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East Pilbara Connection - Native Vegetation Clearing Permit

Supporting Document

August 2024



HORIZON
POWER

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1 Introduction

1.1 Project Context

Regional Power Corporation, trading as (T/A) Horizon Power, is a Western Australian (WA) Government Trading Enterprise (GTE) and the state's regional and remote energy provider. Horizon Power operates under the *Electricity Corporations Act 2005* and is governed by a Board of Directors accountable to the Minister for Energy.

Horizon Power is proposing to construct a 220 kV dual circuit common use transmission line connecting the South Hedland Terminal to the proposed Atlas Ridley Magnetite Mine, in the Pilbara region in Western Australia (the Project). The estimated length of the Transmission Line is 70.2 km comprising of mono poles, with an average height of 40 m. The Project is also likely to consist of access tracks along the pole route, geotechnical investigations and laydown areas for construction.

The Project involves the following permanent elements which will require up to 60.6 ha of permanent clearing:

- Approximately 70.2 km long 220 kV overhead transmission line
- Approximately 201 poles with a 20 x 20 m clearing footprint
- Permanent cleared access tracks (approximately 4 m wide).

The Project involves the following temporary elements which will require up to 40.2 ha of temporary clearing:

- Laydown area
- Geotechnical investigations
- Sites to facilitate stringing and winching of the transmission line.

Specific detail of the proposed clearing is provided in Section 3 of this document.

A Native Vegetation Clearing Permit (NVCP) will be required from the Department of Water and Environmental Regulation (DWER) to allow for the clearing of up to 60.6 ha of permanent clearing and 40.2 ha of temporary clearing.

1.2 Scope and Purpose

This document has been prepared to support a NVCP application for the Project. Specifically, this document provides further detail regarding the proposed activities (Section 2) and related clearing (Section 3).

To support environmental approvals for the Project, an ecological survey was undertaken by SLR (2024) (Appendix A). The results of this survey, as relevant to the proposed clearing, are summarised in Section 4 of this document and have been taken into account when avoiding and mitigating Project environmental impacts (Section 6).

An assessment of the 10 Clearing Principles as outlined in '*A guide to the assessment of applications to clear native vegetation*' (DER 2014) has also been undertaken and is presented Section 8.

A Construction Environment Management Plan (CEMP) has also been prepared in support of the NVCP Application and is provided in Appendix B.

2 Description of the Activity

2.1 Project Location

The Proposal is located between South Hedland and De Grey, within the Pilbara region (Figure 1). As final design has yet to be undertaken, a Development Envelope (DE) has been applied, within which all project activities will be undertaken. The DE is described in Table 1 and shown in Figure 1.

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Table 1 Development Envelope for the Project

Size of Development Envelope (ha)	Development Envelope location	Town	Neighbouring land uses
10,233.9	Reserve 33016 - Lot 273 on DP219540, LR3109/390 (managed by Minister for Water Resources)	Town of Port Hedland	Roads, crown land, crown lots, crown reserves, pastoral leases and residential
	Unallocated Crown Land - Lot 1499 on DP404497, LR3165/640 (subject to dealing)		
	Road - Lot 325 on DP220768, LR3116/935		
	Unallocated Crown Land - Lot 1507 on DP423425, LR3175/534		
	Pastoral Lease P461306 - Lot 1505 on DP423425, LR3175/532 (pastoral lessee: Alinta Dewap Pty Ltd, Alinta Dewah Pty Ltd)		
	Pastoral Lease N50445 - Lot 158 on DP407151, LR3170/570 (pastoral lessee: BHP Billiton Direct Reduced Iron Pty Ltd)		



Figure 1 | Development Envelope and Survey Area



Scale: 1:250,000



2.2 Activity Overview and Timelines

The project requires geotechnical survey works, which will consist of mainly incidental clearing (driving over and parking on native vegetation) for vehicle / machinery access to test sites. The Project also requires construction of the overhead transmission line including poles and permanent access tracks which will be used for maintenance.

A five-year clearing permit is requested with clearing undertaken within 3 months of construction.

2.3 Land Access

Horizon Power will utilise the access conferred by Sections 46 and 49 of the *Energy Operators (Powers) Act 1979* (the Act) for geotechnical investigations and connection infrastructure.

3 Description of Proposed Clearing

3.1 Proposed Clearing Area

The final design and footprint required for the Project will be determined once geotechnical survey works are undertaken. All clearing will be undertaken within the DE, as described in Section 2.1.

The Project involves the following permanent elements which will require up to 60.6 ha of permanent clearing and up to 40.2 ha of temporary clearing. Total clearing for the Project (permanent and temporary) will be up to 100.8 ha.

Table 2 Clearing estimated within the DE

Proposed clearing	Clearing breakdown
100.8 ha	<ul style="list-style-type: none"> Permanent clearing: 60.6 ha Temporary clearing: 40.2 ha

3.2 Proposed Clearing Method

Temporary clearing is proposed for the geotechnical survey, stringing and winching of the transmission line and a laydown area. This will include mechanical removal and driving over vegetation.

Mechanical removal will be undertaken for the permanent infrastructure including poles and permanent maintenance access tracks.

4 Ecological Survey

To inform the Project, SLR (2024) undertook a detailed and targeted flora and vegetation survey, and basic and targeted fauna survey. The survey area covers the entire DE, and was undertaken from 1st March to 10th March 2024. The ecological survey has been appended to this document (Appendix A) and is summarised in Table 3.

Surveys have been undertaken for other projects in the region, these overlap the DE. These surveys are listed in Table 4. Results from these surveys have also been used as secondary information to inform the Project impact assessment.

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Table 3 Summary of ecological survey undertaken for the Project

Survey	Vegetation type
<p>Atlas Ridely Magnetite Project Connection Flora and Fauna Survey Technical Report (SLR, 2024)</p> <p>IBSA Number: IBSA-2024-0325</p>	<p>Survey date: 1st March to 10th March 2024</p> <p>Survey area: Approximately 10,363 ha</p> <p>Flora / Vegetation findings:</p> <ul style="list-style-type: none"> • 172 flora taxa (including subspecies and varieties) representing 40 families and 94 genera were recorded in the survey area. This total comprised 164 native taxa and eight introduced flora taxon. • No flora listed as Threatened under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) or <i>Biodiversity Conservation Act 2016</i> (BC Act) were recorded within the survey area • Two DBCA-listed Priority species were recorded in the survey area: <ul style="list-style-type: none"> ○ <i>Gymnanthera cunninghamii</i> (Priority 3 - DBCA) - Six individuals of <i>Gymnanthera cunninghamii</i> were recorded across four locations in the MaEc vegetation type. ○ <i>Tephrosia rosea</i> subsp. Port Hedland (A.S. George 1114) (Priority 1 - DBCA) - Two individuals of <i>Tephrosia rosea</i> subsp. Port Hedland were recorded from one location in the AsTe vegetation type. <p>Fourteen vegetation types were recorded within the survey area:</p> <ul style="list-style-type: none"> • AiTe - <i>Triodia epactia</i> low hummock grassland (30 ha (0.29%)) • AoTe - Granite and quartz outcroppings (53 ha (0.51%)) • AspTe - Mixed Acacia (<i>A. inaequilatera</i>, <i>A. colei</i>, <i>A. ancistrocarpa</i>, <i>A. acradenia</i>, <i>A. bivenosa</i>) tall shrubland over <i>Triodia epactia</i> (<i>T. wiseana</i>) low to mid hummock grassland (5,495 ha (53.03%)) • AsTe - <i>Acacia stellaticeps</i> mid open shrubland over <i>Triodia epactia</i> low hummock grassland (3,067 ha (29.6%)) • At - <i>Acacia tumida</i> tall shrubland over <i>Triodia epactia</i> mid open hummock grassland (18.3 ha (0.18%)) • CcAcTe - <i>Corymbia candida</i> low sparse woodland over <i>Acacia colei</i> and <i>A. tumida</i> tall open shrubland over <i>Triodia epactia</i> low hummock grassland and <i>Eulalia aurea</i> low open tussock grassland (123.9 ha (1.2%)) • CfAh - <i>Corymbia flavescens</i> (Eucalyptus victrix) low sparse woodland over <i>Atalaya hemiglauca</i> (<i>Dolichandrone occidentalis</i>, <i>Ficus aculeata</i>) tall open shrubland over <i>Eulalia aurea</i> low sparse tussock grassland (42.5 ha (0.41%)) • EvAcTe - <i>Eucalyptus victrix</i> low sparse woodland over <i>Acacia colei</i> tall open shrubland over <i>Triodia epactia</i> mid open hummock grassland (263.5 ha (2.54%)) • EvEa - <i>Eucalyptus victrix</i> low sparse woodland over <i>Acacia colei</i> tall sparse shrubland over <i>Triodai epactia</i> mid sparse hummock grassland and <i>Eulalia aurea</i> mid sparse tussock grassland (24.1 ha (0.23%)) • FspAh - Low sparse woodland of <i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i> over <i>Triodia epactia</i> low sparse hummock grassland (1.8 ha (0.02%)) • FspTe - Mixed Acacia (<i>A. inaequilatera</i>, <i>A. ancistrocarpa</i>) with <i>Ficus brachypoda</i> low isolated trees over low open hummock grassland <i>Triodia epactia</i> (13.5 ha (0.13%))

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- MaEc - *Eucalyptus camaldulensis* subsp. *refulgens* (*E.victrix*), *Melaleuca argentea* low sparse woodland over tall sparse shrubs *Acacia trachycarpa*, *M. glomerata* over *Eulalia aurea* low sparse tussock grasses and *Triodia epactia* low sparse hummock grasses (165.7 ha (1.6%))
- Sh - *Sclerolaena hostilis* low sparse forbland (9.6 ha (0.09%))
- TsTe - *Triodia secunda* and *T. epactia* low hummock grassland (848.4 ha (8.19%))
- Cleared (206.26 ha (1.99%)).

The vegetation condition in the survey area varied from Degraded to Very Good:

- Degraded - 52.1 ha (0.50%)
- Poor - 3.3 ha (0.03%)
- Good - 232.4 ha (2.24%)
- Very Good - 9,868.9 ha (95.23%)
- Cleared – 206.26 ha (1.99%).

No Threatened Ecological Communities (TEC) listed under the EPBC Act or BC Act were identified within the survey area during the field survey. Additionally, no Priority Ecological Communities (PEC) listed by DBCA were identified within the survey area during the field survey.

One vegetation type, MaEc, is likely to represent groundwater dependent ecosystems (GDE) associated with some of the major drainages intersecting the survey area. This vegetation type supports known *phreatophytic* tree species such *Melaleuca argentea* and *Eucalyptus camaldulensis* subsp. *refulgens*, which are reliant on access to the groundwater table.

Fauna / Fauna habitat findings:

Nine fauna habitat types were recorded within the survey area:

- Closed *Acacia* Shrubland - Flat plains with red sand substrate. Vegetation consists of open *Corymbia* and *Eucalyptus* woodland over *Eucalyptus* and *Acacia* open shrubland midstory over low *Triodia* hummock grassland. Microhabitats include *Triodia* hummocks and leaf litter. This habitat contained disturbances caused by vehicle tracks (15.01 ha (0.14%))
- Low *Acacia stellaticeps* over *Triodia* - Flat plains with brown-orange clay, loam and sandy substrate. Vegetation consists of low, isolated clumps of *Acacia stellaticeps* over low *Triodia epactia* open hummock grassland. Microhabitats include *Triodia* hummocks, leaf litter and woody debris were observed. This habitat contained disturbances caused by vehicle tracks and overgrazing (3,071.26 ha (29.64%))
- Major Drainage - Flat plains with red-orange sandy substrate. Vegetation consists of open eucalypt woodland over sparse *Acacia* midstory and open *Triodia* hummock grassland. Microhabitats include *Triodia* hummocks, leaf litter, peeling bark, woody debris, and burrows. Tree hollows, log hollows and logs over 10 cm were also observed. This habitat contained disturbances caused by vehicle tracks, overgrazing and weeds (1100.79 ha (1.60%))
- Minor Drainage - Flat plains with red sandy substrate. Vegetation consists of open *Eucalyptus* woodland over *Eucalyptus* and *Acacia* open shrubland midstory over low *Triodia* hummock grassland. Microhabitats include *Triodia* hummocks, leaf litter, peeling bark and woody debris. This habitat contained disturbances caused by vehicle tracks (24.12 ha (0.23%))
- Mixed *Acacia* Shrubs and *Triodia* Plains - Flat plains with red-orange sandy and clay-loam substrate. Vegetation consists of open *Eucalyptus* woodland over *Acacia* open shrubland midstory with *Triodia* hummock grassland. Microhabitats include *Triodia* hummocks and leaf litter. This habitat contained disturbances caused by vehicle tracks and overgrazing (5,501.32 ha (53.09%))

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- Open *Eucalypt* Woodland - Flat plains with red sandy substrate. Vegetation consists of open *Corymbia* and *Eucalyptus* woodland over *Eucalyptus* and *Acacia* open shrubland midstory over low *Triodia* hummock grassland. Microhabitats include *Triodia* hummocks and leaf litter. This habitat contained disturbances caused by vehicle tracks (429.90 ha (4.15%))
- Outcrops and Breakaways - Sloped granite, ironstone and quartz ridges and outcrops with red-brown sandy-clay substrate. Vegetation consists of open *Acacia* shrubland midstory over sparse and open *Triodia* hummock grassland. Microhabitats include Exfoliating rock, rock crevices, *Triodia* hummocks, leaf litter, peeling bark and woody debris (43.56 ha (0.42%))
- Sparse *Triodia* Plains - Open rocky granite plains with red sandy-pebble substrate. Vegetation consists of sparse *Acacia* shrubland midstory over open hummock grassland. Microhabitats include *Triodia* hummocks and leaf litter. This habitat contained disturbances caused by vehicle tracks and overgrazing (858.02 ha (8.28%))
- Stony Hills - Undulating granite and quartz plains with red sandy substrate. Vegetation consists of sparse *Acacia* shrubland midstory over sparse *Triodia* hummock grassland. Microhabitats include *Triodia* hummocks and termite mounds. This habitat contained disturbances caused by vehicle tracks (47.82 ha (0.46%))
- Cleared - Cleared land for existing tracks/roads (206.26 ha (1.99%)).

A total of 63 fauna taxa were identified in the survey area. This total comprised:

- 33 birds
- 14 mammals
- 16 reptiles.

Three introduced species (European Cattle, Cat and Domestic Pigeon/Rock Dove) were recorded and are included in this total.

Two significant fauna species were recorded in the survey area:

- Pilbara Leaf-nosed Bat (*Rhinioncteris aurantia* (Pilbara form)) – Vulnerable
- Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority 4.

Additional conservation significant fauna assessed as known to occur in the survey area are:

- Northern Quoll (*Dasyurus hallucatus*) – Endangered
- Bilby (*Macrotis lagotis*) – Vulnerable

Conservation significant fauna assessed as likely to occur in the survey area include:

- Grey Falcon (*Falco hypoleucos*) – Vulnerable
- Oriental Pratincole (*Glareola maldivarum*) – Migratory
- Common Greenshank (*Tringa nebularia*) – Migratory
- Barn Swallow (*Hirundo rustica*) – Migratory
- Little Curlew (*Numenius minutus*) – Migratory
- Oriental Plover (*Charadrius veredus*) – Migratory
- Osprey (*Pandion haliaetus*) – Migratory
- Peregrine Falcon (*Falco peregrinus*) – Other specially protected fauna

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- Ghost Bat (*Macroderma gigas*) – Vulnerable
- Brush-tailed Mulgara (*Dasyercus blythi*) – Priority 4
- Pilbara Olive Python (*Liasis olivacea barroni*) – Vulnerable

Conservation significant fauna that may occur in the survey area include:

- Pilbara Grasswren (*Amytornus whitei whitei*) – Priority 4 (as *Amytornis striatus striatus*, DBCA)
- Glossy Ibis (*Plegadis falcinellus*) – Migratory
- Fork-tailed Swift (*Apus pacificus*) – Migratory
- Short-tailed Mouse (*Leggadina lakedownensis*) – Priority 4
- There were an additional 23 bird species that may occur in the survey area due to the proximity of historic records, however with limited suitable habitats within the survey area.

The likelihood of occurrence assessment is provided in Appendix C.

Table 4 Additional surveys that overlap the DE

Year	Author	Survey Name	Relevance to the Project
2023	Focus Vision Consulting (FVC)	Detailed Flora and Vegetation Assessment	33,905.09 ha in size, overlaps the DE.
2022	GHD	Boodarie Solar Farm	Of the 175 ha of the Boodarie solar farm survey area, approximately 90 ha intersects the western portion of the DE.
2024	Biota Environmental Sciences	Ridley Detailed Terrestrial Vertebrate Fauna Survey	Of the 12,235 ha survey area, approximately 5 ha intersects the eastern portion of the DE.
2022	Phoenix Environmental	Detailed terrestrial fauna and targeted Bilby Survey for the Port Hedland Solar Farm Proposal	Of the 9,000 ha survey area, approximately 1,065 ha intersects the western portion of the DE.

5 Existing Environment

The existing environment of the DE is described in Table 5.

Table 5 Existing environment in the DE.

Environmental value	Assessment																																																																
Vegetation associations, types and condition	The Project is located within Pre-European Vegetation Associations 589, 619, 647 and 93. More than 97% of these vegetation associations remain on State, bioregion and local government levels.																																																																
	<table border="1"> <thead> <tr> <th>Vegetation association</th> <th>Scale</th> <th>Pre-European extent (ha)</th> <th>Current extent (ha)</th> <th>% Remaining</th> <th>% of current extent in all DBCA managed</th> </tr> </thead> <tbody> <tr> <td rowspan="5">589</td> <td>State: Western Australia</td> <td>807,698.58</td> <td>802,713.40</td> <td>99.38</td> <td>1.91</td> </tr> <tr> <td>IBRA bioregion: Pilbara</td> <td>728,768.20</td> <td>724,695.82</td> <td>99.44</td> <td>2.11</td> </tr> <tr> <td>IBRA Subregion: Roebourne</td> <td>675,391.80</td> <td>671,327.48</td> <td>99.40</td> <td>2.14</td> </tr> <tr> <td>IBRA Subregion: Chichester</td> <td>53,376.40</td> <td>53,368.34</td> <td>99.98</td> <td>1.78</td> </tr> <tr> <td>LGA: Town of Port Hedland</td> <td>338,269.05</td> <td>335,921.21</td> <td>99.31</td> <td>-</td> </tr> <tr> <td rowspan="4">619</td> <td>State: Western Australia</td> <td>119,373.78</td> <td>118,205.01</td> <td>99.02</td> <td>0.20</td> </tr> <tr> <td>IBRA bioregion: Pilbara</td> <td>118,920.31</td> <td>118,116.78</td> <td>99.32</td> <td>0.20</td> </tr> <tr> <td>IBRA Subregion: Chichester</td> <td>85,543.15</td> <td>85,520.95</td> <td>99.97</td> <td>0.28</td> </tr> <tr> <td>LGA: Town of Port Hedland</td> <td>63,650.59</td> <td>62,598.14</td> <td>98.35</td> <td>-</td> </tr> <tr> <td rowspan="2">647</td> <td>State: Western Australia</td> <td>195,860.89</td> <td>191,711.41</td> <td>97.88</td> <td>-</td> </tr> <tr> <td>IBRA bioregion: Pilbara</td> <td>195,859.95</td> <td>191,710.92</td> <td>97.88</td> <td>-</td> </tr> </tbody> </table>	Vegetation association	Scale	Pre-European extent (ha)	Current extent (ha)	% Remaining	% of current extent in all DBCA managed	589	State: Western Australia	807,698.58	802,713.40	99.38	1.91	IBRA bioregion: Pilbara	728,768.20	724,695.82	99.44	2.11	IBRA Subregion: Roebourne	675,391.80	671,327.48	99.40	2.14	IBRA Subregion: Chichester	53,376.40	53,368.34	99.98	1.78	LGA: Town of Port Hedland	338,269.05	335,921.21	99.31	-	619	State: Western Australia	119,373.78	118,205.01	99.02	0.20	IBRA bioregion: Pilbara	118,920.31	118,116.78	99.32	0.20	IBRA Subregion: Chichester	85,543.15	85,520.95	99.97	0.28	LGA: Town of Port Hedland	63,650.59	62,598.14	98.35	-	647	State: Western Australia	195,860.89	191,711.41	97.88	-	IBRA bioregion: Pilbara	195,859.95	191,710.92	97.88	-
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Environmental value	Assessment				
	IBRA Subregion: Roebourne	188,901.32	184,774.70	97.82	-
	LGA: Town of Port Hedland	180,908.49	176,759.02	97.71	-
93	State: Western Australia	3,044,309.52	3,040,640.98	99.88	1.96
	IBRA bioregion: Pilbara	3,042,114.27	3,038,471.67	99.88	1.96
	IBRA Subregion: Chichester	2,940,348.04	2,936,731.54	99.88	2.03
	IBRA Subregion: Roebourne	46,360.53	46,334.43	99.94	-
	LGA: Town of Port Hedland	1,015,339.22	1,014,599.99	99.93	-

As described in Table 3, fourteen vegetation types were recorded within the DE (SLR, 2024):

Vegetation type	Condition	Extent (ha) within DE	Extent (%) within DE
AiTe	Very Good	30.0	0.3
AoTe	Very Good	53.0	0.5
AspTe	Very Good	5,495.0	53.7
AsTe	Very Good	2,963.1	29.0
At	Very Good	18.3	0.2
CcAcTe	Very Good	123.9	1.2
CfAh	Degraded	42.5	0.4
EvAcTe	Good to Very Good	263.5	2.6
EvEa	Very Good	24.1	0.2
FspAh	Very Good	1.8	0.0
FspTe	Very Good	13.5	0.1
MaEc	Good	165.7	1.6
Sh	Degraded	9.6	0.1
TsTe	Very Good	829.2	8.1
Cleared		200.8	2.0
Total		10,233.9	100%

As described in Table 3, the vegetation condition in the DE varied from Degraded to Very Good, with the majority in Very Good condition (SLR, 2024).

Eight introduced flora taxa were recorded in the DE (SLR, 2024):

- Kapok (**Aerva javanica*)
- Neem tree (**Azadirachta indica*)
- Calotrope (**Calotropis procera*)
- Buffel grass (**Cenchrus ciliaris*)
- **Indigofera oblongifolia*
- Spiked Malvastrum (**Malvastrum Americanum*)
- Stinking Passion Flower (**Passiflora foetida*)

Environmental value	Assessment																																				
	<ul style="list-style-type: none"> Mimosa Bush (<i>*Vachellia farnesiana</i>) <p>None of the introduced flora species are listed as Weeds of National Significance (WoNS). One taxon (<i>*Calotropis procera</i>) is listed as a Declared Pest under the <i>Biosecurity and Agriculture Management Act 2007</i> (BAM Act), of which approximately 144 individuals were recorded opportunistically, and another four individuals within flora sites (SLR, 2024).</p>																																				
Fauna habitat	<p>As described in Table 3, nine fauna habitat types were recorded within the DE (SLR, 2024):</p> <table border="1"> <thead> <tr> <th>Fauna habitat</th> <th>Extent (ha) within DE</th> <th>Extent (%) within DE</th> </tr> </thead> <tbody> <tr> <td>Closed <i>Acacia</i> Shrubland</td> <td>15.0</td> <td>0.1</td> </tr> <tr> <td>Low <i>Acacia stellaticeps</i> over <i>Triodia</i></td> <td>2966.9</td> <td>29.0</td> </tr> <tr> <td>Major Drainage</td> <td>165.7</td> <td>1.6</td> </tr> <tr> <td>Minor Drainage</td> <td>24.1</td> <td>0.2</td> </tr> <tr> <td>Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains</td> <td>5501.3</td> <td>53.8</td> </tr> <tr> <td>Open Eucalypt Woodland</td> <td>429.9</td> <td>4.2</td> </tr> <tr> <td>Outcrops and Breakaways</td> <td>43.6</td> <td>0.4</td> </tr> <tr> <td>Sparse <i>Triodia</i> Plains</td> <td>838.8</td> <td>8.2</td> </tr> <tr> <td>Stony Hills</td> <td>47.8</td> <td>0.5</td> </tr> <tr> <td>Cleared</td> <td>200.8</td> <td>2.0</td> </tr> <tr> <td>Total</td> <td>10,233.9</td> <td>100%</td> </tr> </tbody> </table>	Fauna habitat	Extent (ha) within DE	Extent (%) within DE	Closed <i>Acacia</i> Shrubland	15.0	0.1	Low <i>Acacia stellaticeps</i> over <i>Triodia</i>	2966.9	29.0	Major Drainage	165.7	1.6	Minor Drainage	24.1	0.2	Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains	5501.3	53.8	Open Eucalypt Woodland	429.9	4.2	Outcrops and Breakaways	43.6	0.4	Sparse <i>Triodia</i> Plains	838.8	8.2	Stony Hills	47.8	0.5	Cleared	200.8	2.0	Total	10,233.9	100%
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Environmental value	Assessment
Significant ecological linkages	The Major Drainage and Minor Drainage habitat types play a role as ecological linkage and provides water sources for significant species such as Northern Quoll and Pilbara Olive Python.
Ecological communities	No TECs listed under the EPBC Act or BC Act were identified within the DE during the SLR (2024) field survey. Additionally, no PECs listed by DBCA were identified within the DE during the field survey. One vegetation type, MaEc, is likely to represent GDE associated with some of the major drainages intersecting the DE. This vegetation type supports known <i>phreatophytic</i> tree species such <i>Melaleuca argentea</i> and <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> , which are reliant on access to the groundwater table (SLR, 2024).
Significant flora	Conservation significant flora that were recorded in the DE include (SLR, 2024): <ul style="list-style-type: none"> <i>Gymnanthera cunninghamii</i> (Priority 3) - Six individuals of <i>Gymnanthera cunninghamii</i> were recorded across four locations in the MaEc vegetation type. <i>Tephrosia rosea</i> subsp. Port Hedland (A.S. George 1114) (Priority 1) - Two individuals of <i>Tephrosia rosea</i> subsp. Port Hedland were recorded from one location in the AsTe vegetation type. An additional two Priority 3 species are considered likely to occur, <i>Eragrostis crateriformis</i> (Priority 3) and <i>Euploca mutica</i> (Priority 3). The likelihood of occurrence assessment is provided in Appendix D.
Wetlands and/or waterways	Two drainage habitats within the DE are connected to an important wetland, the Leslie (Port Hedland) Saltfields System approximately 6 km north of the DE.
Water resources	The Pilbara Groundwater Area (Proclaimed under the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act)) is present within the DE. No Public Drinking Water Source Areas (PDWSAs) are present within the DE. The De Grey River Water Reserve (Priority 1) is located approximately 2 km east of the DE. The Pilbara Surface Water Proclaimed under the RIWI Act is present within the DE. No rivers proclaimed under the RIWI Act are present within the DE.
Conservation Reserves	No DBCA managed conservation areas occur within the DE or within 20 km of the DE.
Environmentally Sensitive Areas (ESAs)	There are no ESAs within the DE.
Land and soil quality	The DE intersects the following land systems: <ul style="list-style-type: none"> Uaroo System (281Ua) - Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered Acacia shrubs. River System (281Ri) - Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of Acacia and fringing communities of eucalypts sometimes with tussock grasses or spinifex. Boolaloo System (281Bo) - Granite hills, domes, tor fields and sandy plains supporting spinifex grasslands with scattered shrubs. Macroy System (281Mc) - Stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands. Capricorn System (281Cp) - Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low Acacia shrublands or hard spinifex grasslands with scattered shrubs. Paradise System (281Pd) - Alluvial plains supporting soft spinifex grasslands and tussock grasslands. Boolgeeda System (280Bg) - Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands. A review of Acid Sulphate Soil (ASS) risk mapping (spatial dataset DWER-048; GoWA, 2024) indicates that the northern portion of the DE overlaps an area of moderate to low risk of ASS occurring within 3 m of natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface. The DE does not intersect any contaminated sites (spatial dataset DWER-059; GoWA, 2024). No known contaminated sites are recorded within 20 km of the DE.

Environmental value	Assessment
Environmental heritage	There are no National or World Heritage Areas mapped as overlapping the DE.

6 Avoidance, Mitigation and Management Measures

6.1 Avoidance

Initial avoidance and minimisation was undertaken during route selection and a large area was surveyed to allow for further refinement after the biological survey, to remove environmental constraints from the DE.

The following avoidance measures have been applied:

- A 20 m avoidance buffer has been placed around Priority species recorded during the SLR (2024) survey, including:
 - *Gymnanthera cunninghamii*
 - *Tephrosia rosea* var. Port Hedland (A.S. George 1114).
- Avoidance areas have been placed around Stony Hills and Rocky Outcrops and Breakaways fauna habitat types. These will be avoided for all project activities.
- Avoidance areas have been placed around the Minor Drainage and Major Drainage habitat types. These will not be impacted by permanent clearing including permanent access tracks, there may be minor temporary impacts to this habitat type in the form of vehicles driving over these habitat types during stringing. Helicopter stringing is being considered which will further reduce impacts to drainage lines, however this constructability decision can not be finalised until design is completed.
- Avoidance areas have been placed around the MaEc vegetation type, which is also associated with the major drainage fauna habitat type. There may still be minor temporary clearing in the form of vehicles driving over this vegetation type during stringing.

6.2 Mitigation and Management

6.2.1 Geotechnical works

A CEMP has been developed for the project (Appendix B), this lists the specific mitigation and management measures to be applied. Key management measures include:

- Avoidance areas will be clearly communicated prior to geotechnical investigations commencing and no more than 35.2 ha of clearing will be undertaken for geotechnical investigations.
- Works will be undertaken systematically to minimise re-run and compaction of access tracks.
- Standard weed and hygiene management practices which will be applied to these works.
- Mechanical clearing will be undertaken slowly and in a one-way direction to allow fauna to move offsite if present.
- Implementation of the standard management measures to minimise risks to vegetation and flora.
- Dust, noise and vibration management measures will be implemented during construction.

6.2.2 Project infrastructure

Key management measures detailed in the CEMP for the project infrastructure include the following:

- No clearing is permitted outside the DE.
- Clearing areas are to be checked by an Environmental Specialist or Site Supervisor prior to clearing to ensure no more than 100.8 ha of clearing is undertaken for the Project (including the 35.2 ha of clearing required for geotechnical investigations detailed above).
- Clearing impacts will be further reduced through the detailed design process, including the positioning of access tracks, poles and pole pads to minimise impacts to vegetation and flora.

- Avoidance areas are to be identified and communicated prior to clearing activities commencing.
- Where possible, pre-existing access tracks will be used.
- Clearing impacts will be further reduced through the detailed design process, including the positioning of access tracks, poles and pole pads to minimise impacts to vegetation and flora.
- Works will be undertaken systematically to minimise re-run and compaction of access tracks.
- Standard weed and hygiene management practices which will be applied to these works.
- A pre-clearing toolbox will be held so all staff are aware of their responsibilities under the permit.
- Mechanical clearing will be undertaken slowly and in a one-way direction to allow fauna to move offsite if present.
- Implementation of the standard management measures to minimise risks to vegetation and flora.
- Dust, noise and vibration management measures will be implemented during construction.

6.2.3 Restoration of Cleared Areas

Restoration of the DE following temporary clearing will be undertaken, as follows:

- Topsoil will be stockpiled separately to other excavated materials.
- On completion of test pit works for the geotechnical survey, excavated materials will be placed back into the test pits. Topsoil from the test pit will then be respread over the surface.
- Recontouring of soil within the test pit and laydown areas will be undertaken to prevent compaction.
- Any clearing required for temporary purposes, and not required for ongoing maintenance, will be rehabilitated upon completion of construction including re-laying of soil and recontouring to prevent compaction.

7 Stakeholder Engagement

Horizon Power will continue engagement with Traditional Owners, local businesses and community, the local Shire and Department of Planning, Lands and Heritage prior to undertaking this work.

8 Assessment Against the 10 Clearing Principles

An assessment against the 10 Clearing Principles has been undertaken to support the NVCP application for the Project, as presented in Table 6. The assessment found that the Project may be at variance with clearing principle b and is unlikely to be at variance with any of the other clearing principles.

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Table 6 Assessment Against the 10 Clearing Principles

Principle	Assessment	Outcome
<p>(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.</p>	<p>Up to 100.8 ha of native vegetation is proposed to be cleared for the Project within the DE, of which 40.2 ha is temporary clearing.</p> <p>Vegetation</p> <p>The DE is located in the Pilbara bioregion and the Roebourne and Chichester sub-regions as described by IBRA. 14 vegetation types were identified in the DE during the SLR (2024) survey. These vegetation types are described in Table 5.</p> <p>The vegetation condition in the DE varied from Degraded to Very Good, with the majority of vegetation in Very Good condition (95.23% of the SLR (2024) survey area). The areas of vegetation in Good, Poor or Degraded condition were often affected by weeds such as <i>*Cenchrus ciliaris</i> and <i>*Calotropis</i>. These occurred in areas associated with drainagelines and floodplains, which were also impacted by livestock that act as vectors for the spread of weeds.</p> <p>No TECs listed under the EPBC Act or BC Act were identified within the DE during the SLR (2024) field survey. Additionally, no PECs listed by DBCA were identified within the DE during the field survey.</p> <p>One vegetation type, MaEc, is likely to represent GDE associated with some of the major drainage lines intersecting the DE (SLR, 2024). This vegetation type supports known <i>phreatophytic</i> tree species such <i>Melaleuca argentea</i> and <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>, which are reliant on access to the groundwater table. As shown in Figure 2, avoidance areas for permanent clearing have been placed around the MaEc vegetation type. There may still be temporary clearing in the form of vehicles driving over this vegetation type during stringing, which will result in a negligible impact.</p> <p>Examination of similarities of vegetation descriptions shows the vegetation types are representative of the vegetation associations in the region (SLR, 2024). As shown in Table 5, there is a high proportion (greater than 97%) of the pre-European extent of these vegetation associations remaining.</p> <p>Flora</p> <p>172 flora taxa (including subspecies and varieties) representing 40 families and 94 genera were recorded in the DE during the SLR (2024) field survey. This total comprised 164 native taxa and eight introduced flora taxon.</p> <p>The below conservation significant flora that were recorded in the DE have been excluded from the DE with a 20 m buffer to avoid impacts from the Project (as shown in Figure 2):</p> <ul style="list-style-type: none"> • <i>Gymnanthera cunninghamii</i> (Priority 3 - DBCA) • <i>Tephrosia rosea</i> subsp. Port Hedland (A.S. George 1114) (Priority 1 - DBCA). <p>As outlined in Appendix D, an additional eight Priority flora species were considered to likely occur or may occur within the DE:</p> <ul style="list-style-type: none"> • <i>Eragrostis crateriformis</i> (Priority 3) • <i>Euploca mutica</i> (Priority 3) • <i>Euploca parviantrum</i> (Priority 1) • <i>Euphorbia inappendiculata</i> var. <i>inappendiculata</i> (Priority 2) • <i>Abutilon</i> sp. <i>Pritzelianum</i> (S. van Leeuwen 5095) (Priority 3) 	<p>Proposed clearing is unlikely to be at variance to this Principle.</p>

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Principle	Assessment	Outcome
	<ul style="list-style-type: none"> • <i>Euphorbia clementii</i> (Priority 3) • <i>Rothia indica</i> subsp. <i>australis</i> (Priority 3) • <i>Bulbostylis burbridgeae</i> (Priority 4). <p>Eight introduced flora taxa were recorded in the DE:</p> <ul style="list-style-type: none"> • <i>Kapok</i> (*<i>Aerva javanica</i>) • <i>Neem tree</i> (*<i>Azadirachta indica</i>) • <i>Calotrope</i> (*<i>Calotropis procera</i>) • <i>Buffel grass</i> (*<i>Cenchrus ciliaris</i>) • <i>*Indigofera oblongifolia</i> • <i>Spiked Malvastrum</i> (*<i>Malvastrum Americanum</i>) • <i>Stinking Passion Flower</i> (*<i>Passiflora foetida</i>) • <i>Mimosa Bush</i> (*<i>Vachellia farnesiana</i>) <p>None of these introduced flora species are listed as WoNS. One taxon (*<i>Calotropis procera</i>) is listed as a Declared Pest under the <i>Biosecurity and Agriculture Management Act 2007</i> (BAM Act), of which approximately 144 individuals were recorded opportunistically, and another four individuals within flora sites that were surveyed by SLR (2024). Standard weed and hygiene management practices which will be applied to mitigate the spread of weeds from the Project.</p> <p>The suite of flora taxa recorded during the survey is considered typical for the bioregion and aligns with the database search results obtained (SLR, 2024).</p> <p>Fauna Habitat</p> <p>Nine fauna habitat types were recorded within the DE during the SLR (2024) survey (Closed <i>Acacia</i> Shrubland, Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Major Drainage, Minor Drainage, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Open Eucalypt Woodland, Outcrops and Breakaways, Sparse <i>Triodia</i> Plains and Stony Hills). These habitat types are described in Table 5.</p> <p>The habitat types recorded in the DE are typical of the Pilbara bioregion and consistent with habitats identified by previous studies in the region (SLR, 2024). Nearly all fauna habitat types extend outside the DE to form larger ecosystems. However, there is one pocket of Stony Hills and Closed <i>Acacia</i> Shrubland habitats, and a series of Outcrops and Breakaways habitat contained entirely within the DE which lack connectivity to similar habitats (SLR, 2024). Avoidance areas have been placed around Stony Hills and Rocky Outcrops and Breakaways habitat types to prevent impacts from the Project.</p> <p>The Major Drainage and Minor Drainage habitat types play a role as ecological linkages, and provide water sources for significant species such as Northern Quoll and Pilbara Olive Python. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types during stringing, which will result in a negligible impact.</p> <p>The avoidance areas around the Stony Hills, Rocky Outcrops and Breakaways, Major Drainage and Minor Drainage habitats are shown in Figure 2 to mitigate impacts to conservation significant fauna from clearing of important habitat.</p> <p>Fauna</p>	

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Principle	Assessment	Outcome
	<p>A total of 63 fauna species were identified in the DE (SLR, 2024). This total comprised 33 birds, 14 mammals and 16 reptiles and included three introduced species (European Cattle, Cat and Domestic Pigeon/Rock Dove). The DE has a typical level of fauna diversity, based on comparisons of fauna diversity captured in other fauna surveys conducted in the region (See Table 3).</p> <p>Two significant fauna species were recorded in the DE (SLR, 2024):</p> <ul style="list-style-type: none"> • Pilbara Leaf-nosed Bat (<i>Rhinioncteris aurantia</i> (Pilbara form)) – Vulnerable • Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>) – Priority 4. <p>Additional conservation significant fauna assessed as known to occur in the DE and are detailed in Principle b.</p> <p>The Project will mitigate impacts to biological diversity by utilising existing access tracks and degraded areas where possible, as well as the application of avoidance areas for significant aspects identified in the biological survey. Overall, the flora, vegetation and fauna values of the DE are highly represented outside the DE and surrounding vegetation typically has similar or better condition vegetation. The native vegetation within the DE is not considered to comprise high levels of biological diversity compared to the surrounding region, and as such, the proposed clearing is not considered to be at variance with this principle.</p>	
<p>(b) Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous Western Australia.</p>	<p>Fauna Habitat</p> <p>Nine fauna habitat types were recorded within the DE and are described in Table 5.</p> <p>The habitat types recorded in the DE are typical of the Pilbara bioregion and consistent with habitats identified by previous studies in the region (SLR, 2024). Nearly all fauna habitat types extend outside the DE to form larger ecosystems. However, there is one pocket of Stony Hills and Closed <i>Acacia</i> Shrubland habitats, and a series of Outcrops and Breakaways habitat contained entirely within the DE which lack connectivity to similar habitats (SLR, 2024). Avoidance areas have been placed around Stony Hills and Rocky Outcrops and Breakaways habitats as these were considered high value habitat for conservation significant species and are located in discrete pocket that can be excluded from the impact area.</p> <p>The Major Drainage and Minor Drainage habitat types play a role as ecological linkage and provides water sources for some significant species. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types during stringing, which will result in a negligible impact.</p> <p>The avoidance areas around the Stony Hills, Rocky Outcrops and Breakaways, Major Drainage and Minor Drainage habitats are shown in Figure 2 to mitigate impacts to conservation significant fauna from clearing of important habitat.</p> <p>Fauna</p> <p>The desktop assessment conducted by SLR (2024) identified the presence/potential presence of 76 significant fauna species within 50 km of the DE. This total comprised 62 birds, 11 mammals and three reptiles. A total of 63 fauna species were identified in the DE (SLR, 2024). This total comprised 33 birds, 14 mammals and 16 reptiles and included three introduced species (European Cattle, Cat and Domestic Pigeon/Rock Dove). The DE has a typical level of fauna diversity, based on comparisons of fauna diversity captured in other fauna surveys conducted in the region.</p> <p>The habitat preferences and suitable habitat within the DE for the conservation significant fauna that are considered known, likely or may occur within the DE are described in Appendix C. Appendix C also outlines whether habitat is considered critical to the survival of a species, according to relevant recovery plans and conservation advice. The discussion of potential impacts for these species is provided below.</p> <p><i>Northern Quoll</i></p>	<p>Proposed clearing may be at variance to this Principle.</p>

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Principle	Assessment	Outcome
	<p>The Northern Quoll is listed as Endangered under the BC Act and known to occur in the DE. As described in Appendix C, the Outcrops and Breakaways and Stony Hills habitats within the DE are considered habitat critical to the survival of the Northern Quoll (Hill and Ward, 2010). Avoidance areas have been applied around these two habitat types to mitigate impacts to the Northern Quoll.</p> <p>Additionally, the Major Drainage and Minor Drainage habitats would provide valuable water sources for the Northern Quoll after significant rain events. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types during stringing, which will result in a negligible impact.</p> <p>The Northern Quoll may also utilise the Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains and Sparse <i>Triodia</i> Plains habitat types within the DE for foraging and dispersal, which is considered supporting habitat. Up to 100.8 ha may be cleared for the Project, of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing.</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Northern Quoll is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha of foraging and dispersal habitat for the Northern Quoll, represents approximately 0.03% of potential habitat available within 20 km of the DE. Up to 60.6 ha of permanent clearing of foraging and dispersal habitat for Northern Quoll is proposed, consisting predominantly of 20m x 20m pole pads and a small maintenance access track. Given the linear nature of the Project, the dispersal and foraging habitat for Northern Quoll in the region is unlikely to be significantly impacted.</p> <p><i>Pilbara Leaf-nosed Bat</i></p> <p>The Pilbara Leaf-nosed Bat is listed as Vulnerable under the BC Act and known to occur in the DE. As described in Appendix C, the Outcrops and Breakaways and Stony Hills habitats within the DE are considered habitat critical to the survival of the Pilbara Leaf-nosed bat (TSSC, 2016). Avoidance areas have been applied around these two habitat types to mitigate impacts to the Pilbara Leaf-nosed Bat.</p> <p>Additionally, the Major Drainage and Minor Drainage habitats may provide potential foraging and dispersal habitat for the species. Avoidance areas have also been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>The Pilbara Leaf-nosed Bat may also utilise the Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains and Open Eucalypt Woodland habitats for foraging and dispersal. As described in Appendix C, these habitats are considered critical to the survival of the Pilbara Leaf-nosed Bat (TSSC, 2016) and up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Pilbara Leaf-nosed Bat is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.03% of potential habitat available within 20 km of the DE. Given this species is aerial and Pilbara Leaf-nosed Bats can range over 20 km for foraging (Bat Call WA, 2021), the proposed clearing is not considered a significant impact on Pilbara Leaf-nosed bat foraging or dispersal habitat.</p> <p><i>Bilby</i></p> <p>The Bilby is listed as Vulnerable under the BC Act and known to occur in the DE. As described in Appendix C, the Low <i>Acacia stellaticeps</i> over <i>Triodia</i> and Sparse <i>Triodia</i> Plains habitats within the DE are considered habitat critical to the survival of the Bilby (DCCEE, 2023b) due to their values for denning, foraging and dispersal. Up to 100.8 ha of these critical habitats may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p>	

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Principle	Assessment	Outcome
	<p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Bilby is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.03% of potential habitat available within 20 km of the DE. No burrows were identified for Bilby in the survey area. Up to 60.6 ha of permanent clearing of critical habitat for Bilby is proposed, consisting predominantly of 20m x 20m pole pads and a small maintenance access track.</p> <p><i>Western Pebble-mound Mouse</i></p> <p>The Western Pebble-mound Mouse is listed as Priority 4 by DBCA and known to occur in the DE. As described in Appendix C, the Outcrops and Breakaways and Stony Hills habitat types occur within the DE in discrete pockets, and are considered habitat critical to the survival of the Western Pebble-mound Mouse. Avoidance areas have been applied around these two habitat types to mitigate impacts to the Western Pebble-mound Mouse.</p> <p>The Western Pebble-mound Mouse may also utilise other habitat types within the DE for foraging and dispersal. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Western Pebble-mound Mouse is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.03% of potential habitat available within 20 km of the DE. The project will require the permanent clearing of up to 60.6 ha of foraging and dispersal habitat for Western Pebble Mound Mouse. Given the sporadic nature of the clearing for the poles, narrow access track, and abundance of alternative habitat in the region, this impact is not considered significant to Western Pebble Mound mouse.</p> <p><i>Grey Falcon</i></p> <p>The Grey Falcon is listed as Vulnerable under the BC Act and is likely to occur in the DE. As described in Appendix C, the Major Drainage and Minor Drainage habitats in the DE may be suitable nesting habitat for the Grey Falcon. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>The Grey Falcon may also utilise the Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Open Eucalypt Woodland and Sparse <i>Triodia</i> Plains habitat types within the DE for foraging and dispersal. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Grey Falcon is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.03% of potential habitat available within 20 km of the DE.</p> <p>The Grey Falcon occurs in a wide variety of habitats which are abundant in the area (Ehmann and Watson, 2008). As Grey Falcon habitat is abundant in the area and potential nesting habitat will be avoided, it is unlikely that clearing of potential foraging and dispersal habitat for the Project will significantly impact this species.</p> <p><i>Oriental Pratincole</i></p> <p>The Oriental Pratincole is listed as Migratory under the BC Act and is likely to occur in the DE. As described in Appendix C, the Major Drainage and Minor Drainage habitats in the DE may be suitable foraging habitat for the Oriental Pratincole. Avoidance areas have been placed around</p>	

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Principle	Assessment	Outcome
	<p>these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>The Oriental Pratincole may also utilise other habitat types within the DE for foraging. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Oriental Pratincole is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.22% of potential habitat available within 20 km of the DE.</p> <p>As the Oriental Pratincole does not breed in Australia, habitat is abundant in the area and the species is likely to be transient within the DE, significant impacts to this species are considered unlikely.</p> <p><i>Common Greenshank</i></p> <p>The Common Greenshank is listed as Migratory under the BC Act and is likely to occur in the DE. As described in Appendix C, the Major Drainage and Minor Drainage habitats in the DE may be suitable foraging habitat for the Common Greenshank and are considered habitat critical to the species' survival (DCCEEW, 2024e). Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be some minor temporary clearing in the form of vehicles driving over these habitat types.</p> <p>The Common Greenshank was also considered likely to utilize <i>Triodia</i> habitat types (SLR 2024). These are also considered habitat critical to the survival of the Common Greenshank (DCCEEW, 2024e). Up to 100.8 ha may be cleared for the Project, including 60.6 ha of permanent clearing.</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Common Greenshank is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.22% of potential habitat available within 20 km of the DE.</p> <p>The Common Greenshank does not breed in Australia and is likely to be transient within the DE. Given the abundant habitat within the region and the sporadic nature of the permanent clearing proposed (20m x 20m pole pads connected by access track), the Project is unlikely to have a significant impact on Common Greenshank.</p> <p><i>Barn Swallow</i></p> <p>The Barn Swallow is listed as Migratory under the BC Act and is likely to occur in the DE. As described in Appendix C, the Major Drainage and Minor Drainage habitats in the DE may be suitable foraging, roosting and dispersal habitat for the Barn Swallow. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>The Barn Swallow may also utilise the Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, and Sparse <i>Triodia</i> Plains habitat types within the DE for foraging, roosting and dispersal. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Barn Swallow is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.22% of potential habitat available within 20 km of the DE.</p> <p>As the Barn Swallow does not breed in Australia, habitat is abundant in the area and the species is likely to be transient within the DE, it is unlikely that clearing would be significant.</p>	

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Principle	Assessment	Outcome
	<p><i>Little Curlew</i></p> <p>The Little Curlew is listed as Migratory under the BC Act and is likely to occur in the DE. As described in Appendix C, the Major Drainage and Minor Drainage habitats in the DE may be suitable foraging habitat for the Little Curlew. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>The Little Curlew may also utilise the Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains and Open Eucalypt Woodland habitat types within the DE for foraging. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Little Curlew is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.03% of potential habitat available within 20 km of the DE.</p> <p>As the Little Curlew does not breed in Australia, habitat is abundant in the area and the species is likely to be transient within the DE, the proposed clearing is unlikely to be significant.</p> <p><i>Oriental Plover</i></p> <p>The Oriental Plover is listed as Migratory under the BC Act and is likely to occur in the DE. As described in Appendix C, the Major Drainage and Minor Drainage habitats in the DE may be suitable foraging habitat for the Oriental Plover. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>The Oriental Plover may also utilise the Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains and Sparse <i>Triodia</i> Plains habitat types within the DE for foraging. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Oriental Plover is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.03% of potential habitat available within 20 km of the DE.</p> <p>As the Oriental Plover does not breed in Australia, habitat is abundant in the area and the species is likely to be transient within the DE, the proposed clearing is unlikely to be significant.</p> <p><i>Osprey</i></p> <p>The Osprey is listed as Migratory under the BC Act and is likely to occur in the DE. As described in Appendix C, the Major Drainage and Minor Drainage habitats in the DE may be suitable foraging and dispersal habitat for the Osprey. SLR (2024) defined these habitats as critical to the survival of the species. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Osprey is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.20% of potential habitat available within 20 km of the DE.</p>	

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Principle	Assessment	Outcome
	<p>As Osprey habitat is abundant in the area, the species is likely to be transient within the DE, and permanent clearing of critical habitat for the Project will be avoided, the proposed clearing is unlikely to be significant.</p> <p><i>Peregrine Falcon</i></p> <p>The Peregrine Falcon is listed as Other Specially Protected Fauna by DBCA and is likely to occur in the DE. As described in Appendix C, the Major Drainage and Minor Drainage habitats in the DE may be suitable nesting, dispersal and foraging habitat for the Peregrine Falcon. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>The Peregrine Falcon may also utilise the Open Eucalypt Woodland habitat type within the DE for nesting, dispersal and foraging. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Peregrine Falcon is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.82% of potential habitat available within 20 km of the DE.</p> <p>As Peregrine Falcon habitat is abundant in the area, it is unlikely that clearing would result in a significant impact to this species.</p> <p><i>Ghost Bat</i></p> <p>The Ghost Bat is listed as Vulnerable under the BC Act and is likely to occur in the DE. As described in Appendix C, habitat critical to the survival of the Ghost Bat isn't defined, however, Biota (2024) defined the rocky hills habitat within their survey area (which intersects the DE) as potential critical habitat for the Ghost Bat (Biota, 2024). This habitat is considered similar to the Outcrops and Breakaways habitat and is therefore considered critical habitat as well. Avoidance areas have been applied this habitat type to mitigate impacts to the Ghost Bat.</p> <p>The Ghost Bat may also utilise the Major Drainage and Minor Drainage habitat types within the DE for foraging and dispersal. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>Due to avoidance areas being implemented in the DE, no habitat for the Ghost Bat will be cleared for the Project (except potential minor temporary clearing of drainage lines from vehicles). Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Ghost Bat is widespread within a 20 km radius of the DE.</p> <p>As Ghost Bat habitat is abundant in the area, and clearing of critical habitat and other potential foraging and dispersal habitat will be avoided, it is unlikely the Project will significantly impact this species.</p> <p><i>Brush-tailed Mulgara</i></p> <p>The Brush-tailed Mulgara is listed as Priority 4 by DBCA and is likely to occur in the DE. As described in Appendix C, the Low <i>Acacia stellaticeps</i> over <i>Triodia</i> and Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains habitat types may be used as burrowing, foraging and dispersal habitats by the Brush-tailed Mulgara. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Brush-tailed Mulgara is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.03% of potential habitat available within 20 km of the DE.</p>	

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Principle	Assessment	Outcome
	<p>As Brush-tailed Mulgara habitat is abundant in the area, it is unlikely that clearing of potential burrowing, foraging and dispersal habitat (which is not considered critical habitat) for the Project would result in a significant impact to this species.</p> <p><i>Pilbara Olive Python</i></p> <p>The Pilbara Olive Python is listed as Vulnerable under the BC Act and is likely to occur in the DE. As described in Appendix C, critical habitat is not defined for this species (DEWHA, 2008). However, Biota (2024) defined the rocky hills habitat they recorded within the Atlas Iron survey area as potential critical habitat for the species. The Outcrops and Breakaway habitat is similar and therefore potentially critical habitat for the species. Avoidance areas have been applied this habitat type to mitigate impacts to the Pilbara Olive Python.</p> <p>The Pilbara Olive Python may also utilise the Major Drainage and Minor Drainage habitat types within the DE for foraging. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Pilbara Olive Python is widespread within a 20 km radius of the DE.</p> <p>As Pilbara Olive Python habitat is abundant in the area, and clearing of critical habitat and other potential foraging habitat will be avoided, it is unlikely the Project will significantly impact this species.</p> <p><i>Pilbara Grasswren</i></p> <p>The Pilbara Grasswren is listed as Priority 4 by DBCA and may occur in the DE. As described in Appendix C, SLR (2024) defined Stony Hills habitat in the DE as habitat critical to the survival of the Pilbara Grasswren due to its value for foraging and shelter. Avoidance areas have been applied this habitat type to mitigate impacts to the Pilbara Grasswren.</p> <p>The Pilbara Grasswren may also utilise the Sparse <i>Triodia</i> Plains habitat type within the DE for foraging and shelter. SLR (2024) also defined this habitat as critical to the survival of the Pilbara Grasswren. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Pilbara Grasswren is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.03% of potential habitat available within 20 km of the DE.</p> <p>The Project will result in clearing of up to 100.8 ha of critical habitat for foraging and shelter for the Pilbara Grasswren.</p> <p><i>Short-tailed Mouse</i></p> <p>The Short-tailed Mouse is listed as Priority 4 by DBCA and may occur in the DE. As described in Appendix C, SLR (2024) defined the Stony Hills habitat within the DE as habitat critical to the survival of the Short-tailed Mouse due to its foraging and shelter values. Avoidance areas have been applied around this habitat type to mitigate impacts to the Short-tailed Mouse.</p> <p>The Short-tailed Mouse may also utilise the Sparse <i>Triodia</i> Plains habitat type within the DE for foraging and shelter. SLR (2024) also defined this habitat type as habitat critical to the survival of the species. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for the Short-tailed Mouse is widespread within a 20 km radius of the DE. Clearing of up to 100.8 ha within the DE, represents approximately 0.03% of potential habitat available within 20 km of the DE.</p>	

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Principle	Assessment	Outcome
	<p>The Project will result in clearing of up to 100.8 ha of critical foraging and shelter habitat for the Short-tailed Mouse.</p> <p><i>Other Birds</i></p> <p>The Glossy Ibis, Fork-tailed Swift, Curlew Sandpiper, Great Knot, Red Knot, Grey-tailed Tattler, White-winged Black Tern, Gull-billed Tern, Caspian Tern, Common Tern, Common Sandpiper, Sharp-tailed Sandpiper, Sanderling, Broad-billed Sandpiper, Pectoral Sandpiper, Ruff, Red-necked Stint, Long-toed Stint, Pin-tailed Snipe, Bar-tailed Godwit, Black-tailed Godwit, Whimbrel, Red-necked Phalarope, Wood Sandpiper and Marsh Sandpiper may occur in the DE. As described in Appendix C, the bird species may use the Major Drainage and Minor Drainage habitats within the DE for foraging and dispersal after flooding events. This is considered critical habitat for the Curlew Sandpiper, Great Knot, Red Knot, Sharp-tailed Sandpiper and Black-tailed Godwit as any foraging habitat is considered critical habitat for these species (DCCEEW, 2023a; DCCEEW, 2024a, DCCEEW, 2024b; DCCEEW, 2024c; DCCEEW, 2024d). Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types, which will result in a negligible impact.</p> <p>The Glossy Ibis may also utilise the Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains and Sparse <i>Triodia</i> Plains habitats within the DE for foraging and breeding. Up to 100.8 ha may be cleared for the Project (of which only 60.6 ha is permanent clearing and 40.2 is temporary clearing).</p> <p>The Fork-tailed Swift may use the Outcrops and Breakaways and Stony Hills habitats in the DE for suitable foraging and dispersal. Avoidance areas have been applied around the Outcrops and Breakaways and Stony Hills habitat types to mitigate impacts to the Fork-tailed Swift. The Fork-tailed Swift may also utilise the Closed <i>Acacia</i> Shrubland, Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Open Eucalypt Woodland and Sparse <i>Triodia</i> Plains habitats within the DE for foraging and dispersal.</p> <p>Based on aerial imagery and the Native Vegetation Extent (spatial dataset DPIRD-005, GoWA 2024) and Pre-European Vegetation (spatial dataset DPIRD-006, GoWA 2024) datasets, habitat for these bird species is widespread within a 20 km radius of the DE.</p> <p>The main impact to these migratory species would be mortality of individuals from direct collisions with vehicles and the power line infrastructure. As the migratory species that may potentially occur would be likely utilising the habitat as temporary only during flooding events, the number of individuals killed from direct collisions is not expected to be significant.</p> <p>As habitat is abundant in the area, the species are likely to be transient in the DE, and clearing of critical habitat will be avoided, it is unlikely the Project will significantly impact these species.</p> <p><i>Outcome</i></p> <p>Avoidance areas have been applied around the majority of critical habitat for conservation significant species to minimise impacts from the project, and temporary clearing will be rehabilitated. The project is linear and sporadic in nature, with permanent clearing consisting mainly of 20m x 20m pole pads and a narrow maintenance access track connecting the poles, similar to other transmission infrastructure in the Pilbara. Given the abundance of alternative habitat in the region, significant impacts are not expected as the Project will not significantly limit dispersal or foraging habitat in the region. The project may be at variance to Principle b) due to the clearing of critical (foraging, shelter and dispersal) habitat for Pilbara Leaf-nosed Bat, Bilby, Pilbara Grasswren and Short-tailed Mouse.</p>	
(c) Native vegetation should not be cleared if it includes, or is necessary for the	<p>No flora species listed as Threatened under the BC Act or EPBC Act were recorded in the DE by SLR (2024) or were considered likely to occur or may occur within the DE.</p> <p>The proposed clearing of native vegetation for the Project is therefore unlikely to be at variance with this principle.</p>	Proposed clearing is unlikely to be at variance to this Principle.

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Principle	Assessment	Outcome
continued existence of, rare flora.		
(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.	No TECs listed under the EPBC Act or BC Act were identified within the DE during the SLR (2024) survey. As no vegetation within the DE is representative of any TEC, the proposed clearing is not at variance to this Principle.	Proposed clearing is not at variance to this Principle.
(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	14 vegetation types were identified in the DE during the SLR (2024) survey (AiTe, AoTe, AspTe, AsTe, At, CcAcTe, CfAh, EvAcTe, EvEa, FspAh, FspTe, MaEc, Sh and TsTe). These vegetation types are described in Table 5. Broad scale (1:250,000) pre-European vegetation mapping of the area was completed by Beard (1976) at an association level. Vegetation associations 589, 619, 647 and 93 are present in the DE. As shown in Table 5, there is a high proportion (greater than 97%) of the pre-European extent of these vegetation associations remaining. Examination of similarities of vegetation descriptions shows the vegetation types are representative of the vegetation associations in the region (SLR, 2024). The DE is not within an area that has been extensively cleared given it has more than 97% of pre-European extent remaining. Overall, the flora and vegetation values of the DE are highly represented outside the DE and surrounding vegetation typically has similar or better condition vegetation. The vegetation types identified during the survey are not confined to the DE and are considered well represented at the local and regional scale.	Proposed clearing is not at variance to this Principle.
(f) Native vegetation should not be cleared if it is growing in or in association with a watercourse or wetland.	One vegetation type, MaEc, is likely to represent a GDE associated with some of the major drainages intersecting the DE (SLR, 2024). This vegetation type supports known phreatophytic tree species such <i>Melaleuca argentea</i> and <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> , which are reliant on access to the groundwater table. As shown in Figure 2, avoidance areas for permanent clearing have been placed around the MaEc vegetation type, which is associated with the drainage habitats. There may still be temporary clearing in the form of vehicles driving over this vegetation type, which will result in a negligible impact. Two drainage habitats within the DE (Major Drainage and Minor Drainage) are connected to an important wetland, the Leslie (Port Hedland) Saltfields System approximately 6 km north of the DE. There will be no permanent clearing of these habitat types for the Project, and any temporary clearing will be associated with driving over vegetation for stringing. Therefore, the impact to these drainage habitats are expected to be negligible. The proposed clearing is unlikely to be at variance with this Principle.	Proposed clearing is unlikely to be at variance to this Principle.
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to	The DE intersects the following land systems (Van Vreeswyk et al., 2004): <ul style="list-style-type: none"> Uaroo System (281Ua) - Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered <i>Acacia</i> shrubs. Occasionally some erosion and pasture decline is evident on drainage tracts, but generally the system is not susceptible to erosion or significant vegetation degradation. 	Proposed clearing is unlikely to be at variance to this Principle.

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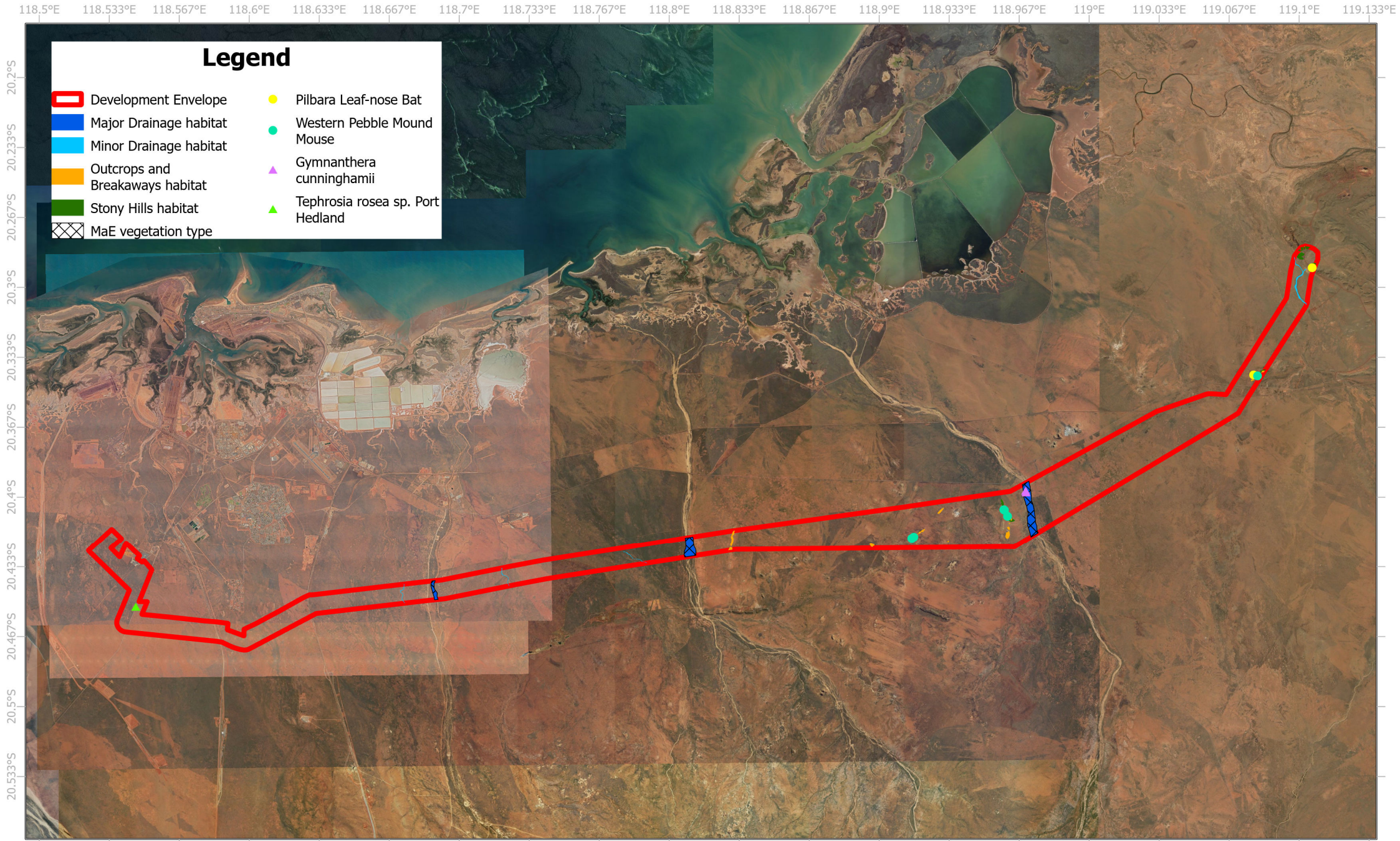
Principle	Assessment	Outcome
<p>cause appreciable land degradation.</p>	<ul style="list-style-type: none"> • River System (281Ri) - Narrow, seasonally active flood plains and major river channels supporting moderately close, tall shrublands or woodlands of <i>Acacias</i> and fringing communities of eucalypts sometimes with tussock grasses or spinifex. The system is largely stabilised by buffel and spinifex and accelerated erosion is uncommon. However, susceptibility to erosion is high or very high if vegetative cover is removed. • Boolaloo System (281Bo) - Granite hills, domes, tor fields and sandy plains supporting spinifex grasslands with scattered shrubs. The spinifex vegetation is not usually prone to grazing induced degradation but is subject to fairly frequent burning. • Macroy System (281Mc) - Stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands. The system has low or very low erosion hazard. • Capricorn System (281Cp) - Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low <i>Acacia</i> shrublands or hard spinifex grasslands with scattered shrubs. The stoniness of this land system confers resistance to erosion. • Paradise System (281Pd) - Alluvial plains supporting soft spinifex grasslands and tussock grasslands. The system is prone to periodic flooding. Much of the vegetation on the system is favoured by grazing animals and is prone to degradation if overgrazed. Loamy plains and alluvial plains are highly susceptible to water and wind erosion if the vegetative cover is depleted. • Boolgeeda System (280Bg) - Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands. Vegetation is generally not prone to degradation and the system is not susceptible to erosion. <p>The majority of the DE is covered by the Uaroo System which is generally not susceptible to erosion. The River and Paradise land systems are susceptible to erosion and land degradation if vegetation cover is depleted. The River land system aligns with Drainage habitat type which will be avoided. Some temporary clearing may be required, in the form of vehicles driving over these habitat types during stringing. The remaining land systems have low erosion and degradation hazards.</p> <p>The soil landscape land quality mapping (spatial dataset DPIRD-017, GoWA 2024) indicates that the DE is within the De Grey-Roebourne Lowlands Zone, which is described as ‘alluvial plains and sandplains on alluvial and marine deposits over the northern Pilbara Craton with Red deep sandy duplexes, Red loamy earths, Red/brown non-cracking clays, Cracking clays, Red sandy earths and Red deep loamy duplexes’. The northeastern tip of the DE overlaps the Nullagine Hills Zone, which is described as ‘hills and ranges (with some stony plains) on volcanic and sedimentary rocks of the Pilbara Craton (including the Hamersley Basin) with Stony soils and Red shallow loams and sands’.</p> <p>A review of ASS risk mapping (spatial dataset DWER-048; GoWA, 2024) indicates that the northern portion of the DE overlaps an area of moderate to low risk of ASS occurring within 3 m of natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface. If digging below 3m is required, an ASS investigation will be undertaken and appropriate management will be applied.</p> <p>The DE does not intersect any contaminated sites (spatial dataset DWER-059; GoWA, 2024). No known contaminated sites are recorded within 20 km of the DE.</p> <p>The clearing proposed in the DE will be 100.8 ha in total, 40.2 ha of which will be temporary clearing that will be revegetated, and 60.6 ha of which will be permanent clearing.</p> <p>Any dust produced during construction will be managed through the implementation of a CEMP. Given the linear nature of the Project, it is not likely that the clearing will cause appreciable land degradation.</p> <p>The DE contains land systems that are generally not susceptible to erosion. It is expected that hydrological regimes will be maintained through design and that standard management practices will be implemented to prevent erosion / sedimentation. Rehabilitation post construction will</p>	

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Principle	Assessment	Outcome
	<p>be undertaken to stabilise areas that are temporarily cleared, especially if there are slopes and exposed soil that increase the risk of erosion. The Project will incorporate standard construction management measures to reduce the risk of soil erosion and sedimentation as a result of ground disturbance and clearing (Attachment B). The clearing is not expected to cause appreciable land degradation and based on the above, the proposed clearing of native vegetation for the Project is not considered to be at variance with this principle.</p>	
<p>(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.</p>	<p>No DBCA managed conservation areas were identified within the DE or within 20 km of the DE. The proposed clearing is not at variance to this principle.</p>	<p>Proposed clearing is not at variance to this Principle.</p>
<p>(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.</p>	<p>The DE occurs within the Pilbara Groundwater Area. The De Grey River Water Reserve (Priority 1 PDWSA) is located approximately 2 km east of the DE (GoWA, 2024).</p> <p>One vegetation type, MaEc, is likely to represent a GDE associated with some of the major drainages intersecting the DE (SLR, 2024). This vegetation type supports known <i>phreatophytic</i> tree species such <i>Melaleuca argentea</i> and <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>, which are reliant on access to the groundwater table. As shown in Figure 2, avoidance areas for permanent clearing have been placed around the MaEc vegetation type, which is associated with the drainage habitats. There may still be temporary clearing in the form of vehicles driving over this vegetation type, which will result in a negligible impact.</p> <p>There will be no permanent clearing of Major Drainage and Minor Drainage habitat types. Any clearing will be temporary and associated with driving over the habitat type and is therefore considered to be a negligible impact.</p> <p>It is not expected that the Project will require dewatering or groundwater abstraction within the DE. The groundwater bores within the DE are drilled to depths ranging from 7.9 m to 72 m. Potential impacts to surface water quality from erosion / sedimentation / hydrocarbons will be managed by the CEMP. Clearing within the DE is unlikely to cause deterioration in the quality of surface or underground water, therefore the proposal is unlikely to be at variance to this principle.</p>	<p>Proposed clearing is unlikely to be at variance to this Principle.</p>
<p>(j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the intensity of flooding.</p>	<p>The nearest Bureau of Meteorology (BoM) weather station with comprehensive data collection and recent historic climate data is at Port Hedland Airport (no. 004032), approximately 8 km north of the DE. Mean annual rainfall is 313.0 mm with February recording the highest monthly mean (88.3 mm) (BoM, 2024).</p> <p>One vegetation type, MaEc, is likely to represent a GDE associated with some of the major drainages intersecting the DE. This vegetation type supports known <i>phreatophytic</i> tree species such <i>Melaleuca argentea</i> and <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>, which are reliant on access to the groundwater table. As shown in Figure 2, avoidance areas for permanent clearing have been placed around the MaEc vegetation type, which is associated with the drainage habitats. There may still be temporary clearing in the form of vehicles driving over this vegetation type, which will result in a negligible impact.</p> <p>There will be no permanent clearing of Major Drainage and Minor Drainage habitat types. Any clearing will be temporary and associated with driving over the habitat type and is therefore considered to be a negligible impact.</p>	<p>Proposed clearing is unlikely to be at variance to this Principle.</p>

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Principle	Assessment	Outcome
	<p>The scale of the DE and clearing required is not likely to have an impact on the flood regimes or increase intensity of flooding in the region. The DE is located on a variety of different landforms including broad sandy plains, flood plains, river channels, granite hills, stony plains, sandstone hills, alluvial plains and stony lower slopes and plains. It is expected that the hydrological regimes of these landforms will be maintained through design and therefore unlikely to incur flooding. Additionally, given the abundance of vegetation within the surrounding region, with over 97% pre-European vegetation remaining, the proposed clearing is not expected to increase the risk of flooding.</p> <p>Standard management measures for construction will be in place to mitigate against / manage erosion and associated environmental aspects. Therefore, the proposed clearing of native vegetation for the Project is not considered to be at variance with this principle.</p>	



Legend

Development Envelope	Pilbara Leaf-nose Bat
Major Drainage habitat	Western Pebble Mound Mouse
Minor Drainage habitat	<i>Gymnanthera cunninghamii</i>
Outcrops and Breakaways habitat	<i>Tephrosia rosea</i> sp. Port Hedland
Stony Hills habitat	
MaE vegetation type	

Figure 2 | Environmental Constraints



Scale: 1:250,000



9 Other matters

9.1 Land Planning

9.1.1 Approvals required under the *Planning and Development Act 2005*

No approvals under the *Planning and Development Act 2005* are required for this project.

9.2 Other approvals

In considering a clearing matter under section 51O of the *Environmental Protection Act 1986* (EP Act), the DWER CEO shall have regard to any planning instrument and other relevant matters when making decisions as to clearing permits. 'Other matters' are not defined in the EP Act, and consequently are any matters the CEO considers relevant. Other matters are generally environmental issues not directly within the scope of the clearing principles, but within the object and principles of the Act. Other approvals that may apply to this Project are detailed in Table 7.

Table 7 Other approvals

Other approvals	Assessment
Referral to Environmental Protection Authority	The impact of this Proposal are only associated with vegetation clearing, and can therefore be assessed under Part V of the EP Act via a Native Vegetation Clearing Permit.
Referral to Department of Climate Change, Energy, the Environment and Water (DCCEEW)	<p><i>Threatened flora, fauna and ecological communities</i></p> <p>No TECs were recorded in the DE.</p> <p>The likelihood of occurrence assessment in Appendix C shows the following species are known to occur, likely to occur or may occur within the DE:</p> <ul style="list-style-type: none"> • Northern Quoll (Endangered) • Pilbara Leaf-nosed Bat (Vulnerable) • Bilby (Vulnerable) • Grey Falcon (Vulnerable) • Common Greenshank (Endangered, Migratory) • Ghost Bat (Vulnerable) • Pilbara Olive Python (Vulnerable) • Curlew Sandpiper (Critically Endangered, Migratory) • Great Knot (Vulnerable, Migratory) • Red Knot (Vulnerable, Migratory) • Sharp-tailed Sandpiper (Vulnerable, Migratory) • Black-tailed Godwit (Endangered, Migratory) <p>As described in Table 6 (Principle b) the Project will require clearing of up to 100.8 ha of potential critical habitat for the Pilbara Leaf-nosed Bat and Bilby, and clearing of potential foraging and dispersal habitat for the Northern Quoll. Given the abundance of habitat within the region and the linear and sporadic nature of the proposed clearing, impacts are not considered significant. An assessment of Matters of National Environmental Significance identified referral to DCCEEW was not required.</p> <p><i>Migratory fauna</i></p> <p>The likelihood of occurrence assessment in Appendix C shows the following species are known to occur, likely to occur or may occur within the DE:</p> <ul style="list-style-type: none"> • Oriental Pratincole (Migratory) • Common Greenshank (Endangered, Migratory) • Barn Swallow (Migratory) • Little Curlew (Migratory) • Oriental Plover (Migratory) • Osprey (Migratory) • Glossy Ibis (Migratory)

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Other approvals	Assessment
	<ul style="list-style-type: none"> • Fork-tailed Swift (Migratory) • Curlew Sandpiper (Critically Endangered, Migratory) • Great Knot (Vulnerable, Migratory) • Red Knot (Vulnerable, Migratory) • Grey-tailed Tattler (Migratory) • White-winged Black Tern (Migratory) • Gull-billed Tern (Migratory) • Caspian Tern (Migratory) • Common Tern (Migratory) • Common Sandpiper (Migratory) • Sharp-tailed Sandpiper (Vulnerable, Migratory) • Sanderling (Migratory) • Broad-billed Sandpiper (Migratory) • Pectoral Sandpiper (Migratory) • Ruff (Migratory) • Red-necked Stint (Migratory) • Long-toed Stint (Migratory) • Pin-tailed Snipe (Migratory) • Bar-tailed Godwit (Migratory) • Black-tailed Godwit (Endangered, Migratory) • Whimbrel (Migratory) • Red-necked Phalarope (Migratory) • Wood Sandpiper (Migratory) • Marsh Sandpiper (Migratory) <p>As described in Table 6 (Principle b), no significant impacts are expected to these Migratory fauna species.</p> <p><i>National heritage</i></p> <p>The DE does not overlap any National Heritage Areas.</p> <p>Aboriginal Heritage surveys have been undertaken for the Project to assess Aboriginal Heritage values within the DE in consultation with Traditional Owners.</p> <p>No impacts to national heritage values are expected from the proposed works.</p> <p><i>Wetlands of international importance</i></p> <p>The DE does not overlap any wetlands of international importance.</p>
Works Approval or Licence under EP Act	No works approvals or licences are required for this project.
Groundwater or surface water licence under the <i>Rights in Water and Irrigation Act 1914</i>	Horizon Power is permitted to access water under Section 42 and 49 of <i>the Energy Operator (Powers) Act 1979</i> . Any licences required for construction water will be acquired by the construction contractor.
Notice of Intent to Clear system under the <i>Soil and Land Conservation Act 1945</i>	Not Applicable.
State and municipal heritage	<p>The DE overlaps the Railway Line from Port Hedland to Newman which is on the Municipal Inventory.</p> <p>Aboriginal Heritage surveys are being undertaken for the Project to assess Aboriginal Heritage values within the DE in consultation with Traditional Owners.</p>

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Other approvals	Assessment
Native title	<p>The DE intersects three separate native title determinations;</p> <ul style="list-style-type: none"> • Kariyarra - WCD2018/015 – RNTBC Kariyarra Aboriginal Corporation • Ngarla Overlap Proceeding - WCD2013/001 – RNTBC Wanparta Aboriginal Corporation • Ngarla and Ngarla # 2 (Area A) - WCD2007/003 - RNTBC Wanparta Aboriginal Corporation
Aboriginal Sites of Significance under the <i>Aboriginal Heritage Act 1972</i>	<p>The DE overlaps two Registered Aboriginal Cultural Heritage places:</p> <ul style="list-style-type: none"> • Mikurrunya Hills (ACH ID: 9904): Creation / Dreaming Narrative • Kumpaja Tree (ACH ID: 729): Creation / Dreaming Narrative. <p>The DE overlaps three Lodged Aboriginal Cultural Heritage places:</p> <ul style="list-style-type: none"> • 12 Mile site (ACH ID 27412): Burial; Ritual / Ceremonial • Strelley Engravings 001, this name has been selected because the traditional name must not be used (ACH ID 37344) • PDO-43-22 (ACH ID 39654): Artefacts / scatter. <p>Both Kariyarra and Wanparta have carried out Aboriginal Heritage surveys for the DE. Based on the findings of these surveys, heritage protection plans will be developed, in consultation with the knowledge holders.</p> <p>Horizon Power has an Aboriginal Cultural Heritage Management Policy, that details our commitment to <i>avoid impacting on Aboriginal Cultural Heritage whenever and wherever possible</i>.</p> <p>As appropriate, management measures will be implemented during activities, such as the engagement of cultural heritage monitors during ground disturbing works.</p>

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DBCA Legislated Lands and Waters (DBCA-011)

Aboriginal Heritage Places (DPLH-001)

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Heritage Council WA - Local Heritage Survey (DPLH-008)

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Appendix A: Atlas Ridley Magnetite Project Connection Flora and Fauna Survey Technical Report



Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

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29 July 2024

Revision: 2.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	9 July 2024	G. Buller L. Berry Y. Li	B. Mason L. Geidans	
2.0	29 July 2024	N/A	L. Geidans	S. Walker

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Horizon Power (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.



Executive Summary

Horizon Power commissioned SLR Consulting Australia Pty Ltd to undertake a detailed flora and vegetation, targeted significant flora, basic terrestrial vertebrate fauna, and targeted significant fauna survey for the proposed Atlas Ridley Magnetite Project Connection. The Survey Area covers approximately 10,363 hectares and runs in an approximate east-west alignment from just south of South Hedland to approximately 50 km east of Port Hedland airport in the Pilbara bioregion of Western Australia.

The objective of the survey was to identify key flora, vegetation, and fauna values or other environmental features within the Survey Area as part of the environmental impact assessment process. This report presents the findings of the survey.

Flora and Vegetation

The flora desktop assessment conducted prior to the survey identified 33 conservation significant species occurring within 50 km of the Survey Area. A pre-survey likelihood of occurrence assessment determined 11 species as having a high likelihood of occurrence, none as having a medium likelihood of occurrence, and the remaining 22 species as having a low likelihood of occurrence.

The detailed flora and vegetation survey recorded the floristic composition and vegetation types from 26 quadrats, 28 relevés, 250 mapping notes, and opportunistic observations. A total of 172 taxa were recorded from 94 genera across 40 families.

No Threatened flora taxa were recorded within the Survey Area. Two Priority flora taxa, both of which had a high pre-survey likelihood of occurrence, were recorded within the Survey Area. *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (P1) was recorded at one location within a roadside drain, and *Gymnanthera cunninghamii* (P3) was recorded in two locations within a major drainage.

Nineteen specimens could not be identified to species level due to the generally sterile and dry conditions at the time of survey. Eight introduced (weed) taxa were recorded during the survey, of which one is a Declared Pest (*Calotropis procera*). Weed abundance was considered standard for the region, with common Pilbara weeds such as *Cenchrus ciliaris*, *Vachellia farnesiana*, *Malvastrum americanum* and *Aerva javanica* regularly observed.

Fourteen vegetation types were described and mapped across five broad landforms (ironstone hilltops and ridges, outcroppings, plains, low lying floodplains/flats/minor drainages and major drainages), none of which were considered analogous to Threatened or Priority Ecological Communities. Vegetation condition within the Survey Area ranged from Degraded to Very Good with the majority considered to be in Very Good condition. Disturbances were widespread in the form of pastoralism/cattle, weeds, litter and historical clearing for infrastructure.

Vertebrate Fauna

The basic and targeted terrestrial vertebrate fauna survey recorded fauna using a variety of detection methods including opportunistic observations, ground searching, and deploying Autonomous Recording Units (ARUs). Fauna habitat mapping was based on a combination of field observations, vegetation mapping, fauna habitat assessment data, and aerial imagery. Nine fauna habitats were mapped within the Survey Area, of which the Low *Acacia stellaticeps* over *Triodia*, Mixed *Acacia* Shrubs and *Triodia* Plains, Outcrops and Breakaways, and Stony Hills habitats represent the most value to fauna assemblages overall.



A total of 63 fauna taxa from 34 families were recorded, comprising 33 birds, 14 mammals, and 16 reptiles. Two significant taxa were recorded during the fauna survey, Western Pebble-mound Mouse (*Pseudomys chapmani*) – P4 (DBCA, and Pilbara Leaf-nosed Bat (*Rhinonictis aurantia*) (Pilbara form) – VU (BC Act & EPBC Act).

A further seven significant fauna taxa have been recorded within the Survey Area during previous surveys, and nine significant fauna taxa were assessed as having a high likelihood, 24 significant fauna taxa were assessed as having a medium likelihood, and 33 significant fauna taxa were assessed as having have a low likelihood of occurring within the Survey Area.

Three introduced taxa were recorded during the survey, European Cattle (*Bos primigenius taurus*), Cat (*Felis catus*), and Domestic Pigeon/Rock Dove (*Columba livia*).



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Acronyms and Abbreviations

°C	Degree Celsius
ALA	Atlas of Living Australia
BAM Act	<i>Biosecurity and Agriculture Management Act 2007</i>
BC Act	<i>Biodiversity Conservation Act 2016</i>
BoM	Bureau of Meteorology
CISS	Centre for Invasive Species Solutions
CR	Critically Endangered
DAWE	Department of Agriculture Water and Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
Desktop Study Area	The area that was studied during the desktop assessment encompassing the Survey Area and surrounds
DMIRS	Department of Mines, Industry Regulation and Safety
DoE	Department of the Environment
DP	Declared Pest
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning, Lands and Heritage
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
DWER	Department of Water and Environmental Regulation
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>
ESA	Environmentally Sensitive Area
GIS	Geographic Information System
GPS	Global Positioning System
GDE	Groundwater Dependent Ecosystem
ha	Hectare
IBRA	Interim Biogeographic Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessments
ILUA	Indigenous land Use Agreement
km	Kilometres
Lat	Latitude
Long	Longitude
m	Metres



mm	Millimetres
mths	Months
MNES	Matters of National Environmental Significance
NVCP	Native Vegetation Clearing Permit
NVIS	National Vegetation Information System
P	Priority
PEC	Priority Ecological Community
PMST	Protected Matters Search Tool
SLR	SLR Consulting Australia
Survey Area	The area that was surveyed
T	Threatened
TEC	Threatened Ecological Community
TPFL	Threatened and Priority Flora Database
TPFRF	Threatened and Priority Flora Report Form
VU	Vulnerable
WA	Western Australia
WAH	Western Australian Herbarium
WAM	Western Australian Museum
WoNS	Weeds of National Significance



1.0 Introduction

1.1 The Project

Horizon Power commissioned SLR Consulting Australia Pty Ltd (SLR) to undertake a detailed flora and vegetation, targeted flora, basic terrestrial vertebrate fauna, and targeted significant fauna survey for the proposed Atlas Ridley Magnetite Project Connection. The survey was undertaken within the Pilbara bioregion of Western Australia, covering 10,363 hectares from South Hedland in the west to Pardoo Iron Ore Mine in the east (the Survey Area) (**Map 1**). All maps are provided in Appendix A.

1.2 Objectives and Scope

The specific objectives of the biological assessments were to:

- Carry out an initial desktop assessment to determine environmental values and significant flora, vegetation, fauna or other environmental features (such as riparian areas, wetlands) relating to the project area.
- Carry out an (in season) detailed flora and vegetation survey, basic fauna and targeted fauna survey focusing on suitable habitat likely to support conservation significant fauna.
- Prepare a technical combined flora and fauna survey report.
- Provide all spatial/mapping data collected during the survey in IBSA format.



2.0 Background

2.1 Statutory and Regulatory Framework

Western Australian flora, vegetation, and fauna is governed by the following legislative measures:

- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). (Commonwealth of Australia, 1999).
- *Biodiversity Conservation Act 2016* (WA) (BC Act) (Biodiversity Conservation Act 2016, 2016).
- *Environmental Protection Act 1986* (WA) (EP Act) (Environmental Protection Act 1986, 1986).
- *Biosecurity and Agriculture Management Act 2007* (WA) (BAM Act) (Biosecurity and Agriculture Management Act 2007, 2007).

In addition to these legislative measures, the following non-legislative lists are considered on a case-by-case basis:

- WA Department of Biodiversity Conservation and Attractions (DBCA) Priority lists for fauna, flora, and ecological communities.
- Weeds of National Significance (WoNS).
- Recognition of locally significant populations by DBCA.

The EIA process is supported by guidance documents published by the Environmental Protection Authority (EPA), DBCA and the Department of Climate Change, Energy, the Environment and Water (DCCEE).W.

Western Australia

- *Environmental Factor Guideline - Flora and Vegetation* (EPA, 2016a).
- *Environmental Factor Guideline – Terrestrial Fauna* (EPA, 2016b).
- *Guidelines for surveys to detect the presence of bilbies and assess the importance of habitat in Western Australia* (DBCA, 2017).
- *Interim Guideline for Preliminary Surveys of Night Parrot (*Pezoporus occidentalis*) in Western Australia* (DPAW, 2017).
- *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA, 2016c).
- *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (Environmental Protection Authority, 2020).

Commonwealth

- *EPBC Act Referral guideline for the endangered northern quoll *Dasyurus hallucatus** (DoE, 2016).
- *Matters of National Environmental Significance – Significant Impact Guidelines 1.1* (DoE, 2013).
- *Survey guidelines for Australia's threatened bats* (DEWHA, 2010a).
- *Survey guidelines for Australia's threatened birds* (DEWHA, 2010b).



- *Survey guidelines for Australia’s threatened frogs* (DEWHA, 2010c).
- *Survey guidelines for Australia’s threatened mammals* (DSEWPaC, 2011a).
- *Survey guidelines for Australia’s threatened reptiles* (DSEWPaC, 2011b).

2.2 Existing Environment

2.2.1 Climate

The closest long-term Bureau of Meteorology weather station with a complete dataset is the Port Hedland Airport Weather Station (Station 004032), located approximately 89 km west of the Survey Area.

The long-term mean minimum temperature for Port Hedland Airport ranges from 12.5°C (July) to 25.7°C (January) (1948 to 2024) and the long-term mean maximum temperature ranges from 27.4°C (July) to 36.8°C (December and March) (1948 to 2022) (**Figure 1**) (Bureau of Meteorology, 2024).

The Port Hedland Airport weather station recorded 100.6 mm of rainfall in the 12 months prior to the survey (March 2023 to February 2024), which is 217.9 mm below the long-term average of 318.5 mm (Bureau of Meteorology, 2024). In the three months prior to the survey (December 2023 to February 2024), just 24 mm of rainfall was recorded, which is 146.6 mm below the long-term average of 170.6 mm for the same time period (Bureau of Meteorology, 2024).

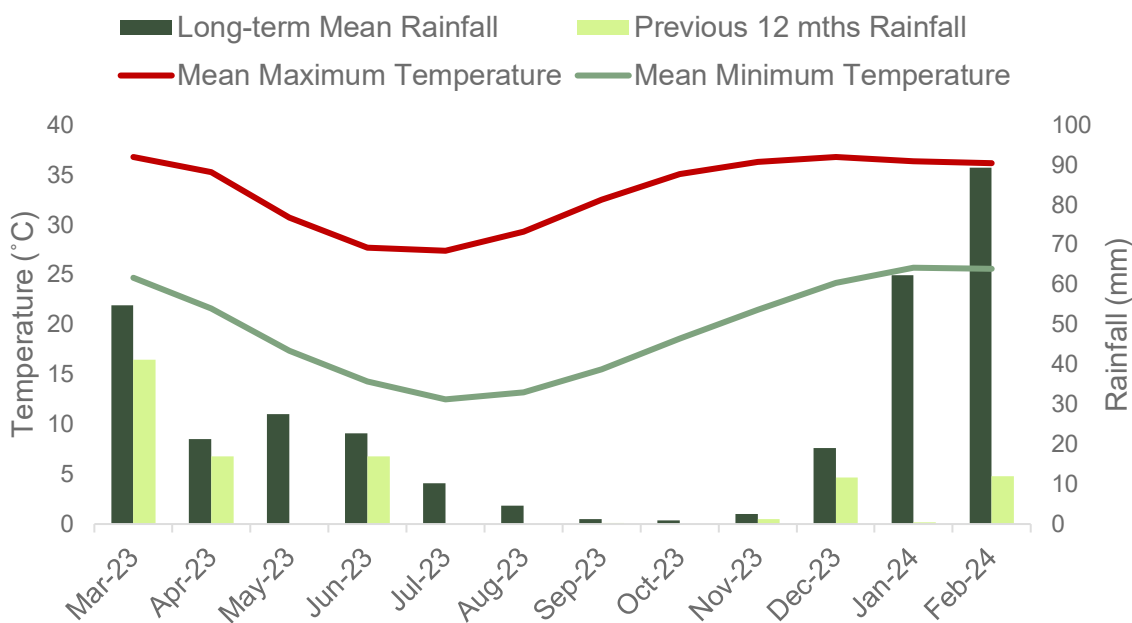


Figure 1: Climate graph of the Port Hedland Airport Weather Station

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 (DCCEEW, 2023). The Survey Area occurs within two subregions of the Pilbara bioregion: the Roebourne (PIL04) and the Chichester (PIL01) subregions (**Map 2**).



The Roebourne (PIL04) subregion is represented by quaternary alluvial and older colluvial coastal and sub-coastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera* (Kendrick & Stanley, 2001). Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands (Kendrick & Stanley, 2001).

The Chichester (PIL01) subregion comprises the northern section of the Pilbara Craton and is characterised by undulating Archaean granite and basalt plains include significant areas of basaltic ranges. The subregion is represented by plains supporting a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, and ranges supporting *Eucalyptus leucophloia* tree steppes. The climate is Semi-desert-tropical and receives 300 mm of rainfall annually, with drainage occurring to the north via numerous rivers (e.g. De Grey, Oakover, Nullagine, Shaw, Yule, Sherlock) (Kendrick & McKenzie, 2001).

2.2.3 Soil Landscapes and Land Systems

Soil landscapes and land system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales, ranging from 1:20,000 to 1:250,000 (DPIRD, 2018). The Survey Area occurs within eight land systems (**Table 1, Map 3**).

Table 1: Land Systems within the Survey Area

Land System		Description (DPIRD, 2018)
Name	Code	
Mallina System	281Ma	Sandy surfaced alluvial plains supporting soft spinifex grasslands and minor hard spinifex and tussock grasslands.
Uaroo System	281Ua	Broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs.
River System	281Ri	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.
Boolaloo System	281Bo	Granite hills, domes, tor fields and sandy plains supporting spinifex grasslands with scattered shrubs.
Macroy System	281Mc	Stony plains and occasional tor fields based on granite supporting hard and soft spinifex shrubby grasslands.
Capricorn System	281Cp	Rugged sandstone hills, ridges, stony footslopes and interfluves supporting low acacia shrublands or hard spinifex grasslands with scattered shrubs.
Paradise System	281Pd	Alluvial plains supporting soft spinifex grasslands and tussock grasslands.
Boolgeeda System	280Bg	Stony lower slopes and plains below hill systems supporting hard and soft spinifex grasslands or mulga shrublands.

2.2.4 Hydrography

Hydrographic features intersecting, and in the vicinity of, the Survey Area are shown in **Map 4** (DWER, 2018). Three major river systems (Turner River, King Edward and Devil Creek) with associated drainage channels intersect the Survey Area, flowing in a northerly direction before discharging into the Indian Ocean east of Port Hedland.



2.2.5 Broad Vegetation Types

Mapping of pre-European vegetation in Western Australia was completed on a broad scale (1:1,000,000) by Beard (1976). These vegetation types were later refined by Shepherd *et al.* (Shepherd, Beeston, and Hopkins, 2002) resulting in 819 vegetation types.

Four broad vegetation system associations are mapped over the Survey Area (**Map 5**). Representation of the system associations at a local, regional, and state level is shown in **Table 2**.

- Abydos Plain (Abydos Plain 589): Short bunch-grass savanna / Grass-steppe
- Abydos Plain (Abydos Plain 93): Hummock grasslands, shrub steppe; kanji over soft spinifex
- Abydos Plain (Abydos Plain 619): Wheatbelt; York gum, salmon gum etc. *Eucalyptus loxophleba*, *E. salmonophloia*. Goldfields; gimlet, redwood etc. *E. salubris*, *E. oleosa*. Riverine; rivergum *E. camaldulensis*.
- Abydos Plain (Abydos Plain 647): Shrub-steppe - hummock grassland with scattered shrubs or mallee *Triodia* spp. *Acacia* spp., *Grevillea* spp. *Eucalyptus* spp.

Table 2: Broad Vegetation Associations within the Survey Area and their Representation at the State, Regional and Local Levels (Government of Western Australia, 2019)

Vegetation Association	Extent			
	Pre-European (ha)	Current (ha)	Remaining (%)	Managed in DBCA Lands (%)
Representation across Western Australia				
Abydos Plain 589	807,698.58	802,713.40	99.38	1.91
Abydos Plain 619	119,373.78	118,205.01	99.02	0.2
Abydos Plain 647	195,860.89	191,711.41	97.88	0
Abydos Plain 93	3,044,309.52	3,040,640.98	99.88	1.96
Representation across the Pilbara Bioregion				
Abydos Plain 589	728,768.20	724,695.82	99.44	2.11
Abydos Plain 619	118,920.31	118,116.78	99.32	0.2
Abydos Plain 647	195,859.95	191,710.92	97.88	0
Abydos Plain 93	3,042,114.27	3,038,471.67	99.88	1.96
Representation across the Roebourne Subregion				
Abydos Plain 589	675,391.80	671,327.48	99.40	2.14
Abydos Plain 619	33,377.16	32,595.83	97.66	n/a
Abydos Plain 647	188,901.32	184,774.70	97.82	n/a
Abydos Plain 93	46,360.53	46,334.43	99.94	n/a
Representation across the Chichester Subregion				
Abydos Plain 589	53,376.40	53,368.34	99.98	1.78
Abydos Plain 619	85,543.15	85,520.95	99.97	0.28
Abydos Plain 647	6,958.63	6,936.22	99.68	n/a



Vegetation Association	Extent			
	Pre-European (ha)	Current (ha)	Remaining (%)	Managed in DBCA Lands (%)
Abydos Plain 93	2,940,348.04	2,936,731.54	99.88	2.03
Representation across the Town of Port Hedland				
Abydos Plain 589	338,269.05	335,921.21	99.31	0
Abydos Plain 619	63,650.59	62,598.14	98.35	0
Abydos Plain 647	180,908.49	176,759.02	97.71	n/a
Abydos Plain 93	1,015,339.22	1,014,599.99	99.93	n/a

*as a portion of the current extent

2.2.6 Environmentally Sensitive and Conservation 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.

The Survey Area is not identified within a conservation area (**Map 6**). The closest mapped ESAs to the Survey Area is the De Grey River located approximately 9.5 kms to the east of the north-eastern end of the Survey Area and the Leslie Saltfields System located approximately 8 kms to the north at its closest point (**Map 6**) (DWER, 2023).

2.2.7 Land Use

Pastoral stations and mining tenements cover almost the entirety of the Survey Area, excluding the far western end. Pippingarra pastoral station occupies majority of the western half of the Survey Area, Strelley pastoral station occupies most of the eastern half, while the far eastern end is occupied by De Grey station (DMIRS, 2024; DPLH, 2023).

3.0 Methods

The surveys documented in this report were undertaken in accordance with relevant EPA and DAWE guidelines (see **Section 2.1**).

3.1 Desktop Assessment

3.1.1 Literature Review

Background information on the Survey Area and surrounds (the Desktop Study Area) was compiled prior to the field survey. The literature review considered a selection of relevant reports detailing assessments undertaken in the region that were either publicly available from sources such as the Index of Biodiversity Surveys for Assessments (IBSA) website, the EPA Consultation Hub, or internet searches, or provided by the client. These reports are listed below and summarised in **Appendix B**.

- De Grey South Borefield Biological Surveys (SLR Consulting, 2023), 10 km east of the Survey Area.
- Detailed Flora and Vegetation Assessment, Ridley Magnetite Project (Focused Vision, 2023), encompassing current Survey Area.
- Flora and Vegetation Assessment, Port Hedland Regional, directly west of the survey area (ENV Australia Pty Ltd, 2011)



- Flora and Vegetation Assessment, Corunna Downs Intersection Works (Woodman Environmental, 2017), approximately 90 km southeast of the survey area.
- Corunna Downs Project, Level 2 Flora, and Vegetation Assessment (Woodman Environmental, 2016), approximately 90 km southeast of the survey area.
- Wodgina Gas Pipeline, Detailed Flora, and Vegetation Survey (360 Environmental Pty Ltd, 2018a), approximately 30 km southeast of the survey area.
- Roy Hill Port Facility Power Line Port Hedland, Ecological Assessment (GHD, 2016), approximately 15 km north of the survey area.
- Flora and Fauna survey Port Hedland International Airport – Highway Precinct 2 (Emerge Associates, 2019), approximately 10 km north of the survey area.
- Flora and Vegetation Reconnaissance Survey of Spoilbank Marina Project Area (Strategen JBS&G, 2020), approximately 15 km north of the survey area.
- Ridley Detailed Terrestrial Vertebrate Fauna Survey (Biota, 2024), overlapping with the eastern section of the survey area.
- Ridley Services Corridors Basic and Targeted Fauna Survey (Biota, 2023), overlapping the survey area.
- Detailed terrestrial fauna and targeted Bilby survey for the Port Hedland Solar Farm Project (Phoenix Environmental, 2022), overlapping the western section of the survey area.
- Wodgina Gas Pipeline targeted Fauna Survey (360 Environmental Pty Ltd, 2018b), 20 km southwest of the Survey Area.
- Wodgina Project: Level 1 Fauna Survey, Targeted Conservation Significant Fauna Survey and Desktop Assessment (Stantec Australia Pty Ltd, 2018), 80 km south of the Survey Area.
- Pardoo Stage 3 Irrigation Project and 80 Mile Beach Ramsar Site Fauna Assessment (Bamford Consulting Ecologists, 2017b), 100 km east of the Survey Area.
- Assessment of the Bilby *Macrotis lagotis* Pardoo Station; Stage 2 areas (Bamford Consulting Ecologists, 2017a), 100 km east of the Survey Area.
- Assessment of the Bilby *Macrotis lagotis* Pardoo Station; Stage 2 and 3 project areas (Bamford Consulting Ecologists, 2016), 100 km east of the Survey Area.
- Supplementary Flora and Vegetation Survey and Terrestrial Fauna Survey for the Balla Balla Infrastructure Group Ltd (Phoenix Environmental, 2018), 100 km west of the Survey Area.
- Terrestrial Fauna Surveys for the Balla Balla Railway Project (Phoenix Environmental, 2014), 100 km west of the Survey Area.

3.1.2 Database Searches

Database searches were undertaken to compile a list of flora and fauna known to occur in the Desktop Study Area and identify significant flora, fauna, and ecological communities with potential to occur within the Survey Area (Table 3).



Table 3: Database Search details

Database name	Date received	Search target	Buffer around the Survey Area
Threatened and Priority Ecological Communities database search (DBCA, 2024c)	26 February 2024	TECs and PECs	50 km
Threatened and Priority Flora (TPFL) database search (DBCA, 2024e)	15 January 2024	Threatened and Priority flora	50 km
Western Australian Herbarium Flora database search (DBCA, 2024f)	15 January 2024	Threatened and Priority flora	50 km
Threatened and Priority Fauna database search (DBCA, 2024d)	15 January 2024	Threatened and Priority fauna	50 km
Protected Matters Search Tool (PMST) (DCCEEW, 2024a)	16 January 2024	Threatened flora, fauna, and ecological communities	50 km
NatureMap (DBCA, 2024b)	22 January 2024	Flora and fauna	50 km

3.1.3 Likelihood of Occurrence

Significant flora and fauna taxa identified during the desktop assessment were assessed to determine the likelihood of their occurrence within the Survey Area before and after the field survey. The assessment used the likelihood of occurrence criteria presented in Table 4.

Taxa listed as Marine only under the EPBC Act were not considered to be significant taxa because the Marine listing does not constitute MNES under the EPBC Act. Additionally, erroneous records (i.e. records that occur well outside a taxon’s known distribution) were excluded from consideration. Only taxa that have been recorded within the Survey Area or were assessed as having a high or medium likelihood of occurrence are discussed in detail.

Table 4: Likelihood of occurrence criteria

Rank	Criteria
Recorded	The taxon was recorded within the Survey Area during the current survey.
Previously Recorded	The taxon has been previously recorded within the Survey Area according to database search or literature review results.
High (Likely to occur)	There are existing records of the taxon near the Survey Area (within 20 km), suitable habitat is present within the Survey Area, and, for fauna, the taxon has been recorded within the Desktop Study Area in the last 15 years.
Medium (May occur)	There are existing records of the taxon within the Desktop Study Area, however, the taxon does not meet the criteria for high likelihood, or suitable habitat within the Survey Area is marginal or limited in extent, or, for fauna, the taxon has not been recorded within the Desktop Study Area in the last 15 years.
Low (Unlikely to occur)	Suitable habitat is not present within the Survey Area, or the taxon is very infrequently recorded in the locality despite reasonable previous search effort, or the taxon is believed to be extinct or locally extinct.



3.2 Field Survey

3.2.1 Survey Timing

The biological assessments were undertaken during one trip from 1st to 10th March 2024

Table 5.

Table 5: Survey Timing and Personne

Trip	Scope	Date	Personnel	Person Field Days
1. Flora and Fauna	<ul style="list-style-type: none"> Establishment of flora sites Preliminary vegetation and condition mapping Inventory of vascular flora Targeted flora searches during traverses between flora sites Targeted fauna survey Basic fauna survey 	01/03/2024-10/03/2024	Lukas Geidans Grant Buller Jack Hardie Lewis Berry	40

3.2.2 Field Personnel and Licences

The flora and vegetation surveys were undertaken by Senior Botanist Grant Buller and Botanist Jack Hardie under flora licences FB62000321-2 and FB62000389-02, respectively. The flora field team has a combined 5.5 years' experience conducting surveys of similar scope in the Pilbara region of Western Australia.

The basic terrestrial vertebrate fauna survey was undertaken by Associate Ecologist Lukas Geidans, who has 4.5 years' experience, and Zoologist Lewis Berry who has 2 years' experience, conducting surveys of similar scope in the Pilbara. The fauna fieldwork was completed under Fauna Taking (Biological Assessment) License – Regulation 27 (BA27000816) and an authorisation to take or disturb threatened species under Section 40 of the BC Act (TFA 2223-0222). Animal ethics approval was obtained under scientific use licence number U336 / 2023 - 2025 and permit number WAEC 24-02-11.

During the survey, SLR personnel were accompanied by Traditional Owners from the Kariyarra group to the west of the King Edward River, and to the east by traditional owners from the Wanparta group.

3.2.3 Weather Conditions

Weather conditions during the fauna survey are presented in Table 6. Daily temperature and rainfall data is from the Port Hedland Weather Station (Station 004032) (BoM, 2024). Weather conditions can impact potential detection of fauna taxa during a survey.

Table 6: Field survey weather conditions

Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
01/03/2024	28.7	35.0	0
02/03/2024	27.8	33.7	1.8
03/03/2024	26.4	34.4	0
04/03/2024	26.5	34.1	0



Date	Temperature (°C)		Rainfall (mm)
	Min	Max	
05/03/2024	25.2	34	8.4
06/03/2024	28.3	34.7	0
07/03/2024	27.1	35.5	0
08/03/2024	27.4	36.2	8
09/03/2024	27.9	35.2	0
10/03/2024	28	34.5	0

3.3 Flora and Vegetation

3.3.1 Field Survey

The detailed flora and vegetation survey was undertaken from 1 - 10 March 2024. A handheld Fulcrum mobile data collection device was used to record data, and mapping notes, opportunistic flora collections and photographs were also taken where required. The survey effort showing flora site locations and GPS track logs is shown in **Map 7**.

Vegetation types were described based on their structure and species composition, and condition was assessed according to the Eremaean and Northern Botanical Provinces vegetation condition scale (EPA, 2016c). Broad vegetation and condition mapping was conducted in the field, with boundaries delineated over aerial photography, at a scale of 1:2,000. Broad vegetation units were refined based on taxonomic identification of flora collections, and mapping notes taken during the field survey. Vegetation condition mapping was refined based on site data and mapping notes. Finalised polygons were digitised and produced as electronic mapping data using GIS software.

3.3.2 Establishment of Flora Sites

Indicative site selection was undertaken prior to the survey based on aerial photography and available literature. The number and locations of flora sites were then adjusted on site to achieve sites most representative of the vegetation present. Where possible, at least three flora sites were established in each vegetation type within the Survey Area. In instances where vegetation types were not large enough to accommodate three flora sites, one or two sites were established.

Flora sites consisted of either quadrats or relevés. Quadrats were 50 x 50 m with corners aligned to northwest, northeast, southeast and southwest, and were measured out using measuring tapes. Fence droppers are generally used as standard practice for marking north-west corners, however these were not used to avoid ground disturbance in accordance with traditional owner requirements. Relevés comprised unbounded sites of approximately 50 x 50 m where possible, or alternate configurations approximating 2500 m² (as required in linear areas such as drainage lines, gullies, and narrow ridge lines). A comprehensive list of the flora present at the time of sampling was recorded for both quadrat and relevé sites.

Flora site locations were recorded using a GPS-enabled handheld device, with points recorded at each corner of a quadrat, the start and finish point of linear relevés, and the central point of circular relevés. The following information was recorded at each flora site:

- Site code.
- Date and personnel.
- Landform and soil description.



- Relevant site descriptors including, slope, aspect, litter cover, bare ground cover, and fire history.
- Inventory of vascular flora including the approximate average height and percentage foliar cover for each taxon.
- Vegetation description in accordance with the National Vegetation Information System (NVIS) Level 5 'association' whereby the dominant growth form, height, cover, and species (three species) for the three traditional strata (upper, mid, and ground) are described.
- Vegetation condition in accordance with the Eremaean and Northern Botanical Provinces vegetation condition scale (EPA, 2016c).
- Evidence of disturbance (for example clearing, rubbish, feral animals, weed incursion, and evidence of feral animals and dieback) where present.
- Photograph of the vegetation occurring within the site.

A total of 54 flora sites comprising 26 quadrats and 28 relevés were established within the Survey Area. An additional approximately 250 mapping notes were completed to aid vegetation mapping. Flora site locations are shown in **Map 7**.

3.3.3 Opportunistic Flora

Flora taxa observed outside flora sites were recorded opportunistically. When significant flora, Declared Pests (DPs), or WoNS were encountered opportunistically, a GPS location and count of the individuals present was recorded.

3.3.4 Targeted Searching

Prior to the survey a list of significant flora taxa with the potential to occur within the Survey Area was compiled (see Section 3.1.3). Field personnel familiarised themselves with photographs, reference samples, and descriptions of these taxa before conducting the survey.

Targeted searching was undertaken within habitat suitable for Threatened and Priority flora as per standard practice in the Pilbara. The entire Survey Area was not systematically searched. Potential habitat within the proposed footprint was prioritised over areas outside the proposed footprint.

When Threatened or Priority flora were encountered in the field a GPS location was taken and a count of individuals was recorded, followed by a search in the local vicinity to determine if any other individuals were present nearby and delineate population boundaries where relevant and possible. Specimens of potential significant flora that could not be identified in the field were collected for identification and lodgement at the Western Australian Herbarium (WAH).

3.3.5 Vegetation Type and Condition Mapping

Vegetation type and condition mapping was initially conducted in the field with boundaries delineated over aerial photography at a scale of 1:5,000. Vegetation types were refined based on taxonomic identification of flora collections and mapping notes taken during the field survey. Further validation of vegetation types was undertaken using multivariate analysis of data collected from the quadrats and relevés. Vegetation condition mapping was refined based on site data and mapping notes. Polygons were digitised using GIS software.



3.3.6 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected for identification using resources of the WAH. Identification of flora collections was completed by SLR Principal Botanist Simon Colwill and WAH taxonomist Mike Hislop.

The finalised species list was checked against FloraBase (Department of Biodiversity Conservation and Attractions, 2023) to determine the conservation status and known distribution of each taxon. Introduced species were compared against the current BAM Act Declared Plants list the WoNS list to determine their control status (DAWE, 2023; DPIRD, 2023). FloraBase (DBCA, 2024a) was used to determine the conservation status and known distribution of each taxon. The control status of introduced flora was sourced from the WoNS list and declared plants list (CISS, 2024; DPIRD, 2024).

Any significant flora taxa, including potential Threatened and Priority taxa, range extensions, and potential new taxa, were submitted to the WAH for verification and lodgement. Where relevant, Threatened and Priority Flora Report Forms (TPFRFs) were submitted to DBCA.

3.3.7 Statistical Analyses

3.3.7.1 Vegetation Type Validation

Multivariate analysis to validate vegetation types was undertaken using PRIMER version 7. A comparison of the similarity of floristic composition between flora sites based on species presence or absence was undertaken using the Bray-Curtis similarity index. Vegetation types were defined based on approximately 40-80% similarity and distinguished visually in a dendrogram cluster analysis. The analysis was undertaken on a data matrix comprising 80 vascular flora taxa and 54 flora sites. Quadrats and relevés were included in the analysis as comprehensive species presence or absence was recorded at both site types. Singletons (flora taxa recorded at only one site) were excluded from the analysis as they can result in bias due to the Bray-Curtis coefficient and grouping properties. Unidentified or partially identified flora taxa were removed based on their ambiguity; exceptions were made for taxa that could not be identified but were confirmed to be the same across multiple sites. Introduced taxa (with the exception of dominant species, primarily Buffel Grass, **Cenchrus ciliaris*) were also excluded as their presence is typically associated with a disturbance rather than representative of a vegetation type.

3.3.7.2 Species Accumulation Curve

A species accumulation curve was plotted using Primer v7 to determine the adequacy of the survey. The treatments comprised Sobs (Mao Tao), which effectively smooths the curve of observed species by simulating an infinite number of randomisations of the sample order, and richness estimators Chao 1, Chao 2, Jackknife 1, Bootstrap, and Michaelis-Menton to predict the theoretical maximum number of species that could potentially be recorded. The species accumulation curve was calculated using systematic sampling data from flora sites and does not include opportunistic flora records. All identified flora taxa, including annual and perennial, within each flora site was used to generate the species accumulation curve. Unknown flora taxa that could not be identified to a species level was excluded.

3.4 Fauna

3.4.1 Habitat Assessment and Mapping

Habitat assessments were undertaken in representative areas of fauna habitat within the Survey Area to record habitat values. Where possible, at least one habitat assessment was recorded within each habitat type. Habitat assessment locations are shown in **Map 7**.



The following information was collected at each habitat assessment locations using a GPS-enabled handheld device:

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

Fauna habitat mapping was based on a combination of field observations, habitat assessment data, aerial imagery, and, if available, vegetation type mapping. Polygons were digitised using GIS software.

3.4.2 Camera Traps

A total of 49 motion sensitive camera traps were set up during the targeted survey. Site selection was based on suitable habitat features targeting the Northern Quoll. Cameras were baited with universal bait (rolled oats and peanut butter and sardines). **Table 7** shows the total camera trap survey effort, and camera trap locations are shown in **Map 7**.

Table 7: Camera trap survey effort

Fauna Habitat	Camera ID number	Total camera trap nights
Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-CAM-52	4
Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-CAM-53	4
Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-CAM-55	4
Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-CAM-59	4
Major Drainage	675.072189-CAM-31	4
Major Drainage	675.072189-CAM-39	5
Major Drainage	675.072189-CAM-49	4
Major Drainage	675.072189-CAM-51	5
Major Drainage	675.072189-CAM-54	5
Major Drainage	675.072189-CAM-36	4
Major Drainage	675.072189-CAM-57	4
Major Drainage	675.072189-CAM-58	4
Major Drainage	675.072189-CAM-64	4
Mixed Acacia Shrubs and Triodia Plains	675.072189-CAM-22	4
Mixed Acacia Shrubs and Triodia Plains	675.072189-CAM-44	5



Fauna Habitat	Camera ID number	Total camera trap nights
Mixed Acacia Shrubs and Triodia Plains	675.072189-CAM-56	4
Open Eucalypt Woodland	675.072189-CAM-37	4
Open Eucalypt Woodland	675.072189-CAM-41	4
Open Eucalypt Woodland	675.072189-CAM-65	4
Outcrops and Breakaways	675.072189-CAM-19	4
Outcrops and Breakaways	675.072189-CAM-20	4
Outcrops and Breakaways	675.072189-CAM-21	4
Outcrops and Breakaways	675.072189-CAM-23	4
Outcrops and Breakaways	675.072189-CAM-24	4
Outcrops and Breakaways	675.072189-CAM-25	4
Outcrops and Breakaways	675.072189-CAM-26	4
Outcrops and Breakaways	675.072189-CAM-27	4
Outcrops and Breakaways	675.072189-CAM-28	4
Outcrops and Breakaways	675.072189-CAM-29	4
Outcrops and Breakaways	675.072189-CAM-32	4
Outcrops and Breakaways	675.072189-CAM-33	4
Outcrops and Breakaways	675.072189-CAM-34	4
Outcrops and Breakaways	675.072189-CAM-35	4
Outcrops and Breakaways	675.072189-CAM-38	4
Outcrops and Breakaways	675.072189-CAM-40	4
Outcrops and Breakaways	675.072189-CAM-42	4
Outcrops and Breakaways	675.072189-CAM-43	4
Outcrops and Breakaways	675.072189-CAM-45	5
Outcrops and Breakaways	675.072189-CAM-46	4
Outcrops and Breakaways	675.072189-CAM-47	4
Outcrops and Breakaways	675.072189-CAM-48	4
Outcrops and Breakaways	675.072189-CAM-50	4
Outcrops and Breakaways	675.072189-CAM-60	4
Outcrops and Breakaways	675.072189-CAM-61	4
Outcrops and Breakaways	675.072189-CAM-62	4
Outcrops and Breakaways	675.072189-CAM-63	4
Outcrops and Breakaways	675.072189-CAM-66	4
Outcrops and Breakaways	675.072189-CAM-67	4
Stony Hills	675.072189-CAM-30	4
Total		201



3.4.3 Acoustic Surveys

Autonomous recording units (ARUs) were used to passively record animal calls during the field survey.

3.4.3.1 Bats

Song Meter SM4BAT ultrasonic ARUs were used to target bats with a particular focus on the Pilbara Leaf-nosed Bat and Ghost Bat. SM4BAT ARUs were deployed in habitats likely to be used by significant bat species, such as water sources or rocky areas, for a minimum of four nights at each location. The number and time of significant bat species calls was documented, whereas non-significant bat species were simply recorded as present or absent per night at each location. **Table 8** shows the total SM4BAT ARU survey effort, and locations are shown in **Map 7**.

Table 8: SM4BAT ARU survey effort

Habitat	Site number	Trap nights
Outcrops and Breakaways	675.072189-BAT-1	9
Outcrops and Breakaways	675.072189-BAT-2	6
Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-BAT-3	5
Outcrops and Breakaways	675.072189-BAT-4	4
Major Drainage	675.072189-BAT-5	6
Total		30

3.4.3.2 Night Parrot

Song Meter SM4 ARUs were used to target Night Parrot (*Pezoporus occidentalis*). SM4 ARUs were deployed in habitats likely to be used by Night Parrot, such as water sources or long unburnt spinifex, for a minimum of six nights at each location. **Table 9** shows the total SM4 ARU survey effort, and locations are shown in **Map 7**.

Table 9: SM4 ARU survey effort

Habitat	Site number	Trap nights
Mixed Acacia Shrubs and Triodia Plains	675.072189-BIR-14	6
Open Eucalypt Woodland	675.072189-BIR-15	4
Major Drainage	675.072189-BIR-16	6
Open Eucalypt Woodland	675.072189-BIR-17	6
Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-BIR-18	6
Total		28

3.4.4 Opportunistic Observations

Opportunistic observations of fauna were recorded throughout the Survey Area, including primary evidence (direct sightings, calls) and secondary evidence (tracks, scats, diggings, remains).



3.4.5 Bilby Searches

Targeted Bilby searches were undertaken throughout the Survey Area in areas of suitable Bilby habitat and consisted of personnel conducting transect searches searching for evidence of Bilby activity, such as burrows, diggings, scats, and tracks. A total of 44 targeted Bilby searches were undertaken. **Table 10** shows the total survey effort for Bilby searches, and locations are shown in **Map 7**.

Table 10: Targeted Bilby search effort

Search Number	Habitat	Habitat Site Sheet	Search length (Kms)
Bilby Search 1	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-CAM-59	0.26
Bilby Search 2	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-CAM-52. 675.072189-BIR-18	0.72
Bilby Search 3	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-CAM-55	0.59
Bilby Search 4	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-CAM-53	2.09
Bilby Search 5	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-HAB-71	0.69
Bilby Search 6	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-HAB-71	3.87
Bilby Search 7	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-HAB-70	0.77
Bilby Search 8	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-HAB-77	1.71
Bilby Search 9	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-HAB-76	2.03
Bilby Search 10	Open Eucalypt Woodland	675.072189-BIL-6	1.84
Bilby Search 11	Open Eucalypt Woodland	675.072189-HAB-74	2.39
Bilby Search 12	Mixed Acacia Shrubs and Triodia Plains	675.072189-CAM-56	1.04
Bilby Search 13	Open Eucalypt Woodland	675.072189-HAB-93	2.52
Bilby Search 14	Minor Drainage	675.072189-CAM-57	0.23
Bilby Search 15	Minor Drainage	675.072189-CAM-58	0.59
Bilby Search 16	Major Drainage	675.072189-CAM-54	2.52
Bilby Search 17	Mixed Acacia Shrubs and Triodia Plains	675.072189-BIL-13, 675.072189-CAM-64, 675.072189-HAB-90	1.46
Bilby Search 18	Mixed Acacia Shrubs and Triodia Plains	675.072189-BIL-13	4.08



Search Number	Habitat	Habitat Site Sheet	Search length (Kms)
Bilby Search 19	Mixed Acacia Shrubs and Triodia Plains	675.072189-HAB-92	1.60
Bilby Search 20	Major Drainage	675.072189-CAM-31	1.58
Bilby Search 21	Major Drainage	675.072189-CAM-51	1.50
Bilby Search 22	Outcrops and Breakaways	675.072189-CAM-20, 675.072189-CAM-25, 675.072189-CAM-21	4.09
Bilby Search 23	Mixed Acacia Shrubs and Triodia Plains	675.072189-HAB-84	0.46
Bilby Search 24	Mixed Acacia Shrubs and Triodia Plains	675.072189-BIL-12	15.30
Bilby Search 25	Outcrops and Breakaways	675.072189-CAM-19	1.39
Bilby Search 26	Mixed Acacia Shrubs and Triodia Plains	675.072189-HAB-68	5.54
Bilby Search 27	Mixed Acacia Shrubs and Triodia Plains	675.072189-CAM-22	0.22
Bilby Search 28	Outcrops and Breakaways	675.072189-CAM-67	4.24
Bilby Search 29	Outcrops and Breakaways	675.072189-CAM-61	5.08
Bilby Search 30	Mixed Acacia Shrubs and Triodia Plains	675.072189-HAB-86	1.67
Bilby Search 31	Sparse Triodia Plains	675.072189-HAB-82	0.85
Bilby Search 32	Sparse Triodia Plains	675.072189-HAB-82	0.76
Bilby Search 33	Major Drainage	675.072189-HAB-81	1.89
Bilby Search 34	Major Drainage	675.072189-HAB-81	1.18
Bilby Search 35	Major Drainage	675.072189-CAM-39	0.56
Bilby Search 36	Major Drainage	675.072189-CAM-49	1.25
Bilby Search 37	Mixed Acacia Shrubs and Triodia Plains	675.072189-BIL-11	3.45
Bilby Search 38	Outcrops and Breakaways	675.072189-BIL-9 675.072189-BIL-10	1.97
Bilby Search 39	Low <i>Acacia stellaticeps</i> over Triodia Plains	675.072189-CAM-32	3.81
Bilby Search 40	Outcrops and Breakaways	675.072189-BIL-7	2.08
Bilby Search 41	Sparse Triodia Plains	675.072189-CAM-36	3.35
Bilby Search 42	Minor Drainage	675.072189-CAM-37	0.82



Search Number	Habitat	Habitat Site Sheet	Search length (Kms)
Bilby Search 43	Open Eucalypt Woodland	675.072189-CAM-41	0.37
Bilby Search 44	Open Eucalypt Woodland	675.072189-CAM-65	0.29
Total		94.7	

3.4.6 Identification and Taxonomy

Terrestrial vertebrate fauna taxa were identified in the field and released on site. Bat and bird calls were analysed by Robert Bullen from Bat Call WA.

Where there was doubt on a species name (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the Checklist of the Terrestrial Vertebrate Fauna of Western Australia (WAM, 2024) where relevant.

3.5 Limitations

Limitations and constraints of the flora, vegetation, and fauna survey are detailed below in **Table 11**.

Table 11: Limitations and constraints associated with the survey

Variable	Degree of limitation	Potential constraints on survey outcomes
Availability of data and information	None	Sufficient data and information, including regional and local contextual information, was available to complete the scope of the survey.
Competency and experience of the survey team	None	The survey was undertaken by a team with the following extensive experience undertaking similar scopes within the Pilbara bioregion. <ul style="list-style-type: none"> • Associate Ecologist Lukas Geidans – 4.5 years' experience • Zoologist Lewis Berry – 2.5 years' experience • Botanist Jack Hardie – 2.5 years' experience • Senior Botanist Grant Buller – 3 years' experience
The proportion of flora and fauna identified, recorded, or collected	None	Of the 172 flora taxa recorded, 19 specimens (11%), could not be identified to species level because they were sterile at the time of the survey. The unidentified flora specimens were not analogous to significant flora taxa. All of the fauna recorded during the field survey were identified on site.
Scope of the survey	None	The scope of the survey was limited to vascular plants and terrestrial vertebrate fauna. No further exclusions were made within these groups.
Adequacy of the survey intensity and proportion of survey achieved	None	A minimum of three flora sites were installed within most vegetation types, apart from two vegetation types which were restricted in distribution, and a minimum of two fauna habitat assessment were made within each habitat type. Additional survey effort may yield additional flora and fauna taxa, however,



Variable	Degree of limitation	Potential constraints on survey outcomes
		sufficient time and effort was allocated to the survey given the size and complexity of the Survey Area and the expected level of survey intensity.
Access problems	None	The different vegetation types and habitats within the Survey Area were sufficiently accessed by vehicle and on foot.
Timing, weather, and season	Partial	<p>The recommended primary survey period Eremaean Botanical Province as per the EPA Technical Guidance occurs 6-8 weeks post wet season (March to June). The flora and vegetation survey was undertaken within the recommended primary survey period, however rainfall in the 3 and 12-month periods prior to the survey was well below average.</p> <p>The recommended primary periods for fauna surveys in the Pilbara region are:</p> <ul style="list-style-type: none"> • Amphibians – immediately following rainfall • Birds – immediately following rainfall • Mammals – no preferred time • Reptiles – September to April <p>The fauna survey was undertaken within the recommended primary survey period for all vertebrate species.</p>
Disturbance that may have affected the results of survey	None	Areas of disturbance associated with weeds and livestock/pastoralism were present within the Survey Area but were not a limitation on the results of the survey.
Problems with data and analysis, including sampling biases	None	Survey effort for significant flora and fauna taxa was concentrated in preferred habitats. This may introduce a bias where the use of non-preferred habitat is underrepresented, however, this is not considered a limitation on the survey outcomes.



4.0 Results

4.1 Flora and Vegetation

4.1.1 Desktop Assessment

4.1.1.1 Database Searches

The database searches and literature review identified 33 significant flora taxa occurring within the Desktop Study Area, comprising:

- One Threatened taxa
- Eight Priority 1 taxa
- Two Priority 2 taxa
- 20 Priority 3 taxa
- Two Priority 4 taxa

Key findings of the literature review and database search results are summarised in **Appendix B** and presented in **Map 8**.

Three PECs were identified within the Desktop Study Area:

- Eighty Mile Land System (Priority 3), approximately 19 km north of the Survey Area.
- Gregory Land System (Priority 3), approximately 49 km south-south-west of the Survey Area.
- Horseflat Land System of the Roebourne Plains (Priority 3) approximately 75 km south west of the Survey Area.

The PECs identified by database searches are presented in **Map 8**.

4.1.1.2 Likelihood of Occurrence

The pre-survey likelihood of occurrence assessment identified that of the 33 significant flora species identified by the desktop assessment:

- None had previously been recorded within the Survey Area
- 11 were considered to have a high likelihood of occurrence
- None were considered to have a medium likelihood of occurrence
- 22 were considered to have a low likelihood of occurrence.

Following the survey, the likelihood of occurrence assessment identified that:

- Two taxa were recorded within the Survey Area
- Two taxa were considered to have a high likelihood of occurrence
- Six taxa were considered to have a medium likelihood of occurrence
- 23 taxa were considered to have a low likelihood of occurrence.

The likelihood of occurrence assessment is provided in **Appendix C**.



4.1.2 Field Survey

4.1.2.1 Floristic Composition

The survey recorded a total of 172 taxa from 94 genera across 40 families (**Appendix D**). The dominant families were Fabaceae (45 species), Poaceae (19 species) and Malvaceae (14 species). The dominant genera were *Acacia* (18 species), *Corymbia* and *Ptilotus* (6 species each). Of the 172 taxa recorded, 15 were identified to genus and two were identified to family, however these specimens are unlikely to represent conservation significant flora.

4.1.2.2 Significant Flora

Threatened and Priority Flora Recorded Within the Survey Area

No Threatened flora species pursuant to the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 and/or gazetted as Threatened pursuant to the Biodiversity Conservation (BC) Act 2016 were recorded during the survey.

Two DBCA-listed Priority species, *Gymnanthera cunninghamii* (P3) and *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (P1), were recorded within the Survey Area (Map 9). Six individuals of *Gymnanthera cunninghamii* (Plate 1) was recorded opportunistically in Devil Creek (vegetation type MaEc), while two individuals of *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (Plate 2) were recorded opportunistically within vegetation type AsTe adjacent to Great Northern Highway at the western end of the survey area.

Threatened and Priority Flora Report Forms have been submitted to DBCA and are provided in **Appendix E**.



Plate 1. *Gymnanthera cunninghamii* (P3) (Source: SLR Consulting).





**Plate 2: *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114)
(Source: SLR Consulting)**

Significant Flora Potentially Occurring Within the Survey Area

No significant flora taxa have been recorded within the Survey Area during previous surveys.

4.1.3 Introduced Flora

A total of eight introduced taxa were recorded within the Survey Area, representing 4.7% of the total taxa recorded (**Table 12; Map 10**). None are listed as WoNS. One taxon (**Calotropis procera*) is listed as a Declared Pest under the BAM Act, of which approximately 144 individuals were recorded opportunistically, and another four individuals within flora sites.

One individual of **Azadirachta indica* (Neem Tree) was recorded opportunistically in the King Edward River drainage; this record was determined to be a range extension as its current distribution according to Florabase is within the Kimberley region (DBCA, 2024a). The specimen collected was vouchered at the request of Mike Hislop from WAH (pers. com. M Hislop, 2024). The remaining six weed species recorded are commonly found throughout the Pilbara.

Table 12: Introduced Flora Taxa Recorded within the Survey Area

Taxon	Common name	Status under BAM Act	WoNS
<i>*Aerva javanica</i>	Kapok	Permitted – s11	No
<i>*Azadirachta indica</i>	Neem tree	Permitted – s11	No
<i>*Calotropis procera</i>	Calotrope	Declared Pest - s22(2)	No
<i>*Cenchrus ciliaris</i>	Buffel grass	Permitted – s11	No
<i>*Indigofera oblongifolia</i>		Permitted – s11	No
<i>*Malvastrum americanum</i>	Spiked Malvastrum	Permitted – s11	No
<i>*Passiflora foetida</i>	Stinking Passion Flower	Permitted – s11	No
<i>*Vachellia farnesiana</i>	Mimosa Bush	Permitted – s11	No



4.1.4 Unconfirmed Flora

Nineteen specimens (11% of the taxa recorded) could not be identified to species level because the taxa were too sterile and/or in poor condition at the time of the survey (Flora Inventory, **Appendix D**). Of these specimens, three were identified to family level, 15 were identified to genus level, and one was tentatively identified to species level. None of the unconfirmed flora taxa were analogous to significant flora taxa identified by the desktop assessment and may represent duplicates of taxa that were confirmed within the Survey Area. One of the three taxa identified to Family level (i.e. Violaceae) was only tentatively assigned a genus (i.e. ?*Afrohybanthus*) (refer to Discussion, Section **5.1.2.1**).



4.1.5 Vegetation Types

Fourteen vegetation types were described and mapped across five broad landforms within the Survey Area (**Table 13**; **Map 9**).

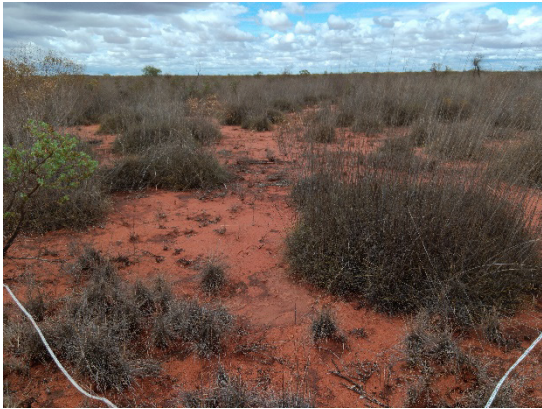
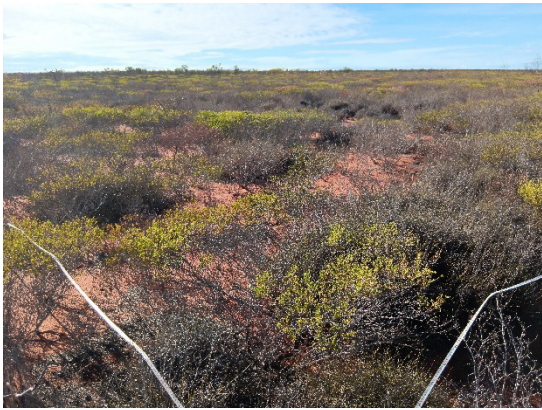
Detailed site sheets for each quadrat are provided in **Appendix F**.





Table 13: Vegetation types recorded within the Survey Area

Vegetation type and description*	Local landform	Total area, percentage of Survey Area	Sites	Vegetation condition	Representative photograph
<p>Vegetation Type Code: AiTe: <i>Triodia epactia</i> low hummock grassland</p>	Ironstone hilltops and ridges	30 ha, 0.29%	AR10, AR13, AR45	Very Good	
<p>Vegetation Type Code: AoTe: <i>Acacia orthocarpa</i> tall open shrubland over <i>Triodia epactia</i> low open hummock grassland</p>	Granite and quartz outcroppings	53 ha, 0.51%	AR05, AR36, AR38, AR40	Very Good	





Vegetation type and description*	Local landform	Total area, percentage of Survey Area	Sites	Vegetation condition	Representative photograph
<p>Vegetation Type Code: AspTe: Mixed <i>Acacia</i> (<i>A. inaequilatera</i>, <i>A. colei</i>, <i>A. ancistrocarpa</i>, <i>A. acradenia</i>, <i>A. bivenosa</i>) tall shrubland over <i>Triodia epactia</i> (<i>T. wiseana</i>) low to mid hummock grassland</p>	Plains	5495 ha, 53.03%	AR15, AR18, AR23, AR34, AR32, AR49, AR52	Very Good	
<p>Vegetation Type Code: AsTe: <i>Acacia stellaticeps</i> mid open shrubland over <i>Triodia epactia</i> low hummock grassland</p>	Plains	3067 ha, 29.6%	AR02, AR03, AR04, AR20, AR31, AR42	Very Good	





Vegetation type and description*	Local landform	Total area, percentage of Survey Area	Sites	Vegetation condition	Representative photograph
<p>Vegetation Type Code: At: <i>Acacia tumida</i> tall shrubland over <i>Triodia epactia</i> mid open hummock grassland</p>	Plains and foothills	18.3 ha, 0.18%	AR29, AR35, AR46	Very Good	
<p>Vegetation Type Code: CcAcTe: <i>Corymbia candida</i> low sparse woodland over <i>Acacia colei</i> and <i>A. tumida</i> tall open shrubland over <i>Triodia epactia</i> low hummock grassland and <i>Eulalia aurea</i> low open tussock grassland</p>	Plains	123.9 ha, 1.2%	AR25, AR54, AR53	Very Good	





Vegetation type and description*	Local landform	Total area, percentage of Survey Area	Sites	Vegetation condition	Representative photograph
<p>Vegetation Type Code: CfAh: <i>Corymbia flavescens</i> (<i>Eucalyptus victrix</i>) low sparse woodland over <i>Atalaya hemiglauc</i> (<i>Dolichandrone occidentalis</i>, <i>Ficus aculeata</i>) tall open shrubland over <i>Eulalia aurea</i> low sparse tussock grassland</p>	Low lying floodplain/minor drainages	42.5 ha, 0.41%	AR16, AR17	Degraded	
<p>Vegetation Type Code: EvAcTe: <i>Eucalyptus victrix</i> low sparse woodland over <i>Acacia colei</i> tall open shrubland over <i>Triodia epactia</i> mid open hummock grassland</p>	Minor floodplains	263.5 ha, 2.54%	AR06, AR07, AR08, AR22, AR21	Good to Very Good	





Vegetation type and description*	Local landform	Total area, percentage of Survey Area	Sites	Vegetation condition	Representative photograph
<p>Vegetation Type Code: EvEa: <i>Eucalyptus victrix</i> low sparse woodland over <i>Acacia coleii</i> tall sparse shrubland over <i>Triodai epactia</i> mid sparse hummock grassland and <i>Eulalia aurea</i> mid sparse tussock grassland</p>	<p>Drainage</p>	<p>24.1 ha, 0.23%</p>	<p>AR12, AR26, AR27, AR33, AR30</p>	<p>Very Good</p>	
<p>Vegetation Type Code: FspAh: Low sparse woodland of <i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i> over <i>Triodia epactia</i> low sparse hummock grassland</p>	<p>Ironstone hilltops and ridges</p>	<p>1.8 ha, 0.02%</p>	<p>AR09, AR14, AR44</p>	<p>Very Good</p>	



Vegetation type and description*	Local landform	Total area, percentage of Survey Area	Sites	Vegetation condition	Representative photograph
<p>Vegetation Type Code: FspTe: Mixed <i>Acacia</i> (<i>A. inaequilatera</i>, <i>A. ancistrocarpa</i>) with <i>Ficus brachypoda</i> low isolated trees over low open hummock grassland <i>Triodia epactia</i></p>	Granite outcropping	13.5 ha, 0.13%	AR37, AR48, AR50	Very Good	
<p>Vegetation Type Code: MaEc: <i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i> (<i>E. victrix</i>), <i>Melaleuca argentea</i> low sparse woodland over tall sparse shrubs <i>Acacia trachycarpa</i>, <i>M. glomerata</i> over <i>Eulalia aurea</i> low sparse tussock grasses and <i>Triodia epactia</i> low sparse hummock grasses</p>	Major drainages	165.7 ha, 1.6%	AR28, AR39, AR41, AR47	Good	



Vegetation type and description*	Local landform	Total area, percentage of Survey Area	Sites	Vegetation condition	Representative photograph
<p>Vegetation Type Code: Sh: <i>Sclerolaena hostilis</i> low sparse forbland</p>	Low lying colluvial flats,	9.6 ha, 0.09%	AR11	Degraded	
<p>Vegetation Type Code: TsTe: <i>Triodia secunda</i> and <i>T. epactia</i> low hummock grassland</p>	Flats, floodplain	848.4 ha, 8.19%	AR01, AR19, AR24, AR43, AR51	Very Good	

*Brackets indicate species that may or may not be present, but were observed as dominant at some of the sites that make up the vegetation type



4.1.6 Vegetation Condition

Vegetation condition within the Survey Area ranged from Degraded to Very Good, with the majority (95.2%) being in Very Good condition (**Table 14; Map 10**).

The remainder of the Survey Area comprised previously cleared areas (i.e. for roads, tracks, pastoralism infrastructure) and were not assigned a vegetation condition (206.3 ha / 2 %).

Evidence of disturbance included historical clearing for access tracks, cattle grazing, trampling and scats, weeds, and frequent burning.

Table 14: Summary of Vegetation Condition within the Survey Area

Vegetation Condition	Area (ha)	Percentage of Survey Area (%)
Degraded	52.1	0.5
Good	232.4	2.2
Poor	3.3	0.03
Very Good	9868.9	95.2

4.1.7 Significant Vegetation

4.1.7.1 Threatened and Priority Ecological Communities

None of the vegetation types within the Survey Area were considered analogous to TECs or PECs.

4.1.8 Groundwater Dependent Ecosystems

One vegetation type, MaEc, is likely to represent groundwater dependent ecosystems (GDE) associated with some of the major drainages intersecting the survey area (i.e. King Edward River, Turner River and Devil Creek). This vegetation type supports known phreatophytic tree species such as *Melaleuca argentea* and *Eucalyptus camaldulensis* subsp. *refulgens*, which are reliant on access to the groundwater table.

4.1.9 Statistical Analysis

4.1.9.1 Floristics

Data was modified in accordance with the methodology in Section 3.3.7.1. Selected inputs and outputs of the floristic analysis are presented in **Appendix G**. The following observations were made from the floristic analysis and the dendrogram output (**Figure 2**):

- Acacia dominated vegetation types on plains (At, AspTe, AoTe, AsTe and FspTe) grouped broadly together; these groups largely represented the Acacia plains which dominated the majority of the Survey Area (approximately 83%). While FspTe was included in this grouping, this was largely based on the shared presence of common Acacia shrubs which exist across a range of habitats and landforms (e.g. *A. inaequilatera* and *A. ancistrocarpa*). Vegetation mapping from the flora survey, however, determined the FspTe vegetation type to be separate based on the presence of *Ficus brachypoda* which is often associated with these landforms (i.e. granite outcroppings) and less so on the plains. These granite outcroppings also often represent a different suite of species to the surrounding plains, despite often sharing some common Acacias.



- The major drainage sites (MaEc) were grouped together with a shared similarity of 40 %, sharing dominant drainage/GDE-associated species such as *Melaleuca argentea*, *M. glomerata*, *Eucalyptus camaldulensis* subsp. *refulgens*, *Acacia trachycarpa*, *Cyperus vaginata* and *Eulalia aurea*. This grouping was generally consistent with mapping from the field survey.
- Low lying flats and floodplain sites associated with vegetation type TsTe grouped together, which was consistent with mapping from the survey. TsTe was often in close proximity to the widespread Acacia plains, and the analysis also grouped some AspTe sites with the four TsTe sites; this was due to some crossover of common Acacia species (e.g. *A. ancistrocarpa*, *A. acradenia*, *A. bivenosa*, *A. colei*, *A. inaequilatera*).
- One of the TsTe sites, AR19, grouped separately from the others due to the absence of *Triodia epactia*, however it was retained in TsTe by the survey vegetation mapping due to the dominant presence of *T. secunda*.
- Sites within the FspAh and AiTe vegetation types were associated with the ironstone ridge, hilltop and slopes landforms, and were generally grouped together by the analysis based on shared presence of *Ficus* spp. The ironstone ridge sites (FspAh) were separated from the nearby hilltop sites (AiTe) by the survey vegetation mapping due to the absence of *Ficus* spp. and *Atalaya hemiglauca* in these hilltop sites, however the close proximity of these landforms still resulted in the crossover of common species (e.g. *Acacia inaequilatera*) and therefore the floristic grouping of these sites by the analysis.
- Sites within the vegetation types EvAcTe and CcAcTe were grouped together, as well as some sites from EvEa. These vegetation types were associated with low lying plains, minor floodplains and minor drainages, and shared some similarities, particularly a low sparse overstorey of *Eucalyptus victrix* and a mid-storey of tall sparse to open shrubland of *Acacia colei* var. *colei*. EvEa was associated with a different landform (minor drainages) to EvAcTe and CcAcTe however was included in this grouping by the analysis due to presence of *Eulalia aurea* and *Eucalyptus victrix*; *E. victrix* is a facultative phreatophyte which often grows in minor drainages but also is common across low lying plains and minor floodplains, while *E. aurea* often inhabits watercourses, damp areas and floodplains though is commonly found across a range of habitats.



Atlas Ridley Flora Cluster Analysis

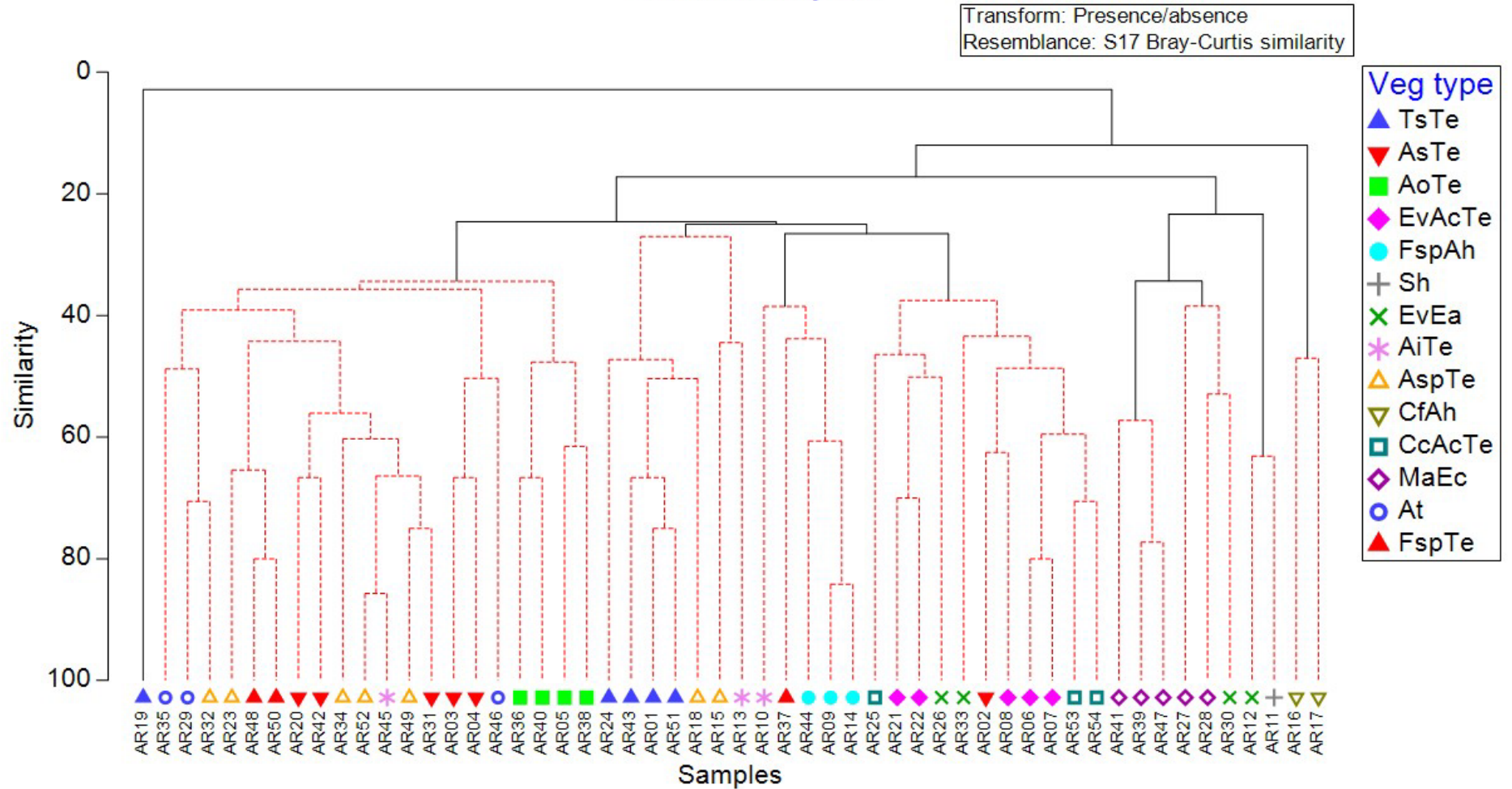


Figure 2: Cluster analysis (dendrogram) showing floristic groupings of sites for each vegetation type.



4.1.9.2 Flora Species Accumulation

Analysis of systematic flora data for the Survey Area Analysis of systematic flora data for the Survey Area produced a Sobs curve that is approaching an asymptotic plateau (**Figure 3**). All richness estimators were at or greater than the Sobs curve, indicating that the observed species richness was lower than, or equal to, that predicted by the analysis. The observed species richness for the Survey Area was 121, whereas estimated species richness ranged from 121 (Chao 1 and 2, Jackknife 1) to 157 (MM), which suggests that approximately 77 to 100% of the theoretical maximum number of flora species was recorded during the field survey (**Table 15**).

The data used to produce the species accumulation curve was conservative because opportunistic species (which are not associated with a site), and unconfirmed flora were not included. With opportunistic and unconfirmed flora included, the number of flora taxa recorded during the survey was 153, which is 98.0% of the highest expected species richness, and 126.4% of the lowest expected species richness.

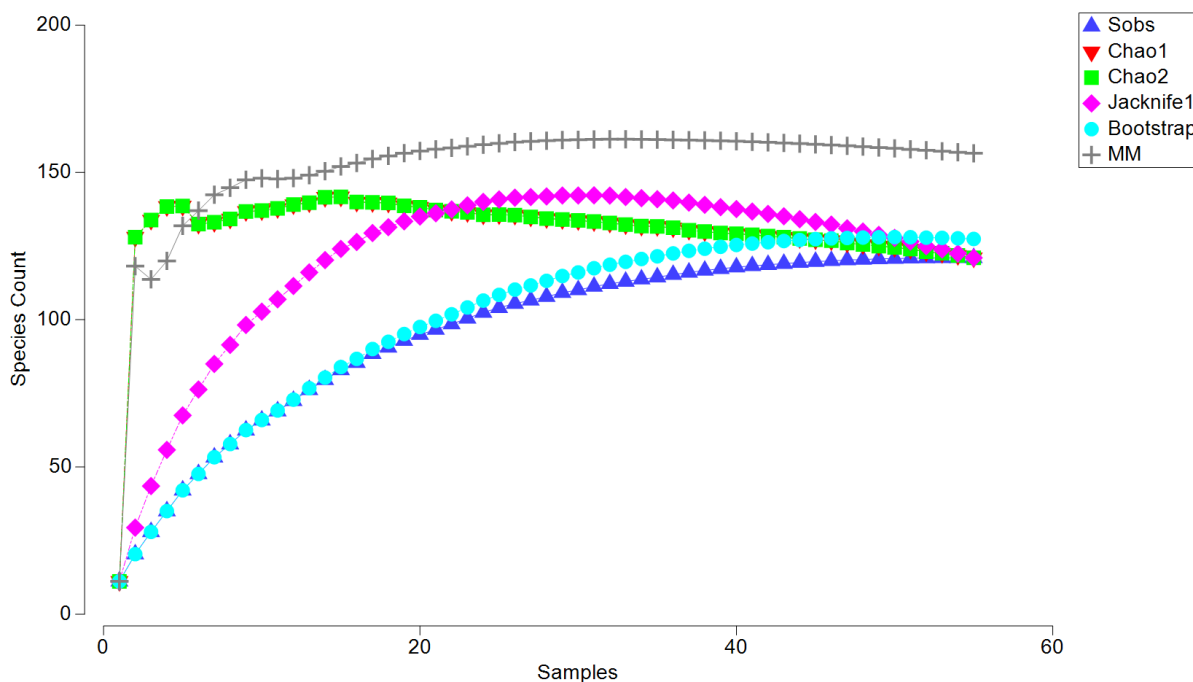


Figure 3: Flora Species Accumulation Curve

Table 15: Flora species richness estimators

Treatment	Estimated species richness	Observed species richness as a proportion of estimated species richness
Chao 1	121	100.00
Chao 2	121	100.00
Jackknife 1	121	100.00
Bootstrap	127.40	94.98
Michaelis-Menton	156.49	77.32



4.2 Fauna

4.2.1 Desktop Assessment

The database searches and literature review identified 426 terrestrial vertebrate fauna taxa occurring within the Desktop Study Area, comprising:

- 14 amphibians, of which none are significant.
- 244 birds, of which 62 are significant.
- 56 mammals, of which 11 are significant.
- 112 reptiles, of which three are significant.



Key findings of the literature review are summarised in **Appendix B**, a complete list of fauna taxa returned by the database search results is presented in **Appendix H** and displayed in **Map 11**.

4.2.2 Fauna Habitat



Nine fauna habitats (excluding cleared areas) were identified and mapped within the Survey Area. Fauna habitats are presented in **Map 12**, described below in **Table 16**, and site sheets for each habitat assessment are provided in **Appendix I**. Small discrepancies in fauna habitat extents (i.e., not adding up to the exact area extent of the Survey Area) are due to rounding.





Table 16: Fauna habitats recorded within the Survey Area

Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Closed Acacia Shrubland	15.01 ha, 0.14%	<p>Flat plains with red sandy substrate. Vegetation consists of open <i>Corymbia</i> and <i>Eucalyptus</i> woodland over <i>Eucalyptus</i> and <i>Acacia</i> open shrubland midstory over low <i>Triodia</i> hummock grassland. Microhabitats include <i>Triodia</i> hummocks and leaf litter. This habitat contained disturbances caused by vehicle tracks.</p>	
Low <i>Acacia stellaticeps</i> over <i>Triodia</i>	3,071.26 ha, 29.64%	<p>Flat plains with brown-orange clay, loam and sandy substrate. Vegetation consists of low, isolated clumps of <i>Acacia stellaticeps</i> over low <i>Triodia epactia</i> open hummock grassland. Microhabitats include <i>Triodia</i> hummocks, leaf litter and woody debris were observed. This habitat contained disturbances caused by vehicle tracks and overgrazing.</p> <p>The significant Pilbara Leaf-nosed Bat was recorded within this habitat. Previous surveys have recorded the Bilby, Oriental Pratincole, and the Brush-tailed Mulgara within this habitat type.</p>	





Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Major Drainage	165.69 ha, 1.60%	<p>Flat plains with red-orange sandy substrate. Vegetation consists of open eucalypt woodland over sparse acacia midstory and open <i>Triodia</i> hummock grassland. Microhabitats include <i>Triodia</i> hummocks, leaf litter, peeling bark, woody debris, and burrows. Tree hollows, log hollows and logs over 10cm were also observed. This habitat contained disturbances caused by vehicle tracks, overgrazing and weeds.</p> <p>The significant Grey Falcon and Barn Swallow may utilise the eucalypt trees within this habitat for nesting. The significant Ghost Bat and Osprey may utilise this habitat for foraging.</p>	
Minor Drainage	24.12 ha, 0.23%	<p>Flat plains with red sandy substrate. Vegetation consists of open <i>Eucalyptus</i> woodland over <i>Eucalyptus</i> and <i>Acacia</i> open shrubland midstory over low <i>Triodia</i> hummock grassland. Microhabitats include <i>Triodia</i> hummocks, leaf litter, peeling bark and woody debris. This habitat contained disturbances caused by vehicle tracks.</p> <p>The significant Grey Falcon and Barn Swallow may utilise the eucalypt trees within this habitat for nesting. The significant Ghost Bat and Osprey may utilise this habitat for foraging.</p>	




Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Mixed Acacia Shrubs and <i>Triodia</i> Plains	5,501.32 ha, 53.09%	<p>Flat plains with red-orange sandy and clay-loam substrate. Vegetation consists of open <i>Eucalyptus</i> woodland over <i>Acacia</i> open shrubland midstory with <i>Triodia</i> hummock grassland. Microhabitats include <i>Triodia</i> hummocks and leaf litter. This habitat contained disturbances caused by vehicle tracks and overgrazing.</p> <p>The significant Western Pebble-mound Mouse was recorded within this habitat. The Marsh Sandpiper, Red-necked Phalarope, and the Sanderling have been previously recorded within this habitat type. The significant Common Greenshank, Little Curlew, Oriental Plover, and the Glossy Ibis may utilise this habitat after significant rainfall event.</p>	
Open Eucalypt Woodland	429.90 ha, 4.15%	<p>Flat plains with red sandy substrate. Vegetation consists of open <i>Corymbia</i> and <i>Eucalyptus</i> woodland over <i>Eucalyptus</i> and <i>Acacia</i> open shrubland midstory over low <i>Triodia</i> hummock grassland. Microhabitats include <i>Triodia</i> hummocks and leaf litter. This habitat contained disturbances caused by vehicle tracks.</p> <p>The significant Peregrine Falcon may utilise this habitat for nesting and hunting.</p>	



Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Outcrops and Breakaways	43.56 ha, 0.42%	<p>Sloped granite, ironstone and quartz ridges and outcrops with red-brown sandy-clay substrate. Vegetation consists of open acacia shrubland midstory over sparse and open <i>Triodia</i> hummock grassland. Microhabitats include Exfoliating rock, rock crevices, <i>Triodia</i> hummocks, leaf litter, peeling bark and woody debris.</p> <p>The significant Pilbara Leaf-nosed Bat and Western Pebble-mound Mouse were recorded within this habitat. The significant Northern Quoll has also been recorded by previous surveys within this habitat type. The significant Pilbara Olive Python may utilise this habitat for dispersal.</p>	
Sparse <i>Triodia</i> Plains	858.02 ha, 8.28%	<p>Open rocky granite plains with red sandy-pebble substrate. Vegetation consists of sparse acacia shrubland midstory over open hummock grassland. Microhabitats include <i>Triodia</i> hummocks and leaf litter. This habitat contained disturbances caused by vehicle tracks and overgrazing.</p> <p>The significant Western Pebble-mound Mouse was recorded within this habitat. The significant Common Greenshank, Little Curlew, Oriental Plover, and the Glossy Ibis may utilise this habitat after significant rainfall event. The Pilbara Grasswren and the Short-tailed Mouse may also utilise this habitat for foraging and shelter.</p>	



Fauna habitat	Total area, percentage of Survey Area	Habitat description	Representative photograph
Stony Hills	47.82 ha, 0.46%	<p>Undulating granite and quartz plains with red sandy substrate. Vegetation consists of sparse <i>Acacia</i> shrubland midstory over sparse <i>Triodia</i> hummock grassland. Microhabitats include <i>Triodia</i> hummocks and termite mounds. This habitat contained disturbances caused by vehicle tracks.</p> <p>The Pilbara Grasswren and the Short-tailed Mouse may also utilise this habitat for foraging and shelter.</p>	
Cleared	206.26 ha, 1.99%	Cleared land for existing tracks/roads. Low/negligible fauna habitat value.	
Total	10,363 ha		



4.2.3 Fauna Records

The fauna survey recorded a total of 63 fauna taxa from 34 families. The fauna diversity within each habitat type is summarised in **Table 17** and a full inventory of fauna taxa recorded during the field survey is provided in **Appendix J**.

Table 17: Fauna diversity by habitat type

Fauna habitat	Birds	Mammals	Reptiles	Total
Closed Acacia Shrubland	0	0	0	0
Low <i>Acacia stellaticeps</i> over Triodia	20	10*	3	33*
Major Drainage	10	7	5	22
Minor Drainage	5	1	2	8
Mixed Acacia Shrubs and Triodia Plains	15	3*	10	28*
Open Eucalypt Woodland	8	2	3	13
Outcrops and Breakaways	4	12*	5	21*
Sparse Triodia Plains	9	1	0	10
Stony Hills	1	2*	0	3*
Cleared	7	0	1	8

*Contains significant fauna

Birds

A total of 33 native birds from 20 families were recorded within the Survey Area. The most abundant bird taxa were the Australian Zebra Finch (*Taeniopygia castanotis*), Spinifex Pigeon (*Geophaps plumifera*), and Crested Pigeon (*Ocyphaps lophotes*). The most diverse bird families were Alcedinidae (Four taxa), and Falconidae (three taxa), and Cacatuidae (three taxa).

No significant birds (see **Section 4.2.4.1**) and one introduced bird were recorded.

Mammals

A total of 14 native mammals from nine families were recorded within the Survey Area, comprising four non-volant (non-flying) mammals and six volant mammals (bats). The most abundant mammal taxa were the Gould's Wattled Bat (*Chalinolobus gouldii*), Sheath-tailed Bat (*Taphozous spp*), Greater Northern Free-tailed Bat (*Chaerephon jobensis*) and Finlayson's Cave Bat (*Vespadelus finlaysoni*). The most diverse mammal families were Vespertilionidae (three taxa) and Macropodidae (two taxa).

Two significant mammals (see **Section 4.2.4.1**) and two introduced mammals were recorded.

Reptiles

A total of 16 native reptiles from five families were recorded within the Survey Area. The most abundant reptile taxa were the Rock Ctenotus (*Ctenotus saxatilis*), Western Ring-tailed Dragon (*Ctenophorus caudicinctus*), and Spiny-tailed Goanna (*Varanus acanthurus*). The most diverse reptile families were Scincidae (five taxa), Agamidae (three taxa), and Varanidae (three taxa).

No significant reptiles (see **Section 4.2.4.1**) and no introduced reptiles were recorded.



Amphibians

No amphibians were recorded within the Survey Area

4.2.4 Significant Fauna

4.2.4.1 Recorded within the Survey Area during the current survey

Two significant fauna taxa were recorded within the Survey Area:

- Pilbara Leaf-nosed Bat (*Rhinonictoris aurantia*) (Pilbara form), listed as Vulnerable under the BC Act and EPBC Act, was recorded seven times during the field survey. All individuals were recorded by ultrasonic ARUs within Outcrops and Breakaways (-20.2906, 119.1062) and Low *Acacia stellaticeps* over *Triodia* adjacent to Outcrops and Breakaways (-20.3417, 119.0783) (**Map 12**).
- Western Pebble-mound Mouse (*Pseudomys chapmani*), listed as Priority 4 by DBCA, was recorded six times during the field survey. All individuals were recorded by residual mounds within Stony Hills (-20.4059, 118.9593; -20.4061, 118.9596; -20.4090, 118.9611), Outcrops and Breakaways (-20.4190, 118.9164; -20.3421, 118.0801), and Mixed *Acacia* Shrubs and *Triodia* Plains adjacent to Outcrops and Breakaways (-20.4196, 118.9155) (**Map 12**).

4.2.4.2 Previously recorded within the Survey Area

Seven significant fauna taxa have been recorded within the Survey Area in recent years but were not recorded during the current survey:

- Northern Quoll (*Dasyurus hallucatus*), listed as Endangered under the BC Act and EPBC Act.
- Bilby (*Macrotis lagotis*), listed as Vulnerable under the BC Act and EPBC Act.
- Oriental Pratincole (*Glareola maldivarum*), listed as Migratory under the BC Act and EPBC Act, and Marine under the EPBC Act.
- Marsh Sandpiper (*Tringa stagnatilis*), listed as Migratory under the BC Act and EPBC Act, and Marine under the EPBC Act.
- Red-necked Phalarope (*Phalaropus lobatus*), listed as Migratory under the BC Act, and Migratory and Marine under the EPBC Act.
- Sanderling (*Calidris alba*), listed as Migratory under the BC Act, and Migratory and Marine under the EPBC Act.
- Brush-tailed Mulgara (*Dasyercus blythi*), listed as Priority 4 by DBCA.

4.2.4.3 High likelihood of occurrence within the Survey Area

Nine significant fauna taxa were assessed as having a high likelihood of occurring within the Survey Area:

- Grey Falcon (*Falco hypoleucos*), listed as Vulnerable under the BC Act and EPBC Act.
- Ghost Bat (*Macroderma gigas*), listed as Vulnerable under the BC Act and EPBC Act.
- Pilbara Olive Python (*Liasis olivaceus barroni*), listed as Vulnerable under the BC Act and EPBC Act.



- Common Greenshank (*Tringa nebularia*), listed as Migratory under the BC Act, and Endangered, Migratory and Marine under the EPBC Act.
- Barn Swallow (*Hirundo rustica*), listed as Migratory under the BC Act, and Migratory and Marine under the EPBC Act.
- Little Curlew (*Numenius minutus*), listed as Migratory under the BC Act, and Migratory and Marine under the EPBC Act.
- Oriental Plover (*Charadrius veredus*), listed as Migratory under the BC Act, and Migratory and Marine under the EPBC Act.
- Osprey (*Pandion haliaetus*), listed as Migratory under the BC Act, and Migratory and Marine under the EPBC Act.
- Peregrine Falcon (*Falco peregrinus*), listed as Other Specially protected species under the BC Act.

4.2.4.4 Medium likelihood of occurrence within the Survey Area

A total of 25 significant fauna taxa were assessed as having a medium likelihood of occurring within the Survey Area, including:

- Glossy Ibis (*Plegadis falcinellus*), listed as Migratory under the BC Act, and Migratory and Marine under the EPBC Act.
- Pacific Swift/Fork-tailed Swift (*Apus pacificus*), listed as Migratory under the BC Act, and Migratory and Marine under the EPBC Act.
- Pilbara Grasswren (*Amytornis whitei whitei*), listed as P4 (as *A. striatus striatus*) by DBCA.
- Short-tailed Mouse (*Leggadina lakedownensis*), listed as Priority 4 by DBCA.

A further 21 shorebird species were also assessed as having a medium likelihood of occurring within the Survey Area (**Appendix K**). These species will be discussed as a group due to the similarities of their habitat requirement within the Survey Area.

A total of 33 significant fauna taxa were assessed as having a low likelihood of occurring within the Survey Area. The complete results of the significant fauna likelihood of occurrence assessment including justification for the assessment outcome for each taxon is provided in **Appendix K**.

5.0 Discussion

5.1 Flora and Vegetation

5.1.1 Floristic Composition

The suite of flora taxa recorded during the survey is considered typical for the respective areas (Beard 1976) and aligns with the database search results obtained.



Rainfall in the three month and 12-month periods prior to the survey was well below average. This likely resulted in a lower than expected floristic diversity when considering other surveys undertaken in the region and the timing of the survey undertaken. The lack of rainfall also likely contributed to several small herbs and grasses that could not be identified to species level due the poor and/or sterile nature of these specimens. Had rainfall totals in the 3 and 12 months prior to the survey been closer to the long-term average for these periods, the survey results may have shown fewer sterile species and a higher floristic diversity, including more annuals and ephemerals.

5.1.2 Significant Flora

The two DBCA-listed Priority species recorded, *Gymnanthera cunninghamii* (P3) and *Tephrosia rosea subsp.* Port Hedland (A.S. George 1114) (P1), were each determined by the pre-survey desktop assessment to be of high likelihood of occurrence.

Gymnanthera cunninghamii is an erect shrub that grows from 1 to 2 metres high with cream-yellow-green flowers from January to December (Department of Biodiversity Conservation and Attractions, 2020). The species grows in sandy soils (Department of Biodiversity Conservation and Attractions, 2023) and often favours creek beds, river systems and major drainage lines.

Tephrosia rosea subsp. Port Hedland (A.S. George 1114) is an erect, spindly shrub that has been recorded from only a few locations in the Pilbara, mostly on pale red-yellow-brown sand on sand plains (Western Australian Herbarium, 2023).

Focused Vision (2023) recorded one individual of *Tephrosia rosea subsp.* Port Hedland (A.S. George 1114) within their 2023 survey, located approximately 6.5 km to the north of the far western end of the current survey area.

5.1.2.1 Other Species of Interest

One flora collection from the survey, *?Afrohybanthus*, could not be positively identified to Genus level, however it was noted by WAH taxonomist Mike Hislop as an interesting collection with some vegetative characters shared between the *Afrohybanthus* and *Pigea* genera (both in the Violaceae family). While this specimen has a generally similar vegetative morphology to a WAH specimen referred to as *A. aff. aurantiacus* from the PH area (Loudon, B.; Henshaw, N. BLNH-036), it differs from the WAH specimen which has hairy branchlets. A better specimen collected during a season with higher rainfall may yield a positive identification.

5.1.3 Vegetation Types and Condition

Mapping reliability ranged from very high, in areas where flora sites and mapping notes were completed within intact vegetation, to moderate in areas that were not traversed. The majority of the survey area (approximately 86.5%) comprised plains consisting of *Acacia stellaticeps* and mixed *Acacia* spp. with isolated patches of *Eucalyptus victrix* and *Corymbia* spp. woodland. Some areas, particularly in the AsTe vegetation type, were heavily fire affected, however sufficient intact vegetation remained to reliably inform vegetation mapping.

Five broad landforms – ironstone hilltops and ridges, outcroppings, plains, low lying floodplains/flats/minor drainages and major drainages – were recorded within the Survey Area.



Based on examining similarities in vegetation descriptions, vegetation within the survey area was largely representative of existing broad scale vegetation and soil and land system mapping for the area (Beard, 1976, Shepherd et al., 2002).

The vegetation throughout the majority of the survey area was in 'Very Good' condition. With many pastoral stations situated in the Port Hedland region, disturbances from livestock and weeds in this region are widespread; as such, these disturbances automatically downgrades any vegetation condition below that of 'Excellent' (EPA, 2016c). Areas in Good, Poor or Degraded condition were often affected by the presence of more aggressive and/or declared pest species of weeds such as **Cenchrus ciliaris* and **Calotropis procera* (DP). These areas were often associated with drainages and floodplains frequented by livestock, which often act as vectors for the spread of these weeds, as well as other weeds such as **Vachellia farnesiana* and **Malvastrum americanum*. Areas that had been cleared of vegetation for roads, tracks and infrastructure were not assigned a vegetation condition.

5.1.4 Significant Vegetation

5.1.4.1 Groundwater Dependent Ecosystems

Vegetation type MaEc is likely to be representative of groundwater dependent ecosystems. This is indicated by the presence of known phreatophytic vegetation, specifically *Melaleuca argentea* and *Eucalyptus camaldulensis* subsp. *refulgens*. *Melaleuca argentea* is an obligate phreatophyte and is almost exclusively dependent on groundwater for its water requirements while *Eucalyptus camaldulensis* subsp. *refulgens* is a facultative phreatophyte and utilises groundwater as well as water from other sources (Rio Tinto, 2017).

Whilst the MaEc vegetation type comprised a small proportion of the Survey Area (1.6%), it was mapped in three different locations, each one traversing the full width of the Survey Area corridor (see **Map 9**). These locations correspond to the three major drainages (from west to east): Turner River, King Edward River and Devil Creek.

Previous surveys conducted by Focused Vision in 2023 mapped the King Edward and Devil Creek as potentially representative of GDV due to a dominant overstorey of facultative phreatophytes *Eucalyptus camaldulensis* subsp. *refulgens* and *Eucalyptus victrix*.

5.1.5 Survey Adequacy

The flora and vegetation survey were conducted in accordance with the scope of works, and appropriate for a detailed flora and vegetation survey in the Pilbara. Fifty-four flora sites were sampled across the Survey Area, comprising 26 quadrats and 28 relevés. The inventory of vascular flora and records of significant and weed species was compiled using flora site data and opportunistic observations made during traverses between sites and targeted searches of habitat likely to support significant flora (e.g. drainages).

A minimum of three flora sites were sampled in each vegetation type, except for vegetation types Sh and CfAh which were each too restricted in distribution to accommodate three sites. Vegetation type FspAh comprised the smallest proportion of the total survey area (0.02%), however the ironstone ridges with which the vegetation type was associated with were distributed adequately enough to incorporate three flora sites.



When a curve approaches an asymptote, it indicates sampling effort has been sufficient to adequately collect the species comprising the floral assemblage at the locations sampled. The value at which the curve asymptotes can also be used as an approximate measure of the total size of the species complement at that location.

The species accumulation curve and the richness estimators approached asymptote and plateaued, indicating that additional surveys would be unlikely to record many additional vascular flora taxa. This in turn is indicative of the paucity of flora taxa throughout the Atlas Ridley Survey Area as a result of very dry conditions in the 3- and 12-month periods prior to the survey. The presence of ephemeral and annual herbs was very low, and even perennial grasses such as *Triodia* spp., *Eulalia aurea*, *Eragrostis* spp. and **Cenchrus ciliaris* (Buffel grass) were often observed either dead or sterile.

5.1.6 Regional Representation

According to the EPA (2000), the threshold level below which species loss appears to accelerate exponentially at an ecosystem level is regarded as being 30% of the pre-clearing extent of the vegetation type. Proposals that would affect a vegetation association with 30% or less of its pre-clearing extent remaining are likely to be formally assessed by the EPA (2006).

Each of the four Abydos Plain vegetation associations within the Survey Area are above the threshold level of 30% of the pre-clearing extent set by the EPA for protecting biological diversity.

5.2 Fauna

5.2.1 Fauna habitat

The nine broad fauna habitats (excluding cleared areas) identified within the Survey Area are typical of the Pilbara bioregion and consistent with habitats identified by previous studies in the region (Appendix B). At least one habitat assessment was conducted within each habitat type. Multiple assessments were conducted within the fauna habitats with the highest value to significant fauna (e.g. Outcrops and Breakaways) and overall fauna assemblages (e.g. Low *Acacia stellaticeps* over *Triodia*). Nearly all identified fauna habitats extend outside the Survey Area to form larger ecosystems. However, there is one pocket of Stony Hills and Closed Acacia Shrubland habitats, and a series of Outcrops and Breakaways habitat contained entirely within the Survey Area which lack connectivity to similar habitats.

Four fauna habitats: Outcrops and Breakaways; Stony Hills; Low *Acacia stellaticeps* over *Triodia* and Mixed Acacia Shrubs; and *Triodia* Plains habitats, represent the highest value to overall fauna assemblages and the highest value to significant fauna.

The Outcrops and Breakaways habitats are of value to significant fauna species such as Northern Quoll, Pilbara Leaf-nosed Bat, and Western Pebble-mound Mouse. The caves and rock crevices found throughout the habitats provide roosting, denning, and refuge habitat. The hills and valleys within these habitats may also occasionally flood, providing a temporary water source for fauna species.

The Stony Hill habitat is of value to significant species such as the Western Pebble-mound Mouse as it provides suitable burrowing, refuge, and foraging habitat. This habitat can also provide suitable hunting habitat for Northern Quoll and Pilbara Leaf-nosed Bat in areas adjacent to Outcrops and Breakaways.



The Low *Acacia stellaticeps* over Triodia habitat had the highest number of fauna species recorded of all fauna habitats and supports significant fauna species such as Brush Tailed Mulgara, Bilby, and Western Pebble-mound Mouse. This habitat can also provide suitable hunting habitat for Northern Quoll and Pilbara Leaf-nosed Bat in areas adjacent to Outcrops and Breakaways.

Mixed Acacia Shrubs and Triodia Plains habitats recorded the second highest number of species of all fauna habitats. In addition, they support significant species that favours plains habitats, such as Brush-tailed Mulgara and Western Pebble-mound Mouse. When adjacent to Outcrops and Breakaways habitat they can also support significant fauna such as Northern Quoll and Pilbara Leaf-nosed Bat.

The Major and Minor Drainage Line habitats represent moderate value to significant fauna due to dense fringing shrubland which provide suitable foraging habitat and plays a role as an ecological linkage. These habitats may also contain ephemeral pools after significant rain events, providing valuable water sources for significant species such as Northern Quoll and Pilbara Olive Python.

Habitat condition varied throughout the Survey Area. Large portions of the Survey Area had been recently cleared for mining activity, drill pads, and associated access tracks. Weeds and degradation caused by cattle and historic settlement were observed throughout all habitats.

5.2.2 Significant Fauna

5.2.2.1 Recorded within the Survey Area during the current survey

Pilbara Leaf-nosed Bat (*Rhinoicteris aurantia*) (Pilbara form) – VU (BC Act); VU (EPBC Act)

The Pilbara Leaf-nosed Bat was originally considered to be the same species as the Orange Leaf-nosed Bat, which occurs in the Kimberley region, Northern Territory, and northwest Queensland. It is now considered to be a separate form based on morphology; however, formal reclassification has not yet been undertaken (Cramer et al., 2016). The taxon is restricted to areas with suitable day roosts, which are typically deep caves that retain humidity or disused underground mines (Cramer et al., 2016).

The Pilbara Leaf-nosed Bat was recorded once within the Outcrops and Breakaways habitat, and one was recorded by an ARU 10 m away from the mapped boundary of an Outcrops and Breakaways habitat. The caves in this habitat provide ideal roosting habitat for the taxon.

Western Pebble-mound Mouse (*Pseudomys chapmani*) – P4 (DBCA)

The Western Pebble-mound Mouse is endemic to the Pilbara, where it builds pebble mounds from small stones. These pebble mounds typically cover areas from 0.5 – 9.0m² and are characteristic of this species. 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 & Johnson, 2007; Van Dyck & 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).



Western Pebble-mound Mouse mound was recorded three times within the Stony Hills habitat, and twice within the Outcrops and Breakaways habitat. Given the presence of an entrance hole and the lack of debris around the entrance, it is highly likely that the mounds are currently occupied. This species was recorded once within the Mixed Acacia Shrubs and Triodia Plains habitat, however, the record is < 40 m away from the mapped boundary of an Outcrops and Breakaways habitat, therefore it is considered an ecotone of the Outcrops and Breakaways habitat.

5.2.2.2 Previously recorded within the Survey Area

Northern Quoll (*Dasyurus hallucatus*) – EN (BC Act); EN (EPBC Act)

The range of the Northern Quoll has contracted across northern Australia since European settlement, and it now occurs as several disjunct populations (Braithwaite & Griffiths, 1994). The Northern Quoll can be locally common, but its former range has retracted considerably (Van Dyck & Strahan, 2008). The Northern Quoll is found in dissected rocky escarpments, utilising a variety of den sites, including rock crevices, tree hollows, logs, and termite mounds. It favours rocky areas, taking refuge in rock crevices, and utilises gullies and drainage lines.

It is important to note that much of the ecological information for the Northern Quoll comes from studies in the Top End of the Northern Territory (e.g. (Begg, 1981); (Oakwood, 2000)). Much of their ecology is likely to be similar in the Pilbara; however, differences in genetic structure and some demographic parameters have been observed (How et al., 2009).

The Northern Quoll has a relatively large home-range size of up to 150 ha for males (35 ha for females). Movements between den sites on consecutive nights can be up to 1.85 km for males (Oakwood, 2000). In the Northern Territory, mating occurs in late May to June and all males die after the mating season and females rear the young alone (Oakwood, 2000). The young spend about two months in the pouch and are then left in a succession of nursery dens for the next three months for periods at night while the mother forages (Oakwood, 2000). In the Kimberley region, Schmitt et al. (1989) found that breeding occurred in July and August. However, at Woodstock Station in the Pilbara, breeding occurred in September, a month later than the Kimberley (How et al., 2009). This variation in time of breeding across three distinct populations indicates some reproductive flexibility in the species.

There is an abundant (1,282) amount of previous Northern Quoll records within and around the Survey Area (DBCA, 2023). Most of the previous records of the Northern Quoll are in the Outcrops and Breakaways habitat, except for one record less than 1 km away. This is expected as the Outcrops and Breakaways, as well as the surrounding habitats constitute core habitat for the Northern Quoll because of their value for denning and foraging. In addition, the records range from early 1980 to the current days, which shows that the species occupies the Survey Area consistently.



Bilby (*Macrotis lagotis*) – VU (BC Act); VU (EPBC Act)

The Bilby is a solitary and nocturnal type of bandicoot, characterised by its distinct rabbit-like ears and long face with a pointed snout (Department of Biodiversity Conservation and Attractions, 2017a). The range of the Bilby has declined northwards, with wild subpopulations now restricted predominantly to the Tanami Desert in the Northern Territory and the Gibson, Little Sandy and Great Sandy Deserts as well as parts of the Pilbara region in Western Australia (Dziminski & Carpenter, 2017; Southgate, 1990). The Bilby is described as occupying a wide range of vegetation types, including open tussock grassland on upland hills, Mulga woodland/shrubland growing on ridges and rises and spinifex growing on sandplains and dunes, drainage systems, salt lake systems, and other alluvial areas (Dziminski & Carpenter, 2017; Pavey, 2006).

This species was recorded in large numbers within the Survey Area during a previous survey (Phoenix Environmental, 2022). They were previously recorded in the Low *Acacia stellaticeps* over Triodia and Sparse Triodia Plains habitats. The field survey did not identify evidence of the species within the Survey Area. These habitats constitute core habitat for the Bilby because of their value for denning, foraging, and dispersal.

Oriental Pratincole (*Glareola maldivarum*) – MI (BC Act); MI, MA (EPBC Act)

The Oriental Pratincole typically prefers plains, shallow wet and dry edges of open bare wetlands and tidal mudflats and beaches for habitat (Pizzey & Knight, 2013). However, as this species breeds in Pakistan, India, and parts of south-east Asia, the Survey Area would be used for foraging only (Pizzey & Knight, 2013).

The Oriental Pratincole was previously recorded within the Survey Area in 2004 (DBCA, 2023), within the Low *Acacia stellaticeps* over Triodia habitat, which have the potential to become inundated during the wet season, providing the taxon with foraging habitat.

Brush-tailed Mulgara (*Dasyercus blythi*) - P4 (DBCA)

The Brush-tailed Mulgara is distributed widely across inland Australia with a population that fluctuates somewhat in response to seasonal conditions, although is probably substantially greater than 10,000 individuals even at its lowest point (Woinarski et al., 2014). Brush-tailed Mulgara habitat is bounded broadly by the Tanami Desert in the north, the Simpson Desert in the east, the Great Victoria Desert in the south and the Carnarvon, Murchison and Pilbara IBRA regions in the west (Woinarski et al., 2014). It is associated with hummock spinifex grasslands, but also uses other vegetation types (often sandplains, grasslands and woodlands) when mixed with or adjacent to hummock grasslands. It is mainly nocturnal and shelters during the day in burrow systems. Brush-tailed Mulgara burrows typically contain between two and nine entrances, tunnels are mostly on a single level and to a depth of about 300 mm (Thompson & Thompson, 2007). The diet of the Brush-tailed Mulgara comprises a broad range of invertebrates and small vertebrates (Woinarski et al., 2014).

The Brush-tailed Mulgara was previously recorded in the Low *Acacia stellaticeps* over Triodia habitat within the Survey Area (DBCA, 2023), which is the preferred habitat of the taxa. These records are concentrated to the western portion of the Survey Area, however, 83% of the Survey Area consists of Low *Acacia stellaticeps* over Triodia & Mixed Acacia Shrubs and Triodia Plains habitats, which indicates the species may be able to persist throughout the majority of the Survey Area.



Other Previously Recorded Species

There are three historical (1981) records of Marsh Sandpiper (*Tringa stagnatilis*), Red-necked Phalarope (*Phalaropus lobatus*), and Sanderling (*Calidris alba*) within the Survey Area (DBCA, 2023). All three records are associated with vouchered specimens by the Western Australian Museum and have the same coordinate.

The records of the three taxa are located in the Mixed Acacia Shrubs and Triodia Plains habitat, which is not the typical habitat preferred by these taxa (Menkhorst et al., 2019; Pizzey & Knight, 2013). Therefore, considering the age of the records, it is reasonable to assume the coordinates are inaccurate, and the specimens were likely vouchered north of the Survey Area near the coast, where most of the recent records of these species are located.

The Sanderling (*Calidris alba*) seldomly ventures away from the coast (Menkhorst et al., 2019; Pizzey & Knight, 2013), but the Marsh Sandpiper (*Tringa stagnatilis*) and the Red-necked Phalarope (*Phalaropus lobatus*) are able to utilize freshwater wetland habitat (Menkhorst et al., 2019; Pizzey & Knight, 2013). Considering there are tidal flats < 10 km to the north of the Survey Area, and major drainage habitat connecting these tidal flats to the Survey Area, it is possible for these species occupy the Survey Area after significant rain events. However, if we consider the records inside the Survey Area to be inaccurate, then their adjusted likelihood would be Low, as there are minimal recent or nearby records and limited suitable habitat.

5.2.2.3 High likelihood of occurrence within the Survey Area

Grey Falcon (*Falco hypoleucos*) – VU (BC Act); VU (EPBC Act)

The Grey Falcon is an elusive and endemic bird of the arid interior (Schoenjahn et al., 2019). It 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 Western Australia (BirdLife International, 2016a; Johnstone & Storr, 2004). The Grey Falcon is restricted largely to areas of the highest annual average temperatures where there is 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, 2016a; Johnstone & Storr, 2004).

The Survey Area has three Major Drainage habitats with eucalypt trees along the riverbanks, which constitute suitable nesting habitat for the Grey Falcon. The plains surrounding Major Drainage habitats are likely to be utilised by this taxon for hunting.

Ghost Bat (*Macroderma gigas*) – VU (BC Act); VU (EPBC Act)

The Ghost Bat is patchily distributed in small colonies in three areas of northern Australia, including the Pilbara and Kimberley in WA, the Northern Territory, and the northeast of QLD. The species requires undisturbed roost caves or mineshafts, usually complex systems with several openings (Van Dyck & Strahan, 2008). The species eats large insects, geckoes, frogs, small birds, and 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).



The presence of other bat species in the Survey Area indicates that there are suitable roosting caves for Ghost bat in the vicinity of the Survey Area. Ghost Bat also predate heavily on other bat species, particularly Pilbara Leaf-nosed Bat, which were recorded during the field survey. The Major and Minor Drainage habitats constitute moderate value habitat as the taxon may use these habitats for foraging and dispersal.

Pilbara Olive Python (*Liasis olivacea barroni*) – VU (BC Act); VU (EPBC Act)

The Olive Python 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). This large python is threatened due to its relatively small distribution, low population densities and may be affected by habitat disturbance such as grazing and fire. This species is known to frequent water bodies where it ambushes prey (Pearson, 1993). During a systematic survey of a large series of quadrats in the Pilbara, the Olive Python was only recorded in one quadrat (Doughty et al., 2011). This species is extremely cryptic given its method of hunting and nocturnality.

The Pilbara Olive Python was recorded frequently and recently throughout the Desktop Study Area. Preferred habitat is not present within the Survey Area; however, several water source occur throughout the desktop study area which have recorded the species that are linked to the Survey Area. The taxon is likely to use Outcrops and Breakaways habitats for dispersal and the Major and Minor Drainages provide supporting habitat.

Common Greenshank (*Tringa nebularia*) – MI (BC Act); MI, MA (EPBC Act)

The Common Greenshank is a migratory species to Australia that typically breeds in the boreal forest zone from sea level to 1,200 m in Norway (BirdLife International, 2016b). Common Greenshanks are present in the North-west Marine Region in internationally significant numbers, with approximately 1% of the flyway population visiting Ashmore Reef between September and March (Bamford et al., 2008). The species is found in coastal areas, riverbanks and coastal to freshwater wetlands, where it wades in shallow water foraging for prey, often lunging or probing for fish and invertebrates (BirdLife International, 2016b; Menkhorst et al., 2017; Pizzey & Knight, 2001). It is generally absent from the Western Deserts although there are a few records from the Great Sandy Desert and the Nullarbor Plain. It occurs around most of the coast from Cape Arid in the south to Carnarvon in the north-west. In the Kimberley it is recorded in the south-west and the north-east (Pizzey & Knight, 2001).

The Common Greenshank has been recorded frequently and recently within the Desktop Study Area and likely occurs within the Survey Area. Within the Survey Area, the Mixed Acacia Shrubs and Triodia Plains, and Sparse Triodia Plains habitats constitute supporting habitat for the Common Greenshank as they may become flooded after significant rain events. The taxon is likely to be transient within the Survey Area and, if present, will occur within the Survey Area between August and March.

Barn Swallow (*Hirundo rustica*) – MI (BC Act); MI, MA (EPBC Act)

The Barn Swallow is a casual visitor primarily to coastal areas from the Gascoyne north, although the species may appear as a vagrant in inland areas on an irregular basis (Johnstone & 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 & Storr, 1998). It is typically observed in the vicinity of urban water bodies and coastal wetlands.



The Barn Swallow has been recorded frequently within the Desktop Study Area and likely occurs within the Survey Area. Within the Survey Area, the Major and Minor Drainage habitats constitute supporting habitat for the Barn Swallow because of their value for roosting, foraging, and dispersal. The taxon is likely to be transient within the Survey Area and, if present, will occur within the Survey Area between Spring and Summer.

Little Curlew (*Numenius minutus*) – MI (BC Act); MI, MA (EPBC Act)

The Little Curlew is the smallest curlew, and generally spend the non-breeding season in northern Australia from Port Hedland in Western Australia to the Queensland coast. The Little Curlew is most often found feeding in short, dry grassland and sedgeland, including dry floodplains and blacksoil plains, which have scattered, shallow freshwater pools or areas seasonally inundated. Open woodlands with a grassy or burnt understorey, dry saltmarshes, coastal swamps, mudflats or sandflats of estuaries or beaches on sheltered coasts, mown lawns, gardens, recreational areas, ovals, racecourses and verges of roads, and airstrips are also used. Foraging sites are usually within 5 km of daytime roosting sites, as birds move between grassland and wetland, most feeding in drier grassland occurring during the first few hours after dawn and the late afternoon (DAWE, 2022).

The Little Curlew has been recorded frequently and recently within the Desktop Study Area and likely occurs within the Survey Area. Within the Survey Area, the Mixed Acacia Shrubs and Triodia Plains, and Sparse Triodia Plains habitats constitute supporting habitat for the Little Curlew as they may become flooded after significant rain events. The taxon is likely to be transient within the Survey Area and, if present, will occur within the Survey Area between October and April.

Oriental Plover (*Charadrius veredus*) – MI (BC Act); MI, MA (EPBC Act)

The Oriental Plover typically prefers grasslands and thinly vegetated plains, and open areas such as recently burnt country and heavily grazed pastures. During the hottest times of the day large flocks can be found on areas of wet ground associated with wetlands (Menkhorst et al., 2017). As this species breeds in China and Mongolia, the Survey Area would be used for foraging only.

The Oriental Plover has been recorded recently within the Desktop Study Area and likely occurs within the Survey Area. Within the Survey Area, the Mixed Acacia Shrubs and Triodia Plains, and Sparse Triodia Plains habitats constitute supporting habitat for the Oriental Plover as they may become flooded after significant rain events. The taxon is likely to be transient within the Survey Area during these flooding events and, if present, will occur within the Survey Area between mid-September and April.

Osprey (*Pandion haliaetus*) – MI (DBCA); MI, MA (EPBC Act)

The Osprey is considered to be moderately common in Australia (P. Olsen, 1998). The species is most abundant in northern Australia, where high population densities occur in remote areas (Johnstone & Storr, 1998). They require extensive areas of open fresh, brackish, or saline water for foraging (Marchant and Higgins, 1993). They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia (Johnstone & Storr, 1998; P. Olsen, 1998). They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes (Johnstone & Storr, 1998; P. Olsen, 1998).



The Osprey has been recorded recently within the Desktop Study Area and is likely to occur within the Survey Area. Within the Survey Area, the Major and Minor Drainage habitats constitute critical habitat for the Osprey because of their value for hunting and dispersal. The taxon is likely to be transient within the Survey Area during flooding events.

Peregrine Falcon (*Falco peregrinus*) – OS (DBCA)

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., 2019). The diet of the Peregrine Falcon has been well studied and primarily includes flocking species such as parrots, pigeons and on the east coast, European Starlings (J. Olsen & Fuentes, 2008).

Peregrine Falcon was not observed during the survey; however, this species has been previously recorded twice within 3 km of the Survey Area in recent years (DBCA, 2023). In the absence of cliff ledges, Peregrine Falcons will use trees for nesting (Morcombe & Stewart, 2013). The Open Eucalypt Woodland habitat within the Survey Area and surrounds may provide suitable nesting and hunting habitat to support this species.

5.2.2.4 Medium likelihood of occurrence within the Survey Area

Glossy Ibis (*Plegadis falcinellus*) – MI (BC Act); MI, MA (EPBC Act)

The preferred foraging and breeding habitat of the Glossy Ibis includes freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation (del Hoyo et al., 1992; Marchant & Higgins, 1990). The Glossy Ibis builds a platform nest of sticks in trees or shrubs above water and typically nests in colonies (Pizzey & Knight, 2013). The distribution of the Glossy Ibis is generally east of the Kimberley in Western Australia and Eyre Peninsula in South Australia. The species is also known to be patchily distributed in the rest of Western Australia (DEE, 2020).

The Glossy Ibis has been recorded within the Desktop Study Area and may occur within the Survey Area. Within the Survey Area, there are several habitats which may flood during significant rain events and provide suitable habitat for the Glossy Ibis. The taxon may be transient within the Survey Area during these flooding events.

Pacific Swift/Fork-tailed Swift (*Apus pacificus*) – MI (BC Act); MI, MA (EPBC Act)

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 (i.e. low to very high) over varied habitats, ranging from rainforests to semi-deserts (Morcombe, 2003).

The Pacific Swift has been recorded within the Desktop Study Area and may occur within the Survey Area. Within the Survey Area, all habitats within the Survey Area may be utilised for foraging and dispersal.



Pilbara Grasswren (*Amytornis whitei whitei*) – P4 (as *Amytornis striatus striatus*, DBCA)

Restricted to spinifex associations on rocky slopes and ridges, with or without shrubs or light tree cover, preferring areas with tall dense spinifex hummocks (Menkhorst et al., 2019). Its distribution across the ironstone Chichester, Hamersley, Ophthalmia and Parry Ranges is bisected by the Fortescue River, with an outlying population south of the Ashburton River in the Barlee Range. It is widely but patchily distributed and generally uncommon (Johnstone et al., 2013; Johnstone & Storr, 2004).

The Pilbara Grasswren has been recorded within the Desktop Study Area and may occur within the Survey Area. Within the Survey Area, the Sparse Triodia Plains and Stony Hills habitats constitute critical habitat for the Pilbara Grasswren because of their value for foraging and shelter.

Short-tailed Mouse (*Leggadina lakedownensis*) – P4 (DBCA)

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 & Strahan, 2008). In the Pilbara it occurs on stony hummock grassland. It is generally rare, with scattered populations, and very little is known of its biology (Van Dyck & Strahan, 2008).

The Short-tailed Mouse has been recorded within the Desktop Study Area and may occur within the Survey Area. Within the Survey Area, the Sparse Triodia Plains and Stony Hills habitats constitute critical habitat for the Short-tailed Mouse because of their value for foraging and shelter.

Other species with medium likelihood of occurrence within the Survey Area

There were an additional 20 shorebird species that were considered to have a medium likelihood of occurrence due to the proximity of historic records and the limited suitable habitats within the Survey Area. As there are suitable tidal flats < 10 km north of the Survey Area, and there are drainage habitats that connect these flats to the Survey Area, there presents an opportunity for these species to occur within the Survey Area after significant rain events that would flood these habitats.



6.0 Conclusion

Flora and Vegetation

- No Threatened flora species pursuant to the EPBC Act 1999 and/or gazetted as Threatened/Declared Rare Flora pursuant to the BC Act 2016 were recorded during the survey.
- Two DBCA listed Priority flora are considered to have been recorded; *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (P1) and *Gymnanthera cunninghamii* (P3).
- Eight introduced species were recorded during the survey, including **Calotropis procera* which is listed by the State Department of Primary Industries and Regional Development as a Declared Pest.
- Fourteen vegetation types were mapped within the Survey Area, one of which likely represents GDEs. Vegetation condition throughout the Survey Area was largely in Very Good condition, with drainages and some low-lying floodplain areas in Good to Degraded condition, primarily due to Buffel Grass (**Cenchrus ciliaris*) and livestock/pastoralism.
- No TECs or PECs were recorded within the Survey Area.

Vertebrate Fauna

- Nine fauna habitats were mapped within the Survey Area, of which the Low *Acacia stellaticeps* over Triodia, Mixed Acacia Shrubs and Triodia Plains, Outcrops and Breakaways, and Stony Hills habitats represent the most value to fauna assemblages overall.
- Two significant fauna species were recorded during the fauna survey.
- Seven significant fauna species were previously recorded within the Survey Area.
- Nine significant fauna species had a high likelihood of occurrence, 24 had a medium likelihood of occurrence, and 33 species had a low likelihood of occurrence.
- Three introduced species were recorded during the survey, European Cattle (**Bos primigenius taurus*), Cat (**Felis catus*), and Domestic Pigeon/Rock Dove (*Columba livia*).



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Appendix A Maps

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

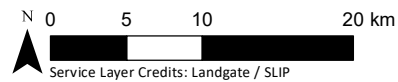
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29 July 2024

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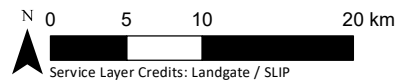
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Survey Area
 MAP 1

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





























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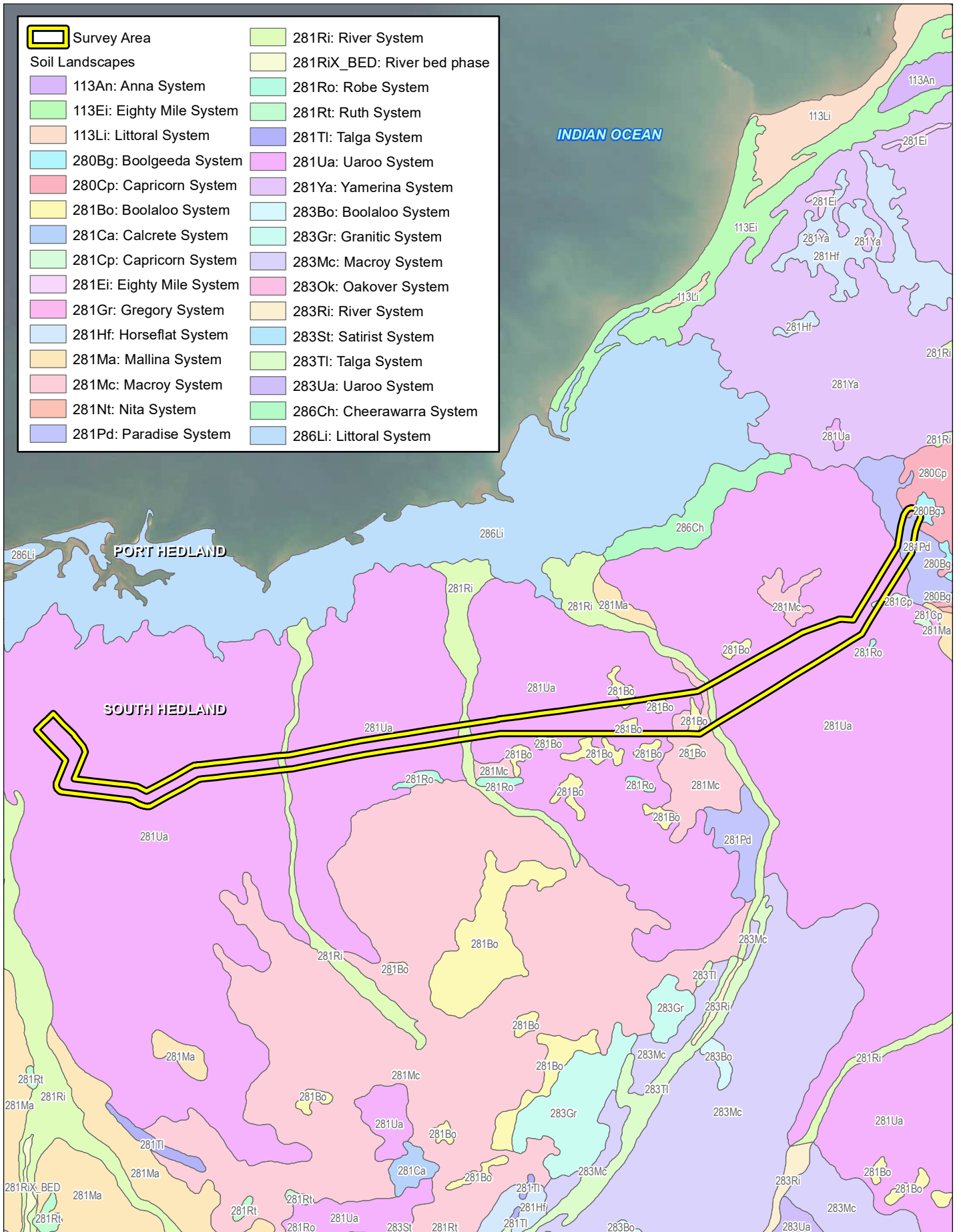


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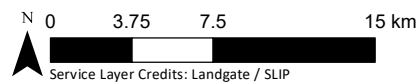
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 Flora and Fauna Survey Technical Report

IBRA Subregions
 MAP 2

 Survey Area	 281Ri: River System
Soil Landscapes	 281RiX_BED: River bed phase
 113An: Anna System	 281Ro: Robe System
 113Ei: Eighty Mile System	 281Rt: Ruth System
 113Li: Littoral System	 281Ti: Talga System
 280Bg: Boolgeeda System	 281Ua: Uaroo System
 280Cp: Capricorn System	 281Ya: Yamerina System
 281Bo: Boolaloo System	 283Bo: Boolaloo System
 281Ca: Calcrete System	 283Gr: Granitic System
 281Cp: Capricorn System	 283Mc: Macroy System
 281Ei: Eighty Mile System	 283Ok: Oakover System
 281Gr: Gregory System	 283Ri: River System
 281Hf: Horseflat System	 283St: Satirist System
 281Ma: Mallina System	 283Ti: Talga System
 281Mc: Macroy System	 283Ua: Uaroo System
 281Nt: Nita System	 286Ch: Cheerawarra System
 281Pd: Paradise System	 286Li: Littoral System



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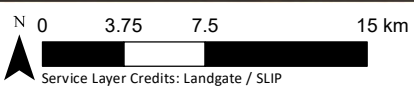
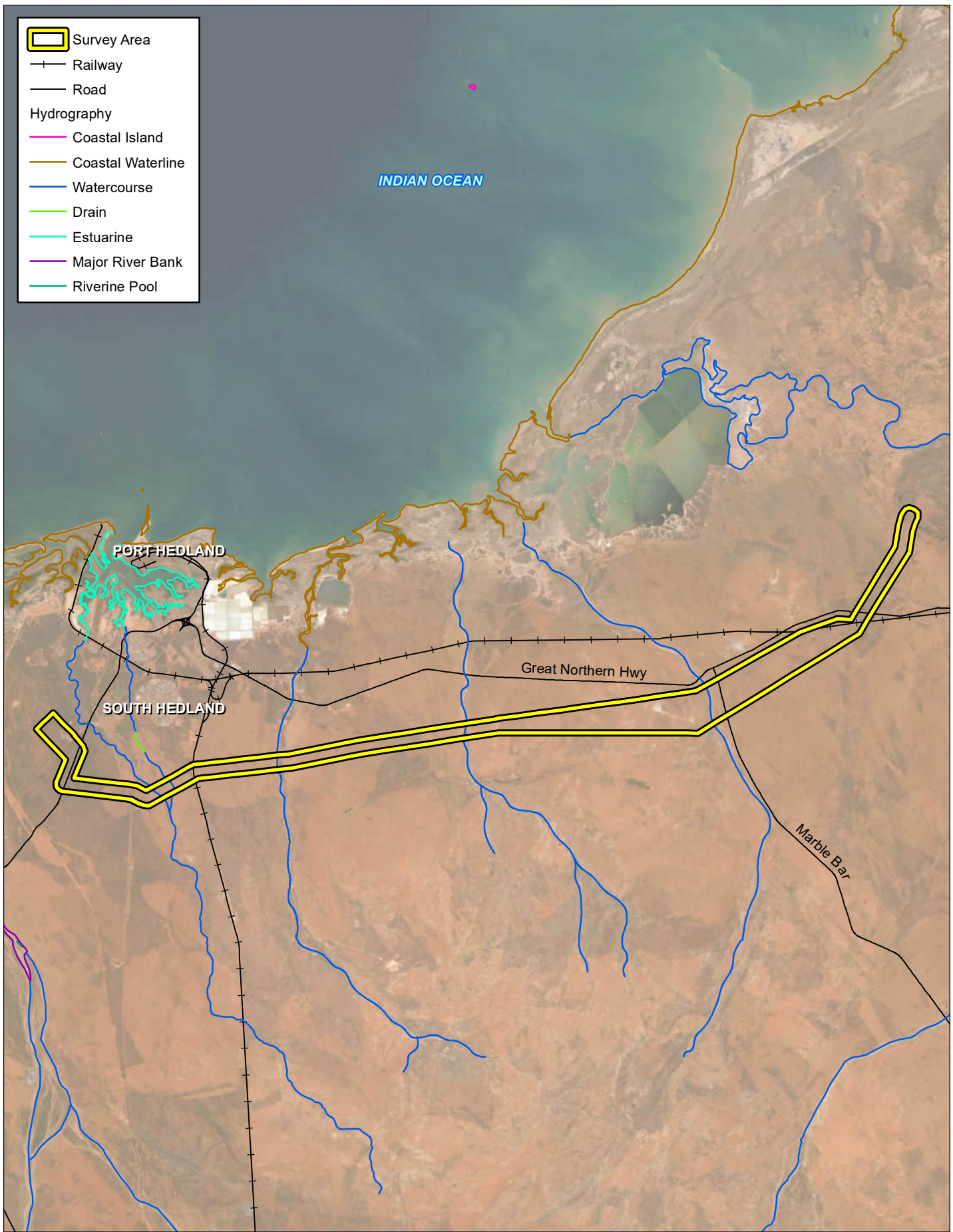
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Soil Landscapes
 MAP 3

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-  Survey Area
-  Railway
-  Road
- Hydrography
 -  Coastal Island
 -  Coastal Waterline
 -  Watercourse
 -  Drain
 -  Estuarine
 -  Major River Bank
 -  Riverine Pool



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Hydrography
 MAP 4
















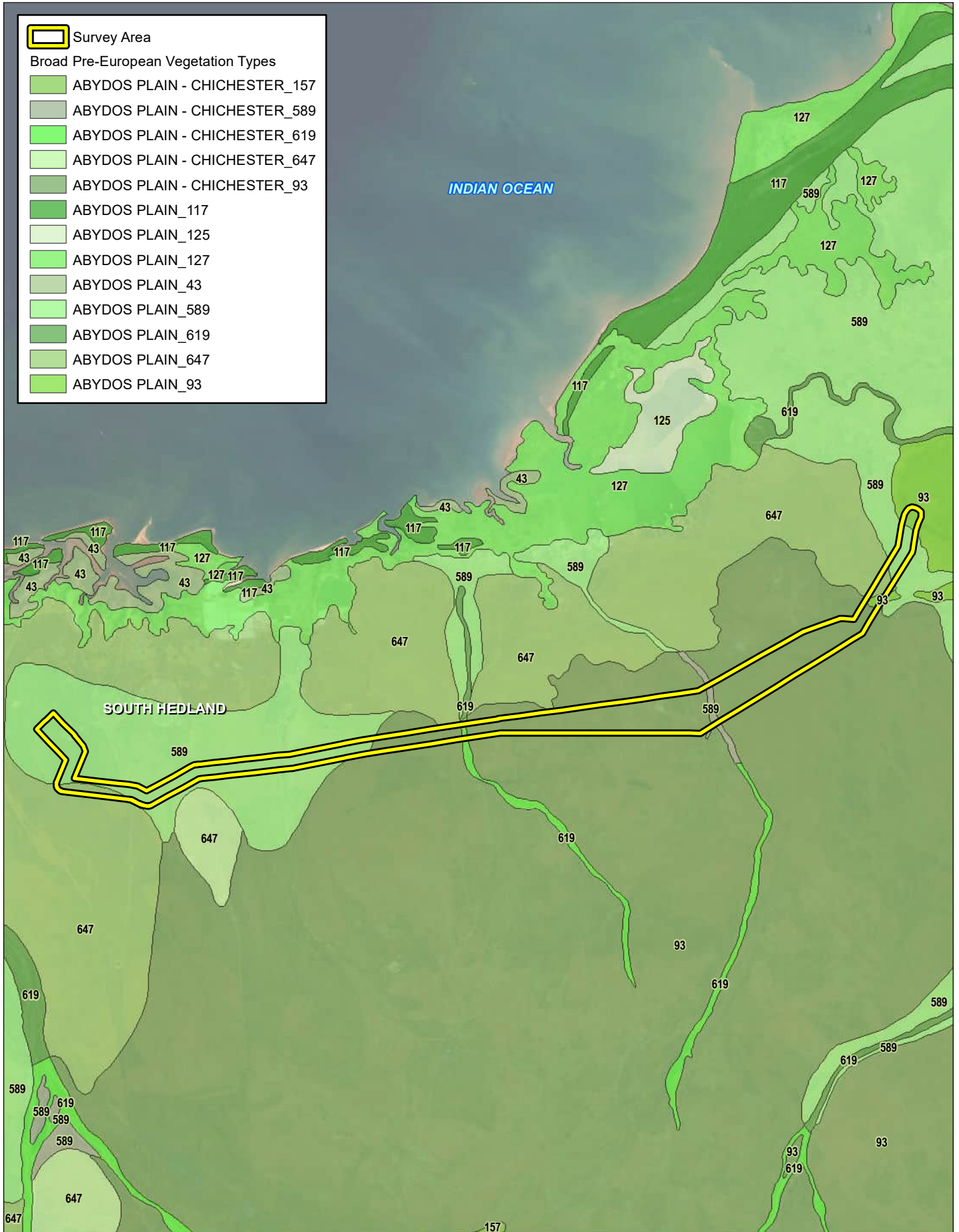
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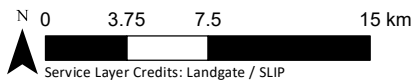
 Survey Area

Broad Pre-European Vegetation Types

-  ABYDOS PLAIN - CHICHESTER_157
-  ABYDOS PLAIN - CHICHESTER_589
-  ABYDOS PLAIN - CHICHESTER_619
-  ABYDOS PLAIN - CHICHESTER_647
-  ABYDOS PLAIN - CHICHESTER_93
-  ABYDOS PLAIN_117
-  ABYDOS PLAIN_125
-  ABYDOS PLAIN_127
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-  ABYDOS PLAIN_93








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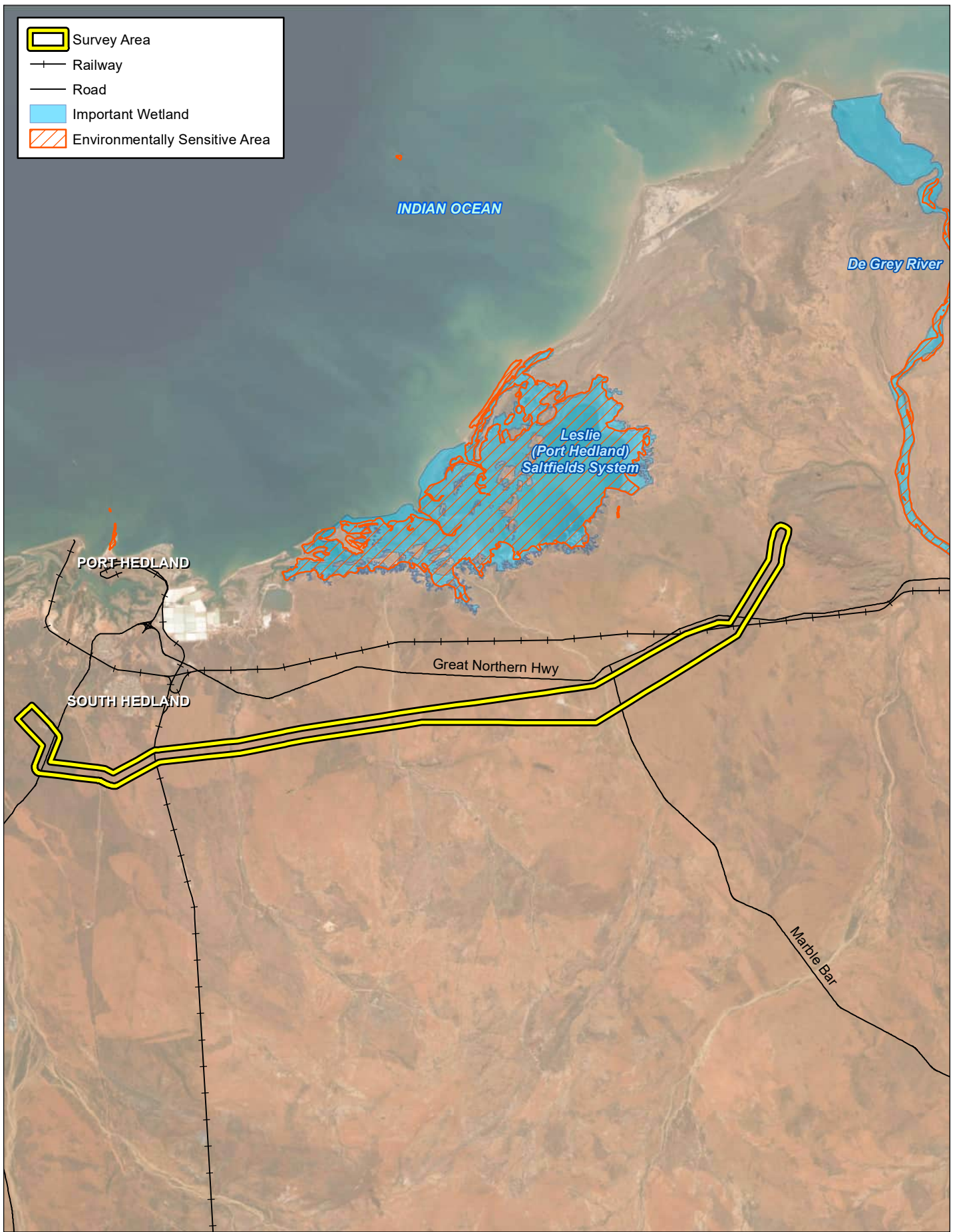


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Broad Pre-European Vegetation Types
MAP 5

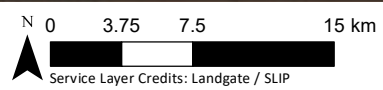
-  Survey Area
-  Railway
-  Road
-  Important Wetland
-  Environmentally Sensitive Area



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 Flora and Fauna Survey Technical Report

ESAs and Conservation Areas
 MAP 6

Survey Area

Significant Flora

- Threatened
- Priority 1
- Priority 2
- Priority 3
- Priority 4

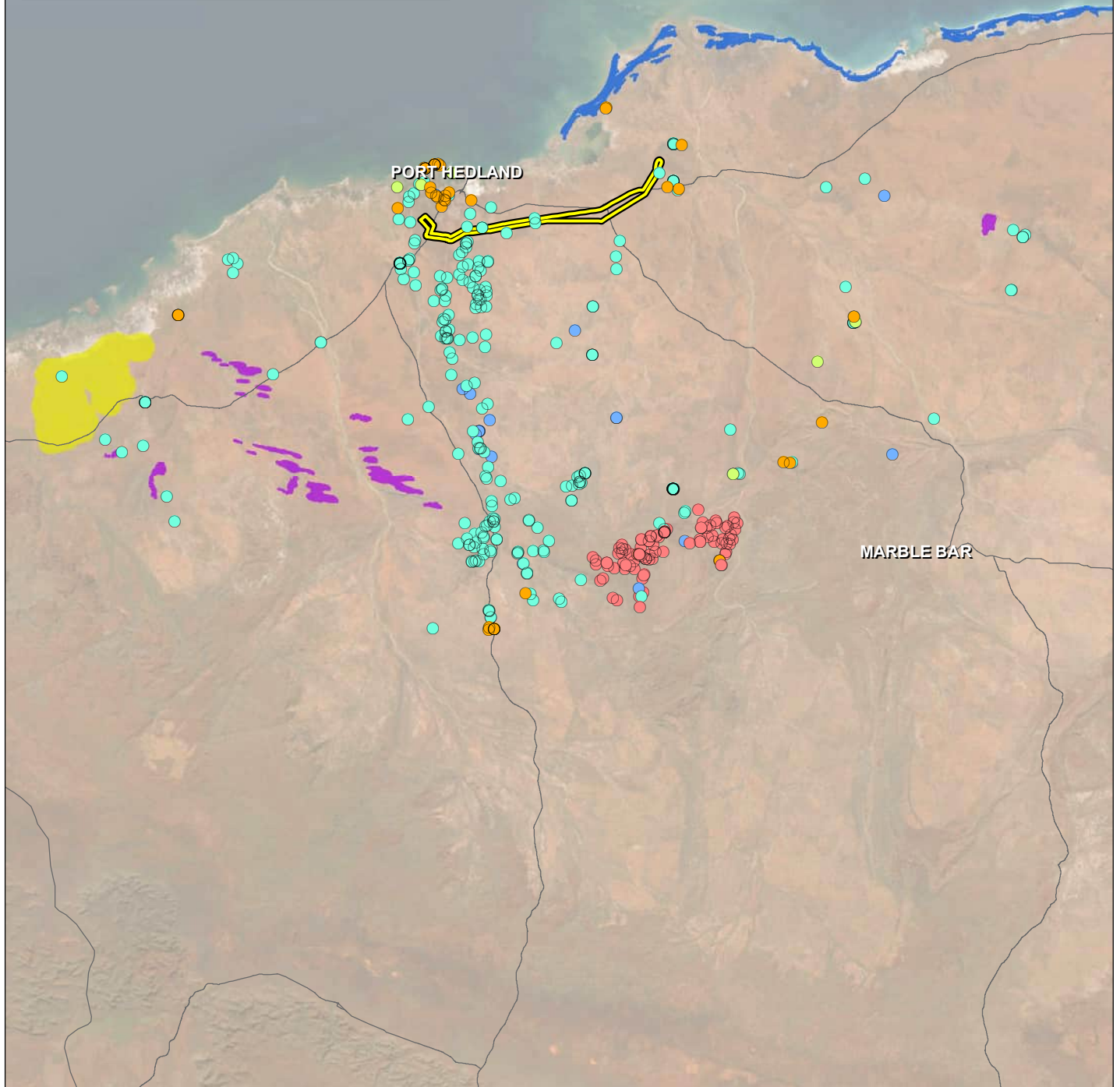
Significant Ecological Community

- Eighty Mile Land System
- Gregory Land System
- Horseflat Land System of the Roebourne Plains

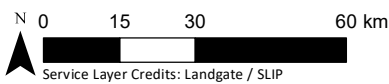
INDIAN OCEAN

PORT HEDLAND

MARBLE BAR



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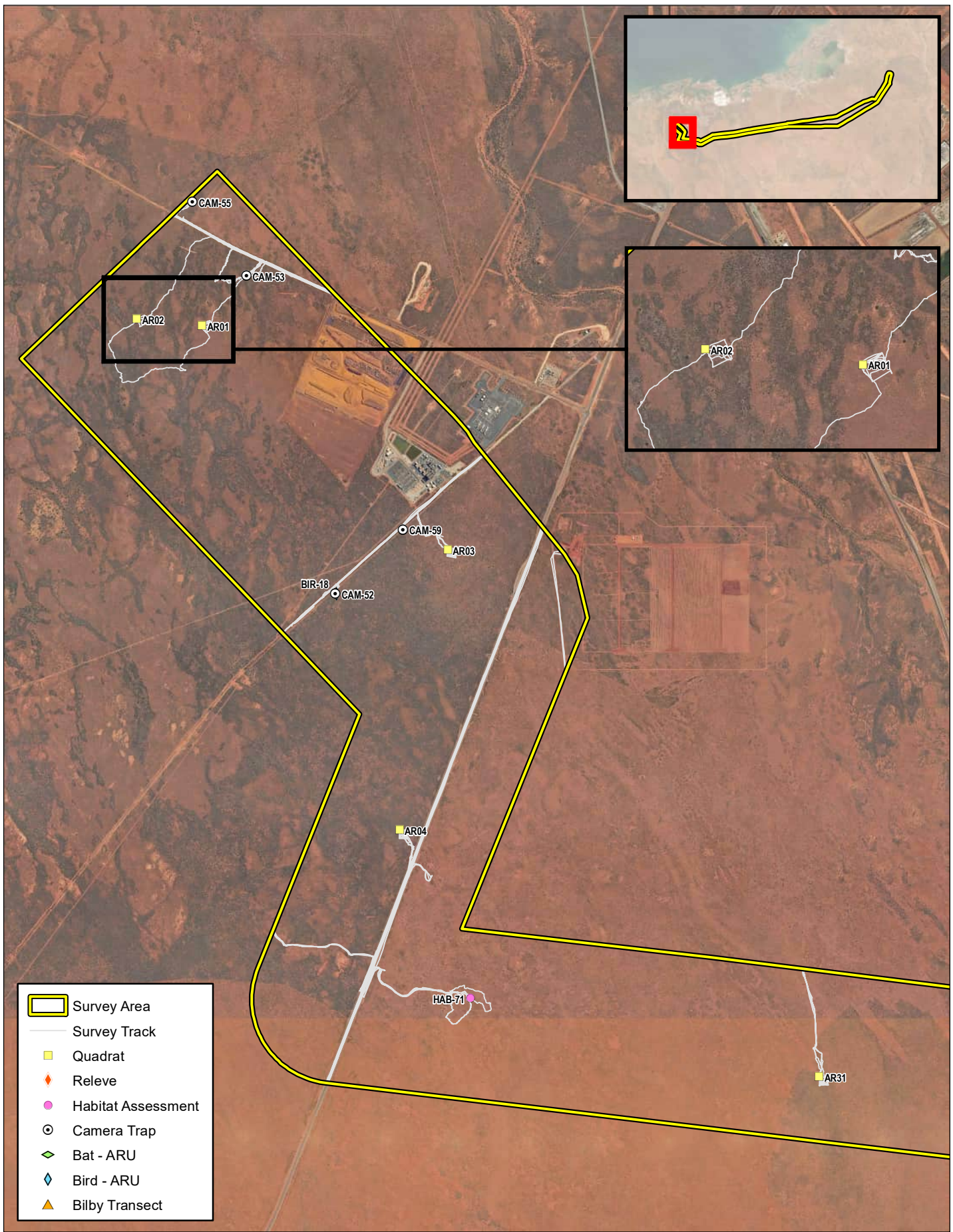
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 Scale : 1:1,500,000 @ A4
 Project Number : 072189
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Significant Flora and Ecological
 Community Database Search Results
 MAP 7

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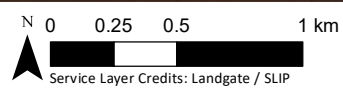
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- Survey Area
- Survey Track
- Quadrat
- Releve
- Habitat Assessment
- Camera Trap
- Bat - ARU
- Bird - ARU
- Bilby Transect



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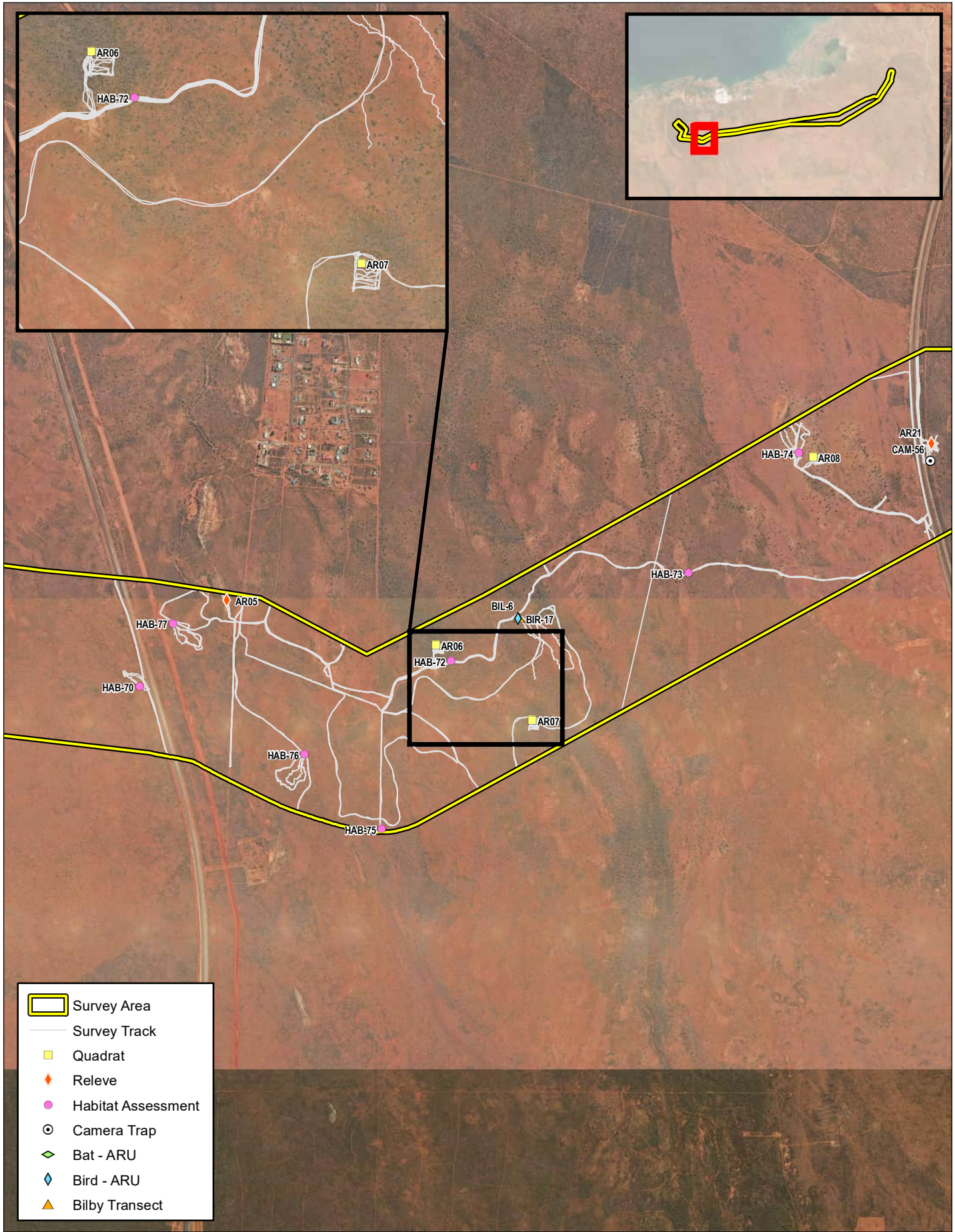


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Survey Effort
 MAP 08a

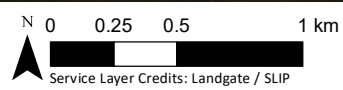
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- Survey Area
- Survey Track
- Quadrat
- ◆ Revele
- Habitat Assessment
- ⊙ Camera Trap
- ◇ Bat - ARU
- ◇ Bird - ARU
- ▲ Bilby Transect



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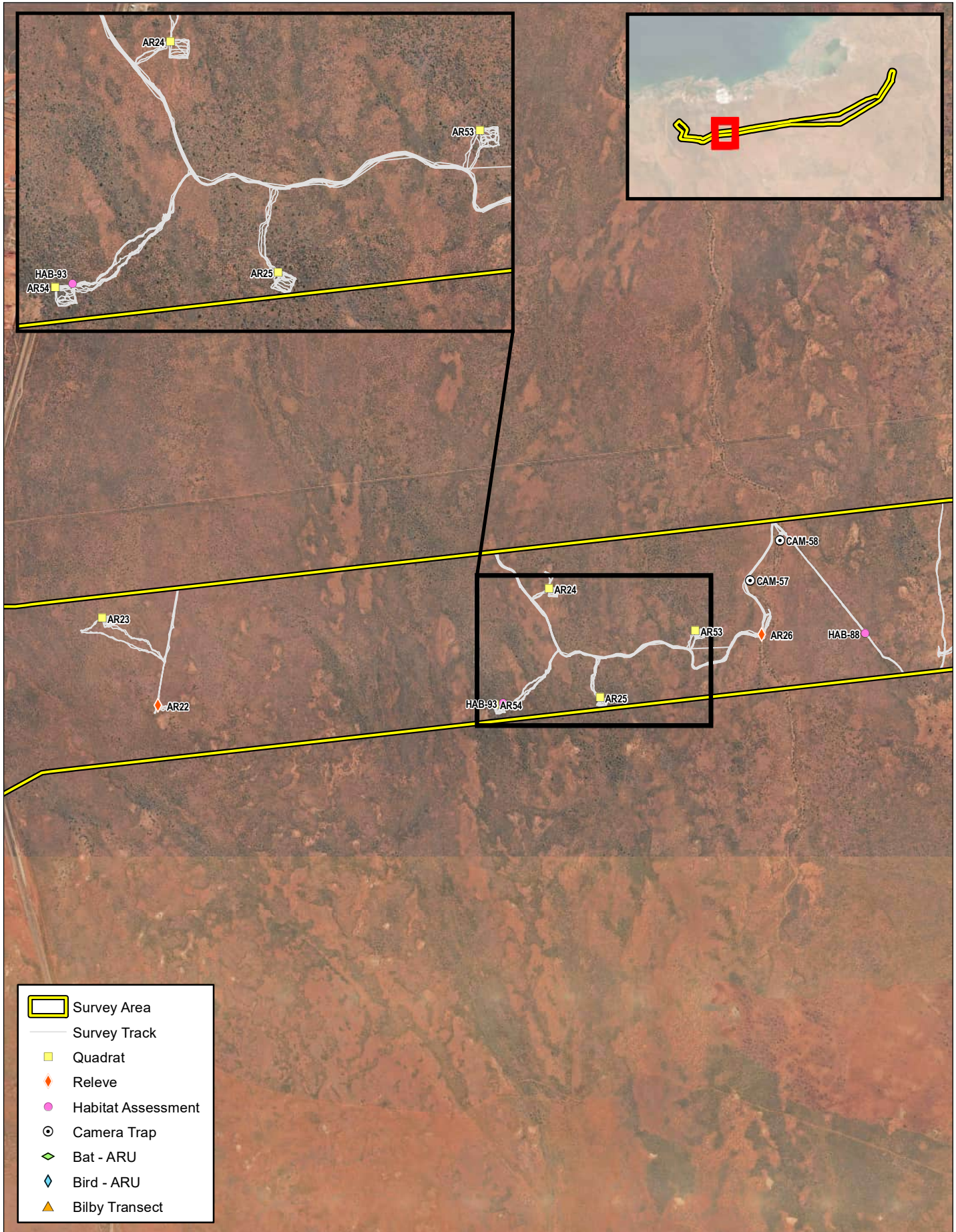











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 MAP 08b

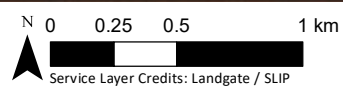
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-  Survey Area
-  Survey Track
-  Quadrat
-  Releve
-  Habitat Assessment
-  Camera Trap
-  Bat - ARU
-  Bird - ARU
-  Bilby Transect



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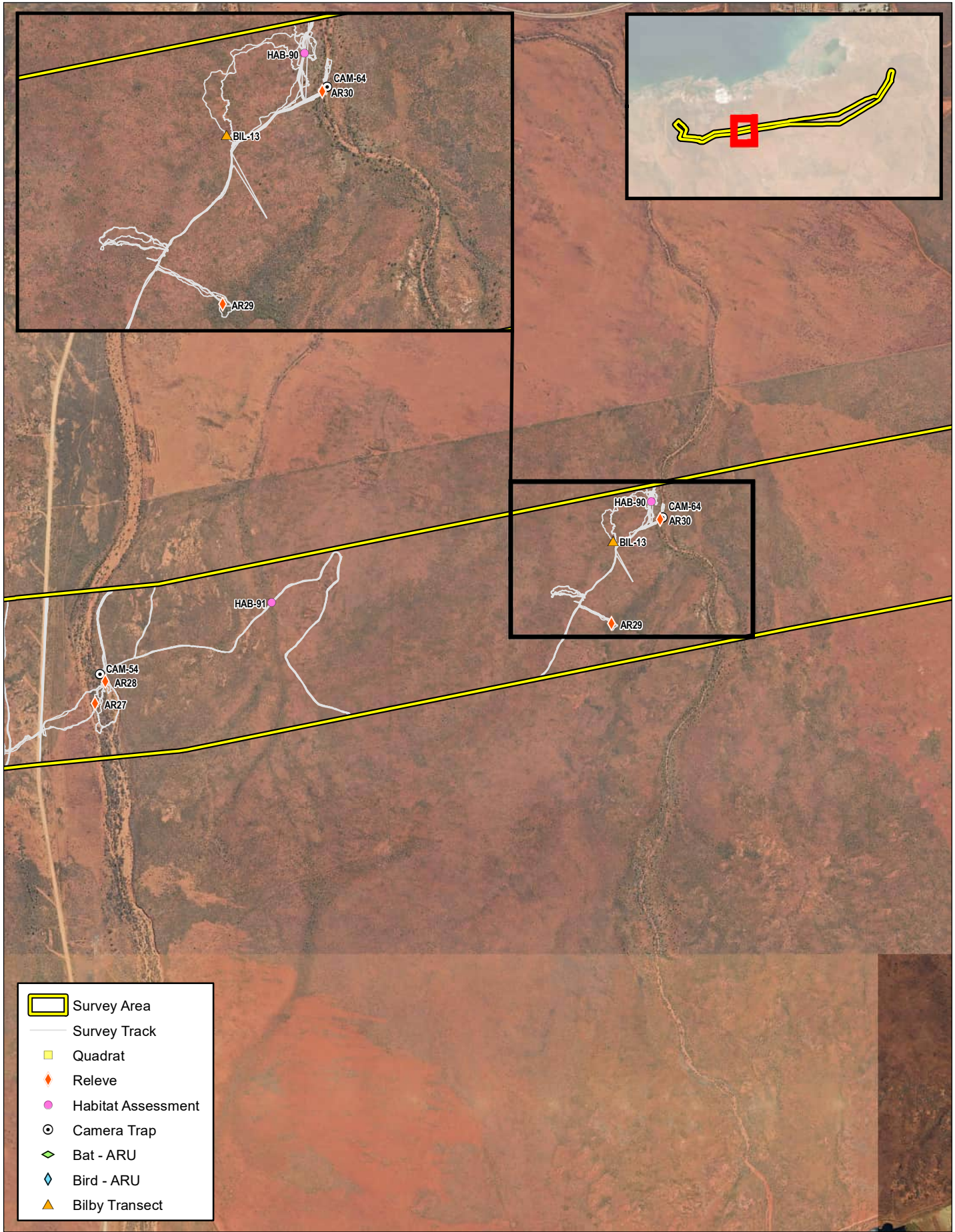


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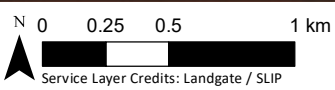
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 MAP 08c

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- Survey Area
- Survey Track
- Quadrat
- Releve
- Habitat Assessment
- Camera Trap
- Bat - ARU
- Bird - ARU
- Bilby Transect



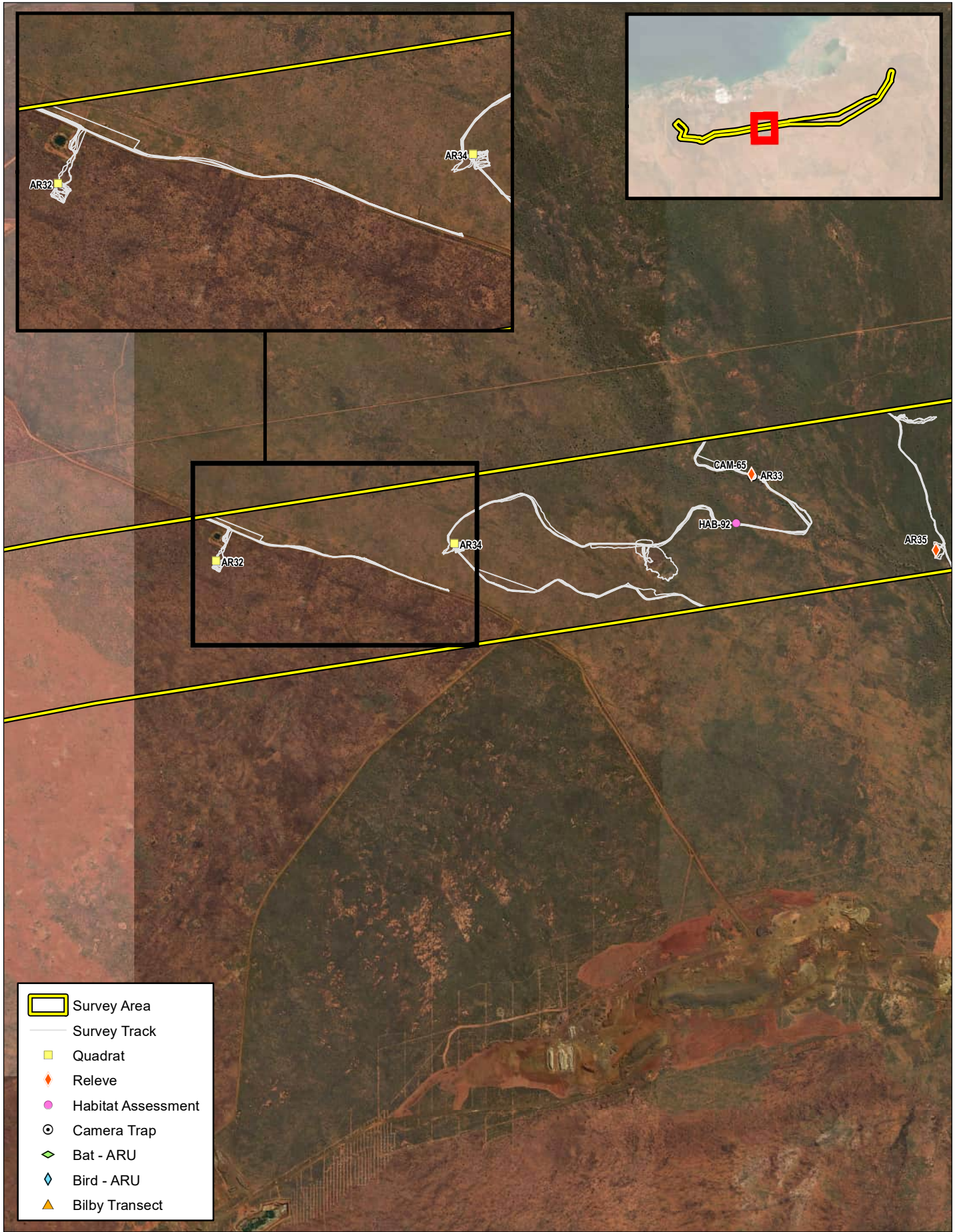
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




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 MAP 08d

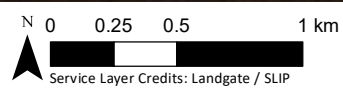
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-  Survey Area
-  Survey Track
-  Quadrat
-  Releve
-  Habitat Assessment
-  Camera Trap
-  Bat - ARU
-  Bird - ARU
-  Bilby Transect



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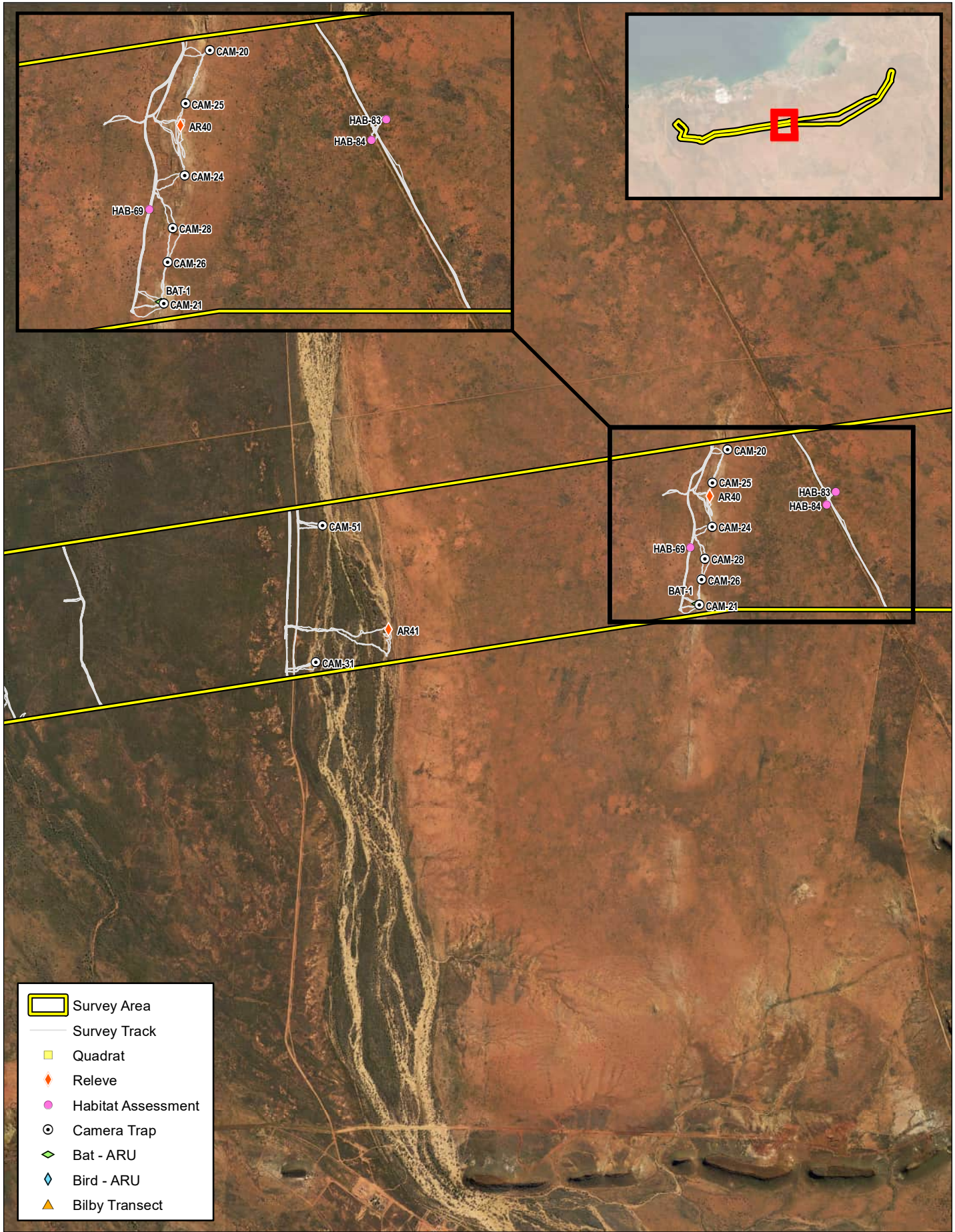


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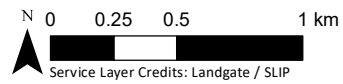
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 MAP 08e

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- Survey Area
- Survey Track
- Quadrat
- Releve
- Habitat Assessment
- Camera Trap
- Bat - ARU
- Bird - ARU
- Bilby Transect



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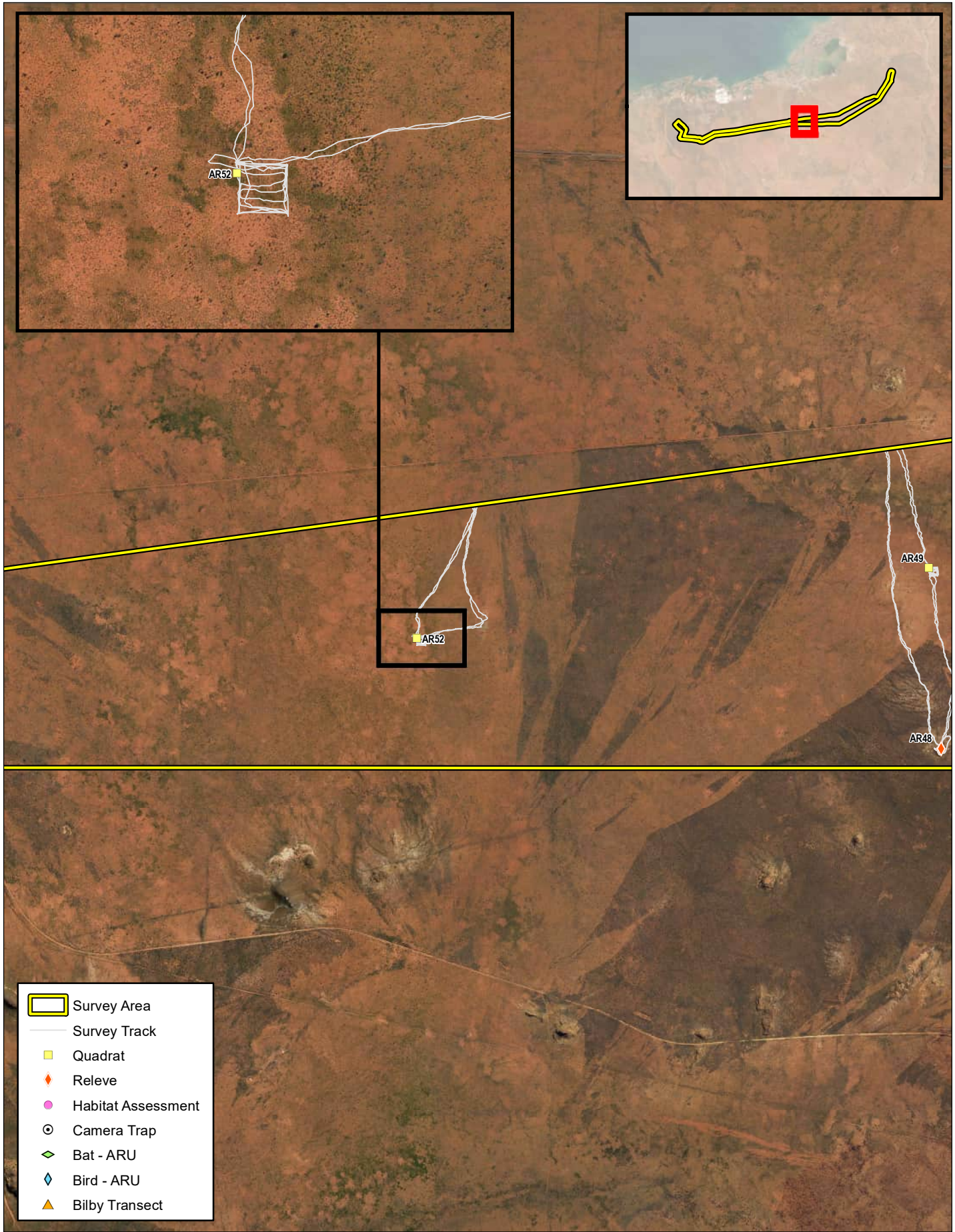











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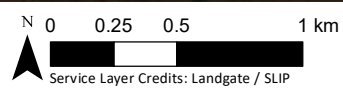
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Survey Effort
 MAP 08f

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-  Survey Area
-  Survey Track
-  Quadrat
-  Releve
-  Habitat Assessment
-  Camera Trap
-  Bat - ARU
-  Bird - ARU
-  Bilby Transect



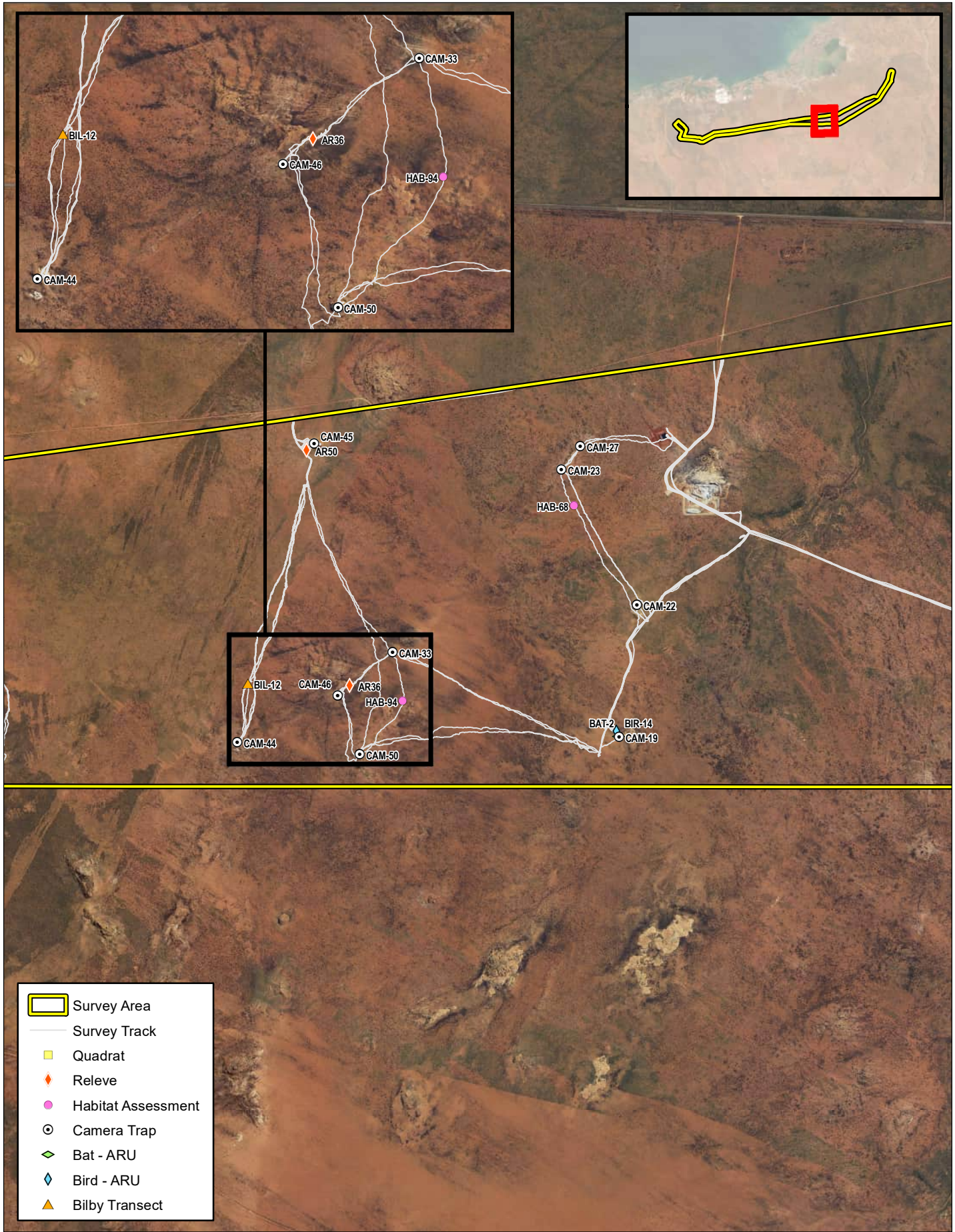
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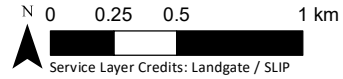
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 MAP 08g

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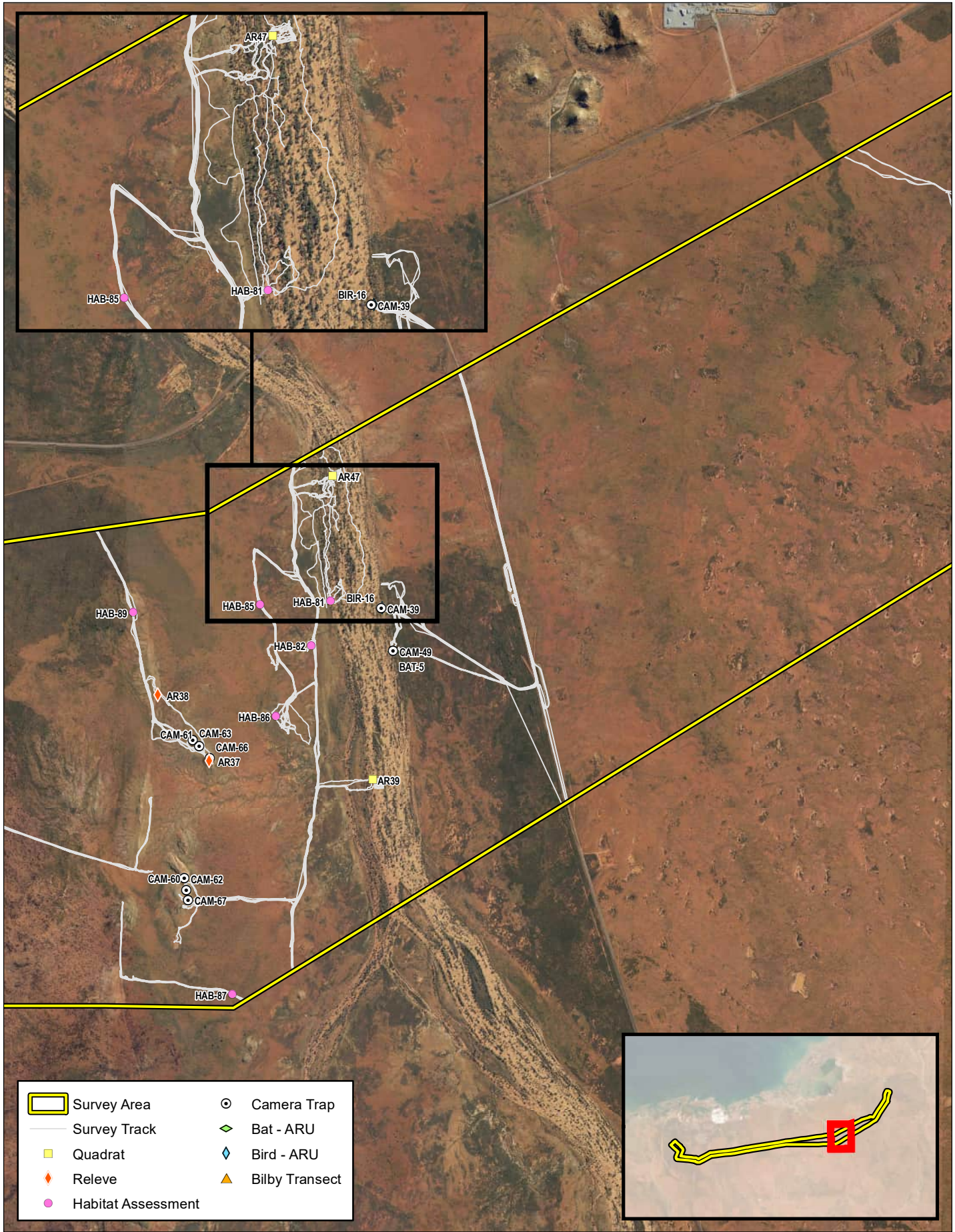


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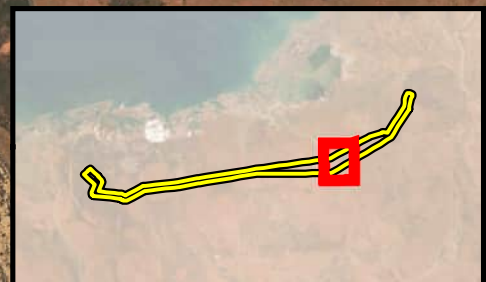
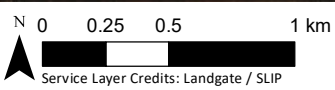
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 MAP 08h

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	Survey Area		Camera Trap
	Survey Track		Bat - ARU
	Quadrat		Bird - ARU
	Releve		Bilby Transect
	Habitat Assessment		



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Flora and Fauna Survey Technical Report

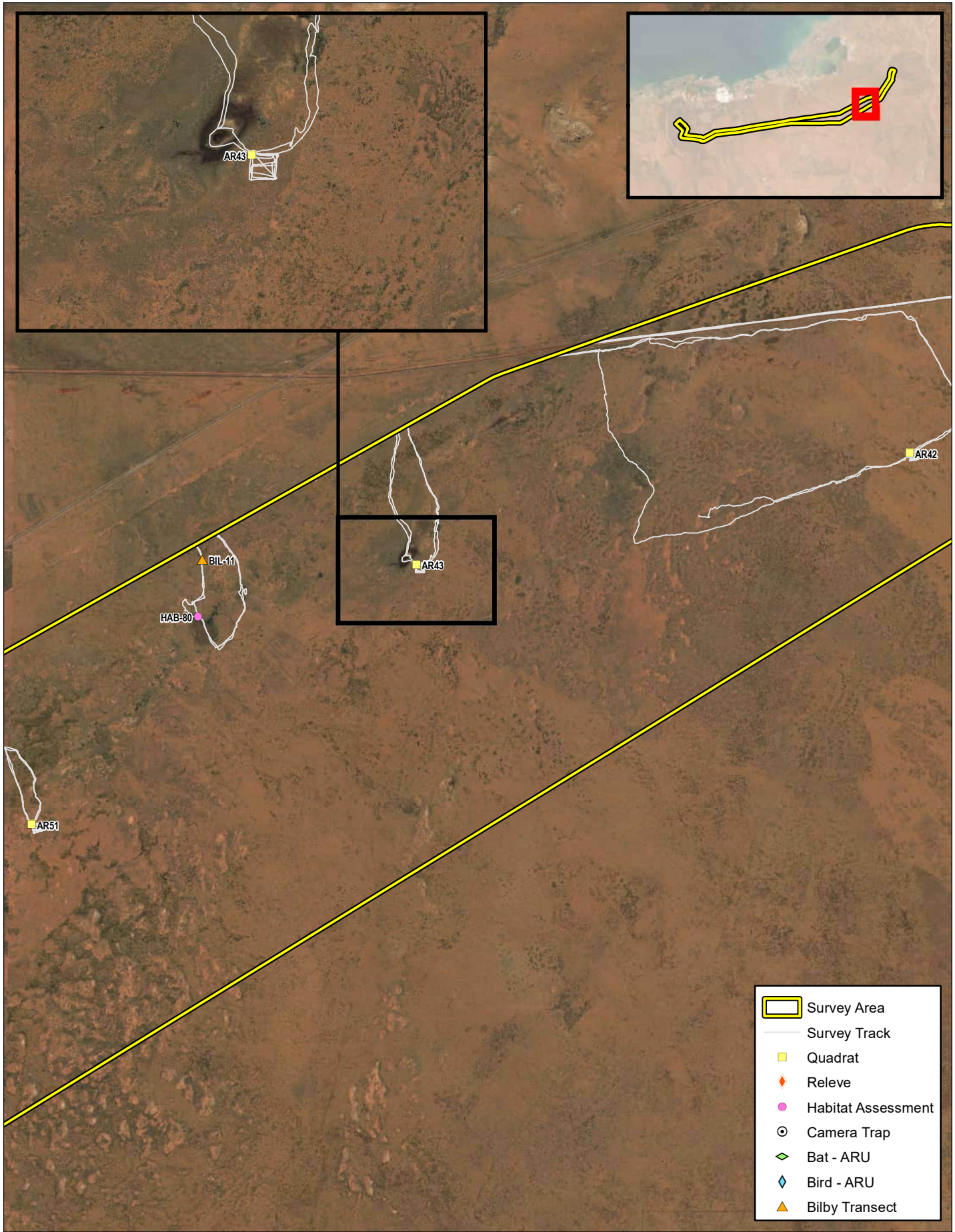


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MAP 08i

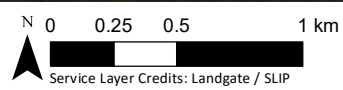
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- Survey Area
- Survey Track
- Quadrat
- Revele
- Habitat Assessment
- Camera Trap
- Bat - ARU
- Bird - ARU
- Bilby Transect



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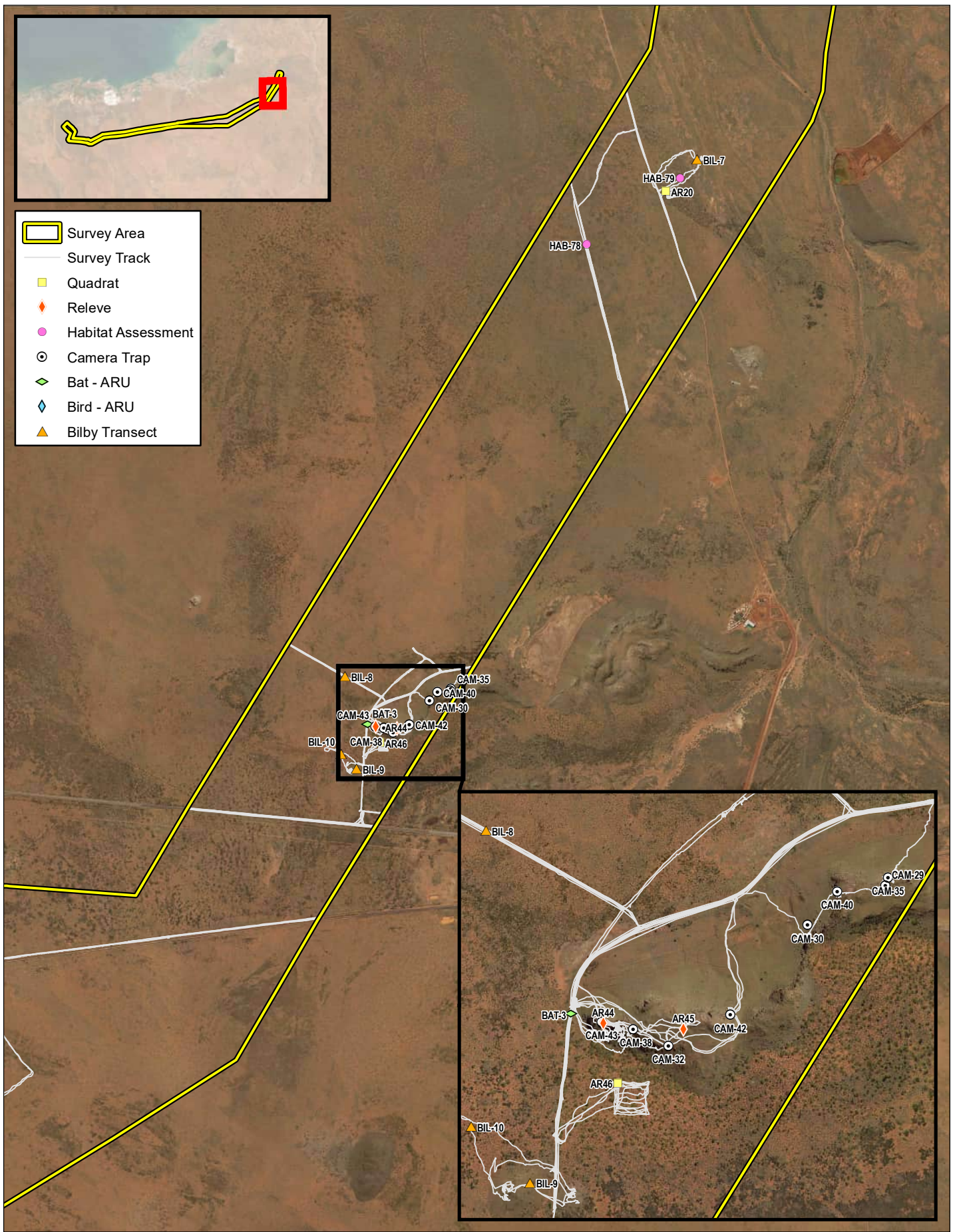
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 MAP 08j

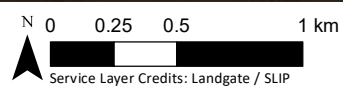
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- Survey Area
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- Releve
- Habitat Assessment
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- Bird - ARU
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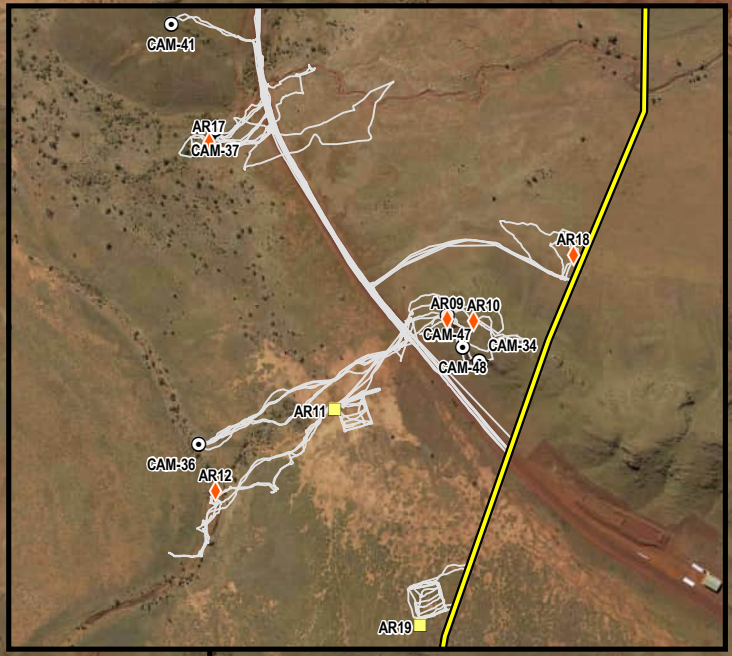
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Survey Effort
 MAP 08k

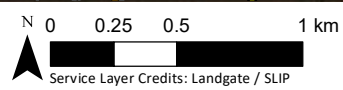
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- Survey Area
- Survey Track
- Quadrat
- Revele
- Habitat Assessment
- Camera Trap
- Bat - ARU
- Bird - ARU
- Bilby Transect




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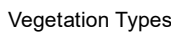











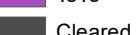
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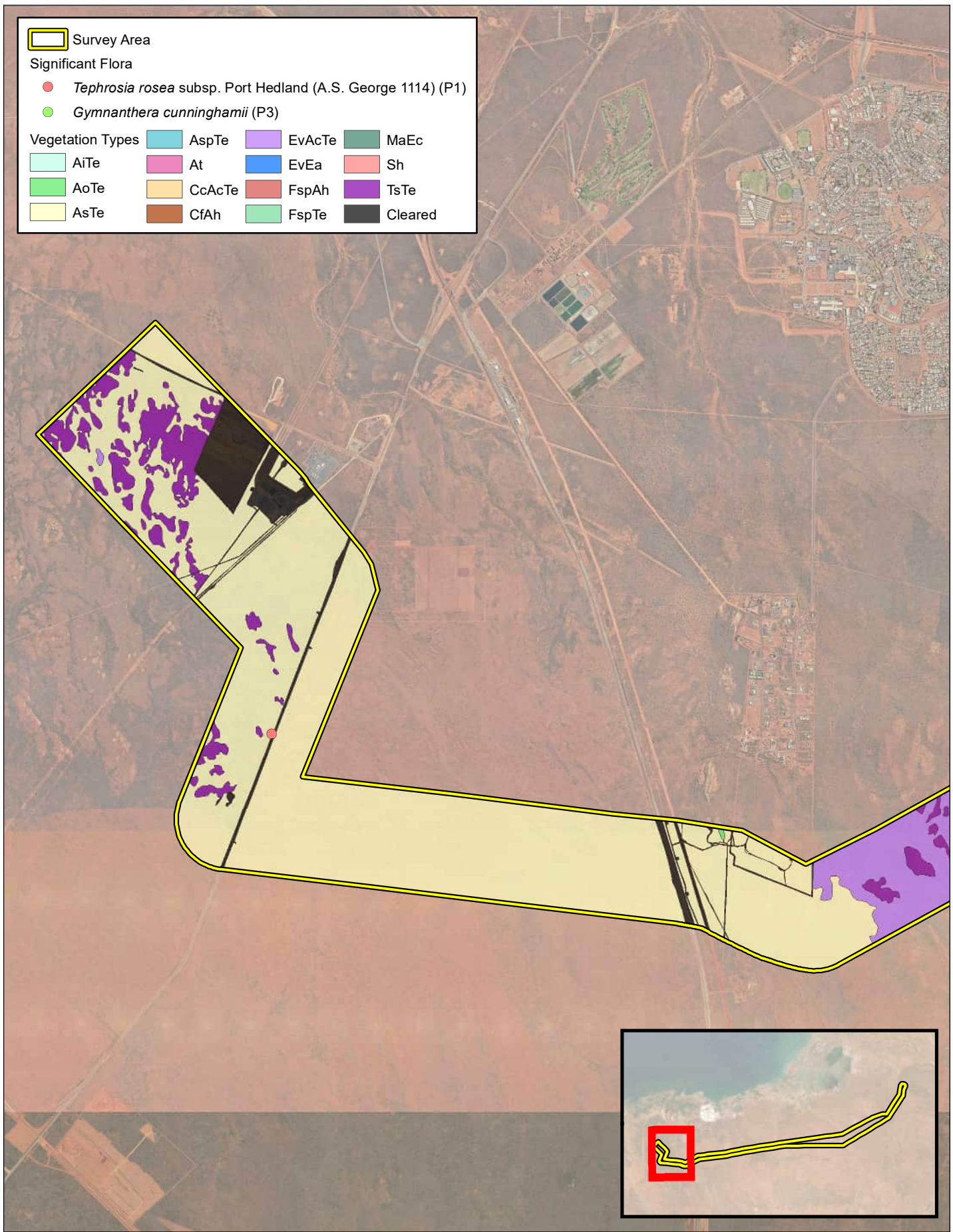
Survey Effort
 MAP 081

 Survey Area

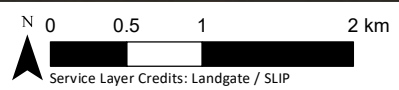
Significant Flora

-  *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (P1)
-  *Gymnanthera cunninghamii* (P3)

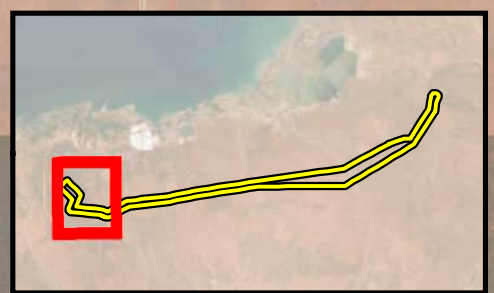
Vegetation Types		
 AspTe	 EvAcTe	 MaEc
 AiTe	 At	 EvEa
 AoTe	 CcAcTe	 FspAh
 AsTe	 CfAh	 FspTe
		 Cleared



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


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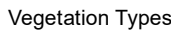





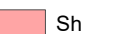



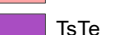



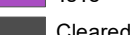
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Atlas Ridley Magnetite Project Connection
Flora and Fauna Survey Technical Report
Vegetation Types and Significant Flora
in the Survey Area
MAP 09a

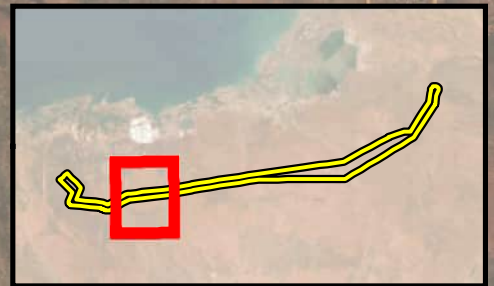
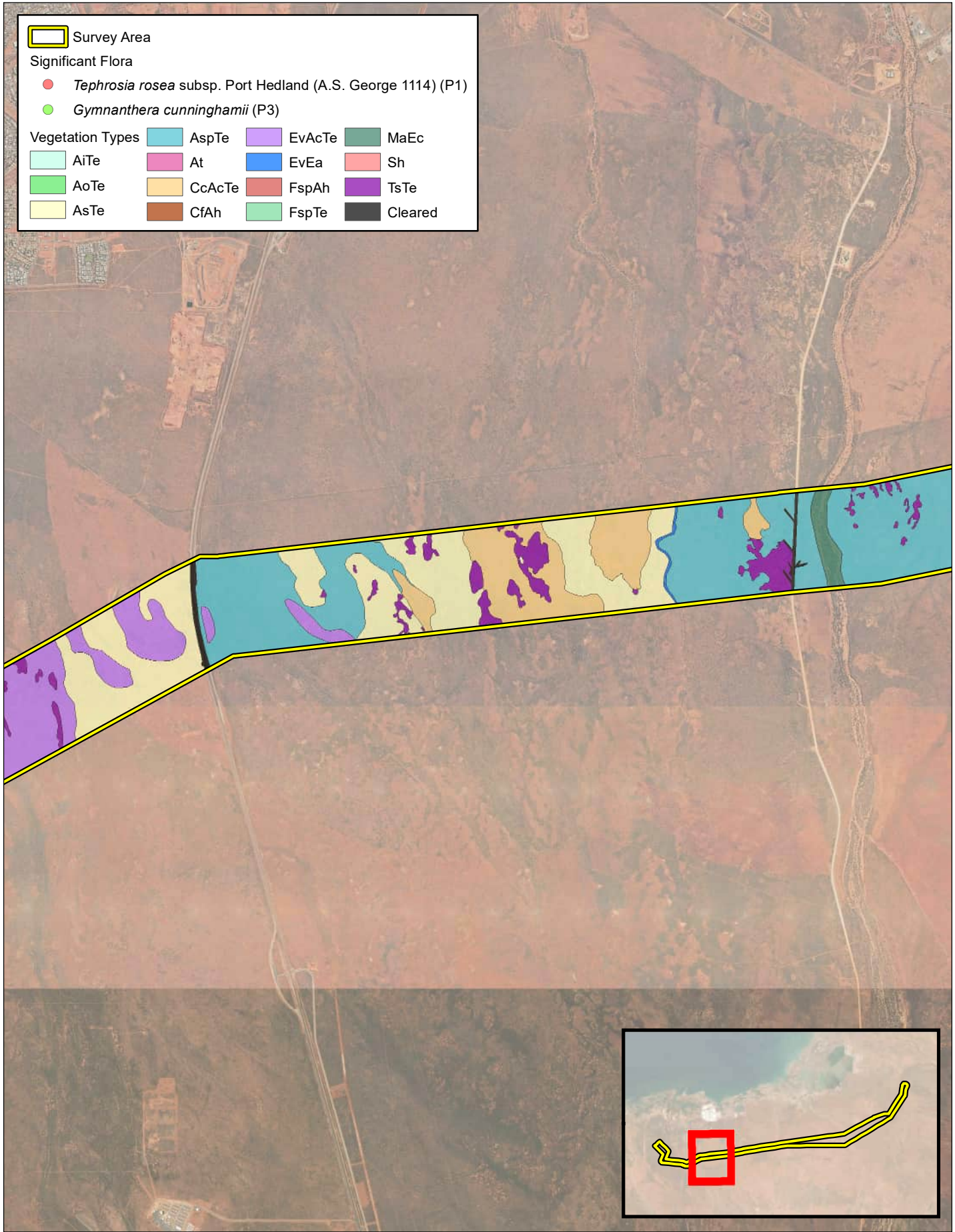
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 Survey Area

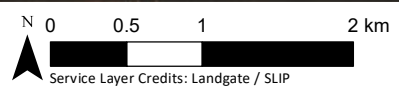
Significant Flora

-  *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (P1)
-  *Gymnanthera cunninghamii* (P3)

 AspTe	 EvAcTe	 MaEc	
 AiTe	 At	 EvEa	 Sh
 AoTe	 CcAcTe	 FspAh	 TsTe
 AsTe	 CfAh	 FspTe	 Cleared



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Flora and Fauna Survey Technical Report

Vegetation Types and Significant Flora
in the Survey Area
MAP 09b

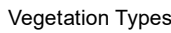








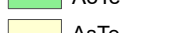


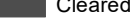
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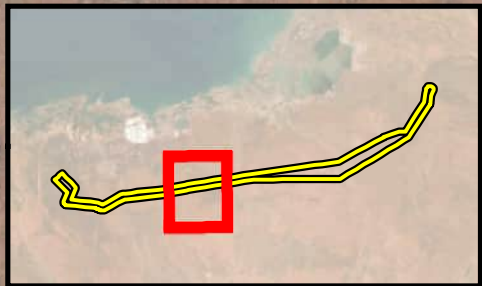
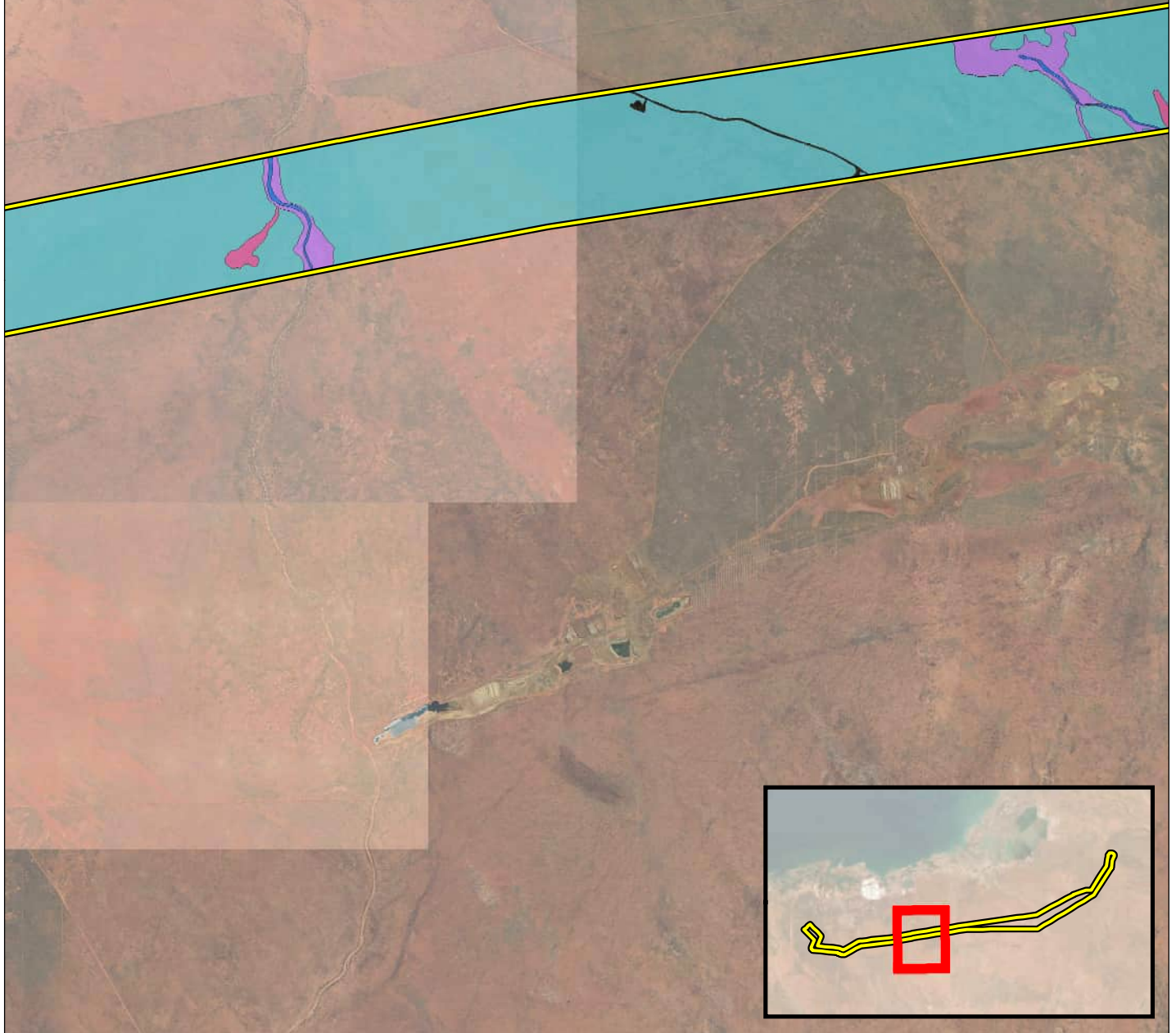
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 Survey Area

Significant Flora

- *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (P1)
- *Gymnanthera cunninghamii* (P3)

 AspTe	 EvAcTe	 MaEc
 AiTe	 At	 EvEa
 AoTe	 CcAcTe	 FspAh
 AsTe	 CfAh	 FspTe
		 Cleared



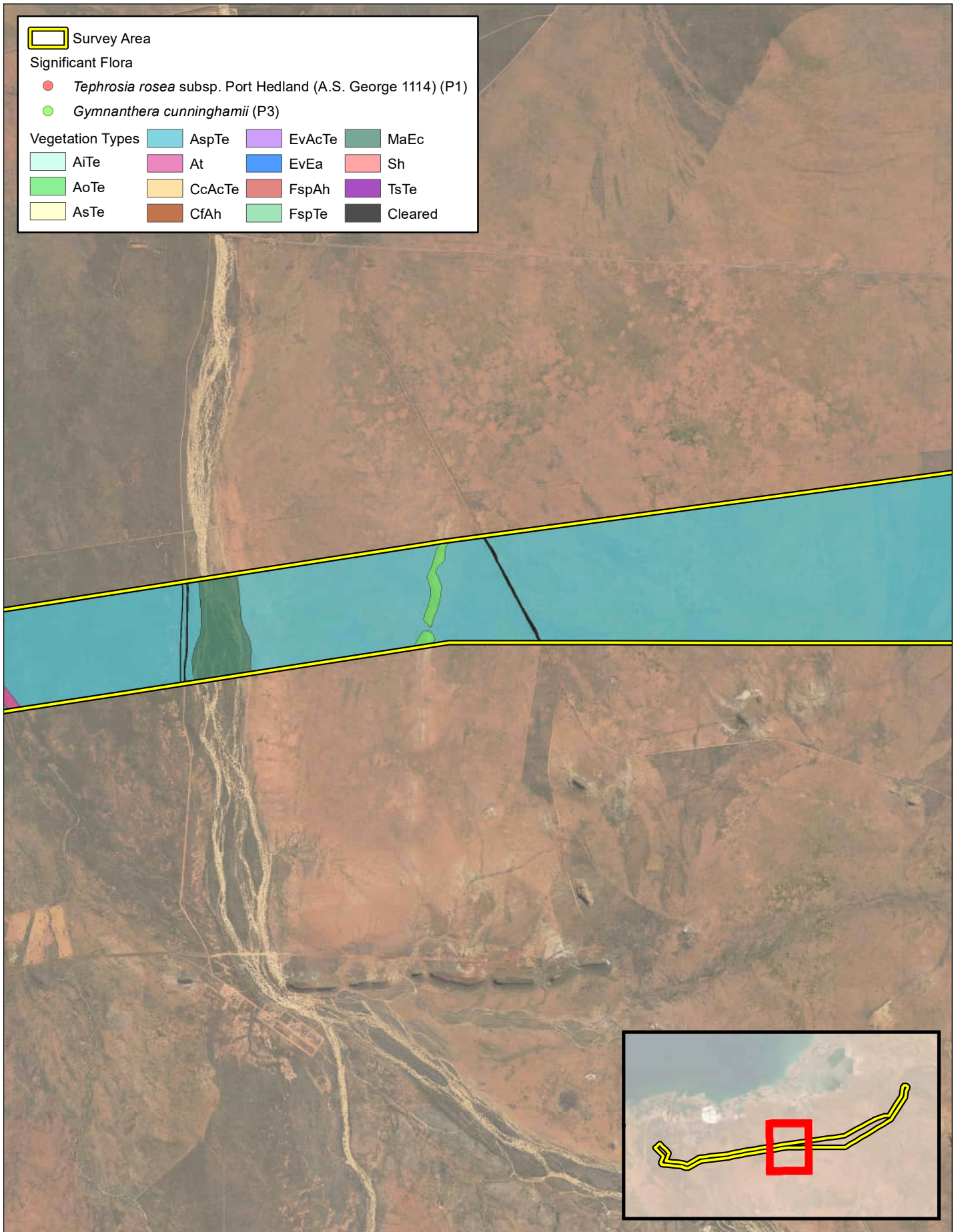
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 Project Number : 072189
 Date Drawn : 26/06/2024
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 Reviewed By : GB

Horizon Power
 Atlas Ridley Magnetite Project Connection
 Flora and Fauna Survey Technical Report
 Vegetation Types and Significant Flora
 in the Survey Area
 MAP 09c

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Survey Area

Significant Flora

- *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (P1)
- *Gymnanthera cunninghamii* (P3)

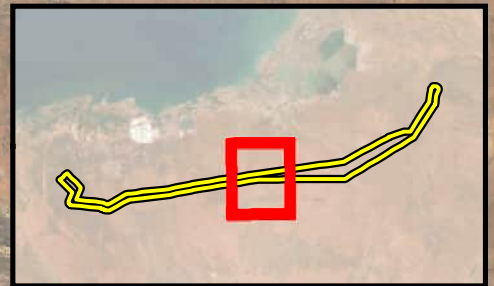
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AiTe	At	EvEa
AoTe	CcAcTe	FspAh
AsTe	CfAh	FspTe
		Cleared



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


Coordinate System: GDA 1994 MGA Zone 50 @ A4
 Scale : 1:50,000 @ A4
 Project Number : 072189
 Date Drawn : 26/06/2024
 Drawn By : Environmaps
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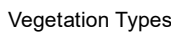











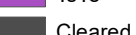
Horizon Power
 Atlas Ridley Magnetite Project Connection
 Flora and Fauna Survey Technical Report
 Vegetation Types and Significant Flora
 in the Survey Area
MAP 09d

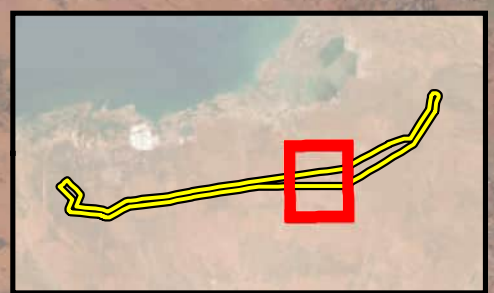
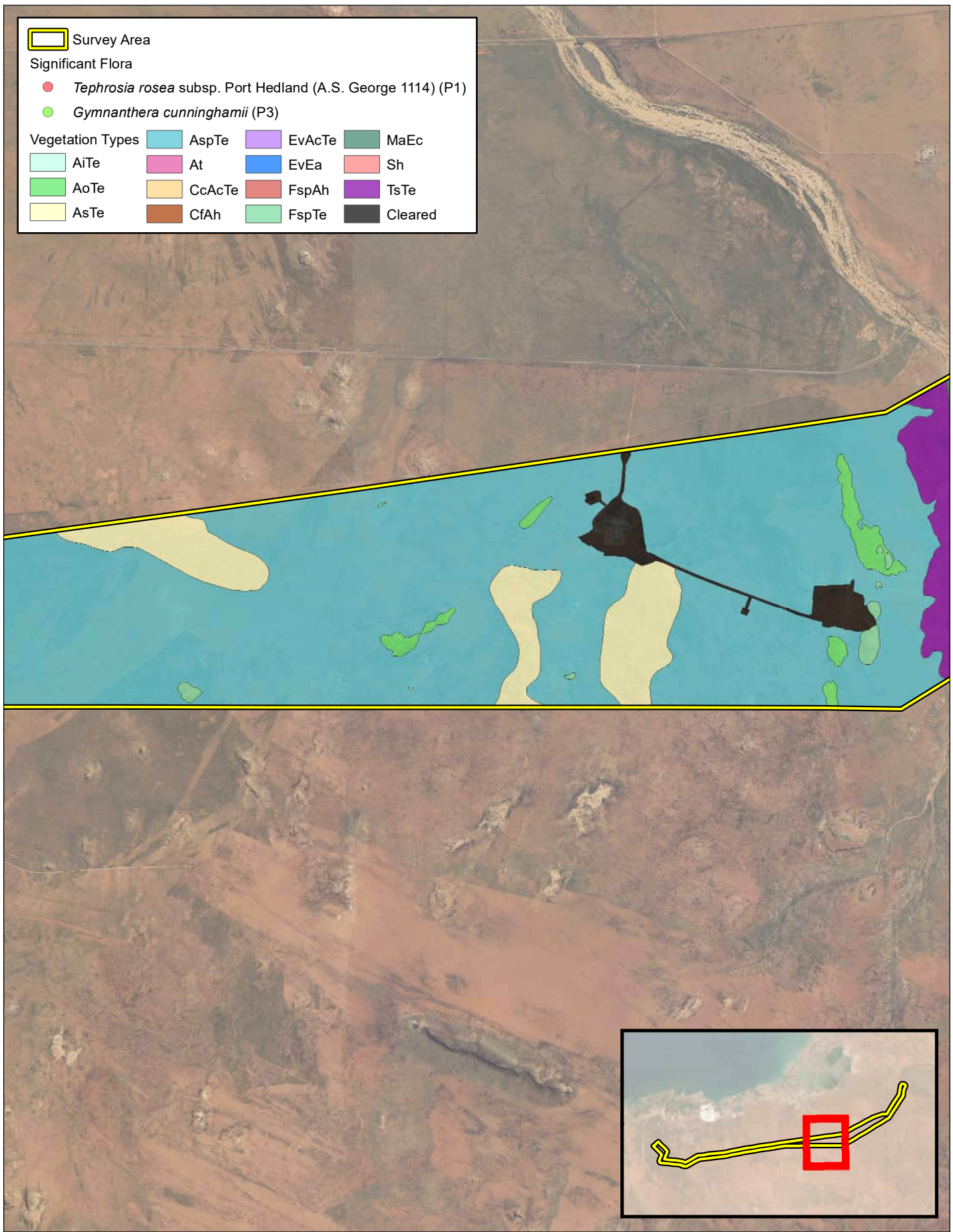
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 Survey Area

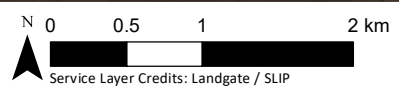
Significant Flora

-  *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (P1)
-  *Gymnanthera cunninghamii* (P3)

 AspTe	 EvAcTe	 MaEc
 AiTe	 At	 EvEa
 AoTe	 CcAcTe	 FspAh
 AsTe	 CfAh	 FspTe
		 Cleared




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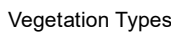













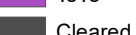
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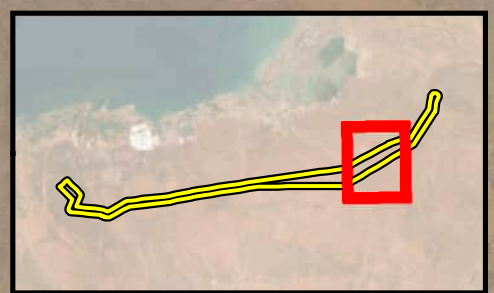
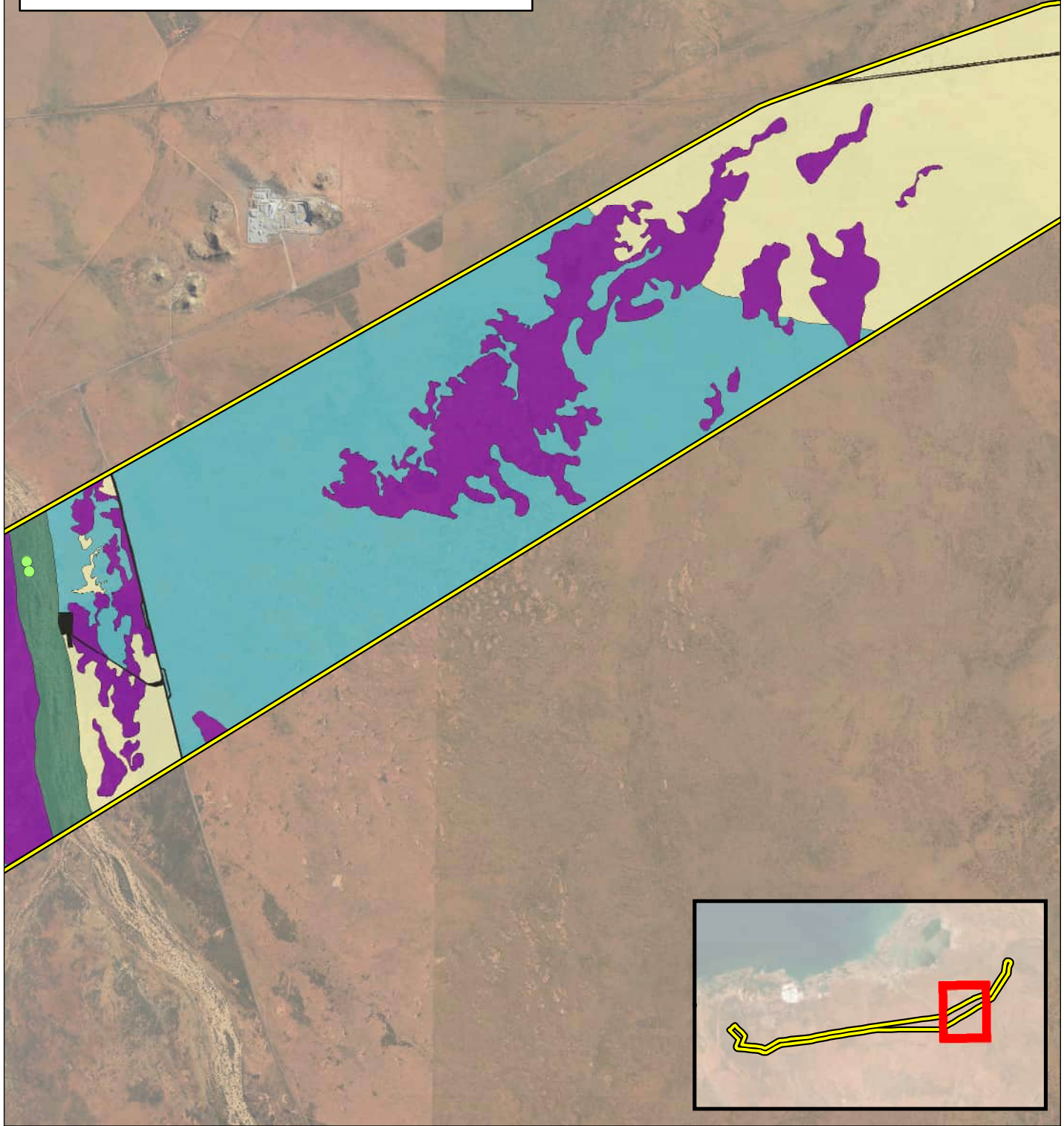
Vegetation Types and Significant Flora
 in the Survey Area
 MAP 09e

 Survey Area

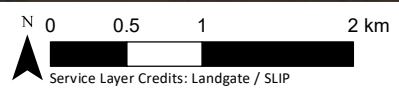
Significant Flora

-  *Tephrosia rosea* subsp. Port Hedland (A.S. George 1114) (P1)
-  *Gymnanthera cunninghamii* (P3)

 AspTe	 EvAcTe	 MaEc	
 AiTe	 At	 EvEa	 Sh
 AoTe	 CcAcTe	 FspAh	 TsTe
 AsTe	 CfAh	 FspTe	 Cleared



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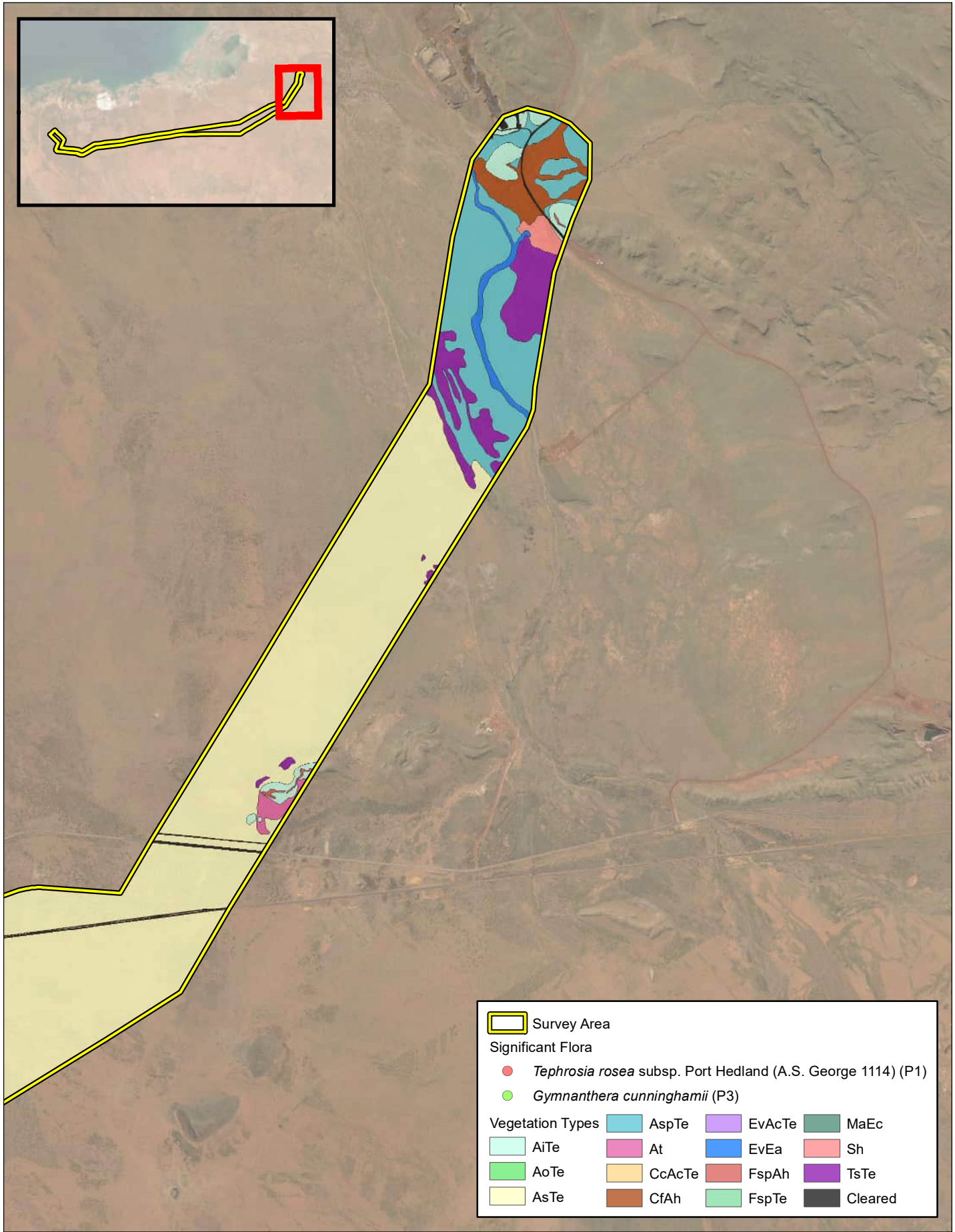


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Scale : 1:50,000 @ A4
Project Number : 072189
Date Drawn : 26/06/2024
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Horizon Power
Atlas Ridley Magnetite Project Connection
Flora and Fauna Survey Technical Report
Vegetation Types and Significant Flora
in the Survey Area
MAP 09f

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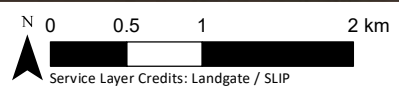
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	Survey Area						
Significant Flora							
	<i>Tephrosia rosea</i> subsp. Port Hedland (A.S. George 1114) (P1)						
	<i>Gymnanthera cunninghamii</i> (P3)						
Vegetation Types							
	AspTe		EvAcTe		MaEc		
	AiTTe		At		EvEa		Sh
	AoTe		CcAcTe		FspAh		TsTe
	AsTe		CfAh		FspTe		Cleared



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Horizon Power
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Vegetation Types and Significant Flora
 in the Survey Area
 MAP 09g


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 Survey Area


Introduced Flora Record


 **Calotropis procera* (DP)


Vegetation Condition

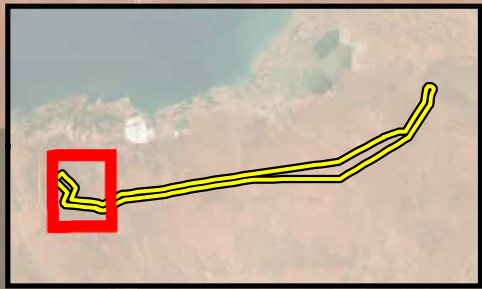
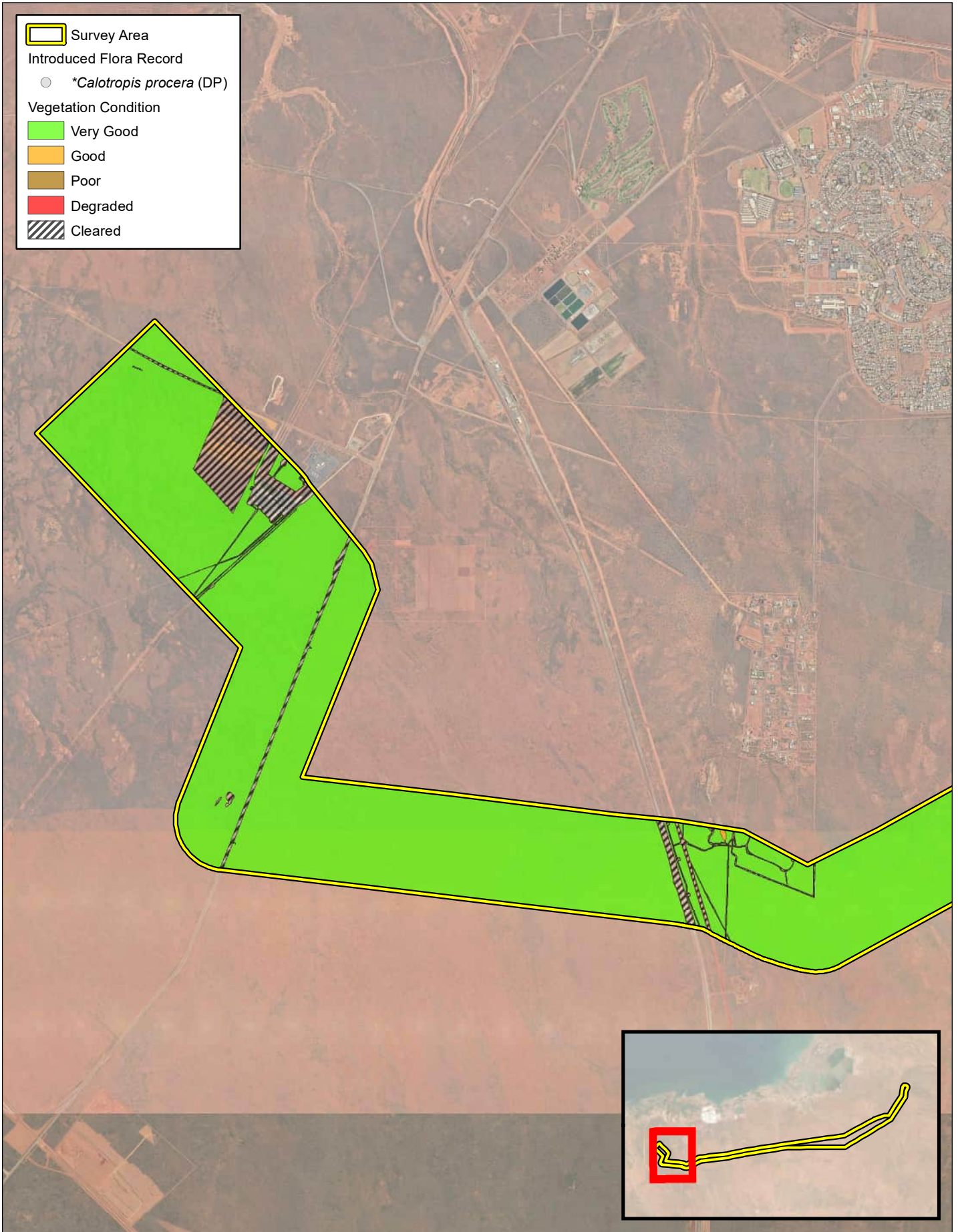
 Very Good

 Good

 Poor

 Degraded

 Cleared




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 Date Drawn : 8/07/2024
 Drawn By : Environmaps
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 Flora and Fauna Survey Technical Report


Vegetation Condition and
 Introduced Flora Records
 MAP 10a


 Survey Area


Introduced Flora Record


 **Calotropis procera* (DP)


Vegetation Condition

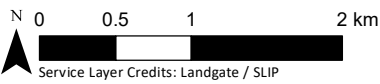
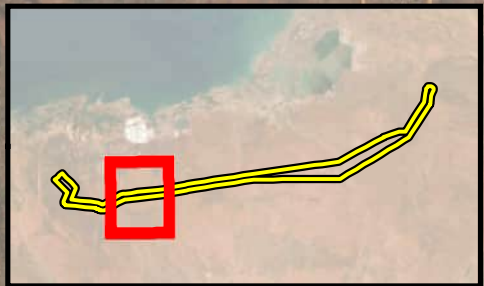
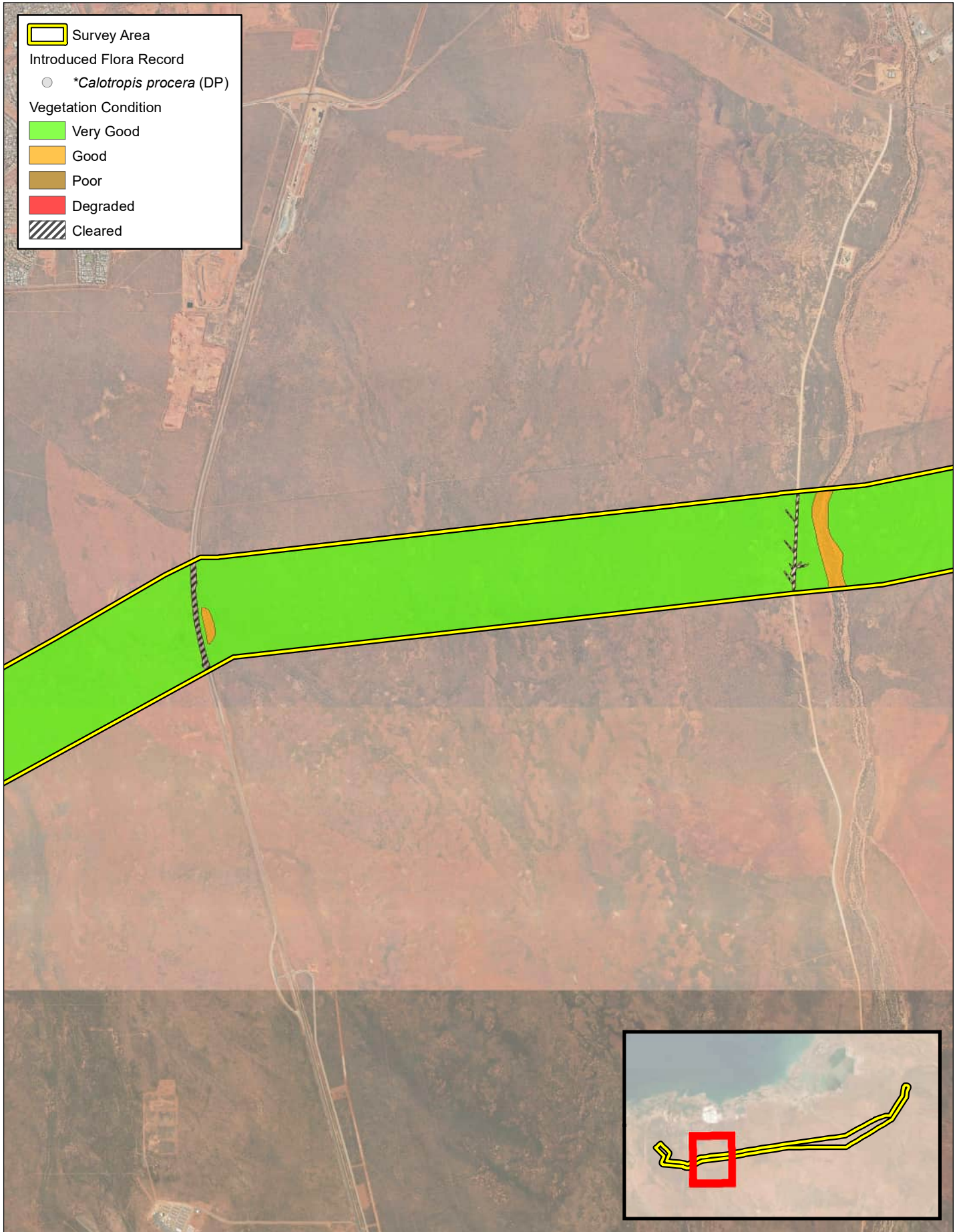
 Very Good

 Good

 Poor

 Degraded

 Cleared



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 Date Drawn : 26/06/2024
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Vegetation Condition and
 Introduced Flora Records
 MAP 10b

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 Survey Area


Introduced Flora Record


 **Calotropis procera* (DP)


Vegetation Condition

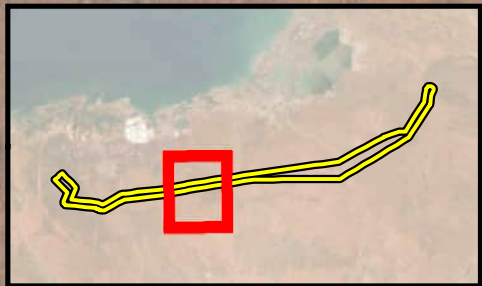
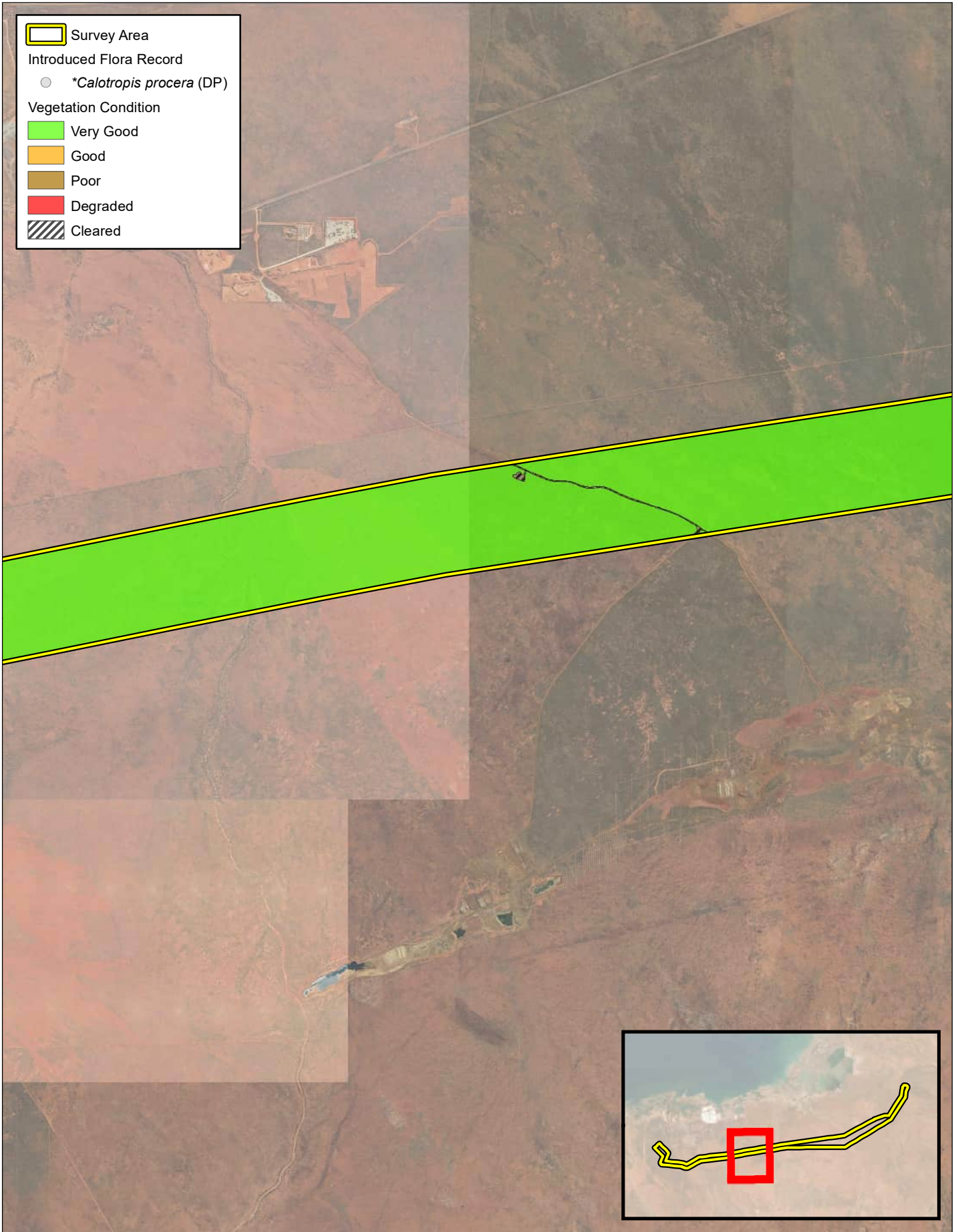
 Very Good

 Good

 Poor

 Degraded

 Cleared



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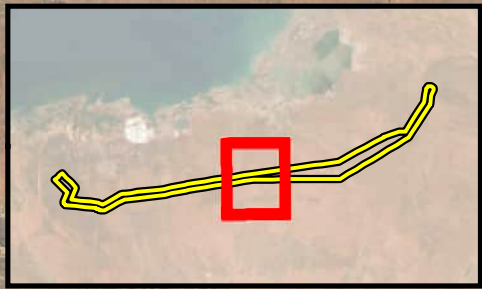
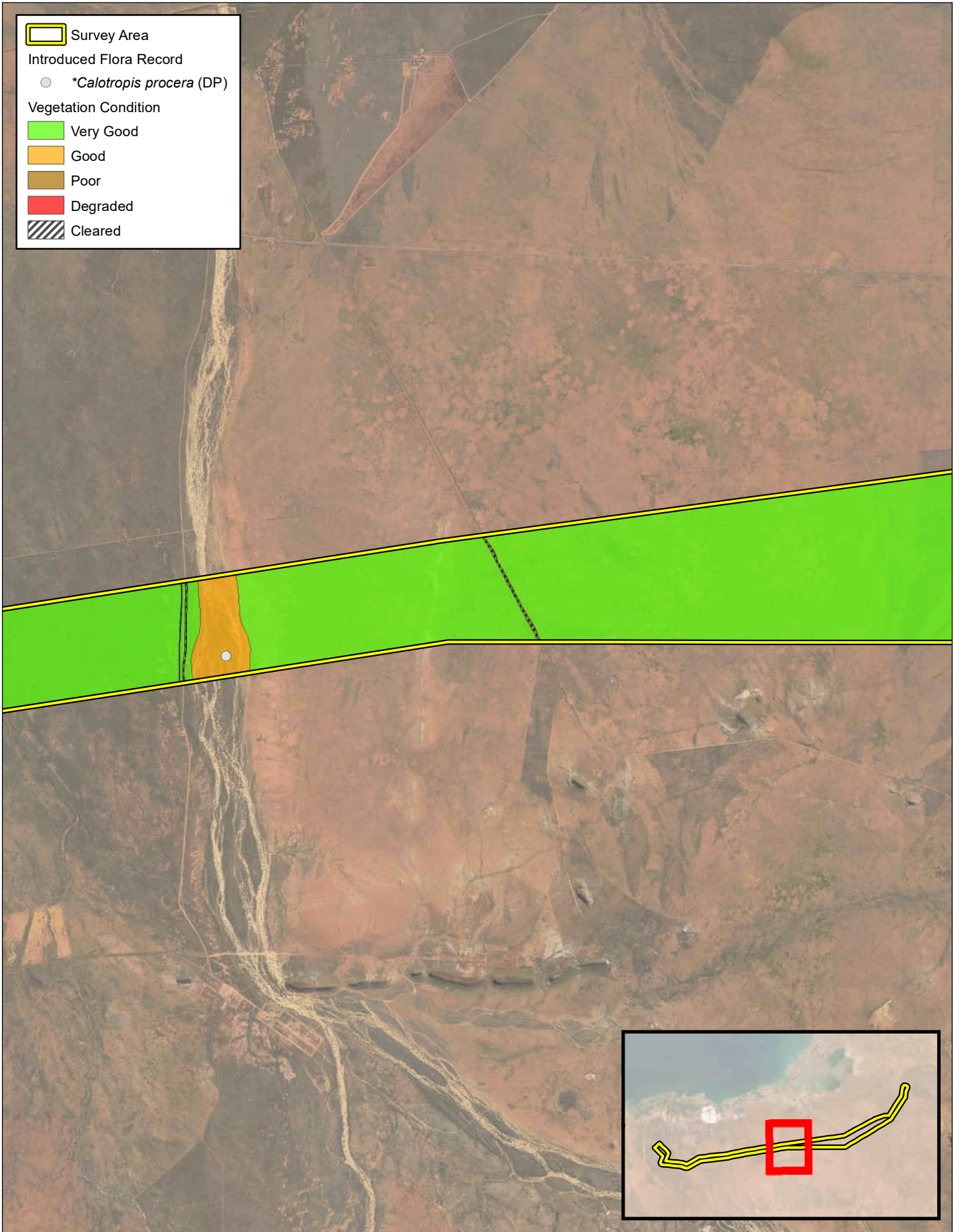
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 Scale : 1:50,000 @ A4
 Project Number : 072189
 Date Drawn : 26/06/2024
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Vegetation Condition and
 Introduced Flora Records
 MAP 10c

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-  Survey Area
- Introduced Flora Record
-  **Calotropis procera* (DP)
- Vegetation Condition
-  Very Good
-  Good
-  Poor
-  Degraded
-  Cleared



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Vegetation Condition and
 Introduced Flora Records
 MAP 10d


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 Survey Area


Introduced Flora Record


 **Calotropis procera* (DP)


Vegetation Condition

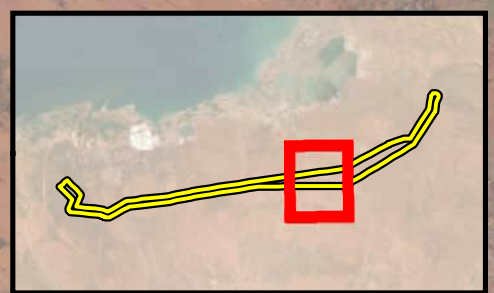
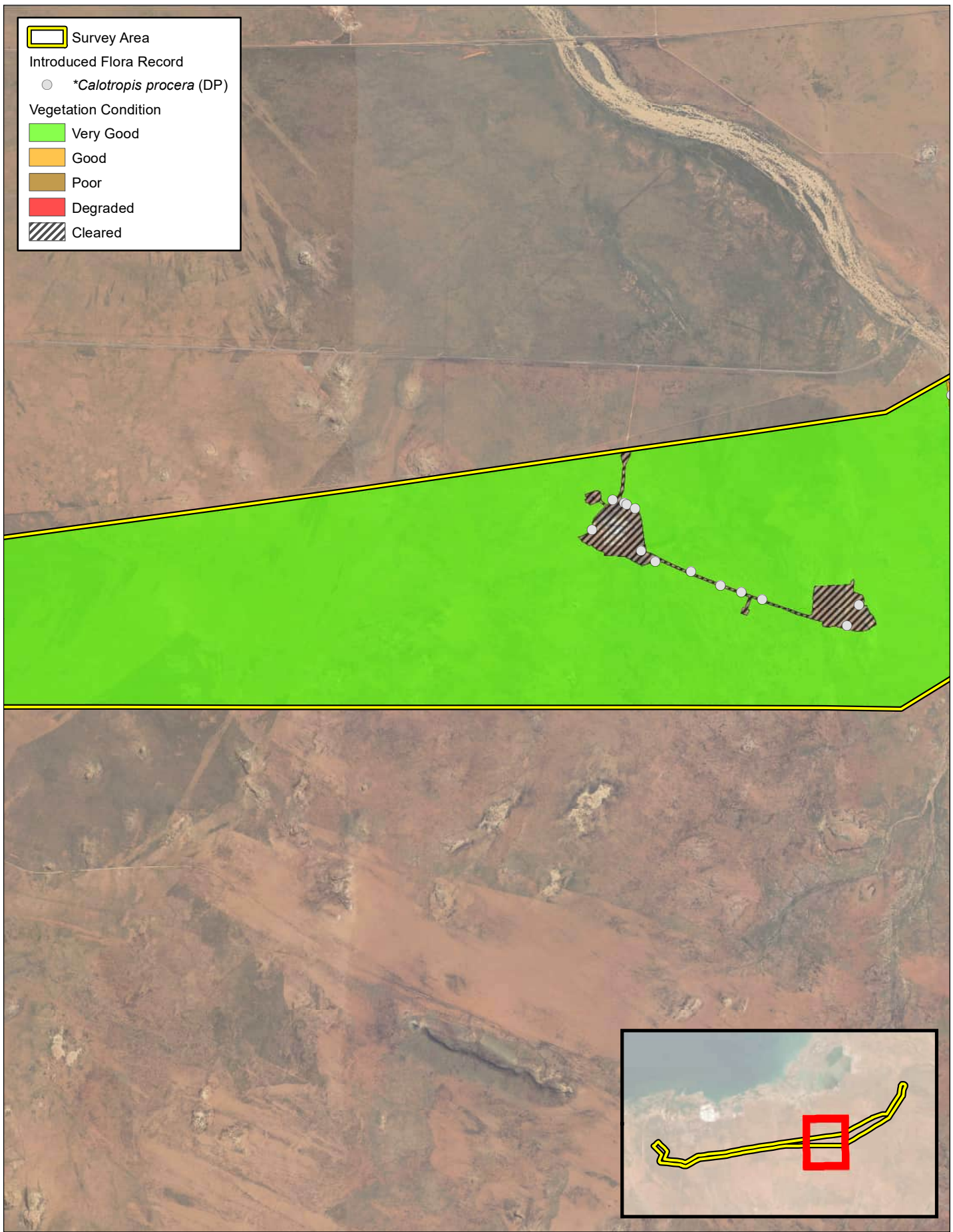
 Very Good

 Good

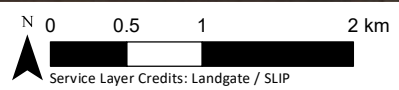
 Poor

 Degraded

 Cleared



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Vegetation Condition and
 Introduced Flora Records
 MAP 10e


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 Survey Area


Introduced Flora Record


 **Calotropis procera* (DP)


Vegetation Condition

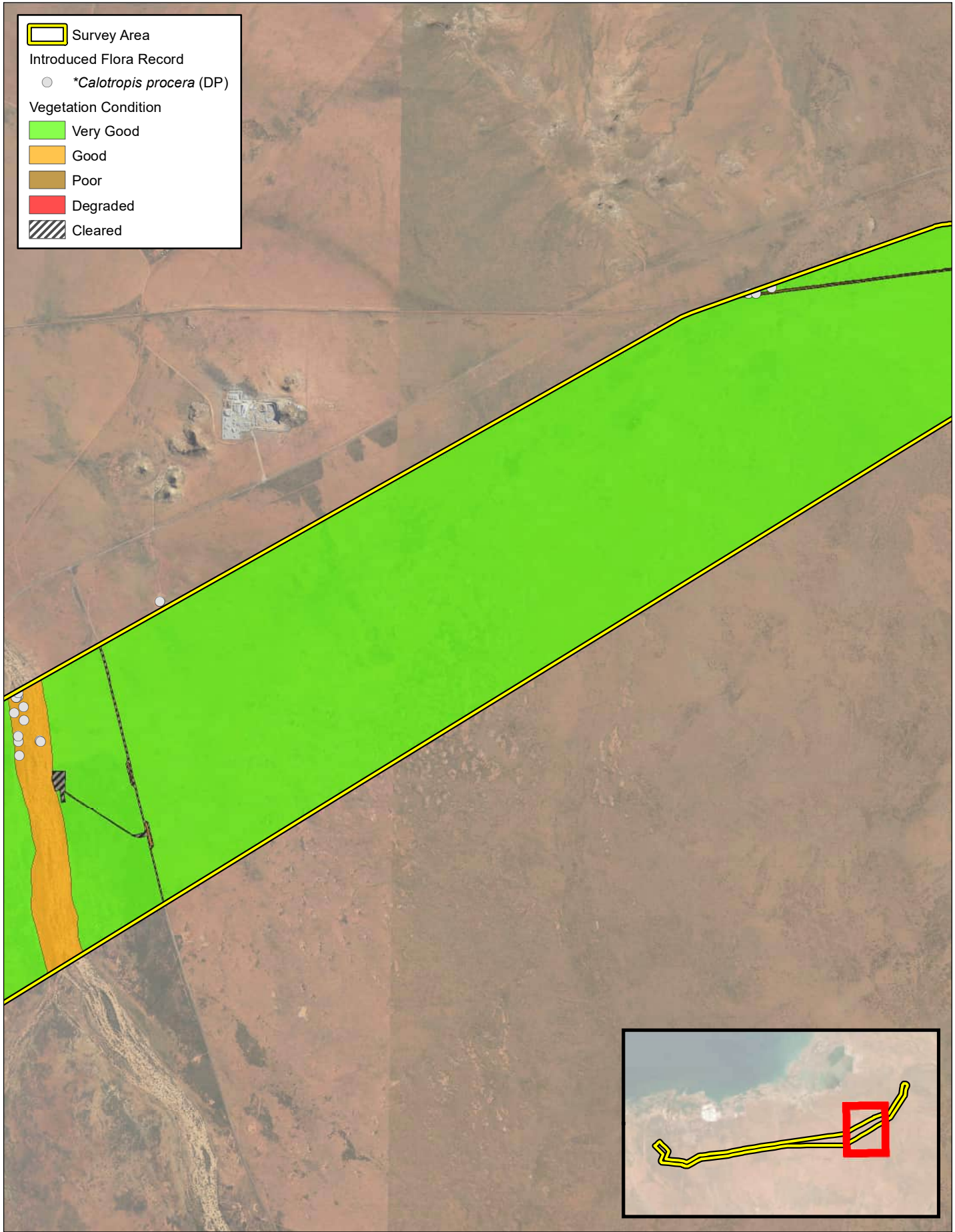
 Very Good

 Good

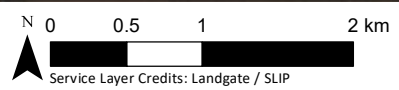
 Poor

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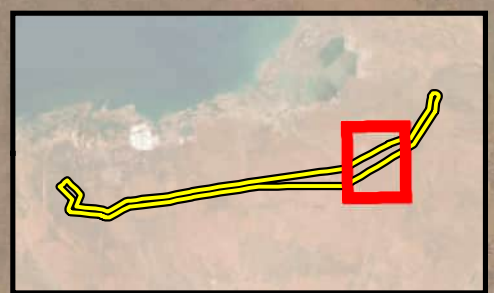
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Vegetation Condition and
 Introduced Flora Records
 MAP 10f


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 Survey Area


Introduced Flora Record


 **Calotropis procera* (DP)


Vegetation Condition

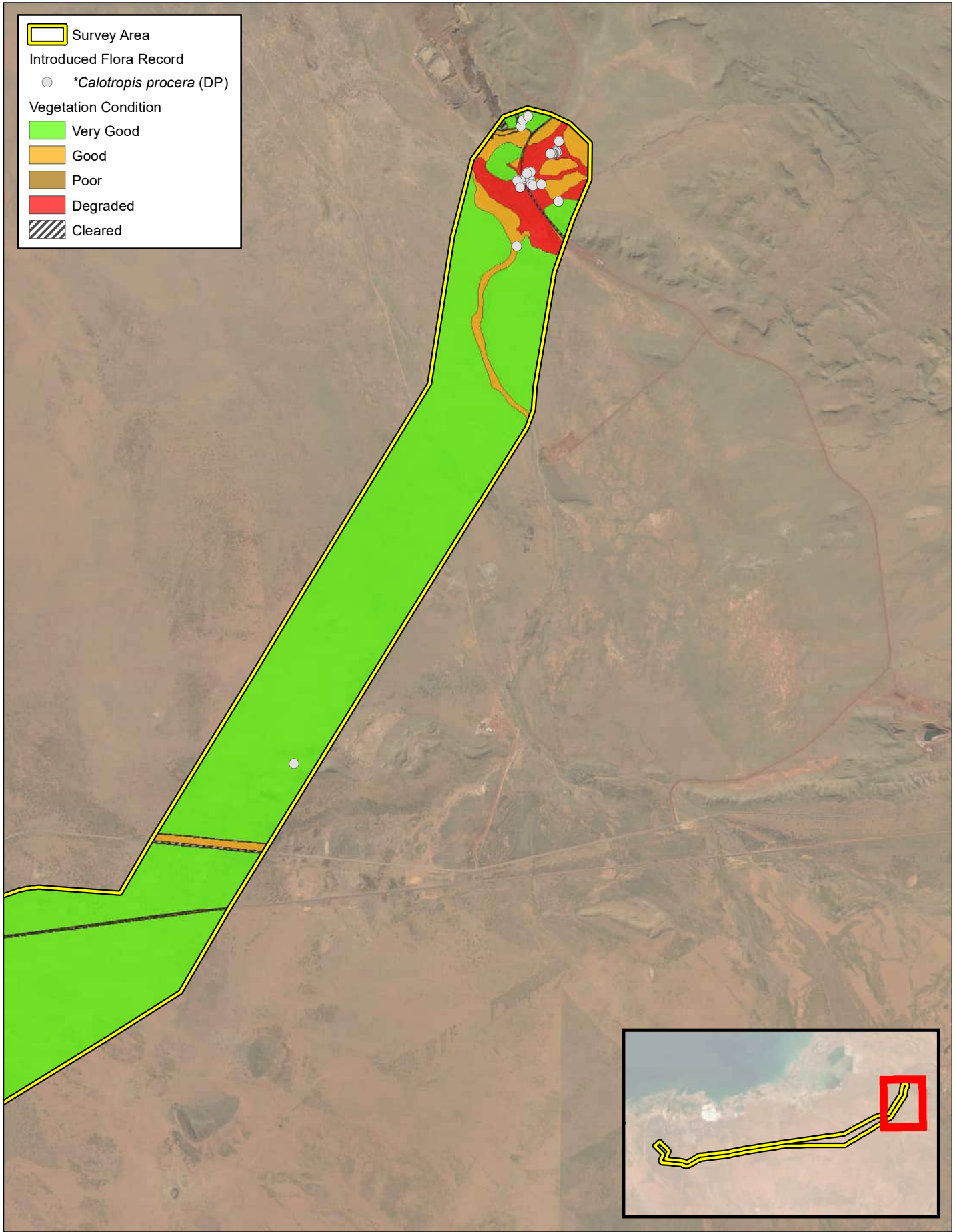
 Very Good

 Good

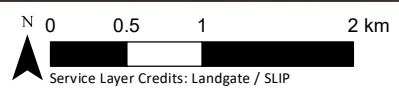
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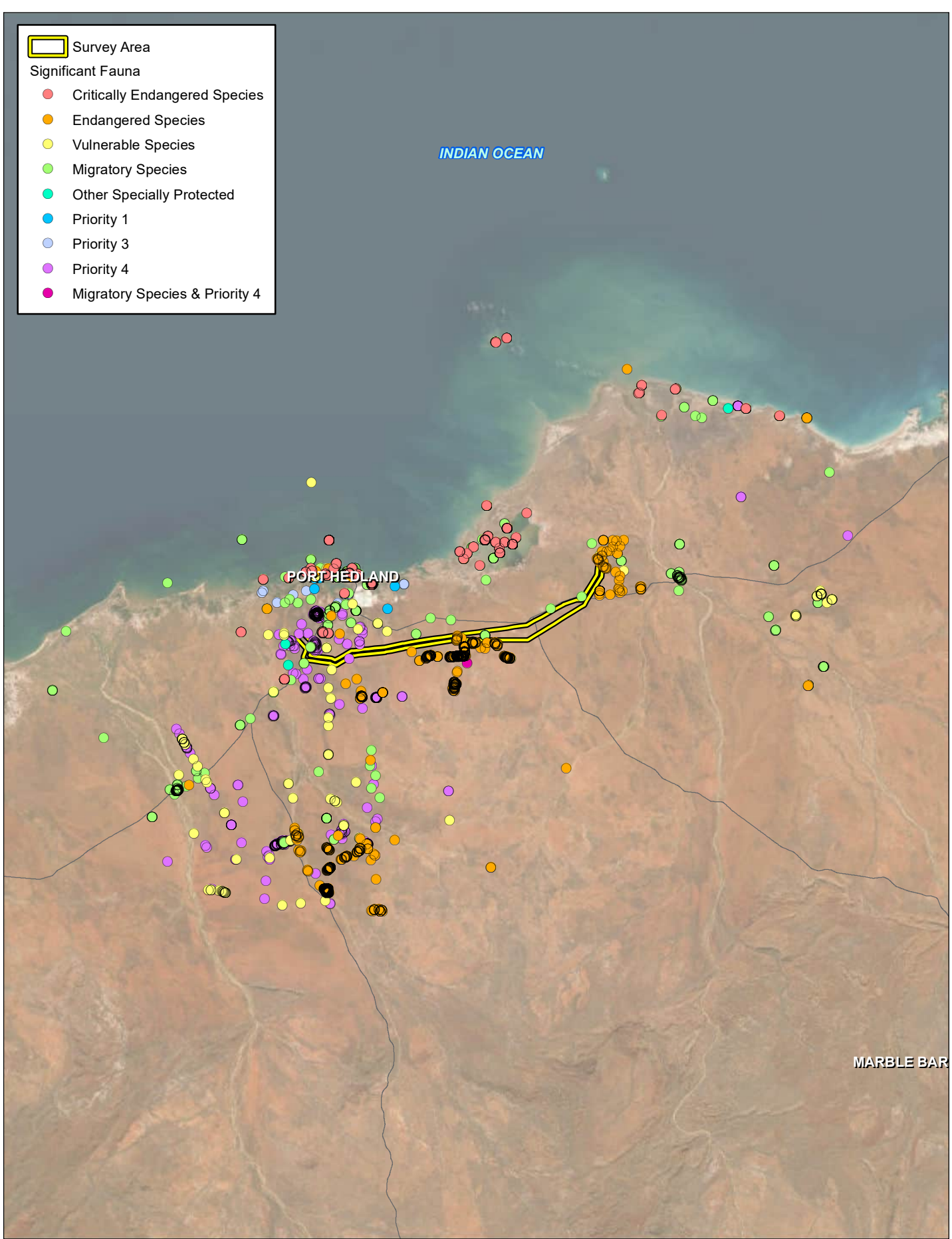


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 Date Drawn : 26/06/2024
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Vegetation Condition and
 Introduced Flora Records
 MAP 10g

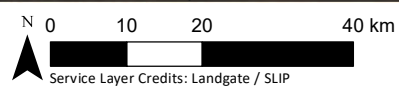
- Survey Area
- Significant Fauna**
- Critically Endangered Species
- Endangered Species
- Vulnerable Species
- Migratory Species
- Other Specially Protected
- Priority 1
- Priority 3
- Priority 4
- Migratory Species & Priority 4



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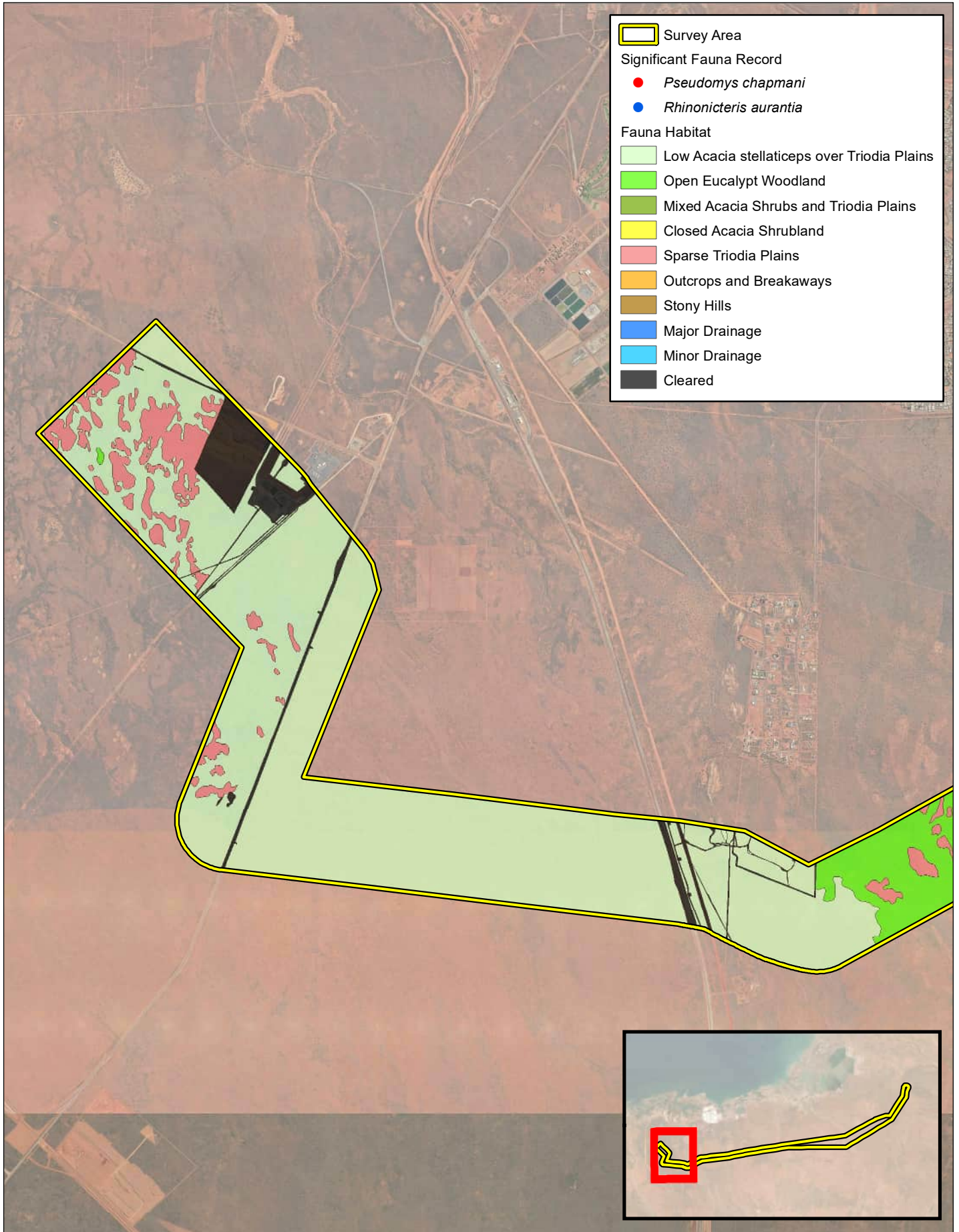


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 Project Number : 072189
 Date Drawn : 25/06/2024
 Drawn By : Environmaps
 Reviewed By : GB

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Significant Fauna
 Database Search Results
 MAP 11

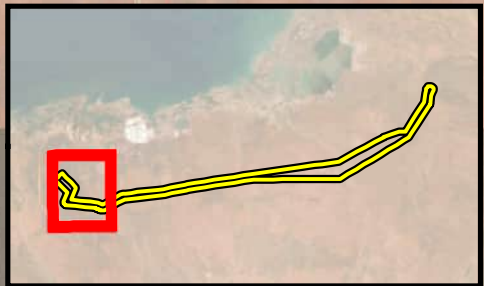
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 Flora and Fauna Survey Technical Report

Fauna Habitat and
 Significant Fauna Records
 MAP 12a

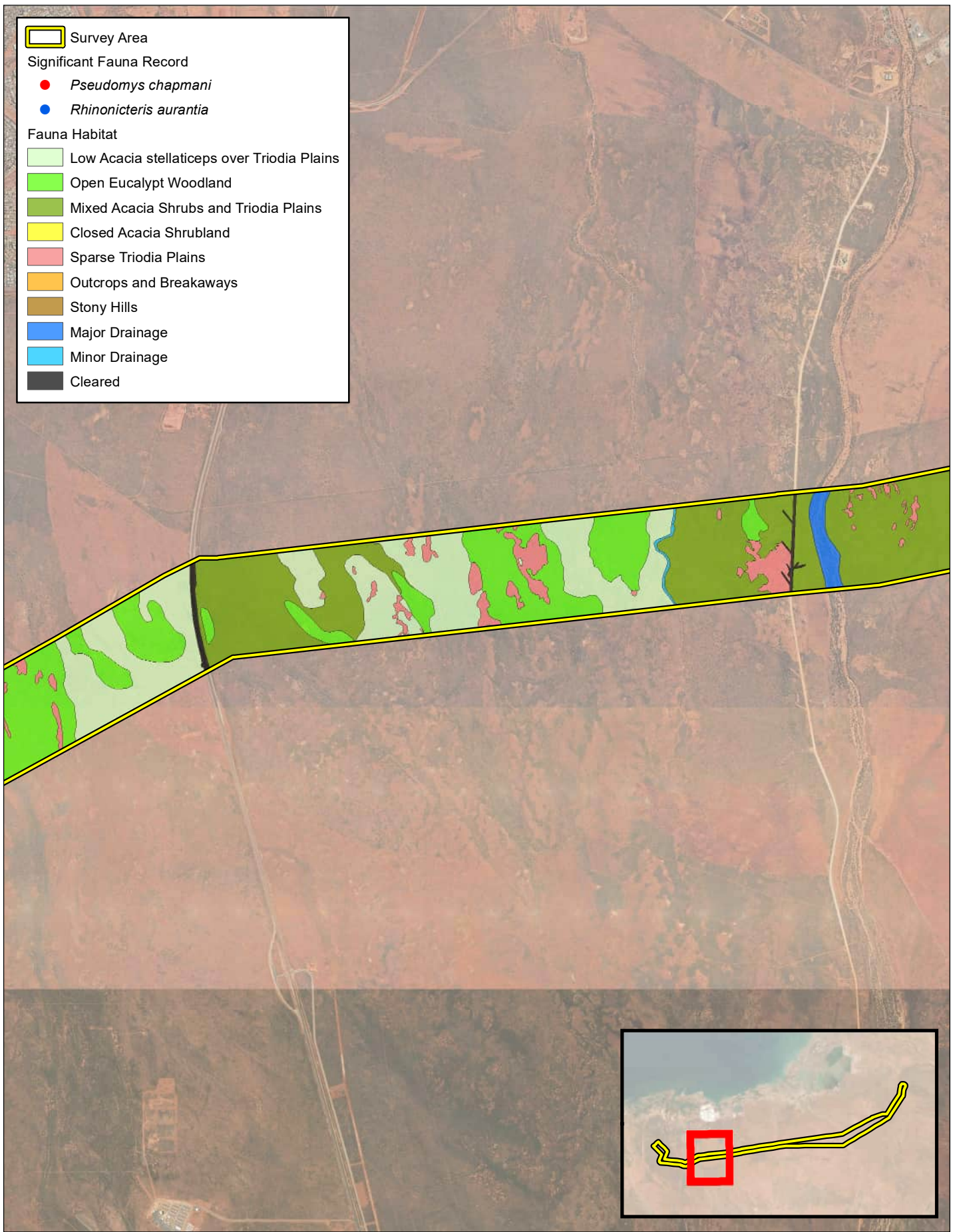
Survey Area

Significant Fauna Record

- *Pseudomys chapmani*
- *Rhinonictoris aurantia*

Fauna Habitat

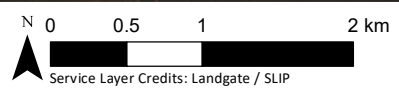
- Low Acacia *stellaticeps* over *Triodia* Plains
- Open Eucalypt Woodland
- Mixed Acacia Shrubs and *Triodia* Plains
- Closed Acacia Shrubland
- Sparse *Triodia* Plains
- Outcrops and Breakaways
- Stony Hills
- Major Drainage
- Minor Drainage
- Cleared



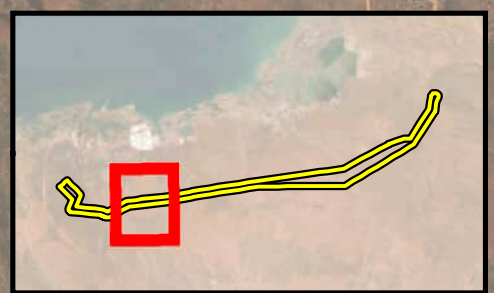
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 Atlas Ridley Magnetite Project Connection
 Flora and Fauna Survey Technical Report


Fauna Habitat and
 Significant Fauna Records
 MAP 12b

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
 Survey Area


Significant Fauna Record


 *Pseudomys chapmani*

 *Rhinonictoris aurantia*


Fauna Habitat


 Low Acacia stellaticeps over Triodia Plains

 Open Eucalypt Woodland


 Mixed Acacia Shrubs and Triodia Plains


 Closed Acacia Shrubland

 Sparse Triodia Plains

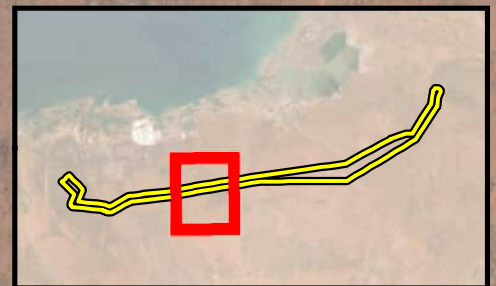
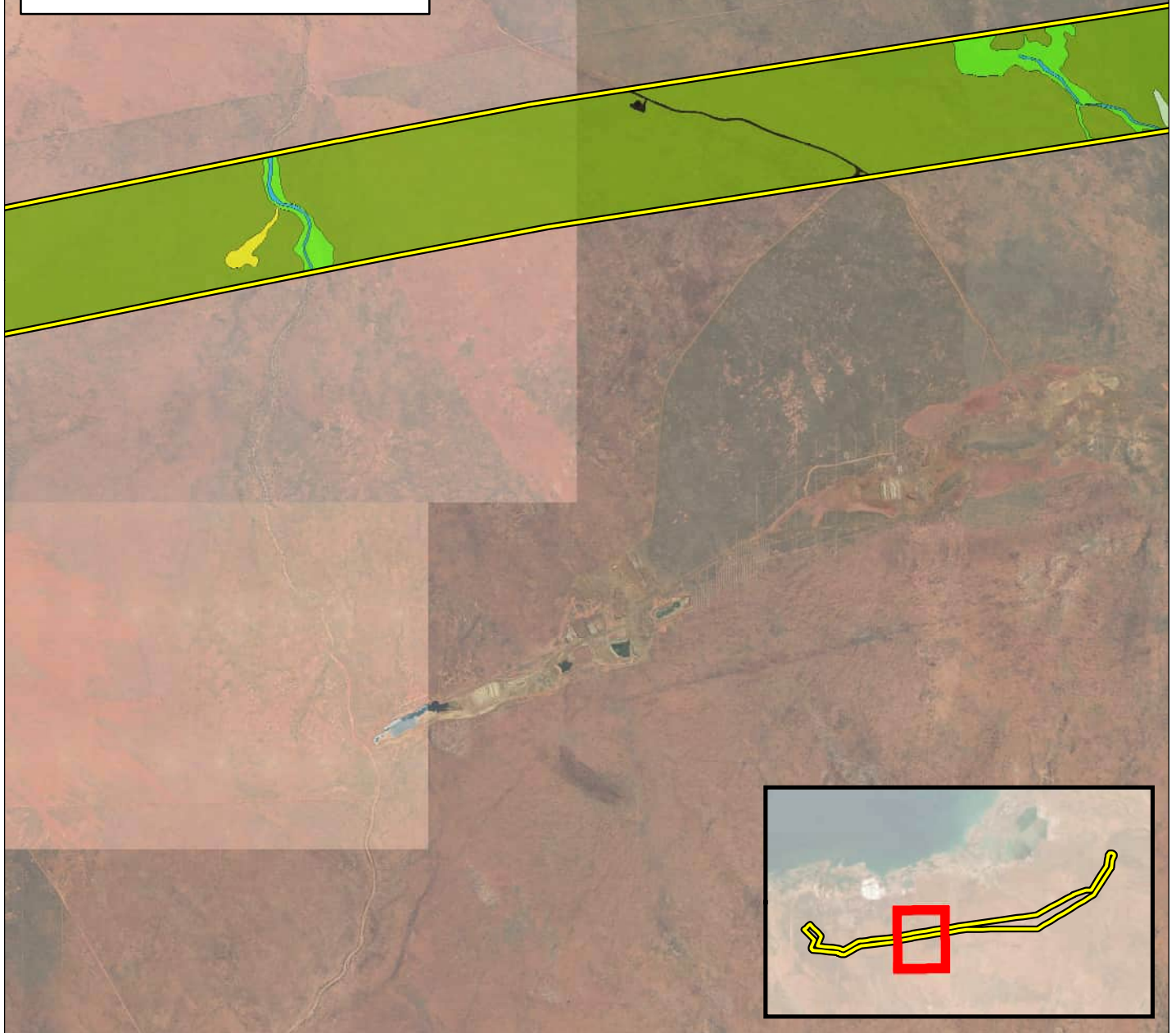
 Outcrops and Breakaways

 Stony Hills

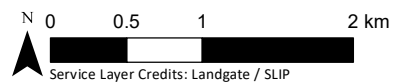
 Major Drainage

 Minor Drainage

 Cleared



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Flora and Fauna Survey Technical Report

Fauna Habitat and
Significant Fauna Records
MAP 12c











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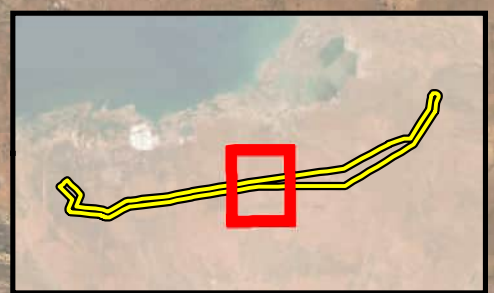
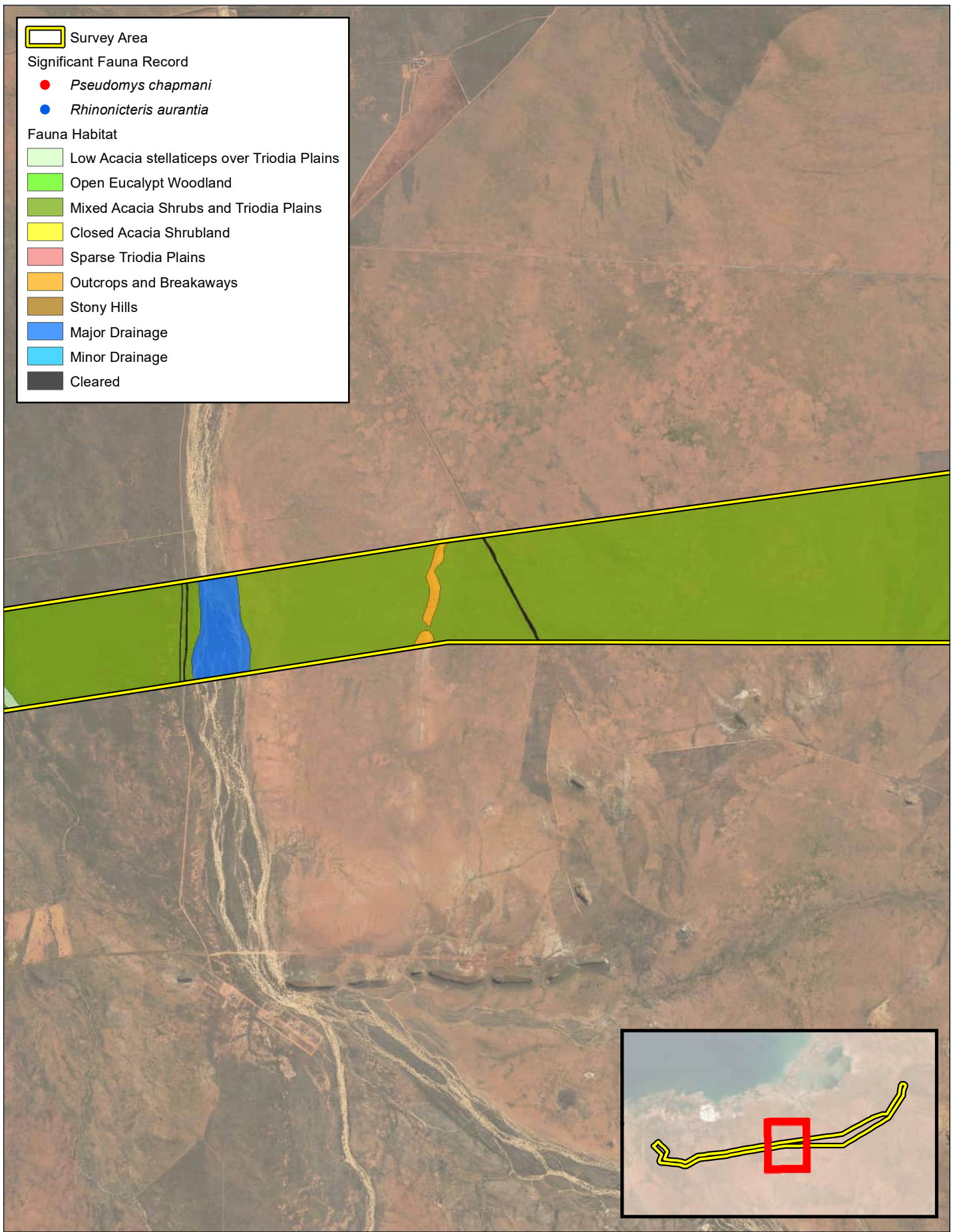
 Survey Area

Significant Fauna Record

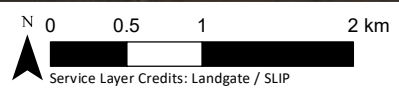
-  *Pseudomys chapmani*
-  *Rhinonictoris aurantia*

Fauna Habitat

-  Low Acacia stellaticeps over Triodia Plains
-  Open Eucalypt Woodland
-  Mixed Acacia Shrubs and Triodia Plains
-  Closed Acacia Shrubland
-  Sparse Triodia Plains
-  Outcrops and Breakaways
-  Stony Hills
-  Major Drainage
-  Minor Drainage
-  Cleared



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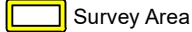


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Fauna Habitat and
 Significant Fauna Records
 MAP 12d

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Survey Area

Significant Fauna Record

● *Pseudomys chapmani*

● *Rhinonictoris aurantia*

Fauna Habitat

Low Acacia stellaticeps over Triodia Plains

Open Eucalypt Woodland

Mixed Acacia Shrubs and Triodia Plains

Closed Acacia Shrubland

Sparse Triodia Plains

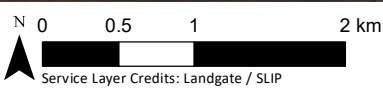
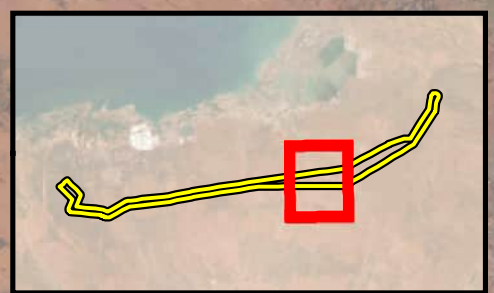
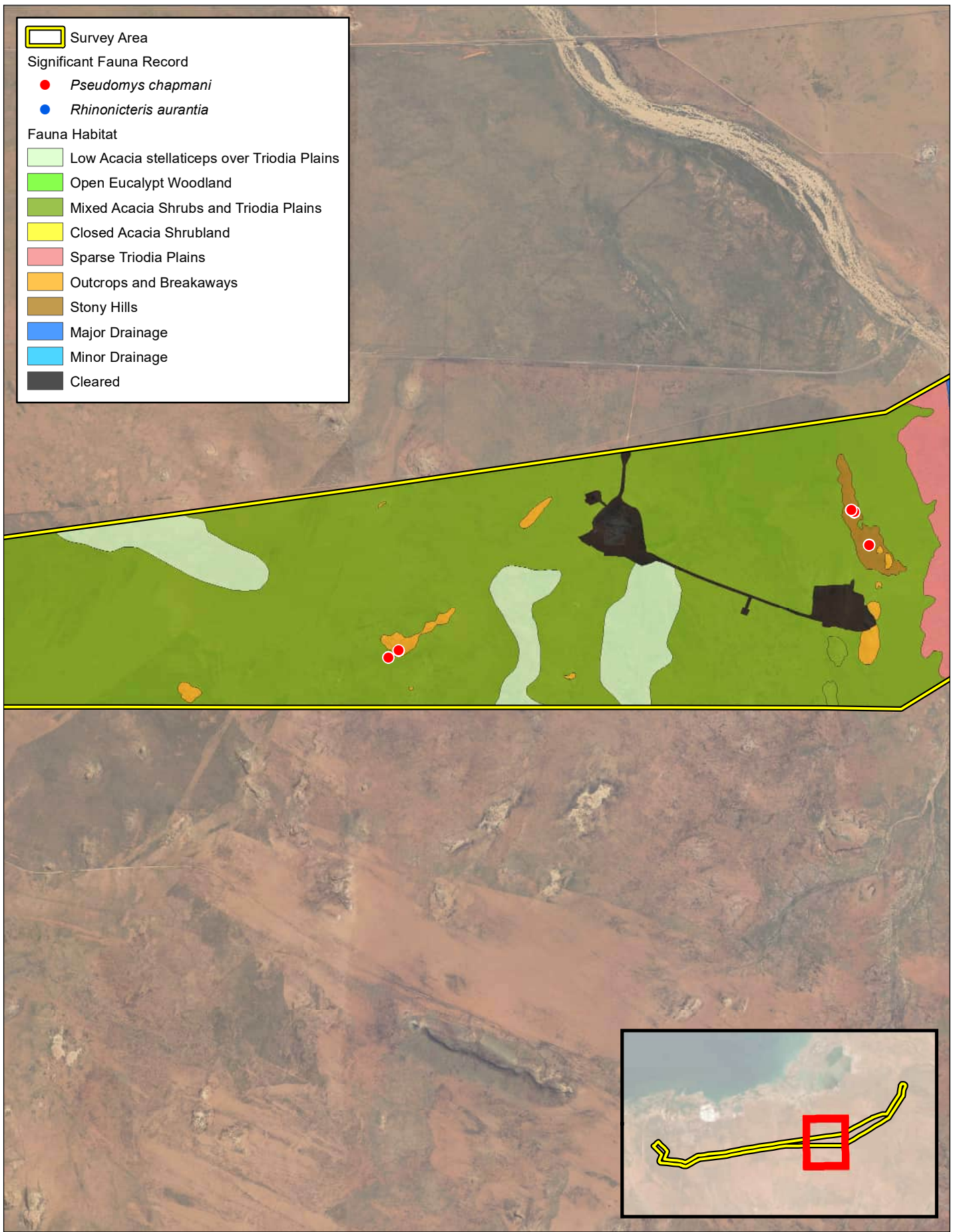
Outcrops and Breakaways

Stony Hills

Major Drainage

Minor Drainage

Cleared



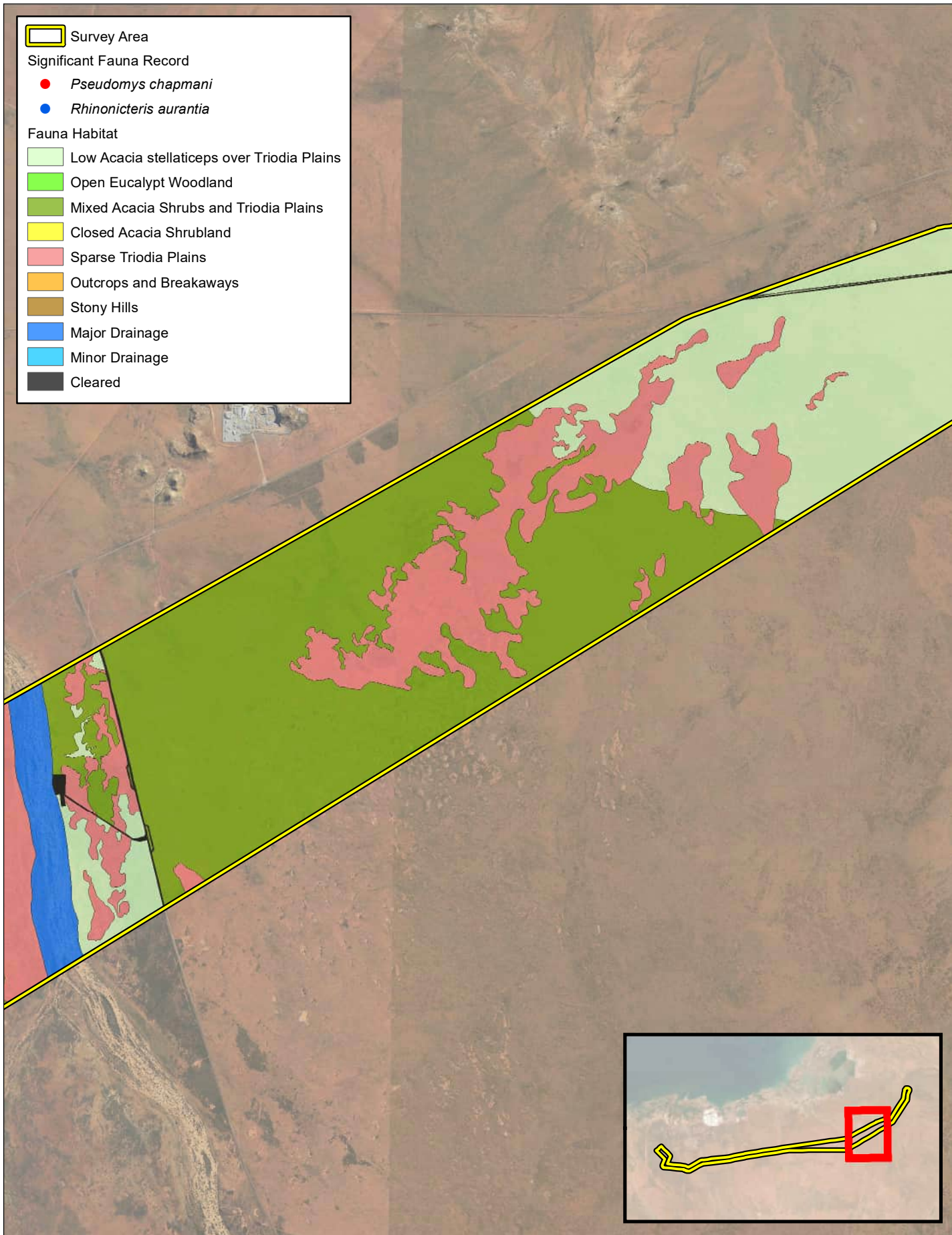
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Fauna Habitat and
Significant Fauna Records
MAP 12e

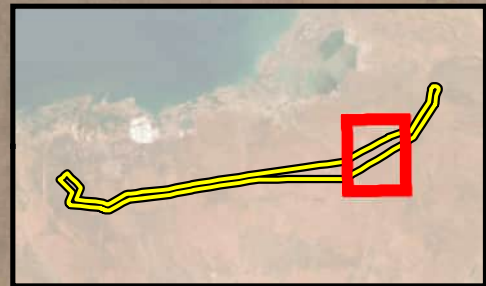
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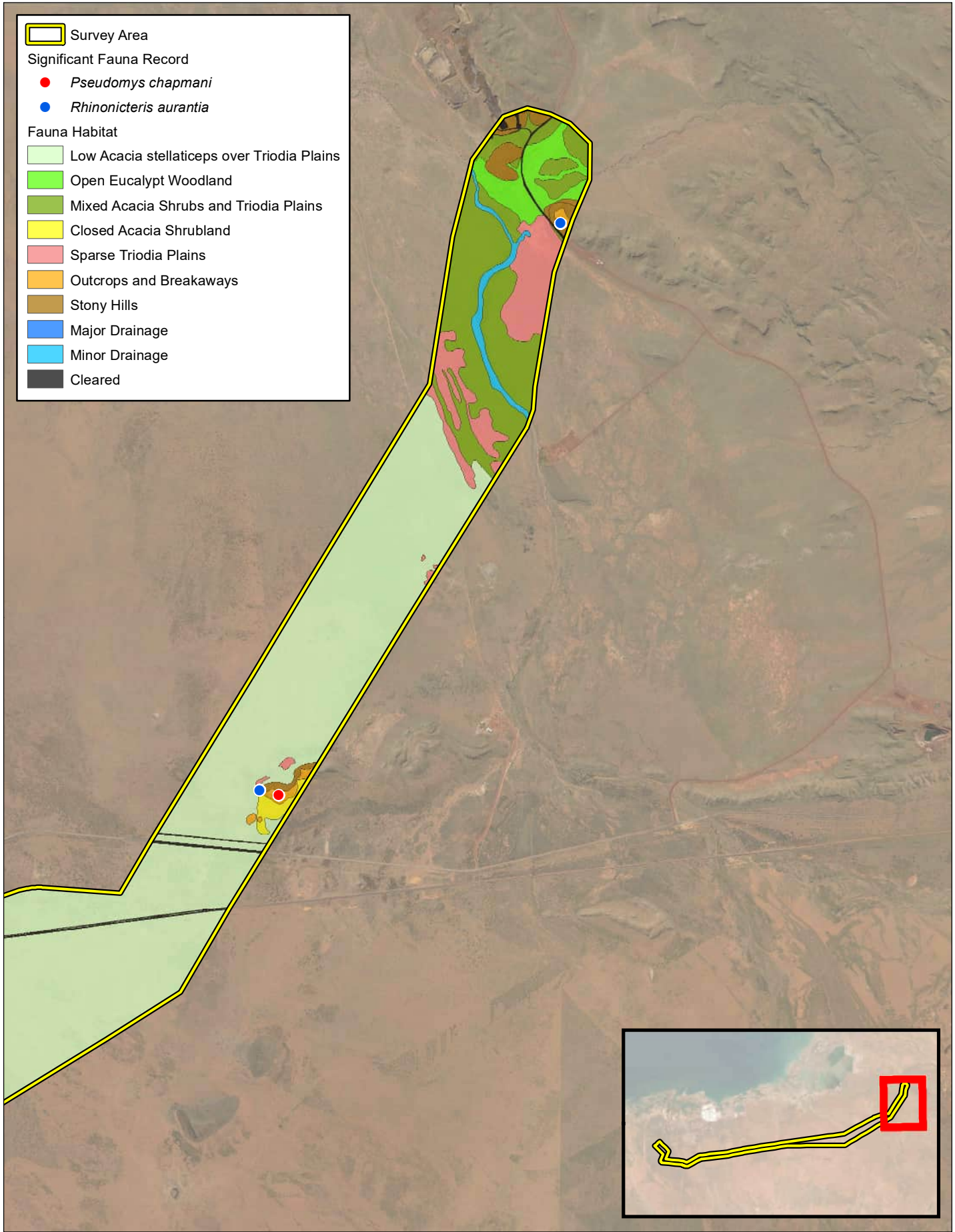
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Fauna Habitat and
 Significant Fauna Records
 MAP 12f

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Survey Area

Significant Fauna Record

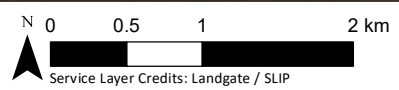
- *Pseudomys chapmani*
- *Rhinonictoris aurantia*

Fauna Habitat

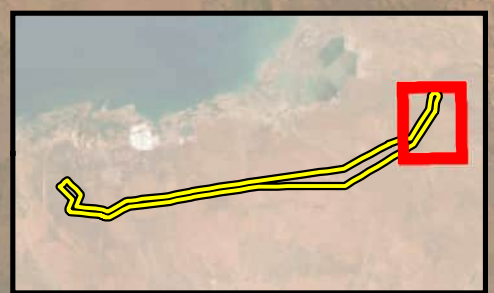
- Low Acacia stellaticeps over Triodia Plains
- Open Eucalypt Woodland
- Mixed Acacia Shrubs and Triodia Plains
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- Sparse Triodia Plains
- Outcrops and Breakaways
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- Major Drainage
- Minor Drainage
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Fauna Habitat and
 Significant Fauna Records
 MAP 12g



Appendix B Literature Review Summary

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

SLR Project No.: 675.072189.00001

29 July 2024

Report	Project Area	Survey Timing	Survey Effort	Conservation Significant Ecological Communities	Conservation Significant Flora	Introduced Flora
Detailed Flora and Vegetation Assessment, Ridley Magnetite Project (Focused Vision 2023)	Assessment intersects the current survey area	May, June, July 2022, and June, August 2023	Detailed flora and vegetation assessment	Presence of the Eighty Mile Land System PEC (P3)	<ul style="list-style-type: none"> • <i>Atriplex eremitis</i> (P1) • <i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114) (P1) • <i>Euphorbia inappendiculata</i> var. <i>queenslandica</i> (P2) • <i>Rothia indica</i> subsp. <i>australis</i> (P3) 	<ul style="list-style-type: none"> • *<i>Calotropis procera</i> • *<i>Parkinsonia aculeata</i>
De Grey South Borefield Biological Surveys (SLR Consulting, 2023),	10 km east of the Survey Area.	July 2023	Detailed flora and basic fauna vegetation assessment	None recorded	None recorded	<ul style="list-style-type: none"> • *<i>Calotropis procera</i> • *<i>Cenchrus ciliaris</i> • *<i>Cenchrus setiger</i> • *<i>Chloris barbata</i> • *<i>Vachellia farnesiana</i>
Flora and Vegetation Assessment, Port Hedland Regional (ENV Australia 2011)	Directly west of the current survey area	April – May 2011, June – July 2011	Detailed flora and vegetation assessment	None recorded	<ul style="list-style-type: none"> • <i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095) (P3) • <i>Euploca muticum</i> (P3) • <i>Tephrosia rosea</i> var. Port Headland (A.S. George 1114) • <i>Gomphrena pusilla</i> (P2) 	<ul style="list-style-type: none"> • *<i>Aerva javanica</i> • *<i>Cenchrus ciliaris</i> • *<i>Citrulus colocynthis</i> • *<i>Cucumis melo</i> subsp. <i>agrestis</i> • *<i>Eragrostis curvula</i> • *<i>Flaveria trinerva</i> • *<i>Indigofera sessiliflora</i> • *<i>Physalis angulate</i> • *<i>Portulaca oleracea</i> • *<i>Stylosanthes hamata</i> • <i>Vaccaria hispanica</i> • *<i>Vachellia farnesiana</i>
Flora and Vegetation Assessment, Corunna Downs Intersection Works (Woodman Environmental 2017)	Approximately 90 km southeast of the survey area	April 2017	Reconnaissance Flora and Vegetation Survey	None recorded	None recorded	<ul style="list-style-type: none"> • *<i>Aerva javanica</i> • *<i>Cenchrus ciliaris</i>

Report	Project Area	Survey Timing	Survey Effort	Conservation Significant Ecological Communities	Conservation Significant Flora	Introduced Flora
Corunna Downs Project, Level 2 Flora and Vegetation Assessment (Woodman Environmental 2016)	Approximately 90 km southeast of the survey area	March – April 2014, April – May 2014, and May 2016	Detailed Flora and Vegetation Survey	None recorded	<ul style="list-style-type: none"> • <i>Cochlospermum macnamarae</i> (P1) • <i>Rothia indica</i> subsp. <i>australis</i> (P3) • <i>Schoenus coultasii</i> (P1) • <i>Stylidium weeliwolli</i> (P3) • <i>Acacia levata</i> (P3) • <i>Eragrostis crateriformis</i> (P3) • <i>Heliotropium murinum</i> (P3) • <i>Nicotiana umbratica</i>(P3) • <i>Rostellularia adscendens</i> var. <i>latifolia</i> (P3) • <i>Swainsona thompsoniana</i> (P3) • <i>Ptilotus mollis</i> (P4) 	<ul style="list-style-type: none"> • <i>Aerva javanica</i> • <i>Argemone ochroleuca</i> subsp. <i>ochroleuca</i> • <i>Calotropis procera</i> • <i>Cenchrus ciliaris</i> • <i>Cenchrus setiger</i> • <i>Chloris barbata</i> • <i>Cynodon dactylon</i> • <i>Echonochoa colona</i> • <i>Flaveria trinerva</i> • <i>Malvastrum Americanum</i> • <i>Passiflora foetida</i> var. <i>hispida</i> • <i>Portulaca pilosa</i> • <i>Setaria verticillata</i> • <i>Solanum nigrum</i> • <i>Sonchus oleraceus</i> • <i>Tribulus terrestris</i> • <i>Vachellia farnesiana</i>
Wodgina Gas Pipeline, Detailed Flora and Vegetation Survey (360 Environmental 2018)	Approximately 30 km southeast of the survey area	June 2018	Detailed Flora and Vegetation Survey	None recorded	<ul style="list-style-type: none"> • <i>Euphorbia clementii</i> (P3) 	<ul style="list-style-type: none"> • <i>Aerva javanica</i> • <i>Malvastrum americanum</i> • <i>Cenchrus ciliaris</i>
Roy Hill Port Facility Power Line Port Hedland, Ecological Assessment (GHD 2016)	Approximately 15 km north of the survey area	June 2016	Reconnaissance Flora and Vegetation Survey	None recorded	None recorded	<ul style="list-style-type: none"> • <i>Aerva javanica</i> • <i>Cenchrus ciliaris</i>
Flora and Fauna survey Port Hedland International Airport – Highway Precinct	Approximately 10 km north of the survey area	November 2018	Reconnaissance Flora and Vegetation Survey	None recorded	<ul style="list-style-type: none"> • <i>Gomphrena leptophylla</i> (P3) 	<ul style="list-style-type: none"> • <i>Washingtonia filifera</i> • <i>Aerva javanica</i> • <i>Calatropis procera</i> • <i>Cenchrus ciliaris</i>

Report	Project Area	Survey Timing	Survey Effort	Conservation Significant Ecological Communities	Conservation Significant Flora	Introduced Flora
2 (Emerge Associates 2019)						<ul style="list-style-type: none"> • <i>*Cenchrus setiger</i>
Flora and Vegetation Reconnaissance Survey of Spoilbank Marina Project Area (Strategen-JBS&G 2020)	Approximately 15 km north of the survey area		Reconnaissance Flora and Vegetation Survey	None recorded	None recorded	<ul style="list-style-type: none"> • <i>*Aerva javanica</i> • <i>*Calatropis procera</i> • <i>*Cenchrus ciliaris</i> • <i>*Spathodea campanulate</i> • <i>*Stylosanthes hamata</i> • <i>*Tamarix aphylla</i>

ID	Report	Project Area	Survey Timing	Survey Effort	Significant Fauna Recorded Onsite	Fauna Habitats
Lit A	Ridley Detailed Terrestrial Vertebrate Fauna Survey (Biota, 2024)	Overlaps with the eastern section of the Survey Area	June 2022 – June 2023	Detailed fauna survey	<ul style="list-style-type: none"> • Far Eastern Curlew (<i>Numenius madagascariensis</i>) – CR (BC Act & EPBC); MI (EPBC Act) • Northern Quoll (<i>Dasyurus hallucatus</i>) – EN (BC & EPBC Act) • Pilbara Leaf-nosed Bat (<i>Rhinonictoris aurantia</i> Pilbara form) – VU (BC & EPBC Act) • Ghost Bat (<i>Macroderma gigas</i>) – VU (BC & EPBC Act) • Pilbara Olive Python (<i>Liasis olivaceus barroni</i>) – VU (BC & EPBC Act) • Brush-tailed Mulgara (<i>Dasycercus blythi</i>) – P4 (DBCAs) • Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>) – P4 (DBCAs) • Pacific Swift (<i>Apus pacificus</i>) – MI (BC & EPBC) • Australian Tern (<i>Gelochelidon macrotarsa</i>) – Mi (BC & EPBC Act) • Peregrine Falcon (<i>Falco peregrinus</i>) – OS (BC Act) 	<p>Seven fauna habitats were identified:</p> <ul style="list-style-type: none"> • Acacia shrubland over spinifex sandplain • Rocky hills • Major drainage line • Spinifex and saltbush flat • Medium drainage line • Tussock grassland • Cleared areas

ID	Report	Project Area	Survey Timing	Survey Effort	Significant Fauna Recorded Onsite	Fauna Habitats
Lit B	Ridley Services Corridors Basic and Targeted Fauna Survey (Biota, 2023)	Overlaps the Survey Area	June 2023	Basic and Targeted fauna survey	<ul style="list-style-type: none"> • Bar-tailed Godwit (<i>Limosa lapponica</i>) – CR (BC Act & EPBC Act); MI (EPBC Act) • Northern Quoll (<i>Dasyurus hallucatus</i>) – EN (BC & EPBC Act) • Brush-tailed Mulgara (<i>Dasyercus blythi</i>) – P4 (DBCAs) • Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>) – P4 (DBCAs) • Eurasian Whimbrel (<i>Numenius phaeopus</i>) – MI (BC & EPBC Act) • Sanderling (<i>Calidris alba</i>) – MI (BC & EPBC Act) • Australian Tern (<i>Gelochelidon macrotarsa</i>) – MI (BC & EPBC Act) • Common Gull-billed Tern (<i>Gelochelidon nilotica</i>) – MI (BC & EPBC Act) • Caspian Tern (<i>Hydroprogne caspia</i>) – MI (BC & EPBC Act) • Greater Crested Tern (<i>Thalasseus bergii</i>) – MI (BC & EPBC Act) • Little Tern (<i>Sternula albifrons</i>) – MI (BC & EPBC Act) 	<p>Eleven fauna habitats were identified:</p> <ul style="list-style-type: none"> • Acacia shrubland over spinifex sandplain • Tussock grassland • Spinifex sandplain • Spinifex and saltbush flat • Open eucalypt woodland • Rocky hills • Medium drainage line • Major drainage line • Coastal dunes • Sandy beach • Cleared areas

ID	Report	Project Area	Survey Timing	Survey Effort	Significant Fauna Recorded Onsite	Fauna Habitats
Lit C	Detailed terrestrial fauna and targeted Bilby survey for the Port Hedland Solar Farm Project (Pheonix Environmental, 2022)	Overlaps the western section of the Survey Area	March – October, 2021	Detailed fauna, Targeted Bilby, and SRE survey	<ul style="list-style-type: none"> Bilby (<i>Macrotis lagotis</i>) – VU (BC Act & EPBC Act) Brush-tailed Mulgara (<i>Dasyercus blythi</i>) – P4 (DBCAs) 	<p>Eleven fauna habitats were identified:</p> <ul style="list-style-type: none"> Beach/Dune Tidal Flats Mangroves Riverine Sandplain Billabong Low Hill Granite Tor/Isolated Rockpile Quartz Hill Ocean Disturbed
Lit D	Wodgina Gas Pipeline targeted Fauna Survey (360 Environmental Pty Ltd, 2018)	Approx. 20 km southwest of the Survey Area	June 2018	Targeted fauna survey	<ul style="list-style-type: none"> Bilby (<i>Macrotis lagotis</i>) – VU (BC Act & EPBC Act) Pilbara Leaf-nosed Bat (<i>Rhinioncteris aurantia</i> Pilbara form) – VU (BC Act & EPBC Act) 	<p>Five fauna habitats were identified:</p> <ul style="list-style-type: none"> Grassland Low woodland Low-lying habitat Major drainage lines
Lit E	Wodgina Project: Level 1 Fauna Survey, Targeted Conservation Significant Fauna Survey and Desktop Assessment (Stantec Australia Pty Ltd, 2018)	Approx 80 km south of the Survey Area	July 2018	Basic Fauna Survey Targeted Fauna Survey	<ul style="list-style-type: none"> Northern Quoll (<i>Dasyurus hallucatus</i>) – EN (BC Act & EPBC Act) Pilbara Leaf-nosed Bat (<i>Rhinioncteris aurantia</i> Pilbara form) – VU (BC Act & EPBC Act) 	<p>Six fauna habitats were identified:</p> <ul style="list-style-type: none"> Ironstone ridge top Rocky ridge and gorge Rocky foothills Stony Rise Spinifex stony plain Drainage line

ID	Report	Project Area	Survey Timing	Survey Effort	Significant Fauna Recorded Onsite	Fauna Habitats
					<ul style="list-style-type: none"> • Ghost Bat (<i>Macroderma gigas</i>) – VU (BC Act & EPBC Act) • Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>) – P4 (BC Act) 	
Lit F	Pardoo Stage 3 Irrigation Project and 80 Mile Beach Ramsar Site Fauna Assessment (Bamford Consulting Ecologists, 2017b)	Approx. 100 km east of Survey Area	12 -14 July 2016, 18 - 21 Sept 2017	Basic fauna survey Targeted fauna survey	<ul style="list-style-type: none"> • Fork-tailed Swift (<i>Apus pacificus</i>) - MI (BC Act), MI & MA (EPBC Act) • Oriental Plover (<i>Charadrius veredus</i>) - MI (BC Act), MI & MA (EPBC Act) • Brush-tailed Mulgara (<i>Dasyercus blythi</i>) – P4 (DBCA) • Bilby (<i>Macrotis lagotis</i>) – VU (BC Act & EPBC Act) 	<p>Six fauna habitats were identified:</p> <ul style="list-style-type: none"> • Pindan shrublands • Coastal plain thickets and shrublands • Coastal plain grasslands and low shrublands • Salt pans • Low limestone ridges • Completely degraded area associated with agricultural structures.
Lit G	Assessment of the Bilby <i>Macrotis lagotis</i> Pardoo Station; Stage 2 areas (Bamford Consulting Ecologists, 2017a)	Approx. 100 km east of Survey Area	28 - 30 June 2017	Targeted fauna survey	<ul style="list-style-type: none"> • Bilby (<i>Macrotis lagotis</i>) – VU (BC Act & EPBC Act) 	<p>One fauna habitat was identified:</p> <ul style="list-style-type: none"> • Pindan shrublands
Lit H	Supplementary Flora and Vegetation Survey and Terrestrial Fauna Survey for the Balla Balla Infrastructure Group Ltd (Phoenix Environmental, 2018)	Approx 100 km west of the Survey Area	June 2017	Basic Fauna Survey Targeted Fauna Survey	<ul style="list-style-type: none"> • Northern Quoll (<i>Dasyurus hallucatus</i>) – EN (BC Act & EPBC Act) • Bilby (<i>Macrotis lagotis</i>) – VU (BC Act & EPBC Act) 	<p>Seven fauna habitats were identified:</p> <ul style="list-style-type: none"> • Hummock and tussock grassland • Minor creek and drainage line • Open and closed shrubland • Rocky hill slope

ID	Report	Project Area	Survey Timing	Survey Effort	Significant Fauna Recorded Onsite	Fauna Habitats
						<ul style="list-style-type: none"> • Woodland • Gully Sandplain
Lit I	Assessment of the Bilby <i>Macrotis lagotis</i> Pardoo Station; Stage 2 and 3 project areas (Bamford Consulting Ecologists, 2016)	Approx. 100 km east of Survey Area	12 - 14 July 2016	Targeted fauna survey	<ul style="list-style-type: none"> • Brush-Tailed Mulgara (<i>Dasyercus blythi</i>) – P4 (BC Act) 	One fauna habitat was identified: <ul style="list-style-type: none"> • Pindan shrublands
Lit J	Terrestrial Fauna Surveys for the Balla Balla Railway Project (Phoenix Environmental, 2014)	Approx 100 km west of the Survey Area	June – July 2014	Targeted Fauna Survey	<ul style="list-style-type: none"> • Northern Quoll (<i>Dasyurus hallucatus</i>) – EN (BC Act & EPBC Act) • Western Pebble-mound mouse (<i>Pseudomys chapmani</i>) – P4 (BC Act)) 	Eight fauna habitats were identified: <ul style="list-style-type: none"> • Hummock and tussock grassland • Open and closed shrubland • Rocky hill slope • Minor creek and drainage line • Woodland • Gully • Isolated sand dunes



Appendix C Flora Desktop Assessment Results and Likelihood of Occurrence

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

SLR Project No.: 675.072189.00001

29 July 2024

Summary of results of the database searches (numbers represent counts of records within 50 km of the Survey Area).

Taxon	NatureMap	TPFL [^]	WAH ⁺
T			
<i>Quoya zonalis</i>		71	22
P1			
<i>Acacia cyperophylla</i> var. <i>omearana</i>			1
<i>Acacia leeuweniana</i>		1	7
<i>Atriplex eremitis</i>	✓	1	1
<i>Corchorus</i> sp. Yarrie (J. Bull & D. Roberts CAL 01.05)			3
<i>Euploca parviantrum</i>	✓		1
<i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114)	✓		27
<i>Themeda</i> sp. Panorama (J. Nelson et al. NS 102)			3
<i>Triodia degreyensis</i>			1
<i>Triodia</i> sp. De Grey River (M.D. Barrett & B.M. Anderson MDB 4432)			1
P2			
<i>Euphorbia inappendiculata</i> var. <i>inappendiculata</i>			3
<i>Gomphrena pusilla</i>	✓		5
P3			
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	✓	1	37
<i>Acacia levata</i>		1	2
<i>Dolichocarpa</i> sp. Hamersley Station (A.A. Mitchell PRP 1479)			1
<i>Eragrostis crateriformis</i>	✓	2	22
<i>Euphorbia clementii</i>	✓	5	25
<i>Euploca mutica</i>	✓		71
<i>Gomphrena cucullata</i>	✓	1	1
<i>Gomphrena leptophylla</i>	✓		2
<i>Goodenia obscurata</i>			1
<i>Gymnanthera cunninghamii</i>	✓	2	12
<i>Heliotropium murinum</i>			3
<i>Indigofera ammobia</i>		1	1
<i>Nicotiana umbratica</i>			7
<i>Phyllanthus hebecarpus</i>			4
<i>Rothia indica</i> subsp. <i>australis</i>	✓		14
<i>Stylidium weeliwollii</i>			2
<i>Terminalia supranitifolia</i>			5
<i>Triodia basitricha</i>			3
<i>Triodia chichesterensis</i>	✓		28
<i>Vigna triodiophila</i>			5
P4			
<i>Bulbostylis burbridgeae</i>	✓	2	17
<i>Ptilotus mollis</i>	✓		4

[^]Department of Biodiversity Conservation and Attractions. (2024e). Threatened and Priority Flora List (TPFL) database request (custom search). ⁺Department of Biodiversity Conservation and Attractions. (2024f). Western Australia Herbarium Flora Database (custom search).

Community*	TEC/PEC
P3	
Eighty Mile Land System	15
Gregory Land System	21
Horseflat Land System of the Roebourne Plains	3

*Department of Biodiversity Conservation and Attractions. (2024c). Threatened and Priority Ecological Communities database request (custom search).

Appendix C: Assessment of the Likelihood of Occurrence of Threatened and Priority Flora as per Desktop Assessment Database Searches surrounding the Survey Area

Distance to Nearest Record from the Survey Area is based on a distance analysis undertaken against 2024 DBCA database. High = Suitable habitat present and records less than 20 km from the Survey Area, Medium = Suitable habitat present and records between 20 km and 40 km from the Survey Area, and Low = No suitable habitat present and/or records greater than 40 km from the Survey Area, Unknown = Insufficient information available to classify. CR= Listed as Critically Endangered under the EPBC Act, EN = Listed as Endangered under the EPBC Act, VU = listed as Vulnerable under the EPBC Act. T = Threatened under the BC Act, P = Priority Listed, Ranked and Listed by the DBCA. Likelihoods are assessed both pre and post survey based on knowledge of the Survey Area, nearest known records, known flowering period of flora taxa and knowledge gained from the survey effort during ground truthing. ¹: Department of Biodiversity, Conservation and Attractions (2024). FloraBase - The Western Australian Flora. <https://florabase.dpaw.wa.gov.au/>

Species	Conservation Status		Source			Distance to Nearest Record (km)	Flowering Period	Preferred Habitat	Pre-Survey Likelihood of Occurrence	Habitat Occurs in Survey Area?	Post-Survey Likelihood of Occurrence
	DBCA	EPBC	NatureMap	PMST	DBCA						
Threatened											
<i>Quoya zonalis</i>	T	EN			X	77.53	Aug	Rocky ironstone or granite or conglomerate steep hill slopes. ¹	Low	No	Low
Priority 1											
<i>Acacia cyperophylla</i> var. <i>omearana</i>	P1				X	73.40	Mar - Apr	Stony and gritty alluvium. Along drainage lines. ¹	Low	No	Low
<i>Acacia leeuweniana</i>	P1				X	91.78	Apr - May	Gritty, skeletal red-grey sandy loam, light orange-brown gravelly sand, granite. In rock fissures in outcrops, among boulders. ¹	Low	No	Low
<i>Atriplex eremitis</i>	P1		X		X	18.78	Aug	Tussock grassland associated with <i>Eragrostis xerophila</i> and the introduced <i>Cenchrus ciliaris</i> occurring as a component of a sub-unit of the Anna land system composed of level sand plains and a mosaic of saline plains. ¹	Low	No	Low
<i>Corchorus</i> sp. Yarrie (J. Bull & D. Roberts CAL 01.05)	P1				X	61.34	Jun	Drainage line, ironstone, loamy soil. ¹	Low	Yes	Low
<i>Euploca parviantrum</i>	P1		X		X	6.87	-	Sandy soils. Flats, plains, rocky slopes. ¹	High	Yes	Medium
<i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114)	P1		X		X	3.83	Jul - Sep	Pale red/yellow/brown sand. Sand plains. ¹	High	Yes	Recorded
<i>Themeda</i> sp. Panorama (J. Nelson et al. NS 102)	P1				X	85.41	-	Skeletal soils, red clay loam. Rock gullies, steep rocky slopes, high in the landscape. ¹	Low	No	Low
<i>Triodia degreyensis</i>	P1				X	6.18	-	Skeletal soils, ironstone outcropping. ¹	Low	Yes	Low
Priority 2											
<i>Euphorbia inappendiculata</i> var. <i>inappendiculata</i>	P2				X	60.93	May, Aug	Red, brown clay or loam. Plains. ¹	Low	Yes	Medium
<i>Gomphrena pusilla</i>	P2		X		X	8.05	Mar - Apr	Fine beach sand. Behind foredune, on limestone. ¹	Low	No	Low
Priority 3											

¹ Department of Agriculture, Water and Environment (2024) ²Western Australian Herbarium (2024)

<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3		X		X	3.03	Jun, Aug - Sep	Sandy plains. ¹	High	Yes	Medium
<i>Acacia levata</i>	P3				X	98.73	May	Sand or sandy loam over granite. Hillslopes. ¹	Low	Yes	Low
<i>Dolichocarpa</i> sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3				X	72.70	May - Jul or Sep	Brown sandy clay, or medium clay. Claypans, drainage lines, cracking clays, crabhole plains. ¹	Low	No	Low
<i>Eragrostis crateriformis</i>	P3		X		X	0.15	Jan - May or Jul	Clayey loam or clay. Creek banks, depressions. ¹	High	Yes	High
<i>Euphorbia clementii</i>	P3		X		X	6.19	Jun	Gravelly hillsides, stony grounds. ¹	High	Yes	Medium
<i>Euploca mutica</i>	P3		X		X	0.08	Aug	Flat sand plains. ¹	High	Yes	High
<i>Gomphrena cucullata</i>	P3		X		X	47.87	Feb - Apr	Red sandy loam, clayey sand. Open floodplains. ¹	Low	Yes	Low
<i>Gomphrena leptophylla</i>	P3		X		X	6.31	Mar - Sep	Sand, sandy to clayey loam, granite, quartzite. Open flats, sandy creek beds, edges salt pans and marshes, stony hillsides. ¹	High	No	Low
<i>Goodenia obscurata</i>	P3				X	75.95	-	Stony soils on hills. ¹	Low	Yes	Low
<i>Gymnanthera cunninghamii</i>	P3		X		X	6.87	Jan - Dec	Sandy soils. ¹	High	Yes	Recorded
<i>Heliotropium murinum</i>	P3				X	55.50	May or Sep	Red sand. Plains. ¹	Low	Yes	Low
<i>Indigofera ammobia</i>	P3				X	94.15	Sep	Red sand. Sand dunes. ¹	Low	No	Low
<i>Nicotiana umbratica</i>	P3				X	72.04	Apr - Jun	Shallow soils. Rocky outcrops. ¹	Low	Yes	Low
<i>Phyllanthus hebecarpus</i>	P3				X	86.93	-	Granite boulders, granite outcrop, rock land, slopes. ¹	Low	Yes	Low
<i>Rothia indica</i> subsp. <i>australis</i>	P3		X		X	Occurs within survey boundary	Apr - Aug	Sandy soils. Sandhills and sandy flats. ¹	High	Yes	Medium
<i>Stylidium weeliwollii</i>	P3				X	53.32	Aug - Sep	Gritty sand soil, sandy clay. Edge of watercourses. ¹	Low	Yes	Low
<i>Terminalia supranitifolia</i>	P3				X	76.29	May or Jul or Dec	Sand. Among basalt rocks. Hill tops. ¹	Low	No	Low
<i>Triodia basitricha</i>	P3				X	77.78	-	Stony ground, gravelly hill, crests, hills, in gorges. ¹	Low	Yes	Low
<i>Triodia chichesterensis</i>	P3		X		X	9.67	Feb - Apr, Aug	Flat plains, light sandy soil, hill slopes, stony soil. ¹	High	Yes	Low
<i>Vigna triodiophila</i>	P3				X	66.94	Mar - May	Stony red-brown clay loam. Among boulders, steep slopes. ¹	Low	No	Low
Priority 4											

¹ Department of Agriculture, Water and Environment (2024) ²Western Australian Herbarium (2024)

<i>Bulbostylis burbidgeae</i>	P4		X		X	5.85	Mar or Jun - Aug	Granitic soils. Granite outcrops, cliff bases. ¹	High	Yes	Medium
<i>Ptilotus mollis</i>	P4		X		X	20.05	May or Sep	Stony hills and screes. ¹	Low	No	Low

¹ Department of Agriculture, Water and Environment (2024) ²Western Australian Herbarium (2024)



Appendix D Flora Recorded During the Survey

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

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Appendix A: Flora Inventory

Family	Taxa	Status
Aizoaceae	<i>Trianthema triquetrum</i>	
Amaranthaceae	<i>Aerva javanica</i>	Weed
	<i>Alternanthera nana</i>	
	<i>Ptilotus astrolasius</i>	
	<i>Ptilotus axillaris</i>	
	<i>Ptilotus exaltatus</i>	
	<i>Ptilotus fusiformis</i>	
	<i>Ptilotus murrayi</i>	
	<i>Ptilotus</i> sp.	
Apocynaceae	<i>Calotropis procera</i>	Weed (DP)
	<i>Carissa lanceolata</i>	
	<i>Cynanchum floribundum</i>	
	<i>Cynanchum viminale</i> subsp. <i>australe</i>	
	<i>Gymnanthera cunninghamii</i>	P3
Asteraceae	<i>Pluchea dentex</i>	
	<i>Pluchea ferdinandi-muelleri</i>	
	<i>Pluchea rubelliflora</i>	
	<i>Streptoglossa</i> sp.	
Bignoniaceae	<i>Dolichandrone occidentalis</i>	
Boraginaceae	<i>Euploca cunninghamii</i>	
	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	
Campanulaceae	<i>Wahlenbergia tumidifructa</i>	
Capparaceae	<i>Capparis spinosa</i> subsp. <i>nummularia</i>	
	<i>Capparis umbonata</i>	
Chenopodiaceae	<i>Maireana melanocoma</i>	
	<i>Salsola australis</i>	
	<i>Sclerolaena hostilis</i>	
Cleomaceae	<i>Arivela viscosa</i>	
Combretaceae	<i>Terminalia circumulata</i>	
Convolvulaceae	<i>Bonamia alatisemina</i>	
	<i>Bonamia erecta</i>	
	<i>Bonamia linearis</i>	
	<i>Bonamia pilbarensis</i>	
	<i>Evolvulus</i> sp.	
	<i>Ipomoea muelleri</i>	
	<i>Operculina aequisepala</i>	
	<i>Polymeria ambigua</i>	
Cucurbitaceae	<i>Cucumis variabilis</i>	
Cyperaceae	<i>Bulbostylis barbata</i>	
	<i>Cyperus conicus</i>	
	<i>Cyperus</i> sp.	
	<i>Cyperus vaginatus</i>	
Elatinaceae	<i>Bergia trimera</i>	
Euphorbiaceae	<i>Euphorbia australis</i> var. <i>subtomentosa</i>	
	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	
	<i>Euphorbia trigonosperma</i>	
	<i>Microstachys chamaelea</i>	

Appendix A: Flora Inventory

Family	Taxa	Status
Fabaceae	<i>Acacia acradenia</i>	
	<i>Acacia adoxa</i> var. <i>adoxo</i>	
	<i>Acacia ampliceps</i>	
	<i>Acacia ancistrocarpa</i>	
	<i>Acacia bivenosa</i>	
	<i>Acacia colei</i> var. <i>colei</i>	
	<i>Acacia coriacea</i> subsp. <i>pendens</i>	
	<i>Acacia inaequilatera</i>	
	<i>Acacia orthocarpa</i>	
	<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>	
	<i>Acacia sericophylla</i>	
	<i>Acacia</i> sp.	
	<i>Acacia sphaerostachya</i>	
	<i>Acacia stellaticeps</i>	
	<i>Acacia synchronica</i>	
	<i>Acacia trachycarpa</i>	
	<i>Acacia trachycarpa</i> x <i>tumida</i> var. <i>pilbarensis</i>	
	<i>Acacia tumida</i> var. <i>pilbarensis</i>	
	<i>Cajanus pubescens</i>	
	<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	
	<i>Crotalaria ramosissima</i>	
	<i>Cullen leucanthum</i>	
	<i>Indigofera hirsuta</i>	
	<i>Indigofera linnaei</i>	
	<i>Indigofera monophylla</i>	
	<i>Indigofera oblongifolia</i>	Weed
	<i>Isotropis atropurpurea</i>	
	<i>Neptunia dimorphantha</i>	
	<i>Neptunia</i> sp.	
	<i>Petalostylis cassioides</i>	
	<i>Petalostylis labicheoides</i>	
	<i>Rhynchosia minima</i>	
	<i>Senna artemisioides</i> subsp. <i>helmsii</i>	
	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	
	<i>Senna notabilis</i>	
	<i>Senna symonii</i>	
	<i>Senna venusta</i>	
	<i>Sesbania formosa</i>	
	<i>Tephrosia</i> ? <i>supina</i>	
	<i>Tephrosia rosea</i> subsp. Port Hedland (A.S. George 1114)	P1
<i>Tephrosia rosea</i> var. <i>clementii</i>		
<i>Tephrosia rosea</i> var. Fortescue creeks (M.I.H. Brooker 2186)		
<i>Tephrosia</i> sp. Bungaroo Creek (M.E. Trudgen 11601)		
<i>Vachellia farnesiana</i>	Weed	
<i>Vigna lanceolata</i> var. <i>lanceolata</i>		
Goodeniaceae	<i>Goodenia lamprosperma</i>	
	<i>Goodenia muelleriana</i>	

Appendix A: Flora Inventory

Family	Taxa	Status
Goodeniaceae	<i>Goodenia stobbsiana</i>	
	<i>Scaevola browniana</i>	
	<i>Scaevola spinescens</i>	
Gyrostemonaceae	<i>Codonocarpus cotinifolius</i>	
Gyrostemonaceae	<i>Gyrostemon tepperi</i>	
Hemerocallidaceae	<i>Corynotheca</i> sp.	
Lauraceae	<i>Cassytha capillaris</i>	
Malvaceae	<i>Abutilon lepidum</i>	
	<i>Corchorus incanus</i> subsp. <i>incanus</i>	
	<i>Corchorus laniflorus</i>	
	<i>Corchorus</i> sp.	
	<i>Hibiscus austrinus</i> var. <i>austrinus</i>	
	<i>Malvaceae</i> sp.	
	<i>Malvastrum americanum</i>	Weed
	<i>Sida clementii</i>	
	<i>Sida</i> sp.	
	<i>Sida</i> sp. Pilbara (A.A. Mitchell PRP 1543)	
	<i>Sida</i> sp. Pindan (B.G. Thomson 3398)	
	<i>Triumfetta clementii</i>	
	<i>Triumfetta</i> sp.	
<i>Waltheria indica</i>		
Meliaceae	<i>Azadirachta indica</i>	Weed
	<i>Owenia reticulata</i>	
Menispermaceae	<i>Tinospora smilacina</i>	
Molluginaceae	<i>Glinus lotoides</i>	
Moraceae	<i>Ficus aculeata</i> var. <i>indecora</i>	
	<i>Ficus brachypoda</i>	
	<i>Ficus aculeata</i>	
Myrtaceae	<i>Corymbia candida</i> subsp. <i>candida</i>	
	<i>Corymbia candida</i> subsp. <i>indet.</i>	
	<i>Corymbia deserticola</i>	
	<i>Corymbia flavescens</i>	
	<i>Corymbia hamersleyana</i>	
	<i>Corymbia zygophylla</i>	
	<i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>	
	<i>Eucalyptus victrix</i>	
	<i>Melaleuca argentea</i>	
<i>Melaleuca glomerata</i>		
Nyctaginaceae	<i>Boerhavia repleta</i>	
	<i>Boerhavia</i> sp.	
Passifloraceae	<i>Passiflora foetida</i>	Weed
Phyllanthaceae	<i>Nellica maderaspatensis</i>	
	<i>Notoleptopus decaisnei</i>	
Plantaginaceae	<i>Stemodia grossa</i>	
	<i>Stemodia viscosa</i>	
Poaceae	<i>Aristida holathera</i> var. <i>holathera</i>	
	<i>Cenchrus ciliaris</i>	Weed

Appendix A: Flora Inventory

Family	Taxa	Status
Poaceae	<i>Chrysopogon fallax</i>	
	<i>Cymbopogon ambiguus</i>	
	<i>Cymbopogon</i> sp.	
	<i>Eragrostis eriopoda</i>	
	<i>Eragrostis speciosa</i>	
	<i>Eriachne lanata</i>	
	<i>Eriachne mucronata</i>	
	<i>Eriachne obtusa</i>	
	<i>Eulalia aurea</i>	
	<i>Paraneurachne muelleri</i>	
	<i>Poaceae</i> sp.	
	<i>Sporobolus australasicus</i>	
	<i>Themeda triandra</i>	
	<i>Triodia epactia</i>	
	<i>Triodia secunda</i>	
	<i>Triodia</i> sp.	
<i>Triodia wiseana</i>		
Proteaceae	<i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>	
	<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>	
	<i>Hakea lorea</i> subsp. <i>lorea</i>	
Pteridaceae	<i>Cheilanthes</i> sp.	
Rubiaceae	<i>Dentella asperata</i>	
Santalaceae	<i>Santalum lanceolatum</i>	
Sapindaceae	<i>Atalaya hemiglauca</i>	
Scrophulariaceae	<i>Eremophila longifolia</i>	
Solanaceae	<i>Solanum diversiflorum</i>	
	<i>Solanum horridum</i>	
	<i>Solanum lasiophyllum</i>	
	<i>Solanum</i> sp.	
Violaceae	? <i>Afrohybanthus</i> sp.	
	<i>Afrohybanthus aurantiacus</i>	



Appendix E Threatened and Priority Flora Report Forms

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

SLR Project No.: 675.072189.00001

29 July 2024



Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

TAXON: Gymnanthera cunninghamii **TPFL Pop. No.:** _____

OBSERVATION DATE: 10/03/2024 **CONSERVATION STATUS:** P3 **New population**

OBSERVER/S: Jack Hardie, Grant Buller **PHONE:** _____

ROLE: Botanists **ORGANISATION:** SLR Consulting

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):
Devil Creek, 37km east of South Hedland

Reserve No.: _____

DBC DISTRICT: Pilbara **LGA:** Port Hedland **Land manager present:**

DATUM: **COORDINATES:** (If UTM coords provided, Zone is also required) **METHOD USED:**

GDA94 / MGA94 DecDegrees DegMinSec UTM GPS Differential GPS Map
 AGD84 / AMG84 **Lat / Northing:** 705557 No. satellites: _____ Map used: _____
 WGS84 **Long / Easting:** 7743392 Boundary polygon captured: Map scale: _____
 Unknown **ZONE:** 50

LAND TENURE:

Nature reserve Timber reserve Private property Rail reserve Shire road reserve
 National park State forest Pastoral lease MRWA road reserve Other Crown reserve
 Conservation park Water reserve UCL SLK/Pole _____ to _____ Specify other: _____

AREA ASSESSMENT: Edge survey Partial survey Full survey Area observed (m²): _____

EFFORT: Time spent surveying (minutes): _____ No. of minutes spent / 100 m²: _____

POP'N COUNT ACCURACY: Actual Extrapolation Estimate Count method: Actual count - individuals
(Refer to field manual for list)

WHAT COUNTED: Plants Clumps Clonal stems

TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:	Area of pop (m ²):
Alive		3		3	_____
Dead					

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. _____ Size _____ Data attached Total area of quadrats (m²): _____

Summary Quad. Totals: Alive

REPRODUCTIVE STATE: Clonal Vegetative Flowerbud Flower
 Immature fruit Fruit Dehisced fruit Percentage in flower: _____ %

CONDITION OF PLANTS: Healthy Moderate Poor Senescent

COMMENT: _____

THREATS - type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
• Pastoralism/livestock	N	M	L
• Clearing (clearing was observed on the eastern bank several hundred metres south of record location)	N	L	L
•	_____	_____	_____

Please return completed form to **Species And Communities Branch DBCA**,
 Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au
RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.



Threatened and Priority Flora Report Form

HABITAT INFORMATION:

LANDFORM:

- Crest
- Hill
- Ridge
- Outcrop
- Slope
- Flat
- Open depression
- Drainage line
- Closed depression
- Wetland

ROCK TYPE:

- Granite
- Dolerite
- Laterite
- Ironstone
- Limestone
- Quartz

Specify other: _____

Specific Landform Element:

(Refer to field manual for additional values)

LOOSE ROCK:

(on soil surface; eg gravel, quartz fields)

- 0-10%
- 10-30%
- 30-50%
- 50-100%

SOIL TYPE:

- Sand
- Sandy loam
- Loam
- Clay loam
- Light clay
- Peat

Specify other: _____

SOIL COLOUR:

- Red
- Brown
- Yellow
- White
- Grey
- Black

Specify other: _____

DRAINAGE:

- Well drained
- Seasonally inundated
- Permanently inundated
- Tidal

CONDITION OF SOIL:

- Dry
- Moist
- Waterlogged
- Inundated

VEGETATION CLASSIFICATION*:

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);
 2. Open shrubland (Hibbertia sp., Acacia spp.);
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. Eucalyptus camaldulensis subsp. refulgens, Melaleuca argentea low open woodland
2. Acacia trachycarpa, Melaleuca glomerata mid isolated shrubs
3. Eulalia aurea, *Cenchrus ciliaris low isolated clumps of grasses
- 4.

ASSOCIATED SPECIES:

Other (non-dominant) spp _____

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT:

- Pristine
- Excellent
- Very good
- Good
- Degraded
- Completely degraded

COMMENT:

FIRE HISTORY:

Last Fire: Season/Month: _____ Year: _____ Fire Intensity: High Medium Low No signs of fire

FENCING:

- Not required
- Present
- Replace / repair
- Required
- Length req'd: _____

ROADSIDE MARKERS:

- Not required
- Present
- Replace / reposition
- Required
- Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) _____

DRF PERMIT/ LICENCE No:

Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN:

Collectors No: _____ WA Herb. Regional Herb. District Herb. Other: _____

ATTACHED:

Map Mudmap Photo GIS data Field notes Other: _____

COPY SENT TO:

Regional Office District Office Other: _____

Submitter of Record: Grant Buller

Role: Senior Botanist

Signed:

Date: 8/07/2024

Please return completed form to **Species And Communities Branch DBCA**,
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RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.



Threatened and Priority Flora Report Form

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au> under Standard Report Forms

TAXON: Tephrosia rosea subsp. Port Hedland (A.S. George 1114) **TPFL Pop. No.:** _____

OBSERVATION DATE: 2/03/2024 **CONSERVATION STATUS:** P1 **New population**

OBSERVER/S: Jack Hardie, Grant Buller **PHONE:** _____

ROLE: Botanists **ORGANISATION:** SLR Consulting

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):
Road verge, Great Northern Highway, south of Boodarie/South Hedland

Reserve No.: _____

DBC DISTRICT: Pilbara **LGA:** Port Hedland **Land manager present:**

DATUM: **COORDINATES:** (If UTM coords provided, Zone is also required) **METHOD USED:**

DecDegrees DegMinSec UTM GPS Differential GPS Map

GDA94 / MGA94 **Lat / Northing:** 661261 **No. satellites:** _____ **Map used:** _____

AGD84 / AMG84 **Long / Easting:** 7737710 **Boundary polygon captured:** **Map scale:** _____

WGS84 **ZONE:** 50

Unknown

LAND TENURE:

Nature reserve Timber reserve Private property Rail reserve Shire road reserve

National park State forest Pastoral lease MRWA road reserve Other Crown reserve

Conservation park Water reserve UCL SLK/Pole 1595 to 1596 **Specify other:** _____

AREA ASSESSMENT: Edge survey Partial survey Full survey **Area observed (m²):** _____

EFFORT: Time spent surveying (minutes): _____ **No. of minutes spent / 100 m²:** _____

POP'N COUNT ACCURACY: Actual Extrapolation Estimate **Count method:** Actual count - individuals
(Refer to field manual for list)

WHAT COUNTED: Plants Clumps Clonal stems

TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:	Area of pop (m²):
Alive				2	_____
Dead					

QUADRATS PRESENT: No. _____ Size _____ Data attached **Total area of quadrats (m²):** _____

Summary Quad. Totals: Alive

REPRODUCTIVE STATE: Clonal Vegetative Flowerbud Flower
Immature fruit Fruit Dehisced fruit **Percentage in flower:** _____ %

CONDITION OF PLANTS: Healthy Moderate Poor Senescent

COMMENT: _____

THREATS - type, agent and supporting information:	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)			
• Clearing for road verge	N	H	M
•	_____	_____	_____
•	_____	_____	_____

Please return completed form to **Species And Communities Branch DBCA**,
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RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.



Threatened and Priority Flora Report Form

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input checked="" type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input checked="" type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input checked="" type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input type="checkbox"/>	
Flat <input checked="" type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					
CONDITION OF SOIL:	Dry <input type="checkbox"/>	Moist <input type="checkbox"/>	Waterlogged <input type="checkbox"/>	Inundated <input type="checkbox"/>	

VEGETATION CLASSIFICATION*:

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);
 2. Open shrubland (Hibbertia sp., Acacia spp.);
 3. Isolated clumps of sedges (Mesomelaena tetragona)

1. Acacia stellaticeps low open shrubland _____
 2. Triodia epactia low hummock grassland _____
 3. _____
 4. _____

ASSOCIATED SPECIES:

Other (non-dominant) spp _____

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine Excellent Very good Good Degraded Completely degraded

COMMENT: Recorded in roadside drain, surrounding habitat in Very Good condition

FIRE HISTORY: Last Fire: Season/Month: _____ Year: _____ Fire Intensity: High Medium Low No signs of fire

FENCING: Not required Present Replace / repair Required Length req'd: _____

ROADSIDE MARKERS: Not required Present Replace / reposition Required Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.) _____

DRF PERMIT/ LICENCE No: Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licencing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: _____ WA Herb. Regional Herb. District Herb. Other: _____

ATTACHED: Map Mudmap Photo GIS data Field notes Other: _____

COPY SENT TO: Regional Office District Office Other: _____

Submitter of Record: Grant Buller Role: Senior Botanist Signed:  Date: 8/07/2024



Appendix F Flora Site Sheets

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

SLR Project No.: 675.072189.00001

29 July 2024

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR01
Location MGA 50 660017 mE 7740884 mN
Described by: GB,JH
Date: 1-03-2024
Type: QUADRAT
Landform: PlainFlat
Slope: N/A
Rock Type: N/A
Soil Type: Sand
Soil Colour: Orange



Vegetation: *Pluchea ferdinandi-muelleri* and *P. dentex* low isolated shrubs over *Triodia epactia* and *T. secunda* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Pluchea dentex</i>	20	0.1	
<i>Pluchea ferdinandi-muelleri</i>	50	0.1	
<i>Triodia epactia</i>	30	40	
<i>Triodia secunda</i>	30	5	

FLORA SITE SHEET

Project Name: Atlas Ridley Biological Survey
Site: AR02
Location: MGA 50 659628 mE 7740921 mN
Described by: GB,JH
Date: 1-03-2024
Type: QUADRAT
Landform: PlainsFlat
Slope: N/A
Rock Type: N/A
Soil Type: Sand
Soil Colour: Orange



Vegetation: *Eucalyptus victrix* and *Corymbia candida* subsp. *candida* low isolated trees over *Acacia stellaticeps*, *A. colei* var. *colei* and *Hakea lorea* subsp. *lorea* low sparse shrubland over *Triodia epactia* low open hummock grassland.

Condition: Excellent **Disturbance Type:** None
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	160	0.1	
<i>Acacia stellaticeps</i>	45	20	
<i>Cassutha capillaris</i>	10	0.1	
<i>Corymbia candida</i> subsp. <i>candida</i>	250	0.1	
<i>Eucalyptus victrix</i>	500	0.1	
<i>Hakea lorea</i> subsp. <i>lorea</i>	60	0.1	
<i>Pluchea dentex</i>	30	0.1	
<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)	30	0.1	
<i>Triodia epactia</i>	30	31	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR03
Location MGA 50 661481 mE 7739545 mN
Described by: GB,JH
Date: 2-03-2024
Type: QUADRAT
Landform: Plains Flat
Slope: N/A
Rock Type: N/A
Soil Type: Sand
Soil Colour: Orange



Vegetation: *Acacia tumida* var. *pilbarensis* mid sparse shrubland over *Acacia stellaticeps* low sparse shrubland over *Triodia epactia* open hummock grassland.

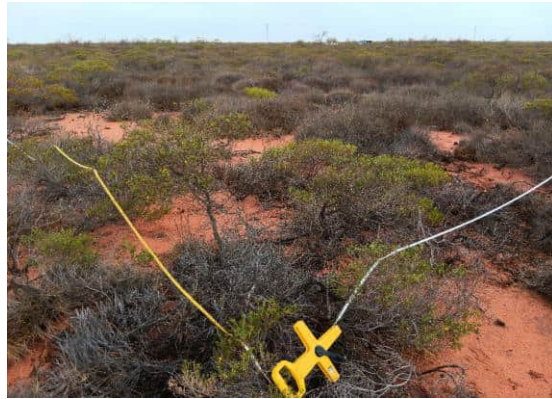
Condition: Very Good **Disturbance Type:** Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia stellaticeps</i>	60	10	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	170	10	
<i>Cassutha capillaris</i>	30	0.1	
<i>Corchorus</i> sp.	30	0.1	
<i>Cymbopogon</i> sp.	50	0.1	
<i>Eragrostis eriopoda</i>	20	0.1	
<i>Hakea lorea</i> subsp. <i>lorea</i>	140	0.1	
<i>Paraneurachne muelleri</i>	30	0.1	
<i>Poaceae</i> sp.	30	2	
<i>Sida</i> sp.	30	0.1	
<i>Solanum</i> sp.	20	0.1	
<i>Triodia epactia</i>	40	29	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR04
Location MGA 50 661194 mE 7737874 mN
Described by: GB,JH
Date: 2-03-2024
Type: QUADRAT
Landform: PlainsFlat
Slope: N/A
Rock Type: N/A
Soil Type: Sand
Soil Colour: Orange



Vegetation: *Acacia stellaticeps* low sparse shrubland over *Triodia epactia* and *Triodia sp.* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Fauna tracks/scats,Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia stellaticeps</i>	60	20	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	200	0.1	
<i>Eragrostis eriopoda</i>	20	0.1	
<i>Poaceae</i> sp.	20	0.1	
<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)	20	0.1	
<i>Triodia epactia</i>	40	31	
<i>Triodia</i> sp.	20	0.5	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR05
Location MGA 50 665737 mE 7736737 mN
Described by: GB,JH
Date: 2-03-2024
Type: RELEVE
Landform: Low hill crestGentle
Slope: N/A
Rock Type: Quartzite
Soil Type: Clay,Loam
Soil Colour: Brown,Orange



Vegetation: *Acacia orthocarpa* and *A. tumida* var. *pilbarensis* Mid open shrubland over *Triodia epactia* low open hummock grassland.

Condition: Good **Disturbance Type:** Vehicle tracks,Litter,Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ancistrocarpa</i>	180	0.1	
<i>Acacia inaequilatera</i>	160	0.1	
<i>Acacia orthocarpa</i>	200	25	
<i>Acacia</i> sp	200	0.1	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	200	0.5	
<i>Eriachne lanata</i>	20	0.1	
<i>Goodenia stobbsiana</i>	20	0.1	
<i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>	250	0.1	
<i>Hakea lorea</i> subsp. <i>lorea</i>	20	0.1	
<i>Triodia epactia</i>	30	25	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR06
Location MGA 50 666981 mE 7736472 mN
Described by: GB,JH
Date: 2-03-2024
Type: QUADRAT
Landform: PlainsFlat
Slope: N/A
Rock Type: N/A
Soil Type: Clay,Loam
Soil Colour: Brown,Orange



Vegetation: *Corymbia hamersleyana* and *Eucalyptus victrix* low open woodland over *Acacia colei* var. *colei* and *A. synchronicia* mid sparse shrubland over *Eulalia aurea* low open tussock grassland.

Condition: Very Good **Disturbance Type:** Litter
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Eucalyptus victrix</i>	500	3	
<i>Acacia colei</i> var. <i>colei</i>	250	15	
<i>Cassutha capillaris</i>	20	0.1	
<i>Corymbia hamersleyana</i>	200	15	
<i>Acacia synchronicia</i>	50	0.5	
<i>Eulalia aurea</i>	30	40	
<i>Triodia epactia</i>	30	0.5	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR07
Location MGA 50 667553 mE 7736022 mN
Described by: GB,JH
Date: 2-03-2024
Type: QUADRAT
Landform: PlainFlat
Slope: N/A
Rock Type: N/A
Soil Type: Clay,Loam,Sand
Soil Colour: Brown,Orange



Vegetation: *Eucalyptus victrix* low open woodland over *Triodia epactia* mid sparse hummock grassland over *Eulalia aurea* low open tussock grassland.

Condition: Very Good **Disturbance Type:** None
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	250	3	
<i>Acacia synchronicia</i>	140	0.1	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	140	0.1	
<i>Cassyltha capillaris</i>	50	0.1	
<i>Eucalyptus victrix</i>	550	10	
<i>Eulalia aurea</i>	30	20	
<i>Pluchea dentex</i>	30	0.1	
<i>Triodia epactia</i>	50	20	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR08
Location MGA 50 669224 mE 7737589 mN

Described by: GB,JH
Date: 2-03-2024
Type: QUADRAT

Landform: PlainsFlat
Slope: N/A Photo: unavailable
Rock Type: N/A
Soil Type: Clay,Loam,Sand
Soil Colour: Beige

Vegetation: *Eucalyptus victrix* mid isolated clumps of trees over *Triodia epactia* low open hummock grassland over *Eulalia aurea* low isolated clumps of tussock grasses.

Condition: Very Good **Disturbance Type:** Litter
Fire Age: 1-5 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	50	0.1	
<i>Acacia stellaticeps</i>	10	0.1	
<i>Corchorus</i> sp.	20	0.1	
<i>Eucalyptus victrix</i>	1000	5	
<i>Eulalia aurea</i>	20	0.5	
<i>Senna notabilis</i>	20	0.1	
<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)	20	0.1	
<i>Triodia epactia</i>	30	25	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR09
Location MGA 50 719898 mE 7755031 mN
Described by: GB,JH
Date: 3-03-2024
Type: RELEVE
Landform: Ironstone ridgeSteep
Slope: N/A
Rock Type: Ironstone
Soil Type: Clay
Soil Colour: Brown,Red



Vegetation: *Atalaya hemiglauca* tall isolated clumps of shrubs over *Ficus brachypoda*, *Acacia colei* var. *colei* and *Afrohybanthus aurantiacus* low isolated clumps of shrubs over **Cenchrus ciliaris*, *Triodia epactia* and *Cymbopogon ambiguus* low sparse grassland

Condition: Very Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	100	0.1	
<i>Afrohybanthus aurantiacus</i>	20	0.1	
<i>Atalaya hemiglauca</i>	350	3	
<i>Boerhavia</i> sp.	2	0.1	
* <i>Cenchrus ciliaris</i>	30	4	
<i>Cucumis variabilis</i>	20	0.1	
<i>Cymbopogon ambiguus</i>	40	0.1	
<i>Eriachne mucronata</i>	20	0.1	
<i>Ficus brachypoda</i>	170	1	
<i>Notoleptopus decaisnei</i>	5	0.1	
<i>Ptilotus</i> sp.	20	0.1	
<i>Senna venusta</i>	25	0.1	
<i>Triodia epactia</i>	30	4	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR10
Location MGA 50 719944 mE 7755028 mN
Described by: GB,JH
Date: 3-03-2024
Type: RELEVE
Landform: Ironstone hilltopGentle
Slope: N/A
Rock Type: Ironstone
Soil Type: Clay
Soil Colour: Brown,Red



Vegetation: *Triodia epactia* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Weeds,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
* <i>Cenchrus ciliaris</i>	20	0.1	
<i>Ptilotus</i> sp.	5	0.1	
<i>Triodia epactia</i>	20	50	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR11
Location MGA 50 719701 mE 7754874 mN
Described by: GB,JH
Date: 3-03-2024
Type: QUADRAT
Landform: FloodplainFlat
Slope: N/A
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown



Vegetation: *Cyperus sp.* Low isolated clumps of sedges over *Sclerolaena hostilis* low sparse forbland.

Condition: Degraded **Disturbance Type:** Weeds,Grazing,Litter,Fauna tracks/scats
Fire Age: Unknown

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Boerhavia repleta</i>	30	0.1	
* <i>Calotropis procera</i>	50	0.1	
<i>Crotalaria ramosissima</i>	30	0.1	
<i>Cyperus conicus</i>	20	0.1	
<i>Cyperus sp.</i>	50	1	
<i>Goodenia lamprosperma</i>	20	0.1	
<i>Ipomoea muelleri</i>	20	0.1	
<i>Neptunia sp.</i>	5	0.1	
<i>Poaceae sp.</i>	20	0.1	
<i>Polymeria ambigua</i>	5	0.1	
<i>Sclerolaena hostilis</i>	30	10	
<i>Trianthema triquetrum</i>	2	0.1	
<i>Triodia epactia</i>	20	0.1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR12
Location MGA 50 719492 mE 7754730 mN
Described by: GB,JH
Date: 3-03-2024
Type: RELEVE
Landform: DrainageFlat
Slope: N/A
Rock Type: N/A
Soil Type: Sand
Soil Colour: Brown,Orange



Vegetation: *Eucalyptus victrix* low isolated clumps of trees over *Acacia colei* var. *colei* tall isolated clumps of shrubs over *Eulalia aurea* low isolated clumps of tussock grasses.

Condition: Good **Disturbance Type:** Weeds,Grazing,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	300	0.5	
<i>Afrohybanthus aurantiacus</i>	10	0.1	
<i>Boerhavia repleta</i>	10	0.1	
* <i>Calotropis procera</i>	80	0.1	
<i>Corchorus incanus</i> subsp. <i>incanus</i>	30	0.1	
<i>Cyperus conicus</i>	20	0.1	
<i>Cyperus vaginatus</i>	50	1	
<i>Eucalyptus victrix</i>	900	5	
<i>Eulalia aurea</i>	30	2	
<i>Euploca cunninghamii</i>	10	0.1	
<i>Goodenia lamprosperma</i>	30	0.1	
<i>Ipomoea muelleri</i>	10	0.1	
<i>Poaceae</i> sp.	20	0.1	
<i>Polymeria ambigua</i>	10	0.1	
<i>Sporobolus australasicus</i>	20	0.1	
<i>Triodia epactia</i>	30	0.1	
* <i>Vachellia farnesiana</i>	180	0.1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR13
Location MGA 50 719707 mE 7756078 mN
Described by: GB,JH
Date: 3-03-2024
Type: RELEVE
Landform: Ironstone HilltopGentle
Slope: N/A
Rock Type: Ironstone
Soil Type: Clay
Soil Colour: Brown



Vegetation: *Triodia epactia* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Bonamia pilbarensis</i>	2	0.1	
<i>Isotropis atropurpurea</i>	5	0.1	
<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)	60	0.1	
<i>Solanum diversiflorum</i>	30	0.1	
<i>Triodia epactia</i>	20	40	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR14
Location MGA 50 719576 mE 7756081 mN
Described by: GB,JH
Date: 3-03-2024
Type: RELEVE
Landform: Ironstone ridgeSteep
Slope: N/A
Rock Type: Ironstone
Soil Type: Clay
Soil Colour: Brown



Vegetation: *Ficus brachypoda*, *Ficus aculeata* and *Atalaya hemiglauca* low isolated clumps of trees over *Acacia colei* var. *colei* mid isolated clumps of shrubs over *Triodia epactia* low isolated clumps of hummock grasses.

Condition: Very Good **Disturbance Type:** Weeds,Grazing
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	200	0.5	
<i>Atalaya hemiglauca</i>	250	2	
<i>Boerhavia</i> sp.	3	0.1	
* <i>Cenchrus ciliaris</i>	20	0.5	
<i>Cymbopogon ambiguus</i>	30	0.1	
<i>Eriachne mucronata</i>	20	0.1	
<i>Ficus brachypoda</i>	300	0.5	
<i>Ficus aculeata</i>	200	0.5	
<i>Senna venusta</i>	30	0.1	
<i>Triodia epactia</i>	30	5	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR15
Location MGA 50 719631 mE 7755998 mN
Described by: GB,JH
Date: 3-03-2024
Type: RELEVE
Landform: Between two hillsGentle
Slope: N/A
Rock Type: Ironstone
Soil Type: Clay
Soil Colour: Brown



Vegetation: *Acacia colei* var. *colei* tall sparse shrubland over *Acacia bivenosa* mid isolated clumps of shrubs over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Grazing,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia acradenia</i>	100	0.1	
<i>Acacia bivenosa</i>	120	0.5	
<i>Acacia colei</i> var. <i>colei</i>	300	20	
<i>Boerhavia repleta</i>	10	0.1	
<i>Indigofera monophylla</i>	30	0.1	
<i>Isotropis atropurpurea</i>	10	0.1	
<i>Rhynchosia minima</i>	10	0.1	
<i>Triodia epactia</i>	30	30	
<i>Triumfetta clementii</i>	5	0.1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR16
Location MGA 50 719958 mE 7755674 mN
Described by: GB,JH
Date: 3-03-2024
Type: RELEVE
Landform: Low lying flood plain (look up better word)Flat
Slope: N/A
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown,Orange



Vegetation: *Corymbia flavescens*, *Atalaya hemiglauca* and *Ficus aculeata* low open woodland over *Dolichandrone occidentalis* and **Indigofera oblongifolia* tall isolated clumps of shrubs over *Eulalia aurea* low isolated clumps of tussock grasses.

Condition: Degraded **Disturbance Type:** Weeds,Grazing,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia bivenosa</i>	200	0.1	
<i>Corymbia flavescens</i>	700	5	
<i>Boerhavia repleta</i>	10	0.1	
* <i>Calotropis procera</i>	300	0.1	
<i>Atalaya hemiglauca</i>	400	1	
<i>Dolichandrone occidentalis</i>	400	2	
<i>Ficus aculeata</i>	300	1	
* <i>Indigofera oblongifolia</i>	200	2	
<i>Eulalia aurea</i>	30	2	
<i>Pluchea dentex</i>	20	0.1	
<i>Terminalia circumulata</i>	300	0.1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR17
Location MGA 50 719480 mE 7755341 mN
Described by: GB,JH
Date: 3-03-2024
Type: RELEVE
Landform: Drainage and shoulder Flat
Slope: N/A
Rock Type: N/A
Soil Type: Clay,Loam
Soil Colour: Brown,Orange



Vegetation: *Corymbia flavescens* and *Eucalyptus victrix* low open woodland over *Acacia colei* var. *colei* tall sparse shrubland over *Eulalia aurea* low isolated clumps of tussock grasses.

Condition: Degraded **Disturbance Type:** Weeds,Grazing,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	300	8	
<i>Atalaya hemiglauca</i>	200	0.1	
* <i>Calotropis procera</i>	200	0.1	
<i>Carissa lanceolata</i>	200	0.1	
* <i>Cenchrus ciliaris</i>	30	2	
<i>Corymbia flavescens</i>	700	4	
<i>Cyperus</i> sp.	20	0.1	
<i>Eucalyptus victrix</i>	700	2	
<i>Eulalia aurea</i>	40	2	
<i>Ficus aculeata</i>	200	0.1	
<i>Vigna lanceolata</i> var. <i>lanceolata</i>	20	0.1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR18
Location MGA 50 720119 mE 7755143 mN
Described by: GB,JH
Date: 3-03-2024
Type: RELEVE
Landform: Edge of foothillFlat
Slope: N/A
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown,Orange



Vegetation: *Acacia colei* var. *colei* tall sparse shrubland over *Acacia inaequilatera* low isolated clumps of shrubs over *Triodia epactia* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Grazing,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	250	20	
<i>Acacia inaequilatera</i>	200	4	
<i>Pluchea dentex</i>	20	0.1	
<i>Pluchea ferdinandi-muelleri</i>	40	0.1	
<i>Triodia epactia</i>	40	30	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR19
Location MGA 50 719850 mE 7754495 mN
Described by: GB,JH
Date: 3-03-2024
Type: QUADRAT
Landform: FloodplainFlat
Slope: N/A
Rock Type: N/A
Soil Type: Clay,Loam,Sand
Soil Colour: Beige,Brown



Vegetation: *Sclerolaena hostilis* low isolated clumps of shrubs over *Triodia secunda* low hummock grassland.

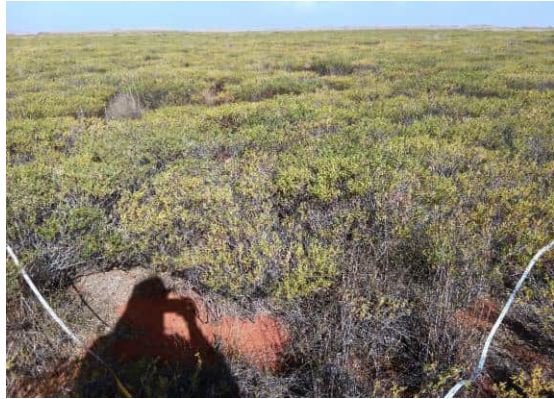
Condition: Good **Disturbance Type:** Grazing,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Maireana melanocoma</i>	10	0.1	
<i>Sclerolaena hostilis</i>	20	1	
<i>Triodia secunda</i>	20	71	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR20
Location MGA 50 718747 mE 7752516 mN
Described by: GB,JH
Date: 3-03-2024
Type: QUADRAT
Landform: PlainsFlat
Slope: N/A
Rock Type: N/A
Soil Type: Sand
Soil Colour: Orange



Vegetation: *Acacia stellaticeps* low closed shrubland over *Triodia epactia* low sparse hummock grassland

Condition: Very Good **Disturbance Type:** Litter,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia stellaticeps</i>	50	85	
<i>Cassutha capillaris</i>	30	0.1	
<i>Triodia epactia</i>	30	8	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR21
Location MGA 50 669928 mE 7737669 mN
Described by: GB,JH
Date: 4-03-2024
Type: RELEVE
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Brown,Orange



Vegetation: *Eucalyptus victrix* low open woodland over *Acacia colei* var. *colei* tall isolated clumps of shrubs over *Triodia epactia* mid sparse hummock grassland.

Condition: Good **Disturbance Type:** Grazing,Litter,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ampliceps</i>	350	0.1	
<i>Eucalyptus victrix</i>	900	7	
<i>Acacia coriacea</i> subsp. <i>pendens</i>	200	0.1	
<i>Carissa lanceolata</i>	160	0.1	
<i>Acacia colei</i> var. <i>colei</i>	250	0.5	
<i>Cyperus</i> sp.	20	0.1	
<i>Triodia epactia</i>	60	15	
<i>Hakea lorea</i> subsp. <i>lorea</i>	150	0.1	
<i>Pluchea dentex</i>	30	0.1	
<i>Chrysopogon fallax</i>	40	2	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR22
Location MGA 50 670914 mE 7737642 mN
Described by: GB,JH
Date: 4-03-2024
Type: RELEVE
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Brown,Orange



Vegetation: *Eucalyptus victrix* low open woodland over *Acacia colei* var. *colei* tall isolated clumps of shrubs over *Triodia epactia* and *T. sp.* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Grazing,Fauna tracks/scats,Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ancistrocarpa</i>	140	0.1	
<i>Eucalyptus victrix</i>	900	7	
<i>Acacia inaequilatera</i>	200	0.1	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	150	0.1	
<i>Carissa lanceolata</i>	160	0.1	
<i>Acacia colei</i> var. <i>colei</i>	250	0.5	
<i>Corchorus</i> sp.	20	0.1	
<i>Corymbia candida</i> subsp. <i>indet.</i>	250	0.1	
<i>Triodia epactia</i>	60	15	
<i>Hakea lorea</i> subsp. <i>lorea</i>	150	0.1	
<i>Melaleuca glomerata</i>	140	0.1	
<i>Pluchea dentex</i>	30	0.1	
<i>Chrysopogon fallax</i>	40	2	
<i>Triodia</i> sp.	20	3	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR23
Location MGA 50 670584 mE 7738164 mN
Described by: GB,JH
Date: 4-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown,Orange



Vegetation: *Corymbia hamersleyana* low open woodland over *Melaleuca glomerata*, *Acacia colei* var. *colei* and *Carissa lanceolata* mid sparse shrubland over *Triodia epactia* and *T. sp.* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Infrastructure
Fire Age: > 5 years,>10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ancistrocarpa</i>	150	0.1	
<i>Acacia colei</i> var. <i>colei</i>	200	0.5	
<i>Acacia coriacea</i> subsp. <i>pendens</i>	140	0.1	
<i>Acacia inaequilatera</i>	170	0.1	
<i>Carissa lanceolata</i>	200	0.5	
<i>Corymbia hamersleyana</i>	200	9	
<i>Melaleuca glomerata</i>	200	5	
<i>Hakea lorea</i> subsp. <i>lorea</i>	40	0.1	
<i>Acacia stellaticeps</i>	40	1	
<i>Triodia epactia</i>	30	12	
<i>Triodia sp.</i>	20	8	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR24
Location MGA 50 673238 mE 7738339 mN
Described by: GB,JH
Date: 4-03-2024
Type: QUADRAT
Landform: Alluvial flat
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Brown,Orange



Vegetation: *Triodia epactia* and *T. secunda* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	170	0.1	
<i>Chrysopogon fallax</i>	5	0.1	
<i>Triodia epactia</i>	40	30	
<i>Triodia secunda</i>	20	10	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR25
Location MGA 50 673541 mE 7737691 mN
Described by: GB,JH
Date: 4-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown,Orange



Vegetation: *Corymbia candida* subsp. *candida* low isolated clumps of trees over *Acacia colei* var. *colei* tall sparse shrubland over *Triodia epactia* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Weeds,Fauna tracks/scats
Fire Age: > 15 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	400	12	
<i>Acacia inaequilatera</i>	160	0.1	
<i>Carissa lanceolata</i>	170	0.1	
* <i>Cenchrus ciliaris</i>	20	0.1	
<i>Chrysopogon fallax</i>	20	0.1	
<i>Corymbia candida</i> subsp. <i>candida</i>	900	5	
<i>Dolichandrone occidentalis</i>	30	0.1	
<i>Malvaceae</i> sp.	10	0.1	
<i>Melaleuca glomerata</i>	250	0.1	
<i>Paraneurachne muelleri</i>	10	0.1	
<i>Triodia epactia</i>	40	31	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR26
Location MGA 50 674502 mE 7738067 mN
Described by: GB,JH
Date: 4-03-2024
Type: RELEVE
Landform: Minor drainage
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Beige



Vegetation: *Eucalyptus victrix* low isolated clumps of trees over *Acacia colei* var. *colei* mid isolated clumps of shrubs over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Litter
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	250	0.5	
<i>Afrohybanthus aurantiacus</i>	5	0.1	
<i>Bonamia linearis</i>	5	0.1	
<i>Carissa lanceolata</i>	120	0.1	
<i>Cassutha capillaris</i>	10	0.1	
<i>Chrysopogon fallax</i>	20	0.5	
<i>Corchorus incanus</i> subsp. <i>incanus</i>	30	0.1	
<i>Eucalyptus victrix</i>	800	5	
<i>Tinospora smilacina</i>	30	0.1	
<i>Triodia epactia</i>	30	10	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR27
Location MGA 50 676097 mE 7738235 mN
Described by: GB,JH
Date: 4-03-2024
Type: RELEVE
Landform: Drainage shoulder
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown,Orange



Vegetation: *Melaleuca glomerata* and *Acacia trachycarpa* tall open shrubland over **Cenchrus ciliaris* low sparse tussock grassland over *Triodia epactia* low isolated clumps of hummock grassland.

Condition: Degraded **Disturbance Type:** Weeds,Grazing,Litter,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia trachycarpa</i>	250	3	
* <i>Aerva javanica</i>	30	0.1	
<i>Afrohybanthus aurantiacus</i>	10	0.1	
<i>Carissa lanceolata</i>	200	0.1	
* <i>Cenchrus ciliaris</i>	40	20	
<i>Corchorus incanus</i> subsp. <i>incanus</i>	20	0.1	
<i>Cucumis variabilis</i>	30	0.1	
<i>Melaleuca glomerata</i>	300	20	
<i>Triodia epactia</i>	40	3	
<i>Waltheria indica</i>	10	0.1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR28
Location MGA 50 676159 mE 7738365 mN
Described by: GB,JH
Date: 4-03-2024
Type: RELEVE
Landform: Drainage
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Orange



Vegetation: *Eucalyptus victrix* low isolated clumps of trees over *Melaleuca glomerata* and *Crotalaria cunninghamii* subsp. *sturtii*
 mid isolated clumps of shrubs over *Triodia epactia* low isolated clumps of hummock grasses.

Condition: Good **Disturbance Type:** Weeds,Grazing,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Afrohybanthus aurantiacus</i>	20	0.1	
<i>Arivela viscosa</i>	30	0.1	
<i>Cajanus pubescens</i>	80	0.1	
* <i>Cenchrus ciliaris</i>	30	0.1	
<i>Corchorus incanus</i> subsp. <i>incanus</i>	20	0.1	
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	100	0.5	
<i>Cynanchum floribundum</i>	30	0.1	
<i>Eucalyptus victrix</i>	900	4	
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	20	0.1	
<i>Euphorbia trigonosperma</i>	40	0.1	
<i>Evolvulus</i> sp.	5	0.1	
<i>Ipomoea muelleri</i>	20	0.1	
<i>Melaleuca glomerata</i>	180	1	
<i>Polymeria ambigua</i>	2	0.1	
<i>Rhynchosia minima</i>	20	0.1	
<i>Senna notabilis</i>	20	0.1	
<i>Tephrosia rosea</i> var. <i>Fortescue creeks</i> (M.I.H. Brooke)	80	0.1	
<i>Tinospora smilacina</i>	20	0.1	
<i>Triodia epactia</i>	40	1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR29
Location MGA 50 679167 mE 7738712 mN
Described by: GB,JH
Date: 4-03-2024
Type: RELEVE
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Loam
Soil Colour: Orange



Vegetation: *Acacia tumida* var. *pilbarensis* and *Grevillea wickhamii* subsp. *hispidula* tall open shrubland over *Acacia stellaticeps* low isolated clumps of shrubs over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia inaequilatera</i>	200	0.1	
<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>	400	4	
<i>Acacia trachycarpa</i> x <i>tumida</i> var. <i>pilbarensis</i>	300	0.1	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	300	30	
<i>Acacia stellaticeps</i>	40	0.5	
<i>Eulalia aurea</i>	40	0.5	
<i>Hakea lorea</i> subsp. <i>lorea</i>	200	0.1	
<i>Pluchea dentex</i>	30	0.1	
<i>Triodia epactia</i>	40	10	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR30
Location MGA 50 679457 mE 7739332 mN
Described by: GB,JH
Date: 4-03-2024
Type: RELEVE
Landform: Minor drainage
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Brown



Vegetation: *Eucalyptus victrix* low open woodland over *Acacia trachycarpa* tall sparse shrubland over *Triodia epactia* isolated clumps of hummock grasses.

Condition: Very Good **Disturbance Type:** Grazing, Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	200	0.1	
<i>Acacia trachycarpa</i>	350	6	
<i>Afrohybanthus aurantiacus</i>	20	0.1	
<i>Cajanus pubescens</i>	20	0.1	
<i>Carissa lanceolata</i>	140	0.1	
<i>Cassutha capillaris</i>	20	0.1	
<i>Corymbia hamersleyana</i>	200	0.1	
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	20	0.1	
<i>Cynanchum floribundum</i>	20	0.1	
<i>Eucalyptus victrix</i>	800	5	
<i>Eulalia aurea</i>	40	0.5	
<i>Euphorbia trigonosperma</i>	20	0.1	
<i>Ficus aculeata</i> var. <i>indecora</i>	200	0.1	
<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>	180	0.1	
<i>Hakea lorea</i> subsp. <i>lorea</i>	200	0.1	
<i>Melaleuca glomerata</i>	300	0.1	
<i>Tephrosia rosea</i> var. <i>Fortescue creeks</i> (M.I.H. Brooke)	20	0.1	
<i>Themeda triandra</i>	30	0.1	
<i>Triodia epactia</i>	30	1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR31
Location MGA 50 663695 mE 7736402 mN
Described by: GB,JH
Date: 5-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Orange



Vegetation: *Acacia stellaticeps* low open shrubland over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** None
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ancistrocarpa</i>	180	0.1	
<i>Acacia stellaticeps</i>	50	31	
<i>Triodia epactia</i>	40	20	

FLORA SITE SHEET

Project Name: Atlas Ridley Biological Survey
Site: AR32
Location: MGA 50 682436 mE 7739814 mN
Described by: GB,JH
Date: 5-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Orange



Vegetation: *Acacia inaequilatera* tall isolated clumps of shrubs over *Acacia stellaticeps* mid isolated clumps of shrubs over *Triodia epactia* low open hummock grassland.

Condition: Good **Disturbance Type:** Litter,Fauna tracks/scats,Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia inaequilatera</i>	250	3	
<i>Acacia sericophylla</i>	170	0.1	
<i>Acacia stellaticeps</i>	150	0.5	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	70	0.1	
<i>Bonamia erecta</i>	20	0.1	
<i>Chrysopogon fallax</i>	20	0.5	
<i>Hakea lorea</i> subsp. <i>lorea</i>	30	0.1	
<i>Pluchea dentex</i>	30	0.1	
<i>Triodia epactia</i>	40	31	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR33
Location MGA 50 685620 mE 7740326 mN
Described by: GB,JH
Date: 5-03-2024
Type: RELEVE
Landform: Minor drainage
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Brown,Orange



Vegetation: *Eucalyptus victrix* and *Corymbia candida* subsp. *candida* low isolated clumps of trees over *Acacia colei* var. *colei* mid isolated clumps of shrubs over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Vehicle tracks,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	350	0.5	
<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>	180	0.1	
<i>Aristida holathera</i> var. <i>holathera</i>	10	0.1	
<i>Atalaya hemiglauca</i>	450	0.1	
<i>Carissa lanceolata</i>	180	0.1	
<i>Cassutha capillaris</i>	100	0.1	
<i>Corchorus laniflorus</i>	40	0.1	
<i>Corchorus</i> sp.	40	0.1	
<i>Corymbia candida</i> subsp. <i>candida</i>	700	0.5	
<i>Eremophila longifolia</i>	100	0.1	
<i>Eucalyptus victrix</i>	900	1	
<i>Eulalia aurea</i>	30	8	
<i>Euphorbia australis</i> var. <i>subtomentosa</i>	10	0.1	
<i>Indigofera linnaei</i>	10	0.1	
<i>Ipomoea muelleri</i>	10	0.1	
<i>Nellica maderaspatensis</i>	20	0.1	
<i>Triodia epactia</i>	30	10	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR34
Location MGA 50 683853 mE 7739914 mN
Described by: GB,JH
Date: 5-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Loam,Sand
Soil Colour: Orange



Vegetation: *Acacia inaequilatera* and *A. bivenosa* mid sparse shrubland over *Acacia stellaticeps* low isolated clumps of shrubs over *Triodia epactia* and *T. sp.* low open hummock grasses.

Condition: Very Good **Disturbance Type:** Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ancistrocarpa</i>	160	0.1	
<i>Acacia bivenosa</i>	160	4	
<i>Acacia inaequilatera</i>	180	4	
<i>Acacia stellaticeps</i>	50	1	
<i>Bonamia erecta</i>	20	0.1	
<i>Hakea lorea</i> subsp. <i>lorea</i>	50	0.1	
<i>Triodia epactia</i>	40	31	
<i>Triodia sp.</i>	20	2	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR35
Location MGA 50 686718 mE 7739877 mN
Described by: GB,JH
Date: 5-03-2024
Type: RELEVE
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Loam,Sand
Soil Colour: Brown



Vegetation: *Acacia tumida* var. *pilbarensis* and *A. ancistrocarpa* tall open shrubland over *Triodia epactia* low sparse hummock grassland over *Eulalia aurea* and *Chrysopogon fallax* low isolated clumps of tussock grasses.

Condition: Very Good **Disturbance Type:** Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ancistrocarpa</i>	300	2	
<i>Acacia inaequilatera</i>	250	0.1	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	350	20	
<i>Chrysopogon fallax</i>	50	1	
<i>Corymbia flavescens</i>	350	0.1	
<i>Dolichandrone occidentalis</i>	140	0.1	
<i>Eulalia aurea</i>	40	5	
<i>Goodenia lamprosperma</i>	10	0.1	
<i>Pluchea dentex</i>	30	0.1	
<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)	50	0.1	
<i>Stemodia grossa</i>	30	0.5	
<i>Triodia epactia</i>	30	10	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR36
Location MGA 50 700023 mE 7741014 mN
Described by: GB,JH
Date: 6-03-2024
Type: RELEVE
Landform: Granite quartz outcropping
Slope: Moderate
Rock Type: Granite, Quartzite
Soil Type: Clay, Loam
Soil Colour: Brown



Vegetation: *Acacia tumida* var. *pilbarensis*, *Grevillea pyramidalis* subsp. *leucadendron* and *G. wickhamii* subsp. *hispidula* mid isolated clumps of shrubs over *Acacia ancistrocarpa* low isolated clumps of shrubs over *Triodia epactia* low open hummock grassland.

Condition: Excellent **Disturbance Type:** None
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ancistrocarpa</i>	100	0.5	
<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>	50	0.1	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	200	0.5	
<i>Acacia adoxa</i> var. <i>adoxo</i>	20	0.1	
<i>Corymbia hamersleyana</i>	170	0.1	
<i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>	170	0.5	
<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>	150	0.5	
<i>Triodia epactia</i>	30	25	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR37
Location MGA 50 704815 mE 7741870 mN
Described by: GB,JH
Date: 6-03-2024
Type: RELEVE
Landform: Granite outcropping
Slope: Moderate
Rock Type: Orange
Soil Type: Gravel
Soil Colour: Orange



Vegetation: *Acacia inaequilatera* and *Eremophila longifolia* mid isolated clumps of shrubs over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Weeds,Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Abutilon lepidum</i>	30	0.1	
<i>Acacia colei</i> var. <i>colei</i>	30	0.1	
<i>Acacia inaequilatera</i>	150	0.5	
<i>Cajanus pubescens</i>	60	0.1	
* <i>Cenchrus ciliaris</i>	20	0.1	
<i>Eremophila longifolia</i>	150	0.5	
<i>Senna artemisioides</i> subsp. <i>helmsii</i>	50	0.1	
<i>Senna venusta</i>	30	0.1	
<i>Solanum</i> sp.	20	0.1	
<i>Tinospora smilacina</i>	180	0.1	
<i>Triodia epactia</i>	15	15	
<i>Triumfetta</i> sp.	30	0.1	

FLORA SITE SHEET

Project Name: Atlas Ridley Biological Survey
Site: AR38
Location: MGA 50 704511 mE 7742260 mN
Described by: GB,JH
Date: 6-03-2024
Type: RELEVE
Landform: Quartz ridge
Slope: Gentle
Rock Type: Granite, Quartzite
Soil Type: Gravel
Soil Colour: Orange



Vegetation: *Acacia inaequilatera* mid isolated clumps of shrubs over *A. orthocarpa* low isolated clumps of shrubs over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Infrastructure
Fire Age: 1-5 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia inaequilatera</i>	180	2	
<i>Acacia orthocarpa</i>	50	2	
<i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>	70	0.1	
<i>Petalostylis labicheoides</i>	30	0.1	
<i>Sida</i> sp. <i>Pilbara</i> (A.A. Mitchell PRP 1543)	30	0.1	
<i>Triodia epactia</i>	20	20	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR39
Location MGA 50 705789 mE 7741757 mN
Described by: GB,JH
Date: 6-03-2024
Type: QUADRAT
Landform: Major drainage
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Beige



Vegetation: *Eucalyptus camaldulensis* subsp. *refulgens* and *Melaleuca argentea* low isolated clumps of trees over *Acacia trachycarpa* and *A. colei* var. *colei* tall sparse shrubland over *Triodia epactia* low isolated clumps of grasses.

Condition: Very Good **Disturbance Type:** Litter, Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	250	0.5	
<i>Acacia trachycarpa</i>	350	6	
<i>Cassyltha capillaris</i>	100	0.1	
<i>Corchorus laniflorus</i>	30	0.1	
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	120	0.1	
<i>Cymbopogon ambiguus</i>	30	0.1	
<i>Cynanchum floribundum</i>	50	0.1	
<i>Cyperus vaginatus</i>	50	0.1	
<i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>	900	1	
<i>Eulalia aurea</i>	70	0.1	
<i>Euphorbia australis</i> var. <i>subtomentosa</i>	10	0.1	
<i>Euphorbia trigonosperma</i>	50	0.1	
<i>Goodenia lamprosperma</i>	20	0.1	
<i>Goodenia muelleriana</i>	20	0.1	
<i>Melaleuca argentea</i>	700	4	
<i>Melaleuca glomerata</i>	40	0.1	
<i>Microstachys chamaelea</i>	50	0.1	
* <i>Passiflora foetida</i>	30	0.1	
<i>Triodia epactia</i>	40	0.5	
<i>Waltheria indica</i>	20	0.1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR40
Location MGA 50 690947 mE 7741096 mN

Described by: GB,JH
Date: 6-03-2024
Type: RELEVE

Landform: Quartz ridge
Slope: Moderate
Rock Type: Quartzite
Soil Type: Gravel
Soil Colour: Orange



Vegetation: *Acacia orthocarpa* and *A. tumida* var. *pilbarensis* mid isolated clumps of shrubs over *Triodia epactia* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia adoxa</i> var. <i>adoxo</i>	30	0.1	
<i>Acacia ancistrocarpa</i>	200	0.1	
<i>Acacia inaequilatera</i>	180	0.1	
<i>Acacia orthocarpa</i>	140	3	
<i>Acacia sericophylla</i>	60	0.1	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	100	0.5	
<i>Bulbostylis barbata</i>	10	0.1	
<i>Corymbia hamersleyana</i>	150	0.1	
<i>Corymbia zygophylla</i>	100	0.1	
<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>	180	0.1	
<i>Petalostylis labicheoides</i>	50	0.1	
<i>Triodia epactia</i>	20	25	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR41
Location MGA 50 689036 mE 7740301 mN
Described by: GB,JH
Date: 6-03-2024
Type: RELEVE
Landform: Major drainage
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Beige



Vegetation: *Eucalyptus victrix*, *E. camaldulensis* subsp. *refulgens* and *Melaleuca argentea* low isolated clumps of trees over *Acacia trachycarpa* and *M. glomerata* tall isolated clumps of shrubs over *Triodia epactia* low isolated clumps of hummock grasses.

Condition: Good **Disturbance Type:** Grazing,Litter,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ampliceps</i>	100	0.1	
<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>	100	0.1	
<i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>	800	0.5	
<i>Cassutha capillaris</i>	100	0.1	
<i>Cyperus vaginatus</i>	50	0.1	
<i>Eucalyptus victrix</i>	800	1	
<i>Melaleuca argentea</i>	450	1	
<i>Eulalia aurea</i>	50	0.1	
<i>Acacia trachycarpa</i>	250	1	
<i>Melaleuca glomerata</i>	250	1	
<i>Microstachys chamaelea</i>	30	0.1	
<i>Stemodia viscosa</i>	40	0.1	
<i>Triodia epactia</i>	40	1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR42
Location MGA 50 714592 mE 7747015 mN
Described by: GB,JH
Date: 7-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Loam,Sand
Soil Colour: Brown,Orange



Vegetation: *Acacia stellaticeps* low isolated clumps of shrubs over *Triodia epactia* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Grazing,Fauna tracks/scats
Fire Age: 1-5 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia stellaticeps</i>	50	5	
<i>Bonamia alatisemina</i>	10	0.1	
<i>Pluchea ferdinandi-muelleri</i>	60	0.1	
<i>Triodia epactia</i>	40	40	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR43
Location MGA 50 711657 mE 7746351 mN
Described by: GB,JH
Date: 7-03-2024
Type: QUADRAT
Landform: Alluvial flat
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown,Orange



Vegetation: *Pluchea ferdinandi-muelleri* low isolated shrubs over *Triodia secunda* and *T. epactia* low open hummock grassland.

Condition: Good **Disturbance Type:** Grazing,Fauna tracks/scats,Infrastructure
Fire Age: 1-5 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Bonamia linearis</i>	20	0.1	
<i>Eriachne obtusa</i>	10	0.5	
<i>Pluchea ferdinandi-muelleri</i>	50	0.5	
<i>Triodia epactia</i>	20	0.5	
<i>Triodia secunda</i>	20	40	

FLORA SITE SHEET

Project Name: Atlas Ridley Biological Survey
Site: AR44
Location: MGA 50 717019 mE 7749321 mN
Described by: GB,JH
Date: 7-03-2024
Type: RELEVE
Landform: Ironstone ridge
Slope: Steep
Rock Type: Ironstone
Soil Type: Gravel
Soil Colour: Brown



Vegetation: *Ficus brachypoda* low isolated clumps of trees over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Weeds
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	200	0.1	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	200	0.1	
<i>Carissa lanceolata</i>	200	0.1	
* <i>Cenchrus ciliaris</i>	30	0.1	
<i>Cheilanthes</i> sp.	10	0.1	
<i>Eriachne mucronata</i>	30	0.1	
<i>Ficus brachypoda</i>	350	0.5	
<i>Solanum horridum</i>	30	0.1	
<i>Triodia epactia</i>	30	15	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR45
Location MGA 50 717145 mE 7749312 mN
Described by: GB,JH
Date: 7-03-2024
Type: RELEVE
Landform: Ironstone hilltop
Slope: Moderate
Rock Type: Ironstone
Soil Type: Gravel
Soil Colour: Orange



Vegetation: *Acacia inaequilatera* tall isolated clumps of shrubs over *A. stellaticeps* low isolated clumps of shrubs over *Triodia epactia* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia inaequilatera</i>	350	0.5	
<i>Acacia stellaticeps</i>	30	0.5	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	100	0.1	
<i>Triodia epactia</i>	30	29	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR46
Location MGA 50 717042 mE 7749227 mN

Described by: GB,JH
Date: 7-03-2024
Type: QUADRAT

Landform: Foothills
Slope: Gentle Photo: unavailable
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Orange

Vegetation: *Acacia tumida* var. *pilbarensis* mid sparse shrubland over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Infrastructure
Fire Age: 1-5 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia tumida</i> var. <i>pilbarensis</i>	200	15	
<i>Bonamia erecta</i>	20	0.1	
<i>Corynotheca</i> sp.	30	0.1	
<i>Eragrostis eriopoda</i>	30	0.1	
? <i>Afrohybanthus</i> sp	10	0.1	
<i>Grevillea pyramidalis</i> subsp. <i>leucadendron</i>	20	0.1	
<i>Ipomoea muelleri</i>	10	0.1	
<i>Triodia epactia</i>	30	20	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR47
Location MGA 50 705551 mE 7743565 mN
Described by: GB,JH
Date: 7-03-2024
Type: QUADRAT
Landform: Major drainage
Slope: Flat
Rock Type: N/A
Soil Type: Sand
Soil Colour: Beige



Vegetation: *Melaleuca argentea* and *Eucalyptus camaldulensis* subsp. *refulgens* low open woodland over *Acacia ampliceps*, *A. trachycarpa* and *M. glomerata* mid isolated clumps of shrubs over *Eulalia aurea* and **Cenchrus ciliaris* low isolated clumps of tussock grasses.

Condition: Good **Disturbance Type:** Weeds,Grazing,Litter,Infrastructure
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ampliceps</i>	200	0.5	
<i>Acacia colei</i> var. <i>colei</i>	200	0.1	
<i>Acacia trachycarpa</i>	200	0.5	
<i>Aristida holathera</i> var. <i>holathera</i>	15	0.1	
<i>Arivela viscosa</i>	20	0.1	
<i>Cassyntha capillaris</i>	30	0.5	
* <i>Cenchrus ciliaris</i>	30	2	
<i>Corchorus laniflorus</i>	50	0.1	
<i>Crotalaria cunninghamii</i> subsp. <i>sturtii</i>	70	0.1	
<i>Cynanchum floribundum</i>	30	0.1	
<i>Cyperus vaginatus</i>	30	0.1	
<i>Eucalyptus camaldulensis</i> subsp. <i>refulgens</i>	900	1	
<i>Eulalia aurea</i>	50	2	
<i>Euphorbia australis</i> var. <i>subtomentosa</i>	10	0.1	
<i>Euphorbia trigonosperma</i>	10	0.1	
<i>Bonamia linearis</i>	10	0.1	
<i>Goodenia lamprosperma</i>	30	0.1	
<i>Indigofera linnaei</i>	10	0.1	
<i>Melaleuca argentea</i>	500	15	
<i>Melaleuca glomerata</i>	200	0.5	
<i>Microstachys chamaelea</i>	40	0.1	
<i>Operculina aequisepala</i>	30	0.1	
* <i>Passiflora foetida</i>	30	0.1	
<i>Ptilotus fusiformis</i>	30	0.1	
<i>Rhynchosia minima</i>	30	0.1	
<i>Stemodia viscosa</i>	30	0.1	
<i>Tinospora smilacina</i>	5	0.1	
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	70	0.1	
<i>Triodia epactia</i>	30	1	
<i>Vigna lanceolata</i> var. <i>lanceolata</i>	20	0.1	
<i>Wahlenbergia tumidifrutta</i>	10	0.1	
<i>Waltheria indica</i>	40	0.1	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR48
Location MGA 50 697923 mE 7740531 mN
Described by: GB,JH
Date: 8-03-2024
Type: RELEVE
Landform: Outcropping
Slope: Moderate
Rock Type: Granite
Soil Type: Gravel
Soil Colour: Brown,Orange



Vegetation: *Acacia ancistrocarpa* and *A. inaequilatera* mid isolated clumps of shrubs over *Triodia epactia* low open hummock grassland.

Condition: Excellent **Disturbance Type:** None
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ancistrocarpa</i>	200	0.5	
<i>Acacia colei</i> var. <i>colei</i>	200	0.1	
<i>Acacia inaequilatera</i>	200	0.5	
<i>Acacia stellaticeps</i>	30	0.1	
<i>Capparis spinosa</i> subsp. <i>nummularia</i>	50	0.1	
<i>Corymbia hamersleyana</i>	200	0.1	
<i>Ficus brachypoda</i>	200	0.1	
<i>Hakea lorea</i> subsp. <i>lorea</i>	150	0.1	
<i>Scaevola spinescens</i>	100	0.1	
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	50	0.1	
<i>Senna symonii</i>	30	0.1	
<i>Triodia epactia</i>	20	25	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR49
Location MGA 50 697849 mE 7741607 mN
Described by: GB,JH
Date: 8-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown,Orange



Vegetation: *Acacia inaequilatera* and *A. ancistrocarpa* mid isolated clumps of shrubs over *A. stellaticeps* low isolated clumps of shrubs over *Triodia wiseana* and *T. epactia* low open hummock grassland.

Condition: Excellent **Disturbance Type:** None
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia adoxa</i> var. <i>adoxo</i>	30	0.1	
<i>Acacia ancistrocarpa</i>	150	2	
<i>Acacia inaequilatera</i>	180	3	
<i>Acacia stellaticeps</i>	30	0.5	
<i>Triodia epactia</i>	30	3	
<i>Triodia wiseana</i>	30	28	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR50
Location MGA 50 699765 mE 7742416 mN
Described by: GB,JH
Date: 8-03-2024
Type: RELEVE
Landform: Granite outcrop
Slope: Steep
Rock Type: Granite
Soil Type: Gravel
Soil Colour: Beige



Vegetation: *Atalaya hemiglauca* mid isolated clumps of shrubs over *Triodia epactia* low open hummock grassland.

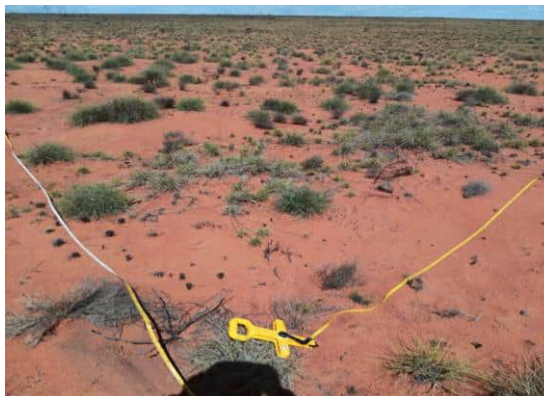
Condition: Excellent **Disturbance Type:** None
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia ancistrocarpa</i>	200	0.1	
<i>Acacia colei</i> var. <i>colei</i>	200	0.1	
<i>Acacia inaequilatera</i>	200	0.5	
<i>Acacia orthocarpa</i>	170	0.1	
<i>Acacia stellaticeps</i>	40	0.1	
<i>Atalaya hemiglauca</i>	140	1	
<i>Capparis umbonata</i>	120	0.1	
<i>Cyperus</i> sp.	20	0.1	
<i>Ficus brachypoda</i>	200	0.1	
<i>Hakea lorea</i> subsp. <i>lorea</i>	140	0.1	
<i>Senna glutinosa</i> subsp. <i>glutinosa</i>	170	0.1	
<i>Tinospora smilacina</i>	20	0.1	
<i>Triodia epactia</i>	30	28	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR51
Location MGA 50 709368 mE 7744803 mN
Described by: GB,JH
Date: 8-03-2024
Type: QUADRAT
Landform: Alluvial flat
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Orange



Vegetation: *Triodia epactia* and *T. secunda* low open hummock grassland over *Eriachne obtusa* low isolated clumps of tussock grasses.

Condition: Very Good **Disturbance Type:** Grazing,Fauna tracks/scats
Fire Age: 1-5 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Eriachne obtusa</i>	10	1	
<i>Pluchea dentex</i>	30	0.1	
<i>Triodia epactia</i>	20	19	
<i>Triodia secunda</i>	20	10	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR52
Location MGA 50 694803 mE 7741190 mN
Described by: GB,JH
Date: 9-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Orange



Vegetation: *Acacia inaequilatera* mid isolated clumps of shrubs over *A. stellaticeps* low isolated clumps of shrubs over *Triodia epactia* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Grazing,Fauna tracks/scats
Fire Age: > 5 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia inaequilatera</i>	190	1	
<i>Acacia stellaticeps</i>	50	0.5	
<i>Triodia epactia</i>	30	31	

FLORA SITE SHEET

Project Name Atlas Ridley Biological Survey
Site: AR53
Location MGA 50 674107 mE 7738089 mN
Described by: GB,JH
Date: 9-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown,Orange



Vegetation: *Corymbia candida* subsp. *candida* and *C. hamersleyana* low open woodland over *Acacia tumida* var. *pilbarensis* and *A. colei* var. *colei* tall sparse shrubland over *Triodia epactia* low sparse hummock grassland.

Condition: Very Good **Disturbance Type:** Grazing,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Corymbia candida</i> subsp. <i>candida</i>	600	3	
<i>Acacia inaequilatera</i>	150	0.1	
<i>Acacia sericophylla</i>	200	0.1	
<i>Corymbia hamersleyana</i>	400	3	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	300	5	
<i>Cassutha capillaris</i>	100	0.1	
<i>Corchorus</i> sp.	20	0.1	
<i>Acacia colei</i> var. <i>colei</i>	200	5	
<i>Carissa lanceolata</i>	180	0.5	
<i>Eulalia aurea</i>	40	5	
<i>Triodia epactia</i>	40	15	

FLORA SITE SHEET

Project Name: Atlas Ridley Biological Survey
Site: AR54
Location: MGA 50 672915 mE 7737650 mN
Described by: GB,JH
Date: 9-03-2024
Type: QUADRAT
Landform: Plains
Slope: Flat
Rock Type: N/A
Soil Type: Clay,Sand
Soil Colour: Brown,Orange



Vegetation: *Corymbia candida* subsp. *candida* low isolated clumps of trees over *Acacia colei* var. *colei* and *A. tumida* var. *pilbarensis* tall sparse shrubland over *Triodia epactia* low open hummock grassland.

Condition: Very Good **Disturbance Type:** Grazing,Fauna tracks/scats
Fire Age: >10 years

SPECIES LIST

Taxon	Height (cm)	Cover (%)	Notes
<i>Acacia colei</i> var. <i>colei</i>	200	10	
<i>Acacia tumida</i> var. <i>pilbarensis</i>	300	3	
<i>Cassutha capillaris</i>	30	0.1	
<i>Corchorus</i> sp.	20	0.1	
<i>Corymbia candida</i> subsp. <i>candida</i>	600	2	
<i>Eulalia aurea</i>	40	5	
<i>Grevillea wickhamii</i> subsp. <i>hispidula</i>	250	0.1	
<i>Triodia epactia</i>	40	35	



Appendix G Flora Statistical Analysis

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

SLR Project No.: 675.072189.00001

29 July 2024

Selected inputs and outputs of the floristic cluster analysis: taxa omitted from analysis.

Taxon	Site Count	Status
? <i>Afrohybanthus</i> sp.	1	Omitted: Singleton
<i>Abutilon lepidum</i>	1	Omitted: Singleton
<i>Acacia acradenia</i>	1	Omitted: Singleton
<i>Acacia</i> sp.	1	Omitted: Singleton; may represent multiple species
<i>Acacia trachycarpa</i> x <i>tumida</i> var. <i>pilbarensis</i>	1	Omitted: Singleton
<i>Aerva javanica</i>	1	Omitted: Singleton
<i>Boerhavia</i> sp.	2	Omitted: May represent multiple species
<i>Bonamia alatisemina</i>	1	Omitted: Singleton
<i>Bonamia pilbarensis</i>	1	Omitted: Singleton
<i>Bulbostylis barbata</i>	1	Omitted: Singleton
<i>Calotropis procera</i>	4	Omitted: Introduced taxon
<i>Capparis spinosa</i> subsp. <i>nummularia</i>	1	Omitted: Singleton
<i>Capparis umbonata</i>	1	Omitted: Singleton
<i>Cheilanthes</i> sp.	1	Omitted: Singleton
<i>Corchorus</i> sp.	6	Omitted: May represent multiple species
<i>Corymbia candida</i> subsp. <i>indet.</i>	1	Omitted: Singleton; may represent multiple species
<i>Corymbia zygophylla</i>	1	Omitted: Singleton
<i>Corynotheca</i> sp.	1	Omitted: Singleton
<i>Crotalaria ramosissima</i>	1	Omitted: Singleton
<i>Cymbopogon</i> sp.	1	Omitted: Singleton
<i>Cyperus</i> sp.	4	Omitted: May represent multiple species
<i>Eriachne lanata</i>	1	Omitted: Singleton
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	1	Omitted: Singleton
<i>Euploca cunninghamii</i>	1	Omitted: Singleton
<i>Evolvulus</i> sp.	1	Omitted: Singleton
<i>Ficus aculeata</i> var. <i>indecora</i>	1	Omitted: Singleton
<i>Goodenia muelleriana</i>	1	Omitted: Singleton
<i>Goodenia stobbsiana</i>	1	Omitted: Singleton
<i>Indigofera monophylla</i>	1	Omitted: Singleton
<i>Indigofera oblongifolia</i>	1	Omitted: Singleton; introduced species
<i>Maireana melanocoma</i>	1	Omitted: Singleton
<i>Malvaceae</i> sp.	1	Omitted: Singleton
<i>Nellica maderaspatensis</i>	1	Omitted: Singleton
<i>Neptunia</i> sp.	1	Omitted: Singleton
<i>Notoleptopus decaisnei</i>	1	Omitted: Singleton
<i>Operculina aequisepala</i>	1	Omitted: Singleton
<i>Passiflora foetida</i>	2	Omitted: Introduced taxon
<i>Poaceae</i> sp.	4	Omitted: May represent multiple species
<i>Ptilotus fusiformis</i>	1	Omitted: Singleton
<i>Ptilotus</i> sp.	2	Omitted: May represent multiple species
<i>Scaevola spinescens</i>	1	Omitted: Singleton
<i>Senna artemisioides</i> subsp. <i>helmsii</i>	1	Omitted: Singleton
<i>Senna symonii</i>	1	Omitted: Singleton
<i>Sida</i> sp.	1	Omitted: Singleton
<i>Solanum diversiflorum</i>	1	Omitted: Singleton
<i>Solanum horridum</i>	1	Omitted: Singleton
<i>Solanum</i> sp.	2	Omitted: May represent multiple species
<i>Sporobolus australasicus</i>	1	Omitted: Singleton
<i>Stemodia grossa</i>	1	Omitted: Singleton
<i>Terminalia circumulata</i>	1	Omitted: Singleton
<i>Themeda triandra</i>	1	Omitted: Singleton
<i>Trianthema triquetrum</i>	1	Omitted: Singleton
<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>	1	Omitted: Singleton
<i>Triodia</i> sp.	4	Omitted: May represent multiple species
<i>Triodia wiseana</i>	1	Omitted: Singleton
<i>Triumfetta clementii</i>	1	Omitted: Singleton
<i>Triumfetta</i> sp.	1	Omitted: Singleton
<i>Vachellia farnesiana</i>	1	Omitted: Singleton; introduced species
<i>Wahlenbergia tumidifructa</i>	1	Omitted: Singleton



Appendix H Fauna Database Search Results

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

SLR Project No.: 675.072189.00001

29 July 2024

Conservation Status: State - Listed under Biodiversity Conservation Act 2016 or Department of Biodiversity, Conservation and Attractions Conservation, Commonwealth - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, MI - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.

Database: NM - NatureMap, PMST - EPBC Protected Matters Search Tool, DBCA - DBCA Threatened and Priority Fauna database search, Field - Recorded during the current field survey.

Literature: A - Ridley Detailed Terrestrial Vertebrate Fauna Survey (Biota, 2024)

Literature: B - Ridley Services Corridors Basic and Targeted Fauna Survey (Biota, 2023)

Literature: C - Detailed terrestrial fauna and targeted Bilby survey for the Port Hedland Solar Farm Project (Pheonix Environmental, 2022)

Literature: D - Wodgina Gas Pipeline targeted Fauna Survey (360 Environmental Pty Ltd, 2018)

Literature: E - Wodgina Project: Level 1 Fauna Survey, Targeted Conservation Significant Fauna Survey and Desktop Assessment (Stantec Australia Pty Ltd, 2018)

Literature: F - Pardoo Stage 3 Irrigation Project and 80 Mile Beach Ramsar Site Fauna Assessment (Bamford Consulting Ecologists, 2017b)

Literature: G - Assessment of the Bilby Macrotis lagotis Pardoo Station; Stage 2 areas (Bamford Consulting Ecologists, 2017a)

Literature: H - Supplementary Flora and Vegetation Survey and Terrestrial Fauna Survey for the Balla Balla Infrastructure Group Ltd (Phoenix Environmental, 2018)

Literature: I - Assessment of the Bilby Macrotis lagotis Pardoo Station; Stage 2 and 3 project areas (Bamford Consulting Ecologists, 2016)

Literature: J - Terrestrial Fauna Surveys for the Balla Balla Railway Project (Phoenix Environmental, 2014)

Family	Scientific Name	Common Name	Conservation Status		Database			Field	Literature									
			State	Commonwealth	NM	PMST	DBCA		A	B	C	D	E	F	G	H	I	J
Amphibia																		
Limnodynastidae	<i>Neobatrachus aquilonius</i>	Northern Burrowing Frog	-	-	x				x		x							
Limnodynastidae	<i>Neobatrachus sutor</i>	Shoemaker Frog	-	-	x													
Limnodynastidae	<i>Notaden nichollsi</i>	Desert Spadefoot	-	-	x				x		x							
Limnodynastidae	<i>Platyplectrum spenceri</i>	Centralian Burrowing Frog	-	-	x				x		x							
Myobatrachidae	<i>Uperoleia glandulosa</i>	Glandular Toadlet	-	-	x						x							
Myobatrachidae	<i>Uperoleia micromeles</i>	Tanami Toadlet	-	-	x													
Myobatrachidae	<i>Uperoleia russelli</i>	Northwest Toadlet	-	-	x													
Myobatrachidae	<i>Uperoleia saxatilis</i>	Pilbara Toadlet	-	-	x													
Myobatrachidae	<i>Uperoleia talpa</i>	Ratcheting Toadlet	-	-	x													
Pelodyadidae	<i>Cyclorana australis</i>	Giant Frog	-	-	x				x									
Pelodyadidae	<i>Cyclorana maini</i>	Sheep Frog	-	-	x				x		x							
Pelodyadidae	<i>Litoria caerulea</i>	Green Tree Frog	-	-	x													
Pelodyadidae	<i>Litoria ridibunda</i>	Western Laughing Tree Frog	-	-	x													
Pelodyadidae	<i>Litoria rubella</i>	Little Red Tree Frog	-	-	x				x		x							x
Aves																		
Acanthizidae	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	-	-	x													
Acanthizidae	<i>Gerygone fusca</i>	Western Gerygone	-	-	x				x	x								
Acanthizidae	<i>Gerygone tenebrosa</i>	Dusky Gerygone	-	-	x													
Acanthizidae	<i>Smicronis brevirostris</i>	Weebill	-	-	x				x									x
Accipitridae	<i>Accipiter cirrocephalus</i>	Collared Sparrowhawk	-	-	x				x	x								
Accipitridae	<i>Accipiter fasciatus</i>	Brown Goshawk	-	MA	x				x									x
Accipitridae	<i>Aquila audax</i>	Wedge-tailed Eagle	-	-	x			x	x	x			x					x
Accipitridae	<i>Circus approximans</i>	Swamp Harrier	-	MA	x													x
Accipitridae	<i>Circus assimilis</i>	Spotted Harrier	-	-	x				x	x								x
Accipitridae	<i>Elanus axillaris</i>	Black-shouldered Kite	-	-	x				x									
Accipitridae	<i>Erythrotriorchis radiatus</i>	Red Goshawk	VU	EN		x												
Accipitridae	<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	-	MA	x	x			x	x								
Accipitridae	<i>Haliastur indus</i>	Brahminy Kite	-	MA	x				x		x							
Accipitridae	<i>Haliastur sphenurus</i>	Whistling Kite	-	MA	x				x	x			x					
Accipitridae	<i>Hamirostra melanosternon</i>	Black-breasted Buzzard	-	-	x				x				x					
Accipitridae	<i>Hieraaetus morphnoides</i>	Little Eagle	-	-	x				x									x
Accipitridae	<i>Lophoictinia isura</i>	Square-tailed Kite	-	-	x													
Accipitridae	<i>Milvus migrans</i>	Black Kite	-	-	x			x					x					x
Acrocephalidae	<i>Acrocephalus australis</i>	Australian Reed Warbler	-	MA	x													
Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owllet-nightjar	-	-	x				x	x								x
Alaudidae	<i>Mirafra javanica</i>	Horsfield's Bush Lark	-	-	x			x	x	x	x							x

Alcedinidae	<i>Dacelo leachii</i>	Blue-winged Kookaburra	-	-	x				x				x					x
Alcedinidae	<i>Todiramphus chloris</i> (Wallacea transition point from <i>T. sordidus</i>)	Collared Kingfisher	-	-	x													
Alcedinidae	<i>Todiramphus pyrrhopygius</i>	Red-backed Kingfisher	-	-	x				x	x			x					x
Alcedinidae	<i>Todiramphus sanctus</i>	Sacred Kingfisher	-	MA	x			x	x									x
Alcedinidae	<i>Todiramphus sordidus pilbara</i>	Pilbara Collared Kingfisher	-	-	x													
Anatidae	<i>Anas gracilis</i>	Grey Teal	-	-	x				x	x								
Anatidae	<i>Anas superciliosa</i>	Pacific Black Duck	-	-	x				x	x								x
Anatidae	<i>Aythya australis</i>	Hardhead	-	-	x								x					
Anatidae	<i>Chenonetta jubata</i>	Australian Wood Duck, Wood Duck, Maned Duck	-	-	x													
Anatidae	<i>Cygnus atratus</i>	Black Swan	-	-	x													x
Anatidae	<i>Dendrocygna arcuata</i>	Wandering Whistling Duck, Chestnut Whistling Duck	-	MA	x													
Anatidae	<i>Dendrocygna eytoni</i>	Plumed Whistling Duck	-	-	x							x						
Anatidae	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck	-	-	x													
Anatidae	<i>Spatula rhynchotis</i>	Australasian Shoveler	-	-	x													
Anatidae	<i>Tadorna tadornoides</i>	Australian Shelduck, Mountain Duck	-	-								x						
Anhingidae	<i>Anhinga melanogaster</i>	Oriental Darter	-	-	x													
Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian Darter	-	-	x				x									
Apodidae	<i>Apus pacificus</i>	Pacific Swift, Fork-tailed Swift	MI	MI, MA	x	x	x		x						x			
Ardeidae	<i>Ardea alba</i>	Great Egret, Eastern Great Egret	-	MA	x							x						
Ardeidae	<i>Ardea intermedia</i>	Intermediate Egret	-	MA	x													
Ardeidae	<i>Ardea pacifica</i>	White-necked Heron	-	-	x				x					x				x
Ardeidae	<i>Bubulcus coromandus</i>	Eastern Cattle Egret	-	-	x	x												
Ardeidae	<i>Butorides striata</i>	Striated Heron Mangrove Heron	-	-	x													
Ardeidae	<i>Egretta garzetta</i>	Little Egret	-	MA	x													x
Ardeidae	<i>Egretta novaehollandiae</i>	White-faced Heron	-	-	x				x	x								x
Ardeidae	<i>Egretta sacra</i>	Eastern Reef Heron, Pacific Reef Heron	-	MA	x													
Ardeidae	<i>Nycticorax caledonicus</i>	Nankeen Night Heron, Rufous Night Heron	-	MA	x													x
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow	-	-	x			x	x	x	x			x				
Artamidae	<i>Artamus cyanopterus</i>	Dusky Woodswallow	-	-	x													
Artamidae	<i>Artamus leucorhynchus</i>	White-breasted Woodswallow	-	-	x				x	x								
Artamidae	<i>Artamus minor</i>	Little Woodswallow	-	-	x				x									x
Artamidae	<i>Artamus personatus</i>	Masked Woodswallow	-	-	x				x									x
Artamidae	<i>Artamus superciliosus</i>	White-browed Woodswallow	-	-	x													
Artamidae	<i>Cracticus nigrogularis</i>	Pied Butcherbird	-	-	x			x	x	x								x
Artamidae	<i>Cracticus torquatus</i>	Grey Butcherbird	-	-	x													
Artamidae	<i>Gymnorhina tibicen</i>	Australian Magpie	-	-	x			x										x
Burhinidae	<i>Burhinus grallarius</i>	Bush Stone-curlew, Bush Thick-knee	-	-	x													
Burhinidae	<i>Esacus magnirostris</i>	Beach Stone-curlew, Beach Thick-knee	-	MA	x													
Cacatuidae	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	-	-	x			x										
Cacatuidae	<i>Cacatua sanguinea</i>	Little Corella	-	-	x			x	x	x				x				x
Cacatuidae	<i>Eolophus roseicapilla</i>	Galah	-	-	x			x	x	x	x			x				x
Cacatuidae	<i>Nymphicus hollandicus</i>	Cockatiel	-	-	x				x	x	x							x
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike	-	MA	x			x	x	x	x			x				x
Campephagidae	<i>Lalage tricolor</i>	White-winged Triller	-	-	x				x									x
Caprimulgidae	<i>Eurostopus argus</i>	Spotted Nightjar	-	MA	x				x					x				x
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu	-	-	x			x										x
Charadriidae	<i>Charadrius leschenaultii</i>	Greater Sand Plover	VU	VU, MI, MA	x	x	x											
Charadriidae	<i>Charadrius mongolus</i>	Lesser Sand Plover	EN	EN, MI, MA	x	x	x											
Charadriidae	<i>Charadrius ruficapillus</i>	Red-capped Plover	-	MA	x	x					x							



Appendix I Fauna Site Sheets

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

SLR Project No.: 675.072189.00001

29 July 2024

675.072189-BAT-1

Project:	675.072189			Sample Type	ARU
Date	1-03-2024				
Zone	50	Eastings	690876	Northing	7740452
Landform and Soil			Rock		
Landform	Outcrop/breakaway		Rock type/s	Quartz	
Aspect	West		Surface stone cover	75 - 100%	
Soil type	Sand		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)	
Soil colour	Red				
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Exfoliating rock, Hummocks, Rock crevices	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	76-100%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia coleii</i>	
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia sp.</i>	



Fulcrum photo ID 3e20cbbb-6a6b-4f2b-8d6a-e7865c62b5f0

675.072189-BAT-2

Project:	675.072189			Sample Type	ARU
Date	1-03-2024				
Zone	50	Eastings	701623	Northing	7740708.5
Landform and Soil			Rock		
Landform	Plain		Rock type/s	Granite	
Aspect	Negligible		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Rocks (20 - 60 cm), Big Rocks (60 cm - 2 m), Boulders (>2 m), Small Rocks (6 - 20 cm)	
Soil colour	Orange				
Condition			Habitat Features		
Quality	High quality		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Termite mounds, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	26-50%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia sp.</i>	
Ground stratum	Low (>0.5 m)	Closed hummock grassland (>80%)		<i>Triodia epactia</i>	



Fulcrum photo ID 62505859-d69d-424a-b438-073c23ab4962

675.072189-BAT-3

Project:	675.072189		
Date	2-03-2024	Sample Type	ARU
Zone	50	Easting	719698
		Northing	7749334
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Granite, Ironstone, Quartz
Aspect	North	Surface stone cover	50 - 75%
Soil type	Sand	Surface stone size classes present	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)
Soil colour	Red		
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Caves, Exfoliating rock, Hummocks, Rock crevices
Disturbance	Overgrazing	Ground Cover	
Introduced fauna	Cattle		
Vegetation			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID 86a89a3c-39c7-47cb-9440-9df6551d1eea

675.072189-BAT-4

Project:	675.072189		
Date	2-03-2024	Sample Type	ARU
Zone	50	Easting	719953
		Northing	7754956.3
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Granite
Aspect	West	Surface stone cover	75 - 100%
Soil type	Rock	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Rocks (20 - 60 cm), Big Rocks (60 cm - 2 m), Boulders (>2 m), Small Rocks (6 - 20 cm)
Soil colour	Orange		
Condition		Habitat Features	
Quality	High quality	Water Source	Absent
Fire History	Burnt (1-5 years)	Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris
Disturbance	None observed	Ground Cover	11-25%
Introduced fauna	None observed		
Vegetation			
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)	<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia sp.</i>



Fulcrum photo ID 7b5335c9-98ff-40b2-8b96-9c27e29db566

675.072189-BAT-5

Project:		675.072189					
Date		2-03-2024		Sample Type		ARU	
Zone	50	Easting	705916	Northing	7742518		
Landform and Soil				Rock			
Landform	Drainage line			Rock type/s	None		
Aspect	Negligible			Surface stone cover			
Soil type	Sand			Surface stone size classes	present		
Soil colour	Red						
Condition				Habitat Features			
Quality	Good			Water Source	Absent		
Fire History	Little or no fire evidence (>5 years)			Microhabitats	Hummocks, Leaf litter		
Disturbance	None observed			Ground Cover			
Introduced fauna	None observed						
Vegetation							
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Eucalyptus melaleuca</i>			
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia</i> sp.			
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>			



Fulcrum photo ID 39731cc9-60a3-4bcd-936c-6e4f11664eb3

675.072189-BIL-6

Project:		675.072189					
Date		3-03-2024		Sample Type		Bilby Search	
Zone	50	Easting	667478	Northing	7736632.3		
Landform and Soil				Rock			
Landform	Plain			Rock type/s	None		
Aspect	Negligible			Surface stone cover			
Soil type	Sandy loam			Surface stone size classes	present		
Soil colour	Orange						
Condition				Habitat Features			
Quality	Very good			Water Source	Absent		
Fire History	Little or no fire evidence (>5 years)			Microhabitats	Caves, Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris		
Disturbance	Vehicle tracks			Ground Cover	51-75%		
Introduced fauna	None observed						
Vegetation							
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Eucalyptus victrix</i>			
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Eucalyptus victrix</i>			
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>			



Fulcrum photo ID 3ac6a6bf-cb3f-4392-8979-f6ce998c7fe5

675.072189-BIL-7

Project:		675.072189			
Date		4-03-2024		Sample Type	Bilby Search
Zone	50	Easting	718934	Northing	7752705
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Good		Water Source	Present	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks	
Disturbance	None observed		Ground Cover	51-75%	
Introduced fauna	Cattle				
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)		<i>Triodia secunda</i> <i>Acacia stellaticeps</i>	
				Fulcrum photo ID	107d370e-5367-4d15-b434-84d3e61495b5.e61fe2c6-8666-467b-



675.072189-BIL-8

Project:		675.072189			
Date		4-03-2024		Sample Type	Bilby Search
Zone	50	Easting	716835	Northing	7749621.6
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Disturbed		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter	
Disturbance	Overgrazing, Vehicle tracks		Ground Cover	51-75%	
Introduced fauna	Cattle				
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i> and <i>Acacia stellaticeps</i>	
				Fulcrum photo ID	12fab39-ac9a-4cd9-9c9c-242da5192f05,3955ed23-f85c-4187-80bf-



675.072189-BIL-9

Project:	675.072189		
Date	4-03-2024	Sample Type	Bilby Search
Zone	50	Easting	716904
		Northing	7749069
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Ironstone
Aspect	North	Surface stone cover	50 - 75%
Soil type	Rock	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)
Soil colour	Black, Brown, Red		
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Rock crevices
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	
Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Grevillea sp. or Hakea sp., and Acacia inaequilatera</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia sp.</i>



Fulcrum photo ID 63b1a5ff-a1c5-400b-ae5e-a1fe522158e7,a7ed4d92-313f-4e46-a1ae-

675.072189-BIL-10

Project:	675.072189		
Date	4-03-2024	Sample Type	Bilby Search
Zone	50	Easting	716811
		Northing	7749157.6
Landform and Soil		Rock	
Landform	Dune crest	Rock type/s	None
Aspect	North	Surface stone cover	
Soil type	Sand	Surface stone size classes present	
Soil colour	Red		
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter
Disturbance	Overgrazing		
Introduced fauna	Cattle	Ground Cover	
Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia coleii</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia and Acacia stellaticeps</i>



Fulcrum photo ID e559afca-a53d-4f53-9bd2-3252e55333f8,6be2d548-40a0-4677-9f99-

675.072189-BIL-11

Project:		675.072189			
Date		4-03-2024		Sample Type	Bilby Search
Zone	50	Easting	710384	Northing	7746378
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Disturbed		Water Source	Present	
Fire History	Recently burnt (<1 year)		Microhabitats	Hummocks	
Disturbance	None observed		Ground Cover	<10%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID 2ea4fc1c-d3b8-4425-890f-c342fa984582,6cb20729-91ad-4f24-9955-

675.072189-BIL-12

Project:		675.072189			
Date		7-03-2024		Sample Type	Bilby Search
Zone	50	Easting	699416	Northing	7741024.8
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks	
Disturbance	None observed		Ground Cover	51-75%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Absent				
Mid stratum	Low (0.5-1 m)	Isolated shrubs and/or heath shrubs (<0.25%)		<i>Acacia Inaequilatera</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID b0f6bf39-7835-4d22-9e57-6830de2458c4

675.072189-BIL-13

Project:		675.072189			
Date		9-03-2024		Sample Type	Bilby Search
Zone	50	Easting	679178	Northing	7739203
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Termite mounds	
Disturbance	None observed		Ground Cover	51-75%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia Inaequilatera</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID 06ed5988-2a43-4f6c-8520-577b3d99220f,c5972ade-3dd7-4efd-9645-

675.072189-BIR-14

Project:		675.072189			
Date		1-03-2024		Sample Type	ARU
Zone	50	Easting	701609	Northing	7740740.9
Landform and Soil			Rock		
Landform	Plain		Rock type/s	Granite	
Aspect	Negligible		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Rocks (20 - 60 cm), Big Rocks (60 cm - 2 m), Boulders (>2 m), Small Rocks (6 - 20 cm)	
Soil colour	Orange		present		
Condition			Habitat Features		
Quality	High quality		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Termite mounds, Woody debris	
Disturbance	None observed		Ground Cover	26-50%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia sp.</i>	
Ground stratum	Low (>0.5 m)	Closed hummock grassland (>80%)		<i>Triodia epactia</i>	



Fulcrum photo ID 918fae2c-2e93-42c0-89df-a62a9f546241

675.072189-BIR-15

Project:		675.072189			
Date		2-03-2024		Sample Type	ARU
Zone	50	Easting	719490	Northing	7755363
Landform and Soil			Rock		
Landform	Drainage line		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Disturbed		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	Overgrazing, Weeds		Ground Cover		
Introduced fauna	Cattle				
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Corymbia flavescens</i>	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia coleii</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID 8dc6f329-c8be-45ac-bace-216d4a90a599

675.072189-BIR-16

Project:		675.072189			
Date		2-03-2024		Sample Type	ARU
Zone	50	Easting	705845	Northing	7742778.4
Landform and Soil			Rock		
Landform	Drainage line		Rock type/s	None	
Aspect	North		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	White, Yellow		present		
Condition			Habitat Features		
Quality	Disturbed		Water Source		
Fire History	Unknown		Microhabitats	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Woody debris	
Disturbance	Vehicle tracks		Ground Cover	26-50%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Low (<10 m)	Woodland (20-50%)		<i>Acacia cyperophylla</i> , Paper bark	
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia sp.</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID c196bc9b-894b-419b-ae7d-93e67e56c67d

675.072189-BIR-17

Project:	675.072189		
Date	3-03-2024	Sample Type	ARU
Zone	50	Easting	667469
		Northing	7736627
Landform and Soil		Rock	
Landform	Plain	Rock type/s	None
Aspect	Negligible	Surface stone cover	
Soil type	Sandy loam	Surface stone size classes	
Soil colour	Orange	present	
Condition		Habitat Features	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Caves, Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris
Disturbance	Vehicle tracks	Ground Cover	51-75%
Introduced fauna	None observed	Vegetation	
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Eucalyptus victrix</i>
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Eucalyptus victrix</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID 8a790cc8-8976-4ae5-86e2-5d4a357a349a,e210a7b2-e529-4ea1-ae00

675.072189-BIR-18

Project:	675.072189		
Date	3-03-2024	Sample Type	ARU
Zone	50	Easting	660818
		Northing	7739279.4
Landform and Soil		Rock	
Landform	Plain	Rock type/s	None
Aspect	Negligible	Surface stone cover	
Soil type	Sand	Surface stone size classes	
Soil colour	Orange	present	
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter, Woody debris, Logs > 10 cm
Disturbance	Litter, Vehicle tracks	Ground Cover	51-75%
Introduced fauna	None observed	Vegetation	
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Eucalyptus sp.</i>
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia stellaticeps</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID 1eca219b-fa86-4ffa-bbf8-21f7f6639f0e

675.072189-CAM-19

Project:		675.072189			
Date		1-03-2024		Sample Type	Camera Trap
Zone	50	Easting	701625	Northing	7740707
Landform and Soil			Rock		
Landform	Plain		Rock type/s	Granite	
Aspect	Negligible		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Rocks (20 - 60 cm), Big Rocks (60 cm - 2 m), Boulders (>2 m), Small Rocks (6 - 20 cm)	
Soil colour	Orange				
Condition			Habitat Features		
Quality	High quality		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Termite mounds, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	26-50%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia sp.</i>	
Ground stratum	Low (>0.5 m)	Closed hummock grassland (>80%)		<i>Triodia epactia</i>	



Fulcrum photo ID cc87c3e1-4dc6-48a7-af7f-47c76f0b4aa2

675.072189-CAM-20

Project:		675.072189			
Date		1-03-2024		Sample Type	Camera Trap
Zone	50	Easting	691054	Northing	7741368.9
Landform and Soil			Rock		
Landform	Outcrop/breakaway		Rock type/s	Quartz	
Aspect	Negligible		Surface stone cover	75 - 100%	
Soil type	Sand		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)	
Soil colour	Orange				
Condition			Habitat Features		
Quality	High quality		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	26-50%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia orthocarpa</i>	
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>	



Fulcrum photo ID 14c27e77-be77-4ef4-8bc9-272770ca39b

675.072189-CAM-21

Project:				675.072189			
Date:				1-03-2024			
Sample Type		Camera Trap		Zone		50	
Easting		690886		Northing		7740445	
Landform and Soil				Rock			
Landform		Outcrop/breakaway		Rock type/s		Quartz	
Aspect		East		Surface stone cover		75 - 100%	
Soil type		Sand		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)	
Soil colour		Red					
Condition				Habitat Features			
Quality		Very good		Water Source		Absent	
Fire History		Little or no fire evidence (>5 years)		Microhabitats		Exfoliating rock, Hummocks, Rock crevices	
Disturbance		None observed		Ground Cover		76-100%	
Introduced fauna		None observed					
Vegetation							
Upper stratum		Absent					
Mid stratum		Low (0.5-1 m)		Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia orthocarpa</i>	
Ground stratum		Low (>0.5 m)		Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>	



Fulcrum photo ID 5094ed45-c28f-4cae-b618-0ad0a297cc6c

675.072189-CAM-22

Project:				675.072189			
Date:				1-03-2024			
Sample Type		Camera Trap		Zone		50	
Easting		701732		Northing		7741492.9	
Landform and Soil				Rock			
Landform		Plain		Rock type/s		Granite	
Aspect		Negligible		Surface stone cover		75 - 100%	
Soil type		Rock		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)	
Soil colour		Orange					
Condition				Habitat Features			
Quality		High quality		Water Source		Absent	
Fire History		Burnt (1-5 years)		Microhabitats		Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance		None observed		Ground Cover		26-50%	
Introduced fauna		None observed					
Vegetation							
Upper stratum		Absent					
Mid stratum		Mid (1-2 m)		Open shrubland and/or heathland (20-50%)		<i>Acacia sp.</i>	
Ground stratum		Low (>0.5 m)		Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID 914e5902-fb78-4ed0-81cc-ac92a6fa6136

675.072189-CAM-23

Project:		675.072189	
Date		1-03-2024	
Sample Type	Camera Trap		
Zone	50	Easting	701282
Northing	7742299		
Landform and Soil		Rock	
Landform	Outcrop/breakaway		Rock type/s
Aspect	North		Quartz
Soil type	Sand		Surface stone cover
Soil colour	Red		75 - 100%
Condition		Habitat Features	
Quality	High quality		Surface stone size classes present
Fire History	Little or no fire evidence (>5 years)		Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm), Rocks (20 - 60 cm)
Disturbance	None observed		Microhabitats
Introduced fauna	None observed		Exfoliating rock, Hummocks, Rock crevices
Vegetation		Ground Cover	
Upper stratum	Absent		51-75%
Mid stratum	Low (0.5-1 m)		Isolated shrubs and/or heath shrubs (<0.25%)
Ground stratum	Low (>0.5 m)		Open hummock grassland (20-50%)
		<i>Triodia epactia</i>	



Fulcrum photo ID ac269577-2f11-472c-9570-873aea8b91ea,986ce288-c86b-4447-a998-

675.072189-CAM-24

Project:		675.072189	
Date		1-03-2024	
Sample Type	Camera Trap		
Zone	50	Easting	690962
Northing	7740912.2		
Landform and Soil		Rock	
Landform	Outcrop/breakaway		Rock type/s
Aspect	Negligible		Quartz
Soil type	Sand		Surface stone cover
Soil colour	Orange		75 - 100%
Condition		Habitat Features	
Quality	High quality		Surface stone size classes present
Fire History	Burnt (1-5 years)		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)
Disturbance	None observed		Microhabitats
Introduced fauna	None observed		Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris
Vegetation		Ground Cover	
Upper stratum	Absent		26-50%
Mid stratum	Low (0.5-1 m)		Open shrubland and/or heathland (20-50%)
Ground stratum	Low (>0.5 m)		Sparse hummock grassland (0.25-20%)
		<i>Triodia epactia</i>	



Fulcrum photo ID 38f0ec07-46bc-44c3-8048-cfd5aaa24ef9

675.072189-CAM-25

Project:	675.072189		
Date	1-03-2024	Sample Type	Camera Trap
Zone	50	Easting	690965
		Northing	7741174
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Quartz
Aspect	Negligible	Surface stone cover	75 - 100%
Soil type	Sand	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)
Soil colour	Orange		
Condition		Habitat Features	
Quality	High quality	Water Source	Absent
Fire History	Burnt (1-5 years)	Microhabitats	Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	26-50%
Vegetation			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia orthocarpa</i>
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i>



Fulcrum photo ID cc62e386-69ff-4ac8-bdcb-d03ae4b940a7

675.072189-CAM-26

Project:	675.072189		
Date	1-03-2024	Sample Type	Camera Trap
Zone	50	Easting	690899
		Northing	7740597.4
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Quartz
Aspect	West	Surface stone cover	75 - 100%
Soil type	Sand	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)
Soil colour	Red		
Condition		Habitat Features	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Exfoliating rock, Hummocks, Rock crevices
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	76-100%
Vegetation			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia orthocarpa</i>
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i>



Fulcrum photo ID 21c18e9a-8324-4f4f-b97f-febc0b456b88

675.072189-CAM-27

Project:		675.072189	
Date		1-03-2024	
Sample Type		Camera Trap	
Zone	50	Easting	701393
Northing		7742438	
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Quartz
Aspect	Negligible	Surface stone cover	75 - 100%
Soil type	Sand	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)
Soil colour	Red		
Condition		Habitat Features	
Quality	High quality	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Exfoliating rock, Hummocks, Rock crevices
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	51-75%
Vegetation			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID 137a23d4-2c27-43c5-a596-c06dc20abb81

675.072189-CAM-28

Project:		675.072189	
Date		1-03-2024	
Sample Type		Camera Trap	
Zone	50	Easting	690919
Northing		7740721.9	
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Quartz
Aspect	East	Surface stone cover	75 - 100%
Soil type	Sand	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)
Soil colour	Red		
Condition		Habitat Features	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Exfoliating rock, Hummocks, Rock crevices
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	76-100%
Vegetation			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia orthocarpa</i>
Ground stratum	Low (<0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i>



Ground station	Low (200 m)	Sparse tall herb grassland (1/20 20m)	medium spectra	Fulcrum photo ID	687c5795-6f29-49e5-9162-f914d6de9c19
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675.072189-CAM-29

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	717460	Northing	7749535
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite	
Aspect	North		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes present	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), Pebbles (<0.6 cm)	
Soil colour	Orange				
Condition		Habitat Features			
Quality	Very good		Water Source		
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Woody debris, Peeling bark	
Disturbance	Vehicle tracks				
Introduced fauna	Cattle		Ground Cover	11-25%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)		<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>	
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>	



Fulcrum photo ID fcd9014c-e753-4a9c-9f78-cc1eacee77a7

675.072189-CAM-30

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	717338	Northing	7749473.6
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite	
Aspect	North		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes present	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), Pebbles (<0.6 cm)	
Soil colour	Orange				
Condition		Habitat Features			
Quality	Very good		Water Source		
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Woody debris, Peeling bark	
Disturbance	Vehicle tracks				
Introduced fauna	Cattle		Ground Cover	11-25%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)		<i>Acacia</i> sp.	
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>	



Fulcrum photo ID d0f9985a-ea40-45dd-a604-b9fa9ecaec25

675.072189-CAM-31

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	688604	Northing	7740105
Landform and Soil			Rock		
Landform	Drainage line		Rock type/s	None	
Aspect	North		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Orange		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed		Ground Cover	51-75%	
Introduced fauna	Cattle				
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Melaleuca argentea</i>		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia coleii</i>		
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i>		



Fulcrum photo ID 2b6ed36d-8b93-49c0-96a3-53c4a052bd72

675.072189-CAM-32

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	717120	Northing	7749284.4
Landform and Soil			Rock		
Landform	Outcrop/breakaway		Rock type/s	Granite, Ironstone, Quartz	
Aspect	North		Surface stone cover	50 - 75%	
Soil type	Sand		Surface stone size classes	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)	
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Rock crevices	
Disturbance	Overgrazing		Ground Cover		
Introduced fauna	Cattle				
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>		



Fulcrum photo ID 98f2686f-85ac-41de-b1d4-48f52118eeb6

675.072189-CAM-33

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	700279	Northing	7741209
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Quartz	
Aspect	South		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes present	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)	
Soil colour	Red				
Condition		Habitat Features			
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Exfoliating rock, Hummocks, Rock crevices	
Disturbance	None observed		Ground Cover	26-50%	
Introduced fauna	None observed		Vegetation		
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>		



Fulcrum photo ID 035e4c7c-491f-40f4-8188-f9d8d8800288

675.072189-CAM-34

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	719953	Northing	7754955.9
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite	
Aspect	West		Surface stone cover	75 - 100%	
Soil type	Rock		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Rocks (20 - 60 cm), Big Rocks (60 cm - 2 m), Boulders (>2 m), Small Rocks (6 - 20 cm)	
Soil colour	Orange				
Condition		Habitat Features			
Quality	High quality		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	None observed		Ground Cover	11-25%	
Introduced fauna	None observed		Vegetation		
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)		<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>	
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)		<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>	
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia sp.</i>	



Fulcrum photo ID 9e49a70e-39b9-465b-8b41-210a96dbe7b8,ff149b68-2dae-46d8-

675.072189-CAM-35

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	717464	Northing	7749547
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite	
Aspect	North		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes present	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), Pebbles (<0.6 cm)	
Soil colour	Orange				
Condition		Habitat Features			
Quality	Very good		Water Source		
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Woody debris, Peeling bark	
Disturbance	Vehicle tracks				
Introduced fauna	Cattle		Ground Cover	11-25%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)		<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>	
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>	



Fulcrum photo ID 733fb305-7279-411f-91a1-1b42b3359bd6,e4896b6a-3a8b-4bac-b0b1

675.072189-CAM-36

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	719462	Northing	7754811.4
Landform and Soil		Rock			
Landform	Drainage line		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes present		
Soil colour	Red				
Condition		Habitat Features			
Quality	Disturbed		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter, Logs > 10 cm, Peeling bark	
Disturbance	Overgrazing, Weeds				
Introduced fauna	Cattle		Ground Cover	51-75%	
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Eucalyptus victrix</i>	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia coleii</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i> and <i>Eulalia aurea</i>	



Fulcrum photo ID 4e0eaea2-878e-4141-b397-3151d77f0f17

675.072189-CAM-37

Project:	675.072189		
Date	2-03-2024	Sample Type	Camera Trap
Zone	50	Easting	719490
		Northing	7755363
Landform and Soil		Rock	
Landform	Drainage line	Rock type/s	None
Aspect	Negligible	Surface stone cover	
Soil type	Sand	Surface stone size classes	
Soil colour	Red	present	
Condition		Habitat Features	
Quality	Disturbed	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter, Peeling bark, Woody debris
Disturbance	Overgrazing, Weeds	Ground Cover	
Introduced fauna	Cattle		
Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Corymbia flavescens</i>
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia coleii</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID f177ae7e-15f1-4550-af34-ef6b7519d370

675.072189-CAM-38

Project:	675.072189		
Date	2-03-2024	Sample Type	Camera Trap
Zone	50	Easting	717065
		Northing	7749310.3
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Granite, Ironstone, Quartz
Aspect	North	Surface stone cover	50 - 75%
Soil type	Sand	Surface stone size classes	Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm),
Soil colour	Red	present	Rocks (20 - 60 cm), Big Rocks (60 cm - 2 m)
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Caves, Exfoliating rock, Hummocks, Rock crevices
Disturbance	Overgrazing	Ground Cover	
Introduced fauna	Cattle		
Vegetation			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID 88ac542d-9fc3-4340-9fb7-7e5f6f50eef1

675.072189-CAM-39

Project:	675.072189		
Date	2-03-2024	Sample Type	Camera Trap
Zone	50	Easting	705838
		Northing	7742778
Landform and Soil		Rock	
Landform	Drainage line	Rock type/s	None
Aspect	North	Surface stone cover	
Soil type	Sand	Surface stone size classes present	
Soil colour	White, Yellow		
Condition		Habitat Features	
Quality	Disturbed	Water Source	
Fire History	Unknown	Microhabitats	Hollows - logs, Hollows - trees, Hummocks, Leaf litter, Woody debris
Disturbance	Vehicle tracks	Ground Cover	26-50%
Introduced fauna	None observed		
Vegetation			
Upper stratum	Low (<10 m)	Woodland (20-50%)	<i>Acacia cyperophylla</i> , <i>Paper bark</i>
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia sp.</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID 2259cceb-db1c-4f76-869e-73319d6085c0

675.072189-CAM-40

Project:	675.072189		
Date	2-03-2024	Sample Type	Camera Trap
Zone	50	Easting	717385
		Northing	7749526.3
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Granite
Aspect	North	Surface stone cover	75 - 100%
Soil type	Sand	Surface stone size classes present	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), Pebbles (<0.6 cm)
Soil colour	Orange		
Condition		Habitat Features	
Quality	Very good	Water Source	
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Rock crevices, Woody debris, Peeling bark
Disturbance	Vehicle tracks	Ground Cover	11-25%
Introduced fauna	Cattle		
Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Isolated shrubs and/or heath shrubs (<0.25%)	<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i>



Fulcrum photo ID e3ce36af-bbbc-48db-ae7a-c6ca62b1e724

675.072189-CAM-41

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	719414	Northing	7755547
Landform and Soil		Rock			
Landform	Drainage line		Rock type/s	Granite	
Aspect	East		Surface stone cover	0 - 5%	
Soil type	Clay loam		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Orange				
Condition		Habitat Features			
Quality	Good		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Hummocks, Leaf litter, Logs > 10 cm, Peeling bark, Woody debris	
Disturbance	Vehicle tracks		Ground Cover	26-50%	
Introduced fauna	Cattle		Vegetation		
Upper stratum	Low (<10 m)	Woodland (20-50%)	<i>Acacia sp.</i>		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia sp.</i>		
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>		



Fulcrum photo ID 8c6ce9d3-f756-46c1-a2fb-2ef3762f9c68,dbbb467d-7fe1-466c-9112-

675.072189-CAM-42

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	717217	Northing	7749332.8
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite, Ironstone, Quartz	
Aspect	North		Surface stone cover	50 - 75%	
Soil type	Sand		Surface stone size classes present	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)	
Soil colour	Red				
Condition		Habitat Features			
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Rock crevices	
Disturbance	Overgrazing		Ground Cover		
Introduced fauna	Cattle		Vegetation		
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>		



Fulcrum photo ID 75932079-4849-4db7-8de1-078b9c1ba833

675.072189-CAM-43

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	717016	Northing	7749322
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite, Ironstone, Quartz	
Aspect	North		Surface stone cover	50 - 75%	
Soil type	Sand		Surface stone size classes present	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)	
Soil colour	Red		Habitat Features		
Condition		Habitat Features			
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Rock crevices	
Disturbance	Overgrazing		Ground Cover		
Introduced fauna	Cattle		Vegetation		
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Cenchrus ciliaris and Triodia sp.</i>		



Fulcrum photo ID 38ebb745-6181-4852-aaca-db0cd870262e

675.072189-CAM-44

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	699355	Northing	7740673.2
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Unknown	
Aspect	West		Surface stone cover	25 - 50%	
Soil type	Sand		Surface stone size classes present	Boulders (>2 m), Small Rocks (6 - 20 cm)	
Soil colour	Orange, Grey		Habitat Features		
Condition		Habitat Features			
Quality	Good		Water Source	Absent	
Fire History	Recently burnt (<1 year)		Microhabitats	Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Woody debris, Rock crevices	
Disturbance	None observed		Ground Cover	51-75%	
Introduced fauna	None observed		Vegetation		
Upper stratum	Low (<10 m)		<i>Acacia Inaequilatera</i>		
Mid stratum	Absent				
Ground stratum	Mid (0.5-1 m)	Hummock grassland (50-80%)	<i>Triodia epactia</i>		



Fulcrum photo ID c33ec222-b009-4b8c-abcb-18e83bf6bc8d

675.072189-CAM-45

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	699811	Northing	7742455
Landform and Soil			Rock		
Landform	Outcrop/breakaway		Rock type/s	Laterite	
Aspect	North		Surface stone cover	50 - 75%	
Soil type	Sand		Surface stone size classes present	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)	
Soil colour	Red				
Condition			Habitat Features		
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Exfoliating rock, Hummocks, Rock crevices	
Disturbance	None observed		Ground Cover	11-25%	
Introduced fauna	Cat				
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>	



Fulcrum photo ID 59f639d9-84d6-4d1d-a4de-78789c5fa00d

675.072189-CAM-46

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	699950	Northing	7740952.4
Landform and Soil			Rock		
Landform	Outcrop/breakaway		Rock type/s	Quartz	
Aspect	North		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes present	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)	
Soil colour	Red				
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Exfoliating rock, Hummocks, Rock crevices	
Disturbance	None observed		Ground Cover	26-50%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum		Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>	



Fulcrum photo ID 6e392ed3-6d9b-4f9b-b747-180ea692fc5b

675.072189-CAM-47

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	719897	Northing	7755038
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite	
Aspect	West		Surface stone cover	75 - 100%	
Soil type	Rock		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Rocks (20 - 60 cm), Big Rocks (60 cm - 2 m), Boulders (>2 m), Small Rocks (6 - 20 cm)	
Soil colour	Orange				
Condition		Habitat Features			
Quality	High quality		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	None observed		Ground Cover	11-25%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>		
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)	<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>		
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia</i> sp.		



Fulcrum photo ID 26a50f4a-3047-4a39-a0b5-f88901e8ac73

675.072189-CAM-48

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	719924	Northing	7754981.1
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite	
Aspect	West		Surface stone cover	75 - 100%	
Soil type	Rock		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Rocks (20 - 60 cm), Big Rocks (60 cm - 2 m), Boulders (>2 m), Small Rocks (6 - 20 cm)	
Soil colour	Orange				
Condition		Habitat Features			
Quality	High quality		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Peeling bark, Rock crevices, Woody debris	
Disturbance	None observed		Ground Cover	11-25%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)	<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>		
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)	<i>Atalaya hemiglauca</i> and <i>Ficus brachypoda</i>		
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia</i> sp.		



Fulcrum photo ID 7bb66d9b-c078-45f3-b984-0a4d117589d9

675.072189-CAM-49

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	705911	Northing	7742520
Landform and Soil		Rock			
Landform	Drainage line		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition		Habitat Features			
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter	
Disturbance	None observed		Ground Cover		
Introduced fauna	None observed				
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Eucalyptus Melaleuca</i>		
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia</i> sp.		
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>		



Fulcrum photo ID d5f208b1-8392-402d-99db-2c93a19190b1

675.072189-CAM-50

Project:	675.072189				
Date	2-03-2024		Sample Type	Camera Trap	
Zone	50	Easting	700083	Northing	7740603.2
Landform and Soil		Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite, Quartz	
Aspect	South		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes	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)	
Soil colour	Red		present		
Condition		Habitat Features			
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Exfoliating rock, Hummocks, Rock crevices	
Disturbance	None observed		Ground Cover		
Introduced fauna	None observed				
Vegetation					
Upper stratum	Absent				
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia coleii</i>		
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>		



Fulcrum photo ID c37f032a-62d5-4ba2-be27-fcaeed61eeb5,491b6f84-f553-459e-b48c-

675.072189-CAM-51

Project:	675.072189		
Date	2-03-2024	Sample Type	Camera Trap
Zone	50	Easting	688646
		Northing	7740917
Landform and Soil		Rock	
Landform	Drainage line	Rock type/s	Granite, Quartz
Aspect	Negligible	Surface stone cover	5 - 25%
Soil type	Sand	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)
Soil colour	Red		
Condition		Habitat Features	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Exfoliating rock, Hummocks, Leaf litter, Logs > 10 cm, Rock crevices
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	
Vegetation			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Eucalyptus camaldulensis</i> , <i>Melaleuca argentea</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID | 0eec3229-f671-4024-bd6a-abca79c89446

675.072189-CAM-52

Project:	675.072189		
Date	3-03-2024	Sample Type	Camera Trap
Zone	50	Easting	660811
		Northing	7739282.7
Landform and Soil		Rock	
Landform	Plain	Rock type/s	None
Aspect	Negligible	Surface stone cover	
Soil type	Sand	Surface stone size classes present	
Soil colour	Orange		
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter, Woody debris, Logs > 10 cm
Disturbance	Litter, Vehicle tracks		
Introduced fauna	None observed	Ground Cover	51-75%
Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Eucalyptus</i> sp.
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia stellaticeps</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID | bff234e9-d528-446b-bca8-7a22918c02e3

675.072189-CAM-53

Project:		675.072189			
Date		3-03-2024		Sample Type	Camera Trap
Zone	50	Easting	660281	Northing	7741179
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes present		
Soil colour	Red				
Condition			Habitat Features		
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	Vehicle tracks, Weeds				
Introduced fauna	None observed		Ground Cover	51-75%	
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Eucalyptus sp.</i>	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia stellaticeps</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia and Acacia stellaticeps</i>	



Fulcrum photo ID 2ae6c94-03d3-45cd-9f0b-887bd5cb9ba6

675.072189-CAM-54

Project:		675.072189			
Date		5-03-2024		Sample Type	Camera Trap
Zone	50	Easting	676125	Northing	7738409.0
Landform and Soil			Rock		
Landform	Drainage line		Rock type/s	None	
Aspect	North		Surface stone cover		
Soil type	Sand		Surface stone size classes present		
Soil colour	Orange, Grey				
Condition			Habitat Features		
Quality			Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Burrows, Peeling bark, Leaf litter, Hummocks, Woody debris	
Disturbance	None observed				
Introduced fauna	Cattle		Ground Cover	26-50%	
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Eucalyptus camaldulensis</i>	
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia trachycarpa</i>	
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)		<i>Triodia epactia</i>	



Fulcrum photo ID 2e66357f-17cd-4e40-bf01-1e6d2670e225

675.072189-CAM-55

Project:		675.072189			
Date		5-03-2024		Sample Type	Camera Trap
Zone	50	Easting	659959	Northing	7741619
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sandy loam		Surface stone size classes		
Soil colour	Orange		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Burrows, Hummocks, Leaf litter, Peeling bark, Woody debris	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	51-75%	
Vegetation					
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)		<i>Eucalyptus camaldulensis</i>	
Mid stratum	Low (0.5-1 m)	Isolated shrubs and/or heath shrubs (<0.25%)		<i>Eucalyptus camaldulensis</i>	
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)		<i>Triodia epactia and Acacia stellaticeps</i>	



Fulcrum photo ID 1bcb9feb-46a2-4c8c-90af-55a580050845

675.072189-CAM-56

Project:		675.072189			
Date		5-03-2024		Sample Type	Camera Trap
Zone	50	Easting	669924	Northing	7737566.3
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sandy loam		Surface stone size classes		
Soil colour	Orange		present		
Condition			Habitat Features		
Quality	Good		Water Source		
Fire History	Little or no fire evidence (>5 years)		Microhabitats		
Disturbance	Vehicle tracks, Clearing, Infrastructure				
Introduced fauna	None observed		Ground Cover	26-50%	
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Eucalyptus victrix</i>	
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia and Acacia stellaticeps</i>	



Fulcrum photo ID bb2a0241-da1c-46c4-b2f4-1c8a572272f8

675.072189-CAM-57

Project:		675.072189	
Date		5-03-2024	
Sample Type		Camera Trap	
Zone	50	Easting	674434
Northing		7738387	
Landform and Soil		Rock	
Landform	Drainage line	Rock type/s	
Aspect	West	Surface stone cover	25 - 50%
Soil type	Sand	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)
Soil colour	Red		
Condition		Habitat Features	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter, Logs > 10 cm
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	
Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Eucalyptus victrix</i>
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Eucalyptus victrix</i> and <i>Acacia colei</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID 571cfc56-b200-4dab-a59d-b9ab5757ad46

675.072189-CAM-58

Project:		675.072189	
Date		5-03-2024	
Sample Type		Camera Trap	
Zone	50	Easting	674610
Northing		7738626.1	
Landform and Soil		Rock	
Landform	Drainage line	Rock type/s	Other
Aspect	West	Surface stone cover	25 - 50%
Soil type	Sand	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)
Soil colour	Red		
Condition		Habitat Features	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Leaf litter, Logs > 10 cm
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	
Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Eucalyptus victrix</i>
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Eucalyptus victrix</i> , <i>Acacia colei</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID 1949a106-8148-4f67-ad36-413a6f6230cd,e04c6456-a64c-4c94-9ba3-

675.072189-CAM-59

Project:		675.072189			
Date		5-03-2024		Sample Type	Camera Trap
Zone	50	Easting	661215	Northing	7739665
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes present		
Soil colour	Orange				
Condition			Habitat Features		
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter, Woody debris, Logs > 10 cm	
Disturbance	Litter, Vehicle tracks				
Introduced fauna	None observed		Ground Cover	51-75%	
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Eucalyptus</i> sp.	
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia stellaticeps</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID e7e80357-8660-41be-b5bd-a825c9839883

675.072189-CAM-60

Project:		675.072189			
Date		6-03-2024		Sample Type	Camera Trap
Zone	50	Easting	704681	Northing	7741098.3
Landform and Soil			Rock		
Landform	Outcrop/breakaway		Rock type/s	Granite	
Aspect	East		Surface stone cover	75 - 100%	
Soil type	Sand		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm), Boulders (>2 m)	
Soil colour	Red				
Condition			Habitat Features		
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Exfoliating rock, Hummocks, Rock crevices	
Disturbance	Infrastructure, Vehicle tracks				
Introduced fauna	None observed		Ground Cover		
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>	



Fulcrum photo ID 82216676-483d-41d4-9a66-14081df56566

675.072189-CAM-61

Project:		675.072189		Sample Type		Camera Trap	
Date		6-03-2024		Sample Type		Camera Trap	
Zone	50	Eastings	704756	Northings		7741958	
Landform and Soil				Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite			
Aspect	Negligible		Surface stone cover	75 - 100%			
Soil type	Peat		Surface stone size classes present	Boulders (>2 m), Big Rocks (60 cm - 2 m), Rocks (20 - 60 cm), Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Small Rocks (6 - 20 cm), Stones (2 - 6 cm)			
Soil colour	Orange						
Condition				Habitat Features			
Quality	Good		Water Source	Absent			
Fire History	Burnt (1-5 years)		Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Rock crevices			
Disturbance	Vehicle tracks						
Introduced fauna	None observed		Ground Cover	11-25%			
Vegetation							
Upper stratum	Absent						
Mid stratum	Absent						
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>			



Fulcrum photo ID | a7158cd1-c512-4eef-8979-1a6a2a060a49

675.072189-CAM-62

Project:		675.072189		Sample Type		Camera Trap	
Date		6-03-2024		Sample Type		Camera Trap	
Zone	50	Eastings	704668	Northings		7741169.1	
Landform and Soil				Rock			
Landform	Outcrop/breakaway		Rock type/s	Granite			
Aspect	East		Surface stone cover	75 - 100%			
Soil type	Sand		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm), Boulders (>2 m)			
Soil colour	Red						
Condition				Habitat Features			
Quality	Good		Water Source	Absent			
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Exfoliating rock, Hummocks, Rock crevices			
Disturbance	Infrastructure, Vehicle tracks						
Introduced fauna	None observed		Ground Cover				
Vegetation							
Upper stratum	Absent						
Mid stratum	Absent						
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>			



Fulcrum photo ID | f228013c-d7c9-4663-a671-8d5e4ce882cd

675.072189-CAM-63

Project:		675.072189	
Date		6-03-2024	
Sample Type		Camera Trap	
Zone	50	Easting	704720
Northing		7741989	
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Granite
Aspect	Negligible	Surface stone cover	75 - 100%
Soil type	Peat	Surface stone size classes present	Boulders (>2 m), Big Rocks (60 cm - 2 m), Rocks (20 - 60 cm), Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Small Rocks (6 - 20 cm), Stones (2 - 6 cm)
Soil colour	Orange		
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Burnt (1-5 years)	Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Rock crevices
Disturbance	Vehicle tracks		
Introduced fauna	None observed	Ground Cover	11-25%
Vegetation			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i>



Fulcrum photo ID 48ee0618-4efc-4a5f-8222-fc06022a9b57

675.072189-CAM-64

Project:		675.072189	
Date		6-03-2024	
Sample Type		Camera Trap	
Zone	50	Easting	679471
Northing		7739344.0	
Landform and Soil		Rock	
Landform	Drainage line	Rock type/s	Granite, Quartz
Aspect	North	Surface stone cover	5 - 25%
Soil type	Sand	Surface stone size classes present	Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Pebbles (<0.6 cm)
Soil colour	Orange		
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Unknown	Microhabitats	
Disturbance	Vehicle tracks		
Introduced fauna	Cattle	Ground Cover	26-50%
Vegetation			
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Eucalyptus victrix</i>
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)	<i>Acacia trachycarpa</i>
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i> and <i>Eulalia aurea</i>



Fulcrum photo ID 410638c5-b2ae-47df-a28b-e36fde476284

675.072189-CAM-65

Project:	675.072189		
Date	6-03-2024	Sample Type	Camera Trap
Zone	50	Easting	685627
		Northing	7740314
Landform and Soil		Rock	
Landform	Drainage line	Rock type/s	None
Aspect	Negligible	Surface stone cover	
Soil type	Sand	Surface stone size classes	
Soil colour	Red	present	
Condition		Habitat Features	
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	Ground Cover	76-100%
Introduced fauna	None observed	Vegetation	
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)	<i>Eucalyptus victrix</i>
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia coleii</i>
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)	<i>Triodia epactia</i>



Fulcrum photo ID 85812315-bd62-428d-871f-6697e215792a

675.072189-CAM-66

Project:	675.072189		
Date	6-03-2024	Sample Type	Camera Trap
Zone	50	Easting	704820
		Northing	7741885.2
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Granite
Aspect	Negligible	Surface stone cover	75 - 100%
Soil type	Peat	Surface stone size classes	Boulders (>2 m), Big Rocks (60 cm - 2 m), Rocks (20 - 60 cm), Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Small Rocks (6 - 20 cm), Stones (2 - 6 cm)
Soil colour	Orange	present	
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Burnt (1-5 years)	Microhabitats	Caves, Exfoliating rock, Hummocks, Leaf litter, Rock crevices
Disturbance	Vehicle tracks	Ground Cover	11-25%
Introduced fauna	None observed	Vegetation	
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i>



Fulcrum photo ID 2f8b118d-628f-427b-a65c-ebef497c98c7

675.072189-CAM-67

Project:		675.072189	
Date		6-03-2024	
Zone	50	Easting	704691
Sample Type		Camera Trap	
Northing		7741038	
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Granite
Aspect	East	Surface stone cover	75 - 100%
Soil type	Sand	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm), Boulders (>2 m)
Soil colour	Red		
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Exfoliating rock, Hummocks, Rock crevices
Disturbance	Infrastructure, Vehicle tracks		
Introduced fauna	None observed	Ground Cover	
Vegetation			
Upper stratum	Absent		
Mid stratum	Absent		
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i>



Fulcrum photo ID | 34fa4921-e688-4e88-bdea-9e4f6569a9d6

675.072189-HAB-68

Project:		675.072189	
Date		1-03-2024	
Zone	50	Easting	701356
Sample Type		Habitat Assessment	
Northing		7742084.8	
Landform and Soil		Rock	
Landform	Plain	Rock type/s	Quartz
Aspect	Negligible	Surface stone cover	5 - 25%
Soil type	Sand	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)
Soil colour	Red		
Condition		Habitat Features	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Exfoliating rock
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	
Vegetation			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia colei</i> , and <i>Acacia ancistrocarpa</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID | c50509c0-8cd5-4de2-af2e-6da2faa7e947

675.072189-HAB-69

Project:		675.072189			
Date		1-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	690832	Northing	7740789
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes present		
Soil colour	Red				
Condition			Habitat Features		
Quality	Good		Water Source	Absent	
Fire History	Unknown		Microhabitats	Hummocks, Leaf litter	
Disturbance	Vehicle tracks				
Introduced fauna			Ground Cover		
Vegetation					
Upper stratum	Absent				
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia orthocarpa</i>	
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)		<i>Triodia epactia</i>	



Fulcrum photo ID ef75bb0c-759a-4764-95c7-25ccffa6fa7

675.072189-HAB-70

Project:		675.072189			
Date		3-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	665218	Northing	7736221.6
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sandy clay		Surface stone size classes present		
Soil colour	Red				
Condition			Habitat Features		
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		Ground Cover	51-75%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Low (0.5-1 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia stellaticeps</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID 07de4620-1d52-4e86-98b7-2accbf3dacd3

675.072189-HAB-71

Project:		675.072189			
Date		3-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	661616	Northing	7736868
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Disturbed		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Leaf litter	
Disturbance	Vehicle tracks		Ground Cover		
Introduced fauna	None observed				
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Acacia stellaticeps</i>	



Fulcrum photo ID 3f48a051-89d5-48e0-b71e-33b4c2afcb69,cecfda48-79b0-4be5-a6c0-

675.072189-HAB-72

Project:		675.072189			
Date		3-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	667071	Northing	7736372.8
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	North		Surface stone cover		
Soil type	Sandy clay		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter, Woody debris	
Disturbance	Vehicle tracks		Ground Cover	51-75%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Absent				
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)		<i>Eucalyptus victrix</i> and <i>Acacia coleii</i>	
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID a247a3af-beb6-4d0c-99b1-8a09dce8cadb,89dab242-cff0-4f60-86eb-

675.072189-HAB-73

Project:		675.072189			
Date		3-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	668481	Northing	7736896
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Disturbed		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter, Woody debris	
Disturbance	Overgrazing, Vehicle tracks				
Introduced fauna	Cattle		Ground Cover	51-75%	
Vegetation					
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)		<i>Eucalyptus victrix</i>	
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia stellaticeps</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID b6d8fe73-2ebd-46f2-8e68-3e9c88129d1a,f76312d8-ee6-4f22-8c06-

675.072189-HAB-74

Project:		675.072189			
Date		3-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	669140	Northing	7737612.4
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red, White		present		
Condition			Habitat Features		
Quality	Disturbed		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Hummocks, Woody debris	
Disturbance	Litter, Overgrazing, Vehicle tracks				
Introduced fauna	None observed		Ground Cover		
Vegetation					
Upper stratum	Mid (10-30 m)	Open woodland (0.25-20%)		<i>Eucalyptus victrix</i>	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Eucalyptus</i> sp.	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID d0e91653-48e9-48dd-9fdc-336960fb95f8

675.072189-HAB-75

Project:		675.072189			
Date		3-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	666659	Northing	7735372
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sandy clay		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Disturbed		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter, Woody debris	
Disturbance	Litter, Vehicle tracks				
Introduced fauna	None observed		Ground Cover	51-75%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia colei</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID e7b3cc6d-2a22-4db7-8442-7e977a24141e,fe44216f-a511-43a7-91b9-

675.072189-HAB-76

Project:		675.072189			
Date		3-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	666199	Northing	7735818.3
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		Ground Cover		
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia inaequilatera</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID 3d37cc13-4576-4865-9762-127dec7d92f1

675.072189-HAB-77

Project:		675.072189			
Date		3-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	665425	Northing	7736606
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes present		
Soil colour	Red				
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		Ground Cover	76-100%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia Inaequilatera</i>	
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)		<i>Triodia sp. and Acacia stellaticeps</i>	



Fulcrum photo ID 99f98150-3f3a-4280-84c1-945d78d4c716,204ca89d-09a2-4423-be67-

675.072189-HAB-78

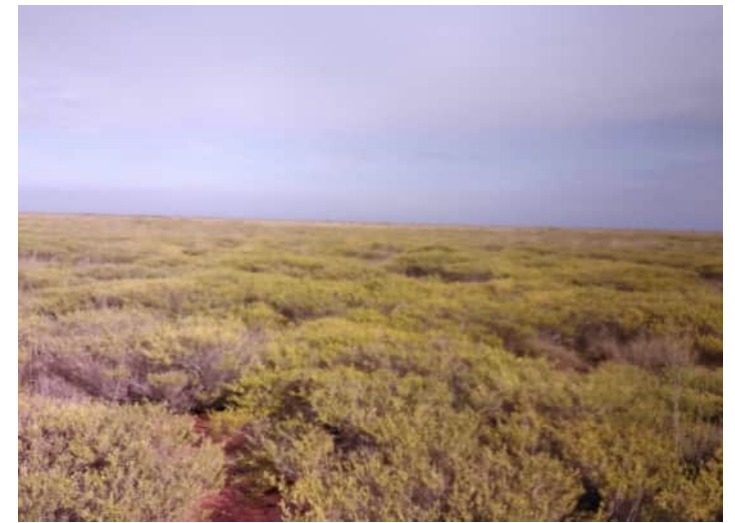
Project:		675.072189			
Date		4-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	718275	Northing	7752198.4
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sandy loam		Surface stone size classes present		
Soil colour	Orange				
Condition			Habitat Features		
Quality	Disturbed		Water Source	Absent	
Fire History	Burnt (1-5 years)		Microhabitats	Hummocks, Woody debris, Leaf litter	
Disturbance	Overgrazing, Vehicle tracks, Infrastructure				
Introduced fauna	Cattle		Ground Cover	51-75%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)		<i>Triodia epactia and Acacia stellaticeps</i>	



Fulcrum photo ID 195f0c46-5f59-4828-b746-1620954b17e8

675.072189-HAB-79

Project:		675.072189			
Date		4-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	718832	Northing	7752593
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	76-100%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)		<i>Triodia epactia</i> and <i>Acacia stellaticeps</i>	



Fulcrum photo ID ef609770-6009-4211-a976-92a3de6f130f,234034f5-7be2-43e4-9acb-

675.072189-HAB-80

Project:		675.072189			
Date		4-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	710356	Northing	7746038.1
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Disturbed		Water Source	Present	
Fire History	Recently burnt (<1 year)		Microhabitats	Hummocks	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	11-25%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia colei</i>	
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i> and <i>Acacia stellaticeps</i>	



Fulcrum photo ID 611ef857-d727-424d-a700-26128af248d3,79a8c89e-68ba-40d3-adcc-

675.072189-HAB-81

Project:		675.072189			
Date		4-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	705537	Northing	7742821
Landform and Soil			Rock		
Landform	Drainage line		Rock type/s		
Aspect	Negligible		Surface stone cover	0 - 5%	
Soil type	Sand		Surface stone size classes present	Pebbles (<0.6 cm)	
Soil colour	Red				
Condition			Habitat Features		
Quality	Disturbed		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hollows - logs, Hollows - trees, Leaf litter, Woody debris	
Disturbance	Vehicle tracks				
Introduced fauna	Cattle		Ground Cover	26-50%	
Vegetation					
Upper stratum	Mid (10-30 m)	Woodland (20-50%)		<i>Eucalyptus camaldulensis</i> or <i>Eucalyptus victrix</i>	
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia</i> sp.	
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia epactia</i>	



Fulcrum photo ID 1b92d4e6-66cd-409f-8dec-f08a1eab90f3,0d1ed0b0-d8f7-4830-bac0-

675.072189-HAB-82

Project:		675.072189			
Date		4-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	705422	Northing	7742554.8
Landform and Soil			Rock		
Landform	Plain		Rock type/s	Granite	
Aspect	Negligible		Surface stone cover	75 - 100%	
Soil type	Rock		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Red				
Condition			Habitat Features		
Quality	Disturbed		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter	
Disturbance	Overgrazing, Vehicle tracks				
Introduced fauna	Cattle		Ground Cover		
Vegetation					
Upper stratum	Absent				
Mid stratum	Absent				
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)		<i>Triodia</i> sp.	



Fulcrum photo ID b7032231-71ca-4a0e-865f-9a336edd1e68

675.072189-HAB-83

Project:		675.072189			
Date		5-03-2024		Sample Type	Habitat Assessment
Zone	50	Eastings	691697	Northing	7741118
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Clay loam		Surface stone size classes		
Soil colour	Orange		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Termite mounds, Woody debris, Peeling bark, Logs > 10 cm, Hummocks, Burrows	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		Ground Cover	26-50%	
Vegetation					
Upper stratum	Low (<10 m)	Isolated trees (<0.25%)		<i>Eucalyptus sp.</i>	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia sp.</i>	
Ground stratum	Absent	Open hummock grassland (20-50%)		<i>Triodia epactia and Acacia stellaticeps</i>	



Fulcrum photo ID | 4134a2fe-344e-4d09-808c-aac01b61eb87

675.072189-HAB-84

Project:		675.072189			
Date		5-03-2024		Sample Type	Habitat Assessment
Zone	50	Eastings	691642	Northing	7741041.5
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		Ground Cover	26-50%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Acacia sp.</i>	
Ground stratum	Mid (0.5-1 m)	Open hummock grassland (20-50%)		<i>Triodia epactia and Acacia stellaticeps</i>	



Fulcrum photo ID | 37c81848-687d-4378-94be-50fd47d021bb

675.072189-HAB-85

Project:		675.072189	
Date		5-03-2024	
Zone	50	Easting	705117
Sample Type		Habitat Assessment	
Northing		7742798	
Landform and Soil		Rock	
Landform	Plain	Rock type/s	Granite
Aspect	Negligible	Surface stone cover	0 - 5%
Soil type	Sand	Surface stone size classes present	Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
Soil colour	Red		
Condition		Habitat Features	
Quality	Very good	Water Source	Present
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks, Rock crevices
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	26-50%
Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia Inaequilatera</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia secunda</i>



Fulcrum photo ID 0a608e4d-4291-4c1f-9b20-83715219d02b,ff897837-e14a-4972-902a-

675.072189-HAB-86

Project:		675.072189	
Date		5-03-2024	
Zone	50	Easting	705211
Sample Type		Habitat Assessment	
Northing		7742135.1	
Landform and Soil		Rock	
Landform	Outcrop/breakaway	Rock type/s	Granite
Aspect	Negligible	Surface stone cover	75 - 100%
Soil type	Sandy clay	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)
Soil colour	Red		
Condition		Habitat Features	
Quality	Very good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Exfoliating rock, Hummocks, Rock crevices
Disturbance	None observed		
Introduced fauna	None observed	Ground Cover	11-25%
Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia Inaequilatera</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID cac9779f-3811-4ec8-af64-3172769c40bb,7fbb166e-dd1e-4bdf-8e07-

675.072189-HAB-87

Project:		675.072189			
Date		5-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	704953	Northing	7740478
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Good		Water Source	Present	
Fire History	Unknown		Microhabitats	Hummocks	
Disturbance	Vehicle tracks				
Introduced fauna	None observed		Ground Cover	51-75%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia Inaequilatera</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID 34cd996e-ae1-4dde-841e-f06e1997b8e0,2a0032c7-b59d-471e-b5a1

675.072189-HAB-88

Project:		675.072189			
Date		5-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	675117	Northing	7738072.3
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Present	
Fire History	Unknown		Microhabitats	Hummocks, Leaf litter	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	51-75%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Tall (>2 m)	Open shrubland and/or heathland (20-50%)		<i>Eucalyptus sp.</i>	
Ground stratum	Low (>0.5 m)	Hummock grassland (50-80%)		<i>Triodia epactia and Acacia stellaticeps</i>	



Fulcrum photo ID 7060878e-b139-4f8b-a60a-bc28c44f1e23,4c7dd966-0377-4479-a764-

675.072189-HAB-89

Project:		675.072189	
Date		6-03-2024	
Sample Type		Habitat Assessment	
Zone	50	Easting	704362
Northing		7742751	
Landform and Soil		Rock	
Landform	Undulating plain	Rock type/s	Granite, Quartz
Aspect	Negligible	Surface stone cover	75 - 100%
Soil type	Sand	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
Soil colour	Red		
Condition		Habitat Features	
Quality	Good	Water Source	Present
Fire History	Burnt (1-5 years)	Microhabitats	Hummocks, Termite mounds
Disturbance	Vehicle tracks		
Introduced fauna	None observed	Ground Cover	11-25%
Vegetation			
Upper stratum	Absent		
Mid stratum	Low (0.5-1 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia Inaequilatera</i>
Ground stratum	Low (>0.5 m)	Sparse hummock grassland (0.25-20%)	<i>Triodia epactia</i>



Fulcrum photo ID 834a9930-49b9-499c-aaf1-bb053e9db2d9,a4c77984-9b15-4a74-a417-

675.072189-HAB-90

Project:		675.072189	
Date		6-03-2024	
Sample Type		Habitat Assessment	
Zone	50	Easting	679404
Northing		7739440.1	
Landform and Soil		Rock	
Landform	Plain	Rock type/s	Limestone, Quartz
Aspect	Negligible	Surface stone cover	75 - 100%
Soil type	Sand	Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm), Small Rocks (6 - 20 cm)
Soil colour	Red		
Condition		Habitat Features	
Quality	Good	Water Source	Absent
Fire History	Little or no fire evidence (>5 years)	Microhabitats	Hummocks
Disturbance	Vehicle tracks		
Introduced fauna	None observed	Ground Cover	51-75%
Vegetation			
Upper stratum	Absent		
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)	<i>Acacia Inaequilatera</i>
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)	<i>Triodia epactia</i>



Fulcrum photo ID 5b7b119e-1d32-4d8a-91db-bad4e76792b3,3ba5136a-8e32-4406-

675.072189-HAB-91

Project:		675.072189			
Date		6-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	677145	Northing	7738837
Landform and Soil			Rock		
Landform	Drainage line		Rock type/s		
Aspect	Negligible		Surface stone cover	0 - 5%	
Soil type	Sand		Surface stone size classes present	Pebbles (<0.6 cm), Small Stones (0.6 - 2 cm), Stones (2 - 6 cm)	
Soil colour	Red				
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter	
Disturbance	None observed		Ground Cover	51-75%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Eucalyptus victrix</i>	
Mid stratum	Mid (1-2 m)	Sparse shrubland and/or heathland (0.25-20%)		<i>Eucalyptus sp.</i>	
Ground stratum	Mid (0.5-1 m)	Hummock grassland (50-80%)		<i>Triodia epactia</i>	



Fulcrum photo ID c3a16e9e-7c1b-4dbf-bc6b-de14f56f4f25,ced3c877-84ea-45e7-9429-

675.072189-HAB-92

Project:		675.072189			
Date		8-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	685527	Northing	7740034.9
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes present		
Soil colour	Red				
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter	
Disturbance	None observed		Ground Cover	26-50%	
Introduced fauna	None observed				
Vegetation					
Upper stratum	Absent				
Mid stratum	Mid (1-2 m)	Open shrubland and/or heathland (20-50%)		<i>Acacia inaequilatera</i> , and <i>Acacia colei</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i> and <i>Acacia stellaticeps</i>	



Fulcrum photo ID 0b422a7b-016e-4cd4-a1ff-bb7d066ae838,2ab5d530-c840-4c56-8ec2-

675.072189-HAB-93

Project:		675.072189			
Date		9-03-2024		Sample Type	Habitat Assessment
Zone	50	Easting	672963	Northing	7737657
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks, Leaf litter	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	51-75%	
Vegetation					
Upper stratum	Low (<10 m)	Open woodland (0.25-20%)		<i>Corymbia candida</i>	
Mid stratum	Tall (>2 m)	Shrubland and/or heathland (50-80%)		<i>Acaica coleii</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia, Eulalia sp.</i>	



Fulcrum photo ID 9ede5cf7-3991-448c-af54-15bb8bea5c0d,76baa306-8dc5-40bb-9d7f-

675.072189-HAB-94

Project:		675.072189			
Date		0-01-1900		Sample Type	Habitat Assessment
Zone	50	Easting	700338	Northing	7740919.7
Landform and Soil			Rock		
Landform	Plain		Rock type/s	None	
Aspect	Negligible		Surface stone cover		
Soil type	Sand		Surface stone size classes		
Soil colour	Red		present		
Condition			Habitat Features		
Quality	Very good		Water Source	Absent	
Fire History	Little or no fire evidence (>5 years)		Microhabitats	Hummocks	
Disturbance	None observed				
Introduced fauna	None observed		Ground Cover	51-75%	
Vegetation					
Upper stratum	Absent				
Mid stratum	Low (0.5-1 m)	Isolated shrubs and/or heath shrubs (<0.25%)		<i>Acacia Inaequilatera</i>	
Ground stratum	Low (>0.5 m)	Open hummock grassland (20-50%)		<i>Triodia epactia</i>	



Fulcrum photo ID cff17ceb-7bc8-4bbb-ae8d-dd119bd8296c



Appendix J Fauna Recorded During the Survey

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

SLR Project No.: 675.072189.00001

29 July 2024

Conservation Status: State - Listed under Biodiversity Conservation Act 2016, Federal - Listed under Environmental Protection and Biodiversity Conservation Act 1999. CR - Critically Endangered, EN - Endangered, VU - Vulnerable, MI/IA - Migratory, CD - Conservation Dependent fauna, OS - Other Specially Protected fauna, MA - Marine, P - Listed as Priority by DBCA.

Family	Scientific Name	Common Name	Conservation Status		Method							
			State	Federal	Call	Sighting	Scat	Tracks	Remains	Mound	ARU	Camera Trap
Aves												
Accipitridae	<i>Aquila audax</i>	Wedge-tailed Eagle				1						
Alaudidae	<i>Mirafra javanica</i>	Horsfield's Bush Lark				1						1
Alcedinidae	<i>Todiramphus sanctus</i>	Sacred Kingfisher		MA		1						
Artamidae	<i>Gymnorhina tibicen</i>	Australian Magpie				1						
Artamidae	<i>Artamus cinereus</i>	Black-faced Woodswallow				3	1					
Artamidae	<i>Cracticus nigrogularis</i>	Pied Butcherbird				1						
Cacatuidae	<i>Eolophus roseicapilla</i>	Galah				4						
Cacatuidae	<i>Cacatua sanguinea</i>	Little Corella				2						
Cacatuidae	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo				1						
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike		MA		4						1
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu						1				
Columbidae	<i>Ocyphaps lophotes</i>	Crested Pigeon				6						1
Columbidae	<i>Geophaps plumifera</i>	Spinifex Pigeon				7						4
Columbidae	<i>Geopelia cuneata</i>	Diamond Dove				1						6
Corvidae	<i>Corvus orru</i>	Torresian Crow				1	3					4
Estrildidae	<i>Taeniopygia castanotis</i>	Australian Zebra Finch				4	6					3
Falconidae	<i>Falco berigora</i>	Brown Falcon					3					
Falconidae	<i>Falco cenchroides</i>	Nankeen Kestrel		MA			4					
Maluridae	<i>Malurus leucopterus</i>	White-winged Fairywren		MA			2					
Meliphagidae	<i>Gavicalis virescens</i>	Singing Honeyeater				1	4					
Meliphagidae	<i>Lichmera indistincta</i>	Brown Honeyeater					1					
Meliphagidae	<i>Ptilotula penicillata</i>	White-plumed Honeyeater					1					
Meliphagidae	<i>Manorina flavigula</i>	Yellow-throated Miner										2
Meropidae	<i>Merops ornatus</i>	Rainbow Bee-eater		MA		1	4					
Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark		MA			1					2
Motacillidae	<i>Anthus australis</i>	Australian Pipit		MA			3					
Otididae	<i>Ardeotis australis</i>	Australian Bustard					1			1		
Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian Grebe, Black-throated Grebe					1					



Appendix K Significant Fauna Likelihood of Occurrence

Atlas Ridley Magnetite Project Connection

Flora and Fauna Survey Technical Report

Horizon Power

SLR Project No.: 675.072189.00001

29 July 2024

Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Birds						
Accipitridae	<i>Erythrotriorchis radiatus</i> Red Goshawk	VU	EN	Tropical and subtropical open-forests and woodlands dominated by eucalypts and paperbarks along streams and near wetlands (Menkhorst et al., 2017).	No nearby records identified from the database searches or literature.	Low No nearby records.
Apodidae	<i>Apus pacificus</i> Pacific Swift, Fork-tailed Swift	MI	MI, MA	Low to very high airspace over varied habitat (Pizzey and Knight, 2012).	The DBCA database identified six records within 50 km of the Survey Area, including one record 3.5 km east in 2007 and two records approximately 38 km south in 2022 (DBCA, 2024d).	Medium Multiple historic records. Taxon may utilise airspace over the Survey Area.
Charadriidae	<i>Charadrius leschenaultii</i> Greater Sand Plover	VU	VU, MI, MA	Wide, sandy, or shelly beaches; sandspits, tidal mudflats, reefs, sand cays, mangroves, saltmarsh, dune wilderness, bare paddocks; seldom far inland (Pizzey and Knight, 2012).	The DBCA database identified 55 records within 50 km of the Survey Area, including two records 15 km north in 2016 and 2017 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Charadriidae	<i>Charadrius mongolus</i> Lesser Sand Plover	EN	EN, MI, MA	Tidal mudflats and sandflats; gently sloping sandy and shelly beaches; saltmarsh, estuaries, atolls, reefs, mangroves, airfield. Occasionally inland on freshwater lakes, swamps, bore drains (Pizzey and Knight, 2012).	The DBCA database identified 34 records within 50 km of the Survey Area, including two records 15 km north in 2016 and 2017 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Charadriidae	<i>Charadrius veredus</i> Oriental Plover	MI	MI, MA	Open plains; bare, rolling country, often far from water; ploughed land; muddy or sandy wastes near inland swamps or tidal flats; bare claypans; margins of coastal marshes; grassy airfields, sports fields, lawns (Pizzey and Knight, 2012).	The DBCA database identified 18 records within 50 km of the Survey Area, including two records 14 km north in 2015 and 2016 (DBCA, 2024d).	High Nearby records, and suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Charadriidae	<i>Pluvialis fulva</i> Pacific Golden Plover	MI	MI, MA	Estuaries, mudflats, saltmarshes, mangroves; rocky reefs and stranded seaweed on ocean shores; margins of shallow open inland swamps; sewage ponds, short-grass paddocks, sportsground, airfield, ploughed land (Pizzey and Knight, 2012).	The DBCA database identified 24 records within 50 km of Survey Area, including two records 15 km north in 2016 and 2017 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Charadriidae	<i>Pluvialis squatarola</i> Grey Plover	MI	VU, MI, MA	Mudflats, saltmarsh; tidal reefs and estuaries, rarely inland (Pizzey and Knight, 2012).	The DBCA database identified 30 records within 50 km of the Survey Area, including two records 15 km north in 2016 and 2017 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Cuculidae	<i>Cuculus saturatus optatus</i> Horsfield's Cuckoo	MI	MI, MA	Monsoon forest, rainforest edges; leafy trees in paddocks; river flats, roadsides, mangroves, islands (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature.	Low No nearby records.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Falconidae	<i>Falco hypoleucos</i> Grey Falcon	VU	VU	Open plains with treed watercourses in arid inland (Menkhorst et al., 2017).	The DBCA database identified nine records within 50 km of the Survey Area, including 2.9 km north in 2016 and 9 km southwest in 2018 (DBCA, 2024d).	High Nearby records, and suitable treed watercourses in arid inland habitat within the Survey Area
Falconidae	<i>Falco peregrinus</i> Peregrine Falcon	OS	–	Most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species (Menkhorst et al., 2017).	The DBCA database identified seven records within 50 km of the Survey Area, including two records 2.5 and 3 km west in 2012 (DBCA, 2024d).	High Nearby Records, and suitable habitat within the Survey Area. May use Survey Area for Hunting.
Fregatidae	<i>Fregata ariel</i> Lesser Frigatebird	MI	MI, MA	Oceanic, breed on islands (Pizzey and Knight, 2012).	The DBCA database identified 17 records within 50 km of the Survey Area, including two records 13 and 15 km north in 2016 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Fregatidae	<i>Fregata minor</i> Greater Frigatebird	MI	MI, MA	Oceanic, breed on islands (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature.	Low No nearby records and no suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Glareolidae	<i>Glareola maldivarum</i> Oriental Pratincole	MI	MI, MA	Plains; shallow wet and dry edges of open bare wetlands; tidal mudflats, beaches (Pizzey and Knight, 2012).	The DBCA database identified 29 records within 50 km of the Survey Area, including one record within the Survey Area in 2004 and 0.2 km from the Survey area in 2013 (DBCA, 2024d).	Previously Recorded Recorded within the Survey Area in 2004 and limited suitable open plains and seasonal wetland habitat within the Survey Area.
Hirundinidae	<i>Hirundo rustica</i> Barn Swallow	MI	MI, MA	Open country; agricultural land, especially near water; railyards, towns, overhead wires (Pizzey and Knight).	The DBCA database identified 20 records within 50 km of the Survey Area, including 14 km north in 2015 and 8 km north in 2014 (DBCA, 2024d).	High Nearby records, and suitable open country and seasonal wetland habitat within the Survey Area.
Laridae	<i>Anous stolidus</i> Common Noddy, Brown Noddy	MI	MI, MA	Oceanic; cays, reefs, buoys and piles (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature.	Low No nearby records and no suitable habitat within the Survey Area.
Laridae	<i>Chlidonias leucopterus</i> White-winged Black Tern	MI	MI, MA	Large coastal and inland wetland; saltfields, sewage ponds, estuaries, coastal waters (Pizzey and Knight, 2012).	The DBCA database identified 44 records within 50 km of the Survey Area, including 15 km north in 2016 and 3 km north in 2010 (DBCA, 2024d).	Medium Nearby records and limited seasonal wetland habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Laridae	<i>Gelochelidon nilotica</i> Gull-billed Tern	MI	MI, MA	Coastal, offshore waters; beaches, mudflats, estuaries, larger rivers, reservoirs, lakes (Pizzey and Knight, 2012).	The DBCA database identified 45 records within 50 km of the Survey Area, including 0.7 km south in 2004 and 15 km north in 2017 (DBCA, 2024d).	Medium Limited major drainage habitat within the Survey Area.
Laridae	<i>Hydroprogne caspia</i> Caspian Tern	MI	MI, MA	Coastal, offshore waters; beaches, mudflats, estuaries, larger rivers, reservoirs, lakes. Sometimes found inland (Pizzey and Knight, 2012).	The DBCA database identified 119 records within 50 km of the Survey Area, including two records 3 km north in 2007 and 15 km north in 2017 (DBCA, 2024d).	Medium Limited major drainage habitat within the Survey Area.
Laridae	<i>Onychoprion anaethetus</i> Bridled Tern	MI	MI, MA	Oceanic, rarely coastal (Pizzey and Knight, 2012).	The DBCA database identified two records within 50 km of the Survey Area, 11.3 km north in 1995 and 13.1 km north in 1995 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Laridae	<i>Sterna dougallii</i> Roseate Tern	MI	MI, MA	Offshore waters, islands, coral reefs, sand cays, beaches, tidal inlets (Pizzey and Knight).	The DBCA database identified one record within 50 km of the Survey Area, including 18 km north in 2015 and 12 km north in 2014 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Laridae	<i>Sterna hirundo</i> Common Tern	MI	MI, MA	Offshore waters, beaches, reefs, bays, estuaries, sandflats, saltfields, sewage ponds, freshwater wetlands (Pizzey and Knight, 2012).	The DBCA database identified 12 records within 50 km of the Survey Area, including 12.3 km north in 2014 and 12.7 km north in 2004 (DBCA, 2024d).	Medium Limited seasonal wetland habitat within the Survey Area.
Laridae	<i>Sternula albifrons</i> Little Tern	MI	MI, MA	Coastal waters, bays, inlets, saline or brackish lakes, saltfields, sewage ponds near coast (Pizzey and Knight, 2012).	The DBCA database identified 28 records within 50 km of the Survey Area, including two records 15 km north in 2016 and 2017 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Laridae	<i>Sternula nereis nereis</i> Fairy Tern	VU	VU, MA	Coastal, bays, inlets, beaches, salt ponds and lakes (Morcombe, 2003).	The DBCA database identified two records within 50 km of the Survey Area, including 11.3 km north in 1995 and 12.6 km north in 2008 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Laridae	<i>Thalasseus bergii</i> Greater Crested Tern, Crested Tern	MI	MI, MA	Coastal, offshore waters; beaches, bays, inlets, tidal rivers, salt swamps, lakes, larger rivers (Pizzey and Knight, 2012).	The DBCA database identified 37 records within 50 km of the Survey Area, including two records 15 km north in 2016 and 2017, and 3 km east in 2007 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Maluridae	<i>Amytornis whitei whitei</i> Rufous Grasswren	P4	–	Spinifex associated with mallee, acacias, though prefer tall dense spinifex hummocks; rocky slopes, and ridges; <i>A. whitei whitei</i> also inhabit coastal shrubs (Pizzey and Knight, 2012; Menkhorst et al. 2017).	Two NatureMap records were identified (DBCA, 2024b).	Medium Two records within desktop study area. Suitable habitat present within the Survey Area.
Motacillidae	<i>Motacilla cinerea</i> Grey Wagtail	MI	MI, MA	Running water near disused quarries; sandy, rocky streams in escarpments; sewage ponds, ploughed fields, airfields (Pizzey and Knight 2012).	No nearby records identified from the database searches or literature.	Low Limited seasonal damp grassland habitat within the Survey Area but no recent record.
Motacillidae	<i>Motacilla tschutschensis</i> Eastern Yellow Wagtail	MI	MI, MA	Short grass and bare ground; swamp margins, sewage ponds, saltmarshes, ploughed fields, airfields, lawns (Pizzey and Knight, 2012).	The DBCA database identified two records within 50 km of the Survey Area, both 13.7 km north in 1982 (DBCA, 2024d).	Low Limited seasonal damp grassland habitat within the Survey Area but no recent record.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Pandionidae	<i>Pandion haliaetus</i> Osprey	MI	MI, MA	Coasts, estuaries, bays, inlets; islands and surrounding waters; coral atolls, reefs, lagoons, rock cliffs, stacks; larger rivers (Pizzey and Knight, 2012).	The DBCA database identified 87 records within 50 km of the Survey Area, including 15 km north in 2017 and 5.0 km north in 2013 (DBCA, 2024d).	High Nearby and recent records and suitable major drainage line habitat within the Survey Area.
Psittaculidae	<i>Pezoporus occidentalis</i> Night Parrot	CR	EN	Seeding spinifex on stony rises, breakaway country, sandy lowlands; shrubby glasswort, chenopods; succulents on flats around salt lakes; flooded claypans, saltbush, bluebush, bassia associations (Pizzey and Knight, 2012).	No nearby records identified from the database searches or literature.	Low No suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Actitis hypoleucos</i> Common Sandpiper	MI	MI, MA	Shallow, pebbly, muddy, or sandy sedges of rivers and streams, coastal to far inland; dams, lakes, sewage ponds; margins of tidal rivers; waterways in mangroves or saltmarsh; mudflats; rocky or sandy beaches; causeways, riverside lawns, drains, street gutters (Pizzey and Knight, 2012).	The DBCA database identified 90 records within 50 km of the Survey Area, including two records 15 km north in 2017 and 3 km north in 2014 (DBCA, 2024d).	Medium Nearby records and limited seasonal wetland habitat within the Survey Area.
Scolopacidae	<i>Arenaria interpres</i> Ruddy Turnstone	MI	VU, MI, MA	Tidal reefs and pools; weed-covered rocks; pebbly, shelly and sandy shores with stranded seaweed; mudflats; occasionally inland on shallow waters; sewage ponds, commercial saltflats, open or ploughed ground (Pizzey and Knight, 2012).	The DBCA database identified 104 records within 50 km of the Survey Area, including two records 3 km north in 2010 and 15 km north in 2017 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Calidris acuminata</i> Sharp-tailed Sandpiper	MI	VU, MI, MA	Tidal mudflats, saltmarshes, mangroves; shallow fresh, brackish or saline inland wetlands; muddy edges of lagoons, swamps, lakes, floodwaters, dams, irrigated pastures and crops; sewage ponds, saltfields (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified 48 records within 50 km of the Survey Area, including two records 3 km north in 2014, and 15 km north in 2017 (DBCA, 2024d).	Medium Nearby records and limited suitable habitat present within the Survey Area.
Scolopacidae	<i>Calidris alba</i> Sanderling	MI	MI, MA	Broad ocean beaches of firm sand with seaweed; often near river mouths; also, inlets, tidal mudflats, coastal lagoons (Pizzey and Knight, 2012).	The DBCA database identified 24 records within 50 km of the Survey Area, including one record within the Survey Area in 1981 and 15 km north in 2017 (DBCA, 2024d).	Previously Recorded One historic record inside the Survey Area and nearby recent records. Suitable tidal mudflat habitats 10 km north have connectivity to the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Calidris canutus</i> Red Knot	EN	VU, MI, MA	Tidal mudflats, sandflats, beaches, saltmarshes, flooded pastures, ploughed lands (Pizzey and Knight, 2012).	The DBCA database identified 20 records within 50 km of the Survey Area, including three records 13 km north in 2014 and 15 km north in 2016 (DBCA, 2024d).	Medium Limited seasonal floodwater habitat within the Survey Area.
Scolopacidae	<i>Calidris falcinellus</i> Broad-billed Sandpiper	MI	MI, MA	Tidal mudflats, estuaries, reefs, saltmarsh, freshwater wetlands and lakes, near-coastal salt lakes; sewage ponds; favours muddy ooze (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified 24 records within 50 km of the Survey Area, including two records 15 km north in 2016 and 2017(DBCA, 2024d).	Medium Limited seasonal wetland habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Calidris ferruginea</i> Curlew Sandpiper	CR	CR, MI, MA	Inter-tidal mudflats of estuaries, lagoons, mangrove channel; saltmarsh, saltfields; fresh, brackish, or saline wetlands; flooded saltbush surrounds of inland lakes; dams, floodwaters, sewage ponds (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified 47 records within 50 km of the Survey Area, including two records 3 km north in 2010, and two records 15 km north in 2016 and 2017 (DBCA, 2024d).	Medium Nearby records and limited seasonal floodwater habitat within the Survey Area.
Scolopacidae	<i>Calidris melanotos</i> Pectoral Sandpiper	MI	MI, MA	Shallow fresh waters, often with low grass or other herbage; swamp margins, flooded pastures, sewage ponds; occasionally tidal areas, saltmarshes (Pizzey and Knight, 2012).	The DBCA database identified two records within 50 km of the Survey Area, including 7.5 km north in 2014 and 17.2 km north in 1988 (DBCA, 2024d).	Medium Nearby record and limited seasonal floodwater habitat within the Survey Area.
Scolopacidae	<i>Calidris pugnax</i> Ruff	MI	MI, MA	Fresh, brackish, and saline wetlands; tidal mudflats, saltfields, sewage farms (Pizzey and Knight, 2012).	The DBCA database identified two records within 50 km of the Survey Area, including 5.5 km south in 1979 and 15.0 km north in 2017 (DBCA, 2024d).	Medium Limited seasonal wetland habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Calidris ruficollis</i> Red-necked Stint	MI	MI, MA	Tidal mudflats, saltmarshes, sandy or shelly beaches; saline and freshwater wetlands, salt fields, sewage ponds (Pizzey and Knight, 2012).	The DBCA database identified 84 records within 50 km of the Survey Area, including 3 km north in 2014 and two records 15 km north in 2016 and 2017 (DBCA, 2024d).	Medium Nearby record and limited seasonal wetland habitat within the Survey Area.
Scolopacidae	<i>Calidris subminuta</i> Long-toed Stint	MI	MI, MA	Tussocky, weedy margins of shallow wetlands, coastal and inland; sewage ponds, weed on tideline, tidal mudflats (Pizzey and Knight, 2012).	The DBCA database identified 13 records within 50 km of the Survey Area, including two records 3 km north in 2010 and one record 15 km north in 2015 (DBCA, 2024d).	Medium Nearby record and limited seasonal wetland habitat within the Survey Area.
Scolopacidae	<i>Calidris tenuirostris</i> Great Knot	CR	VU, MI, MA	Tidal mudflats; sandy ocean and bay shores; estuaries; shallow saline and freshwater wetlands (Pizzey and Knight, 2012).	The DBCA database identified 38 records within 50 km of the Survey Area, including two records 15 km north in 2016 and 2017, and one record 12 km north in 2014 (DBCA, 2024d).	Medium Limited seasonal wetland habitat within the Survey Area.
Scolopacidae	<i>Gallinago megala</i> Swinhoe's Snipe	MI	MI, MA	Wet grassy ground; edges of reedy swamps (Pizzey and Knight, 2012).	The DBCA database identified one record within 50 km of the Survey Area, 43.0 km east in 1977 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Gallinago stenura</i> Pin-tailed Snipe	MI	MI, MA	Boggy edges of vegetated wetlands; sewage and other ponds; stubbles, grasslands with shrubs, pastures (Pizzey and Knight, 2012).	The DBCA database identified three records within 50 km of the Survey Area, including 6.8 km north in 2014 and 13.7 km north in 1976 (DBCA, 2024d).	Medium Limited seasonal floodwater habitat within the Survey Area.
Scolopacidae	<i>Limnodromus semipalmatus</i> Asian Dowitcher	MI	VU, MI, MA	Beaches, mudflats, commercial saltfields, and sewage ponds (Pizzey and Knight, 2012).	The DBCA database identified 15 records within 50 km of the Survey Area, including 12.8 km north in 1994 and 15.0 km north in 2017 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Scolopacidae	<i>Limosa lapponica</i> Bar-tailed Godwit	MI	MI, MA	Tidal mudflats, estuaries, sewage ponds, shallow river margins, brackish or saline inland lakes, flooded pastures, airfields (Pizzey and Knight, 2012).	The DBCA database identified 71 records within 50 km of the Survey Area, including two records 12 km north in 2014, and two records 15 km north in 2016 and 2017 (DBCA, 2024d).	Medium Limited seasonal flooded paddock and river margin habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Limosa limosa</i> Black-tailed Godwit	MI	EN, MI, MA	Tidal mudflats, estuaries, sandspits, shallow river margins, sewage ponds; inland on large shallow fresh or brackish waters (Pizzey and Knight, 2012).	The DBCA database identified 12 records within 50 km of the Survey Area, including two records 15 km north in 2013 and 2016 (DBCA, 2024d).	Medium Nearby records, and seasonal wetland habitat within the Survey Area.
Scolopacidae	<i>Numenius madagascariensis</i> Far Eastern Curlew, Eastern Curlew	CR	CR, MI, MA	Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves; occasionally fresh or brackish lakes; bare grasslands near water (Pizzey and Knight, 2012).	The DBCA database identified 49 records within 50 km of the Survey Area, including 12 km north in 2014 and 13 km north in 2017 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Scolopacidae	<i>Numenius minutus</i> Little Curlew	MI	MI, MA	Dry grasslands, floodplains, margins of drying swamps; tidal mudflats, airfields, playing fields, crops, commercial saltfields, sewage ponds (Pizzey and Knight, 2012).	The DBCA database identified 30 records within 50 km of the Survey Area, including two records 3 km north in 2010, and one record 14 km north in 2016 (DBCA, 2024d).	High Nearby records, and suitable dry grassland plains within the Survey Area



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Numenius phaeopus</i> Whimbrel	MI	MI, MA	Estuaries, mangroves, tidal flats, coral cays, exposed reefs, flooded paddocks, sewage ponds, bare grasslands, sport grounds, lawns (Pizzey and Knight, 2012).	The DBCA database identified 80 records within 50 km of the Survey Area, including 12 km north in 2015 and 13 km north in 2017 (DBCA, 2024d).	Medium Limited seasonal flooded paddock habitat within the Survey Area.
Scolopacidae	<i>Phalaropus lobatus</i> Red-necked Phalarope	MI	MI, MA	Shallow pools, tidal mudflats, beaches, saltmarshes, freshwater wetlands; commercial saltfields (Pizzey and Knight, 2012).	The DBCA database identified 11 records within 50 km of the Survey Area, including four records within the Survey Area in 1981 and 15 km north in 2017 (DBCA, 2024d).	Previously Recorded Limited seasonal wetland habitat within the Survey Area.
Scolopacidae	<i>Tringa brevipes</i> Grey-tailed Tattler	MI, P4	MI, MA	Estuaries, tidal mudflats, mangroves; wave-washed rocks and reefs; shallow margins of coastal or inland rivers (Pizzey and Knight, 2012).	The DBCA database identified 74 records within 50 km of the Survey Area, including two records 15 km north in 2016 and 2017, and one record 11 km north in 2014 (DBCA, 2024d).	Medium Limited minor and major drainage habitats within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Tringa glareola</i> Wood Sandpiper	MI	MI, MA	Muddy margins of wetlands with emergent sedges and taller fringing vegetation; tidal mangroves; margins of tidal mudflats; saltmarshes, sewage pond (Pizzey and Knight, 2012; Menkhorst et al., 2017).	The DBCA database identified 37 records within 50 km of the Survey Area, including one record 3 km north and four records 8 km north in 2014 (DBCA, 2024d).	Medium Nearby records and limited seasonal wetland habitat within the Survey Area.
Scolopacidae	<i>Tringa nebularia</i> Common Greenshank	MI	EN, MI, MA	Mudflats, estuaries, saltmarshes, swamps, margins of lakes, muddy shallows of lagoons; permanent and temporary wetlands, claypans; commercial saltfield, irrigated crops, sewage ponds (Morcombe, 2003; Pizzey and Knight, 2012).	The DBCA database identified 92 records within 50 km of the Survey Area, including two records 3 km north in 2010, and two records 15 km north in 2016 and 2017 (DBCA, 2024d).	High Nearby records and suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scolopacidae	<i>Tringa stagnatilis</i> Marsh Sandpiper	MI	MI, MA	Fresh, brackish, and saline wetlands; sewage ponds, commercial saltfields, bore drains, mangroves, tidal mudflats, estuaries (Pizzey and Knight, 2012).	The DBCA database identified 35 records within 50 km of the Survey Area, including one record within the Survey Area in 1981 and 12 km north in 2014 (DBCA, 2024d).	Previously Recorded Limited seasonal wetland habitat within the Survey Area.
Scolopacidae	<i>Xenus cinereus</i> Terek Sandpiper	MI	VU, MI, MA	Tidal mudflats, estuaries; shores and reefs of islands; coastal swamps, commercial saltfields (Pizzey and Knight, 2012).	The DBCA database identified 32 records within 50 km of the Survey Area, including 13 km north in 2015 and 15 km north in 2017 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Sulidae	<i>Sula leucogaster</i> Brown Booby	MI	MI, MA	Nests on islands. Rarely on shoreline, only to perch on pylons/piers (Menkhorst et al., 2017).	The DBCA database identified two records within 50 km of the Survey Area, including 19.2 km north in 1979 and 45.5 km north in 1984 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Threskiornithidae	<i>Plegadis falcinellus</i> Glossy Ibis	MI	MI, MA	Well-vegetated wetlands, wet pastures, ricefields, flooded waters, floodplains; brackish or occasionally saline wetlands, mangroves, mudflats, occasionally dry grasslands (Pizzey and Knight, 2012).	The DBCA database identified 13 records within 50 km of the Survey Area, including 14 km north in 2013 and 15 km east in 2011 (DBCA, 2024d).	Medium Nearby records, and seasonal wetland and dry grassland habitat within the Survey Area.
Mammals						
Dasyuridae	<i>Dasycercus blythi</i> Brush-tailed Mulgara, Ampurta	P4	–	Hummock grasslands (e.g. <i>Triodia</i> spp.) and shrublands on sandy soils (Menkhorst and Knight, 2010).	The DBCA database identified 287 records within 50 km of the Survey Area, including 15 records within the Survey Area in 2012 (DBCA, 2024d).	Previously Recorded Recorded within the Survey Area in 2012, and suitable habitat within the Survey Area.
Dasyuridae	<i>Dasycercus cristicauda</i> Crest-tailed Mulgara	P4	–	Outside the distribution of the species.	The DBCA database identified three records within 50 km of the Survey Area in 2009 (DBCA, 2024d).	Low The records are most likely the result of misidentification, as the Survey Area is well outside of the species' historical and extant distribution.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Dasyuridae	<i>Dasyurus hallucatus</i> Northern Quoll	EN	EN	Dissected rocky escarpments; eucalypt forest and woodland; human settlements; occasionally in rainforest patches or on beaches (Van Dyck, Gynther and Baker, 2013).	The DBCA database identified 1282 records within 50 km of the Survey Area, including nine records within the Survey Area in 2012 and 2014 (DBCA, 2024d).	Previously Recorded Recorded within the Survey Area in 2012, and suitable habitat within the Survey Area.
Macropodidae	<i>Lagostrophus fasciatus fasciatus</i> Banded Hare-wallaby	VU	VU	Dense thickets of <i>Acacia</i> and <i>Alectryon</i> scrub on the sandplains, and <i>Diplolaena</i> and <i>Acacia</i> on the dunes (Van Dyck, Gynther and Baker, 2013).	The DBCA database identified one historical record 8.5 km north of the Survey Area (DBCA, 2024d).	Low No recent records, outside known distribution.
Megadermatidae	<i>Macroderma gigas</i> Ghost Bat	VU	VU	Deep caves and mines, and occasionally rock fissures and boulder piles occurring within a widespread but patchy distribution across northern Australia from the arid Pilbara to the lush rainforests of north Queensland (Baker and Gynther, 2023).	The DBCA database identified 65 records within 50 km of the Survey Area, including 38 km south in 2022, 3 km south in 2017, and 63 records less than 4.0 km south in 2009 (DBCA, 2024d).	High Recent and nearby records. Suitable rock fissures and boulder piles within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Molossidae	<i>Ozimops cobourgianus</i> Northern Coastal Free-tailed Bat	P1	–	Mangroves, monsoon and paperbark forests, eucalypt forests and woodland. Use hollows and crevices in mangroves as nesting sites (Van Dyck, Gynther and Baker, 2013). Restricted to mangrove habitat in north-west coastal WA (McKenzie, Bullen and Gibson, 2020).	The DBCA database identified seven records within 50 km of the Survey Area, including two records 13 km north in 2008 and 2009 (DBCA, 2024d).	Low No suitable habitats within the Survey Area.
Muridae	<i>Leggadina lakedownensis</i> Short-tailed Mouse	P4	–	Monsoon tropical coast to semiarid areas in spinifex and tussock grasslands, samphire, sedgelands, Acacia shrublands, tropical eucalypt and Melaleuca woodlands and stony ranges (Van Dyck, Gynther and Baker, 2013).	The DBCA database identified 10 records within 50 km of the Survey Area, including two records 30.4 km east in 2006 (DBCA, 2024d).	Medium Multiple historic records. Suitable habitats present within the Survey Area.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Muridae	<i>Pseudomys chapmani</i> Western Pebble-mound Mouse	P4	–	Gentler slopes of rocky ranges covered by stony mulch and hard spinifex, often with a sparse overstorey of eucalypts and scattered shrubs (Van Dyck, Gynther and Baker, 2013).	The DBCA database identified 93 records within 50 km of the Survey Area, including 27 records within 36 km in 2022, and 4 records 3 km south in 2009 (DBCA, 2024d).	Recorded Recorded during the field survey.
Rhinycteridae	<i>Rhinycteris aurantia Pilbara form</i> Pilbara Leaf-nosed Bat	VU	VU	Most easily observed foraging in gorges and gullies, often over pools, also spinifex hummock grasslands. Roosts in relatively deep, warm, and humid caves and mine adits (Van Dyck, Gynther and Baker, 2013).	The DBCA database identified 12 records within 50 km of the Survey Area, including 3 records 3 km south in 2009, and one record 35 km south in 2019 (DBCA, 2024d).	Recorded Recorded during the field survey.

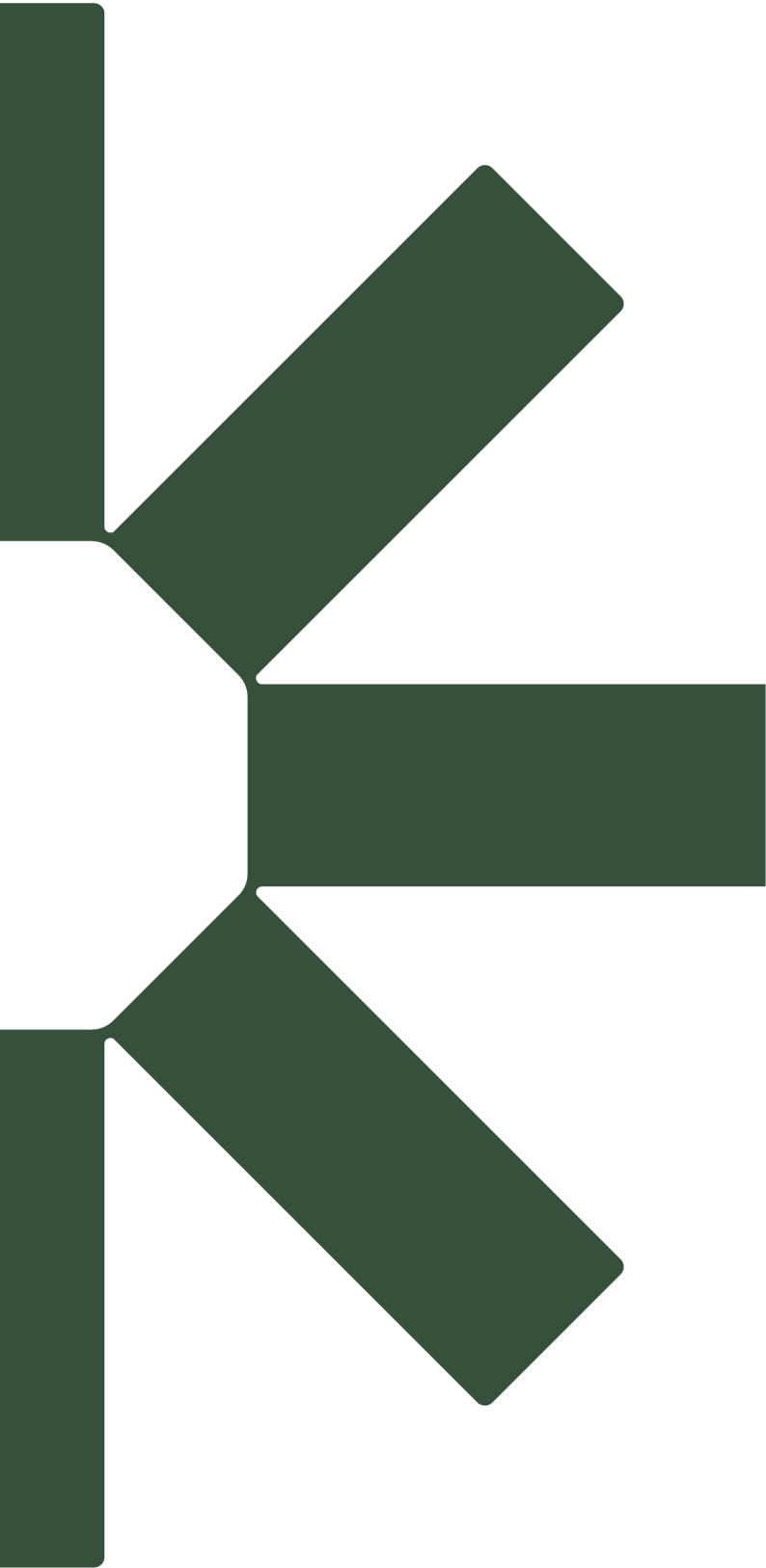


Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Thylacomyidae	<i>Macrotis lagotis</i> Bilby, Dalgyte	VU	VU	Mitchell grass and stony downs country of cracking clays, desert sandplains and dune fields sometimes containing laterite, hummock grassland and massive red earths with <i>Acacia</i> shrubland (Van Dyck, Gynther and Baker, 2013).	A total of 95 DBCA records were identified. These include 3 records within 2 km of the Survey Area from 2018 to 2019; 4 records within 10 km of the Survey Area from 2010 to 2019, and a further 19 records within 50 km of the Survey Area from 2021 to 2022 (DBCA, 2024d).	Previously Recorded Previous records identified from the literature review occur inside the Survey Area. Suitable habitat is present.
Reptiles						
Pythonidae	<i>Liasis olivaceus barroni</i> Pilbara Olive Python	VU	VU	Associated with open water, watercourses, and rock pools especially those close to rocky areas. Often found in rocky hills, escarpments, and plains dominated by dense grassy vegetation such as <i>Triodia</i> (Wilson and Swan, 2021).	The DBCA database identified five records within 50 km of the Survey Area, including 1.5 km east in 2013 and 3.5 km east in 2007 (DBCA, 2024d).	High Nearby records, and limited watercourses close to rocky areas within the Survey Area. May travel through the Survey Area along Drainage Line habitats.



Family	Scientific Name	Conservation Status		Habitat	Previous Records	Likelihood of Occurrence
		State	Commonwealth			
Scincidae	<i>Ctenotus angusticeps</i> Northwestern Coastal Ctenotus	P3	–	Mainland population inhabits coastal mudflats vegetated with samphire, sometimes sheltering in crab holes on intertidal zone (Wilson and Swan, 2021).	The DBCA database identified 16 records within 50 km of the Survey Area, including two records 7.8 km north in 2012 (DBCA, 2024d).	Low No suitable habitat within the Survey Area.
Scincidae	<i>Notoscincus butleri</i> Lined Soil-crevice Skink	P4	–	Arid, rocky, near coastal Pilbara. Associated with spinifex-dominated areas near creek and river margins (Wilson and Swan, 2021).	One record from literature, 100 km west of the Survey Area in 2014 (Phoenix Environmental Sciences, 2014).	Low No nearby records, and limited spinifex-dominated areas near river margin habitat within the Survey Area.





Making Sustainability Happen

Appendix B: Construction Environmental Management Plan

PROTECTED

East Pilbara Connection Project Construction Environmental Management Plan

August 2024



HORIZON
POWER

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1 Introduction

1.1 Project Context and Scope

Regional Power Corporation, trading as (T/A) Horizon Power, is a Western Australian (WA) Government Trading Enterprise (GTE) and the state's regional and remote energy provider. Horizon Power operates under the *Electricity Corporations Act 2005* and is governed by a Board of Directors accountable to the Minister for Energy.

Horizon Power is proposing to construct a 220 kV dual circuit common use transmission line connecting the South Hedland Terminal to the proposed Atlas Ridley Magnetite Mine, in the Pilbara region in Western Australia (the Project). The estimated length of the Transmission Line is 70.2 km comprising of mono poles, with an average height of 40 m. The Project is also likely to consist of access tracks along the pole route, geotechnical investigations and laydown areas for construction.

The Project involves the following permanent elements which will require up to 60.6 ha of permanent clearing:

- Approximately 70.2 km long 220 kV overhead transmission line
- Approximately 201 poles with a 20 x 20 m clearing footprint
- Permanent cleared access tracks (approximately 4 m wide).

The Project involves the following temporary elements which will require up to 40.2 ha of temporary clearing:

- Laydown area
- Geotechnical investigations
- Sites to facilitate stringing and winching of the transmission line.

1.2 Scope and purpose

This Construction Environmental Management Plan (CEMP) has been developed to outline environmental management measures to be implemented by Horizon Power and its contractors during the construction of the Project. This includes, but is not limited to, measures to manage dust, erosion and spread of weeds during clearing of native vegetation.

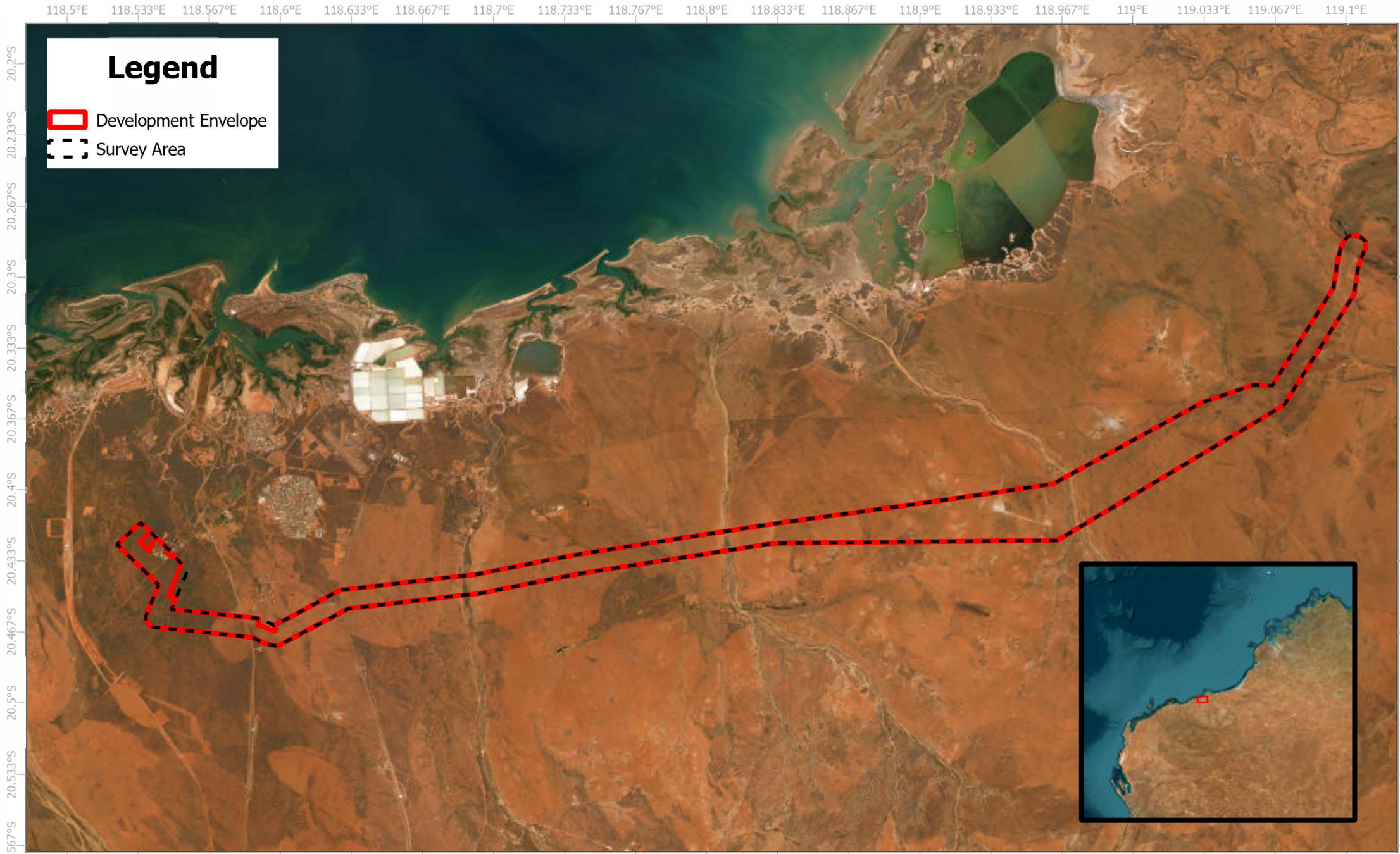
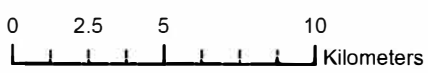


Figure 1 | Project Location and Development Envelope



Scale: 1:250,000



2 Description of the Activity

2.1 Activity Overview

The project requires geotechnical survey works, which will consist of mainly incidental clearing (driving over and parking on native vegetation) for vehicle / machinery access to test sites. The Project also requires construction of the overhead transmission line including poles and permanent access tracks which will be used for maintenance.

2.2 Clearing of Native Vegetation

The proposed clearing will occur within the Development Envelope (Figure 1) which is 10,363 ha in size. No more than 100.8 ha of clearing is proposed, as shown in Table 1.

Clearing of native vegetation within the DE will only be undertaken as specified by the Clearing Permit, including the extent and method of clearing to be undertaken and any specific management measures outlined in the permit conditions.

Table 1 Clearing estimated within the DE

Proposed clearing	Clearing breakdown
100.8 ha	– Permanent clearing: 60.6 ha
	– Temporary clearing: 40.2 ha

3 Avoidance Measures

Initial avoidance and minimisation was undertaken during route selection and a large area was surveyed to allow for further refinement after the biological survey, to remove environmental constraints from the DE. The following avoidance measures have been applied:

- A 20 m avoidance buffer has been placed around Priority species recorded during the SLR (2024) survey, including:
 - *Gymnanthera cunninghamii*
 - *Tephrosia rosea* var. Port Hedland (A.S. George 1114).
- Avoidance areas have been placed around Stony Hills and Rocky Outcrops and Breakaways fauna habitat types. These will be avoided for all project activities.
- Avoidance areas have been placed around the Minor Drainage and Major Drainage habitat types. These will not be impacted by permanent clearing, there may be minor temporary impacts to this habitat type in the form of vehicles driving over these habitat types during stringing.
- Avoidance areas have been placed around the MaEc vegetation type, which is also associated with the major drainage fauna habitat type. There may still be minor temporary clearing in the form of vehicles driving over this vegetation type during stringing.

4 Management Measures

The management measures listed in Table 2 will be implemented during geotechnical investigations and construction of this Project. Clearing of native vegetation will occur as per the conditions in the NVCP issued by DWER.

Table 2 Management Measures to be Implemented During Geotechnical Investigations and Construction

Aspect	Management Measure
Geotechnical works	
Extent of Clearing	– No clearing is permitted outside the DE (Figure 1)

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Aspect	Management Measure
	<ul style="list-style-type: none"> – Where possible, pre-existing access tracks will be used and vehicles and machinery will exit the DE along the same route used for access. – Avoidance areas will be clearly communicated prior to geotechnical investigations commencing and no more than 35.2 ha of clearing will be undertaken for geotechnical investigations. – Clearing will be minimised where possible through placement of geotechnical tests in existing cleared locations. – Mechanical clearing for the development of formal access tracks is not proposed during geotechnical works. – Works will be undertaken systematically to minimise re-run and compaction of access tracks. – The clearing locations are to be demarcated with flagging tape, GPS or similar prior to clearing activities. – A pre-clearing toolbox will be held so all staff are aware of their responsibilities under the permit and the application of the avoidance areas. – Clearing areas are to be checked by an Environmental Specialist or Site Supervisor prior to clearing to ensure avoidance areas are correctly applied.
Flora and vegetation	<ul style="list-style-type: none"> – Areas that are degraded, sparsely vegetated and/or previously cleared will be used preferentially for geotechnical tests, laydown and access. – Mechanically cleared areas will be restored, as follows: <ul style="list-style-type: none"> • Topsoil will be stockpiled separately to other excavated materials. • On completion of test pit works, excavated materials will be placed back into the test pits. Topsoil from the test pit will then be respread over the surface. • Recontouring of soil within the test pit and laydown areas will be undertaken to prevent compaction. – The clearing area allows for driving over vegetation to access geotechnical sites. Driving on vegetation will be kept to the minimum required to perform the works. – Movement of vehicles and machinery will be in convoy along access tracks/ routes and will not go into adjacent vegetation. – No permanent clearing in drainage lines is permitted, including permanent access tracks
Fauna	<ul style="list-style-type: none"> – Clearing of native vegetation will be undertaken in a slow, progressive manner in one direction to allow fauna to move away from the clearing area. – Construction personnel will not touch, feed or otherwise directly interact with fauna. – Vehicle and machinery speeds within the DE will be restricted to reduce the likelihood of fauna strike.
Weeds	<ul style="list-style-type: none"> – All vehicles and machinery will arrive clean on site. – Movement of vehicles and machinery will be restricted to the DE or established tracks and roads.
Soils and erosion	<ul style="list-style-type: none"> – Standard construction measures regarding erosion and sediment control will be implemented during clearing and geotechnical works. – Designated access tracks will be applied to prevent additional disturbance.
Dust	<ul style="list-style-type: none"> – Standard construction dust control and mitigation measures will be implemented during clearing. This may include the use of a water trucks, or similar. – Ground disturbance and clearing of vegetation will be restricted during high winds if dust cannot be adequately controlled. – Reduced vehicle speed limits will be applied in areas of unconsolidated soil. – Use of defined routes for machinery/ vehicles travelling on unsealed roads.
Noise	<ul style="list-style-type: none"> – The contractor will comply with the Environmental Protection (Noise) Regulations 1997 – Complaints regarding noise will be recorded and investigated by Horizon Power.
Waste	<ul style="list-style-type: none"> – Rubbish will be disposed of in appropriate containers and all waste will be removed from the site.

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Aspect	Management Measure
Hydrocarbons and chemicals	<ul style="list-style-type: none"> – Hydrocarbons and chemicals will be appropriately managed on site to prevent spills, including maintaining equipment in good working order in accordance with manufacturers specifications. – No refuelling will be undertaken within 50 m of a waterway, drain or drainage line. – Hydrocarbons will be appropriately stored at least 50 m away from drainage lines and stored in an appropriate bunded container. – Refuelling will be undertaken on hardstand or using catch trays only. Uncontrolled refuelling is not permitted. – Chemicals will be appropriately stored.
Heritage	<ul style="list-style-type: none"> – Should aboriginal cultural heritage materials be uncovered during construction works, works are to stop immediately within 20 m of the find. The Contractor is to contact the Horizon Project Manager and an incident will be raised. The area will be cordoned off and no access permitted to the area by people until the incident is investigated and resolved.
Construction	
Extent of Clearing	<ul style="list-style-type: none"> – No clearing is permitted outside the DE (Figure 1) – Clearing will be minimised where possible through placement of assets and access tracks in existing cleared locations where possible. – The clearing locations are to be demarcated prior to clearing activities. – Clearing areas are to be checked by an Environmental Specialist or Site Supervisor prior to clearing to ensure no more than 100.8 ha of clearing is undertaken for the Project (including the 35.2 ha of clearing required for geotechnical investigations detailed above). – A pre-clearing toolbox will be held so all staff are aware of their responsibilities under the permit and application of avoidance areas. – Avoidance areas will be applied to prevent impacts to Priority flora and critical fauna habitat.
Flora and vegetation	<ul style="list-style-type: none"> – Areas that are degraded, sparsely vegetated and/or previously cleared will be used preferentially for laydown and access tracks. – Works will be undertaken systematically to minimise re-run and compaction of access tracks. – Any clearing required for temporary purposes, and not required for ongoing maintenance, will be rehabilitated upon completion of construction including re-laying of soil and recontouring to prevent compaction.
Fauna	<ul style="list-style-type: none"> – Clearing of native vegetation will be undertaken in a slow, progressive manner in one direction to allow fauna to move away from the clearing area. – Construction personnel will not touch, feed or otherwise directly interact with fauna. – Vehicle and machinery speeds within the DE will be restricted to reduce the likelihood of fauna strike.
Weeds	<ul style="list-style-type: none"> – The Contractor will ensure that no weed-affected soil, mulch, fill or other material is brought into the DE. – Vehicles and machinery will arrive clean, and weed control will be undertaken at the site post-construction as required. – Movement of vehicles and machinery will be restricted to the DE or established tracks and roads to prevent the spread of weeds.
Erosion and soils	<ul style="list-style-type: none"> – Standard construction measures regarding erosion and sediment control will be implemented during construction works. – Designated access tracks will be applied to prevent additional disturbance. – Acid sulphate soils will be managed in accordance with the ASSMP (if required pending geotechnical investigations, in accordance with the <i>Treatment and management of soils and water in acid sulfate soil landscapes</i> (DER, 2015b¹).

¹ Department of Environment Regulation 2015b, Treatment and management of soils and water in acid sulfate soil landscapes, May 2015, Perth, Western Australia

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Aspect	Management Measure
Dust	<ul style="list-style-type: none">– Standard construction dust control and mitigation measures will be implemented during clearing. This may include the use of a water trucks, or similar.– Ground disturbance and clearing of vegetation will be restricted during high winds if dust cannot be adequately controlled.– Reduced vehicle speed limits will be applied in areas of unconsolidated soil.
Noise	<ul style="list-style-type: none">– The contractor will comply with the Environmental Protection (Noise) Regulations 1997– Complaints regarding noise will be recorded and investigated by Horizon Power.
Waste	<ul style="list-style-type: none">– Rubbish will be disposed of in appropriate containers and all waste will be removed from the site.
Hydrocarbons and chemicals	<ul style="list-style-type: none">– Hydrocarbons and chemicals will be appropriately managed on site to prevent spills, including maintaining equipment in good working order in accordance with manufacturers specifications.– No refuelling will be undertaken within 50 m of a waterway, drain or drainage line.– Hydrocarbons will be appropriately stored at least 50 m away from drainage lines and stored in an appropriate bunded container.– Refuelling will be undertaken on hardstand or using catch trays only. Uncontrolled refuelling is not permitted.– Chemicals will be appropriately stored.
Heritage	<ul style="list-style-type: none">– Should aboriginal cultural heritage materials be uncovered during construction works, works are to stop immediately within 20 m of the find. The Contractor is to contact the Horizon Project Manager and an incident will be raised. The area will be cordoned off and no access permitted to the area by people until the incident is investigated and resolved.

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Appendix C: Significant Fauna Likelihood of Occurrence Assessment

Table 8: Significant fauna likelihood of occurrence assessment for species that are known, likely or may occur within the Development Envelope

Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
Northern Quoll (<i>Dasyurus hallucatus</i>)	Endangered under BC Act and EPBC Act	<p>Known to occur</p> <p>The Northern Quoll favours dissected rocky escarpments, utilising a variety of den sites, including rocky crevices, tree hollows, log and termite mounds. It favours rocky areas, taking refuge in rock crevices and utilising gullies and drainage lines.</p> <p>This species was not recorded during the field survey (SLR, 2024). However, a recent survey that intersects the eastern section of the DE recorded the Northern Quoll (Biota, 2024). There are also abundant (1,282) previous records within the DE (DBCA, 2023), with most of the records within the Outcrops and Breakaways habitat type.</p> <p>Therefore, the Northern Quoll is known to occur within the DE.</p>	<ol style="list-style-type: none"> 1. Outcrops and Breakaways: This habitat may be used for denning and foraging and is considered habitat critical to the survival of the Northern Quoll as they are rocky areas that provide prime habitat for the species (Hill & Ward, 2010). Avoidance areas have been applied around this habitat type to mitigate impacts to the Northern Quoll. 2. Stony Hills: This habitat may be used for denning and foraging is considered habitat critical to the survival of the Northern Quoll as they are rocky areas that provide prime habitat for the species (Hill & Ward, 2010). Avoidance areas have been applied around this habitat type to mitigate impacts to the Northern Quoll. 3. Major Drainage and Minor Drainage: After significant rainfall events these habitats will provide valuable and water sources for this species. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types. 4. Open Eucalypt Woodland, Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains and Sparse <i>Triodia</i> Plains: This is suitable foraging and dispersal habitat for the Northern Quoll. Up to 100.8 ha may be cleared for the Project.
Pilbara Leaf-nosed Bat (<i>Rhinioncteris aurantia</i>) (Pilbara form)	Vulnerable under BC Act and EPBC Act	<p>Known to occur</p> <p>The Pilbara Leaf-nosed Bat is restricted to areas with suitable day roosts, which are typically deep caves that retain humidity or disused underground mines (Cramer et al., 2016).</p> <p>The Pilbara Leaf-nosed Bat was recorded seven times within the Outcrops and Breakaways and Low <i>Acacia stellaticeps</i> over <i>Triodia</i> adjacent to the Outcrops and Breakaways habitat (SLR, 2024). Further, this species was recorded in a recent survey that intersects the eastern section of the DE (Biota, 2024).</p> <p>Therefore the Pilbara Leaf-nosed Bat is known to occur within the DE.</p>	<ol style="list-style-type: none"> 5. Outcrops and Breakaways: The caves in the Outcrops and Breakaways provide ideal roosting habitat for the Pilbara Leaf-nosed Bat and this habitat type is considered habitat critical to the survival of the species as the conservation advice (TSSC, 2016) defines transitory diurnal roosts as critical habitat. Avoidance areas have been applied around this habitat type to mitigate impacts to the Pilbara Leaf-nosed Bat. 6. Major Drainage and Minor Drainage: the Pilbara Leaf-nosed Bat may use these habitats for foraging and dispersal. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types.

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
			<p>7. Stony Hills: the Pilbara Leaf-nosed Bat may use these habitats for foraging and dispersal. Potential foraging habitat surrounding known or suspected roost sites can be critical to the survival of the Pilbara Leaf-nosed Bat (TSSC, 2016). The Stony Hills habitat type was mapped as surrounding sites where the Pilbara Leaf-nosed Bat was recorded in the SLR (2024) survey. Therefore, this is considered critical habitat for the species. Avoidance areas have been applied around these habitat types to mitigate impacts to the Pilbara Leaf-nosed Bat.</p> <p>8. Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains and Open Eucalypt Woodland: the Pilbara Leaf-nosed Bat may use these habitats for foraging and dispersal. Potential foraging habitat surrounding known or suspected roost sites can be critical to the survival of the Pilbara Leaf-nosed Bat (TSSC, 2016). Each of these habitat types were mapped as surrounding sites where the Pilbara Leaf-nosed Bat was recorded in the SLR (2024) survey. Therefore, they are considered critical habitat for the species. Up to 100.8 ha of this suitable foraging and dispersal habitat may be cleared for the Project.</p>
<p>Bilby (<i>Macrotis lagotis</i>)</p>	<p>Vulnerable under BC Act and EPBC Act</p>	<p>Known to occur The Bilby is described as occupying a wide range of vegetation types, including open tussock grasslands on upland hills. Mulga woodland/shrubland growing on ridges and rises and spinifex growing on sandplains and dunes, drainage systems, salt lake systems and other alluvial areas.</p> <p>Targeted Bilby searches were undertaken throughout the survey (SLR, 2024) in areas of suitable Bilby habitat with no Bilbies recorded. Further, a targeted assessment for the Bilby by GHD in 2022 (which intersects the DE) did not record the species. However, Bilby have been recorded within the western portion of the DE in previous studies (Phoenix, 2022). The species was previously recorded in the Low <i>Acacia stellaticeps</i> over <i>Triodia</i> and Sparse <i>Triodia</i> Plains habitats.</p> <p>Therefore, the Bilby is known to occur within the DE.</p>	<p>9. Low <i>Acacia stellaticeps</i> over <i>Triodia</i> and Sparse <i>Triodia</i> Plains: The Bilby has been previously recorded in these habitats and may use them for denning, foraging and dispersal. Critical habitat for the Bilby includes suitable habitats where the species is likely to occupy (DCCEEW, 2023b). Therefore, these habitats are critical habitat for the Bilby and up to 100.8 ha of may be cleared.</p> <p>10. Major Drainage, Minor Drainage, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains and Open Eucalypt Woodland: Based on habitat preferences for the Bilby as described in their recovery plan (DCCEEW, 2023b), they may occur within these habitat types, however were not recorded here during the SLR (2024) survey.</p>
<p>Western Pebble-mound Mouse (<i>Pseudomys chapmani</i>)</p>	<p>Priority 4 under DBCA list</p>	<p>Known to occur The Western Pebble-mound Mouse is endemic to the Pilbara and their mounds are usually found on gentle slopes and spurs that are often</p>	<p>11. Stony Hills: the Western Pebble-mound mouse was recorded three times within this habitat and it is highly likely that mounds are currently occupied (SLR, 2024). This habitat is considered suitable burrowing, refuge, and foraging habitat for the Western Pebble-mound Mouse and is therefore considered critical habitat. Avoidance areas have been</p>

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
		<p>vegetated by hard spinifex (Ford and Johnson, 2007; Van Dyck and Strahan, 2008).</p> <p>Western Pebble-mound Mouse mounds were recorded three times within the Stony Hills habitat, and twice within the Outcrops and Breakaways habitat (SLR, 2024). However, studies have shown that not all mounds in an area are occupied by a Pebble-mound Mouse at any one time (Anstee, 1996). Further, given the presence of an entrance hole and the lack of debris around the entrance, it is highly unlikely that the mounds are currently occupied (SLR, 2024). This species was recorded once within the Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains habitat, however, the record is 40 m away from the Outcrops and Breakaways habitat, therefore it is considered dispersal habitat for the species. The Low <i>Acacia stellaticeps</i> over <i>Triodia</i> habitat, Open Eucalypt Woodland and Sparse <i>Triodia</i> Plans are also considered dispersal habitat for the species.</p> <p>This species was also recorded during the Atlas Ridley Mine survey, adjacent to the DE (Biota, 2024).</p> <p>Therefore, the Western Pebble-mound Mouse is known to occur within the DE.</p>	<p>applied around this habitat type to mitigate impacts to the to the Western Pebble-mound Mouse.</p> <p>12. Outcrops and Breakaways: the Western Pebble-mound mouse was recorded twice within this habitat and it is highly likely that mounds are currently occupied (SLR, 2024). This habitat is considered suitable burrowing, refuge, and foraging habitat for the Western Pebble-mound Mouse and is therefore considered critical habitat. Avoidance areas have been applied around this habitat type to mitigate impacts to the to the Western Pebble-mound Mouse.</p> <p>13. Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Open Eucalypt Woodland and Sparse <i>Triodia</i> Plains: Based on habitat preferences, these habitats may be used as foraging and dispersal habitat by the Western Pebble-mound Mouse. Up to 100.8 ha of this suitable foraging and dispersal habitat may be cleared for the Project.</p>
<p>Grey Falcon (<i>Falco hypoleucos</i>)</p>	<p>Vulnerable under BC Act and EPBC Act</p>	<p>Likely to occur</p> <p>This species favours lightly timbered and untimbered lowland plains that are crossed with tree-lined watercourses, but also can be found in grassland and sand dune habitats.</p> <p>The DE has two Drainage habitats with eucalypt trees along the riverbanks, which constitutes suitable nesting habitat. The plains surrounding the Major Drainage and Minor Drainage habitats is likely to supporting habitat used for foraging.</p> <p>Therefore, the Grey Falcon is likely to occur within the DE.</p>	<p>14. Major Drainage and Minor Drainage: The eucalypt trees along the drainage habitats are suitable nesting habitat for the Grey Falcon. Breeding habitat is important to the survival of a species, however critical habitat has not been defined for the Grey Falcon. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types.</p> <p>15. Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Open Eucalypt Woodland and Sparse <i>Triodia</i> Plains: Based on habitat preferences for the Grey Falcon, these habitat types surrounding the Major and Minor Drainage habitats are suitable foraging and dispersal habitats. Up to 100.8 ha of this suitable foraging and dispersal habitat may be cleared for the Project.</p>
<p>Oriental Pratincole (<i>Glareola maldivarum</i>)</p>	<p>Migratory under BC Act and EPBC Act</p>	<p>Likely to occur</p> <p>This species prefers plains, shallow wet and dry edges of open bare wetlands and tidal mudflats and beach habitat. This species does not breed in Australia.</p>	<p>16. Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Major Drainage, Minor Drainage, Open Eucalypt Woodland and Sparse <i>Triodia</i> Plains: These habitats are suitable foraging habitat for the Oriental Pratincole. Avoidance areas have been placed around the Major Drainage and Minor Drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles</p>

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
		<p>The Oriental Pratincole was previously recorded within the DE in 2004 (DBCA, 2023) within the Low <i>Acacia stellaticeps</i> over <i>Triodia</i> habitat, which has the potential to become inundated during the wet season, providing suitable habitat used for foraging. Due to the species preference for open plains and seasonal wetland habitat, it is also considered that the Oriental Pratincole may use the Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Major Drainage, Minor Drainage, Open Eucalypt Woodland and Sparse <i>Triodia</i> Plains habitats within the DE.</p> <p>Therefore, the Oriental Pratincole is likely to occur within the DE.</p>	<p>driving over these drainage habitat types. Up to 100.8 ha of the remaining suitable foraging habitat may be cleared for the Project.</p>
<p>Common Greenshank (<i>Tringa nebularia</i>)</p>	<p>Endangered under EPBC Act Migratory under BC Act and EPBC Act</p>	<p>Likely to occur</p> <p>This species is found in coastal areas, riverbanks and coastal to freshwater wetlands.</p> <p>This species has been recorded frequently and recently within the desktop study (SLR, 2024) and likely occurs within the DE. The Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains, Major Drainage and Minor Drainage habitats constitute supporting habitat for this species. This species is considered likely to occur within the DE and if present will occur between August and March.</p> <p>Therefore, the Common Greenshank is likely to occur within the DE.</p>	<p>17. Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains, Major Drainage and Minor Drainage: These habitat types have the potential to inundated after significant rain events and are therefore suitable foraging habitats. Foraging habitat is defined as habitat critical to the survival of the species (DCCEEW, 2024e). Avoidance areas have been placed around the Major Drainage and Minor Drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these drainage habitat types. Up to 100.8 ha of the remaining critical habitat may be cleared for the Project.</p>
<p>Barn Swallow (<i>Hirundo rustica</i>)</p>	<p>Migratory under BC Act and EPBC Act</p>	<p>Likely to occur</p> <p>This species is typically observed in close proximity to urban water bodies and coastal wetlands.</p> <p>This species has been recorded frequently within the desktop study (SLR, 2024) and likely occurs within the DE. The Major and Minor Drainage habitats constitute supporting habitat for this species for their value as foraging, roosting and dispersal habitat. Additionally, the Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains and Sparse <i>Triodia</i> Plains have the potential to inundated after significant rain events and therefore may also be suitable habitat.</p> <p>This species is considered likely to occur and if present will occur between Spring and Summer.</p>	<p>18. Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains, Major Drainage and Minor Drainage: These habitat types have the potential to inundated after significant rain events and are therefore suitable foraging, roosting and dispersal habitats. Habitat critical for the survival of the Barn Swallow has not been defined. Avoidance areas have been placed around the Major Drainage and Minor Drainage habitat types for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these drainage habitat types. Up to 100.8 ha of the remaining potential foraging, roosting and dispersal habitats may be cleared for the Project.</p>
<p>Little Curlew (<i>Numenius minutus</i>)</p>	<p>Migratory under BC Act and EPBC Act</p>	<p>Likely to occur</p> <p>This species forages within short, dry grassland and sedgeland, including dry floodplains and blacksoil plains, which have scattered, shallow</p>	<p>19. Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains, Major Drainage, Minor Drainage and Open Eucalypt Woodland: These habitats are suitable foraging habitat</p>

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
		<p>freshwater pools or areas seasonally inundated. Open woodlands with grassy or burnt understorey, dry saltmarshes, coastal swamps, mudflats or sandflats of estuaries or beaches on sheltered coasts, mown lawns, gardens, recreational areas, ovals, racecourses and verges of roads, and airstrips are also used.</p> <p>This species has been recorded frequently and recently within the desktop study area (SLR, 2024). The Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains, Major Drainage, Minor Drainage and Open Eucalypt Woodland habitats constitute supporting habitat for the species. If present, the species will occur in the DE between October and April.</p> <p>Therefore, the Little Curlew is likely to occur within the DE.</p>	<p>for the Little Curlew. Habitat critical for the survival of the Little Curlew has not been defined. Avoidance areas have been placed around the Major Drainage and Minor Drainage habitat types for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these drainage habitat types. Up to 100.8 ha of the remaining suitable foraging habitat may be cleared for the Project.</p>
<p>Oriental Plover (<i>Charadrius veredus</i>)</p>	<p>Migratory under BC Act and EPBC Act</p>	<p>Likely to occur</p> <p>This species typically prefers grasslands and thinly vegetated plains, and open areas such as recently burnt country and heavily grazed pastures.</p> <p>This species has been recorded recently within the desktop study area (SLR, 2024). The Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains, Major Drainage and Minor Drainage constitute supporting habitat for the species as they may become inundated after significant rain events. This species is considered likely to occur during potential flooding events, and if present, will occur within the DE between mid-September and April.</p> <p>Therefore, the Oriental Plover is likely to occur within the DE.</p>	<p>20. Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains, Major Drainage and Minor Drainage: These habitat types have the potential to be inundated after significant rain events and are therefore suitable foraging habitat. Habitat critical for the survival of the Oriental Plover has not been defined. Avoidance areas have been placed around the Major Drainage and Minor Drainage habitat types for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these drainage habitat types. Up to 100.8 ha of the remaining suitable foraging habitat may be cleared for the Project.</p>
<p>Osprey (<i>Pandion haliaetus</i>)</p>	<p>Migratory under BC Act and EPBC Act</p>	<p>Likely to occur</p> <p>This species requires extensive areas of open fresh, brackish or saline water for foraging. They are mostly found in coastal areas but occasionally travel inland along major rivers. They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes.</p> <p>This species has been recorded recently within the desktop study area (SLR, 2024). The Major and Minor Drainage habitats constitute critical habitat for the Osprey because of their value for hunting and dispersal.</p> <p>Therefore, the Osprey is likely to occur within the DE during flooding events.</p>	<p>21. Major Drainage and Minor Drainage: SLR (2024) defined these habitats as critical to the survival of the Osprey due to their value for hunting and dispersal. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types.</p>

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
Peregrine Falcon (<i>Falco peregrinus</i>)	Other specially protected under DBCA list	<p>Likely to occur</p> <p>This species mainly occurs along rivers and ranges as well as wooded watercourses and lakes. It nests primarily on cliffs and granite outcrops and quarries.</p> <p>This species was not observed during the field survey (SLR, 2024), however has been previously recorded twice within 3 km of the DE in recent years (DBCA, 2023). The trees in the Open Eucalypt Woodland, Major Drainage and Minor Drainage habitats within the DE and surrounds may provide suitable habitat used for nesting and hunting.</p> <p>Therefore, the Peregrine Falcon is likely to occur within the DE.</p>	<p>22. Open Eucalypt Woodland, Major Drainage and Minor Drainage: These are suitable nesting, dispersal and foraging habitat for the Peregrine Falcon. Critical habitat for the Peregrine Falcon has not been defined, however breeding habitat is considered important. Avoidance areas have been placed around the Major Drainage and Minor Drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these drainage habitat types. Up to 100.8 ha of the remaining suitable foraging, dispersal and nesting habitat may be cleared for the Project.</p>
Ghost Bat (<i>Macroderma gigas</i>)	Vulnerable under BC Act and EPBC Act	<p>Likely to occur</p> <p>This species requires undisturbed roost caves or mineshafts. There are suitable roosting caves for Ghost Bats in the vicinity of the DE.</p> <p>The species was not recorded during the field survey of the DE (SLR, 2024), however was recorded during the Biota (2024) survey outside of the transmission line DE. The Ghost Bat may utilise suitable rock fissures and boulder piles within the DE. The Major and Minor Drainage habitats also constitute moderate value habitat as they may be used as foraging and dispersal habitat.</p> <p>Therefore, the Ghost Bat is likely to occur within the DE.</p>	<p>23. Outcrops and Breakaways: Habitat critical to the survival of the Ghost Bat isn't defined, however, Biota (2024) defined the rocky hills habitat within their survey area (which intersects the DE) as potential critical habitat for the Ghost Bat (Biota, 2024). This habitat is considered similar to the Outcrops and Breakaways habitat and is therefore considered critical habitat as well. Avoidance areas have been applied around this habitat type to mitigate impacts to the Ghost Bat.</p> <p>24. Major Drainage and Minor Drainage: the Ghost Bat may use these habitats for foraging and dispersal. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types.</p>
Brush-tailed Mulgara (<i>Dasyercus blythi</i>)	Priority 4 under DBCA list	<p>Likely to occur</p> <p>The Brush-tailed Mulgara is associated with hummock spinifex grasslands, but also uses other vegetation types (often sandplains, grasslands and woodlands) when mixed with or adjacent to hummock grasslands.</p> <p>This species was previously recorded within the DE (Biota, 2024; Phoenix, 2022). The Low <i>Acacia stellaticeps</i> over <i>Triodia</i> habitat and the Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> habitat would support this species.</p> <p>Approximately 83% of the DE consists of these two habitat types, which indicates the species may be able to persist throughout the majority of the DE.</p> <p>Therefore, the Brush-tailed Mulgara is likely to occur within the DE.</p>	<p>25. Low <i>Acacia stellaticeps</i> over <i>Triodia</i> and Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains: The Brush-tailed Mulgara may use these habitat types for burrowing, foraging and dispersal. The species was not recorded in the DE and habitat critical to the survival of the species has not been defined. Therefore up to 100.8 ha of supporting habitat in the form of burrowing, foraging and dispersal habitat may be cleared for the Project.</p>

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
<p>Pilbara Olive Python (<i>Liasis olivacea barroni</i>)</p>	<p>Vulnerable under BC Act and EPBC Act</p>	<p>Likely to occur</p> <p>This species generally shelters under rock piles, or under spinifex and often basks on top of rocks. This species is known to frequent water bodies.</p> <p>The Pilbara Olive Python has been previously recorded within the DE, however preferred habitat is not within the DE. If present, the species likely utilises the Minor and Major drainage habitats and the Outcrops and Breakaways habitat within the DE as supporting habitat.</p> <p>Therefore, the Pilbara Olive Python is likely to occur within the DE.</p>	<p>26. Outcrops and Breakaway: The Pilbara Olive Python may use this habitat for dispersal. Critical habitat is not defined for this species (DEWHA, 2008). However, Biota (2024) defined the rocky hills habitat they recorded within the Atlas Iron survey area as potential critical habitat for the species. The Outcrops and Breakaway habitat is similar and therefore potentially critical habitat for the species. Avoidance areas have been applied around this habitat type to mitigate impacts to the Pilbara Olive Python.</p> <p>27. Major Drainage and Minor Drainage: The Pilbara Olive Python may use this habitat for foraging. Avoidance areas have been placed around these drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these habitat types.</p>
<p>Pilbara Grasswren (<i>Amytornis whitei whitei</i>)</p>	<p>Priority 4 under DBCA List</p>	<p>May occur</p> <p>This species is restricted to spinifex associations on rocky slopes and ridges, with or without shrubs or light tree cover, preferring areas with tall dense spinifex hummocks.</p> <p>This species has been recorded within the desktop study area (SLR, 2024). The Sparse <i>Triodia</i> Plains and Stony Hills habitats constitute critical habitat for this species due to their value for foraging and shelter.</p> <p>Therefore, the Pilbara Grasswren may occur within the DE.</p>	<p>28. Sparse <i>Triodia</i> Plains and Stony Hills: the Pilbara Grasswren may use these habitats for foraging and shelter. Critical habitat for this species has not been defined however SLR defined these habitats as critical habitat because of their value for foraging and shelter (SLR, 2024). Avoidance areas have been applied around the Stony Hills habitat type. However, up to 100.8 ha of critical habitat in the form of Sparse <i>Triodia</i> Plains may be cleared as a result of the Project.</p>
<p>Glossy Ibis (<i>Plegadis falcinellus</i>)</p>	<p>Migratory under BC Act and EPBC Act</p>	<p>May occur</p> <p>The preferred foraging and breeding habitat of this species includes freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. This species builds a platform nest of sticks in trees or shrubs above water.</p> <p>This species was recorded within the desktop study areas (SLR, 2024) and may occur within the DE. There are several habitats which may flood and provide suitable habitat for the species. Additionally dry grassland habitat is suitable for this species.</p> <p>Therefore, the Glossy Ibis may occur within the DE on a sporadic basis during flooding events.</p>	<p>29. Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Sparse <i>Triodia</i> Plains, Major Drainage and Minor Drainage: These habitat types have the potential to inundated after significant rain events and are therefore suitable foraging and breeding habitats. There is no critical habitat defined for this species. Avoidance areas have been placed around the Major Drainage and Minor Drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these drainage habitat types. Up to 100.8 ha of the remaining potential foraging and breeding habitat may be cleared for the Project.</p>

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
Fork-tailed Swift (<i>Apus pacificus</i>)	Migratory under BC Act and EPBC Act	<p>May occur</p> <p>This species is almost exclusively aerial over varied habitats, ranging from rainforests to semi-deserts.</p> <p>This species has been recorded within the desktop study area (SLR, 2024). All habitats within the DE may potentially be utilised as supporting habitat for foraging and dispersal.</p> <p>Therefore, the Fork-tailed Swift may occur within the DE.</p>	<p>30. Closed <i>Acacia</i> Shrubland, Low <i>Acacia stellaticeps</i> over <i>Triodia</i>, Major Drainage, Minor Drainage, Mixed <i>Acacia</i> Shrubs and <i>Triodia</i> Plains, Open Eucalypt Woodland, Outcrops and Breakaways, Sparse <i>Triodia</i> Plains and Stony Hills: All habitats within the DE may be used as foraging and dispersal habitat for the Fork-tailed Swift. There is no critical habitat defined for this species.</p> <p>31. Avoidance areas have been applied around the Outcrops and Breakaways and Stony Hills habitat types.</p> <p>32. Avoidance areas have been placed around the Major Drainage and Minor Drainage habitats for permanent clearing. There may still be temporary clearing in the form of vehicles driving over these drainage habitat types.</p> <p>33. Up to 100.8 ha of the remaining potential foraging and dispersal habitat may be cleared for the Project.</p>
Short-tailed Mouse (<i>Leggadina lakedownensis</i>)	Priority 4 under DBCA List	<p>May occur</p> <p>This species uses spinifex and <i>Acacia</i> on seasonally inundated sandy-clay soils as well as sandy soils and cracking clays to build burrows which they shelter during the day. In the Pilbara, it occurs on stony hummock grassland.</p> <p>This species was recorded within the desktop study area (SLR, 2024). The Sparse <i>Triodia</i> Plains and Stony Hills habitat constitute critical habitat for the species because of their value for foraging and shelter.</p> <p>Therefore, the Short-tailed Mouse may occur within the DE.</p>	<p>34. Sparse <i>Triodia</i> Plains and Stony Hills: SLR (2024) defined these habitats as critical habitat for the Short-tailed Mouse because of their value for foraging and shelter. Avoidance areas have been applied around the Stony Hills habitat type. However up to 100.8 ha of the remaining potential foraging and shelter habitat may be cleared for the Project.</p>
Curlew Sandpiper (<i>Calidris ferruginea</i>)	Critically Endangered under the BC Act and EPBC Act Migratory under EPBC Act	<p>May occur</p> <p>There are records of these species in proximity to the DE, however there are limited suitable habitats for the species within the DE. There are suitable tidal flats < 10 km north of the DE, and there are drainage habitats that connect these flats to the DE. Therefore, there is an opportunity for these species to occur within the DE in the Major Drainage and Minor Drainage habitats after significant rain events that would flood these habitats.</p>	<p>35. Major Drainage and Minor Drainage: The bird species may use this habitat for foraging and dispersal after flooding events. This is considered critical habitat for the Curlew Sandpiper, Great Knot, Red Knot, Sharp-tailed Sandpiper and Black-tailed Godwit as any foraging habitat is considered critical habitat for these species (DCCEEW, 2023; DCCEEW, 2024a, DCCEEW, 2024b; DCCEEW, 2024c; DCCEEW, 2024d). Avoidance areas have been placed around the Major Drainage and Minor Drainage habitats for permanent clearing. There may still be</p>
Great Knot (<i>Calidris tenuirostris</i>)	Critically Endangered under the BC Act		

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
	Vulnerable and Migratory under EPBC Act	<p>These habitats would likely be used as foraging and dispersal habitat only, and do not constitute important habitat for any of the species.</p> <p>Therefore, these species may occur within the DE.</p>	<p>temporary clearing in the form of vehicles driving over these drainage habitat types.</p>
Red Knot (<i>Calidris canutus</i>)	Endangered under the BC Act Vulnerable and Migratory under the EPBC Act		
Grey-tailed Tattler (<i>Tringa brevipes</i>)	Priority 4 listed by DBCA Migratory under BC Act and EPBC Act		
White-winged Black Tern (<i>Chlidonias leucopterus</i>)	Migratory under BC Act and EPBC Act		
Gull-billed Tern (<i>Gelochelidon nilotica</i>)	Migratory under BC Act and EPBC Act		
Caspian Tern (<i>Hydroprogne caspia</i>)	Migratory under BC Act and EPBC Act		
Common Tern (<i>Sterna hirundo</i>)	Migratory under BC Act and EPBC Act		
Common Sandpiper (<i>Actitis hypoleucos</i>)	Migratory under BC Act and EPBC Act		
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	Vulnerable under EPBC Act		

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
	Migratory under BC Act and EPBC Act		
Sanderling (<i>Calidris alba</i>)	Migratory under BC Act and EPBC Act		
Broad-billed Sandpiper (<i>Calidris falcinellus</i>)	Migratory under BC Act and EPBC Act		
Pectoral Sandpiper (<i>Calidris melanotos</i>)	Migratory under BC Act and EPBC Act		
Ruff (<i>Calidris pugnax</i>)	Migratory under BC Act and EPBC Act		
Red-necked Stint (<i>Calidris ruficollis</i>)	Migratory under BC Act and EPBC Act		
Long-toed Stint (<i>Calidris subminuta</i>)	Migratory under BC Act and EPBC Act		
Pin-tailed Snipe (<i>Gallinago stenura</i>)	Migratory under BC Act and EPBC Act		
Bar-tailed Godwit (<i>Limosa lapponica</i>)	Migratory under BC Act and EPBC Act		
Black-tailed Godwit (<i>Limosa limosa</i>)	Migratory under BC Act and EPBC Act		

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Fauna Species	Status	Likelihood of occurrence	Suitable habitat within the DE
	Endangered under EPBC Act		
Whimbrel (<i>Numenius phaeopus</i>)	Migratory under BC Act and EPBC Act		
Red-necked Phalarope (<i>Phalaropus lobatus</i>)	Migratory under BC Act and EPBC Act		
Wood Sandpiper (<i>Tringa glareola</i>)	Migratory under BC Act and EPBC Act		
Marsh Sandpiper (<i>Tringa stagnatilis</i>)	Migratory under BC Act and EPBC Act		

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Appendix D: Significant Flora Likelihood of Occurrence Assessment

Table 9: Significant flora likelihood of occurrence assessment for species that are known, likely or may occur within the Development Envelope

Flora Species	Status	Likelihood of occurrence
<i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114)	Priority 1 under DBCA list	Known to occur Two individuals of <i>Tephrosia rosea</i> subsp. Port Hedland were recorded opportunistically from one location in the AsTe vegetation type.
<i>Gymnanthera cunninghamii</i>	Priority 3 under DBCA list	Known to occur Six individuals of <i>Gymnanthera cunninghamii</i> across four locations were opportunistically recorded in the MaEc vegetation type.
<i>Eragrostis crateriformis</i>	Priority 3 under DBCA list	Likely to occur There are records of this species nearby to the DE, with the closest record being 0.15 km away. This species' preferred habitat is clayey loam or clay, creek banks and depressions (SLR, 2024).
<i>Euploca mutica</i>	Priority 3 under DBCA list	Likely to occur There are records of this species nearby to the DE, with the closest record being 0.08 km away. This species' preferred habitat is flat sand plains (SLR, 2024).
<i>Euploca parviantrum</i>	Priority 1 under DBCA list	May occur There are records of this species nearby to the DE, with the closest record being 6.87 km away. This species' preferred habitat is sandy soils, flats, plains and rocky slopes (SLR, 2024).
<i>Euphorbia inappendiculata</i> var. <i>inappendiculata</i>	Priority 2 under DBCA list	May occur There are records of this species nearby to the DE, with the closest record being 60.93 km away. This species' preferred habitat is red, brown clay or loam and plains (SLR, 2024).
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	Priority 3 under DBCA list	May occur There are records of this species nearby to the DE, with the closest record being 3.03 km away. This species' preferred habitat is sandy plains (SLR, 2024).
<i>Euphorbia clementii</i>	Priority 3 under DBCA list	May occur There are records of this species nearby to the DE, with the closest record being 6.19 km away. This species' preferred habitat is gravelly hillsides and stony grounds (SLR, 2024).
<i>Rothia indica</i> subsp. <i>australis</i>	Priority 3 under DBCA list	May occur

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Flora Species	Status	Likelihood of occurrence
		This species has previously been recorded within the DE. This species' preferred habitat is sandy soils, sandhills and sandy flats (SLR, 2024).
<i>Bulbostylis burbidgeae</i>	Priority 4 under DBCA list	May occur There are records of this species nearby to the DE, with the closest record being 5.85 km away. This species' preferred habitat is granitic soils, granite outcrops and cliff bases (SLR, 2024).