



PILBARA MINERALS LIMITED

TARGETED THREATENED FLORA SEARCH, VEGETATION

ASSESSMENT AND FAUNA HABITAT ASSESSMENT

GREAT NORTHERN HWY INTERSECTION AND REALIGNMENT

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ACRONYMS

BAM Act Biosecurity and Agriculture Management Act 2007

BOM Bureau of Meteorology
BIF Banded Ironstone Formation

CALM Department of Conservation and Land Management (now DCBA and DER)

CAMBA China – Australia Migratory Bird Agreement

CSIRO Commonwealth Scientific and Industrial Research Organisation

DAFWA

Department of Agriculture and Food Western Australia

DBCA

Department of Biodiversity, Conservation and Attractions

DEC

Department of Environment and Conservation (now DBCA)

DER Department of Environmental Regulation

DoEE Department of the Environment and Energy (Previously DSEWPaC)

DCBA Department of Parks and Wildlife (now DCBA)

DSEWPaC Department of Sustainability, Environment, Water, Population and

Communities (now DoEE)

EPA Environment Protection Authority
EP Act Environment Protection Act 1986

EPBC Act Environment Protection and Biodiversity Conservation Act 1999

ESCAVI Executive Steering Committee for Australian Vegetation Information

IA International Agreement

IBRA Interim Biogeographic Regionalisation for Australia

ICE Incidence-based Coverage Estimators

IPA Indigenous Protected Area

IUCN International Union for Conservation of Nature

NVIS National Vegetation Information System

PEC Priority Ecological Community
SAC Species accumulation curve

TFC Threatened Ecological Community

TPFL Threatened and Priority Flora database

TPFR Threatened and Priority Flora Report form

TP List Threatened and Priority Flora List

WA Western Australia

WAHERB Western Australian Herbarium Specimen Database

WAOL Western Australian Organism List
WC Act Wildlife Conservation Act 1950
WONS Weeds of National Significance



EXECUTIVE SUMMARY

The Study Area occupies a small area of approximately 20 ha in the Pilbara bioregion (Chichester subregion) of Western Australia, within which three vegetation associations occur:

Stony and Sandy Plains

Acacia ancistrocarpa and Acacia orthocarpa tall open shrubland over *Triodia epactia* hummock grassland. occurring on stony plains with clay loam soils. This vegetation type occurs over 14.2 ha (70.6%) of the Study Area

Acacia inaequilatera, Acacia acradenia and Corchorus parviflorus open shrubland over Triodia epactia open hummock grassland on stony and sand plains with clay to sand loam soils. This vegetation type occurs over 1.4 ha (6.9%) of the Study Area.

Minor Drainage Depressions

Corymbia hamersleyana low open woodland over Acacia ancistrocarpa and Acacia inaequilatera open shrubland over Triodia epactia hummock grassland occurring on minor drainage lines with clay loam soils. This vegetation type occurs over 1.3 ha (6.5%) of the Study Area.

No Commonwealth or State listed TECs or PECs have been recorded within the vicinity, nor have any been recorded in surveys reviewed as part of this desktop study. No vegetation was assessed as either regionally or locally significant. Vegetation units described are widespread in the region.

Vegetation condition across much of the Study Area was assessed as 'Very Good' with minimal weed invasion.

A total of 32 vascular plant taxa were recorded. The most diverse families were the Fabaceae, Poaceae, Malvaceae, Amaranthaceae, Euphorbiaceae, and Goodeniaceae. One introduced species *Aerva javanica*) was recorded in low abundance within the Study Area.

No flora species of conservation significance, including Priority species, were recorded over the Study Area although four are considered to have a high likelihood of occurring.

Three broad fauna habitats occur over the Study Area: Stony Plains, Sandy Plains and Minor Drainage Depressions. All fauna habitats recorded from the Study Area are considered widespread and typical of the bioregion.

The only species of conservation significance recorded over the Study Area was the Rainbow Bee-eater. The Rainbow Bee-eater (IA) was removed from the list of migratory species under section 209 of the EPBC Act on 9th June 2016, however, still appears on Schedule 5 of the WC Act as 'Migratory birds protected under an international agreement'. Numerous records of the species have been made and because of its broad habitat requirements is likely to occur. However, sandy Drainage Line habitat utilised as breeding habitat does not occur over the Study Area.

Several additional species were assessed with a Likelihood Rating of 2 (Possible). However no rocky escarpments occur and therefore no Northern Quoll (EN) denning habitat is present. Just two hectares of Sandy Plains habitat occurs but no distinctive evidence in the form of burrows, diggings, tracks or scats of either the Greater Bilby (VU) or Brush-tailed Mulgara (P4) was recorded.

The Western Pebble-mound Mouse (P4) is known to have a preference for hilly and/or rocky landscapes which are not present over the Study Area. No distinctive mounds constructed by this species were recorded.

The Pilbara Leaf-nosed Bat (VU) has been recorded within one kilometre of the Study Area, however, no roosting habitat is present within the Study Area. Creek lines provide foraging habitat for the species, as well as 'flyways' for dispersal. Creeklines are not present over the Study Area and the Turner River, one kilometre to the east, is a likely flyway.



Both the Peregrine (OS) and Grey Falcons (VU) are widespread in Australia. Breeding habitat of cliffs, rocky outcrops, or large trees are not present over the Study Area, however, both have the potential to overfly the Study Area.

Similarly the Fork-tailed Swift (IA) is a migratory, almost exclusively aerial species that has the potential to overfly the Study Area without specifically utilising any particular habitat present.



1 INTRODUCTION

1.1 PROJECT BACKGROUND

Pilbara Minerals Limited (Pilbara Minerals) required a targeted threatened flora search, vegetation assessment, and fauna habitat assessment over a section of the Great Northern Highway. Pilbara Minerals proposes to modify and re-align the intersection of its Haul Road with Great Northern Highway (the Study Area, Figure 1-1) as a component of the development of its Pilgangoora Lithium-Tantalum Project (Pilgangoora Project).

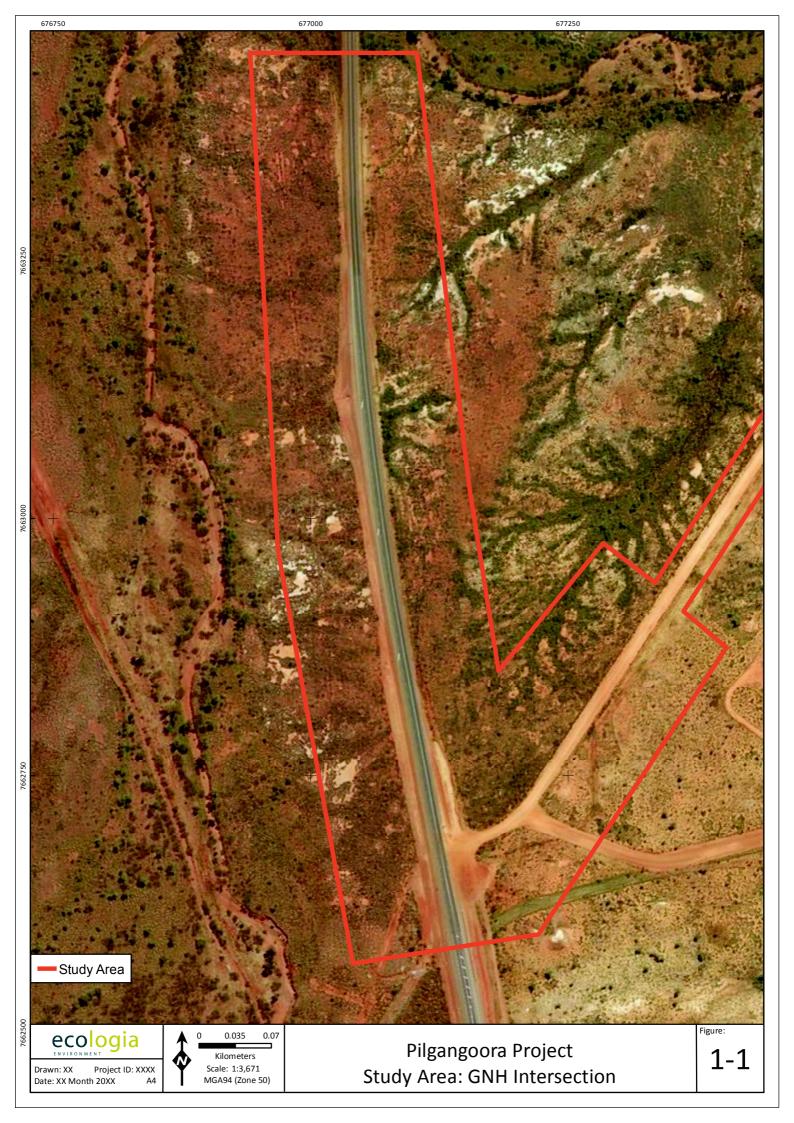
The targeted threatened flora search, vegetation assessment, and fauna habitat assessment over a ~20 ha area of Miscellaneous Tenement L45/426 was required to support a Native Vegetation Clearing Permit (NVCP) to be submitted to the Native Vegetation Assessment Branch (NVAB) of the DMP in conformance with the *Environmental Protection (Clearing of Native Vegetation) Regulations* 2004 (clearing regulations) under the *Environmental Protection Act* 1986 (EP Act).

1.2 SURVEY OBJECTIVES

The objective of this assessment was to provide sufficient information for the DMP to assess the impact of the proposed development on the flora, vegetation and fauna of the Study Area. To this end, the following were provided as part of this assessment:

- A desktop study to evaluate biological values of the Study Area and surrounds, including a review of existing environmental values, threatened and priority flora, vegetation, and fauna databases, and other relevant available literature
- A targeted threatened flora search of the Study Area
- Description and mapping of vegetation types within the Study Area
- An assessment of the local and regional significance of any significant vegetation
- Description and mapping of fauna habitats within the Study Area
- An inventory of the flora and fauna of the Study Area;
- The likelihood of any conservation significant species (vascular flora and vertebrate fauna) occurring within the Study Area





2 METHODOLOGY

2.1 DESKTOP STUDY

A review of background environmental information relevant to the Study Area was undertaken by *ecologia* including data collected from previous flora, vegetation, and fauna surveys, climate (BoM), biogeography (IBRA 7) (USE 2012), land systems (Van Vreeswyk *et al.* 2004), soils (Northcote *et al.* 1960-1968; Tille 2006), and pre-European vegetation (Shepherd *et al.* 2001).

Definitions used for this assessment are presented in Appendix A. Searches of the following databases were undertaken to determine conservation significant species and communities recorded in the vicinity of the Study Area:

- Department of Environment (DoE) EPBC Act Protected Matters Database
- Department of Parks and Wildlife (DCBA), Threatened and Priority Flora Database (TPFL) (Search reference 16-0317FL)
- DCBA Threatened and Priority Flora List (TP List) (Search reference 16-0317FL)
- DCBA Western Australian Herbarium Specimen Database (WAHERB) (Search reference 16-0317FL)
- DCBA Threatened and Priority Ecological Communities Database (Search reference 12-0317EC)
- DCBA NatureMap database (WA)
- DCBA Threatened and Priority Fauna database (WA)
- BirdLife Australia Custom Atlas Bird List

2.2 FIELD METHODOLOGY

The field survey was undertaken by a Principal Scientist Shaun Grein and Principal Zoologist Andre Schmitz on the 5th September 2017. Database search results were used to provide a list of flora and fauna species of conservation significance known from the region. The field team familiarised themselves with these species prior to the field work. The entire Study Area was searched for flora, vegetation and fauna of conservation significance.

After the field assessment each conservation significant species and ecological community identified during the desktop study was assigned a likelihood of occurrence rating within the Study Area based on the criteria shown in Table 2.1.

Table 2.1 - Criteria used to assess likelihood of occurrence of significant flora and fauna

	Rating		Criteria (significant flora and fauna)	Criteria (TEC/PEC)		
Recorded		orded	The taxon has been recorded within the Study Area.	The TEC/PEC (not including buffer) has previously been recorded in the Study Area.		
	1	Likely	Suitable habitat possibly occurs within the Study Area, and there are previous records in the vicinity of the Study Area.	Due to the proximity of previous records and the likely presence of suitable habitat/geology within the Study Area, the TEC/PEC possibly occurs within the Study Area.		
	2	Possible	Suitable habitat possibly occurs within the Study Area, but there are no records in the vicinity of the Study Area; or there is otherwise insufficient information available to exclude the possibility of occurrence.	The community is broadly defined and could possibly occur at the Study Area and there are records in the vicinity of the Study Area; or there is insufficient information available to exclude the possibility of occurrence at the Study Area.		
	3	Unlikely	Suitable habitat is considered unlikely to be present within the Study Area.	The community is well defined and suitable habitat/geology is considered unlikely to be present within the Study Area.		





2.2.1 Flora and Vegetation

A reconnaissance flora and vegetation and targeted flora and vegetation survey was conducted consistent with the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a).

The reconnaissance survey including floristic sampling within vegetation unit via releves Threatened and Priority Flora species identified from the database searches were targeted during the field survey, using previously recorded locations as well as known habitat preferences. Searches for conservation significant species involved searches of potential suitable habitat and opportunistic records taken during foot traverses.

Specimen identification was undertaken with reference to current taxonomic literature and herbarium reference specimens. Atypical or difficult specimens were submitted to the Western Australian Herbarium for identification or confirmation.

Local scale vegetation units were described and mapped consistent with NVIS Level V – Association (ESCAVI 2003). Vegetation mapping was undertaken based on aerial imagery and ground-truthed by the field assessment. Correlated environmental variables such as landform and soil types were also considered when describing differences between vegetation units. Species included within vegetation descriptions are those that are most typical of the vegetation unit as a whole. Vegetation units were described, where appropriate, consistent with those units defined by other studies undertaken for the Pilgangoora Project (i.e. *ecologia* 2017 and MMWC Environmental 2016).

Vegetation condition was assessed based on the scale as described in the Technical Guidance (EPA 2016a) (Table 2.2).

Vegetation Condition	Criterion
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Table 2.2 – Vegetation condition scale

2.2.2 Fauna

The survey methods adopted by *ecologia* for the survey accorded with the technical guide for sampling terrestrial vertebrate fauna for conducting a Level 1 fauna and fauna habitat assessment published by the EPA (2016b).

Prior to the commencement of the survey as part of the desktop assessment, the preferred habitat of the conservation significant species potentially occurring in the Study Area was determined and



used to assess the likelihood of occurrence (Section 3.3). The field survey was used to ground truth these results and, on the basis of the actual habitats present, searches were undertaken to determine the presence of potential conservation significant species occurring. In particular, efforts were made to detect the tracks or scats of the Northern Quoll, Greater Bilby and Spectacled Harewallaby.

A fauna habitat type broadly describes an area of habitat that is distinguishable by its vegetation, soil characteristics and land features from its surroundings, and is likely to host a different fauna assemblage to that found in other fauna habitats. Five habitat assessments were undertaken within the three fauna habitats delineated over the Study Area. Habitat delineation and mapping was based upon interpretation of aerial photography and landforms, habitat site assessments, and the complementary vegetation descriptions for the assessment. Habitat condition was assessed at a rating ranging from 'completely degraded' to 'excellent' (see habitat rating table in Appendix F).

Opportunistic fauna observations were also made during the survey to provide additional data to supplement the targeted searches and habitat mapping results. Observations consisted of direct observation of animals, as well as detection of secondary evidence including tracks, scats, remains and other traces. Sampling of the Study Area was undertaken by hand searching for cryptic species, which included searching beneath the bark of dead trees, breaking open old logs, stumps and dead free-standing trees, investigating burrows and over-turning logs and stones. Tracks, diggings, scats, burrows and nests were recorded wherever possible.

2.2.3 Study Team and Licences

The flora, vegetation, and fauna assessments undertaken by *ecologia* was planned, coordinated, executed and reported by those summarised below in Table 2.3.

Table 2.3 – Study team and licences

Project Staff							
Name	Qualification	Role	Project role				
Shaun Grein B.Sc, Grad.Dip. Nat. Resources, MBA		Managing Director/Principal Scientist	Flora field survey, reporting, QA				
Andre Schmitz	B.Sc. Env. Man.	Senior Zoologist	Fauna field assessment				
Licences - "Licen	ce to Take Flora for Scientif	ic Purposes"					
The flora, vegetation assessment and fauna assessment described in this report was conducted under the authorisation of the following licences issued by DCBA.							
Name		Licence Number	Valid until				
Shaun Grein		SL012096	30/04/2018				



3 RESULTS

3.1 BACKGROUND

3.1.1 Climate

The Study Area is located in the Pilbara region of Western Australia. The Pilbara experiences an arid-tropical climate with two distinct seasons; a hot summer from October to April and a mild winter from May to September. Temperatures are generally high, with summer temperatures frequently exceeding 40°C. Light frosts occasionally occur inland during July and August. The nearest Bureau of Meteorology (BOM) stations for which both rainfall and temperature data are available is Port Hedland Airport (Site No. 4032), 75 km to the north-west the Study Area (BoM 2017) (Figure 3-1).

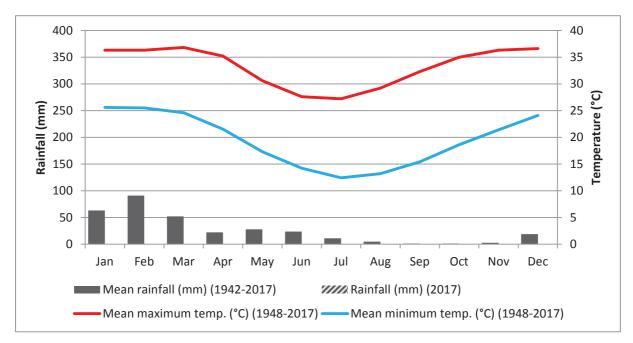


Figure 3-1 - Rainfall and temperature data for Port Headland Airport

3.1.2 IBRA Region and Land Systems

The Study Area is situated within the Pilbara region according to IBRA 7 (DSEWPaC 2012), which is further divided into four sub-regions. The Study Area is situated entirely within the Chichester sub-region. The Chichester sub-region comprises undulating Archaean granite and basalt plains supporting a shrub steppe characterised by *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands.

The Study Area occurs over the Macroy Land System of Van Vreeswyk *et al.* (2004), consisting of stony plains and sandy plains of spinifex hummock grasslands *(Triodia)* with scattered *Acacia inaequilatera* and/or other acacia shrubs. Soils consist of red sands, red sandy earths, and red shallow loams.



3.1.3 Previous Surveys

Nine recent flora and fauna assessments have been conducted in the vicinity of the Study Area, including the adjacent Pilgangoora Project, and are summarised in Table 3.1:

- Pilbara Minerals Ltd: Dakota Satellite Project Level 1 Fauna and Detailed Flora and Vegetation Assessment (ecologia 2017)
- Pilgangoora Project Area Flora, Vegetation and Fauna Assessment
- Pilgangoora Project Area Flora, Vegetation and Fauna Assessment (MMWC Environmental 2016);
- Pilgangoora Project Baseline Vertebrate Fauna Survey (360 Environmental 2016b);
- Pilgangoora Project: Level 1 Short-Range Endemic (SRE) Fauna Assessment (Bennelongia 2016a);
- Pilgangoora Project: Level 1 Subterranean Fauna Assessment (Bennelongia 2016b);
- Pilgangoora Project: Pilbara Leaf-nosed Bat survey and roost searches (360 Environmental 2015) (360 Environmental 2016a);
- FMG North Star Vegetation and Flora Assessment (ecologia 2012a);
- FMG North Star Level 2 Terrestrial Vertebrate Fauna Assessment (ecologia 2012b).
- Wodgina DSO Project Flora and Vegetation Assessment (Outback Ecology 2009);
- Abydos DSO Project Flora and Vegetation Studies (Woodman 2012); and
- Abydos DSO Project terrestrial vertebrate fauna baseline surveys for Atlas Iron Limited (Outback Ecology 2011) (Bamford 2009).



Table 3.1 – Flora, vegetation and fauna surveys conducted in the vicinity of the Study Area								
Survey	Survey type	Location	Number of taxa	Conservation significant species recorded	Vegetation communities/fauna habitats	TEC/PEC		
Pilbara Minerals Ltd: Dakota Satellite Project Level 1 Fauna and Detailed Flora and Vegetation Assessment	Level 2 Flora and Vegetation Level 1 Fauna	ca. 90 km south- southeast of Port Hedland	117 (flora) 45 (fauna)	Euphorbia clementii (P2) Rainbow Bee-eater (IA) Pilbara Leaf-nosed Bat (VU) (inactive mounds) Western Pebble-mound Mouse (P4)	4 vegetation associations 5 fauna habitats	None		
Pilgangoora Project Area Flora, Vegetation and Fauna Assessment (MMWC Environmental 2016)	Level 2 Flora and Vegetation Level 1 Fauna	ca. 90 km south- southeast of Port Hedland	195 (flora) 46 (fauna)	Heliotropium muticum (P1) Rainbow Bee-eater (IA) Pilbara Leaf-nosed Bat (VU) Western Pebble-mound Mouse (P4)	11 vegetation associations 4 fauna habitats	None		
Pilgangoora Project Baseline Vertebrate Fauna Survey (360 Environmental 2016)	Level 2 Baseline Fauna	ca. 90 km south- southeast of Port Hedland	60	Rainbow Bee-eater (IA)	4 fauna habitats	NA		
Pilgangoora Project: SRE Fauna Assessment (Bennelongia 2016a)	Level 1 SRE	ca. 82 km south- southeast of Port Hedland	23	No confirmed SRE species	4 SRE habitats	NA		
Pilgangoora Project: Subterranean Fauna Assessment (Bennelongia 2016b)	Level 1 Subterranean Fauna	ca. 82 km south- southeast of Port Hedland	19 (stygofauna) 5 (Troglofauna)	Bathynella sp. B25, Paramelitidae Genus 2 sp. B15 Nocticola sp. Coleoptera gen 1 sp. B08	Shallow aquifers	NA		
Wodgina DSO Project (Outback Ecology 2009)	Level 2 Flora and Vegetation	ca. 100 km south of Port Hedland	122	Terminalia supranitifolia (P3)	12 vegetation associations	None		
Abydos Direct Shipping Ore Project (Woodman 2012)	Level 2 Flora and Vegetation	ca. 100 km south- southeast of Port Hedland	263	Euphorbia clementii (P2) Gymnanthera cunninghamii (P3) Heliotropium muticum (P1) Pityrodia sp. Marble Bar (T)	10 vegetation associations	None		
Abydos DSO Project Fauna Surveys (Bamford 2009, Outback Ecology 2011)	Level 2 Fauna and targeted searches	ca. 100 km south- southeast of Port Hedland	149	Northern Quoll Pilbara Olive Python Pilbara Leaf-nosed Bat Ghost Bat Western Pebble-mound Mouse Spectacled Hare Wallaby Rainbow Bee-eater	5 fauna habitats	NA		



Survey	Survey type	Location	Number of taxa	Conservation significant species recorded	Vegetation communities/fauna habitats	TEC/PEC
FMG North Star (ecologia 2012a, ecologia 2012b)	Level 2 Flora and Vegetation Level 2 Fauna	ca. 100 km southeast of Port Hedland	453 (flora) 184 (fauna)	Abutilon pritzelianum (P1) Acacia glaucocaesia (P3) Euphorbia clementii (P2) Goodenia nuda (P4) Gymnanthera cunninghamii (P3) Heliotropium muticum (P1) Pityrodia sp. Marble Bar (T) Ptilotus mollis (P4) Northern Quoll (EN) Pilbara Leaf-nosed Bat (VU) Rainbow Bee-eater (IA) Fork-tailed Swift (IA) Pilbara Olive Python (VU)	33 vegetation associations 7 fauna habitats	None



3.2 FLORA AND VEGETAION

3.2.1 Desktop Results

The NatureMap database search returned 221 vascular plant taxa from 46 families and 108 genera (Appendix B). The most diverse families were the Fabaceae (41 taxa), Poaceae (27 taxa), Malvaceae (20 taxa), and Amaranthaceae (14 taxa), while the most diverse genera included *Acacia* (15 taxa), *Tephrosia* (10 taxa), *Triodia* (9 taxa) and *Ptilotus* (8 taxa). This floristic composition is typical for the area.

Thirteen conservation significant plant taxa were identified in the NatureMap search, and the TFPL and WAHERB database searches identified 12 species (Table 3.2, Figure 3-2), including the Threatened taxon, *Pityrodia* sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4). Nine Priority listed species and one Threatened taxon (*Pityrodia* sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4) have been recorded in the vicinity of the Study Area in previous surveys (Table 3.1). An additional 15 taxa were identified in a 'place name' search of the TPList, but have no specific records within the search area (Table 3.2). The EPBC Act Protected Matters Report (Appendix C) did not identify any EPBC listed plant species as potentially occurring in the vicinity of the Study Area. Records obtained from TPFL and WAHERB database searches are provided as Appendix D.

Habitat preferences and flowering times were derived, where available, from relevant taxonomic literature, FloraBase (Western Australian Herbarium 1998-2016), Threatened species profiles (SPRATs) (Threatened Species Scientific Committee 2016), or specimen data from Australia's Virtual Herbarium (AVH) (CHAH 2017). Herbarium catalogue numbers are provided if habitat information were derived from specimen data (AVH).

Four flora species of conservation significance are considered to have at least the potential to occur over the Study Area (likelihood rating '1') based on proximity of previous records and the likely presence of suitable habitat (Table 3.2).

The Threatened species *Pityrodia* sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4) has been recorded at fourteen locations within 10 kms of the Study Area, with the closest 700 m to the north. A recent regional survey for this taxon conducted by *ecologia* (*ecologia* 2016) recorded it almost entirely within the Capricorn Land System, often on ironstone hill slopes. This land system is not present within the Study Area.

Other database records of interest include *Terminalia supranitifolia* (Priority 3) within 12 km to the east, *Bulbostylis burbidgeae* (Priority 4) 15 kms to the south east, and *Heliotropium muticum* (Priority 1) within 17 km to the north (Figure 3-2).

No Commonwealth or State listed TECs or PECs have been recorded within the vicinity, nor have any been recorded in surveys reviewed as part of this desktop study.

3.2.2 Field results

3.2.2.1 Flora

A total of 32 vascular plant taxa (including species, infraspecific taxa, and phrase names) were recorded from the Study Area during the current survey. A full list of species recorded from the Study Area is provided in Appendix D while data collected from releves is included in Appendix I

No flora of conservation significance were identified.

The relatively low diversity of annual species is indicative of the timing and low rainfall preceding the survey.



The broad composition of the flora of the Study Area is included in Appendix E. The most diverse families were the Fabaceae, Poaceae, Malvaceae, Amaranthaceae and Goodeniaceae, while the most diverse genera were *Acacia* (Fabaceae), *Ptilotus* (Amaranthaceae), *Triodia* (Poaceae) and *Senna* (Fabaceae).

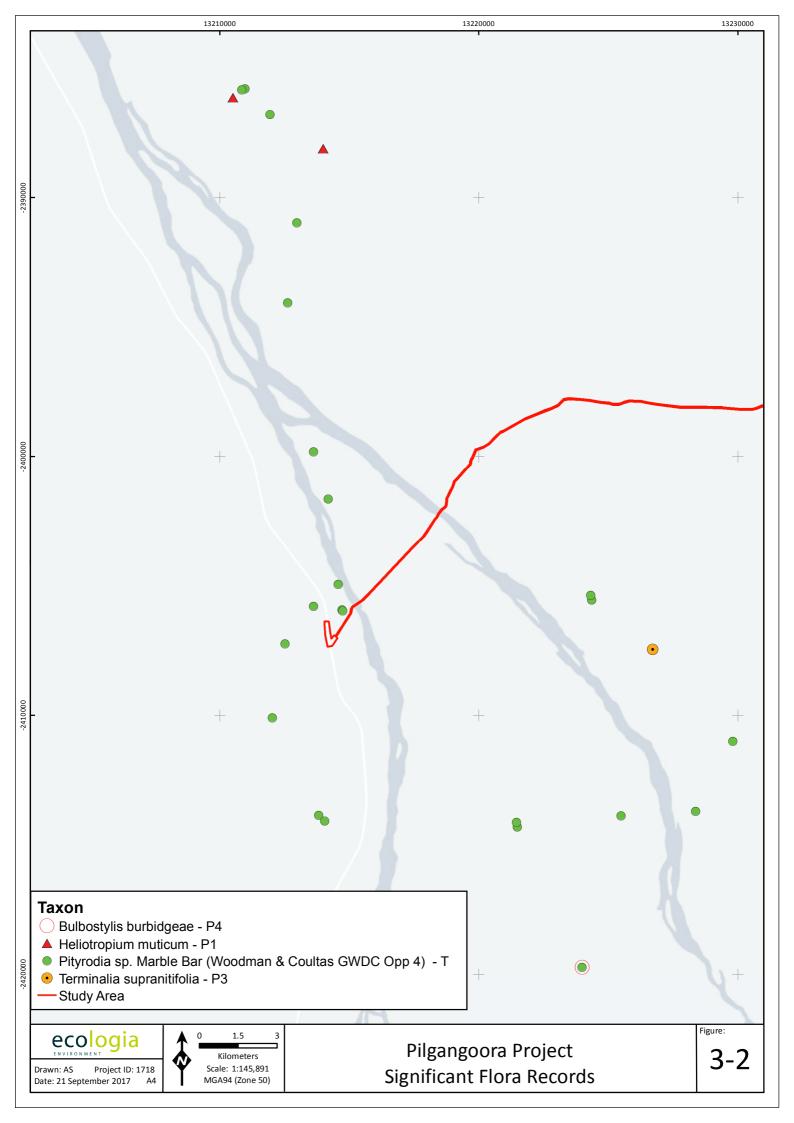


Table 3.2 – Significant plant species records from database search

Telust		Table 3.2 – Significant plant species records from database searches							
Coultas GWDC Opp 4)	Status	Taxon		Habitat	Flowering period	Notes			
Acacia cyperophyllo var. omeranna	т				July to September.	Habitat possibly present; nearby records.	1		
September Habitat possibly present; no nearby records 2	1	Acacia aphanoclada	X	Skeletal stony soils. Rocky hills, ridges & rises.	August to October.	Habitat possibly present; no nearby records.	2		
1 Simmons 3499 X Dry watercourse among low rocky hills. September. Habitat possibly present; no nearby records. 2 1 Acacia sp. Nullagine (B. R. Maslin 4955) X Low-lying area between rocky hills on rocky clay. May to July. Habitat possibly present; no nearby records. 2 1 Acroin sp. Narrie (I. Bull & D. Roberts X Drainage floor with quartz. Not available. Habitat possibly present; no nearby records. 2 1 Acroin sp. Narrie (I. Bull & D. Roberts X Not available. Not available. Habitat possibly present; no nearby records. 1 1 Heliotropium muticum Palins, Flat red silt sand on a low lying floodplain Not available. Habitat possibly present; nearby records. 1 1 Rothia indica subsp. australis Sandy soils. Sandhills and sandy flats. April to August. Habitat possibly present; nearby records. 2 2 Schoenus sp. Marble Bar (D. Coultas & S. X Not available. Sandy soils. Sandhills and sandy flats. April to August. Habitat possibly present; nearby records. 2 3 Acacia glaucocarpa X Story gravelly soils, story grounds. April to June. Habitat possibly present; no nearby records. 2 3 Acacia fecunda X Seletal red soils over massive ironstone. May. Habitat possibly present; no nearby records. 2 3 Acacia fecunda X Carvelly hillsides, story grounds. April to June. Habitat possibly present; no nearby records. 2 4 Stylidium weeliwolli Gritty sand soil, sandy clay. Edge of watercourses. September. Habitat possibly present; no nearby records. 2 5 Stylidium weeliwolli Gritty sand soil, sandy clay. Edge of watercourses. September. Habitat possibly present; no nearby records. 2 5 Acacia fecunda X Carvelly hillsides, story grounds. April to June. Habitat possibly present; no nearby records. 2 6 Acacia fecunda X Carvelly halinge lines, bills of each present in control present. 3 7 Acacia fecunda X Carvella present Acacia glaucocaesia Red loam, sandy loam, clay. Floodplains. July to September. Habitat possibly present; no nearby rec	1	Acacia cyperophylla var. omearana	Х	Stony & gritty alluvium. Along drainage lines.	March to April.	Habitat possibly present; no nearby records.	2		
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4 Bulbostylis burbidgeae Granitic soils. Granite outcrops, cliff bases. March to August. Habitat possibly present; nearby records.	3	Phyllanthus hebecarpus	Х	Sandy areas, granite domes.	April to August.	Habitat possibly present; no nearby records.	2		
	3	Terminalia supranitifolia		Sand. Among basalt rocks. Rocky cliffs.	July or December.	Habitat possibly present; nearby records.	1		
4 Goodenia nuda Seasonally inundated clay soils and drainage lines April to August. Habitat possibly present; nearby records.	4	Bulbostylis burbidgeae		Granitic soils. Granite outcrops, cliff bases.	March to August.	Habitat possibly present; nearby records.	1		
	4	Goodenia nuda		Seasonally inundated clay soils and drainage lines	April to August.	Habitat possibly present; nearby records.	2		

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3.2.2.2 Vegetation

Three vegetation communities were identified, described and mapped for the Study Area (Figure 3.3):

Stony and Sandy Plains

- S1 Acacia ancistrocarpa and Acacia orthocarpa tall open shrubland over Triodia epactia hummock grassland. occurring on stony plains with clay loam soils. This vegetation type occurs over 14.2 ha (70.6%) of the Study Area.
- S2 Acacia inaequilatera, Acacia acradenia and Corchorus parviflorus open shrubland over Triodia epactia open hummock grassland on stony to sandy clay to sand loam. This vegetation type occurs over 1.4 ha (6.9%) of the Study Area.

Minor Drainage Depressions

W1 Corymbia hamersleyana low open woodland over Acacia ancistrocarpa and Acacia inaequilatera open shrubland over Triodia epactia hummock grassland occurring on minor drainage lines with clay loam soils. This vegetation type occurs over 1.3 ha (6.5%) of the Study Area.

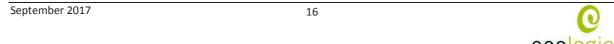


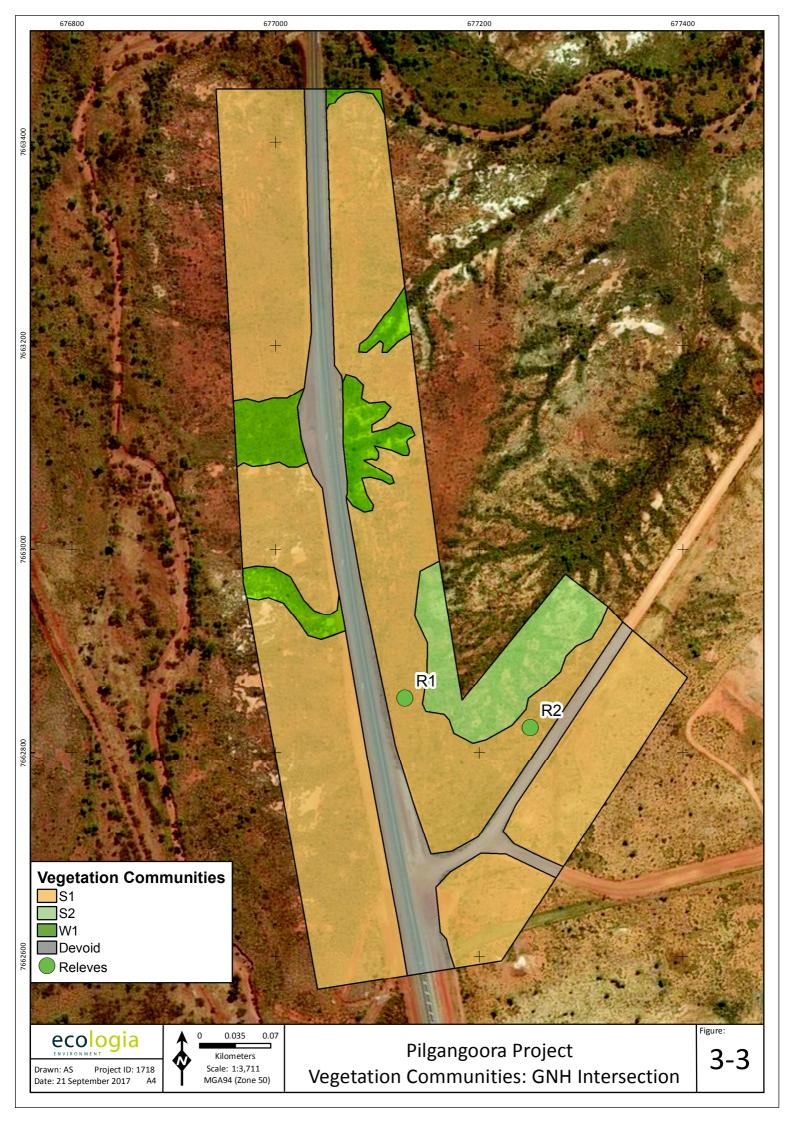
Table 3.3 – Vegetation types at the Study Area

		Table 3.3 – vegetation types at the stat	.,		
Vegetation type code	Broad floristic formation (NVIS III)	Vegetation type (NVIS V)		Landforms (Study Area quadrats)	Proportion of total Study Area
S1	Acacia open Shrubland	Acacia ancistrocarpa and Acacia orthocarpa tall open shru over Triodia epactia hummock grassland	ubland	Stony plains	14.2 ha (70.6%)
S2	Acacia open shrubland	Acacia inaequilatera, Acacia acradenia and Corchorus parviflorus open shrubland over Triodia epactia open hummock grassland.	Si	tony plain	1.4ha (6.9%)



Vegetation type code	Broad floristic formation (NVIS III)	Vegetation type (NVIS V)	Landforms (Study Area quadrats)	Proportion of total Study Area
W1	Corymbia open woodland	Corymbia hamersleyana low open woodland over Acacia ancistrocarpa and Acacia inaequilatera open shrubland over Triodia epactia hummock grassland.	Stony plains	1.3ha (6.5%)
4				
	X.			
	1			





3.2.2.3 Weeds

Twenty introduced species have been recorded in the vicinity of the Study Area (records from previous surveys and the NatureMap database).

Of these, only one was recorded in low abundance within the Study Area: *Aerva javanica* (kapok bush). This species are listed as 'Permitted' on the Western Australian Organism List (DAFWA 2016), and are not Weeds of National Significance. Kapok bush has a 'High' risk rating according to the Environmental Weed Strategy (CALM 1999).

3.2.2.4 Vegetation Condition

Broadly, there has been little to no disturbance to the vegetation within the Study Area. Vegetation condition across much of the Study Area was assessed as Very Good with minimal weed invasion (*Aerva javanica*) in some areas, and generally no other disturbance.

3.2.2.5 Significance

Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia)

No EPBC Act listed Threatened Flora taxa were recorded within the Study Area.

Wildlife Conservation Act 1950 (Western Australia) Threatened Flora Species

No WC Act listed Threatened Flora taxa were recorded within the Study Area.

Priority Flora Species

• No Priority-listed Flora taxa were recorded within the Study Area.

Vegetation of Significance

- No Commonwealth or State listed TECs or PECs have been recorded within the vicinity, nor
 have any been recorded in surveys reviewed as part of this desktop study.
- No vegetation was assessed as either regionally or locally significant. Vegetation units described are widespread in the region.

3.3 VERTEBRATE FAUNA AND HABITATS

3.3.1.1 Fauna Habitats

Habitat assessments were undertaken at 5 representative locations (Figure 3-5). Habitat assessments are provided in Appendix F. Several habitat descriptors have been used in other studies for the Pilgangoora Project and terminology used here has been standardised to maintain consistency with previous mapping and descriptors. The Study Area contains the following fauna habitat types (Table 3.4):

- Stony Plains
- Sandy Plains
- Minor Drainage Depressions



All fauna habitats recorded from the Study Area are considered widespread and typical of the bioregion.

This study	Area (ha)	Condition
Stony Plains	13.9	Very Good
Sandy Plains	2.0	Very Good
Minor Drainage Depressions	1.1	Very Good
Devoid of vegetation (Roads)	3.2	NA
Total	20.1	

Table 3.4 - Broad fauna habitats in Study Area

Stony Plains

Stony Plains habitat comprises the majority of the Study Area (13.9 ha). It is considered widespread and well represented in the region, within both the Macroy and Satirist Land Systems. This habitat type is characterised by scattered low *Acacia inaequilatera* over extensive spinifex cover on plains with a stony substrate with loam, and contains limited microhabitats, with the dominant *Acacia* species providing no tree hollows, few logs, limited leaf litter and sparse vegetation. Stony Plains were assessed to be in Very Good condition (Appendix F).

The Western Pebble-mound Mouse occurs on skeletal soils that provide pebbles of a suitable size, and are usually found on gentle slopes and footslopes vegetated by hard spinifex, however, can sometimes occur on stony plains adjacent to low hills. No mounds of the Western Pebble-mound Mouse were recorded.

Sandy Plains

A small The Sandy Plains habitat is identified by its soils and vegetation. It has a top layer of softer, sandier soils over a lower compacted layer. These soils are more suitable for burrowing fauna species. This habitat type consisted of flat sandy plain with an overstorey of scattered vegetation of *Acacia inaequilatera*, *Acacia bivenosa* and *Acacia citrinoviridis* over *Triodia*. Sandy Plains habitat is widespread and well represented in the region, within the Macroy Land System. Sandy Plains habitat was assessed to be in Very Good condition (Appendix F).

Recently burnt habitat may be used for foraging, while long unburnt areas may be used for shelter for a number of species. Greater Bilby and Mulgara both occur in Sandy Plains or other friable substrates that facilitate the construction of burrows. The limited amount (2 ha) of sandy plains habitat was searched for evidence of these species with none recorded.

Minor Drainage Depressions

Where culverts pass under Great Northern Highway drainage is consolidated to form wetter areas within the Stony Plains habitat. Substrates and vegetation are analogous with Stony Plains habitat however vegetation is denser due to increased moisture and scattered *Corymbia hamersleyana* occurs in places. Minor Drainage Depressions make up just 1.1 ha of the Study Area. Minor Drainage Depressions habitat was assessed to be in Very Good condition (Appendix F).





Stony Plains (Site S04)



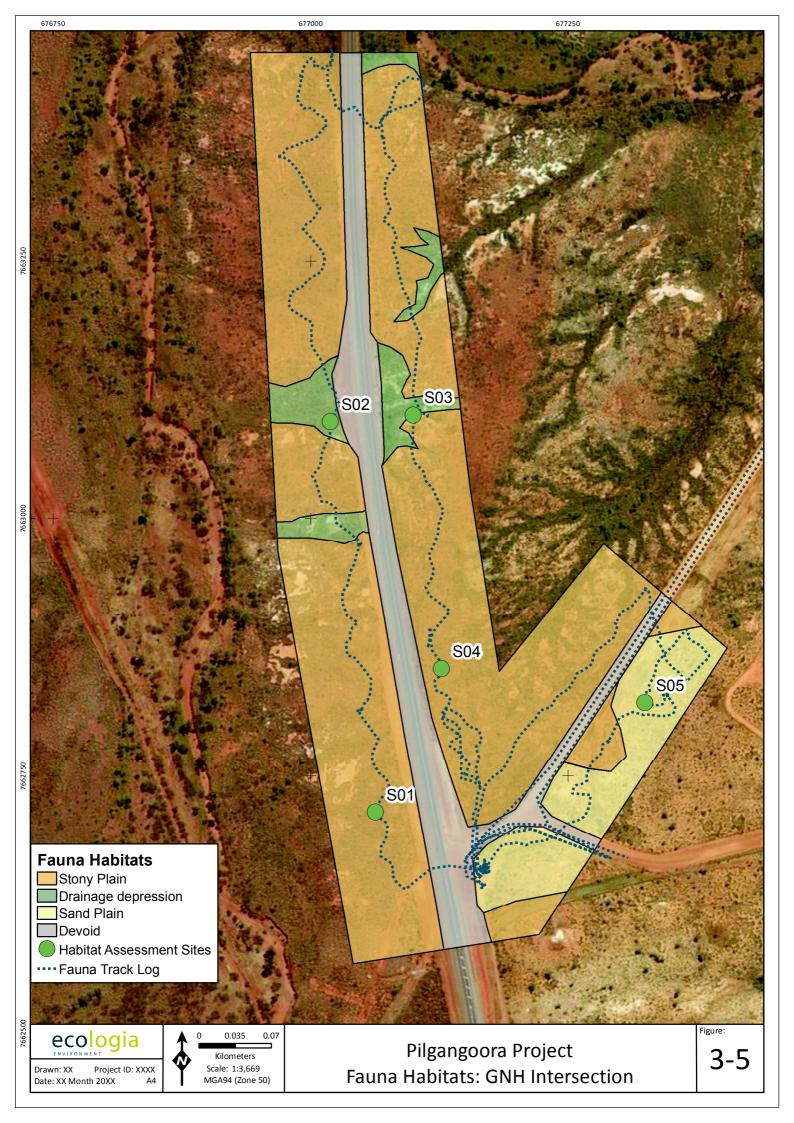
Sandplain (Site S05)



Drainage depression (Site S03)

Figure 3-4 – Photographs of broad fauna habitats of the Study Area





3.3.2 Desktop Results

A total of 204 terrestrial vertebrate species were recorded from the desktop study, including 25 mammals (3 introduced), 118 birds, 60 reptiles, and one amphibian. NatureMap records of all species are presented in Appendix G.

Records of conservation significant fauna records are presented in Appendix H. Twenty-six of the species identified from the literature review and database searches are considered conservation significant (Table 3.6) (Figure 3-6). However, due to the large search areas used many species would not occur within habitats of the Study Area (e.g. migratory shorebirds). Similarly the DoEE Protected Matters Search (DoEE 2017) (Appendix C) list species that have not actually been recorded within the search area including marine-listed species (e.g. White-bellied Sea-Eagle), wetland and saltmarsh migratory shorebirds from the families Scolopacidae, and Charadriidae (e.g. Curlew Sandpiper and Eastern Curlew) and vagrants (e.g. Grey Wagtail and Yellow Wagtail) would not occur over the Study Area. An assessment of likelihood of occurrence for relevant conservation significant fauna species recorded during the desktop assessment was conducted by examining:

- Fauna habitats present within the Study Area;
- Distance of previously recorded significant species based on publically available records;
- Frequency of occurrence of conservation significant species records; and
- Time passed since conservation significant species were recorded.

Each relevant conservation significant vertebrate fauna species potentially occurring over the Study Area was assigned a likelihood of occurrence rating based on the four categories described in Table 2.1 and the habitats actually present over the Study Area. Results are presented in Table 3.6. The Rainbow Bee-eater was recorded during the survey.

3.3.3 Field Results

3.3.3.1 Vertebrate Fauna

Results of species observed during the survey are included in Table 3.5. A concurrent survey was undertaken along the Haul Road to the Pilgangoora minesite and an associated area of 58 ha adjacent to the Haul Road ('West' Area). For context, sightings within these areas are also included. Forty five vertebrate species were recorded during the combined surveys. Of these over the GNH Study Area 12 birds and four reptiles were recorded. No evidence of native mammals were recorded, however, cattle were present.

Table 3.5- Vertebrate fauna species recorded during the survey

Species		GNH	West	Access
BIRDS		GNH	West	Access
Crested Pigeon	Ocyphaps lophotes	х		
Spinifex Pigeon	Geophaps plumifera	х		
Diamond Dove	Geopelia cuneata		x	
Whistling Kite	Haliastur sphenurus			x
Black Kite	Milvus migrans		×	x
Spotted Harrier	Circus assimilis			x
Nankeen Kestrel	Falco cenchroides		×	
Brown Falcon	Falco berigora			x
Little Button-quail	Turnix velox	х	x	
Little Corella	Cacatua sanguinea	Х		x
Cockatiel	Nymphicus hollandicus			Х



Species		CNIII	11/	
BIRDS		GNH	West	Access
Rainbow Bee-eater	Merops ornatus	х		Х
Weebill	Smicrornis brevirostris			х
Red-browed Pardalote	Pardalotus rubricatus			х
Singing Honeyeater	Lichenostomus virescens	X		
Grey-headed Honeyeater	Lichenostomus keartlandi		x	
White-plumed Honeyeater	Lichenostomus penicillatus		Х	
Yellow-throated Miner	Manorina flavigula	х		Х
Brown Honeyeater	Lichmera indistincta			х
White-winged Triller	Lalage sueurii	х		
Crested Bellbird	Oreoica gutturalis	х		
Little Woodswallow	Artamus minor			Х
Pied Butcherbird	Cracticus nigrogularis		х	
Australian Magpie	Cracticus tibicen			Х
Willie Wagtail	Rhipidura leucophrys	х	x	
Torresian Crow	Corvus orru		Х	Х
Magpie-lark	Grallina cyanoleuca			Х
Spinifexbird	Eremiornis carteri	X		
Zebra Finch	Taeniopygia guttata	х	Х	х
REPTILES		GNH	West	Access
Long-nosed Dragon	Amphibolurus longirostris			х
Shaded-litter Rainbow Skink	Carlia munda	x		
Grand Ctenotus	Ctenotus grandis	x		
Stony-soil Ctenotus	Ctenotus saxatilis		x	х
Common Dwarf Skink	Menetia greyii		х	
Ring-tailed Dragon	Ctenophorus caudicinctus			х
Military Dragon	Ctenophorus isolepis	x		
Sand Monitor	Varanus gouldii	x		х
Variegated Dtella	Gehyra variegata			х
Bynoe's Gecko	Heteronotia binoei			х
MAMMALS		GNH	West	Access
Euro	Macropus robustus			х
Western Pebble-mound Mouse	Pseudomys chapmani		х	
Cattle	Bos taurus	х	х	х
Feral Cat	Felis catus			Х

The only species of conservation significance recorded over the GNH Study Area was the Rainbow Bee-eater (IA). The Rainbow Bee-eater was removed from the list of migratory species under section 209 of the EPBC Act on 9th June 2016, however, still appears on Schedule 5 of the WC Act as 'Migratory birds protected under an international agreement'. In Western Australia the Rainbow Bee-eater can occur as a resident, breeding visitor, post-nuptial nomad, passage migrant or summer visitor. Numerous records of the species have been made in the vicinity (Figure 3-6) and because of its broad habitat requirements is likely to occur. However, sandy Drainage Line habitat utilised as breeding habitat does not occur over the Study Area.

Of the other species of conservation significance recorded in the region none were assessed with a Likelihood Rating of 1 (Likely) (Table 2.1).

Several species were assessed with a Likelihood Rating of 2 (Possible). Both the Greater Bilby (VU) and Northern Quoll (EN) have been recorded within two kilometres of the Study Area (Figure 3-6).



However no rocky escarpments occur and therefore no quoll denning habitat is present. Just two hectares of Sandy Plains habitat occurs and no distinctive evidence (burrows, diggings, tracks and scats) of either the Bilby or Mulgara (P4) was recorded.

The Western Pebble-mound Mouse (P4) has been recorded within three kilometres of the Study Area (Figure 3-6). This species is known to have a preference for hilly and/or rocky landscapes (Anstee and Armstrong 2001; Ford and Johnson 2007) which are not present over the Study Area. No distinctive mounds constructed by this species was recorded during the survey.

The Pilbara Leaf-nosed Bat (VU) has been recorded within one kilometre of the Study Area (Figure 3-6). No roosting habitat is present. Creek lines provide foraging habitat for the Pilbara Leaf-nosed Bat, as well as 'flyways' for dispersal. Creeklines are not present over the Study Area and the Turner River, one kilometre to the east, is a likely flyway.

Both the Peregrine (OS) and Grey Falcons (VU) are widespread in Australia. Breeding habitat of cliffs, rocky outcrops, or large trees are not present over the Study Area, however, both have the potential to overfly the Study Area.

Similarly the Fork-tailed Swift (IA) is a migratory, almost exclusively aerial species that, in its non-breeding area in Australia, is independent of terrestrial habitats – feeding along the edge of low pressure systems which help lift insect prey and assists in flight. The Fork-tailed Swift therefore has the potential to overfly the Study Area without specifically utilising any particular habitat present.

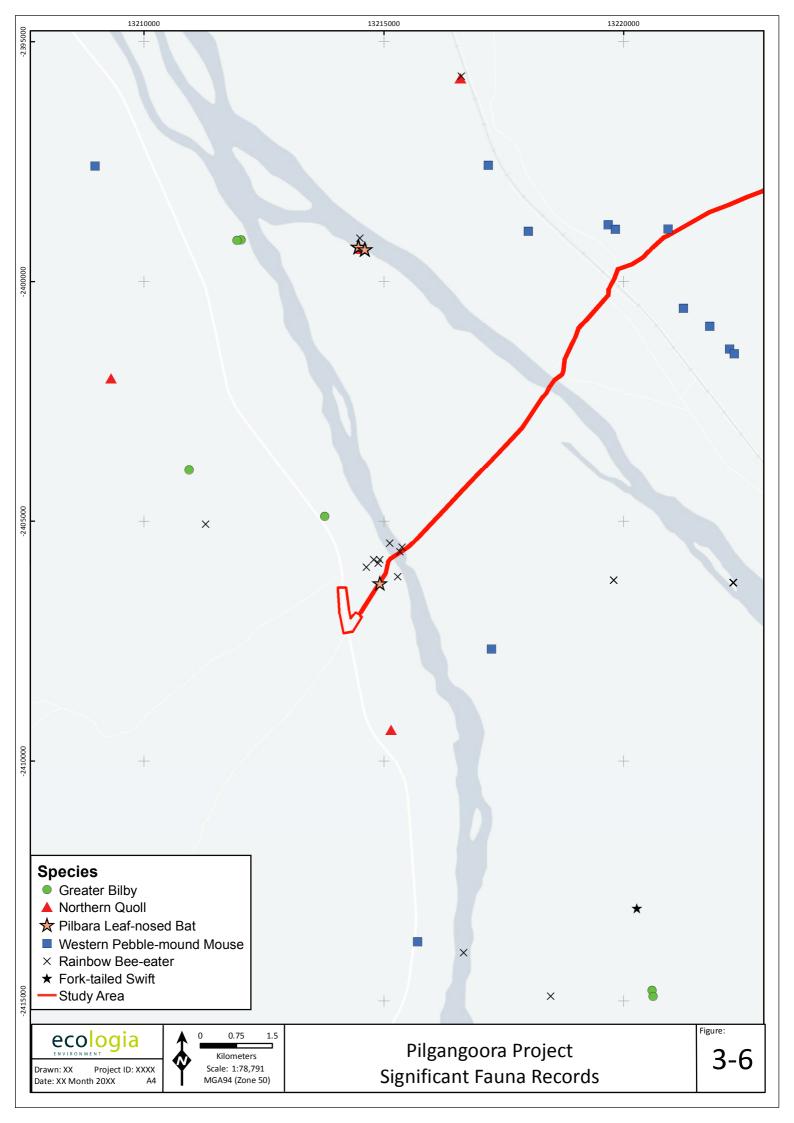


Table 3.6 – Significant vertebrate fauna species records from the database searches

		B			p c c . c . c	cords from the database scarcies	
Common Name	Species	WA Status	EPBC Act Status	Records	Latest Record	Notes	Likelihood of occurrence
Mammals							
Northern Quoll	Dasyurus hallucatus	EN	EN	236	2016	Records from vicinity but no suitable rocky denning habitat present.	2
Brush-tailed Mulgara	Dasycercus blythi	P4		13	2013	Records from region but no evidence recorded.	3
Long-tailed Dunnart	Sminthopsis longicaudata	P4		2	2011	No suitable rocky habitat likely to be present.	3
Greater Bilby	Macrotis lagotis	VU	VU	8	2015	Records from vicinity but no evidence recorded	2
Spectacled Hare-wallaby	Lagorchestes conspicillatus leichardti	Р3		137	1996	Historical record. No suitable mature spinifex habitat present.	3
Western Pebble-mound Mouse	Pseudomys chapmani	P4		26	2015	Record from vicinity. No distinctive mounds present and habitat not suitable.	2
Pilbara Leaf-nosed Bat	Rhinonicteris aurantia (Pilbara)	VU	VU	114	2016	Recorded nearby. However, no roost habitat present.	2
Ghost Bat	Macroderma gigas	VU	VU	13	2016	Records from region. No roost habitat present.	3
Birds							
Night Parrot	Pezoporus occidentalis	CR	EN	0		No suitable unburnt habitat likely to be present.	3
Peregrine Falcon	Falco peregrinus	OS		1	2002	Widespread species that may overfly the Study Area.	2
Grey Falcon	Falco hypoleucos	VU		0		Widespread species that may overfly the Study Area.	2
Barn Swallow	Hirundo rustica	IA	IA	0		Few regional records. Habitat unlikely to be present.	3
Grey Wagtail	Motacilla cinerea	IA	IA	0		Few regional records. Vagrant.	3
Yellow Wagtail	Motacilla flava	IA	IA	0		No records within 30 km. Few regional records. Vagrant.	3
Fork-tailed Swift	Apus pacificus	IA	IA	6	2011	May overfly the Study Area without utilising any of the habitats present.	2
Rainbow Bee-eater	Merops ornatus	IA	IA	84	2016	Recorded. Suitable woodland habitat likely to be present.	R
Great Egret	Ardea modesta	IA	IA	6	2012	Records in vicinity. However, no coastal, wetland or estuarine habitat present.	3
Cattle Egret	Ardea ibis	IA	IA	0		No coastal, wetland or estuarine habitat present.	3
White-bellied Sea-Eagle	Haliaeetus leucogaster	IA	IA	0		No coastal, wetland or estuarine habitat present.	3
Osprey	Pandion haliaetus	IA	IA	0		No coastal, wetland or estuarine habitat present.	3
Australian Painted Snipe	Rostratula australis	EN	EN	0		No coastal, wetland or estuarine habitat present.	3
Curlew Sandpiper	Calidris ferruginea	VU	CR	0		No coastal, wetland or estuarine habitat present.	3
Eastern Curlew	Numenius madagascariensis	VU	CR	0		No coastal, wetland or estuarine habitat present.	3
Oriental Plover	Charadrius veredus	IA	IA	1	1999	No coastal, wetland or estuarine habitat present.	3
Oriental Pratincole	Glareola maldivarum	IA	IA	0		No suitable habitat present.	3
Reptiles							
Pilbara Olive Python	Liasis olivaceus barroni	VU	VU	23	2015	No suitable gorge, gully, riverine, or permanent water habitat present.	3

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4 LIMITATIONS

An assessment of survey-specific issues and limitations (EPA 2016a) is detailed in Table 4.1.

Table 4.1 – Flora and vegetation survey limitations

Constraint	Impact	Comment
Availability of contextual information at a regional and local scale	Nil	Broad scale vegetation, soil, and geology mapping data were available for the Study Area, in addition to flora database records, and conservation significant vegetation community records. This information is considered to be adequate to provide appropriate contextual information for the current survey.
Competency/experience of the team carrying out the survey, including experience in the bioregion surveyed	Nil	The Botanist undertaking the field work and specimen identification for the survey has conducted numerous botanical surveys in the Pilbara bioregion.
Proportion of flora recorded and/or collected, any identification issues	Nil	Representative specimens of taxa that could not be adequately identified in the field were collected. All of these were confidently identified to species level
Was the appropriate area fully surveyed (effort and extent)	Nil	2 relevés were surveyed across the Study Area. Due to the relatively small size and few vegetation communities within the Study Area, this level of survey effort is considered to be sufficient.
Access restrictions within the survey area	Nil	All parts of the Study Area were accessible by walking from existing vehicle tracks.
Survey timing, rainfall, season of survey	Minor	The survey was conducted during outside of optimal seasonal conditions for flora and vegetation surveys in the Pilbara, however the major of species expected to be present, including annual, were able to be identified at the time of the survey
Disturbance that may have affected the results of survey such as fire, flood or clearing	Nil	There were no natural or human interventions that constrained the survey of the Study Area.



According to EPA Guidance Statement No. 56 (EPA 2004b), terrestrial fauna surveys may be limited by several aspects. An assessment of these aspects with regard to this study is detailed in Table 4.2.

Table 4.2 – Fauna survey limitations

Aspect	Constraint	Comment
Competency/experience of the consultant carrying out the survey.	Nil	The Principal Zoologist undertaking the fauna survey has more than 20 years experienced in conducting terrestrial vertebrate fauna surveys in Western Australia, including in the Pilbara
Scope (what faunal groups were sampled and were some sampling methods not able to be employed because of constraints such as weather conditions).	Nil	A detailed fauna survey was not a vital component for this level of assessment (Level 1 Survey). The scope was well defined. Fauna and their habitats were surveyed using standardised and well-established techniques. Relevant databases and previous studies surrounding the Study Area were reviewed.
Proportion of fauna identified, recorded and/or collected.	Low	A detailed fauna survey was not a vital component for this level of assessment (Level 1 Survey). A comprehensive desktop study adequately gathered background information on the Study Area. A reconnaissance survey verified the desktop results and characterised habitats and terrestrial fauna likely to be present to enable an identification of potential impacts.
Sources of information (previously available information as distinct from new data).	Nil	The Study Area is located in a well-surveyed region with comprehensive survey information available from adjacent areas. Database records, including conservation significant species, were available for the area and considered adequate to provide appropriate contextual information for the study.
The proportion of the task achieved and further work which might be needed.	Nil	Planned survey works were conducted and completed according to an agreed scope.
Timing/weather/season/cycle.	Nil	The survey was conducted following higher than average rainfall.
Disturbances which affected results of the survey (e.g. fire, flood, accidental human intervention).	Nil	There were no natural or human interventions that constrained the survey of the Study Area.
Intensity (in retrospect was the intensity adequate).	Nil	Given the access to available information from areas immediately adjacent and in comparable habitats the survey intensity was considered adequate and is appropriate for a Level 1 fauna assessment.
Completeness (e.g. was relevant area fully surveyed).	Nil	The Level 1 survey was considered complete. Database searches and literature reviews were comprehensive and a large proportion of the Study Area was sampled on foot.
Resources (e.g. degree of expertise available in animal identification to taxon level).	Nil	Resources were adequate to carry out the survey and survey participants were competent in the identification of species and likelihood of occurrence. Database searches and literature reviews were used to prepare for the survey and used for the confirmation of any species.
Remoteness and/or access problems.	Nil	The Study Area was easily accessible by vehicle and on foot.
Availability of contextual (e.g. biogeographic) information on the region.	Nil	The data available was adequate for the level of survey work undertaken during this assessment.
Efficacy of sampling methods (i.e. any groups not sampled by survey methods).	Nil	A detailed fauna survey was not a vital component for this level of assessment (Level 1 Survey). A comprehensive desktop study adequately gathered background information on the Study Area. A reconnaissance survey verified the desktop results and characterised habitats



5 CONCLUSION

The Study Area occupies a small area of approximately 20 ha in the Pilbara bioregion (Chichester subregion) of Western Australia, within which three vegetation associations occur:

Stony and Sandy Plains

Acacia ancistrocarpa and Acacia orthocarpa tall open shrubland over *Triodia epactia* hummock grassland. occurring on stony plains with clay loam soils. This vegetation type occurs over 14.2 ha (70.6%) of the Study Area

Acacia inaequilatera, Acacia acradenia and Corchorus parviflorus open shrubland over Triodia epactia open hummock grassland on stony and sand plains with clay to sand loam soils. This vegetation type occurs over 1.4 ha (6.9%) of the Study Area.

Minor Drainage Depressions

Corymbia hamersleyana low open woodland over Acacia ancistrocarpa and Acacia inaequilatera open shrubland over Triodia epactia hummock grassland occurring on minor drainage lines with clay loam soils. This vegetation type occurs over 1.3 ha (6.5%) of the Study Area.

No Commonwealth or State listed TECs or PECs have been recorded within the vicinity, nor have any been recorded in surveys reviewed as part of this desktop study. No vegetation was assessed as either regionally or locally significant. Vegetation units described are widespread in the region.

Vegetation condition across much of the Study Area was assessed as 'Very Good', with minimal weed invasion.

A total of 32 vascular plant taxa were recorded. The most diverse families were the Fabaceae, Poaceae, Malvaceae and Amaranthaceae. One introduced species (*Aerva javanica*) was recorded in low abundance within the Study Area.

No flora species of conservation significance, including Priority species, were recorded over the Study Area and based on previous records four were classified as highly likely to occur.

Three broad fauna habitats occur over the Study Area: Stony Plains, Sandy Plains and Minor Drainage Depressions. All fauna habitats recorded from the Study Area are considered widespread and typical of the bioregion.

The only species of conservation significance recorded over the Study Area was the Rainbow Bee-eater. The Rainbow Bee-eater (IA) was removed from the list of migratory species under section 209 of the EPBC Act on 9th June 2016, however, still appears on Schedule 5 of the WC Act as 'Migratory birds protected under an international agreement'. Numerous records of the species have been made and because of its broad habitat requirements is likely to occur. However, sandy Drainage Line habitat utilised as breeding habitat does not occur over the Study Area.

Several additional species were assessed with a Likelihood Rating of 2 (Possible). However no rocky escarpments occur and therefore no Northern Quoll (EN) denning habitat is present. Just two hectares of Sandy Plains habitat occurs but no distinctive evidence in the form of burrows, diggings, tracks or scats of either the Greater Bilby (VU) or Brush-tailed Mulgara (P4) was recorded.

The Western Pebble-mound Mouse (P4) is known to have a preference for hilly and/or rocky landscapes which are not present over the Study Area. No distinctive mounds constructed by this species was recorded.

The Pilbara Leaf-nosed Bat (VU) has been recorded within one kilometre of the Study Area, however, no roosting habitat is present. Creek lines provide foraging habitat for the species, as well as 'flyways'



for dispersal. Creeklines are not present over the Study Area and the Turner River, one kilometre to the east, is a likely flyway.

Both the Peregrine (OS) and Grey Falcons (VU) are widespread in Australia. Breeding habitat of cliffs, rocky outcrops, or large trees are not present over the Study Area, however, both have the potential to overfly the Study Area.

Similarly the Fork-tailed Swift (IA) is a migratory, almost exclusively aerial species that has the potential to overfly the Study Area without specifically utilising any particular habitat present.



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7 APPENDICES

APPENDIX A DEFINITIONS

Threatened (WC Act) and Priority flora Categories

Code	Definition
	Threatened flora – (Declared Rare Flora – Extant)
Т	Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection and have been gazetted as such (Schedule 1 under the <i>Wildlife Conservation Act 1950</i>).
	Presumed Extinct Flora (Declared Rare Flora - Extinct)
X	Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such Schedule 2 under the <i>Wildlife Conservation Act 1950</i>).
	Priority One – Poorly Known Species
P1	Species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
	Priority Two – Poorly Known Species
P2	Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
	Priority Three – Poorly Known Species
P3	Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
	Priority Four – Rare, Near Threatened and other species in need of monitoring
P4	(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
14	(b) Near Threatened. Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
	(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
	Priority Five - Conservation Dependent species
P5	Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Threatened flora (EPBC Act) Categories

Code	Definition
Ex	Extinct
LX	Taxa which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
	Extinct in the Wild
ExW	Taxa which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
	Critically Endangered
CE	Taxa which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
	Endangered
E	Taxa which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.
	Vulnerable
V	Taxa which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
	Conservation Dependent
CD	Taxa which at a particular time if, at that time, the species is the focus of a specific conservation programme, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Definition of codes for Threatened Ecological Communities

Code	Definition
PD: Presumed Totally Destroyed	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future. An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant
CR: Critically Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated. An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future.
EN: Endangered	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future. An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future.
VU: Vulnerable	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range. An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future.



Definition of codes for Priority Ecological Communities

Code	Definition			
Ecological communities with apparently few, small occurrences, all or most not actively mana conservation (e.g. within agricultural or Pastoral lands, urban areas, active mineral leases) and for current threats exist. Communities may be included if they are comparatively well-known from one localities but do not meet adequacy of survey requirements, and/or are not well defined, and apperunder immediate threat from known threatening processes across their range.				
Communities that are known from few small occurrences, all or most of which are actively mana conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities included if they are comparatively well known from one or more localities but do not meet adequacy or requirements, and/or are not well defined, and appear to be under threat from known threatening process.				
P3: Priority Three	(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; (iii) Communities made up of large, and/or widespread occurrences that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.			
	Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.			
	Ecological communities that are adequately known, Rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.			
P4: Priority Four	(a) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.			
	(b) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.			
	(c) Ecological communities that have been removed from the list of threatened communities during the past five years.			
P5: Priority Five	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.			



BAM Act Definitions (Declared Pests)

Legal status	Definition
Declared Pest, Prohibited - s12	Prohibited organisms are declared pests by virtue of section 22(1), and may only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Declared Pest - s22(2)	Declared pests must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia.
Permitted - s11	Permitted organisms must satisfy any applicable import requirements when imported. They may be subject to an import permit if they are potential carriers of high-risk organisms.
Permitted, Requires Permit - r73	Regulation 73 permitted organisms may only be imported subject to an import permit. These organisms may be subject to restriction under legislation other than the Biosecurity and Agriculture Management Act 2007. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions.
Unlisted - s14	If you are considering importing an unlisted organism/s you will need to submit the name/s for assessment, as unlisted organisms are automatically prohibited entry into WA.
Control categories	Definition
C1 Exclusion	Organisms which should be excluded from part or all of Western Australia.
C2 Eradication	Organisms which should be eradicated from part or all of Western Australia.
C3 Management	Organisms that should have some form of management applied that will alleviate the harmful impact of the organism, reduce the numbers or distribution of the organism or prevent or contain the spread of the organism.
Unassigned	Unassigned: Declared pests that are recognised as having a harmful impact under certain circumstances, where their subsequent control requirements are determined by a Plan or other legislative arrangements under the Act.

Categorisation of Environmental Weeds

Criteria	Description
Invasiveness	Ability to invade bushland in good to excellent condition or ability to invade waterways.
Distribution	Wide current or potential distribution including consideration of known history of widespread distribution elsewhere in the world.
Environmental impacts	Ability to change the structure, composition and function of ecosystems. In particular an ability to form single-species stands.
Category	Scoring System
Category High	Scoring System A species which scores yes to all three of the above criteria. A rating of high indicates a species that should be prioritised for control and/or research.
<u> </u>	A species which scores yes to all three of the above criteria. A rating of high indicates a species that should be
High	A species which scores yes to all three of the above criteria. A rating of high indicates a species that should be prioritised for control and/or research. A species which scores yes for two of the above criteria. A rating of moderate indicates a species which should be



Threatened (WC Act) Fauna Categories

Category	Code	Definition	Schedule
Critically Endangered	CR	Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i> , in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.	Schedule 1 Fauna that is rare or is likely to become extinct as critically endangered fauna
Endangered	Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950,</i> in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.		
Vulnerable	VU	Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i> , in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.	Schedule 3 Fauna that is rare or is likely to become extinct as vulnerable fauna
Presumed Extinct	EX	Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i> , in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.	Schedule 4 Fauna presumed to be extinct
Migratory	IA	Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.	Schedule 5 Migratory birds protected under an international agreement
Conservation Dependent	CD	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the <i>Wildlife Conservation Act 1950,</i> in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.	Schedule 6 Fauna that is of special conservation need as conservation dependent fauna
Special Protection	OS	Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the <i>Wildlife Conservation Act 1950</i> , in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.	Schedule 7 Other specially protected fauna

Fauna (EPBC Act) Categories

Category	Code	Definition	
Extinct	Ex	Fauna not definitely located in the wild during the past 50 years	
Extinct in the Wild	EW	una which is known only to survive in captivity	
Critically Endangered	CR	auna that is considered to be facing an extremely high risk of extinction in the wild in the immediate future	
Endangered	EN	Fauna that is considered to be facing a very high risk of extinction in the wild in the near future	
Vulnerable	VU	Fauna that is considered to be facing a high risk of extinction in the wild in the medium-term future	
Conservation Dependent	CD	Fauna whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classified as Vulnerable or more severely threatened.	
Migratory	IA	Fauna that migrates to, over and within Australia and its external territories.	



Definition of codes for Priority Fauna

Code	Definition
P1: Priority One	Poorly-known species Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2: Priority Two	Poorly-known species Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3: Priority Three	Poorly-known species Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4: Priority Four	Rare, Near Threatened and other species in need of monitoring (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

APPENDIX B VASCULAR FLORA RECORDS. NATUREMAP



NatureMap Species Report

Created By Guest user on 12/04/2017

Kingdom Plantae

Current Names Only Yes

Core Datasets Only Yes

Vouchered Status Vouchered

Method 'By Circle'

Centre 118° 55' 14" E,21° 00' 51" S

Buffer 40km

Group By Conservation Status

Area (ha)		502569.66
Taxa:	Naturalised	8
	Native	213
Endemics:		1
Families:		46
Genera:		108
Conservation Status:	-	208
	1	2
	3	5
	Т	1
	4	3
	2	2
MS Status:	-	213
	PN	8
Rank:	-	189
	subsp.	16
	var	16

Top Ten Families			Top Ten Genera		
	Species	Records		Species	Records
1. Fabaceae	41	65	1. Acacia	15	24
2. Poaceae	27	41	2. Tephrosia	10	19
3. Malvaceae	20	37	3. Triodia	9	16
4. Amaranthaceae	14	19	4. Ptilotus	8	12
Cyperaceae	13	24	5. Heliotropium	7	36
6. Asteraceae	11	14	6. Triumfetta	7	21
7. Boraginaceae	10	39	7. Cyperus	6	8
8. Goodeniaceae	10	16	8. Trianthema	6	7
9. Aizoaceae	6	7	9. Pluchea	5	7
10. Euphorbiaceae	5	22	10. Goodenia	5	7

Endemic To Query Area

Name ID **Species Conservation Status**

Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)

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

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







NatureMap Species Report

Created By Guest user on 12/04/2017

Kingdom Plantae

Current Names Only Yes

Core Datasets Only Yes

Vouchered Status Vouchered

Method 'By Circle'

Centre 118° 55' 14" E,21° 00' 51" S

Buffer 40km

Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon Priority 1 Priority 2 Priority 3 Priority 4 Rare or likely to become extinct	208 2 2 5 3	305 24 19 14 11
TOTAL	221	383

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Rare or like	ely to bec	come extinct			
1.	37720	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)		Т	Υ
Priority 1					
2.	10891	Heliotropium muticum		P1	
3.		Rothia indica subsp. australis		P1	
	11120	Norma maioa dabap. dadirano			
Priority 2					
4.		Euphorbia clementii		P2	
5.	18123	Stylidium weeliwolli		P2	
Priority 3					
6.	12673	Acacia glaucocaesia		P3	
7.		Eragrostis crateriformis		P3	
8.		Gymnanthera cunninghamii		P3	
9.	6980	Nicotiana umbratica		P3	
10.	5313	Terminalia supranitifolia		P3	
Dui a nitu . 4					
Priority 4	754	Double and the bound information			
11.		Bulbostylis burbidgeae		P4	
12.		Goodenia nuda		P4	
13.	2/44	Ptilotus mollis		P4	
Non-conse	rvation ta	axon			
14.	4895	Abutilon lepidum			
15.	42920	Abutilon sp. Dioicum (A.A. Mitchell PRP 1618)			
16.	3198	Acacia acradenia			
17.	3209	Acacia ampliceps			
18.	3223	Acacia arida			
19.	13502	Acacia coriacea subsp. pendens			
20.	16174	Acacia elachantha			
21.	3370	Acacia hilliana			
22.	3377	Acacia inaequilatera (Baderi)			
23.	3471	Acacia orthocarpa (Needleleaf Wattle)			
24.	29015	Acacia pyrifolia var. pyrifolia			
25.	13078	Acacia sclerosperma subsp. sclerosperma			
26.	3553	Acacia spondylophylla			
27.	19456	Acacia stellaticeps			
28.	13070	Acacia synchronicia			
29.	20319	Acacia tumida var. pilbarensis			
30.	17422	Adriana tomentosa var. tomentosa			
31.	2646	Aerva javanica (Kapok Bush)	Υ		







	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
32.	2652	Alternanthera nodiflora (Common Joyweed)			
33.		Amaranthus interruptus (Native Amaranth)			
34.		Amaranthus undulatus			
35.		Aristida burbidgeae			
36. 37.		Aristida holathera var. holathera Bergia ammannioides			
38.		Boerhavia coccinea (Tar Vine, Wituka)			
39.		Bonamia erecta			
40.	44782	Bonamia pilbarensis			
41.	18073	Byblis filifolia			
42.	11055	Cajanus cinereus			
43.	40825	Calandrinia pentavalvis			
44.		Calandrinia quadrivalvis			
45.		Calandrinia stagnensis			
46.		Calocephalus beardii	V		
47. 48.		Calotropis procera (Calotrope) Cenchrus ciliaris (Buffel Grass)	Y		
49.		Centified minima (Spreading Sneezewood, Kanjirralaa, Inteng-inteng, Karengkal,	·		
40.	7010	Kata-palkalpa, Munyu-parnti-parnti)			
50.	32	Cheilanthes brownii			
51.	29101	Cleome uncifera subsp. uncifera			
52.	2988	Cleome viscosa (Tickweed, Tjinduwadhu)			
53.	2778	Codonocarpus cotinifolius (Native Poplar, Kundurangu)			
54.	13659	Corchorus Ianiflorus			
55.	4862	Corchorus parviflorus			
56.		Corymbia hamersleyana			
57.		Corymbia zygophylla			
58.		Corynotheca pungens			
59.		Crotalaria cunninghamii (Green Birdflower, Bilbun)			
60. 61.		Crotalaria medicaginea var. neglecta Crotalaria novae-hollandiae (New Holland Rattlepod)			
62.		Cucumis melo (Ulcardo Melon)			
63.		Cullen leucanthum			
64.		Cullen leucochaites			
65.		Cullen stipulaceum			
66.	33077	Cylindropuntia imbricata	Υ		
67.	6583	Cynanchum carnosum			
68.	12801	Cyperus blakeanus			
69.	13657	Cyperus castaneus var. brevimucronatus			
70.		Cyperus conicus			
71.		Cyperus cunninghamii subsp. cunninghamii			
72. 73.		Cyperus hesperius			
73. 74.		Cyperus rigidellus Dampiera candicans			
75.		Dentella asperata			
76.		Dichanthium sericeum subsp. humilius			
77.		Drosera burmanni (Tropical Sundew)			
78.	823	Eleocharis atropurpurea			
79.	360	Enneapogon lindleyanus (Wiry Nineawn, Purple-head Nineawn)			
80.	15733	Eragrostis fallax			
81.		Eragrostis minor (Smaller Stinkgrass)	Υ		
82.		Eragrostis speciosa (Handsome Lovegrass)			
83.		Eremophila forrestii subsp. forrestii			
84.		Eriachne festucacea (Plains Wandarrie Grass)			
85. 86.		Eriachne melicacea Eriachne obtusa (Northern Wandarrie Grass)			
87.		Erymophyllum ramosum subsp. ramosum			
88.		Eucalyptus leucophloia (Snappy Gum, Migum)			
89.		Euphorbia australis var. subtomentosa			
90.		Euphorbia careyi			
91.		Euphorbia tannensis subsp. eremophila (Desert Spurge)			
92.		Fimbristylis elegans			
93.	862	Fimbristylis microcarya			
94.	12159	Fimbristylis simulans			
95.		Fuirena ciliaris			
96.		Gomphrena cunninghamii			
97.		Gomphrena leptoclada subsp. leptoclada			
98. 99.		Gonocarpus ephemerus Gonocarpus lamprosperma			
99. 100.		Goodenia lamprosperma Goodenia microptera			
100.	7.520	and a second sec			
				Departmen	tof







	Nar	ne ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
			Goodenia muelleriana			
			Goodenia stobbsiana			
			Gossypium australe (Native Cotton) Crevilles pyramidalis subsp. leucadendron			
			Grevillea pyramidalis subsp. leucadendron Gyrostemon tepperi			
			Halgania solanacea var. Mt Doreen (G.M. Chippendale 4206)			
			Heliotropium chrysocarpum			
1	08.	6705	Heliotropium crispatum			
1	09.	6706	Heliotropium cunninghamii			
1	10. 1	7309	Heliotropium pachyphyllum			
			Heliotropium skeleton			
			Heliotropium vestitum			
	13. 14.		Heteropogon contortus (Bunch Speargrass) Hibiscus burtonii			
			Hibiscus goldsworthii			
			Hibiscus sturtii var. campylochlamys			
			Hybanthus aurantiacus			
1	18.	3985	Indigofera rugosa			
1	19. 3	1035	Indigofera trita subsp. trita			
			Ipomoea coptica			
			Isotropis atropurpurea (Poison Sage)			
			Jasminum didymum subsp. lineare (Desert Jasmine)			
	23.24.		Lepidium pedicellosum Lepidium pholidogynum			
			Lobelia arnhemiaca			
			Melaleuca linophylla			
1			Mitrasacme connata			
1	28. 3	8422	Notoleptopus decaisnei var. decaisnei			
1	29. 3	1799	Opuntia elata	Υ		
			Opuntia stricta (Common Prickly Pear)	Υ		
			Owenia reticulata (Native Walnut, Bandal)			
	32. 33.		Panicum decompositum (Native Millet, Kaltu-kaltu) Paraneurachne muelleri (Northern Mulga Grass)			
	34.		Petalostylis labicheoides (Slender Petalostylis)			
			Phyllanthus maderaspatensis			
1			Pluchea dentex			
1	37. 1	7816	Pluchea ferdinandi-muelleri			
1	38. 4	3944	Pluchea longiseta			
			Pluchea rubelliflora			
			Pluchea tetranthera			
	41. 42.		Polycarpaea corymbosa Polycarpaea involucrata			
			Polygala glaucifolia			
			Polygala saccopetala			
1	45.		Polymeria ambigua (Morning Glory)			
1	46.	2695	Ptilotus arthrolasius			
1	47.	2698	Ptilotus auriculifolius			
	48.		Ptilotus axillaris (Mat Mulla Mulla)			
			Ptilotus calostachyus (Weeping Mulla Mulla)			
			Ptilotus clementii (Tassel Top) Ptilotus fusiformis			
			Ptilotus incanus			
			Rhodanthe margarethae			
			Salsola australis			
1	55. 1	3006	Sarcostemma viminale subsp. australe			
			Scaevola amblyanthera var. centralis			
			Scaevola browniana			
			Scaevola browniana subsp. browniana			
	59. 4 60.		Schenkia australis Schizachyrium fragile (Senale Redgrass)			
	61.		Schoenoplectus laevis			
			Senna ferraria			
			Seringia nephrosperma (Free carpel fire-bush)			
1	64.	4966	Sida arenicola			
1	65.	4970	Sida calyxhymenia (Tall Sida)			
			Sida clementii			
			Solanum cleistogamum			
			Solanum horridum Solanum lasiophyllum (Flannel Bush, Mindjulu)			
			Solanum phlomoides			
·	-	,_0	,		Design Design	**************************************







	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
171.	7098	Stemodia grossa (Marsh Stemodia, Mindjaara)			
172.	7102	Stemodia viscosa (Pagurda)			
173.	8235	Streptoglossa bubakii			
174.	8240	Streptoglossa odora			
175.	7711	Stylidium desertorum			
176.	4223	Swainsona decurrens			
177.	12356	Swainsona formosa			
178.	7363	Synaptantha tillaeacea			
179.	13339	Synaptantha tillaeacea var. tillaeacea			
180.	4263	Tephrosia clementii			
181.	19531	Tephrosia rosea var. clementii			
182.	19529	Tephrosia rosea var. rosea			
183.	15947	Tephrosia sp. B Kimberley Flora (C.A. Gardner 7300)			
184.	17768	Tephrosia sp. Bungaroo Creek (M.E. Trudgen 11601)			
185.	41811	Tephrosia sp. Fortescue (A.A. Mitchell 606)			
186.	20380	Tephrosia sp. Meentheena (S. van Leeuwen 4479)			
187.	42442	Tephrosia sp. NW Eremaean (S. van Leeuwen et al. PBS 0356)			
188.	4285	Tephrosia supina			
189.	4287	Tephrosia virens			
190.	45698	Terminalia circumalata			
191.	19043	Trachymene oleracea subsp. oleracea			
192.	44240	Trianthema cusackianum			
193.	44241	Trianthema glossostigmum			
194.	44261	Trianthema oxycalyptrum var. oxycalyptrum			
195.	2830	Trianthema portulacastrum (Giant Pigweed)	Υ		
196.	44362	Trianthema triquetrum			
197.	44360	Trianthema turgidifolium			
198.	4377	Tribulus hirsutus			
199.	6727	Trichodesma zeylanicum (Camel Bush, Kumbalin)			
200.	13559	Trichodesma zeylanicum var. grandiflorum			
201.	679	Triodia angusta			
202.	680	Triodia basedowii (Lobed Spinifex)			
203.	17889	Triodia bitextura			
204.	13131	Triodia epactia			
205.	689	Triodia lanigera			
206.	690	Triodia longiceps (Giant Grey Spinifex)			
207.	694	Triodia plurinervata			
208.	17873	Triodia schinzii			
209.	700	Triodia secunda			
210.	4873	Triumfetta appendiculata			
211.	14694	Triumfetta clementii			
212.	16306	Triumfetta deserticola			
213.	4878	Triumfetta johnstonii			
214.	14942	Triumfetta maconochieana			
215.	17317	Triumfetta propinqua			
216.	13481	Triumfetta ramosa			
217.	7654	Velleia connata (Cup Velleia)			
218.		Vigna sp.			
219.	5107	Waltheria virgata			
220.	729	Xerochloa barbata (Rice Grass)			
221.	732	Yakirra australiensis			





Conservation Codes

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

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

APPENDIX C EPBC PROTECTED MATTERS SEARCH TOOL

EPBC Act Protected Matters Report

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

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

Information is available about <u>Environment Assessments</u> and the EPBC Act including significance guidelines, forms and application process details.

Report created: 11/04/17 13:40:32

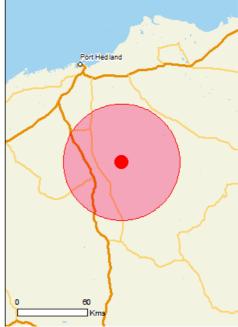
Summary

Details

Matters of NES
Other Matters Protected by the EPBC Act
Extra Information

Caveat

Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 50.0Km



Summary

Matters of National Environmental Significance

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

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

Other Matters Protected by the EPBC Act

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

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

A <u>permit</u> may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	11
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis		
Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus hallucatus		
Northern Quoll, Digul [331]	Endangered	Species or species habitat known to occur within area
Macroderma gigas		
Ghost Bat [174]	Vulnerable	Breeding likely to occur within area
Macrotis lagotis		
Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area
Rhinonicteris aurantia (Pilbara form)		
Pilbara Leaf-nosed Bat [82790]	Vulnerable	Roosting known to occur within area
Reptiles		Within a Gu
Liasis olivaceus barroni		
Olive Python (Pilbara subspecies) [66699]	Vulnerable	Species or species habitat likely to occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on	he EDRC Act. Threatened	
Name	Threatened	Type of Presence
Migratory Marine Birds	Tilleaterieu	Type of Fresence
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundo rustica		
Barn Swallow [662]		Species or species habitat may occur within

Name	Threatened	Type of Presence
Nume	Thicatorica	area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat
		may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat
		likely to occur within area
Migratory Wetlands Species		
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat
		may occur within area
Charadrius veredus		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat
		may occur within area
Glareola maldivarum		
Oriental Pratincole [840]		Species or species habitat
		may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat
		may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat
		likely to occur within area

Other Matters Protected by the EPBC Act

Other Matters Protected by the EPBC Act					
Listed Marine Species		[Resource Information]			
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.					
Name	Threatened	Type of Presence			
Birds					
Apus pacificus					
Fork-tailed Swift [678]		Species or species habitat likely to occur within area			
Ardea alba					
Great Egret, White Egret [59541]		Species or species habitat known to occur within area			
Ardea ibis					
Cattle Egret [59542]		Species or species habitat may occur within area			
Calidris ferruginea					
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area			
Charadrius veredus					
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area			
Glareola maldivarum					
Oriental Pratincole [840]		Species or species habitat may occur within area			
Haliaeetus leucogaster					
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area			
<u>Hirundo rustica</u>					
Barn Swallow [662]		Species or species habitat may occur within			

Name	Threatened	Type of Presence
		area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat likely to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Mammals		
Camelus dromedarius		
Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus asinus		
Donkey, Ass [4]		Species or species habitat likely to occur within area
Equus caballus		
Horse [5]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Mus musculus		
House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa		
Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cenchrus ciliaris		
Buffel-grass, Black Buffel-grass [20213]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-21.01404 118.92097

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact Us page.

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APPENDIX D SIGNIFICANT FLORA RECORDS. TPFL AND WAHERB DATABASES



MAMERIA Accord glasscoccesion 3 -2.1086558 131.512041 1270/201197 1717-1717	Source	Taxon	ConsStatus	WARank	Gda94Lat	Gda94Long	Record Date
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WAHERB Gymnanthera cunninghamii 3 -21.233333 118.793056 7/05/2006 WAHERB Holitoroplum muticum 3 -21.018379 118.600889 10/04/2011 WAHERB Heliotroplum muticum 1 -21.184585 118.70344 5/04/2011 WAHERB Heliotroplum muticum 1 -21.117792 118.70903 13/05/2008 WAHERB Heliotroplum muticum 1 -21.112992 118.790931 21/05/2008 WAHERB Heliotropium muticum 1 -21.112992 118.79038 28/05/2010 WAHERB Heliotropium muticum 1 -21.037211 119.147665 15/10/2011 WAHERB Heliotropium muticum 1 -21.037211 119.147652 15/10/2011 WAHERB Heliotropium muticum 1 -21.037131 119.149732 15/10/2011 WAHERB Heliotropium muticum 1 -21.037131 119.14871 15/10/2011 WAHERB Heliotropium muticum 1 -21.037473 119.14871 15/10/2011 WA	TPFL	Gymnanthera cunninghamii	3		-21.233333	118.793056	7/05/2006
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	TPFL		Т	EN			

Source	Taxon	ConsStatus	WARank	Gda94Lat	Gda94Long	Record Date
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.201002	119.09082	17/08/2011
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.198667	119.09082	17/08/2011
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.19045	119.092617	3/06/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.13043	119.106422	17/08/2011
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.182241	119.125875	17/08/2011
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.148484	119.114274	17/04/2012
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.130519	119.134665	17/04/2012
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.166708	119.101304	25/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.156902	119.090941	3/06/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.172316	119.071333	4/06/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.154257	119.071775	4/06/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.196792	118.953675	26/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.214097	118.961406	26/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	T	EN	-21.216683	118.990422	24/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.209288	118.98803	24/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.174395	119.018915	17/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.186052	119.016829	22/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.223314	119.03267	16/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.207701	119.028815	23/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.178913	119.033776	17/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.204976	119.053953	27/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.235181	119.08085	22/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.195654	119.079275	26/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.198294	119.084147	26/09/2015
TPFL	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т	EN	-21.198294	119.084147	26/09/2015
WAHERB	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т		-21.137833	119.12775	30/08/2010
WAHERB	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т		-21.189	119.067111	30/08/2010
WAHERB	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т		-21.135965	119.129699	4/07/2011
WAHERB	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т		-21.136318	119.129627	4/07/2011
WAHERB	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т		-21.147028	119.095683	29/05/2013
WAHERB	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т		-21.147028	119.095683	29/05/2013
WAHERB	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т		-21.189013	119.067098	22/09/2011
WAHERB	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т		-21.145722	119.109889	28/05/2010
WAHERB	Pityrodia sp. Marble Bar (G. Woodman & D. Coultas GWDC Opp 4)	Т		-21.137833	119.12775	26/05/2010
WAHERB	Rothia indica subsp. australis	1		-20.910363	118.657119	9/04/2011
WAHERB	Stylidium weeliwolli	2		-20.949793	118.670832	9/04/2011
WAHERB	Terminalia supranitifolia	3		-21.130528	118.817472	30/08/2010

APPENDIX E FLORA SPECIES RECORDED OVER THE STUDY AREA

Family	Name			
Amaranthaceae	*Aerva javanica			
Amaranthaceae	Gomphrena cunninghamii			
Amaranthaceae	Ptilotus astrolasius			
Amaranthaceae	Ptilotus astrolasius Ptilotus axillaris			
Amaranthaceae	Ptilotus calostachyus			
Amaranthaceae	Ptilotus nobilis subsp. nobilis			
Asteraceae	Streptoglossa odora			
Chenopodiaceae	Salsola australis			
Cleomaceae	Cleome viscosa			
Fabaceae	Acacia ancistrocarpa			
Fabaceae	Acacia bivenosa			
Fabaceae	Acacia inaequilatera			
Fabaceae	Acacia orthocarpa			
Fabaceae	Acacia monticola			
Fabaceae	Acacia stellaticeps			
Fabaceae	Acacia tumida			
Fabaceae	Cullen cinereum			
Fabaceae	Cullen martinii			
Fabaceae	Senna glutinosa subsp. glutinosa			
Fabaceae	Senna notabilis			
Fabaceae	Tephrosia rosea var. clementii			
Goodeniaceae	Goodenia muelleriana			
Goodeniaceae	Goodenia stobbsiana			
Lauraceae	Cassytha capillaris			
Malvaceae	Corchorus parviflorus			
Myrtaceae	Corymbia hamersleyana			
Poaceae	Aristida holathera var. holathera			
Poaceae	Triodia epactia			
Poaceae	Triodia wiseana			
Proteaceae	Grevillea wickhamii			
Proteaceae	Hakea lorea			
Solanaceae	Solanum lasiophyllum			

APPENDIX F HABITAT ASSESSMENT SHEETS AND PHOTOGRAPHS

Habitat Condition Scale

Habitat Condition	Criteria
Excellent	Pristine or nearly so, no obvious sign of damage caused by modern humans or introduced fauna (cattle, feral cat, dog and rabbit). No signs of recent, extensive fires.
Very Good	Some relatively slight signs of damage caused by the activities of modern humans. eg. damage to tree trunks by repeated fires, no significant signs of introduced fauna or occasional vehicle tracks.
Good	More obvious signs of damage caused by the activities of modern humans, including some obvious impact to vegetation structure such as that caused by low levels of grazing or by selective logging. Some tracks or secondary evidence of introduced fauna. Some signs of recent fires.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of modern humans such as partial clearing or very frequent fires. Presence of introduced fauna.
Very Poor	Severely impacted by grazing, introduced fauna, fire, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management.
Completely Degraded	Areas that are completely or almost completely without vegetation communities and are heavily impacted by extensive fires and/or introduced species e.g. cow paddock

Site	Landfo	rm	(Condition	Habitat
S01	Plain	S	٧	ery Good	Stony Plains
Description	Expansive stony plains of s	cattered Acacia over spi	nifex		
	Bare Soil	30%			
% Ground Cover	Litter	Minor			
% Ground Cover	Canopy Cover	<5%			
	Understorey	70%			
	No exposed rock	X		States	
	<20% exposed rock		an Andrew A	No.	
Rocks	20-50% exposed rock				
	>50% exposed rock				
	Boulders / Rocks %		BATTER MINIS		A CONTRACTOR OF THE PARTY OF TH
Soil	Туре	Stony: Clay-Loam		YM M Z	
3011	Colour	Red		7 1 WW	
	Water Impacts	Minor sheet erosion	\$ 1.7 m	公元 节6年111年1	
	Fire Presence	> 4 yrs		a manage	1000 1000 1000 1000 1000 1000 1000 100
	Woody Debris	None	3.3	SH WAY	The Charles of the Control of the
Habitat Features	Grazing	Low		38	the company of the first of the contract of th
Habitat Features	Rock Crevices	None		A PARTY OF	The state of the latest the state of the sta
	Burrowing Suitability	Low		40.250	The March 25
	Large trees present	No			The second secon
	Tree Hollows (>10cm)	No	The Control of	10000	LE TRANSPORTER AND HAVE BEEN TO BE TO SEE
	Stratum	Form	Height		Species
Vagatation	Upper	None			
Vegetation	Middle	Shrub	2m	Acacia ancistrocar	pa and Acacia orthocarpa
	Ground	Grasses	0.5m	Triodia epactia	

Site	Landfor	m	C	Condition	Habitat
S02	Drainag	ge	V	ery Good	Minor Drainage Deoression
Description	Minor drainage area emana	ating from culvert thro	ugh GNH		
	Bare Soil	25%			
°′ 6	Litter	Minor			
% Ground Cover	Canopy Cover	15%	1000		
	Understorey	70%			
	No exposed rock	Х			
	<20% exposed rock				J. Warren
Rocks	20-50% exposed rock		1.00	and the second	AND THE RESERVE OF THE PARTY OF
	>50% exposed rock				
	Boulders / Rocks %			中省中 为为	
2.11	Туре	Loam		17年20年	
Soil	Colour	Red		罗森	A COMPANY OF THE PROPERTY OF T
	Water Impacts	Drainage			丁州/安徽州岭/广泛建筑、"万万
	Fire Presence	> 4 yrs			
	Woody Debris	None			1999年,人名英格兰克里斯·罗斯克斯
Habitat Fastonia	Grazing	Low	1	LE	
Habitat Features	Rock Crevices	None	17 1/2		
	Burrowing Suitability	Moderate			经报刊 生态 2000年 20
	Large trees present	No	18		
	Tree Hollows (>10cm)	No			2000年1月1日 1月1日 1月1日 1日 1
	Stratum	Form	Height		Species
V	Upper	None			
Vegetation	Middle	Shrub	b 1.5m A	Acacia ancistrocar	pa and Acacia inaequilatera
	Ground	Grasses	0.75m	Triodia epactia	

Site	Landfor	m		Condition	Habitat
S03	Watercou	rses	\	Very Good	Minor Drainage Deoression
Description	Minor drainage area flowin	g through culvert und	der GNH		
	Bare Soil	30%	7.5%		
% Ground Cover	Litter	Minor	300	100	
% Ground Cover	Canopy Cover	None	271		
	Understorey	70%		3 7 24	
	No exposed rock	Х	1		
	<20% exposed rock		-		
Rocks	20-50% exposed rock				
	>50% exposed rock				
	Boulders / Rocks %		4	NOW A	
Soil	Туре	Loam		A SHIP !	
5011	Colour	Red			
	Water Impacts	Drainage	1.53.16		12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Fire Presence	> 4 yrs			
	Woody Debris	None	State of		
Habitat Features	Grazing	Low		The state of the same	
Habitat Features	Rock Crevices	None	A SHOW		
	Burrowing Suitability	Moderate			
	Large trees present	No		AND THE RESERVE	
	Tree Hollows (>10cm)	No		24625	
	Stratum	Form	Height		Species
Vegetation	Upper	Tree	2.5m	Scattered Corymbi	ia hamersleyana
Vegetation	Middle	Shrub	1.5m	Acacia ancistrocal	rpa and Acacia inaequilatera
	Ground	Grasses	0.75m	Triodia epactia	

Site	Landform		Condition		Habitat			
S04	Plains		V	ery Good	Stony Plains			
Description	Expansive stony plains of s	pansive stony plains of scattered Acacia over spinifex intersected with minor drainage lines						
	Bare Soil	30%						
% Ground Cover	Litter	Minor						
	Canopy Cover	<10%						
	Understorey	70%						
	No exposed rock	X						
	<20% exposed rock							
Rocks	20-50% exposed rock							
	>50% exposed rock		an artista a	Marie San				
	Boulders / Rocks %		-	SAN THE PARTY	Company of the second			
Soil	Туре	Stony: Clay-Loam	A STATE OF					
3011	Colour	Red	Name of	AND STREET, ST	A CONTRACTOR OF THE PARTY OF TH			
	Water Impacts	Minor sheet erosion	To the second	1777	AV-ALV			
	Fire Presence	> 3 yrs	SHIPS	AND THE PARTY OF				
	Woody Debris	None						
Habitat Features	Grazing	Low	May Code	7. 作业多种的				
nabitat reatures	Rock Crevices	None			The second second			
	Burrowing Suitability	Low						
	Large trees present	No						
	Tree Hollows (>10cm)	No						
	Stratum	Form	Height		Species			
Vegetation	Upper	None						
vegetation	Middle	Shrub	2m	Acacia ancistrocar	pa and Acacia orthocarpa			
	Ground	Grasses	0.5m	Triodia epactia				

Site	Landfor	m		Condition	Habitat
S05	Plains		\	ery Good	Sandplain
Description	Expansive stony plains of so	attered Acacia over s	pinifex inters	ected with minor dr	ainage lines
	Bare Soil	30%			
% Ground Cover	Litter	Minor			the state of the s
	Canopy Cover	<10%			and the second second
	Understorey	70%			
	No exposed rock	Х			
	<20% exposed rock				
Rocks	20-50% exposed rock			The Property of	Part of the Control o
	>50% exposed rock			The second second	· 网络、 排一点 一
	Boulders / Rocks %				Address of the second of the s
Soil	Туре	Sandy-Loam	1000	新闻了中中军发发	
2011	Colour	Red		as a bushel	
	Water Impacts	None		100	
	Fire Presence	> 4 yrs			
	Woody Debris	None			
Habitat Features	Grazing	Low		13.124	
Habitat Features	Rock Crevices	None		Marie .	
	Burrowing Suitability	High	1	Market 1	
	Large trees present	No	(/4°)		
	Tree Hollows (>10cm)	No	2100		
	Stratum	Form	Height		Species
Vagatation	Upper	None			
Vegetation	Middle	Shrub	2m	Acacia inaequilate	era, Acacia acradenia and Corchorus parviflorus
	Ground	Grasses	0.5m	Triodia epactia	

APPENDIX G VERTEBRATE FAUNA RECORDS.





Created By Andre Schmitz on 30/03/2017

Current Names Only Yes Core Datasets Only Yes

Species Group Mammals

Method 'By Circle'

Centre 118° 55' 17" E,21° 00' 48" S

Area (ha)		125622.02
Taxa:	Naturalised	3
	Native	22
Endemics:		0
Families:		10
Genera:		18
Conservation Status:	-	20
	3	1
	T	2
	4	2
MS Status:	-	25
Rank:	-	21
	subsp.	4

Top Ten Families			Top Ten Genera						
		Species	Records			Species	Records		
1.	Dasyuridae	7	43	1.	Macropus	4	4		
2.	Muridae	5	37	2.	Pseudomys	4	30		
3.	Macropodidae	5	140	3.	Sminthopsis	2	5		
4.	Vespertilionidae	2	2	4.	Vespadelus	1	1		
5.	Phalangeridae	1	2	5.	Zyzomys	1	7		
6.	Emballonuridae	1	1	6.	Dasyurus	1	7		
7.	Bovidae	1	4	7.	Ningaui	1	17		
8.	Canidae	1	1	8.	Dasykaluta	1	5		
9.	Felidae	1	1	9.	Taphozous	1	1		
10.	Megadermatidae	1	1	10.	Trichosurus	1	2		

Endemic To Query Area

Name ID Species **Conservation Status**

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

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







Created By Andre Schmitz on 29/03/2017

Current Names Only Yes Core Datasets Only Yes Species Group Mammals

Method 'By Circle'

Centre 118° 55' 17" E,21° 00' 48" S

Buffer 20km

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1.	24251	Bos taurus (European Cattle)	Υ		
2.	24039	Canis lupus subsp. dingo (Dingo)	Υ		
3.	30903	Dasycercus blythi (Brush-tailed Mulgara, Ampurta)		P4	
4.	24091	Dasykaluta rosamondae (Little Red Kaluta)			
5.	24093	Dasyurus hallucatus (Northern Quoll)		Т	
6.	24041	Felis catus (Cat)	Υ		
7.	24122	Lagorchestes conspicillatus subsp. leichardti (Spectacled Hare-wallaby)		P3	
8.	24180	Macroderma gigas (Ghost Bat)		T	
9.	24129	Macropus agilis (Agile Wallaby)			
10.	25489	Macropus robustus (Euro, Biggada)			
11.	24135	Macropus robustus subsp. erubescens (Euro, Biggada)			
12.	24136	Macropus rufus (Red Kangaroo, Marlu)			
13.	24095	Ningaui timealeyi (Pilbara Ningaui)			
14.	24106	Pseudantechinus woolleyae (Woolley's Pseudantechinus)			
15.	24233	Pseudomys chapmani (Western Pebble-mound Mouse, Ngadji)		P4	
16.	24234	Pseudomys delicatulus (Delicate Mouse)			
17.	24235	Pseudomys desertor (Desert Mouse)			
18.	24237	Pseudomys hermannsburgensis (Sandy Inland Mouse)			
19.	24200	Scotorepens greyii (Little Broad-nosed Bat)			
20.	24116	Sminthopsis macroura (Stripe-faced Dunnart)			
21.	24117	Sminthopsis ooldea (Ooldea Dunnart)			
22.	24175	Taphozous georgianus (Common Sheath-tailed Bat)			
23.	24158	Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)			
24.	24205	Vespadelus finlaysoni (Finlayson's Cave Bat)			
25.	24248	Zyzomys argurus (Common Rock-rat)			

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

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







Created By Andre Schmitz on 30/03/2017

Current Names Only Yes Core Datasets Only Yes Species Group Birds

Aroa (ha)

Method 'By Circle'

Centre 118° 55' 17" E,21° 00' 48" S

125622.02

Area (na)		123022.02
Taxa:	Naturalised	0
	Native	81
Endemics:		0
Families:		38
Genera:		65
Conservation Status:	-	77
	IA	3
	S	1
MS Status:	-	81
Rank:	-	79
	subsp.	2

Top Ten Families			Top Ten Genera		
	Species	Records		Species	Records
1. Accipitridae	8	62	1. Falco	6	52
2. Psittacidae	6	63	2. Artamus	2	51
3. Meliphagidae	6	152	3. Petrochelidon	2	19
4. Falconidae	6	52	4. Coracina	2	71
5. Columbidae	5	209	5. Accipiter	2	26
6. Dicruridae	3	142	6. Cracticus	2	54
7. Maluridae	3	35	7. Geopelia	2	66
8. Pachycephalidae	3	32	8. Todiramphus	2	40
9. Halcyonidae	3	63	9. Rhipidura	2	69
10. Cuculidae	2	6	10. Malurus	2	32

Endemic To Query Area

Name ID Species

Conservation Status





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



Created By Andre Schmitz on 29/03/2017

Current Names Only Yes

Core Datasets Only Yes

Species Group Birds

Method 'By Circle'

Centre 118° 55' 17" E,21° 00' 48" S

Buffer 20km

1. 24599 Acardingonys unfaquitaris (Sonty-chelled Floregratery) 2. 25593 Acapting transcriptors (Sonty-chelled Floregratery) 3. 2559 Acapting fractions (Sontation Statement) 5. 24310 Annes supercibiase (Profice Black Duck) 6. 24310 Annes supercibiase (Profice Black Duck) 7. 25554 Agricy annes (Australian Profit) 7. 25554 Agricy annes (Profit Black Duck) 8. 24295 Aquitaris (Sontation Statement) 9. 24391 Adress pacifics (William ended Honor) 10. 24296 Adress annes (Profit Black Duck) 11. 25555 Adress annes (Profit Black Duck) 12. 25555 Adress annes (Little Woodswalkov) 12. 24555 Adress annes (Little Woodswalkov) 13. 25555 Adress annes (Little Woodswalkov) 14. 24390 Burnharg galaxiers (Little Woodswalkov) 15. 25715 Coedation surgiume) (Little Woodswalkov) 16. 25715 Coedation surgiume) (Little Woodswalkov) 17. 44397 Coedation Statement (Little Woodswalkov) 18. 25000 Coetation surgiume) (Little Coetal) 19. 24518 Coetation surgiume) (Little Coetal) 19. 24519 Coetation surgiume) (Little Coetal) 19. 24519 Coetation surgiume) (Little Coetal) 19. 24519 Coetation surgiume) (Little Coetal) 19. 24510 Coetation surgiume) (Little Coetal) 19. 24510 Coetation surgiume) (Little Coetal) 19. 24510 Coetation surgiume) (Protestart Coetal) 19. 24510 Coetation surgiume) (Protestart Coetal) 19. 24510 Coetation surgiume (Protestart Coetal) 20. 24511 Coetation surgiume (Protestart Coetal) 21. 24510 Coetation surgiume (Protestart Coetal) 22. 24520 Coetation surgiume (Protestart Coetal) 23. 25515 Coetation surgiume (Protestart Coetal) 24. 24511 Coetation surgiume (Protestart Coetal) 25. 25515 Coetation surgiume (Protestart Coetal) 26. 25515 Coetation surgiume (Protestart Coetal) 27. 25518 Coetation surgiume (Protestart Coetal) 28. 25515 Coetation surgiume (Protestart Coetal) 29. 25517 Coetation surgiume (Protestart Coetal) 20. 25517 Coetation surgiume (Protestart Coetal) 20. 25517 Coetation surgiume (Protestart Coetal) 21. 25518 Coetation surgiume (Protestart Coetal) 22. 25517 Coetation surgiume (Protestart Coetal) 23. 25517 Coetation surg		Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
3. 2553 Accipiter fascious (Gineral Colored Fundament) 4. 4. 25457 Amptions status (States of Duck) 5. 24516 Anse supercitace (Prefix Black Duck) 6. 24517 Anterior status (States Duck) 7. 2554 Aper pacifica (Fundament Publ) 7. 2554 Aper pacifica (Fundament Publ) 8. 24525 Aquile activity (Autority and Buster) 9. 24541 Actes pacifica (White nectical Ferror) 10. 24510 Actes activity (Autority and Buster) 11. 25565 Anterior string (Autority and Buster) 11. 25565 Anterior string (Autority and Buster) 12. 24535 Aprile activity (Autority and Buster) 13. 2557 Busterior string (Fundament Buster) 14. 2459 Duminus gratianus (Buck-Assed Moodswallow) 15. 25716 Cacatara senguines (Ellack-Assed Moodswallow) 16. 25716 Cacatara senguines (Ellack-Assed Moodswallow) 17. 42577 Cacatara senguines (Ellack-Assed Moodswallow) 18. 2590 Controver phasianum (Processor Coucal) 19. 24577 Cacatara senguines (Patric Corolla) 19. 24577 Cacatara senguines (Processor Coucal) 19. 24578 Cacatara senguines (Processor Coucal) 19. 24578 Caratara senguines (Processor Coucal) 22. 2459 Controver sensitial (Spoted Families) 24. 2459 Concrete maxima (Processor Coucal) 25. 2459 Concrete maxima (Processor Coucal) 26. 2459 Concrete maxima (Processor Coucal) 27. 2459 Concrete maxima (Processor Coucal) 28. 2571 Concrete maxima (Processor Coucal) 29. 2459 Concrete maxima (Processor Coucal) 29. 2459 Concrete maxima (Processor Coucal) 29. 2450 Concrete maxima (Processor Coucal) 29. 2451 Concrete maxima (Processor Coucal) 29. 2452 Concrete maxima (Processor Coucal) 29. 2453 Concrete maxima (Processor Coucal) 29. 2454 Concrete maxima (Processor Coucal) 29. 2455 Concrete maxima (Processor Coucal) 29. 2450 Concrete maxima (Processor Coucal) 29. 2451 Concrete maxima (Processor Coucal) 29. 2452 Concrete maxima (Processor Coucal) 29. 2453 Concrete maxima (Processor Coucal) 29. 2454 Concrete maxima (Processor Coucal) 29. 2457 Concrete maxima (Processor Coucal) 29. 2458 Concrete maxima (Processor Coucal) 29. 2459 Concrete maxima (Processor Coucal) 29. 2450 Concrete maxim	1.	24559	Acanthagenys rufogularis (Spiny-cheeked Honeyeater)			
4. 25917 Anytomia attesta (Chited Grasswere) 5. 24316 Aras sportious (Parket Bock Duck) 6. 25870 Anthus existed (Autorities Pipt) 7. 25854 Agus peoficias (Fini-fielded Saint) 8. 24285 Aquis peoficias (Fini-fielded Saint) 9. 24391 Article paoficia (Fini-fielded Saint) 10. 24610 Article statistic (Autorities Pipt) 11. 25866 Article paoficia (White-necked Henry) 11. 25866 Article paoficia (White-necked Henry) 12. 24455 Article paoficia (White-necked Henry) 13. Barnardius zonarius 14. 24565 Article paoficia (White-necked Woodswellow) 15. 25715 Caedius more (Autorities Chieva) 16. 25716 Caedius reseaugi (Saint) 17. 42576 Caedius reseaugi (Saint) 18. 25716 Caedius reseaugi (Saint) 19. 24650 Caedius reseaugi (Saint) 19. 24650 Caedius reseaugi (Fini-fini-paoficia) 10. 24776 Caedius reseaugi (Fini-fini-paoficia) 10. 24776 Caedius reseaugi (Fini-fini-paoficia) 10. 24776 Caedius reseaugi (Fini-fini-paoficia) 10. 24876 Charadinion werebus (Chieria Plower) 10. 24876 Charadinion reseaugi (Fini-fini-paoficia) 10. 24876 Charadinion reseaugi (Fini-fini-paoficia) 10. 24876 Charadinion reseaugi (Fini-fini-paoficia) 10. 248776 Charadinion reseaugi (Fini-fini-paoficia) 10. 248777 Caedius reseaugi (Spotted Herrier) 10. 24877 Caedius reseaugi (Spotted Herrier) 10. 24878 C	2.	25535	Accipiter cirrocephalus (Collared Sparrowhawk)			
5. 24316 Amas supercitiosa (Product Black Couch) 5. 124507 Affitus australia (Australian District) 7. 25554 Aguis apacificus (Froir-tailed Swift, Practific Swift) 8. 24255 Aguis autorix (Videopt-allied Esple) 9. 24241 Ariesta ganifica (Wither-encled Ferrori) 10. 24310 Artentas australia (Australian Bustard) 11. 22455 Affanus australia (Australian Bustard) 11. 24556 Affanus crinerius (Black-Rechel Woodswallow) 12. 24355 Affanus arminor (Little Woodswallow) 13. Barnardias connius 14. 24359 Burhnus gralianus (Suban Stone-curlen) 15. 25710 Caratias aranjurinae (Little Corolla) 16. 25710 Caratias aranjurinae (Little Corolla) 17. 42500 Centropus phasianius (Pressant Coucal) 18. 25800 Centropus phasianius (Pressant Coucal) 18. 25800 Centropus phasianius (Pressant Coucal) 19. 24636 Centropus phasianius (Pressant Coucal) 24. 24737 Caradias veredus (Onendel Prover) 20. 24737 Caradias veredus (Onendel Prover) 21. 24431 Chrysococyr Abasia (Froireidris' Bronze Cucko) 22. 24280 Circus assamilis (Spoted Harrier) 23. 25675 Calluricincis harminosias (Gey Shrine-thrush) 24. 24581 Coucan amarina (Circus Cuckoo artirke) 25. 25686 Caradian novaeholisindiae (Slack-Rieced Cuckoo-artirke) 26. 24481 Corus bannatis (Circus Cuckoo artirke) 27. 25693 Corus orus (Torossan Cron) 28. 25701 Cottums phasian (Froireidris Prove Cuckoo) 29. 24490 Croccus arimina (Sieud Cuckoo-artirke) 30. 25697 Diacetus minum (Circus Cuckoo artirke) 31. 25697 Diacetus minum (Circus Cuckoo artirke) 32. 25698 Corus orus (Torossan Cron) 33. Egyratia novaeholisindiae (Slack-Rieced Cuckoo-artirke) 34. 24737 Esplomina minumos (Slack-Gronted Dotterel) 35. 24837 Esplomina minumos (Slack-Gronted Dotterel) 36. 24837 Esplomina minumos (Slack-Gronted Dotterel) 37. Esplophus restricapillus 38. 24870 Esplomina minumos (Slack-Gronted Dotterel) 39. 24830 Circus artir (Sjorited Froire) 40. 24858 Esplomina phasian (Sjorited Rightyl) 41. 25693 Falco Inoquentica (Martiria Ricotori) 42. 24847 Falco beringer (Black-Falcon) 43. 25695 Falco Inoquenius (Magnie etris) 44. 25695 Falco Inoq	3.	25536	Accipiter fasciatus (Brown Goshawk)			
6	4.	25647	Amytornis striatus (Striated Grasswren)			
1.	5.	24316	Anas superciliosa (Pacific Black Duck)			
8. 24285 Aquita auxtlar (Wedys-Tailed Egyle) 9. 24311 Adresia pacifica (White-necked Heron) 10. 24310 Adresia auxtlaria (Austlaina Bustard) 11. 22566 Artamus cineraus (Black-flaced Woodsvallow) 12. 24355 Artamus mori (Line Woodsvallow) 13. Barnardius zonarius 14. 4. 24355 Burhums mori (Line Woodsvallow) 15. 25716 Cacatus gradinus (Gulath) 16. 25716 Cacatus gradinus (Gulath) 17. 42307 Cacomandris pasilius (Flatid Curkon) 18. 24500 Certropus pasilanius (Flatid Curkon) 19. 24564 Certificity vanegalius (Flatid Curkon) 19. 24565 Chardrius pasilius (Flatid Curkon) 19. 24565 Chardrius pasilius (Flatid Curkon) 19. 24565 Chardrius vereaus (Oriental Plover) 20. 24376 Chardrius vereaus (Oriental Plover) 21. 24451 Chrysococcyx basalis (Fletid Floreyester) 22. 24285 Circus assamiliu (Spotder Harrier) 23. 25675 Collicionich harminica (Egiles-flaced Curkon-shrike) 24. 24361 Coracina maxima (Ground Curkon-shrike) 25. 25586 Coracinoch harminica (Egiles-flaced Curkon-shrike) 26. 24410 Corous maxima (Ground Curkon-shrike) 27. 25595 Corus con un (Torresian Croxiv) 28. 25701 Columis yasilophora (Brown Qual) 29. 24402 Cracinoch amprojulias (Flate Bulkerheird) 30. 25595 Cracinos Riberta Australian Magnie) 31. 25547 Daciel leachir (Blue-winged Flooksburra) 32. 25707 Dickeuwn humstanceum (Maletechira) 33. Egyetta novembollandine 24. 24351 Enbelman technor (Curinan Charle) 34. 24370 Epileminia carter (Spotler-Brich) 35. 47372 Elseyomis melenoga (Black-fronted Dotterel) 36. 24373 Erminian stocker (Cirman Charle) 37. Eolophus rasecagalius 38. 24370 Ephlaminian stocker (Cirman Charle) 39. 24337 Emelminian stocker (Cirman Charle) 40. 24495 Flato berigora subsp. berigora (Brown Falcon) 41. 25621 Falco berigora (Brown Falcon) 42. 24471 Falco berigora (Brown Falcon) 43. 25622 Falco tongpernia (Australian Holphy) 44. 25623 Falco berigora (Brown Falcon) 45. 24404 Ceroplas striata (Esten Dove) 46. 24407 Falco subngar (Back-Falcon) 47. 24401 Geogles striata (Esten Dove) 48. 25636 Geogles striata (Esten Dove) 48. 24408 Falco barogar (Brown Falcon)	6.	25670	Anthus australis (Australian Pipit)			
9. 24341 Ardea pacifica (Whith-mecked Henror) 10. 24610 Ardeolds australis (Australian Bustard) 11. 25660 Artamus cinerous (Black-Read Woodswallow) 12. 24555 Artamus minor (Little Woodswallow) 13. Barnardus consanus 14. 24559 Burhnus graitenius (Blast Stone-curlew) 15. 22715 Cacatus readicapilin (Blast Stone-curlew) 16. 25715 Cacatus readicapilin (Blast Stone-curlew) 17. 44307 Cacanomates palidius (Pelad Cuskoo) 18. 25600 Centropus phasianius (Pheasant Coucal) 19. 24560 Centropus phasianius (Pheasant Coucal) 19. 24570 Charadus verdius (Portatel Power) 20. 24573 Charadus verdius (Portatel Power) 21. 24510 Cinyanoma verdius (Portatel Power) 22. 24580 Cross scriptilis (Phoratel Power) 23. 25657 Colluironich harmonica (Gray Strike-Trustr) 24. 24581 Cornorian novaeholiandius (Blast-Goode Cuckoo-shrike) 25. 25658 Consus arru (Tornesian Crow) 26. 25710 Columnia positionical (Blast-Goode Cuckoo-shrike) 27. 25593 Consus arru (Tornesian Crow) 28. 25701 Columnia positionical (Blast-Goode Cuckoo-shrike) 29. 24597 Consus prograptius (Pod Bucherbitor) 30. 25595 Cracticus (Blocan (Industrialan Magpie) 31. 25597 Deceloral prograptius (Pod Bucherbitor) 33. Egrata concerbili (Blast-Wingdoo) 34. Elanus avillaris 35. 4737 Eliseyonia melanops (Black-fonded Dotterel) 36. 2438 Erminoria carten (Spinitex-bird) 37. Elokopius rose-capillus 38. Egrata concerbili (Blast-Wingdoo) 39. 2439 Ferminoria carten (Spinitex-bird) 40. 24497 Falco borigora usbas heropro (Roum Falcon) 41. 25201 Falco bengora (Boom Falcon) 42. 2441 Falco bengora (Boom Falcon) 43. 25202 Falco concripcous (Australian Kestre) 44. 25202 Falco concripcous (Australian Kestre) 45. 24401 Geogeles plumifer (Spinitex-Rignon) 46. 24401 Geogeles plumifer (Spinitex Pigenn) 47. 24401 Geogeles striats (Zelbe Doyle)	7.	25554	Apus pacificus (Fork-tailed Swift, Pacific Swift)		IA	
10, 24610 Arteroits australis (Autoralian Bustard)	8.	24285	Aquila audax (Wedge-tailed Eagle)			
11	9.	24341	Ardea pacifica (White-necked Heron)			
12. 24355 Arfamus minor (Little Woodswallow)	10.	24610	Ardeotis australis (Australian Bustard)			
13. Barnardius zonarius 14. 24359 Burhinus grailanus (Bush Stone-curlew) 15. 25715 Gazetus aesiegulia (Galah) 16. 25716 Gazetus aesiegulia (Galah) 17. 42307 Gazenus fispallusia (Fillad Cuckoo) 18. 25900 Certropus phasianius (Pheasant Coucar) 19. 24566 Certhiopus phasianius (Pheasant Coucar) 19. 24562 Certhiopus phasianius (Pheasant Coucar) 19. 24562 Certhiopus phasianius (Pheasant Coucar) 19. 24563 Certhiopus (Phasiant Coucar) 10. 24718 Charadrius veredus (Chertal Plover) IA 11. 24431 Chryacoccyx basalis (Hordifeld's Branze Cuckoo) 22. 24780 Circus assimilis (Spotch Harrier) 23. 25575 Colludinical harmonica (Grey Shrike-thrusth) 24. 24361 Coracina maxima (Granze Cuckoo) 25. 25566 Coracina novaehollandiae (Black-faced Cuckoo-shrike) 26. 24416 Corvus bennetit (Liftle Crow) 27. 2553 Coracina novaehollandiae (Black-faced Cuckoo-shrike) 28. 25701 Cotumis ypsilopana (Brown Quali) 29. 24420 Cracticus principalier (Plade Butcherbriot) 20. 25955 Cracticus bibera (Australian Magpie) 31. 25547 Daecie leachif (Black-faced Kolabourn) 32. 25070 Dicamen Invalinacieum (Midstecberiot) 33. Egretia novaehollandiae 34. 25087 Elevyminis melanogis (Black-fonned Doterel) 36. 24531 Emblema pictum (Plainted Finch) 37. Eclophus rosaicapilus 41. 25521 Falco berigora subsp. berigora (Brown Falcon) 42. 24471 Falco berigora subsp. berigora (Brown Falcon) 43. 24592 Fallos perigora (Brown Falcon) 44. 24592 Fallos perigora (Brown Falcon) 45. 24594 Falco perigora subsp. berigora (Brown Falcon) 46. 24496 Falco perigora subsp. berigora (Brown Falcon) 47. 24401 Geopelia curiata (Cabra Dove) 48. 24595 Geopelia curiata (Cabra Dove) 49. 24440 Geopelia curiata (Cabra Dove) 49. 24440 Geopelia curiata (Cabra Dove) 49. 24440 Geopelia curiata (Cabra Dove) 49.	11.	25566	Artamus cinereus (Black-faced Woodswallow)			
14. 2435 Burhinus grallarius (Bush Stone-curlew) 15. 25716 Cacatus rosaicapila (Galah) 16. 25716 Cacatus anguine (Little Corolls) 17. 42307 Cacomanits pallidus (Pallid Cuckoo) 18. 26500 Centropus phalaininus (Piellid Cuckoo) 19. 2456 Certhionyx variagatus (Piellid Cuckoo) 19. 2458 Charadix veedus (Great Plover) 20. 24378 Charadix veedus (Great Plover) 21. 2431 Chrysacoccyx basalis (Horsfield's Bronze Cuckoo) 22. 24369 Circus assimilis (Spotted Harrier) 23. 25675 Collinionich harmonica (Grey Shrife-thrush)) 24. 24361 Caracina maxima (Ground Cuckoo-shrike) 25. 25588 Corrais noverholandied (Black-faced Cuckoo-shrike) 26. 24410 Convus bennetti (Little Crow) 27. 25593 Convus orru (Torosaian Crow) 28. 25701 Cutumix yasilophora (Brown Quall) 29. 24420 Cradicus ingragularis (Pield Butcherbridy) 30. 25595 Caracina maxima (Blau-winged Kookaburra) 31. 25597 Dacolio laachii (Blau-winged Kookaburra) 32. 25697 Dacolio laachii (Blau-winged Kookaburra) 33. Egreta novaeholandiee 34. 25691 Seprium indennopus (Black-fronted Dotterer) 36. 24631 Embema pictum (Parited Finch) 37. Colophus roseicapilius 38. 24670 Epthianura tricolor (Grimson Chat) 39. 24832 Fermonius carteri (Spinice-bird) 40. 24388 Eurostopodus argus (Spotted Nightjar) 41. 25621 Falco berigora (Brown Falcon) 42. 24417 Falco berigora (Brown Falcon) 43. 25692 Falco centroridos (Australian Kaster, Nankeer Kestral) 44. 25623 Falco centroridos (Rustralian Kaster, Nankeer Kestral) 45. 25624 Falco pergenius (Perprine Falcon) 46. 24467 Falco berigora (Brown Falcon) 47. 24461 Geopolia curreata (Dimmor Dove) 48. 25655 Geopolia straita (Zebra Dove) 49. 24464 Geopolia straita (Zebra Dove) 49. 24469 Hieraestus morphnoides (Little Eagle)	12.	24355	Artamus minor (Little Woodswallow)			
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16. 25716 Cacatus asaquinea (Little Corella) 17. 42307 Cacomantis pallidus (Pallid Cuckoo) 18. 25600 Centropus phasianius (Pheasant Coucal) 19. 24546 Carthionyx variegatus (Pied Honeyeater) 20. 24578 Charadrius veredus (Priental Pioven) 21. 24371 Chrysococcyx basalis (Horsfield's Bronze Cuckoo) 22. 24289 Circus assimilis (Spotted Harrier) 23. 25675 Coulincinela harmonica (Grey Shrike-Intrush) 24. 24311 Coracina maximia (Ground Cuckoo-shrike) 25. 25685 Coracina novaeholianida (Black-Areae Cuckoo-shrike) 26. 24416 Corvus bennetti (Little Crow) 27. 25593 Corvus orus (Torresian Crow) 28. 25701 Coutrus yasilophone (Brown Quali) 29. 24420 Craciticus nigropularis (Pied Butcherbird) 30. 25595 Craciticus titicen (Australian Magpie) 31. 25547 Dacielo leachii (Blue-Winged Kookabura) 32. 25607 Dicaeum hirundinaceum (Mistlecebird) 33. Egretta novaeholiandie 34. Elanus axillaris 35. 47337 Elseyomis melanops (Black-fronted Dotterel) 36. 24331 Emblema pictum (Painted Finch) 37. Eolophus roseicapillus 38. 24570 Ephimaru tricolor (Crimson Chat) 39. 24337 Erremiomis carteri (Spinifex-bird) 40. 24368 Eurostopodus argus (Spotted Nightjar) 41. 25621 Falco benjagon Subp. benjagora (Brown Falcon) 42. 24471 Falco benjagon Subp. benjagora (Brown Falcon) 43. 25622 Falco kongipernis (Australian Hoster) 44. 25623 Falco kongipernis (Australian Hoster) 45. 25625 Falco kongipernis (Australian Hoster) 46. 24475 Esto benjagora (Brown Falcon) 47. 24401 Geopelia striat (Zebra Dove) 48. 25625 Falco kongipernis (Perspinie Falcon) 49. 24403 Geopelia striat (Zebra Dove) 49. 24404 Geopelia striat (Zebra Dove) 50. 24443 Grailina cyanoleuca (Magpie-lark) 51. 47985 Hieraedus morphnoides (Little Eagle)	14.	24359	Burhinus grallarius (Bush Stone-curlew)			
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18	16.	25716	Cacatua sanguinea (Little Corella)			
18	17.	42307	Cacomantis pallidus (Pallid Cuckoo)			
19. 24504 Certhionyx variegatus (Pied Noneyester) 20. 2437 Charadrius veredus (Oriental Plover) 21. 24431 Chrispococcyx basalis (Horsfields Broze Cuckoo) 22. 24299 Circus assimilis (Spotted Harrier) 23. 25675 Colluricincia harmonica (Grey Shrike-thrush) 24. 24381 Coracina maxima (Ground Cuckoo-shrike) 25. 25588 Coracina noveshollandiae (Black-faced Cuckoo-shrike) 26. 24410 Corvus bennetit (Little Cruw) 27. 2593 Corvus orru (Torresian Crow) 28. 25701 Columnix yasilophora (Brown Quali) 29. 24420 Cracicus singogularis (Pied Butchebird) 30. 25595 Cracicus tibicen (Australian Magpie) 31. 25547 Dacedie radicus (Pied Butchebird) 32. 25607 Dicaeum hiturdinareum (Mistletebehrd) 33. Egreta novaehollandiae 34. Elarus axillaris 35. 47937 Elseyomis melanops (Black-fronted Dotterel) 36. 2431 Emblema pictum (Painted Finch) 37. Elopohus roseicagilus 38. 24570 Epthianura tricolor (Crimson Chat) 39. 24387 Eremiomis carteri (Spinflex-hird) 40. 24368 Eurostopodus arque (Spotted Nightar) 41. 25621 Falco berigora subsp. berigora (Brown Falcon) 42. 24417 Falco berigora subsp. berigora (Brown Falcon) 43. 25622 Falco cenchroides (Lustralian Hobby) 44. 25633 Falco longipernis (Australian Hobby) 45. 25624 Falco peregrinus (Peregrine Falcon) 47. 24401 Geopelia strate (Spinflex-hirdon) 48. 25655 Geopelia strate (Spinflex-Pigeon) 59. 24430 Geophaps plumifera (Spinflex Pigeon) 50. 24443 Grallina cyanolouca (Magpie-lark) 51. 24295 Halestur sphermurs (Wistilian Krite) 51. 24295 Halestur sphermurs (Wistilian Krite) 52. 47965 Hirasetus morphonides (Little Eagle)	18.	25600	Centropus phasianinus (Pheasant Coucal)			
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53. 25661 Lichmera indistincta (Brown Honeyeater) 54. 25651 Malurus lamberti (Variegated Fairy-wren) 55. 25652 Malurus lamberti (White-winged Fairy-wren) 56. 24583 Manorina flavigula (Yellow-throated Miner) 57. 47997 Melanodryas cucullata (Hooded Robin) 58. 25665 Mellithreptus guilaris (Black-chinned Honeyeater) 59. 24736 Melopsitacus undulatus (Budgerigar) 60. 24598 Merops ornatus (Rainbow Bee-eater) 61. 25542 Milwus migrans (Black Krile) 62. 24742 Nymphicus hollandicus (Cockatlel) 63. 24407 Ocyphago lophotes (Crested Pigeon) 64. 24613 Orecine gutturalis (Crested Bellibrid) 65. 25680 Pachycephala rufiventris (Rufous Whistler) 66. 24627 Pardalotus rubricaus (Rec-howed Pardalote) 67. 48060 Petrochelidon ariei (Fairy Martin) 68. 43061 Petrochelidon ariei (Fairy Martin) 69. 24499 Phags chalcoptera (Common Bronzewing) 70. 25721 Platycercus zonarius (Grey-crowned Babbler) 71. 25705 Pomatostomus temporalis (Grey-crowned Babbler) 72. 25705 Pomatostomus temporalis (Grey-crowned Babler)		Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
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68. 48061 Petrochelidon nigricans (Tree Martin) 69. 24409 Phaps chalcoptera (Common Bronzewing) 70. 25721 Platycercus zonarius (Australian Ringneck, Ring-necked Parrot) 71. 25703 Podargus strigoides (Tawny Frogmouth) 72. 25706 Pomatostomus temporalis (Grey-crowned Babbler) 73. Ptilonorhynchus guttatus 74. 25614 Rhipidura leucophrys (Willie Wagtail) 75. 24454 Rhipidura leucophrys subsp. leucophrys (Willie Wagtail) 76. 25705 Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe) 77. 30870 Taeniopygia guttata (Zebra Finch) 78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)	66.	24627	Pardalotus rubricatus (Red-browed Pardalote)			
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70. 25721 Platycercus zonarius (Australian Ringneck, Ring-necked Parrot) 71. 25703 Podargus strigoides (Tawny Frogmouth) 72. 25706 Pomatostomus temporalis (Grey-crowned Babbler) 73. Ptilonorhynchus guttatus 74. 25614 Rhipidura leucophrys (Willie Wagtail) 75. 24454 Rhipidura leucophrys subsp. leucophrys (Willie Wagtail) 76. 25705 Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe) 77. 30870 Taeniopygia guttata (Zebra Finch) 78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)	68.	48061	Petrochelidon nigricans (Tree Martin)			
71. 25703 Podargus strigoides (Tawny Frogmouth) 72. 25706 Pomatostomus temporalis (Grey-crowned Babbler) 73. Ptilonorhynchus guttatus 74. 25614 Rhipidura leucophrys (Willie Wagtail) 75. 24454 Rhipidura leucophrys subsp. leucophrys (Willie Wagtail) 76. 25705 Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe) 77. 30870 Taeniopygia guttata (Zebra Finch) 78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)		24409	Phaps chalcoptera (Common Bronzewing)			
72. 25706 Pomatostomus temporalis (Grey-crowned Babbler) 73. Ptilonorhynchus guttatus 74. 25614 Rhipidura leucophrys (Willie Wagtail) 75. 24454 Rhipidura leucophrys subsp. leucophrys (Willie Wagtail) 76. 25705 Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe) 77. 30870 Taeniopygia guttata (Zebra Finch) 78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)		25721	Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)			
73. Ptilonorhynchus guttatus 74. 25614 Rhipidura leucophrys (Willie Wagtail) 75. 24454 Rhipidura leucophrys subsp. leucophrys (Willie Wagtail) 76. 25705 Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe) 77. 30870 Taeniopygia guttata (Zebra Finch) 78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)		25703	Podargus strigoides (Tawny Frogmouth)			
74. 25614 Rhipidura leucophrys (Willie Wagtail) 75. 24454 Rhipidura leucophrys subsp. leucophrys (Willie Wagtail) 76. 25705 Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe) 77. 30870 Taeniopygia guttata (Zebra Finch) 78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)	72.	25706	Pomatostomus temporalis (Grey-crowned Babbler)			
75. 24454 Rhipidura leucophrys subsp. leucophrys (Willie Wagtail) 76. 25705 Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe) 77. 30870 Taeniopygia guttata (Zebra Finch) 78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)	73.		Ptilonorhynchus guttatus			
76. 25705 Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe) 77. 30870 Taeniopygia guttata (Zebra Finch) 78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)	74.	25614	Rhipidura leucophrys (Willie Wagtail)			
77. 30870 Taeniopygia guttata (Zebra Finch) 78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)	75.	24454	Rhipidura leucophrys subsp. leucophrys (Willie Wagtail)			
78. 24845 Threskiornis spinicollis (Straw-necked Ibis) 79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)	76.	25705	Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)			
79. 42351 Todiramphus pyrrhopygius (Red-backed Kingfisher) 80. 25549 Todiramphus sanctus (Sacred Kingfisher)	77.	30870	Taeniopygia guttata (Zebra Finch)			
80. 25549 Todiramphus sanctus (Sacred Kingfisher)	78.	24845	Threskiornis spinicollis (Straw-necked Ibis)			
	79.	42351	Todiramphus pyrrhopygius (Red-backed Kingfisher)			
81. 24851 Turnix velox (Little Button-quail)						
	81.	24851	Turnix velox (Little Button-quail)			

Conservation Codes

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





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



Created By Andre Schmitz on 30/03/2017

Current Names Only Yes Core Datasets Only Yes Species Group Reptiles

Aroa (ha)

Method 'By Circle'

Centre 118° 55' 17" E,21° 00' 48" S

125622.02

Area (na)		123022.02
Taxa:	Naturalised	0
	Native	60
Endemics:		0
Families:		9
Genera:		29
Conservation Status:	-	59
	T	1
MS Status:	-	60
Rank:	-	51
	subsp.	9

Top Ten Families			Top Ten Genera		
	Species	Records		Species	Records
1. Scincidae	24	250	1. Ctenotus	10	98
2. Agamidae	7	26	2. Ctenophorus	5	21
3. Diplodactylidae	7	46	3. Varanus	5	19
4. Pygopodidae	5	12	4. Lerista	5	73
5. Varanidae	5	19	5. Delma	3	5
6. Elapidae	5	10	6. Pseudonaja	2	3
7. Gekkonidae	3	54	7. Antaresia	2	3
8. Boidae	3	4	8. Gehyra	2	29
9. Carphodactylidae	1	1	9. Carlia	2	17
			10. Cyclodomorphus	2	4

Endemic To Query Area

Name ID Species **Conservation Status**

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

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







Created By Andre Schmitz on 29/03/2017

Current Names Only Yes

Core Datasets Only Yes

Species Group Reptiles

Method 'By Circle'

Centre 118° 55' 17" E,21° 00' 48" S

Buffer 20km

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
1.	30833	Amphibolurus longirostris (Long-nosed Dragon)			
2.	25318	Antaresia perthensis (Pygmy Python)			
3.	25448	Antaresia stimsoni (Stimson's Python)			
4.	25331	Brachyurophis approximans (North-western Shovel-nosed Snake)			
5.	25015	Carlia munda (Shaded-litter Rainbow Skink)			
6.	25017	Carlia triacantha (Desert Rainbow Skink)			
7.	25456	Crenadactylus ocellatus (Clawless Gecko)			
8.	25458	Ctenophorus caudicinctus (Ring-tailed Dragon)			
9.	24865	Ctenophorus caudicinctus subsp. caudicinctus (Ring-tailed Dragon)			
10.	25459	Ctenophorus isolepis (Crested Dragon, Military Dragon)			
11.	24876	Ctenophorus isolepis subsp. isolepis (Crested Dragon, Military Dragon)			
12.	24882	Ctenophorus nuchalis (Central Netted Dragon)			
13.	25036	Ctenotus duricola			
14.	25039	Ctenotus fallens			
15.	25462	Ctenotus grandis			
16.	25043	Ctenotus grandis subsp. titan			
17.	25045	Ctenotus helenae			
18.	25052	Ctenotus leonhardii			
19.	25463	Ctenotus pantherinus (Leopard Ctenotus)			
20.	25064	Ctenotus pantherinus subsp. ocellifer (Leopard Ctenotus)			
21.	25072	Ctenotus rubicundus			
22.	25073	Ctenotus saxatilis (Rock Ctenotus)			
23.	25466	Cyclodomorphus melanops (Slender Blue-tongue)			
24.	25090	Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue)			
25.	24998	Delma elegans			
26.	25002	Delma pax			
27.	25004	Delma tincta			
28.	24926	Diplodactylus conspicillatus (Fat-tailed Gecko)			
29.	24944	Diplodactylus savagei (Southern Pilbara Beak-faced Gecko)			
30.	42402	Diporiphora vescus (Northern Pilbara Tree Dragon)			
31.	25301	Furina ornata (Moon Snake)			
32.	24958	Gehyra punctata			
33.		Gehyra variegata			
34.		Heteronotia binoei (Bynoe's Gecko)			
35.	25125	Lerista bipes			
36.		Lerista clara			
37.		Lerista jacksoni			
38.	25155	Lerista muelleri			
39.		Lerista verhmens			
40.		Lialis burtonis			
41.		Liasis olivaceus subsp. barroni (Pilbara Olive Python)		Т	
42.		Lucasium stenodactylum			
43.		Lucasium wombeyi			
44.		Menetia greyii			
45.		Morethia ruficauda			
46.		Morethia ruficauda subsp. exquisita			
47.		Nephrurus levis subsp. pilbarensis			
48.		Proablepharus reginae			
49.		Pseudonaja modesta (Ringed Brown Snake)			
50.		Pseudonaja nuchalis (Gwardar, Northern Brown Snake)			
51.		Pygopus nigriceps Phymphodus grants (Mastern Booked Cooke)			
52.	∠4982	Rhynchoedura ornata (Western Beaked Gecko)			
				Description of the second	PESTEN ANSTRAL





	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
53.	24927	Strophurus elderi			
54.	25202	Tiliqua multifasciata (Central Blue-tongue)			
55.	25209	Varanus acanthurus (Spiny-tailed Monitor)			
56.	25210	Varanus brevicauda (Short-tailed Pygmy Monitor)			
57.	25218	Varanus gouldii (Bungarra or Sand Monitor)			
58.	25223	Varanus panoptes subsp. rubidus			
59.	25224	Varanus pilbarensis (Pilbara Rock Monitor, Northern Pilbara Rock Goanna)			
60.	25311	Vermicella snelli			

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





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



Created By Andre Schmitz on 29/03/2017

Current Names Only Yes Core Datasets Only Yes Species Group Amphibians

Method 'By Circle'

Centre 118° 55' 17" E,21° 00' 48" S

Buffer 20km

Conservation Code ¹Endemic To Query Area Name ID Species Name Naturalised

25445 Uperoleia russelli (Northwest Toadlet)

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

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



APPENDIX H SIGNIFICANT FAUNA RECORDS. NATUREMAP - DCBA DATABASE

Summary of conservation significant fauna records from DPAW Threatened and Priority Species Database

Common Name	Species	WA Status	EPBC Act Status	Records	Latest Record
Fork-tailed Swift	Apus pacificus	IA	IA	6	2011
Great Egret	Ardea modesta	IA	IA	6	2012
Oriental Plover	Charadrius veredus	IA	IA	1	1999
Peregrine Falcon	Falco peregrinus	OS		1	2002
Rainbow Bee-eater	Merops ornatus	IA	IA	84	2016
Striated Grasswren	Amytornis striatus striatus	P4		9	2015
Brush-tailed Mulgara	Dasycercus blythi	P4		13	2013
Ghost Bat	Macroderma gigas	VU	VU	13	2016
Greater Bilby	Macrotis lagotis	VU	VU	8	2015
Long-tailed Dunnart	Sminthopsis longicaudata	P4		2	2011
Northern Quoll	Dasyurus hallucatus	EN	EN	236	2016
Pilbara Leaf-nosed Bat	Rhinonicteris aurantia (Pilbara)	VU	VU	114	2016
Spectacled Hare-wallaby	Lagorchestes conspicillatus	Р3		137	1996
Western Pebble-mound Mouse	Pseudomys chapmani	P4		26	2015
Pilbara Olive Python	Liasis olivaceus barroni	VU	VU	23	2015

APPENDIX I RELEVE SITE DATA

Site R1

Shaun Grein (SBG) Botanist 05/09/2017 Date

Quadrat Size Releve

51J 677127E; 7662854N **NW Corner Coordinates**

Stony Plain Landform Slope & Aspect Negligible Soil Group Loamy Soil Colour Brown Soil Texture Clay Loam

Rock Size and Abundance quartz cobbles (64-256 mm) - numerous (>40%)

Vegetation Condition Very Good

Disturbance Type road edge effects, weeds, rubbish disturbance

Time since Fire +5 years **Leaf Litter Distribution and Cover** Low <10%

Structural Description

Acacia ancistrocarpa and Acacia orthocarpa tall open shrubland over Triodia epactia hummock grassland



Stratum	Taxon	% Cover
Tree (<10 m)	Corymbia hamersleyana	<1
Shrub (1-2 m)	Acacia ancistrocarpa	1
Shrub (1-2 m)	Acacia orthocarpa	1
Shrub (1-2 m)	Acacia monticola	<1
Shrub (1-2 m)	Acacia inaequilatera	<1
Shrub (1-2 m)	Acacia bivenosa	<1
Shrub (1-2 m)	Acacia stellaticeps	<1
Shrub (1-2 m)	Acacia tumida	<1
Shrub (1-2 m)	Grevillea wickhamii	<1
Shrub (1-2 m)	Hakea lorea	<1
Shrub (0-1 m)	*Aerva javanica	<1
Shrub (0-1 m)	Corchorus parviflorus	<1
Shrub (0-1 m)	Gomphrena cunninghamii	<1
Shrub (0-1 m)	Goodenia muelleriana	<1
Shrub (0-1 m)	Ptilotus astrolasius	<1

Stratum	Taxon	% Cover
Shrub (0-1 m)	Ptilotus nobilis	<1
Shrub (0-1 m)	Senna notabilis	<1
Shrub (0-1 m)	Tephrosia rosea var. clementii	<1
Grass	Eriachne pulchella subsp. dominii	<1
Grass	Triodia epactia	80
Herb	*Aerva javanica	<1
Herb	Cleome viscosa	<1
Herb	Gomphrena cunninghamii	<1
Herb	Goodenia muelleriana	<1
Herb	Maireana georgei	<1
Herb	Ptilotus axillaris	<1
Herb	Ptilotus astrolasius	<1
Herb	Ptilotus calostachyus	<1
Herb	Solanum lasiophyllum	<1

Site R2

BotanistShaun Grein (SGB)Date5/09/2017

Quadrat Size Releve

NW Corner Coordinates 51J 677250E; 7662825N Landform Stony Plain /Sandy Plain

Slope & AspectNegligibleSoil GroupStony and SandySoil ColourRed BrownSoil TextureSandy Loam

Rock Size and Abundance Pebbles (2-64 mm) - few (10-30%)

Vegetation Condition Very Good

Disturbance Type No obvious disturbance

Time since Fire +5 years Leaf Litter Distribution and Cover Low <10%

Structural Description

Acacia inaequilatera, Acacia acradenia and Corchorus parviflorus open shrubland over Triodia epactia open hummock grassland.



Stratum	Taxon	% Cover
Shrub (1-2 m)	Acacia ancistrocarpa	1
Shrub (1-2 m)	Acacia inaequilatera	<1
Shrub (1-2 m)	Hakea lorea	<1
Shrub (0-1 m)	Corchorus parviflorus	<1
Shrub (0-1 m)	Cullen cinereum	<1
Shrub (0-1 m)	Salsola australis	<1
Shrub (0-1 m)	Senna glutinosa subsp. glutinosa	<1
Shrub (0-1 m)	Senna notabilis	<1
Shrub (0-1 m)	Triumfetta ramosa	<1
Grass	Triodia epactia	60
Grass	Triodia wiseana	5
Grass	Aristida holathera var. holathera	1
Herb	Goodenia muelleriana	<1
Herb	Ptilotus astrolasius	<1
Herb	Ptilotus axillaris	<1

Stratum	Taxon	% Cover
Herb	Ptilotus calostachyus	<1
Herb	Ptilotus nobilis subsp. nobilis	<1
Herb	Streptoglossa odora	<1
Herb	Solanum lasiophyllum	<1