i>Caloneis bacillum</i> (Grun.) Cl.			
65.	<i>Caloneis silicula</i> (Ehr.) Cl.			
66.	<i>Campylodiscus clypeus</i> Ehr.			
67.	<i>Carenum pulchrum</i>			
68.	<i>Carenum venustum</i>			
69.	25015 <i>Carlia munda</i> (Shaded-litter Rainbow Skink)			
70.	<i>Cavisternum clavatum</i>			
71.	<i>Ceriodaphnia cornuta</i>			
72.	24181 <i>Chaerephon jobensis</i> (Greater Northern Freetail-bat, Northern Mastiff Bat)			
73.	<i>Chaetarthria nigerrimus</i>			
74.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattled Bat)			
75.	<i>Chironomus</i> aff. <i>alternans</i> (V24) (CB)			
76.	<i>Chlaenius australis</i>			
77.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
78.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
79.	<i>Cloeon</i> sp.			
80.	<i>Cocconeis placentula</i> var. <i>euglypta</i> ehr.			
81.	<i>Coelopynia pruinosa</i>			
82.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
83.	<i>Conochilus natans</i>			
84.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
85.	25593 <i>Corvus orru</i> (Torresian Crow)			
86.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
87.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
88.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
89.	<i>Cryptochironomus griseidorsum</i>			
90.	<i>Cryptodus caviceps</i>			
91.	25458 <i>Ctenophorus caudicinctus</i> (Ring-tailed Dragon)			
92.	24865 <i>Ctenophorus caudicinctus</i> subsp. <i>caudicinctus</i> (Ring-tailed Dragon)			
93.	25459 <i>Ctenophorus isolepis</i> (Crested Dragon, Military Dragon)			
94.	24876 <i>Ctenophorus isolepis</i> subsp. <i>isolepis</i> (Crested Dragon, Military Dragon)			
95.	24882 <i>Ctenophorus nuchalis</i> (Central Netted Dragon)			
96.	24886 <i>Ctenophorus reticulatus</i> (Western Netted Dragon)			
97.	25036 <i>Ctenotus duricola</i>			
98.	25462 <i>Ctenotus grandis</i>			
99.	25043 <i>Ctenotus grandis</i> subsp. <i>titan</i>			
100.	25044 <i>Ctenotus hanloni</i>			
101.	25045 <i>Ctenotus helenae</i>			
102.	25463 <i>Ctenotus pantherinus</i> (Leopard Ctenotus)			
103.	25064 <i>Ctenotus pantherinus</i> subsp. <i>ocellifer</i> (Leopard Ctenotus)			
104.	25065 <i>Ctenotus pantherinus</i> subsp. <i>pantherinus</i> (Leopard Ctenotus)			
105.	25072 <i>Ctenotus rubicundus</i>			
106.	25073 <i>Ctenotus saxatilis</i> (Rock Ctenotus)			
107.	<i>Culex</i> sp.			
108.	<i>Cupelopagis vorax</i>			
109.	<i>Cybister tripunctatus</i>			
110.	25375 <i>Cyclorana maini</i> (Sheep Frog)			
111.	<i>Cylotella menghiniana</i> Kütz.			
112.	<i>Cylotella stelligera</i> Cl. & Grun.			
113.	<i>Cymbella affinis</i> Kütz.			
114.	<i>Cymbella cistula</i> (Ehr.) Kirchner			
115.	<i>Cymbella cymbiformis</i> Ag.			
116.	<i>Cymbella delicatula</i> Kütz.			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
117.	<i>Cymbella helvetica</i> Kütz.			Y
118.	<i>Cymbella microcephala</i> Grun.			
119.	<i>Cymbella muellerii</i>			
120.	<i>Cymbella silesiaca</i> Bleisch			
121.	<i>Cypretta seurati</i>			
122.	25547 <i>Dacelo leachii</i> (Blue-winged Kookaburra)			
123.	<i>Dasyheleinae</i> sp. P1 (PSW)			
124.	24091 <i>Dasykaluta rosamondae</i> (Little Red Kaluta)			
125.	24093 <i>Dasyurus hallucatus</i> (Northern Quoll)		T	
126.	25000 <i>Delma haroldi</i>			
127.	25001 <i>Delma nasuta</i>			
128.	25002 <i>Delma pax</i>			
129.	<i>Dero nivea</i>			
130.	<i>Diacyclops humphreysi humphreysi</i>			
131.	<i>Diacyclops sobeprolatus</i>			
132.	<i>Diatoma vulgaris</i> Bory			
133.	<i>Dicrotendipes jobetus</i>			
134.	<i>Diffugia</i> sp. P1			
135.	<i>Dineutus australis</i>			
136.	<i>Diplacodes bipunctata</i>			
137.	<i>Diplacodes haematodes</i>			
138.	24926 <i>Diplodactylus conspicillatus</i> (Fat-tailed Gecko)			
139.	24944 <i>Diplodactylus savagei</i> (Southern Pilbara Beak-faced Gecko)			
140.	<i>Diploneis oblongella</i> (Naegeli) Cl-Euler			
141.	<i>Diploneis pseudovalis</i> Hust.			
142.	<i>Diplonychus eques</i>			
143.	<i>Dolichopodidae</i> sp.			
144.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
145.	<i>Dunhevedia crassa</i>			
146.	<i>Ecnomus pilbarensis</i>			
147.	<i>Egretta novaehollandiae</i>			
148.	<i>Elaphoidella</i> sp.			
149.	47937 <i>Elseyornis melanops</i> (Black-fronted Dotterel)			
150.	24631 <i>Emblema pictum</i> (Painted Finch)			
151.	<i>Encyonema minutum</i> (Hilse ex Rabh.) Mann			
152.	<i>Enochrus deserticola</i>			
153.	<i>Enochrus maculiceps/deserticola</i> (female)			
154.	<i>Entomoneis paludosa</i> (W. Sm.) Reimer			
155.	<i>Eodiaptomus lumholtzi</i>			
156.	<i>Eolophus roseicapillus</i>			
157.	<i>Ephemeropterus barroisi</i> s.l.			
158.	<i>Epithemia smithii</i> Carruthers			
159.	24568 <i>Epthianura aurifrons</i> (Orange Chat)			
160.	24570 <i>Epthianura tricolor</i> (Crimson Chat)			
161.	43381 <i>Eremiascincus pallidus</i> (Western Narrow-banded Skink, Narrow-banded Sand Swimmer)			
162.	24837 <i>Eremiornis carteri</i> (Spinifex-bird)			
163.	<i>Euchlanis dilatata</i>			
164.	<i>Euchlanis oropha</i>			
165.	<i>Eucyclops australiensis</i>			
166.	<i>Euglypha</i> sp.			
167.	<i>Eunotia bilunaris</i> (Ehr.) Mills.			
168.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
169.	<i>Eurysticta coolawanyah</i>			
170.	<i>Eylais</i> sp.			
171.	25621 <i>Falco berigora</i> (Brown Falcon)			
172.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
173.	24041 <i>Felis catus</i> (Cat)	Y		
174.	<i>Forcypomyia</i> sp. P2 (PSW)			
175.	<i>Fragilaria capucina</i> Desm.			
176.	<i>Fragilaria capucina</i> var. <i>mesolepta</i>			Y
177.	<i>Fragilaria tenera</i> (W. Sm.) Lange-Bertalot			
178.	<i>Fragilaria ulna</i> (Nitz.) Lange Bertalot			
179.	25301 <i>Furina ornata</i> (Moon Snake)			
180.	42314 <i>Gavicalis virescens</i> (Singing Honeyeater)			
181.	24958 <i>Gehyra punctata</i>			
182.	24401 <i>Geopelia cuneata</i> (Diamond Dove)			
183.	24404 <i>Geophaps plumifera</i> (Spinifex Pigeon)			
184.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
185.	<i>Gomphonema parvulum</i> (Kütz.) Kütz.			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
186.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
187.	<i>Gretacarus</i> nsp. P1 (PSW)			
188.	<i>Gretacarus</i> sp.			
189.	<i>Gymnocranius grandoculis</i>			
190.	<i>Gyraulus hesperus</i>			
191.	<i>Gyrosigma accuminatum</i> (Kütz.) Rabh.			
192.	<i>Gyrosigma attenuatum</i> (Kütz.) Rabh.			
193.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
194.	<i>Haliphus halsei</i>			
195.	<i>Halosbaena tulki</i>			
196.	<i>Hantzschia amphioxys</i> (Ehr.) Grun.			
197.	<i>Hantzschia marina</i> (Donk.) Cl.			
198.	<i>Harpacticoida</i> sp			
199.	<i>Helluapterus niger</i>			
200.	<i>Hellyethira</i> sp.			
201.	<i>Hemicordulia koomina</i>			
202.	<i>Hemicordulia tau</i>			
203.	24961 <i>Heteronotia binoei</i> (Bynoe's Gecko)			
204.	<i>Hexarthra cf brandorffii</i> (PSW)			
205.	47965 <i>Hieraaetus morphnoides</i> (Little Eagle)			
206.	<i>Hoggicosa snelli</i>			
207.	<i>Humphreyscandona 'akaina'</i> (PSS)			
208.	<i>Hydaticus consanguineus</i>			
209.	<i>Hydra</i> sp.			
210.	<i>Hydrachna</i> sp. 4/5 (PSW)			
211.	<i>Hydraena barbipes</i>			
212.	<i>Hydraena cf. rudallensis</i> (PSW)			
213.	<i>Hydrochus eurypleuron</i>			
214.	<i>Hydrochus</i> group 3 "black" (PSW)			
215.	<i>Hydrochus obscuraeus</i>			
216.	<i>Hydrochus</i> sp. P1 (PSW)			
217.	<i>Hydrodroma</i> sp.			
218.	<i>Hydroglyphus grammopterus</i> (=trilineatus)			
219.	<i>Hydroglyphus leai</i>			
220.	<i>Hydroglyphus orthogrammus</i>			
221.	<i>Hydrometra strigosa</i>			
222.	<i>Hydrovatus weiri</i>			
223.	<i>Hyphydrus elegans</i>			
224.	<i>Hyphydrus lyratus</i>			
225.	<i>Ictinogomphus dobsoni</i>			
226.	<i>Ilyocryptus raridentatus</i>			
227.	<i>Ilyodromus</i> sp BOS25			
228.	<i>Ilyodromus</i> sp.			
229.	<i>Indolpium</i> sp.			
230.	<i>Ischnura aurora aurora</i>			
231.	<i>Kiefferulus intertinctus</i>			
232.	<i>Laccophilus sharpi</i>			
233.	24367 <i>Lalage tricolor</i> (White-winged Triller)			
234.	<i>Larsia albiceps</i>			
235.	<i>Latonopsis australis</i>			
236.	<i>Lecane batillifer</i>			
237.	<i>Lecane bulla</i>			
238.	<i>Lecane crepida</i>			
239.	<i>Lecane hornemanni</i>			
240.	<i>Lecane luna</i>			
241.	<i>Lecane lunaris</i>			
242.	<i>Lecane papuana</i>			
243.	<i>Lecane unguitata</i>			
244.	<i>Lepadella</i> (H.) ehrenbergii			
245.	<i>Lepadella</i> (H.) heterostyla			
246.	<i>Lepadella acuminata</i>			
247.	<i>Lepadella ovalis</i>			
248.	<i>Lepadella triptera</i>			
249.	<i>Lepidiota squamulata</i>			
250.	30928 <i>Leриста clara</i>			
251.	<i>Lesquereusia spiralis</i>			
252.	<i>Lethocerus distinctifemur</i>			
253.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
254.	<i>Limbodessus compactus</i>			
255.	<i>Limnesia</i> sp. 4 (PSW)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
256.	25392 <i>Litoria rubella</i> (Little Red Tree Frog)			
257.	30933 <i>Lucasium stenodactylum</i>			
258.	30934 <i>Lucasium wombeyi</i>			
259.	<i>Lychas</i> sp. 2			
260.	<i>Lycidas</i> sp. 1			
261.	<i>Lycidas</i> sp. 2			
262.	<i>Macrochaetus altamirai</i>			
263.	24180 <i>Macroderma gigas</i> (Ghost Bat)		T	
264.	25489 <i>Macropus robustus</i> (Euro, Biggada)			
265.	25651 <i>Malurus lamberti</i> (Variegated Fairy-wren)			
266.	25652 <i>Malurus leucopterus</i> (White-winged Fairy-wren)			
267.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
268.	<i>Mastogloia elliptica</i> (Ag.) Cl.			
269.	<i>Mastogloia elliptica</i> var. <i>danseii</i> (thwaites) grun.			
270.	<i>Mastogloia pumila</i>			
271.	<i>Mastogloia smithii</i> Thwaites			
272.	<i>Meedo houstoni</i>			
273.	<i>Megacephala greyana</i>			
274.	<i>Melitidae</i> sp. 1 (PSS)			
275.	24736 <i>Melopsittacus undulatus</i> (Budgerigar)			
276.	25184 <i>Menetia greyii</i>			
277.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
278.	<i>Mesocyclops brooksi</i>			
279.	<i>Mesocyclops darwini</i>			
280.	<i>Mesovelia hungerfordi</i>			
281.	<i>Microchironomus</i> 'K1' (PSW)			
282.	<i>Microcyclops varicans</i>			
283.	<i>Micronecta</i> n. sp. P1 (PSW)			
284.	<i>Microvelia</i> ( <i>Austromicrovelia</i> ) <i>peramoena</i>			
285.	<i>Minasteron minusculum</i>			
286.	<i>Missulena rutraspina</i>			
287.	<i>Moina micrura</i> s.l.			
288.	<i>Monommata</i> sp.			
289.	24223 <i>Mus musculus</i> (House Mouse)	Y		
290.	<i>Mytilina ventralis macracantha</i>			
291.	<i>Nais communis</i>			
292.	<i>Navicula bryophila</i> Petersen			
293.	<i>Navicula cohnii</i>			Y
294.	<i>Navicula cryptocephala</i> Kütz.			
295.	<i>Navicula cryptonella</i> Lange-Bertalot			
296.	<i>Navicula leptostriata</i> Jørgensen			
297.	<i>Navicula rhynchocephala</i> Kütz.			
298.	<i>Navicula spicula</i> (Hickie) Cl.			
299.	<i>Navicula subrhynchocephala</i> Hust.			
300.	<i>Navicula veneta</i> Kütz.			
301.	<i>Necterosoma regulare</i>			
302.	<i>Nedsia</i> sp.			
303.	<i>Nematoda</i> sp. P2/P4 (PSW)			
304.	<i>Nematoda</i> sp. P5 (PSW)			
305.	<i>Nematoda</i> sp. P8 (PSW)			
306.	<i>Neohydrocoptus subfasciatus</i>			
307.	<i>Nerthra luteovaria</i>			
308.	<i>Nilobezzia</i> sp. P2 (PSW)			
309.	24095 <i>Ningai timealeyi</i> (Pilbara Ningai)			
310.	<i>Nitzschia amphibia</i> Grun.			
311.	<i>Nitzschia angustata</i> Grun.			
312.	<i>Nitzschia calida</i> Grun.			
313.	<i>Nitzschia compressa</i> (Grun.) Lange-Bertalot			Y
314.	<i>Nitzschia compressa</i> var. <i>elongata</i> (grun.) lange-bertalot			
315.	<i>Nitzschia desertorum</i> Hust.			
316.	<i>Nitzschia dissipata</i> (Kütz.) Grun.			
317.	<i>Nitzschia filiformis</i> (W. Sm.) Van Heurck			
318.	<i>Nitzschia fonticola</i>			Y
319.	<i>Nitzschia frustulum</i> (Kütz.) Grun.			
320.	<i>Nitzschia hybrida</i> Grun.			
321.	<i>Nitzschia microcephala</i> Grun.			
322.	<i>Nitzschia obtusa</i> W. Sm			
323.	<i>Nitzschia palea</i> (Kütz.) W. Sm.			
324.	<i>Nitzschia reversa</i> W. Sm.			
325.	<i>Nitzschia sigma</i> (Kütz.) W. Sm.			

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326.	24224 <i>Notomys alexis</i> (Spinifex Hopping-mouse)			
327.	25499 <i>Notoscincus ornatus</i>			
328.	24742 <i>Nymphicus hollandicus</i> (Cockatiel)			
329.	<i>Ochterus</i> sp.			
330.	<i>Ochthebius</i> sp. P1 (PSW)			
331.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
332.	<i>Oecetis</i> sp. Pilbara 4 (PSW)			
333.	<i>Oecetis</i> sp. Pilbara 5 (PSW)			
334.	<i>Onthophagus margaretensis</i>			
335.	<i>Onthophagus neboissi</i>			
336.	<i>Onychohydus atratus</i>			
337.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			
338.	<i>Oribatida</i> group 1 (PSS)			
339.	<i>Origocandona 'posteriorecta'</i> (PSS)			
340.	<i>Orthetrum caledonicum</i>			
341.	<i>Orthocladinae</i> sp. G (SAP)			
342.	<i>Oxus orientalis</i>			
343.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
344.	<i>Paracyclops</i> sp. 8 (PSW)			
345.	<i>Paracymus spenceri</i>			
346.	<i>Paramelitidae</i> sp.			
347.	<i>Paranacaena horni</i>			
348.	<i>Paratanytarsus</i> sp. P3 (PSW)			
349.	<i>Paratendipes</i> sp. 'K1' (PSW)			
350.	24627 <i>Pardalotus rubricatus</i> (Red-browed Pardalote)			
351.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
352.	24144 <i>Petrogale rothschildi</i> (Rothschild's Rock-wallaby)			
353.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
354.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
355.	<i>Phorticosomus gularis</i>			
356.	<i>Phreodrilid</i> with dissimilar ventral chaetae			
357.	<i>Phreodrilidae</i> sp.			
358.	<i>Pilbarus millsii</i>			
359.	<i>Pinnularia divergens</i> W. Sm.			
360.	<i>Pinnularia gibba</i> Ehr.			
361.	<i>Piona cumberlandensis</i>			
362.	24101 <i>Planigale ingrami</i> (Long-tailed Planigale)			
363.	<i>Planothidium delicatulum</i> (Kütz.) Round & Bukhtiyarova			
364.	<i>Platíonius patulus</i>			
365.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
366.	<i>Platycoelus melliei</i>			
367.	<i>Platyias quadricornis</i>			
368.	<i>Pleurosigma delicatulum</i> W. Sm.			
369.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
370.	24907 <i>Pogona minor</i> subsp. <i>minor</i> (Dwarf Bearded Dragon)			
371.	<i>Polyarthra dolichoptera</i>			
372.	<i>Polypedilum leei</i>			
373.	<i>Polypedilum nubifer</i>			
374.	<i>Polypedilum watsoni</i>			
375.	25706 <i>Pomatostomus temporalis</i> (Grey-crowned Babbler)			
376.	<i>Pristina longiseta</i>			
377.	<i>Procladius paludicola</i>			
378.	<i>Pseudagrion aureofrons</i>			
379.	<i>Pseudagrion microcephalum</i>			
380.	25261 <i>Pseudechis australis</i> (Mulga Snake)			
381.	<i>Pseudectinosoma galassiae</i>			
382.	<i>Pseudohydryphantes</i> sp. P1 (PSW)			
383.	24233 <i>Pseudomys chapmani</i> (Western Pebble-mound Mouse, Ngajji)		P4	
384.	24235 <i>Pseudomys desertor</i> (Desert Mouse)			
385.	24237 <i>Pseudomys hermannsburgensis</i> (Sandy Inland Mouse)			
386.	<i>Pygolabis</i> sp.			
387.	25009 <i>Pygopus nigriceps</i>			
388.	<i>Pyralidae</i> sp. 22 of JHH (PSW) (=Parapoynx stagnalis)			Y
389.	<i>Regimbartia attenuata</i>			
390.	<i>Rhantaticus congestus</i>			
391.	<i>Rheotanytarsus christinae</i>			
392.	<i>Rheotanytarsus trivittatus</i>			
393.	43368 <i>Rhinonicteris aurantia</i> (Orange Leaf-nosed bat)		P4	
394.	48095 <i>Rhinonicteris aurantia</i> (Pilbara) (Pilbara leaf-nosed bat)		T	
395.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			

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396.	<i>Rhoicosphenia abbreviata</i>			
397.	<i>Rhopalodia gibba</i> (Ehr.) O. Mull.)			
398.	<i>Rhopalodia gibberula</i> (Ehr.) O. Müll.			
399.	24174 <i>Saccolaimus flaviventris</i> (Yellow-bellied Sheath-tailed Bat)			
400.	<i>Sciomyzidae</i> sp.			
401.	<i>Scirtidae</i> sp.			
402.	<i>Scolopendra laeta</i>			
403.	24200 <i>Scotorepens greyii</i> (Little Broad-nosed Bat)			
404.	<i>Sellephora pupula</i> (Kütz.) Mereschkowsky			
405.	30948 <i>Smicromis brevirostris</i> (Weebill)			
406.	24116 <i>Sminthopsis macroura</i> (Stripe-faced Dunnart)			
407.	<i>Sternolophus marginicollis</i>			
408.	<i>Sternopriscus pilbarensis</i>			
409.	25656 <i>Stipiturus ruficeps</i> (Rufous-crowned Emu-wren)			
410.	24556 <i>Stipiturus ruficeps</i> subsp. <i>ruficeps</i> (Rufous-crowned Emu-wren)			
411.	<i>Strandesia</i> sp.			
412.	<i>Strandesia</i> sp. 3 (PSS)			Y
413.	<i>Stratiomyidae</i> sp.			
414.	24927 <i>Strophurus elderi</i>			
415.	<i>Stygonitocrella unispinosa</i>			
416.	<i>Tabanidae</i> sp.			
417.	30870 <i>Taeniopygia guttata</i> (Zebra Finch)			
418.	<i>Tanytarsus barbitarsis</i>			
419.	<i>Tanytarsus fuscithorax/semibarbitarsus</i>			
420.	<i>Tanytarsus</i> sp. D (SAP)			
421.	24175 <i>Taphozous georgianus</i> (Common Sheath-tailed Bat)			
422.	<i>Tasmanocoenis arcuata</i>			
423.	<i>Tesserodon novaehollandiae</i>			
424.	<i>Tesserodon tenebroides</i>			
425.	<i>Testudinella amphora</i>			
426.	<i>Testudinella patina</i>			
427.	<i>Thermosbaenacea</i> sp.			
428.	<i>Tiporus lachlani</i>			
429.	<i>Tiporus tambreyi</i>			
430.	<i>Tipulidae</i> type D (SAP)			
431.	42351 <i>Todiramphus pyrrhopygius</i> (Red-backed Kingfisher)			
432.	<i>Trichocarenum cylindricum</i>			
433.	<i>Trichocerca pusilla</i>			
434.	<i>Trichocerca similis</i>			
435.	<i>Trichocyclus nigropunctatus</i>			
436.	<i>Trichocyclus warianga</i>			
437.	24157 <i>Trichosurus vulpecula</i> subsp. <i>amhemensis</i> (northern brushtail possum (Kimberley))		T	
438.	39407 <i>Triops australiensis</i> (Shield Shrimp)			
439.	<i>Turbellaria</i> sp.			
440.	24851 <i>Turnix velox</i> (Little Button-quail)			
441.	<i>Unionicola crassipalpis</i>			
442.	25209 <i>Varanus acanthurus</i> (Spiny-tailed Monitor)			
443.	25210 <i>Varanus brevicauda</i> (Short-tailed Pygmy Monitor)			
444.	25212 <i>Varanus eremius</i> (Pygmy Desert Monitor)			
445.	25216 <i>Varanus giganteus</i> (Perentie)			
446.	25524 <i>Varanus panoptes</i> (Yellow-spotted Monitor)			
447.	<i>Velesunio wilsoni</i>			
448.	<i>Venatrix pullastra</i>			
449.	24205 <i>Vespadelus finlaysoni</i> (Finlayson's Cave Bat)			
450.	<i>Vestalenua marmonieri</i>			
451.	<i>Wyndura kennedy</i>			
452.	<i>Zenodorus orbiculatus</i>			
453.	<i>Zoothamnium</i> sp.			
454.	<i>Zyomma elgneri</i>			

**Conservation Codes**

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

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





# EPBC Act Protected Matters Report

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

Report created: 22-Dec-2021

[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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance (Ramsar)</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	None
<a href="#">Listed Threatened Species:</a>	9
<a href="#">Listed Migratory Species:</a>	11

## 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

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

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

<a href="#">Commonwealth Lands:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	16
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None
<a href="#">Habitat Critical to the Survival of Marine Turtles:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	1
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">EPBC Act Referrals:</a>	6
<a href="#">Key Ecological Features (Marine):</a>	None
<a href="#">Biologically Important Areas:</a>	1
<a href="#">Bioregional Assessments:</a>	None
<a href="#">Geological and Bioregional Assessments:</a>	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
<b>BIRD</b>			
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Pezoporus occidentalis</a> Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
<b>MAMMAL</b>			
<a href="#">Dasyurus hallucatus</a> Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Macroderma gigas</a> Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Rhinonicteris aurantia (Pilbara form)</a> Pilbara Leaf-nosed Bat [82790]	Vulnerable	Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>REPTILE</b>			
<a href="#">Liasis olivaceus barroni</a>			
Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat likely to occur within area	In feature area

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Migratory Marine Birds</b>			
<a href="#">Apus pacificus</a>			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

**Migratory Terrestrial Species**

<a href="#">Hirundo rustica</a>			
Barn Swallow [662]		Species or species habitat may occur within area	In feature area
<a href="#">Motacilla cinerea</a>			
Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
<a href="#">Motacilla flava</a>			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area

**Migratory Wetlands Species**

<a href="#">Actitis hypoleucos</a>			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris acuminata</a>			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris ferruginea</a>			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Calidris melanotos</a>			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
<a href="#">Charadrius veredus</a>			
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Species or species habitat may occur within area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

## Other Matters Protected by the EPBC Act

Listed Marine Species			[ Resource Information ]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Bubulcus ibis as Ardea ibis</a> Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Chalcites osculans as Chrysococcyx osculans</a> Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Charadrius veredus</a> Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Glareola maldivarum</a> Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
<a href="#">Hirundo rustica</a> Barn Swallow [662]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Rostratula australis as Rostratula benghalensis (sensu lato)</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

## Extra Information

### State and Territory Reserves [\[ Resource Information \]](#)

Protected Area Name	Reserve Type	State	Buffer Status
Cane River	Conservation Park	WA	In feature area

### EPBC Act Referrals [\[ Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
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#### Controlled action

<a href="#">Ashburton Infrastructure Project</a>	2021/9064	Controlled Action	Referral Decision	In feature area
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<a href="#">Greater Gorgon Development - Optical Fibre Cable, Mainland to Barrow Island</a>	2005/2141	Controlled Action	Completed	In buffer area only
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<a href="#">Proposed West Pilbara Iron Ore Project</a>	2009/4706	Controlled Action	Post-Approval	In feature area
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<a href="#">Yannarie Solar Salt Project</a>	2004/1679	Controlled Action	Completed	In buffer area only
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#### Not controlled action

<a href="#">Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia</a>	2015/7522	Not Controlled Action	Completed	In feature area
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#### Not controlled action (particular manner)

<a href="#">Buckland Iron Ore Mining Project, Pilbara region, WA</a>	2013/6867	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
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### Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
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#### Seabirds

<a href="#">Ardenna pacifica</a>			
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Wedge-tailed Shearwater [84292]	Breeding	Known to occur	In feature area
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# 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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# **Appendix B**

# **Fauna Licence**



## **FAUNA TAKING (BIOLOGICAL ASSESSMENT) LICENCE**

### **Regulation 27, Biodiversity Conservation Regulations 2018**

Licence Number: BA27000324-2  
Licence Holder: Mr Lukas Geidans  
360 Environmental Services  
Unit 4 / 193 Oxford Street  
LEEDERVILLE WA 6007  
Date of Issue: 16/04/2021  
Date Valid From: 16/04/2021  
Date of Expiry: 01/04/2022

### **LICENSED ACTIVITIES**

Subject to the terms and conditions on this licence, the licence holder may –

1. Take and disturb fauna for biological fauna assessment of a proposed haul road footprint, spanning from Ken's Bore to the Onslow Port, to identify the faunal assemblages and fauna impacts from the construction using baited remote sensing cameras, ultrasonic bat detectors, visual observations, hand collecting techniques, large cage traps, Elliot (medium) traps, 10 pit traps (comprising 20 L buckets and five PVC pipes); and funnel traps.

### **LOCATIONS**

1. Ken's Bore to Onslow haul road survey area, Pilbara Region.

### **AUTHORISED PERSONS**

The following persons or persons of the specified class may assist in carrying out the licensed activities:

1. Lukas Geidans
2. Evan Webb
3. Edward Swinhoe
4. Michael Brown
5. Timothy Moulds
6. Christina Walker
7. Louis Masarei

### **CONDITIONS**

1. Fauna must not be taken on CALM land, (as defined in the Conservation and Land Management Regulations 2002), unless authorised by a written notice of a lawful authority issued under regulations 4 and 8 of the Conservation and Land Management Regulations 2002.
2. If persons, other than the licence holder, are authorised to carry out/assist in carrying out the activities under the licence, the licence holder must ensure those persons have read and understand the licence terms and conditions.
3. The written authorisation of the person in possession or occupation of the land accessed and upon which fauna is taken, as required under regulation 101(2) and referred to in "Additional information" below, must:



- a) state location details (including lot or location number, street/road, suburb and local government authority);
  - b) state land owner or occupier name, and contact phone number;
  - c) specify the time period that the authorisation is valid for;
  - d) be signed and dated; and
  - e) be attached to this licence at all times.
4. This licence, and any written authorisation or lawful authority which authorises the take of fauna on specified locations must be carried at all times while conducting licensed activities and be produced on demand by a wildlife officer.
  5. If a species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* is inadvertently captured, that species is to be released immediately at the point of capture. If the fauna is injured or deceased, the licence holder shall contact the DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)) for advice on treatment or disposal. Details of any capture of threatened fauna must be included in the "Return of Fauna Taken."
  6. The licence holder must not:
    - a) release any fauna in any area where it does not naturally occur;
    - b) transfer fauna to any other person or authority (other than the Western Australian Museum) unless approved in writing by the CEO; or
    - c) dispose of the remains of fauna in any manner likely to interfere the natural or present day distribution of the species.
  7. The licence holder must not take and remove more than ten specimens of any one protected species of fauna from any location less than 20km apart. Where exceptional circumstances make it necessary to take a larger number of specimens from a particular location in order to obtain adequate statistical data, the collector must proceed with circumspection and justify their actions to the Director General in advance.
  8. All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this licence must be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range must be offered to the Western Australian Museum.
  9. All specimens and material retained under the authority of this licence must be offered to the Western Australian Museum for loan, for inclusion in its collection, or on request be made available to other persons involved in relevant scientific studies.
  10. The licence holder must create, compile and maintain records and information as required in a DBCA approved "Return of Fauna Taken" of all fauna taking activities as they occur.
  11. A DBCA approved "Return of Fauna Taken" must be completed in full (including nil taking details) and submitted to DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)) prior to the end of each annual period of the licence (from the valid from date) (refer to "Additional Information" section below).

A handwritten signature in blue ink, appearing to read 'OP Stefoni'.

Danny Stefoni  
LICENSING OFFICER

## WILDLIFE PROTECTION BRANCH

*Delegate of CEO*

### ADDITIONAL INFORMATION

1. It is an offence to take any species of fauna listed as a threatened species under Section 19 of the *Biodiversity Conservation Act 2016* unless the person is authorised under Section 40. The penalty ranges between \$300 000 and \$500 000; Section 150 Biodiversity Conservation Act 2016.
2. Regulation 82 empowers the CEO to add, substitute or delete a term or condition of a licence or to correct errors. Such power may be exercised on application of a licence holder or by the CEO's own initiative. If an amendment to a licence term or condition is required, please contact the CEO or the Licensing Section on [wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au) in the first instance. The licence holder, if adversely affected by a condition imposed in this licence, may apply to the State Administrative Tribunal for review of the decision of the CEO to impose that condition on a licence: regulation 89(2) Biodiversity Conservation Regulations 2018.
3. A person must not contravene a condition of a licence. The penalty for an offence involving the contravention of a condition of a licence is a fine of \$10 000: regulation 84 of the Biodiversity Conservation Regulations 2018.
4. It is an offence for persons authorised by this licence to enter land that is not in their possession or under their control without first having the *prior* written authorisation of the current owner or occupier of the land to:
  - a) enter the land; and
  - b) carry out the activity authorised by this licence.

The penalty for this offence is a fine of \$5 000: regulation 101(2) of the Biodiversity Conservation Regulations 2018.

5. The licence holder must be able to produce for inspection upon request any information or records required by regulation 85(2) of the Biodiversity Conservation Regulations 2018 Penalty \$10 000. It is an offence to knowingly include false or misleading information or make statements in records: regulation 85(3) of the Biodiversity Conservation Regulations 2018 Penalty \$10 000. It is an offence to include any information or make any statement in a return that the licence holder knows to be false or misleading in a material particular: regulation 86 (2) of the Biodiversity Conservation Regulations 2018 Penalty \$10 000.
6. The approved DBCA "Return of Fauna Taken" data file can be downloaded from the DBCA webpage (<https://www.dpaw.wa.gov.au/plants-and-animals/licences-and-authorities>).
7. The issuing of a licence under the Biodiversity Conservation Regulations 2018 does not constitute an animal ethics approval or a licence to use animals for scientific purposes as required under the *Animal Welfare Act 2002*, Animal Welfare (Scientific Purposes) Regulations 2003. It is the responsibility of a licence applicant / licence holder to ensure that they comply with the requirements of all applicable legislation. Enquiries relating to the Animal Welfare Act licences and animal ethics approvals are to be directed to the Department of Primary Industries and Regional Development (<https://www.agric.wa.gov.au/animalwelfare>).
8. Threatened fauna can only be taken under a *Biodiversity Conservation Act 2016* Section 40 authorisation, Occurrences of threatened species must be reported to the CEO. For more information please see <https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals>.



9. Any interaction involving Nationally Listed Threatened Fauna that may be invasive and/or harmful to the fauna may require approval from the Commonwealth Department of the Environment and Energy <http://www.environment.gov.au/about-us/business-us/permits-assessments-licences>. Interaction with such species is controlled by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and Environment Protection and Biodiversity Conservation Regulations 2000 as well as the *Biodiversity Conservation Act 2016* and Biodiversity Conservation Regulations 2018.



## **AUTHORISATION TO TAKE OR DISTURB THREATENED SPECIES**

*Section 40 of the Biodiversity Conservation Act 2016*

### **AUTHORISATION DETAILS**

**Authorisation type:** Fauna

**Authorisation number:** TFA 2020-0104-2

**Authorisation duration:** From date signed by Minister's delegate, below, until 1 April 2022.

### **AUTHORISATION HOLDER**

Lukas Geidans

360 Environmental

Unit 4 / 193 Oxford Street

Leederville WA 6007

### **AREA TO WHICH THIS AUTHORISATION APPLIES**

Ken's Bore to Onslow haul road survey area (Pilbara Region).

### **AUTHORISED ACTIVITY**

**Purpose of taking/disturbance:**

Biological fauna assessment (comprehensive field survey) of a proposed haul road footprint, spanning from Ken's Bore to the Onslow Port, to identify the faunal assemblages and fauna impacts from the construction (Mineral Resources Limited).

**Threatened species authorised to be taken/disturbed (including conservation status):**

Northern quoll, *Dasyurus hallucatus* (Endangered)

Pilbara Olive Python, *Liasis olivaceus barroni* (Vulnerable)

**Quantity of threatened species authorised to be taken/disturbed:**

Any number of individual animals of the above listed threatened fauna species may potentially be captured and released during the trapping program and/or disturbed by the survey activities.

**Authorised taking/disturbance methodology:**

Take northern quolls using cage or Elliott traps (set for up to eight days/seven nights, consecutive, per trapping session). Traps are to be covered with hessian, set in complete shade throughout the whole day and checked within three hours of sunrise. If temperatures are forecast >35 °C, traps will be closed within three hours of sunrise, remain closed during the day and be re-opened in the late afternoon. If any adverse events are observed related to temperature /heat exposure, regardless of



forecast temperature, then traps will be closed during the day (adverse events will be reported as soon as possible). Traps will be baited with universal bait (rolled oats, peanut butter and sardines).

Captured quolls may have morphometric and condition/health details recorded and may be temporarily marked (using xylene free marker pen) to identify recaptures, prior to release near capture site.

Disturb northern quolls and Pilbara olive pythons using camera traps deployed (up to seven nights at each location) with a consumable lure (universal bait - rolled oats, peanut butter and sardines, replenished as necessary or every two days). Pilbara olive pythons may be disturbed by opportunistic active searching.

All proposed activities will be conducted in accordance with DBCA Standard Operating Procedures (SOPs) for fauna survey and monitoring techniques.

### ADDITIONAL AUTHORISED PERSONS

Evan Webb

Timothy Moulds

Edward Swinhoe

Christina Walker

Michael Brown

Louis Masarei

Additional personnel who are suitably qualified and experienced in the authorised activities working under the direction of the authorisation holder.

Field assistants assisting with the authorised activities working under the direct supervision of the authorisation holder or suitably qualified and experienced named additional authorised person.

### CONDITIONS

1. The written authorisation of the person in possession or occupation of the land accessed and upon which threatened fauna is taken or disturbed must:
  - a) state location details (including lot or location number, street/road, suburb and local government authority);
  - b) state land owner or occupier name, and contact phone number;
  - c) specify the time period that the authorisation is valid for;
  - d) be signed and dated; and
  - e) be attached to this Authorisation to take or disturb threatened species at all times.
2. This Authorisation to take or disturb threatened species, and any other written authorisation or lawful authority which authorises the take or disturbance of fauna on specified locations for the authorised activities must be carried at all times while conducting authorised activities and be produced on demand by a wildlife officer.
3. The authorisation holder and additional authorised persons who are not suitably qualified and experienced in the authorised activities, and volunteer field assistants assisting with the authorised activities, must be working under direct supervision of experienced and competent named authorised persons.
4. Any inadvertently captured species of non-target threatened fauna or non-threatened fauna (threatened fauna as defined in *Biodiversity Conservation Act 2016* Section 19) is to be released

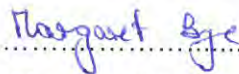
immediately at the point of capture. Details of such fauna must be included in the fauna taking return as required under this authorisation.

5. The authorisation holder, unless specified in the authorised activities, must not:
  - a) release any threatened fauna in any area where it does not naturally occur;
  - b) transfer threatened fauna to any other person or authority (other than the Western Australian Museum) unless the fauna is injured or abandoned fauna (condition 6); or
  - c) dispose of the remains of threatened fauna in any manner likely to confuse the natural or present-day distribution of the species.
6. All threatened fauna injuries, unexpected deaths, unplanned euthanasia, and abandoned young or eggs, must be reported by the authorisation holder to the DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)) to notify of the incident and for advice on treatment or disposal. All deceased threatened fauna must be offered to the Western Australian Museum.
7. All holotypes and syntypes and a half share of paratypes of species or subspecies permitted to be permanently taken under this authorisation must be donated to the Western Australian Museum. Duplicates (one pair in each case) of any species collected, which represents a significant extension of geographic range must be offered to the Western Australian Museum.
8. To prevent any unnecessary collecting in this State, all specimens and material taken and retained under this authorisation, that remain at the conclusion of the activities, must be offered to the Western Australian Museum for loan, for inclusion in its collection, or made available to other persons involved in relevant scientific studies if so required.
9. The authorisation holder must create, compile and maintain records and information as required in a DBCA approved "Return of Fauna Taken/Disturbed" of all fauna taking activities as they occur.
10. A DBCA approved "Return of Fauna Taken/Disturbed" must be completed in full (including nil taking details) and submitted to DBCA Wildlife Protection Branch, Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)) prior to the end of the authorisation duration and, if the authorisation duration is greater than 12 months, prior to the end of each annual period of the authorisation (from the date signed by the Minister's delegate) (refer to "Additional Information" section below). Where a licence to take or disturb fauna is issued in conjunction with this Authorisation to take or disturb threatened species, a combined "Return of Fauna Taken/Disturbed" may be completed and submitted.
11. A written report detailing the undertaken authorised activities, outcome, unintended incidents, injuries and mortalities of threatened fauna, implemented monitoring, mitigation and management, and explaining the records and information as required in a DBCA approved "Return of Fauna Taken/Disturbed" must be submitted, in addition to a "Return of Fauna Taken/Disturbed" to DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)).

## **ADDITIONAL INFORMATION**

1. Before undertaking the Authorised Activity, permission must be obtained from: (a) the owner or occupier of private land; or (b) the Department or Authority controlling Crown land, on which the Threatened Fauna occur. This includes obtaining the written endorsement from Department of Biodiversity, Conservation and Attractions (DBCA) if the authorised activity is proposed for land managed by DBCA.

2. This Authorisation to take or disturb threatened species does not constitute lawful authority issued under regulations 4 and 8 of the *Conservation and Land Management Regulations 2002*. Contact the applicable Department District Officer for further information.
3. The approved DBCA "Return of Fauna Taken/Disturbed" template can be obtained from DBCA Wildlife Licensing Section ([wildlifelicensing@dbca.wa.gov.au](mailto:wildlifelicensing@dbca.wa.gov.au)).
4. Any interaction involving nationally listed threatened fauna that may be harmful to the fauna and/or invasive may require approval from the Commonwealth Department of the Environment and Energy (<http://www.environment.gov.au/biodiversity/threatened/permits>). Interaction with such species is controlled by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and *Environment Protection and Biodiversity Conservation Regulations 2000*.
5. It is the responsibility of the authorisation holder to ensure that they comply with the requirements of all applicable legislation.
6. An Authorisation to take or disturb threatened species does not constitute an animal ethics approval or a licence to use animals for scientific purposes as required under the *Animal Welfare Act 2002*, *Animal Welfare (Scientific Purposes) Regulations 2003*. Enquiries relating to the Animal Welfare Act licences and animal ethics approvals are to be directed to the Western Australian Department of Primary Industries and Regional Development (<https://www.agric.wa.gov.au/animalwelfare>).



Dr Margaret Byrne

Executive Director of Biodiversity and Conservation Science

AS DELEGATE OF THE MINISTER

DATE: 22 / 4 / 2021

# **Appendix C**

## **Database and Literature Fauna Inventory**



















# Appendix D

## Fauna and SRE Habitat Assessments

### Trap01, SRE07

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey				
<b>Date</b>	2021-10-03		<b>Personnel</b>	EW	
<b>Zone</b>	50	<b>Easting</b>	385153	<b>Northing</b>	7572255
<b>Landform and soil</b>			<b>Rock</b>		
<b>Landform</b>	Drainage line		<b>Rock type/s</b>	None	
<b>Soil type</b>	Clay loam		<b>Surface stone cover</b>		
<b>Soil colour</b>	Brown, Orange		<b>Surface stone size classes present</b>		
<b>Condition</b>			<b>Habitat Features</b>		
<b>Quality</b>	Good		<b>Water Source</b>	Absent	
<b>Fire History</b>	Little or no fire evidence (>5 years)		<b>Microhabitats</b>	Hollows - trees, Leaf litter, Peeling bark	
<b>Disturbance</b>	Clearing, Weeds				
<b>Introduced fauna</b>	Cattle				
<b>Vegetation</b>					
<b>Upper stratum</b>	Low (<10 m)	Open forest (50-80%)	<i>Corymbia</i>		
<b>Mid stratum</b>	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia ?colliei</i>		
<b>Ground stratum</b>	Low (>0.5 m)	Tussock grassland (50-80%)			



Fulcrum photo ID 108-0430

### Trap02, SRE10

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey				
<b>Date</b>	2021-10-04		<b>Personnel</b>	EW	
<b>Zone</b>	50	<b>Easting</b>	386551	<b>Northing</b>	7563575
<b>Landform and soil</b>			<b>Rock</b>		
<b>Landform</b>	Drainage line		<b>Rock type/s</b>	Ironstone, Quartz	
<b>Soil type</b>	Sandy loam		<b>Surface stone cover</b>	5 - 25%	
<b>Soil colour</b>	Brown, Red		<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)	
<b>Condition</b>			<b>Habitat Features</b>		
<b>Quality</b>	Very good		<b>Water Source</b>	Absent	
<b>Fire History</b>	Little or no fire evidence (>5 years)		<b>Microhabitats</b>	Burrows, Hummocks, Leaf litter, Peeling bark, Termite mounds, Woody debris	
<b>Disturbance</b>	Fencing				
<b>Introduced fauna</b>	Cattle				
<b>Vegetation</b>					
<b>Upper stratum</b>	Low (<10 m)	Open woodland (0.25-20%)	<i>Acacia inaequilatera, Grevillea, Corymbia</i>		
<b>Mid stratum</b>	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia, Senna</i>		
<b>Ground stratum</b>	Mid (0.5-1 m)	Hummock grassland (50-80%)	<i>Triodia</i>		



Fulcrum photo ID 108-0446

### Cam01, SRE03

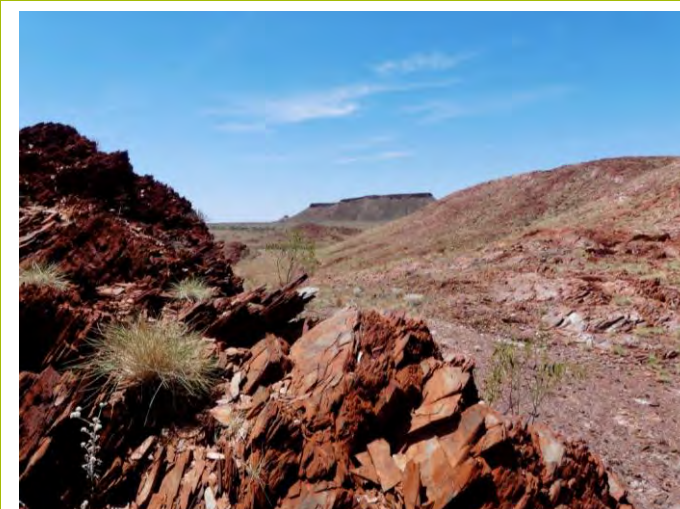
<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-02	<b>Personnel</b>	EW
<b>Zone</b>	50	<b>Easting</b>	393061
		<b>Northing</b>	7569718
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Lower slope	<b>Rock type/s</b>	Quartz
<b>Soil type</b>	Sandy loam	<b>Surface stone cover</b>	50 - 75%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm), Rocks (20 - 60 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Very good	<b>Water Source</b>	Absent
<b>Fire History</b>	Burnt (1-5 years)	<b>Microhabitats</b>	Exfoliating rock, Hummocks, Leaf litter, Rock crevices
<b>Disturbance</b>	None observed		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Absent		
<b>Mid stratum</b>	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia, Ptilotus</i>
<b>Ground stratum</b>	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia</i>



Fulcrum photo ID 108-0424

### Cam02, SRE01

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-01	<b>Personnel</b>	EW
<b>Zone</b>	50	<b>Easting</b>	396152
		<b>Northing</b>	7565580
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Mid slope	<b>Rock type/s</b>	Quartz
<b>Soil type</b>	Clay loam	<b>Surface stone cover</b>	50 - 75%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm), Rocks (20 - 60 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Very good	<b>Water Source</b>	Absent
<b>Fire History</b>	Recently burnt (<1 year)	<b>Microhabitats</b>	Exfoliating rock, Rock crevices
<b>Disturbance</b>	None observed		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Absent		
<b>Mid stratum</b>	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia</i>
<b>Ground stratum</b>	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia</i>



Fulcrum photo ID 108-0417

### Cam03, SRE02

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-01	<b>Personnel</b>	EW
<b>Zone</b>	50	<b>Easting</b>	397540
		<b>Northing</b>	7561647
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Upper slope	<b>Rock type/s</b>	
<b>Soil type</b>	Sandy clay	<b>Surface stone cover</b>	50 - 75%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Very good	<b>Water Source</b>	Absent
<b>Fire History</b>	Burnt (1-5 years)	<b>Microhabitats</b>	Exfoliating rock, Rock crevices
<b>Disturbance</b>	None observed		
<b>Introduced fauna</b>	None observed		
<b>Vegetation</b>			
<b>Upper stratum</b>	Absent		
<b>Mid stratum</b>	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia, Ptilotus</i>
<b>Ground stratum</b>	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia</i>



Fulcrum photo ID 108-0423

### SRE04

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-02	<b>Personnel</b>	EW
<b>Zone</b>	50	<b>Easting</b>	394663
		<b>Northing</b>	7567364
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Plain	<b>Rock type/s</b>	Ironstone, Quartz
<b>Soil type</b>	Sandy loam	<b>Surface stone cover</b>	50 - 75%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm), Rocks (20 - 60 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Very good	<b>Water Source</b>	Absent
<b>Fire History</b>	Burnt (1-5 years)	<b>Microhabitats</b>	Hummocks, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris
<b>Disturbance</b>	Vehicle tracks		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Low (<10 m)	Open woodland (0.25-20%)	<i>Acacia xiphophylla</i>
<b>Mid stratum</b>	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia, Ptilotus</i>
<b>Ground stratum</b>	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia</i>



Fulcrum photo ID 108-0427



### SRE05

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-02	<b>Personnel</b>	EW
<b>Zone</b>	50	<b>Easting</b>	397236
		<b>Northing</b>	7564864
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Plain	<b>Rock type/s</b>	Ironstone, Quartz
<b>Soil type</b>	Sandy loam	<b>Surface stone cover</b>	25 - 50%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Very good	<b>Water Source</b>	Absent
<b>Fire History</b>	Little or no fire evidence (>5 years)	<b>Microhabitats</b>	Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Woody debris
<b>Disturbance</b>	None observed		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Low (<10 m)	Isolated trees (<0.25%)	<i>Acacia xiphophylla</i>
<b>Mid stratum</b>	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia, Senna, Ptilotus, Solanum</i>
<b>Ground stratum</b>	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia</i>



Fulcrum photo ID 108-0428

### SRE06

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-02	<b>Personnel</b>	EW
<b>Zone</b>	50	<b>Easting</b>	394475
		<b>Northing</b>	7561499
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Outcrop/breakaway	<b>Rock type/s</b>	Dolerite, Quartz
<b>Soil type</b>	Sandy loam	<b>Surface stone cover</b>	50 - 75%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm), Rocks (20 - 60 cm), Big Rocks (60 cm - 2 m)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Very good	<b>Water Source</b>	Absent
<b>Fire History</b>	Burnt (1-5 years)	<b>Microhabitats</b>	Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Woody debris
<b>Disturbance</b>	None observed		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Low (<10 m)	Open woodland (0.25-20%)	<i>Corymbia</i>
<b>Mid stratum</b>	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia</i>
<b>Ground stratum</b>	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia</i>



Fulcrum photo ID 108-0429

### SRE08

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-03	<b>Personnel</b>	EW
<b>Zone</b>	50	<b>Easting</b>	389783
		<b>Northing</b>	7571680
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Drainage line	<b>Rock type/s</b>	Ironstone, Quartz
<b>Soil type</b>	Sandy loam	<b>Surface stone cover</b>	25 - 50%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Very good	<b>Water Source</b>	Absent
<b>Fire History</b>	Little or no fire evidence (>5 years)	<b>Microhabitats</b>	Burrows, Hummocks, Leaf litter, Woody debris
<b>Disturbance</b>	None observed		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Absent		
<b>Mid stratum</b>	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia</i>
<b>Ground stratum</b>	Mid (0.5-1 m)	Open hummock grassland (20-50%)	<i>Triodia</i>



Fulcrum photo ID 108-0431

### SRE09

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-03	<b>Personnel</b>	EW
<b>Zone</b>	50	<b>Easting</b>	391932
		<b>Northing</b>	7562057
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Drainage line	<b>Rock type/s</b>	Ironstone, Quartz
<b>Soil type</b>	Sandy clay	<b>Surface stone cover</b>	5 - 25%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Good	<b>Water Source</b>	Absent
<b>Fire History</b>	Little or no fire evidence (>5 years)	<b>Microhabitats</b>	Hummocks, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris
<b>Disturbance</b>	Cattle		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Low (<10 m)	Open woodland (0.25-20%)	<i>Acacia xiphophylla</i>
<b>Mid stratum</b>	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia</i> , <i>Ptilotus</i> , ? <i>Corchorus</i>
<b>Ground stratum</b>	Mid (0.5-1 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia</i>



Fulcrum photo ID 108-0444

### SRE11

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-04	<b>Personnel</b>	EW
<b>Zone</b>	50	<b>Easting</b>	388758
		<b>Northing</b>	7562862
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Mid slope	<b>Rock type/s</b>	
<b>Soil type</b>	Clay loam	<b>Surface stone cover</b>	25 - 50%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Very good	<b>Water Source</b>	Absent
<b>Fire History</b>	Burnt (1-5 years)	<b>Microhabitats</b>	Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Termite mounds, Woody debris
<b>Disturbance</b>	None observed		
<b>Introduced fauna</b>	None observed		
<b>Vegetation</b>			
<b>Upper stratum</b>	Low (<10 m)	Isolated trees (<0.25%)	<i>Corymbia</i>
<b>Mid stratum</b>	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia, Ptilotus</i>
<b>Ground stratum</b>	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia</i>



Fulcrum photo ID 108-0447

### SRE12

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-04	<b>Personnel</b>	LC
<b>Zone</b>	50	<b>Easting</b>	385751
		<b>Northing</b>	7565807
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Drainage line	<b>Rock type/s</b>	Ironstone, Quartz
<b>Soil type</b>	Sandy loam	<b>Surface stone cover</b>	25 - 50%
<b>Soil colour</b>	Brown	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Disturbed	<b>Water Source</b>	Absent
<b>Fire History</b>	Burnt (1-5 years)	<b>Microhabitats</b>	Hummocks, Peeling bark, Rock crevices, Termite mounds
<b>Disturbance</b>	Erosion, Overgrazing		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Low (<10 m)	Open woodland (0.25-20%)	<i>acacia sp.</i>
<b>Mid stratum</b>	Low (0.5-1 m)	Isolated shrubs and/or heath shrubs (<0.25%)	
<b>Ground stratum</b>	Low (>0.5 m)	Closed hummock grassland (>80%)	<i>Triodia</i>



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SRE13

<b>Project:</b>	4846 Red Hill North Haul Road Biological Survey		
<b>Date</b>	2021-10-05	<b>Personnel</b>	LC
<b>Zone</b>	50	<b>Easting</b>	383585
		<b>Northing</b>	7568480
<b>Landform and soil</b>		<b>Rock</b>	
<b>Landform</b>	Plain	<b>Rock type/s</b>	Quartz
<b>Soil type</b>	Clay loam	<b>Surface stone cover</b>	25 - 50%
<b>Soil colour</b>	Brown, Orange	<b>Surface stone size classes present</b>	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
<b>Condition</b>		<b>Habitat Features</b>	
<b>Quality</b>	Good	<b>Water Source</b>	Absent
<b>Fire History</b>	Little or no fire evidence (>5 years)	<b>Microhabitats</b>	Hummocks, Leaf litter, Peeling bark, Woody debris
<b>Disturbance</b>	Overgrazing, Vehicle tracks		
<b>Introduced fauna</b>	Cattle		
<b>Vegetation</b>			
<b>Upper stratum</b>	Low (<10 m)	Open woodland (0.25-20%)	<i>Acacia xiphophylla</i>
<b>Mid stratum</b>	Low (0.5-1 m)	Isolated shrubs and/or heath shrubs (<0.25%)	
<b>Ground stratum</b>	Mid (0.5-1 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia</i>



**Fulcrum photo ID** 4e16e225-e679-4301-a047-bc671a077005, 20070801-1c4a-40e5-a714-b3f6c72930e1\_cc9af0f5-35d3-4dd0-976c-09100f352e82

# Appendix E Fauna Inventory









Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation, Federal - Listed under Environmental Protection and Biodiversity Conservation Act 1999. EN - Endangered, VU - Vulnerable, MA - Marine, P - Listed as Priority by DBCA. ^ - Pilbara Leaf-nosed Bat calls were analysed in detail, therefore precise numbers of calls per night are known, \* - Non-conservation significant bat species were simply recorded as present/absent at each location, therefore abundance counts are indicative only.

Family	Scientific Name	Common Name	Conservation Status		Method							
			State	Federal	Capture	Camera Trap	ARU	Sighting	Call	Scat	Remains	Burrow
<b>Amphibians</b>												
Pelodryadidae	<i>Cyclorana maini</i>	Sheep Frog			2							
<b>Aves</b>												
Alcedinidae	<i>Dacelo leachii</i>	Blue-winged Kookaburra							2			
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow						6				
	<i>Artamus personatus</i>	Masked Woodswallow						2				
Cacatuidae	<i>Cacatua sanguinea</i>	Little Corella						6				
	<i>Eolophus roseicapilla</i>	Galah						13	1			
	<i>Nymphicus hollandicus</i>	Cockatiel						17	1			
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike		MA				1	1			
Columbidae	<i>Geopelia cuneata</i>	Diamond Dove						2	2			
	<i>Geophaps plumifera</i>	Spinifex Pigeon						2				
	<i>Ocyphaps lophotes</i>	Crested Pigeon						13	1			
Corvidae	<i>Corvus orru</i>	Torresian Crow							1			
Estrildidae	<i>Emblema pictum</i>	Painted Finch				1						
	<i>Taeniopygia guttata</i>	Zebra Finch						11	1			
Falconidae	<i>Falco berigora</i>	Brown Falcon						1				
Hirundinidae	<i>Petrochelidon ariel</i>	Fairy Martin						4				
Maluridae	<i>Amytornis whitei</i>	Rufous Grasswren				1						
	<i>Malurus assimilis</i>	Purple-backed Fairywren						5				
Meliphagidae	<i>Gavicalis virescens</i>	Singing Honeyeater				1		3	10			
	<i>Manorina flavigula</i>	Yellow-throated Miner						6				
	<i>Ptilotula penicillata</i>	White-plumed Honeyeater						1	1			
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark		MA				3				
Oreocidae	<i>Oreoica gutturalis</i>	Crested Bellbird				2		1	5			
Otididae	<i>Ardeotis australis</i>	Australian Bustard						1				





# Appendix F

## SRE Inventory

## SRE Specimen Abundance and Tracking Codes

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
<b>Chelicerata</b>										
Arachnida	Mygalomorphae	Anamidae	<i>Aname sp. IS03</i>	Possible A	1	SRE08	3/10/21	Dug from burrow	ISTN2978	Dr T Moulds
Arachnida	Mygalomorphae	Anamidae	<i>Aname sp. IS04</i>	Possible A	1	SRE09	4/10/21	Dug from burrow	ISTN2965	Dr T Moulds
Arachnida	Pseudoscorpionida	Garypidae	<i>Synsphyronus sp.</i>	Widespread	1	SRE05	2/10/21	Leaf litter extracted from tullgren funnel	ISTN2769	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>sp. 1</i>	Possible A	2	SRE05	2/10/21	Active searching and leaf litter sifting	ISTN2967	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>sp. 1</i>	Possible A	1	SRE09	3/10/21	Active searching and leaf litter sifting	ISTN2969	Dr T Moulds
Arachnida	Pseudoscorpionida	Olpiidae	<i>sp. 2</i>	Possible A	3	SRE04	3/10/21	Active searching and leaf litter sifting	ISTN2971	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas 'harveyi'</i>	Widespread	1	SRE05	2/10/21	Active searching and leaf litter sifting	ISTN2968	Dr T Moulds
Arachnida	Scorpionida	Buthidae	<i>Lychas 'harveyi'</i>	Widespread	15	Trap02	5/10/21	Dry pitfall trapping	ISTN3269	Dr T Moulds
<b>Mollusca</b>										
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	SRE03	2/10/21	Active searching and leaf litter sifting	ISTN3271	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	2	SRE06	2/10/21	Active searching and leaf litter sifting	ISTN3272	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	SRE08	3/10/21	Active searching and leaf litter sifting	ISTN2977	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	4	SRE13	5/10/21	Active searching and leaf litter sifting	ISTN3273	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	2	SRE13	5/10/21	Active searching and leaf litter sifting	ISTN2974	Dr T Moulds
Gastropoda	Heterobranchia	Camaenidae	<i>Rhagada convicta</i>	Widespread	1	Trap02	5/10/21	Active searching and leaf litter sifting	ISTN3270	Dr T Moulds
Gastropoda	Heterobranchia	Pupillidae	<i>Pupoides adelaidae?</i>	Widespread	4	SRE04	3/10/21	Active searching and leaf litter sifting	ISTN2972	Dr T Moulds
Gastropoda	Heterobranchia	Pupillidae	<i>Pupoides adelaidae?</i>	Widespread	2	SRE05	2/10/21	Active searching and leaf litter sifting	ISTN2966	Dr T Moulds
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia sp. '14re'</i>	Widespread	2	SRE01	1/10/21	Dry pitfall trapping	ISTN3006	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia sp. '10bf'</i>	Widespread	1	SRE13	5/10/21	Active searching and leaf litter sifting	ISTN2975	Dr S Judd
Malacostraca	Isopoda	Armadillidae	<i>Buddelundia sp. '10bf'</i>	Widespread	15	Trap02	5/10/21	Dry pitfall trapping	ISTN3268	Dr S Judd
<b>Myriapoda</b>										
Chilopoda	Scolopendromorpha	Scolopendridae	<i>Arthrorhabdus mjobergi</i>	Widespread	1	SRE13	5/10/21	Active searching and leaf litter sifting	ISTN2976	Dr T Moulds

## SRE Specimen Abundance and Tracking Codes

Class	Order	Family	Taxon	SRE Status	Abundance	Site	Date	Collection Method	Tracking number	Identified by
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	1	SRE01	1/10/21	Dry pitfall trapping	ISTN3005	Dr T Moulds
Chilopoda	Scutigermorpha	Scutigerae	<i>Pilbarascutigera incola</i>	Widespread	1	SRE07	5/10/21	Active searching and leaf litter sifting	ISTN2964	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus attemsi</i>	Widespread	1	SRE11	4/10/21	Leaf litter extracted from tullgren funnel	ISTN2773	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	4	SRE04	3/10/21	Active searching and leaf litter sifting	ISTN2973	Dr T Moulds
Diplopoda	Polyxenida	Polyxenidae	<i>Unixenus cf. mjoebergi</i>	Widespread	4	SRE09	3/10/21	Active searching and leaf litter sifting	ISTN2970	Dr T Moulds

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