



# **Norton Gold Fields Ltd, Paddington Operations**

Golden Flag Project  
Level 1 Flora and Fauna Assessment

December 2012



# Executive summary

GHD Pty Ltd (GHD) were commissioned by Norton Gold Fields Ltd Paddington Operations (Paddington) to undertake a spring Level 1 Flora and Fauna Assessment for their Golden Flag Project.

The findings of the flora and vegetation survey and fauna assessment are summarised below:

- The project area is located in the Eastern Goldfields sub-region of the Coolgardie bioregion as described by the Interim Biogeographic Regionalisation of Australia (IBRA).
- A search of the Landgate WA Atlas Shared Land Information Platform (SLIP) (Landgate, 2012) identified no environmentally sensitive areas within 10 km of the project area but did report on two Schedule 1 areas within 10 km of the site. (Figure 1, Appendix A)
- Broadscale vegetation mapping of the area undertaken by Beard (1979) indicates three vegetation associations are present in the project area. Based on the current extent of vegetation associations, all the Beard associations are classified as *Least Concern*.
- A search of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters database revealed no Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) within 10 km of the project area.
- Eight vegetation associations (including two cleared/highly disturbed categories) were described within the project area during the October 2012 survey. These vegetation associations are all well represented in the local area and broader region.
- The vegetation condition of the project area was rated as *Very Good* (3) through to *Completely Degraded* (6). The majority of the project area was rated as *Very Good* with the southern section of the site rated as *Degraded*.
- A total of 130 plant taxa (including subspecies and varieties) representing 26 families and 67 genera were recorded in the project area. This total comprised 119 native species and 11 introduced species.
- No Threatened Flora as recognised by the EPBC Act and the State *Wildlife Conservation Act 1950* (WC Act) were recorded within the project area.
- One Priority flora species, *Ptilotus chortophytus* (Priority 1), as listed by the Department of Environment and Conservation (DEC) was recorded within the project area. It is recommended that Paddington consider a targeted survey for this flora species.
- Four types of fauna habitat were identified within the project area: aquatic, rocky outcrops, mixed chenopod shrublands and mixed eucalyptus woodlands.
- A total of 53 fauna taxa were recorded within the project area during the survey, this included: 37 birds, nine reptiles, six mammals and one frog.
- Desktop investigations reported nine conservation significant fauna species as potentially occurring within the project area. One DEC listed priority fauna species, *Ardeotis australis* (Australian Bustard) was observed within the project area during the survey.
- This Project has been assessed against the Ten Clearing Principles and it is considered not or unlikely to be at variance with any of the principles.

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.5 and the assumptions and qualifications contained throughout the Report

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# 1. Introduction

## 1.1 Background

Norton Gold Fields Ltd Paddington Operations (Paddington) has commissioned GHD Pty Ltd (GHD) to undertake a spring Level 1 Flora and Fauna Assessment for their Golden Flag Project ('project area'). Golden Flag is considered a relatively shallow potential open cut resource within the Mount Pleasant project area associated with Paddington.

## 1.2 Project area

Golden Flag is located 19 kilometres (km) west of the Paddington Mill. The project area is approximately 328 hectares (ha) in size and is heavily disturbed by several existing access tracks.

The location of the project area is shown in Figure 1 (Appendix A).

## 1.3 Scope of works

This flora and fauna assessment includes both desktop and field assessments. The scope of works, as per the GHD proposal was to:

- Conduct an initial desktop assessment to determine in broad detail the environmental value and any potential issues in relation to the project area;
- Undertake a Level 1 spring flora and vegetation survey of the project area to provide and present:
  - an inventory of vascular plant species (native and introduced);
  - the presence and location of any observed Threatened (Declared Rare) and Priority Flora species;
  - a description and map of the vegetation types/communities observed; and
  - a rating of condition of the vegetation types/communities observed.
- Undertake a Level 1 fauna assessment of the project area to provide and present:
  - an inventory of the vertebrate fauna species through opportunistic recording of species. The project area will also be searched for tracks, scats, bones, diggings and feeding areas;
  - the presence and location of existing and potential habitat trees;
  - the presence of pest, declared or feral animals; and
  - a description and map of fauna habitat types, including identification of habitat availability for conservation significant fauna species.
- An assessment of the project area against the ten clearing principles. Each principle was assessed in accordance with the Department of Environment and Conservation (DEC) Guideline to Assessment – Clearing of Native Vegetation.

## 1.4 Limitations

This Report has been prepared by GHD for Paddington and may only be used and relied on by Paddington for the purpose agreed between GHD and Paddington as set out in section 1.3 of this Report.

GHD otherwise disclaims responsibility to any person other than Paddington arising in connection with this Report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this Report were limited to those specifically detailed in the Report and are subject to the scope limitations set out in the Report.

The opinions, conclusions and any recommendations in this Report are based on conditions encountered and information reviewed at the date of preparation of the Report. GHD has no responsibility or obligation to update this Report to account for events or changes occurring subsequent to the date that the Report was prepared.

The opinions, conclusions and any recommendations in this Report are based on assumptions made by GHD described in this Report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this Report on the basis of information provided by Paddington and desktop database searches, which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the Report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this Report are based on information obtained from representative survey locations. Site conditions at other parts of the site may be different from the site conditions found at the specific survey points. Investigations undertaken in respect of this Report are constrained by the particular site conditions, such as Site access, seasonality and weather. As a result, not all relevant site features and conditions may have been identified in this Report.

Site conditions may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this Report if the site conditions change. GHD accepts no responsibility for any variation in the flora and fauna present at the site due to natural and seasonal variability.

## **1.5 Assumptions**

The assessment is based on the Project footprint provided by Paddington, and shown in Figure 1 (Appendix A). Any changes to the Project, outside the description provided in section 1.2, are beyond the scope of this assessment.

GHD has relied upon external data, namely publicly available database, to identify species previously recorded in the area. The accuracy of this data lies with the provider, not with GHD.



## 2. Methodology

### 2.1 Desktop assessment

A comprehensive desktop review was undertaken prior to commencement of the field survey to identify relevant environmental information pertaining to the project area. This included:

- A review of previous reports carried out within and adjoining the project area, including:
  - Outback Ecology (2004); and
  - Jim's Seeds, Weeds & Trees (2005);
- A review of adjoining land use including conservation reserves or other listed areas and Environmentally Sensitive Areas (ESAs) (DEC 2012b);
- Broad vegetation types shown in existing mapping (e.g. Beard 1979);
- A review of the Department and Environment (DEC) Threatened Ecological Communities (TEC) and Priority Ecological Communities (PEC) databases (DEC 2010, 2011) to determine the potential for TECs or PECs present within the project area;
- A review of the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) Protected Matters database (DSEWPaC 2012c) to identify species or communities listed under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) potentially occurring within the project area and surrounds;
- A search of the DEC *NatureMap* database (DEC 2012c) to determine vertebrate fauna species and flora previously recorded within the project area and surrounds; and

### 2.2 Field assessment

#### 2.2.1 Flora and vegetation

GHD undertook a flora and vegetation assessment of the project area from 2 to 4 October 2012. The survey was undertaken to provide a description of the dominant vegetation types present, vegetation condition and flora species present at the time of the survey.

Field assessment methodology involved meandering transects of the project area on foot to record plant species present (visible) at the time of the survey.

The survey methodology GHD employed was consistent with the Environmental Protection Authority (EPA) guidelines for flora surveys as outlined in *Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA 2004a) and *Terrestrial Biological Surveys as an Element of Biodiversity Protection, Position Statement No. 3* (EPA 2002).

Species that were well known to the survey botanists were identified in the field, while species that were unknown were collected and assigned a unique number to facilitate tracking. Flora species were identified using local and regional flora keys and by comparison with named species held at the Western Australian Herbarium (WA Herbarium). Where necessary flora taxonomists considered to be an authority on a particular flora group were consulted.

The conservation status of all recorded flora taxa was compared against current lists available on *FloraBase* (DEC 2012a) and the EPBC Threatened species database provided by DSEWPaC (2012b).

## Vegetation associations

Vegetation Associations were described based on Specht's (1970) structural formations in Australia with modification by Aplin (1979) and Trudgen (2002).

## Vegetation condition

The vegetation condition of the site was assessed using the vegetation condition rating scale developed by Keighery (1994) that recognises the intactness of vegetation, which is defined by the following:

- Completeness of structural levels;
- Extent of weed invasion;
- Historical disturbance from tracks and other clearing or dumping; and
- Potential for natural or assisted regeneration.

The scale consists of six (6) rating levels as outlined in Table 1.

**Table 1** Vegetation condition rating scale

Condition rating	Vegetation condition	Description
1	<i>Pristine or Nearly So</i>	No obvious signs of disturbance.
2	<i>Excellent</i>	Vegetation structure intact, disturbance affecting individual species, and weeds are non-aggressive species.
3	<i>Very Good</i>	Vegetation structure altered; obvious signs of disturbance.
4	<i>Good</i>	Vegetation structure significantly altered by very obvious signs of multiple disturbances; retains basic vegetation structure or ability to regenerate it.
5	<i>Degraded</i>	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not in a state approaching good condition without intensive management.
6	<i>Completely Degraded</i>	The structure of the vegetation is no longer intact and the area is completely or almost without native species.

### 2.2.2 Fauna and Habitat Assessment

GHD undertook the fauna assessment in conjunction with the flora and vegetation survey. The survey methodology employed by GHD was consistent with the EPA guidelines for fauna surveys as outlined in the *Assessment of Environmental Factors for Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (Guidance Statement No. 56)* (EPA, 2004b).

The assessment comprised the following:

- Opportunistic searching across all habitat types. This ensured the maximum suite of species potentially occurring at the site was observed. This involved searching through

microhabitats including turning over logs or rocks, turning over leaf litter and examining hollow logs;

- Opportunistic visual and aural surveys. This accounted for bird species potentially utilising the project area; and
- Searching for tracks, scats, bones, diggings and feeding areas for both native and feral fauna throughout the project area.

Nomenclature used in this report follows that used by *NatureMap* database (DEC 2012c).

## **2.3 Limitations**

### **2.3.1 Flora and vegetation survey limitations**

Complete flora and vegetation surveys can require multiple surveys, at different times of year, and over a period of a number of years, to enable observation of all species present. Some flora species, such as annuals, are only available for collection at certain times of the year and others are only identifiable at certain times (such as when they are flowering). Additionally, climatic and stochastic events (such as fire) may affect the presence of plant species. Species that have a very low abundance in the area are more difficult to locate, due to above factors.

Flora composition changes over time, with flora species having specific growing periods, especially annuals and ephemerals (some plants lasting for a markedly brief time, some only a day or two). Therefore, the results of future botanical surveys in this location may differ from the results of this survey.

The GHD survey was undertaken in spring (early October) which is considered the dominant flowering period for the Coolgardie bioregion. Furthermore, the field survey occurred during or close to peak flowering period for all conservation significant flora species identified in the desktop search (*NatureMap*), therefore increasing the species visibility and improving the potential of successfully recording them on-site.

### **2.3.2 Fauna survey limitations**

The fauna assessment undertaken was a reconnaissance survey only (level 1) and thus only sampled those species that can be easily seen, heard or have distinctive signs, such as tracks, scats, diggings etc. Many cryptic and nocturnal species would not have been identified during a reconnaissance survey.

The fauna assessment was aimed at identifying habitat types within the project area. In addition, terrestrial vertebrate fauna using the project area were identified. No sampling for invertebrates or aquatic species occurred. The information available on the identification, distribution and conservation status of invertebrates is generally less extensive than that of vertebrate species.

This survey was carried out during only one season and in one year. Complete faunal surveys often require multiple surveys, at different times of year, and over a period of a number of years, to enable full survey of all species present.

# 3. Existing environment

## 3.1 Bioregion

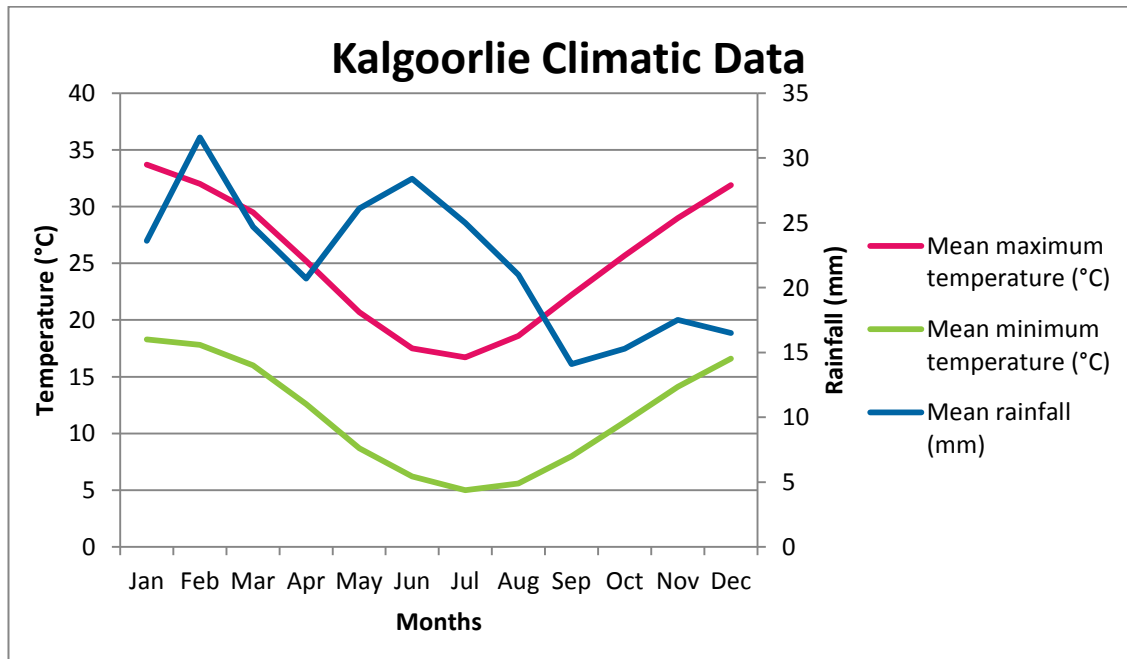
The project area is situated within the Eastern Goldfields sub-region of the Coolgardie bioregion as described by the Interim Biogeographic Regionalisation of Australia (IBRA), (DSEWPaC, 2012a).

The Coolgardie IBRA region is characterised by gently undulating plains and low hills with underlying geology of gneisses and granites, tertiary soils and scattered exposures of bed rock. The vegetation consists of a mosaic of *Acacia*, mallee, samphire and *Dodonaea* shrublands and woodlands. The woodlands in the area have an exceptionally high diversity of *Eucalyptus* species with as many as 170 species occurring in the bioregion (McKenzie *et al.* 2003).

## 3.2 Climate

The Coolgardie bioregion experiences an arid to semi-arid climate with hot, dry summers and mild, wet winters (ANRA 2009). Rainfall is unreliable, tends to be slightly higher during the winter period. Rainfall patterns are typically associated with cold fronts in winter and thunderstorms and rain bearing depressions in summer (McKenzie *et al.* 2003).

The closest official weather recording station to the project area is located at the Kalgoorlie-Boulder Airport (site number: 012038) where climate data is available for the period from 1939 to 2011 (BOM 2012). A summary of the recorded climatic data at the Kalgoorlie-Boulder Airport is presented in Chart 1.



**Chart 1 Climatic data for Kalgoorlie taken from the Bureau of Meteorology (2012)**

## 3.3 Environmentally Sensitive Areas

A search of the Landgate WA Atlas Shared Land Information Platform (SLIP) (Landgate, 2012) identified no environmentally sensitive areas within 10 km of the site. However two Schedule 1 restricted clearing areas were reported to be within 5 km of the site as shown in Figure 1, Appendix A.

## 3.4 Vegetation and flora

### 3.4.1 Broad vegetation types, extent and status

The vegetation within the project area has previously been described by Beard (1979). Beard's mapping indicates that the project area consists of three vegetation associations:

- Bare areas, fresh water lakes (association 125);
- Medium woodland; salmon gum and goldfields blackbutt (association 468) and;
- Succulent steppe with open low woodland; sheoak over saltbush (association 540).

A vegetation type is considered under-represented if there is less than 30% of its original distribution remaining. From a purely biodiversity perspective, and not taking into account any other land degradation issues (such as grazing, altered fire regimes and weeds), there are several key criteria now being applied to vegetation (EPA 2000). These are;

- The "threshold level" below which species loss appears to accelerate exponentially at an ecosystem level is regarded as being at 30% of the pre-European/pre-1750 extent for the vegetation type;
- 10% of the pre-European/pre-1750 extent for the vegetation type is regarded as being a level representing Endangered; and
- Clearing which would put the threat level into the class below (e.g. from depleted to vulnerable) should be avoided.

Vegetation types for conservation purposes are grouped into five (5) classes:

- Presumed Extinct: Probably no longer present in the bioregion
- Endangered\* < 10% of pre-European extent remains
- Vulnerable\* 10-30% of pre-European extent exists
- Depleted\*: > 30% and up to 50% of pre-European extent exists
- Least Concern: > 50% pre-European extent exists and subject to little or no degradation over a majority of this area.

\* Or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

The extent of remnant native vegetation has been assessed by the Government of Western Australia (2011), based on vegetation association mapping undertaken by Beard (1979). The extent of the vegetation associations present within the project area is shown in Table 2. All three vegetation associations reported in the project area are considered as *Least Concern* in the state. These associations are also well represented in the Eastern Goldfields sub-region.

**Table 2 Vegetation association, extent and status within the project area**

Vegetation association number	Association description	Pre-European extent (ha)	Current extent (ha)	% Remaining	Status in state
125	Bare areas, fresh water lakes	3 492 381	3 269 266	93.6	<i>Least Concern</i>
469	Medium woodland; salmon gum & goldfields blackbutt	592 022	593 902	98.63	<i>Least Concern</i>
540	Succulent steppe with open low woodland; sheoak over saltbush	202 423	200 158	98.88	<i>Least Concern</i>

### 3.4.2 Threatened and Priority Ecological Communities

Ecological communities are defined as ‘naturally occurring biological assemblages that occur in a particular type of habitat’ (English and Blythe 1997). TECs are ecological communities that have been assessed and assigned to one of four categories related to the status of the threat to the community, i.e. Presumed Totally Destroyed, Critically Endangered, Endangered, and Vulnerable.

TECs are listed under both State and Federal legislation; Federally-listed TECs are protected under the EPBC Act. The DEC maintains a list of TECs for Western Australia, some of which are also protected under the EPBC Act.

Possible TECs that do not meet survey criteria are added to the DEC Priority Ecological Community (PEC) Lists under Priorities 1, 2 and 3. These are ecological communities that are adequately known; are rare but not threatened, or meet criteria for Near Threatened. PECs that have been recently removed from the threatened list are placed in Priority 4 and require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Relevant Federal and State conservation categories are further described in Appendix B.

A search of the EPBC Act Protected Matters database (DSEWPac 2012c) and DEC TEC/PEC database (DEC 2010, 2011) identified no TECs or PECs within 10 km of the project area.

### 3.4.3 Flora diversity

A *NatureMap* search (DEC, 2012c) indicated 195 flora taxa previously collected within 20 km of the project area, this total included 188 native flora taxa and seven naturalised (introduced) flora taxa. Dominant families within this search included: Asteraceae, Myrtaceae and Chenopodiaceae.

Previous surveys in the local region include Outback Ecology Services (2004) and Jim’s Seeds, Weeds and Trees (2005). These two studies resulted in similar species inventories and vegetation association outcomes. There were no significant flora species recorded in either of these studies and all of the vegetation communities within their study boundaries appeared well represented in the surrounding areas and were not considered ecologically significant.

### 3.4.4 Introduced flora

Of the seven naturalised (introduced) flora taxa identified in *NatureMap* search, one taxon, *Carthamus lanatus* (Saffron Thistle), is Declared under the *Agriculture and Related Resources Protection Act 1976* as a priority 1 weed species for the whole state.

### 3.4.5 Conservation significant flora

Species of significant flora are protected under both State and Federal Acts. Any activities that are deemed to have a significant impact on species that are recognised by the EPBC Act and the *State Wildlife Conservation Act 1950* (WC Act) can trigger referral to DSEWPaC and/or the EPA.

Also in Western Australia, the DEC produces a supplementary list of Priority Flora, these being species that are not considered Threatened under the WC Act but for which the department feels there is a cause for concern. These species have no special legislative protection, but their presence would normally be considered relevant to an assessment of the conservation status of an area. Such taxa need further survey and evaluation of conservation status before consideration can be given to declaration as threatened flora.

Relevant Federal and State conservation categories are further described in Appendix B.

Desktop searches (DSEWPaC 2012b and DEC, 2012c) identified the presence/potential presence of three conservation significant flora species within 20 km of the project area;

- *Angianthus prostratus* – Priority 3;
- *Eremophila praecox* – Priority 1; and
- *Gastrolobium graniticum* – Endangered.

A likelihood of occurrence assessment, which takes into account the habitats present, known species distribution and previous records, was completed for the conservation significant flora identified in the desktop searches (shown in Appendix C). This assessment identified that all these priority species could potentially occur in the project area.

**Table 3 Flora likelihood of occurrence assessment**

Species	Status	Description	Likelihood of Occurrence	Source
<i>Angianthus prostratus</i>	P3	Prostrate annual, herb. Fl. white-yellow, Jul to Sep. Red clay or loamy soils. Saline depressions.	Possible. Species recorded within 10 km and some suitable habitat present within project area.	DEC
<i>Eremophila praecox</i>	P1	Broom-like shrub, 1.5-3 m high. Fl. purple, Oct or Dec. Red/brown sandy loam. Undulating plains.	Possible. Species recorded within 10 km and some suitable habitat present within project area.	DEC
<i>Gastrolobium graniticum</i>	En	Erect, open shrub, to 2.5 m high. Fl. yellow & orange & red, Aug to Sep. Sand, sandy loam, granite. Margins of rock outcrops, along drainage lines.	Possible. Species not recorded within 10 km of project area, but suitable habitat present within project area.	EPBC

## 3.5 Fauna

### 3.5.1 Fauna diversity

A *NatureMap* search (DEC, 2012c) indicated 108 fauna taxa previously collected within 20 km of the project area, this total included no naturalised (introduced) fauna taxa.

### 3.5.2 Conservation significant fauna

The conservation of fauna species and their significance is currently assessed under both Commonwealth and State Acts. The acts include the EPBC Act and WC Act.

#### EPBC Act

The Federal conservation level of fauna species and their significance status is assessed under the EPBC Act. The significance levels for fauna used in the EPBC Act are those recommended by the International Union for the Conservation of Nature and Natural Resources (IUCN). A description of relevant conservation categories under the EPBC Act is detailed in Appendix B.

The DSEWPaC maintains a database of matters of national environmental significance that are protected under the EPBC Act. A desktop search of the DSEWPaC Protected Matters database (DSEWPaC 2012c) identified two Threatened species as potentially occurring within 20 km of the project area:

- Slender-billed Thornbill (*Acanthiza iredalei iredalei*) – Vulnerable; and
- Mallee Fowl (*Leipoa ocellata*) – Vulnerable.

The EPBC Act also protects migratory species that are listed under the following International Agreements:

- Appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a Range State under the Convention;
- The Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA);
- The Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA); and
- The Agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds (ROKAMBA).

A desktop search of the DSEWPaC Protected Matters database (DSEWPaC 2012c) identified four migratory species as potentially occurring within 20 km of the project area:

- Fork tailed Swift (*Apus pacificus*);
- Great Egret (*Ardea alba*);
- Cattle Egret (*Ardea ibis*); and
- Rainbow Bee-eater (*Merops ornatus*).

#### Wildlife Conservation Act

The State conservation level of fauna species and their significance status is assessed under the WC Act. The WC Act uses a set of Schedules but also classifies species using some of the IUCN categories. Schedule 3 fauna species are those which are “subject to an agreement between the government of Australia and the governments of Japan, China and the Republic of



Korea relating to the protection of migratory birds, are declared to be fauna that is in need of special protection” (Government of Western Australia, 2010).

Additionally, in Western Australia, the DEC produces a supplementary list of Priority Fauna; these are species that are not considered Threatened under the WC Act but the Department feels there is a cause for concern. These species have no special legislative protection and need further survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna. However, their presence within a project area would normally be considered relevant to an environmental assessment of the project.

A description of relevant conservation categories is detailed in Appendix B.

A desktop search of the *NatureMap* database (DEC 2012c) identified three species that have been previously reported within 20 km of the project area;

- Hooded Plover (*Charadrius rubicollis*) – listed as a Priority 4; this bird species was not recorded during the field survey.
- Fairy Shrimp (*Branchinella denticulata*) – listed as a Priority 1 species, this aquatic invertebrate species is unlikely to occur within the project area due to lack of habitat and furthermore, invertebrate assessment is outside the scope of this study.
- Australian Bustard (*Ardeotis australis*) – listed as a Priority 4 species, One individual of this bird species was observed within the project area during the field survey.

A likelihood of occurrence assessment for all conservation significant fauna identified from the database searches was completed and the results are shown in Table 4. This assessment was based on;

- Habitat requirements and biology of the species;
- Review of records of the species in the area; and
- Appraisal of the condition and extent of suitable habitat within the project area and surround areas; and
- Observations made during the field survey.

The likelihood of occurrence assessment concluded that five species are unlikely (or highly unlikely) to occur, three species possibly may occur and (as previously mentioned) the Australian Bustard is known to occur within the project area.

**Table 4 Fauna likelihood of occurrence assessment**

Species	Status	Likelihood of occurrence
Fairy Shrimp ( <i>Branchinella denticulata</i> )	WC Act; P1	Highly unlikely. This species is restricted to aquatic habitats that are not present in the study area.
Australian Bustard ( <i>Ardeotis australis</i> )	WC Act; P4	Known to occur. This species was recorded during the field survey.

Species	Status	Likelihood of occurrence
Hooded Plover ( <i>Charadrius rubicollis</i> )	WC Act; P4	Highly unlikely. This species prefers marine-aquatic habitats that are not present in the study area
Slender-billed Thornbill ( <i>Acanthiza iredalei iredalei</i> )	EPBC Act; Vulnerable	Possible. This bird species prefers habitats of Chenopod shrub lands which are common in the study area; the study area is located well within the species known distribution.
Mallee Fowl ( <i>Leipoa ocellata</i> )	WC Act; Vulnerable  EPBC Act; Vulnerable	Unlikely. This conspicuous species prefers long-unburnt Acacia shrub lands and woodlands; the study area has had high fire frequency. The Mallee fowl is also susceptible to predation from feral cats and wild dogs (both present within the project area).
Fork tailed Swift ( <i>Apus pacificus</i> )	EPBC Act; Migratory	Possible. This wide ranging species may occasionally pass through the site.
Great Egret ( <i>Ardea alba</i> )	EPBC Act; Migratory	Unlikely. Egrets prefer wetland habitat which are limited within the study area.
Cattle Egret ( <i>Ardea ibis</i> )	EPBC Act; Migratory	Unlikely. Egrets prefer wetland habitat which are limited within the study area.
Rainbow Bee-eater ( <i>Merops ornatus</i> )	EPBC Act; Migratory	Possible. This wide ranging and common species utilises a variety of habitats types and could possibly utilise the project area.

# 4. Results



## 4.1 Vegetation and flora




### 4.1.1 Vegetation associations




Data collected during the field survey was analysed and grouped together into associations according to similar species composition, structure and dominance at the stratum level. The vegetation in the project area was classified into eight vegetation associations (including two cleared/highly disturbed categories).

The vegetation associations recorded during the GHD field survey are described below in Table 5 and mapped in Figure 2 (Appendix A).

**Table 5 GHD vegetation associations**

ID	GHD vegetation association	Description	Photograph
V1	<i>Eucalyptus salmonophloia</i> Woodland	<i>Eucalyptus salmonophloia</i> Woodland over <i>Exocarpos aphyllus</i> , <i>Casuarina pauper</i> and <i>Alectryon oleifolius</i> subsp. <i>canescens</i> Scattered Tall Shrubs over <i>Atriplex nummularia</i> , <i>Eremophila scoparia</i> , <i>Maireana sedifolia</i> , <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Cratystylis subspinescens</i> Open Heath over <i>Tecticornia ?doleiformis</i> and <i>Ptilotus obovatus</i> Low Open Shrubland on sandy loamy clay flats.	
V2	Open Samphire Shrubland	<i>Tecticornia indica</i> subsp. <i>bidens</i> , <i>Maireana glomerifolia</i> and <i>Frankenia interioris</i> var. <i>interioris</i> Low Shrubland to Low Open Shrubland over <i>Eragrostis dielsii</i> Scattered Grasses over <i>Disphyma crassifolium</i> , <i>Calandrinia polyandra</i> and <i>Eriochiton sclerolaenoides</i> Scattered Herbs on gravelly clay saline flats.	

ID	GHD vegetation association	Description	Photograph
V3	<i>Eucalyptus clelandii</i> Woodland	<i>Eucalyptus clelandii</i> , Woodland over <i>Casuarina pauper</i> , <i>Alectryon oleifolius</i> subsp. <i>canescens</i> and <i>Santalum spicatum</i> Scattered Low Trees over <i>Eremophila interstans</i> subsp. <i>interstans</i> , <i>Eremophila oldfieldii</i> subsp. <i>angustifolia</i> , <i>Acacia tetragonophylla</i> and <i>Dodonaea lobulata</i> Scattered Tall Shrubs over <i>Ptilotus obovatus</i> , <i>Atriplex nummularia</i> , <i>Atriplex ?vesicaria</i> and <i>Olearia muelleri</i> Low Scattered Shrubs over Scattered Herbs and Grasses on gravelly low rises and slopes.	 A photograph showing a woodland area with several tall, slender trees with sparse foliage. The ground is a mix of brown soil and gravelly patches.
V4	Mixed Open Woodland	Mixed <i>Eucalyptus</i> spp. Open Woodland over <i>Casuarina pauper</i> Scattered Low Trees over <i>Acacia tetragonophylla</i> , <i>Alectryon oleifolius</i> subsp. <i>canescens</i> and <i>Eremophila</i> spp. Scattered Tall Shrubs over <i>Atriplex nummularia</i> , <i>Maireana sedifolia</i> and <i>Dodonaea lobulata</i> Shrubland over <i>Cratystylis microphylla</i> , <i>Ptilotus obovatus</i> , and <i>Scaevola spinescens</i> Low Open Shrubland on a low stony ridgeline.	 A photograph of a mixed open woodland with scattered trees and shrubs. The ground is reddish-brown and appears to be a low stony ridgeline.
V5	<i>Eucalyptus</i> spp. Open Woodland	<i>Eucalyptus griffithsii</i> and <i>Eucalyptus ?cylindrifolia</i> Open Woodland over <i>Casuarina pauper</i> and <i>Acacia burkittii</i> Low Open Woodland over <i>Santalum spicatum</i> , <i>Eremophila miniata</i> subsp. <i>miniata</i> and <i>Exocarpos aphyllus</i> High Open Shrubland over <i>Scaevola spinescens</i> , <i>Melaleuca laterifolia</i> , <i>Dodonaea viscosa</i> subsp. <i>angustissima</i> and <i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i> Shrubland over <i>Westringia rigida</i> , <i>Ptilotus obovatus</i> , <i>Olearia muelleri</i> and <i>Zygophyllum eremaeum</i> Low Open Shrubland over <i>Triodia irritans</i> Very Open Hummock Grassland on consolidated sand dunes and	 A photograph of an open woodland area with scattered trees and shrubs. The ground is reddish-brown and appears to be a low stony ridgeline.

ID	GHD vegetation association	Description	Photograph
		gravelly/rocky ridges surrounding the samphire shrublands.	
V6	Open Chenopod shrubland	<i>Hakea preissii</i> , <i>Acacia tetragonophylla</i> and <i>Eremophila scoparia</i> Scattered Tall Shrubs over <i>Rhagodia drummondii</i> , <i>Maireana pyramidata</i> , <i>Tecticornia ?doleiformis</i> , <i>Atriplex nummularia</i> and <i>Minuria cunninghamii</i> Shrubland over <i>Ptilotus obovatus</i> , <i>Frankenia interioris</i> var. <i>interioris</i> and <i>Sclerolaena obliquicuspis</i> Low Shrubland over Scattered Herbs and Grasses on loamy clay flats.	
	Cleared	These are areas within the project area that have been cleared and include highly degraded areas of native vegetation. Specifically, this included completely cleared areas, drilling pads and bores, old mine areas and roads/tracks.	
	Man-made Dam	There is a man-made dam within the project area. The vegetation around this artificial water point was dominated by disturbance and water associated flora species such as <i>Juncus</i> sp.	

#### 4.1.2 Vegetation condition

The vegetation condition of the project area was rated as *Very Good* (3) through to *Completely Degraded* (6) (Figure 3, Appendix A). The site comprised areas of native vegetation, cleared drilling pads/bores and old mine areas. The main disturbance at the site were clearing, grazing impacts, weed invasion, roads and tracks.

The majority of the project area was rated as *Very Good*. The southern section of the site was rated as *Degraded*; this area has been disturbed as a result of exploration activities. Areas of native vegetation displayed only some evidence of grazing disturbance and altered fire regimes.

### 4.1.3 Flora diversity

A total of 129 plant taxa (including subspecies and varieties) representing 28 families and 67 genera were recorded in the project area. This total comprised 119 native species and 10 introduced species.

Dominant families recorded from the project area included:

- Chenopodiaceae (24 native taxa);
- Scrophulariaceae (14 native taxa); and
- Fabaceae (12 native taxa).

A total of seven collections were uncertain species identifications and two collections (all native taxa) could only be identified to genera due to the absence of adequate flowering parts and/or fruiting bodies required for identification.

A flora species list of the field survey is provided in Table 8, Appendix D.

### 4.1.4 Conservation significant flora

During the GHD field survey, searches for conservation significant species were undertaken. The survey did not identify the presence of any EPBC Act listed Threatened or WC Act listed Threatened (Declared Rare) flora taxa.

One DEC listed Priority flora species, *Ptilotus chortophytus* (Priority 1), was identified within the project area. *Ptilotus chortophytus* is described as a perennial shrub to approximately 10 cm high (Plate 1). There are currently five records of *Ptilotus chortophytus* lodged at the WA Herbarium, with four collections from one population east of Port Gregory (Geraldton Sandplains IBRA bioregion) and a single collection north-east of Menzies (Murchison IBRA bioregion) (DEC 2012a). The two known populations are from geographically separated locations and are approximately 800 km apart. The Port Gregory population was recorded on mineralised shale (Davies, R. pers comm 07/12/12).



**Plate 1** *Ptilotus chortophytus*

*Ptilotus chortophytus* was collected in the southern section of the project area on a small quartz outcrop (Easting 335016, Northing 6619112, Horizontal Datum: Geocentric Datum of Australia, Grid: Map Grid of Australia 1994, Zone 51) (Figure 2, Appendix A). There were approximately 30 individuals in this one isolated location. The specimen and associated collection information has been submitted to the WA Herbarium.

This collection of *Ptilotus chortophytus* is considered to be significant as it is the second record from this region since its first discovery by Webers in 1975. A Priority 1 listed species is poorly-known taxa which are known from one or a few collections or sight records (generally less than

five), all on lands not managed for conservation. These taxa 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 (DEC 2012).

#### 4.1.5 Weeds and introduced flora

A total of nine weed species were identified within the project area. The weed species were of low density and generally associated with the more disturbed areas of the site (i.e. around the old mine and infrastructure areas).

## 4.2 Fauna


### 4.2.1 Fauna habitats




The fauna habitat types in the project area are closely aligned with the vegetation associations previously described in Table 5. The habitat types within the project area are described below and mapped in Figure 4 (Appendix A).

The site has four distinct habitat types:

- The aquatic areas have been artificially created through previous disturbance, and these water points do provide some variation in habitat. There are likely to be similar water points scattered throughout the surrounding areas.
- The rocky outcrops are situated in the southern section of the site and provide micro-habitat variation. These outcrops are not extensive and are likely to be present more broadly in the region.
- The Chenopod shrub lands and the Woodland habitat types are well represented in the wider area. Given the historically high fire frequency and pastoralism activities at the site, these habitat types within the study area are degraded and do not provide any unique values as habitat on a regional scale.

**Table 6 Fauna habitat types**

Habitat type	Description	Photo
Aquatic	There is one small dam within the study area and several small pools created by previous earth works. This habitat type would not occur naturally but does provide variation in the landscape and a water source for fauna.	

Habitat type	Description	Photo
Rocky outcrops	There are several areas of rocky slopes and small rock outcrops scattered throughout the project area - particularly in the southern section. This habitat type provides valuable micro- habitat variation. It should be noted that these rocky areas are not highly complex and only contain small caves.	
Mixed Chenopod shrublands	A variety of Chenopod shrub lands occur within the project area including low lying salt pans dominated by <i>Tecticornia</i> shrubs and areas dominated by <i>Atriplex</i> and mixed shrub species.	
Mixed Eucalyptus Woodlands	The woodlands habitats within the project area provide hollows and fallen logs which are valuable nesting and refuge resources for a wide variety of fauna.	

#### 4.2.2 Fauna diversity

A total of 53 fauna taxa were recorded within the project area, this included:

- 37 birds;
- Nine reptiles;
- Six mammals (five of which are introduced species); and
- One frog.

A fauna species list of the field survey is provided in Table 9, Appendix D.

High winds and cool temperatures during most of the survey period may have reduced the number of birds and reptile species recorded, furthermore, the frog species was identified to genus because only tadpoles were present.



### **4.2.3 Conservation significant fauna**

During the GHD field survey no Threatened species listed under the EPBC Act or WC Act, or migratory species listed under the EPBC Act were observed.

One DEC listed priority fauna species, Australian Bustard (*Ardeotis australis*), was observed within the project area during the survey. This species occurs in a variety of habitats in arid and semi-arid Australia including grasslands and open woodlands. Threatening processes for the species include habitat destruction, altered fire regimes and predation from introduced predators.

## **5. Native vegetation clearing**

The clearing of any native vegetation requires a permit under Part V Division 2 of the *Environmental Protection Act 1986* (EP Act), except where an exemption applies under Schedule 6 of the Act or is prescribed by regulation in the *Environmental Protection (Clearing of Native Vegetation) Regulation 2004*, and it is not in an Environmentally Sensitive Area (ESA).

### **5.1 Assessment against the Ten Clearing Principles**

This project has been assessed against the Ten Clearing Principles (Table 7) and it is considered not or unlikely to be at variance with any of the principles.

Table 7 Assessment against the 10 clearing Principles

Letter	Principle	Assessment	Outcome
(a)	Native vegetation should not be cleared if it comprises a high level of biological diversity.	<p>The project area is located in the Coolgardie bioregion of Western Australia. The predominant vegetation consists of a mosaic of <i>Acacia</i>, mallee, samphire and <i>Dodonaea</i> shrublands and woodlands. The Woodlands in the area have exceptionally high diversity of <i>Eucalyptus</i> species with as many as 170 species occurring in the bioregion (McKenzie et al. 2003).</p> <p>The GHD survey identified six vegetation associations within the project area. The vegetation associations are largely consistent with the vegetation associations described by Beard (1979) for the area. GHD considers the vegetation associations well represented in the local area and broader region. Similarly, Outback Ecology Services (2004) and Jim’s Seeds, Weeds and Trees (2005), who have undertaken vegetation and flora surveys in the broader area, considered that all of the vegetation communities within their study boundaries appeared well represented in the surrounding areas and were not considered ecologically significant.</p> <p>The vegetation condition throughout the majority of the project area is rated as <i>Very Good</i>. Areas of native vegetation only display minimal evidence of grazing disturbance and altered fire regimes.</p> <p>The GHD survey identified 119 native flora taxa within the project area. Other vegetation and flora surveys undertaken in the broader area by Outback Ecology Services (2004) identified 28 native flora taxa from six transects within their study area, and Jim’s Seeds, Weeds and Trees (2005) identified 42 native flora taxa from 49 ha study area.</p> <p>The project area is considered to be of moderate biodiversity, but is not considered to be of higher biodiversity than the surrounding areas. Proposed clearing is unlikely to have any significant impact on the biodiversity of the region.</p>	<p>The Project is unlikely to be at variance with the Principle.</p> <p>Sources: Beard (1979), GHD vegetation and flora survey, Jim’s Seeds, Weeds and Trees (2005), McKenzie <i>et al.</i> 2003, Outback Ecology Services (2004)</p>
(b)	Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for	Desktop searches of <i>NatureMap</i> and EPBC Act Protected Matters databases identified nine conservation significant fauna species within 20 km of the project area. A likelihood of occurrence assessment based on known range,	<p>The Project is unlikely to be at variance with the Principle.</p> <p>Sources: DEC 2012c,</p>

Letter	Principle	Assessment	Outcome
	<p>the maintenance of, a significant habitat for fauna indigenous to Western Australia.</p>	<p>habitat requirement and biology of the species, and recent records identified four species which possibly may occur within the project area:</p> <ul style="list-style-type: none"> <li>• <i>Acanthiza iredalei iredalei</i> (Slender-billed Thornbill) - Vulnerable;</li> <li>• <i>Apus pacificus</i> (Fork tailed Swift) - Migratory;</li> <li>• <i>Ardeotis australis</i> (Australian Bustard) – Priority 4; and</li> <li>• <i>Merops ornatus</i> (Rainbow Bee-eater) - Migratory.</li> </ul> <p>During the GHD field survey one conservation significant fauna species was recorded, <i>Ardeotis australis</i> (Australian Bustard).</p> <p>The fauna habitats present within the project area are represented in the areas immediately adjacent to the project area and more widely in the Goldfields region. The project area does not provide any habitat resources that are significant to fauna. It is unlikely that individuals or populations of conservation significant fauna will be impacted by clearing at this project area.</p>	<p>DSEWPaC 2012c, GHD fauna assessment,</p>
(c)	<p>Native vegetation should not be cleared if it included, or is necessary for the continued existence of, rare flora.</p>	<p>The GHD survey of the project area did not identify the presence of any Threatened Flora species as listed under the EPBC Act or the WC Act within the project area. Additionally, several vegetation and flora surveys that have been undertaken in the broader area did not record any Threatened Flora species (Outback Ecology Services 2004, Jim's Seeds, Weeds and Trees 2005).</p> <p>One DEC listed Priority flora species, <i>Ptilotus chortophytus</i> (Priority 1), was identified within the project area. This species was recorded from a small quartz outcrop within the samphire shrubland. There were approximately 30 individuals in this one isolated location.</p> <p>This collection of <i>Ptilotus chortophytus</i> is considered to be significant as it is the second record from this region since its first discovery by Webers in 1975. A Priority 1 listed species is poorly-known taxa which are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation. These taxa may be included if they are comparatively well known from one or more localities but do not meet</p>	<p>The Project may be at variance with this principle.</p> <p>Sources: DEC 2012c, DSEWPaC 2012c, GHD vegetation and flora survey, Jim's Seeds, Weeds and Trees (2005), Outback Ecology Services (2004)</p>

Letter	Principle	Assessment	Outcome
		adequacy of survey requirements and appear to be under immediate threat from known threatening processes (DEC 2012).	
(d)	Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.	<p>A search of the EPBC Protected Matters database and the DEC TEC and PEC databases identified no TECs or PECs occurring within 20 km of the project area.</p> <p>The vegetation associations described and mapped within the project area during the GHD 2012 survey are not considered consistent with any TECs or PECs.</p>	<p>The Project is not at variance with this principle.</p> <p>Sources: DEC 2010, DEC 2011, DSEWPaC 2012c, GHD flora and vegetation survey.</p>
(e)	Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	<p>The native vegetation within the project area has been previously described by Beard (1979). Beard's mapping indicates that the Project area consists of three vegetation associations:</p> <ul style="list-style-type: none"> <li>• Bare areas, fresh water lakes (association 125);</li> <li>• Medium woodland; salmon gum &amp; goldfields blackbutt (association 468) and ;</li> <li>• Succulent steppe with open low woodland; sheoak over saltbush (association 540)</li> </ul> <p>The extent and reservation status of these associations are drawn from the CAR Reserve Analysis 2011 (Government of Western Australia 2011). Extents at the IBRA bioregion level are shown in Table 2. All vegetation associations are considered as Least Concern.</p> <p>Under this principle, clearing in areas with less than 30% of pre European extent remaining are likely to be at variance. Any clearing within the project area will not approach the threshold level of less than 30 % for any of the vegetation associations.</p>	<p>The Project is not at variance with this principle.</p> <p>Sources: Beard 1979, Government of Western Australia 2011.</p>
(f)	Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or	There are no natural watercourses or wetlands within the project area.	<p>The Project is not at variance with this principle.</p> <p>Sources: GHD survey</p>

Letter	Principle	Assessment	Outcome
	wetland.		
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	<p>Any clearing within the project area is unlikely to cause appreciable land degradation. The project area is surrounded by existing mining infrastructure and considered heavily disturbed in some parts with several access tracks.</p> <p>Appropriate management measures should be employed during any clearing activities to reduce erosion and sediment movement. Changes in pH and increases in salinization and waterlogging are not expected to occur as a result of clearing any part of the project area.</p>	<p>The Project is not at variance with this principle.</p> <p>Sources: GHD survey</p>
(h)	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	<p>The project area is not located within or adjacent to any conservation areas of DEC Estates, or does not provide an ecological linkage to any conservation areas.</p> <p>GHD considers the described vegetation associations and fauna habitat types in the project area well represented in the local area and broader region.</p>	<p>The Project is not at variance with this principle.</p> <p>Sources: GHD survey</p>
(i)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	<p>The Project (clearing of vegetation) does not include the taking of groundwater or activities that are likely to impact on groundwater in the long term or include any activities that are likely to cause groundwater contamination. The clearing of vegetation within the project area are not expected to impact on local or regional groundwater.</p> <p>No rivers or surface water areas that are listed under the Rights in Water and Irrigation Act 1914 where found to occur within the project area.</p> <p>The clearing of vegetation within the project area is not expected to have any long term effects on surface water hydrology of the area.</p>	<p>The Project is unlikely to be at variance with this principle.</p> <p>Sources: DOW 2012, GHD survey</p>
(j)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	<p>The project is considered unlikely to impact local flooding occurrence or intensity as the extent of vegetation clearing is minimal in the local and regional context.</p>	<p>The Project is unlikely to be at variance with this principle.</p> <p>Sources: GHD survey</p>

## 6. Conclusions

This survey of the 328 ha Paddington Golden Flag Project was conducted in spring 2012 and was consistent with Level 1 flora and fauna survey requirements.

Of significance is the recording of *Ptilotus chortophytus* within the project area. This flora species is a DEC Priority 1 listed species. Confirmation of the identification of this species was received from Robert Davies at the Western Australian Herbarium. *Ptilotus chortophytus* is a poorly known species as it is known from only two disjunct populations. The population from the Menzies area has not been recorded since 1975. To progress the environmental approvals process for this project it is recommended that Paddington consider a targeted survey for the plant. Targeted surveys typically involve;

- A desktop assessment and literature review of the species and its preferred habitat and ecology;
- Using information gathered in the desktop assessment and literature review phase, field searches are conducted for the plant in the suitable habitat immediately surrounding the project area and broadly in the region;
- With results from the desktop and field surveys the level of impact (from the proposed project) on the species can be assessed and this information can be used to inform the approvals process.

Consultation with DEC is recommended to discuss potential impacts on this species and future management requirements.

Other than the presence of *Ptilotus chortophytus*, the project area has limited significant flora and fauna aspects;

- the vegetation associations are well represented in the local area and more widely across the state;
- With exception of Principle (c) which may be at variance due to the presence of *Ptilotus chortophytus*, the project was found not (or unlikely) to be at variance to any of the remaining clearing principals;
- The fauna habitat types recorded at the study site are all well represented in the local area and broader region;
- The Priority 4 fauna species recorded during the field survey; the Australian Bustard (*Ardeotis australis*), occupies a variety of habitats and is unlikely to be impacted by clearing at the site

## 7. References

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# Appendices

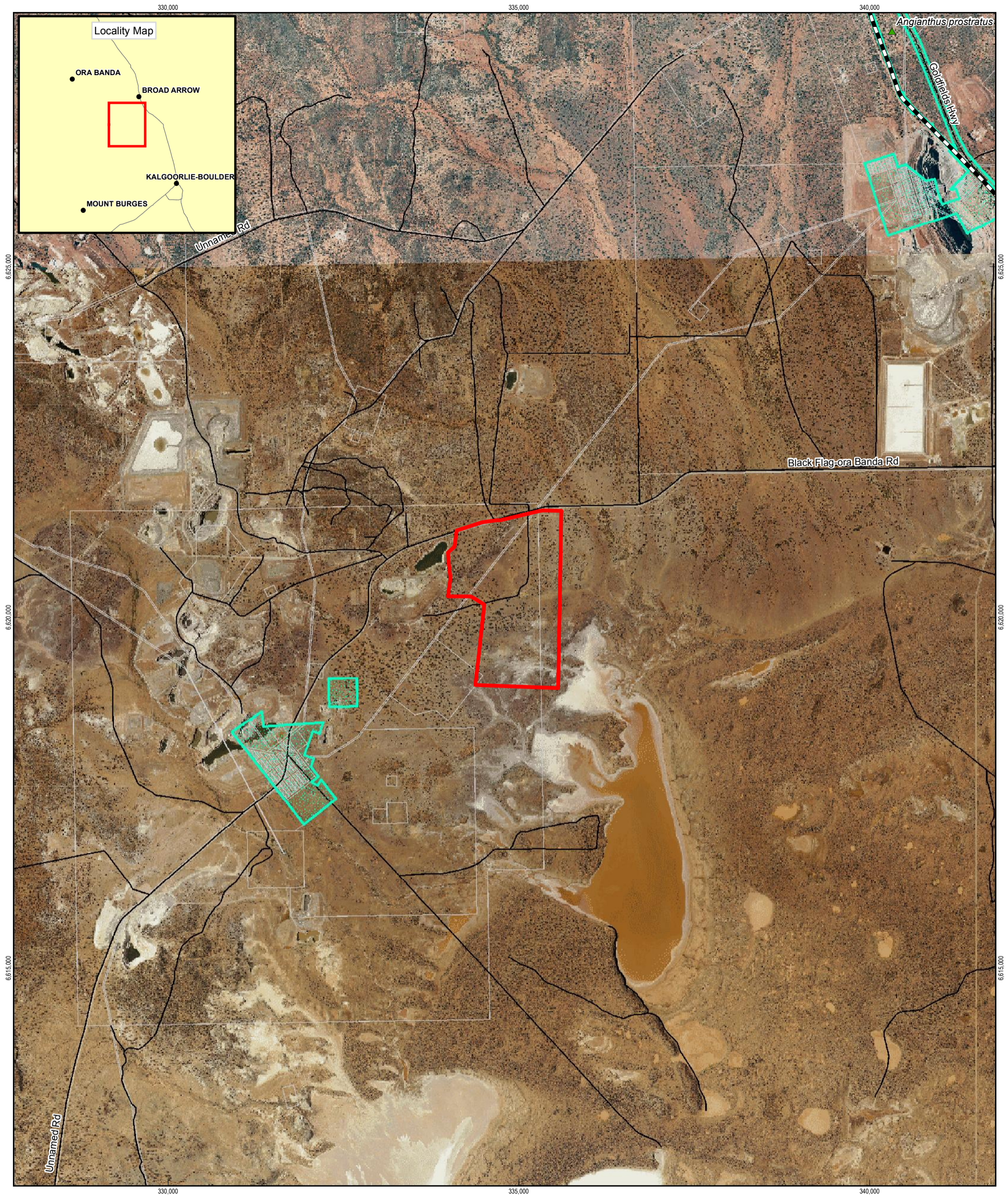
# **Appendix A** - Figures

**Figure 1** Locality and Environmental Constraints

**Figure 2** Vegetation Associations

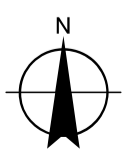
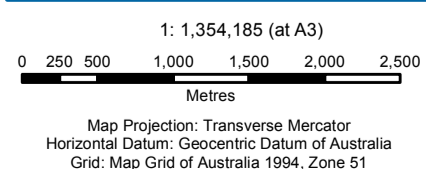
**Figure 3** Vegetation Condition

**Figure 4** Habitat Types



**LEGEND**

<b>Threatened and Priority Species</b>	▲ Priority 3 - Poorly Known Taxa	— Roads	□ Cadastre
▲ (T) Threatened Flora - Extant Taxa	▲ Priority 4 - Rare Taxa	— Railway Line	▭ Survey Area
▲ Priority 1 - Poorly Known Taxa	▲ Priority 5 - Conservation Dependent Taxa	▨ Schedule 1 Areas	
▲ Priority 2 - Poorly Known Taxa			

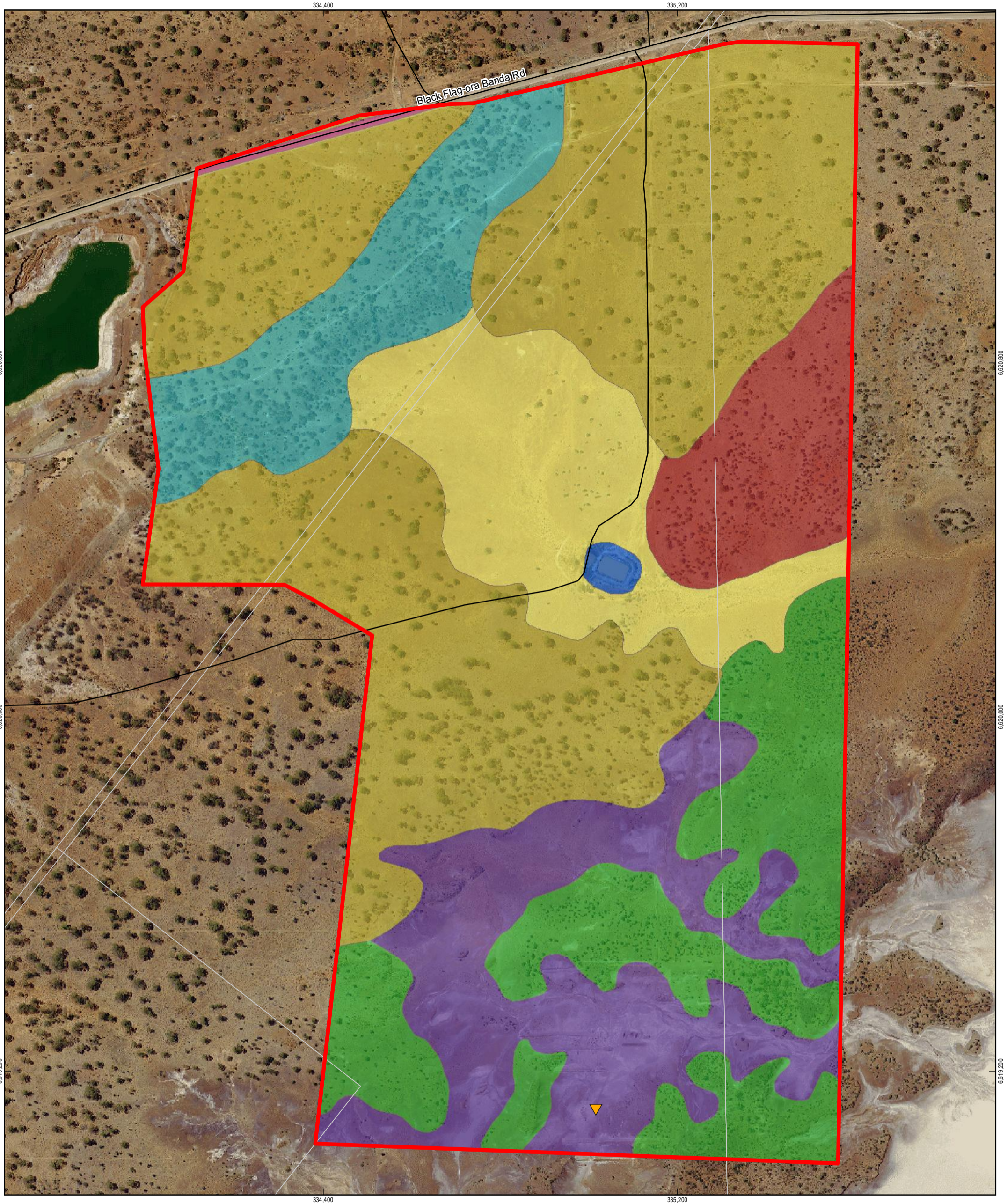


Paddington Gold Pty Limited  
 Paddington Golden Flag Flora & Fauna Survey

**Locality &  
 Environmental Constraints**

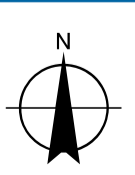
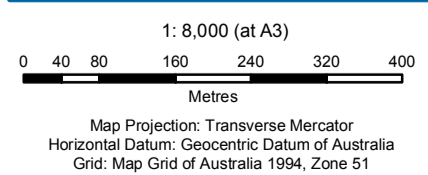
Job Number	61-28674
Revision	0
Date	23 Nov 2012

**Figure 1**



LEGEND

- |                                   |   |   |                            |
|-----------------------------------|---|---|----------------------------|
| <i>Ptilotus chortophytus</i> (P1) | <b>Vegetation Associations</b>              | 3: <i>Eucalyptus clelandii</i> Woodland | 6: Open Chenopod Shrubland |
| Roads                             | 1: <i>Eucalyptus salmonophloia</i> Woodland | 4: Mixed Open Woodland                  | Cleared                    |
| Survey Area                       | 2: Open Samphire Shrubland                  | 5: <i>Eucalyptus</i> spp. Open Woodland | Man-made Dam               |
| Cadastre                          |   |   |                            |

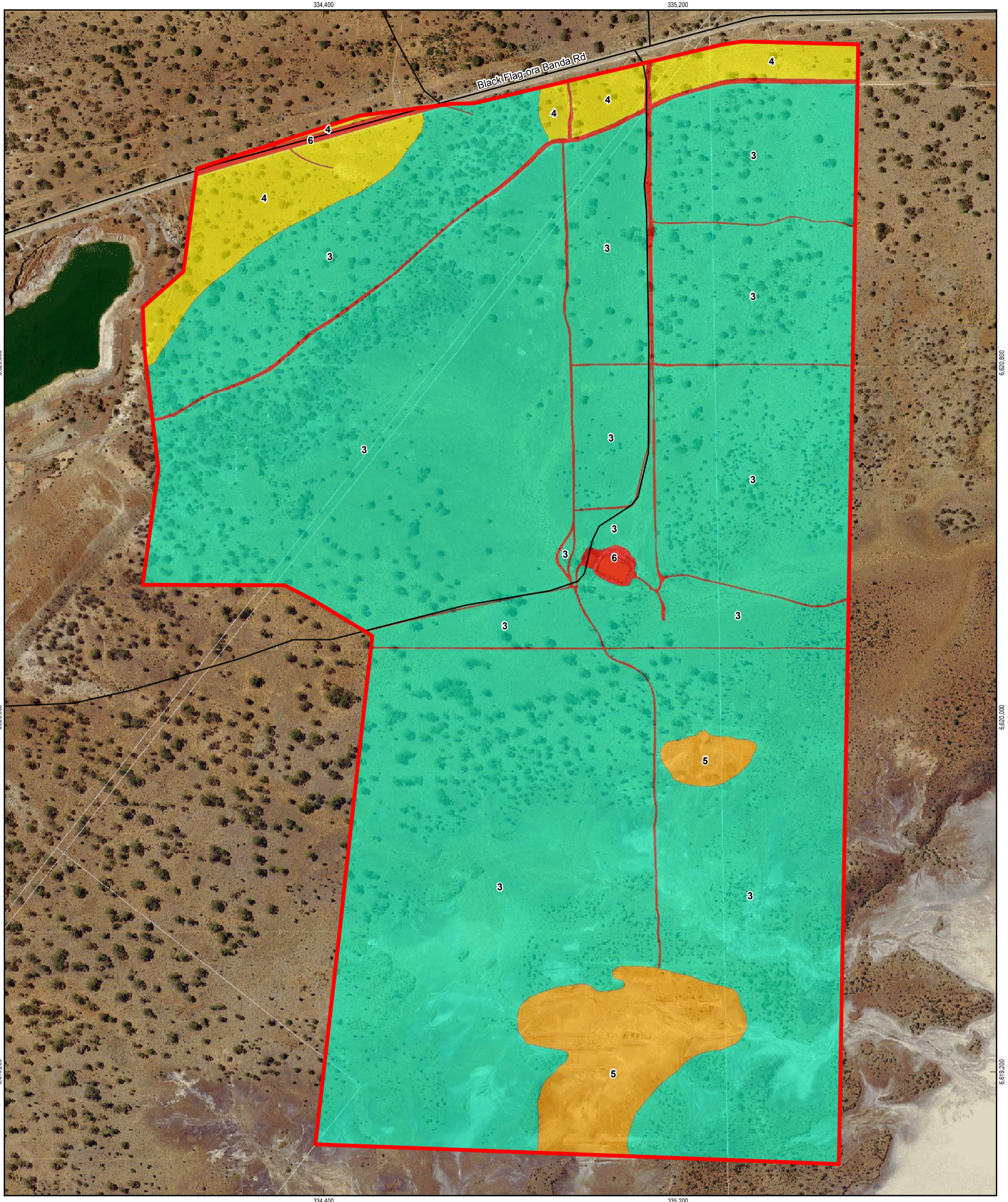


Paddington Gold Pty Limited  
 Paddington Golden Flag Flora & Fauna Survey

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 Revision | 0  
 Date | 06 Dec 2012

Vegetation Associations

Figure 2

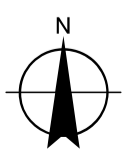


**LEGEND**

Roads	<b>Vegetation Condition</b>	4. Good
Cadastral	1. Pristine or Nearly so	5. Degraded
Survey Area	2. Excellent	6. Completely Degraded
	3. Very Good	

1: 8,000 (at A3)  
 0 40 80 160 240 320 400  
 Metres

Map Projection: Transverse Mercator  
 Horizontal Datum: Geocentric Datum of Australia  
 Grid: Map Grid of Australia 1994, Zone 51



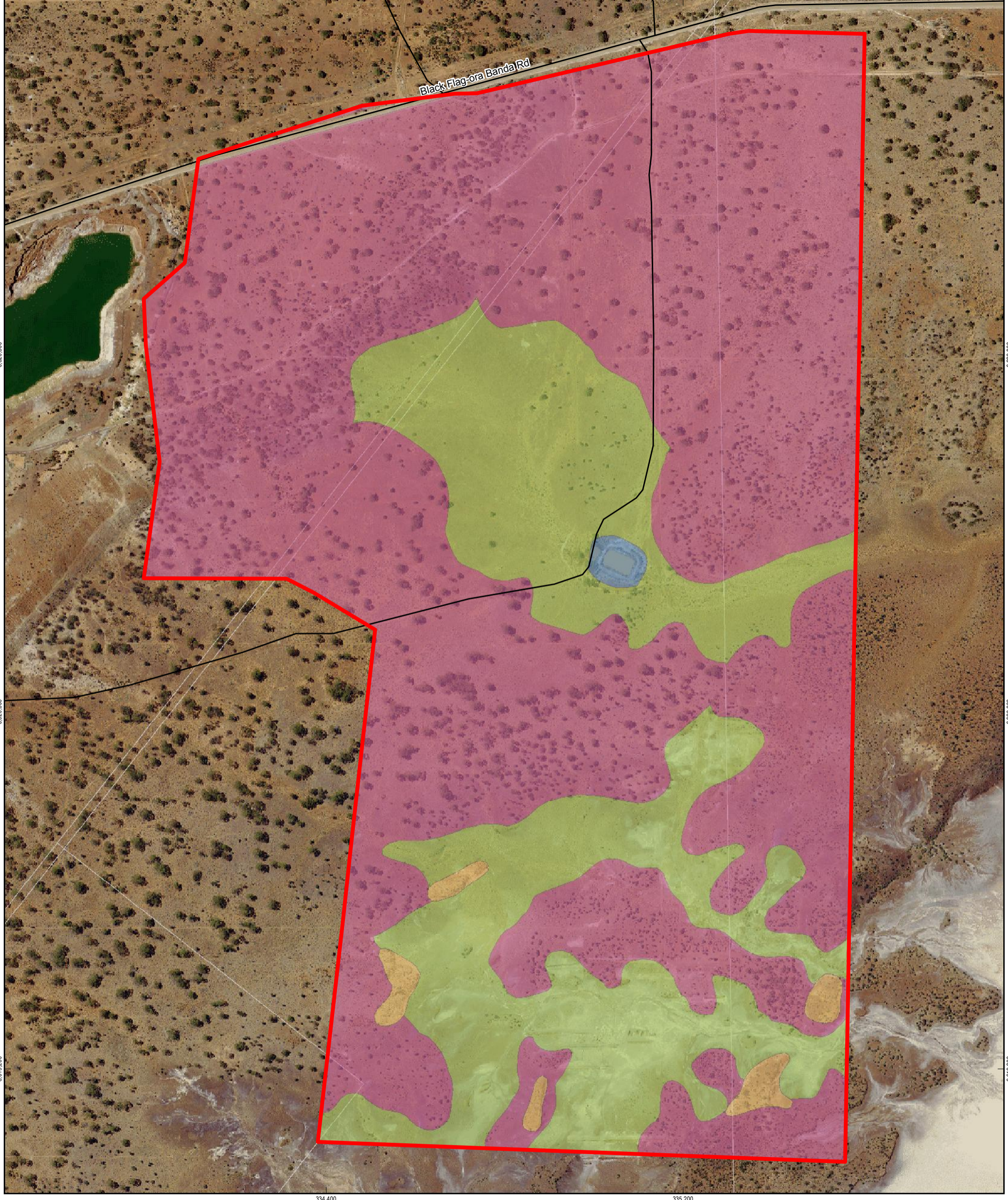
powered by  
**SLIP ENABLER**

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 Paddington Golden Flag Flora & Fauna Survey

**Vegetation Condition**

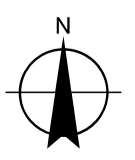
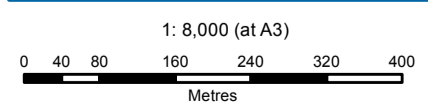
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**Figure 3**



LEGEND

- Roads
- ▭ Survey Area
- Habitat Type**
- ▭ 1: Aquatic
- ▭ 2: Rocky outcrops
- ▭ 3: Chenopod shrubland
- ▭ 4: Mixed Eucalyptus woodland
- ▭ Cadastre



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Habitat Types

Figure 4

# **Appendix B** - Conservation Codes



## **EPBC Act Fauna Conservation Categories**

### **Listed threatened species and ecological communities**

An action will require approval from the Environment Minister if the action has, will have, or is likely to have a significant impact on a species listed in any of the following categories:

- extinct in the wild,
- critically endangered,
- endangered, or
- vulnerable.

### **Critically endangered and endangered species**

An action has, will have, or is likely to have a significant impact on a critically endangered or endangered species if it does, will, or is likely to:

- lead to a long-term decrease in the size of a population, or
- reduce the area of occupancy of the species, or
- fragment an existing population into two or more populations, or
- adversely affect habitat critical to the survival of a species, or
- disrupt the breeding cycle of a population, or
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or
- result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat\*, or
- interfere with the recovery of the species.

*\*Introducing an invasive species into the habitat may result in that species becoming established. An invasive species may harm a critically endangered or endangered species by direct competition, modification of habitat, or predation.*

### **Vulnerable species**

An action has, will have, or is likely to have a significant impact on a vulnerable species if it does, will, or is likely to:

- lead to a long-term decrease in the size of an important population of a species, or
- reduce the area of occupancy of an important population, or
- fragment an existing important population into two or more populations, or
- adversely affect habitat critical to the survival of a species, or
- disrupt the breeding cycle of an important population, or
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or
- result in invasive species that are harmful a vulnerable species becoming established in the vulnerable species' habitat\*, or
- interferes substantially with the recovery of the species.

An important population is one that is necessary for a species' long-term survival and recovery. This may include populations that are:

- key source populations either for breeding or dispersal,
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

*\*Introducing an invasive species into the habitat may result in that species becoming established. An invasive species may harm a vulnerable species by direct competition, modification of habitat, or predation.*

### Listed migratory species

The EPBC Act protects lands and migratory species that are listed under International Agreements.

- Appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a Range State under the Convention;
- The Agreement between the Government of Australia and the Government of the Peoples Republic of China for the Protection of Migratory Birds and their Environment (CAMBA);
- The Agreement between the Government of Japan and the Government of Australia for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA); and
- The Agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds (ROKAMBA).
- other international agreements approved by the Commonwealth Environment Minister.
- An action will require approval from the Environment Minister if the action has, will have, or is likely to have a significant impact on a listed migratory species. Note that some migratory species are also listed as threatened species.

The criteria below are relevant to migratory species that are not threatened.

An action has, will have, or is likely to have a significant impact on a migratory species if it does, will, or is likely to:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species, or
- result in invasive species that is harmful to the migratory species becoming established\* in an area of important habitat of the migratory species, or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species.

An area of important habitat is:

- habitat utilized by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, or
- habitat utilized by a migratory species which is at the limit of the species range, or
- habitat within an area where the species is declining.

Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, what is an ecologically significant proportion of the population varies with the species (each circumstance will need to be evaluated).

*\*Introducing an invasive species into the habitat may result in that species becoming established. An invasive species may harm a migratory species by direct competition, modification of habitat, or predation.*

***Conservation categories and definitions for Environment Protection and Biodiversity Conservation Act 1999 Act listed flora and fauna species***

Conservation Category	Definition
Extinct	Taxa not definitely located in the wild during the past 50 years
Extinct in the Wild	Taxa known to survive only in captivity
Critically Endangered	Taxa facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Taxa facing a very high risk of extinction in the wild in the near future
Vulnerable	Taxa facing a high risk of extinction in the wild in the medium-term
Near Threatened	Taxa that risk becoming Vulnerable in the wild
Conservation Dependent	Taxa whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classified as Vulnerable or more severely threatened.
Data Deficient (Insufficiently Known)	Taxa suspected of being Rare, Vulnerable or Endangered, but whose true status cannot be determined without more information.
Least Concern	Taxa that are not considered Threatened

**Conservation codes and descriptions for DEC Threatened and Priority Flora and Fauna**

Conservation Code	Description
Threatened (T) Declared Rare Flora – Extant Taxa	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.
Priority One (P1) Poorly Known Taxa	Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
Priority Two (P2) Poorly Known Taxa	Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
Priority Three (P3) Poorly Known Taxa	Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey.
Priority Four (P4) Taxa in need of monitoring	Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5 – 10 years.

## **Conservation categories and definitions for Threatened Ecological Communities (TECs)**

### **Presumed Totally Destroyed (PD)**

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 and either of the following applies (A or B):

A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats, or

B) All occurrences recorded within the last 50 years have since been destroyed.

### **Critically Endangered (CR)**

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. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C):

A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii):

i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years);

ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.

B) Current distribution is limited, and one or more of the following apply (i, ii or iii):

i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years);

ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes;

iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.

C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

### **Endangered (EN)**

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. This will be

determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C):

A) The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii):

i) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years);

ii) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.

B) Current distribution is limited, and one or more of the following apply (i, ii or iii):

i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years);

ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes;

iii) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.

C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

#### **Vulnerable (VU)**

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. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C):

A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.

B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.

C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

## Conservation categories and definitions for Priority Ecological Communities (PECs)

### Priority One: Poorly-known ecological communities

Ecological communities that are known from very few occurrences with a very restricted distribution (generally  $\leq 5$  occurrences or a total area of  $\leq 100$ ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

### Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally  $\leq 10$  occurrences or a total area of  $\leq 200$ ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

### Priority Three: Poorly known ecological communities

(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 with 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 may 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.

### Priority Four: 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.

(i) 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.

(ii) 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.

(iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

### Priority Five: Conservation Dependent ecological communities

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.

# **Appendix C** - Desktop Searches



# NatureMap All Fauna Species Report

Created By Guest user on 25/09/2012

Kingdom Animalia  
Current Names Only Yes  
Core Datasets Only Yes  
Method 'By Circle'  
Centre 121°16' 58" E,30°32' 20" S  
Buffer 20km  
Group By Family

Family	Species	Records
Acanthizidae	5	17
Accipitridae	1	1
Agamidae	7	31
Anatidae	2	2
Anhingidae	1	1
Burramyidae	1	14
Campephagidae	1	7
Caprimulgidae	1	1
Carphodactylidae	2	15
Casuariidae	1	2
Charadriidae	1	1
Columbidae	1	3
Corvidae	2	9
Cracticidae	4	17
Dasyuridae	5	33
Dicruridae	2	4
Diplodactylidae	7	37
Elapidae	4	14
Gekkonidae	3	22
Limnodynastidae	2	3
Maluridae	1	3
Meliphagidae	8	42
Molossidae	2	22
Muridae	4	57
Myobatrachidae	1	9
Otididae	1	1
Pachycephalidae	3	8
Pardalotidae	1	9
Petroicidae	1	1
Podargidae	1	1
Podicipedidae	1	1
Pygopodidae	3	6
Recurvirostridae	1	1
Scincidae	14	51
Strigidae	1	1
Thamnocephalidae	1	1
Typhlopidae	2	8
Varanidae	2	7
Vespertilionidae	6	25
<b>TOTAL</b>	<b>107</b>	<b>488</b>

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
<b>Acanthizidae</b>				
1.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill)			
2.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
3.	24265 <i>Acanthiza uropygialis</i> (Chestnut-rumped Thornbill)			
4.	24278 <i>Pyrrholaemus brunneus</i> (Redthroat)			
5.	30948 <i>Smicromis brevirostris</i> (Weebill)			
<b>Accipitridae</b>				
6.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
<b>Agamidae</b>				
7.	24871 <i>Ctenophorus cristatus</i> (Bicycle Dragon)			
8.	24873 <i>Ctenophorus fordi</i> (Mallee Sand Dragon)			
9.	24886 <i>Ctenophorus reticulatus</i> (Western Netted Dragon)			
10.	24888 <i>Ctenophorus salinarum</i> (Salt Pan Dragon)			
11.	24889 <i>Ctenophorus scutulatus</i>			
12.	24904 <i>Moloch horridus</i> (Thorny Devil)			
13.	24907 <i>Pogona minor</i> subsp. <i>minor</i>			

	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Anatidae</b>					
	14.	24322	<i>Cygnus atratus</i> (Black Swan)		
	15.	24331	<i>Tadorna tadornoides</i> (Australian Shelduck)		
<b>Anhingidae</b>					
	16.	24332	<i>Anhinga melanogaster</i> subsp. <i>novaeollandiae</i>		
<b>Burramyidae</b>					
	17.	24086	<i>Cercartetus concinnus</i> (Western Pygmy-possum)		
<b>Campephagidae</b>					
	18.	25568	<i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)		
<b>Caprimulgidae</b>					
	19.	24368	<i>Eurostopodus argus</i> (Spotted Nightjar)		
<b>Carphodactylidae</b>					
	20.	30941	<i>Nephrurus milii</i> (Barking Gecko)		
	21.	24971	<i>Nephrurus vertebralis</i>		
<b>Casuariidae</b>					
	22.	24470	<i>Dromaius novaehollandiae</i> (Emu)		
<b>Charadriidae</b>					
	23.	24376	<i>Charadrius rubricollis</i> (Hooded Plover)	P4	
<b>Columbidae</b>					
	24.	24407	<i>Ocyphaps lophotes</i> (Crested Pigeon)		
<b>Corvidae</b>					
	25.	24416	<i>Corvus bennetti</i> (Little Crow)		
	26.	25592	<i>Corvus coronoides</i> (Australian Raven)		
<b>Cracticidae</b>					
	27.	24420	<i>Cracticus nigrogularis</i> (Pied Butcherbird)		
	28.	25595	<i>Cracticus tibicen</i> (Australian Magpie)		
	29.	25596	<i>Cracticus torquatus</i> (Grey Butcherbird)		
	30.	25597	<i>Strepera versicolor</i> (Grey Currawong)		
<b>Dasyuridae</b>					
	31.	24087	<i>Antechinomys laniger</i> (Kultarr)		
	32.	24094	<i>Ningauai ridei</i> (Wongai Ningau)		
	33.	24096	<i>Ningauai yvonneae</i> (Southern Ningau)		
	34.	24108	<i>Sminthopsis crassicaudata</i> (Fat-tailed Dunnart)		
	35.	24109	<i>Sminthopsis dolichura</i> (Little long-tailed Dunnart)		
<b>Dicruridae</b>					
	36.	24443	<i>Grallina cyanoleuca</i> (Magpie-lark)		
	37.	25614	<i>Rhipidura leucophrys</i> (Willie Wagtail)		
<b>Diplodactylidae</b>					
	38.	24929	<i>Diplodactylus granariensis</i> subsp. <i>granariensis</i>		
	39.	24940	<i>Diplodactylus pulcher</i>		
	40.	30935	<i>Lucasium maini</i>		
	41.	24978	<i>Oedura reticulata</i>		
	42.	24982	<i>Rhynchoedura ornata</i> (Beaked Gecko)		
	43.	24923	<i>Strophurus assimilis</i> (Goldfields Spiny-tailed Gecko)		
	44.	24927	<i>Strophurus elderi</i>		
<b>Elapidae</b>					
	45.	25253	<i>Parasuta gouldii</i>		
	46.	25254	<i>Parasuta monachus</i>		
	47.	25263	<i>Pseudonaja modesta</i> (Ringed Brown Snake)		
	48.	25266	<i>Simoselaps bertholdi</i> (Jan's Banded Snake)		
<b>Gekkonidae</b>					
	49.	24957	<i>Gehyra purpurascens</i>		
	50.	24959	<i>Gehyra variegata</i>		
	51.	24961	<i>Heteronotia binoei</i> (Bynoe's Gecko)		
<b>Limnodynastidae</b>					
	52.	25425	<i>Neobatrachus kunapalari</i> (Kunapalari Frog)		
	53.	25428	<i>Neobatrachus wilsmorei</i> (Plonking Frog)		
<b>Maluridae</b>					
	54.	25654	<i>Malurus splendens</i> (Splendid Fairy-wren)		
<b>Meliphagidae</b>					
	55.	24559	<i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)		

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
56.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
57.	25659 <i>Lichenostomus leucotis</i> (White-eared Honeyeater)			
58.	24577 <i>Lichenostomus ornatus</i> (Yellow-plumed Honeyeater)			
59.	24581 <i>Lichenostomus virescens</i> (Singing Honeyeater)			
60.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
61.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
62.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
<b>Molossidae</b>				
63.	24184 <i>Mormopterus planiceps</i> (Southern Freetail-bat)			
64.	24185 <i>Tadarida australis</i> (White-striped Freetail-bat)			
<b>Muridae</b>				
65.	24223 <i>Mus musculus</i> (House Mouse)			
66.	24230 <i>Pseudomys albocinereus</i> (Ash-grey Mouse)			
67.	24232 <i>Pseudomys bolami</i> (Bolam's Mouse)			
68.	24237 <i>Pseudomys hermannsburgensis</i> (Sandy Inland Mouse)			
<b>Myobatrachidae</b>				
69.	25434 <i>Pseudophryne occidentalis</i> (Western Toadlet)			
<b>Otididae</b>				
70.	24610 <i>Ardeotis australis</i> (Australian Bustard)		P4	
<b>Pachycephalidae</b>				
71.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
72.	24618 <i>Oreoica gutturalis</i> (Crested Bellbird)			
73.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
<b>Pardalotidae</b>				
74.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
<b>Petroicidae</b>				
75.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
<b>Podargidae</b>				
76.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
<b>Podicipedidae</b>				
77.	24681 <i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
<b>Pygopodidae</b>				
78.	24995 <i>Delma australis</i>			
79.	25005 <i>Lialis burtonis</i>			
80.	25009 <i>Pygopus nigriceps</i>			
<b>Recurvirostridae</b>				
81.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
<b>Scincidae</b>				
82.	30893 <i>Cryptoblepharus buchananii</i>			
83.	25020 <i>Cryptoblepharus plagioccephalus</i>			
84.	25026 <i>Ctenotus atlas</i>			
85.	25052 <i>Ctenotus leonhardii</i>			
86.	25074 <i>Ctenotus schomburgkii</i>			
87.	25080 <i>Ctenotus uber</i> subsp. <i>uber</i>			
88.	25089 <i>Cyclodomorphus melanops</i> subsp. <i>elongatus</i>			
89.	25094 <i>Egernia formosa</i>			
90.	25115 <i>Hemiergis initialis</i> subsp. <i>initialis</i>			
91.	30927 <i>Lerista kingi</i>			
92.	25162 <i>Lerista picturata</i>			
93.	25184 <i>Menetia greyii</i>			
94.	25188 <i>Morethia adelaidensis</i>			
95.	25190 <i>Morethia butleri</i>			
<b>Strigidae</b>				
96.	25748 <i>Ninox novaeseelandiae</i> (Boobook Owl)			
<b>Thamnocephalidae</b>				
97.	33934 <i>Branchinella denticulata</i> (fairy shrimp)		P1	Y
<b>Typhlopidae</b>				
98.	25271 <i>Ramphotyphlops australis</i>			
99.	25273 <i>Ramphotyphlops bituberculatus</i>			
<b>Varanidae</b>				
100.	25211 <i>Varanus caudolineatus</i>			
101.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Vespertilionidae</b>				
102.	24186			<i>Chalinolobus gouldii</i> (Gould's Wattled Bat)
103.	24187			<i>Chalinolobus morio</i> (Chocolate Wattled Bat)
104.	24194			<i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)
105.	24199			<i>Scotorepens balstoni</i> (Inland Broad-nosed Bat)
106.	24202			<i>Vespadelus baverstocki</i> (Inland Forest Bat)
107.	24206			<i>Vespadelus regulus</i> (Southern Forest Bat)

**Conservation Codes**

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

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



# NatureMap All Flora Species Report

Created By Guest user on 25/09/2012

Kingdom Plantae  
Current Names Only Yes  
Core Datasets Only Yes  
Method 'By Circle'  
Centre 121°16' 58" E,30°32' 21" S  
Buffer 20km  
Group By Family

Family	Species	Records
Aizoaceae	2	5
Amaranthaceae	5	11
Apiaceae	1	1
Asparagaceae	3	3
Asphodelaceae	1	1
Asteraceae	36	52
Boraginaceae	1	1
Brassicaceae	1	1
Campanulaceae	1	1
Casuarinaceae	1	1
Chenopodiaceae	23	37
Convolvulaceae	1	2
Cupressaceae	1	6
Euphorbiaceae	2	2
Fabaceae	22	46
Frankeniaceae	2	2
Geraniaceae	3	6
Goodeniaceae	8	15
Haloragaceae	1	1
Lamiaceae	4	8
Loranthaceae	1	1
Malvaceae	4	4
Myrtaceae	24	64
Pittosporaceae	1	2
Plantaginaceae	2	2
Poaceae	4	5
Proteaceae	3	5
Ruppiaceae	1	1
Rutaceae	2	4
Santalaceae	1	2
Sapindaceae	4	12
Scrophulariaceae	20	54
Solanaceae	6	12
Thymelaeaceae	1	1
Zygophyllaceae	2	4
<b>TOTAL</b>	<b>195</b>	<b>375</b>

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Aizoaceae</b>				
1.	11681 <i>Disphyma crassifolium</i> subsp. <i>clavellatum</i>			
2.	2822 <i>Tetragonia eremaea</i>			
<b>Amaranthaceae</b>				
3.	2707 <i>Ptilotus carlsonii</i>			
4.	2730 <i>Ptilotus helichrysooides</i>			
5.	2732 <i>Ptilotus holosericeus</i>			
6.	2747 <i>Ptilotus obovatus</i> (Cotton Bush)			
7.	41000 <i>Ptilotus</i> sp. Goldfields (R. Davis 10796)			
<b>Apiaceae</b>				
8.	6218 <i>Daucus glochidiatus</i> (Australian Carrot)			
<b>Asparagaceae</b>				
9.	1505 <i>Agave americana</i> (Century Plant)	Y		
10.	1338 <i>Thysanotus manglesianus</i> (Fringed Lily)			
11.	1343 <i>Thysanotus patersonii</i>			
<b>Asphodelaceae</b>				
12.	1366 <i>Bulbine semibarbata</i> (Leek Lily)			
<b>Asteraceae</b>				

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
13.	7817 <i>Actinobole uliginosum</i> (Flannel Cudweed)			
14.	7834 <i>Angianthus prostratus</i>		P3	
15.	7836 <i>Angianthus tomentosus</i> (Camel-grass)			
16.	7871 <i>Brachyscome ciliaris</i>			
17.	7872 <i>Brachyscome ciliocarpa</i>			
18.	7880 <i>Brachyscome lineariloba</i>			
19.	7903 <i>Calotis hispidula</i> (Bindy Eye)			
20.	7911 <i>Carthamus lanatus</i> (Saffron Thistle)	Y		
21.	13138 <i>Chrysocephalum puteale</i>			
22.	7950 <i>Cratystylis microphylla</i> (Small-leaved Grey Bush)			
23.	14377 <i>Erymophyllum ramosum</i> subsp. <i>ramosum</i>			
24.	8045 <i>Helipterum craspedioides</i> (Yellow Billy Buttons)			
25.	15447 <i>Hyalosperma glutinosum</i> subsp. <i>glutinosum</i>			
26.	19237 <i>Leiocarpa websteri</i>			
27.	12628 <i>Lemooria burkittii</i>			
28.	13260 <i>Leucochrysum fitzgibbonii</i>			
29.	8105 <i>Millotia myosotidifolia</i>			
30.	12631 <i>Millotia perpusilla</i>			
31.	8107 <i>Minuria cunninghamii</i> (Bush Minuria)			
32.	8140 <i>Olearia muelleri</i> (Goldfields Daisy)			
33.	8145 <i>Olearia pimeleoides</i> (Pimelea Daisybush)			
34.	8173 <i>Podolepis capillaris</i> (Wiry Podolepis)			
35.	8187 <i>Pogonolepis muelleriana</i>			
36.	8188 <i>Pogonolepis stricta</i>			
37.	13308 <i>Rhodanthe charsleyae</i>			
38.	13241 <i>Rhodanthe chlorocephala</i> subsp. <i>rosea</i>			
39.	13301 <i>Rhodanthe floribunda</i>			
40.	13293 <i>Rhodanthe haigii</i>			
41.	13253 <i>Rhodanthe rubella</i>			
42.	13254 <i>Rhodanthe stricta</i>			
43.	25881 <i>Senecio lacustrinus</i>			
44.	8236 <i>Streptoglossa cylindriceps</i>			
45.	8238 <i>Streptoglossa liatroides</i>			
46.	12652 <i>Trichanthodium skirrophorum</i>			
47.	13331 <i>Waitzia acuminata</i> var. <i>acuminata</i>			
48.	13328 <i>Waitzia nitida</i>			

**Boraginaceae**

49. 29840 *Halgania cyanea* var. *Allambi Strn* (B.W. Strong 676)

**Brassicaceae**

50. 3008 *Carrichtera annua* (Ward's Weed)

Y

**Campanulaceae**

51. 7397 *Isotoma petraea* (Rock Isotome)

**Casuarinaceae**

52. 12658 *Casuarina pauper* (Black Oak)

**Chenopodiaceae**

53. 12042 *Atriplex lindleyi* subsp. *inflata*

54. 2469 *Atriplex nummularia* (Old Man Saltbush)

55. 11516 *Atriplex nummularia* subsp. *spathulata* (Old Man Saltbush)

56. 11791 *Atriplex quadrivalvata* var. *quadrivalvata*

57. 2481 *Atriplex vesicaria* (Bladder Saltbush)

58. 2514 *Eriochiton sclerolaenoides* (Woolly Bindii)

59. 2533 *Maireana amoena*

60. 2542 *Maireana erioclada*

61. 2544 *Maireana georgei* (Satiny Bluebush)

62. 2545 *Maireana glomerifolia* (Ball Leaf Bluebush)

63. 2555 *Maireana pentatropis*

64. 2560 *Maireana pyramidata* (Sago Bush)

65. 2563 *Maireana sedifolia* (Pearl Bluebush)

66. 2568 *Maireana trichoptera* (Downy Bluebush)

67. 2569 *Maireana triptera* (Threewinged Bluebush)

68. 2625 *Sclerolaena obliquicuspis* (Limestone Bindii)

69. 31719 *Tecticornia chartacea*

70. 31492 *Tecticornia disarticulata*

71. 31918 *Tecticornia doleiformis* (Samphire)

72. 33319 *Tecticornia indica* subsp. *bidens*

73. 33299 *Tecticornia pergranulata* subsp. *elongata*

74. 33297 *Tecticornia pergranulata* subsp. *pergranulata* (Blackseed Samphire)

75. 31717 *Tecticornia undulata*



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
<b>Convolvulaceae</b>				
76.	6614 <i>Convolvulus remotus</i>			
<b>Cupressaceae</b>				
77.	8466 <i>Callitris columellaris</i> (White Cypress Pine)			
<b>Euphorbiaceae</b>				
78.	4626 <i>Euphorbia drummondii</i> (Caustic Weed)			
79.	4664 <i>Monotaxis luteiflora</i>			
<b>Fabaceae</b>				
80.	3201 <i>Acacia acutata</i>			
81.	3269 <i>Acacia coolgardiensis</i> (Spinifex Wattle)			
82.	3315 <i>Acacia duriuscula</i>			
83.	3324 <i>Acacia erinacea</i>			
84.	3366 <i>Acacia hemiteles</i>			
85.	16164 <i>Acacia inceana</i> subsp. <i>inceana</i>			
86.	3393 <i>Acacia jennerae</i>			
87.	14610 <i>Acacia kalgoorliensis</i>			
88.	13503 <i>Acacia masliniana</i>			
89.	3452 <i>Acacia murrayana</i> (Sandplain Wattle)			
90.	3463 <i>Acacia nyssophylla</i>			
91.	19499 <i>Acacia ramulosa</i> var. <i>ramulosa</i>			
92.	29110 <i>Acacia</i> sp. <i>narrow phyllode</i> (B.R. Maslin 7831)			
93.	3577 <i>Acacia tetragonophylla</i> (Kurara)			
94.	3943 <i>Glycyrrhiza acanthocarpa</i> (Native Liquorice)			
95.	17645 <i>Senna artemisioides</i>			
96.	12276 <i>Senna artemisioides</i> subsp. <i>filifolia</i>			
97.	12315 <i>Senna pleurocarpa</i> var. <i>angustifolia</i>			
98.	4220 <i>Swainsona canescens</i> (Grey Swainsona)			
99.	13590 <i>Swainsona halophila</i>			
100.	4231 <i>Swainsona kingii</i>			
101.	13581 <i>Swainsona paradoxa</i>			
<b>Frankeniaceae</b>				
102.	14297 <i>Frankenia pauciflora</i> var. <i>pauciflora</i>			
103.	5213 <i>Frankenia tetrapetala</i> (Four Petaled Frankenia)			
<b>Geraniaceae</b>				
104.	4331 <i>Erodium aureum</i>	Y		
105.	4333 <i>Erodium cicutarium</i> (Common Storksbill)	Y		
106.	4335 <i>Erodium cygnorum</i> (Blue Heronsbill)			
<b>Goodeniaceae</b>				
107.	7413 <i>Brunonia australis</i> (Native Cornflower)			
108.	13155 <i>Dampiera latealata</i>			
109.	7504 <i>Goodenia dyeri</i>			
110.	7531 <i>Goodenia occidentalis</i>			
111.	7541 <i>Goodenia pusilliflora</i> (Smallflower Goodenia)			
112.	7644 <i>Scaevola spinescens</i> (Currant Bush)			
113.	7656 <i>Velleia cynopotamica</i>			
114.	7664 <i>Velleia rosea</i> (Pink Velleia)			
<b>Haloragaceae</b>				
115.	6180 <i>Haloragis trigonocarpa</i>			
<b>Lamiaceae</b>				
116.	17206 <i>Physopsis viscida</i>			
117.	6916 <i>Prostanthera grylloana</i>			
118.	6929 <i>Salvia verbenaca</i> (Wild Sage)	Y		
119.	9247 <i>Westringia rigida</i> (Stiff Westringia)			
<b>Loranthaceae</b>				
120.	13267 <i>Amyema linophylla</i> subsp. <i>linophylla</i>			
<b>Malvaceae</b>				
121.	40923 <i>Commersonia craurophylla</i> (Brittle Leaved Rulingia)			
122.	17725 <i>Hannafordia bissillii</i> subsp. <i>latifolia</i>			
123.	4961 <i>Malva parviflora</i> (Marshmallow)	Y		
124.	4977 <i>Sida fibulifera</i> (Silver Sida)			
<b>Myrtaceae</b>				
125.	14300 <i>Eucalyptus celastroides</i> subsp. <i>celastroides</i> (Mirret)			
126.	5592 <i>Eucalyptus clelandii</i> (Cleland's Blackbutt)			
127.	5595 <i>Eucalyptus comitae-vallis</i> (Comet Vale Mallee)			

Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
128.	13549 <i>Eucalyptus ebbanoensis</i> subsp. <i>ebbanoensis</i>			
129.	18349 <i>Eucalyptus ebbanoensis</i> subsp. <i>glauca</i>			
130.	5636 <i>Eucalyptus eremicola</i>			
131.	12886 <i>Eucalyptus flavida</i> (Yellow-flowered Mallee)			
132.	5665 <i>Eucalyptus griffithsii</i> (Griffith's Grey Gum)			
133.	5673 <i>Eucalyptus horistes</i>			
134.	13056 <i>Eucalyptus leptopoda</i> subsp. <i>subluta</i>			
135.	5697 <i>Eucalyptus lesouefii</i> (Goldfields Blackbutt)			
136.	5726 <i>Eucalyptus oleosa</i> (Giant Mallee)			
137.	12380 <i>Eucalyptus ravida</i>			
138.	5761 <i>Eucalyptus rigidula</i> (Stiff-leaved Mallee)			
139.	5766 <i>Eucalyptus salmonophloia</i> (Salmon Gum)			
140.	5767 <i>Eucalyptus salubris</i> (Gimlet)			
141.	29701 <i>Eucalyptus</i> sp. <i>Mulga Rock</i> (K.D. Hill & L.A.S. Johnson KH 2668)			
142.	5793 <i>Eucalyptus transcontinentalis</i> (Redwood)			
143.	5802 <i>Eucalyptus yilgarnensis</i> (Yorrell)			
144.	16722 <i>Euryomyrtus maidenii</i>			
145.	5815 <i>Homalocalyx thryptomenoides</i>			
146.	5916 <i>Melaleuca halmaturorum</i>			
147.	5925 <i>Melaleuca lateriflora</i> (Gorada)			
148.	6073 <i>Verticordia chrysantha</i>			
<b>Pittosporaceae</b>				
149.	19744 <i>Pittosporum angustifolium</i>			
<b>Plantaginaceae</b>				
150.	7300 <i>Plantago drummondii</i> (Sago Weed)			
151.	14198 <i>Plantago</i> sp. <i>Mt Magnet</i> (A.S. George 6793)			
<b>Poaceae</b>				
152.	17237 <i>Austrostipa elegantissima</i>			
153.	17247 <i>Austrostipa platychaeta</i>			
154.	17251 <i>Austrostipa scabra</i>			
155.	381 <i>Eragrostis falcata</i> (Sickle Lovegrass)			
<b>Proteaceae</b>				
156.	1949 <i>Grevillea acuaria</i>			
157.	12822 <i>Grevillea sarissa</i> subsp. <i>bicolor</i>			
158.	13458 <i>Grevillea sarissa</i> subsp. <i>sarissa</i>			
<b>Ruppiaceae</b>				
159.	116 <i>Ruppia polycarpa</i>			
<b>Rutaceae</b>				
160.	4497 <i>Phebalium canaliculatum</i>			
161.	18537 <i>Philotheca brucei</i> subsp. <i>brucei</i>			
<b>Santalaceae</b>				
162.	2356 <i>Santalum acuminatum</i> (Quandong)			
<b>Sapindaceae</b>				
163.	11730 <i>Alectryon oleifolius</i> subsp. <i>canescens</i>			
164.	4769 <i>Dodonaea lobulata</i> (Bead Hopbush)			
165.	4780 <i>Dodonaea stenozygia</i>			
166.	11247 <i>Dodonaea viscosa</i> subsp. <i>angustissima</i>			
<b>Scrophulariaceae</b>				
167.	7180 <i>Eremophila alternifolia</i> (Poverty Bush)			
168.	13807 <i>Eremophila caperata</i>			
169.	7189 <i>Eremophila clarkei</i> (Turpentine Bush)			
170.	14895 <i>Eremophila decipiens</i> subsp. <i>decipiens</i>			
171.	7198 <i>Eremophila deserti</i>			
172.	14340 <i>Eremophila glabra</i> subsp. <i>glabra</i>			
173.	7219 <i>Eremophila granitica</i> (Thin-leaved Poverty Bush)			
174.	15112 <i>Eremophila interstans</i> subsp. <i>interstans</i>			
175.	15111 <i>Eremophila interstans</i> subsp. <i>virgata</i>			
176.	7234 <i>Eremophila longifolia</i> (Berrigan)			
177.	16363 <i>Eremophila maculata</i> subsp. <i>brevifolia</i> (Native Fuchsia)			
178.	7242 <i>Eremophila miniata</i> (Kopi Poverty Bush)			
179.	15003 <i>Eremophila oldfieldii</i> subsp. <i>angustifolia</i>			
180.	18570 <i>Eremophila oppositifolia</i> subsp. <i>angustifolia</i>			
181.	7250 <i>Eremophila pantonii</i>			
182.	14594 <i>Eremophila parvifolia</i> subsp. <i>auricampa</i>			
183.	14516 <i>Eremophila praecox</i>		P1	
184.	7259 <i>Eremophila pustulata</i> (Warted Eremophila)			



Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
185.	7267 <i>Eremophila scoparia</i> (Broom Bush (			
186.	7283 <i>Eremophila weldii</i>			
<b>Solanaceae</b>				
187.	6955 <i>Crenidium spinescens</i>			
188.	6967 <i>Lycium australe</i> (Australian Boxthorn)			
189.	6978 <i>Nicotiana rotundifolia</i> (Round-leaved Tobacco)			
190.	7018 <i>Solanum lasiophyllum</i> (Flannel Bush)			
191.	7023 <i>Solanum nummularium</i> (Money-leaved Solanum)			
192.	7026 <i>Solanum orbiculatum</i> (Wild Tomato)			
<b>Thymelaeaceae</b>				
193.	11185 <i>Pimelea microcephala</i> subsp. <i>microcephala</i>			
<b>Zygophyllaceae</b>				
194.	4389 <i>Zygophyllum eremaeum</i>			
195.	4392 <i>Zygophyllum iodocarpum</i>			

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# EPBC Act Protected Matters Report

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

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

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

Report created: 25/09/12 16:00:16

[Summary](#)

[Details](#)

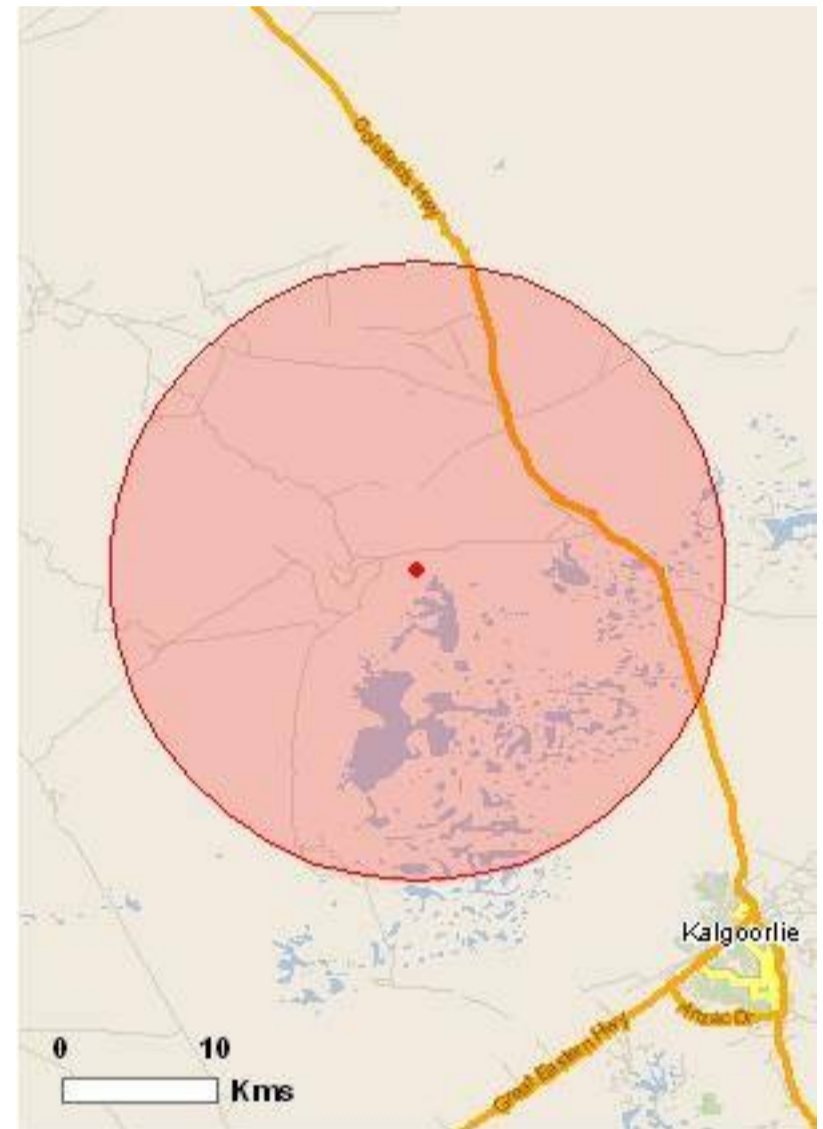
[Matters of NES](#)

[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: 20.0Km



# 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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance:</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Areas:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	None
<a href="#">Listed Threatened Species:</a>	3
<a href="#">Listed Migratory Species:</a>	7

## 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 and the heritage values of a place on the Register of the National Estate.

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.

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

<a href="#">Commonwealth Land:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	4
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves:</a>	None

## Extra Information

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

<a href="#">Place on the RNE:</a>	None
<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Invasive Species:</a>	6
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">Key Ecological Features (Marine)</a>	None

## Details

### Matters of National Environmental Significance

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

Name	Status	Type of Presence
<b>Birds</b>		
<a href="#">Acanthiza iredalei iredalei</a> Slender-billed Thornbill (western) [25967]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
<b>Plants</b>		
<a href="#">Gastrolobium graniticum</a> Granite Poison [14872]	Endangered	Species or species habitat likely to occur within area

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

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

Name	Threatened	Type of Presence
<b>Migratory Marine Birds</b>		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat may occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat may occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<b>Migratory Terrestrial Species</b>		
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species

Name	Threatened	Type of Presence
Migratory Wetlands Species		
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat may occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area

## 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		
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat may occur within area
<a href="#">Ardea alba</a> Great Egret, White Egret [59541]		Species or species habitat may occur within area
<a href="#">Ardea ibis</a> Cattle Egret [59542]		Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area

## 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 Resources Audit, 2001.

Name	Status	Type of Presence
Mammals		

Name	Status	Type of Presence
<a href="#">Capra hircus</a> Goat [2]		Species or species habitat likely to occur within area
<a href="#">Felis catus</a> Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
<a href="#">Oryctolagus cuniculus</a> Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
<a href="#">Vulpes vulpes</a> Red Fox, Fox [18]		Species or species habitat likely to occur within area
<b>Plants</b>		
<a href="#">Carrichtera annua</a> Ward's Weed [9511]		Species or species habitat likely to occur within area
<a href="#">Cenchrus ciliaris</a> Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area

# Coordinates

-30.54006 121.27968

## 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 Heritage and Register of National Estate properties, Wetlands of International 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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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.

# 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:

- [-Department of Environment, Climate Change and Water, New South Wales](#)
- [-Department of Sustainability and Environment, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment and Natural Resources, South Australia](#)
- [-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [-Environmental and Resource Management, Queensland](#)
- [-Department of Environment and Conservation, Western Australia](#)
- [-Department of the Environment, Climate Change, Energy and Water](#)
- [-Birds Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-SA 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, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [-State Forests of NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- 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 - Species Lists

**Table 8 Flora species list**

Family	Genus	Species	Status
Aizoaceae	<i>Disphyma</i>	<i>crassifolium</i>	
Aizoaceae	<i>Gunniopsis</i>	<i>quadrifida</i>	
Amaranthaceae	<i>Hemichroa</i>	<i>diandra</i>	
Amaranthaceae	<i>Ptilotus</i>	<i>chortophytus</i>	Priority 1
Amaranthaceae	<i>Ptilotus</i>	<i>holosericeus</i>	
Amaranthaceae	<i>Ptilotus</i>	<i>nobilis</i>	
Amaranthaceae	<i>Ptilotus</i>	<i>obovatus</i>	
Apocynaceae	<i>Alyxia</i>	<i>buxifolia</i>	
Apocynaceae	<i>Marsdenia</i>	<i>australis</i>	
Asparagaceae	<i>Thysanotus</i>	<i>manglesianus</i>	
Asteraceae	<i>Brachyscome</i>	<i>ciliaris</i>	
Asteraceae	<i>Centaurea</i>	<i>melitensis</i>	Introduced
Asteraceae	<i>Centipeda</i>	<i>crateriformis</i>	Introduced
Asteraceae	<i>Chrysocephalum</i>	<i>puteale</i>	
Asteraceae	<i>Cratystylis</i>	<i>conocephala</i>	
Asteraceae	<i>Cratystylis</i>	<i>microphylla</i>	
Asteraceae	<i>Cratystylis</i>	<i>subspinescens</i>	
Asteraceae	<i>Gnephosis</i>	<i>tenuissima</i>	
Asteraceae	<i>Hyalosperma</i>	<i>glutinosum</i> subsp. <i>glutinosum</i>	
Asteraceae	<i>Minuria</i>	<i>cunninghamii</i>	
Asteraceae	<i>Monoculus</i>	<i>monstrosus</i>	Introduced
Asteraceae	<i>Olearia</i>	<i>muelleri</i>	
Asteraceae	<i>Sonchus</i>	<i>?oleraceus</i>	Introduced
Asteraceae	<i>Streptoglossa</i>	<i>liatroides</i>	
Casuarinaceae	<i>Casuarina</i>	<i>pauper</i>	
Chenopodiaceae	<i>Atriplex</i>	<i>lindleyi</i> subsp. <i>inflata</i>	
Chenopodiaceae	<i>Atriplex</i>	<i>nummularia</i> subsp. <i>spathulata</i>	

Family	Genus	Species	Status
Chenopodiaceae	<i>Atriplex</i>	<i>semibaccata</i>	
Chenopodiaceae	<i>Atriplex</i>	<i>?vesicaria</i>	
Chenopodiaceae	<i>Enchylaena</i>	<i>tomentosa</i>	
Chenopodiaceae	<i>Eriochiton</i>	<i>sclerolaenoides</i>	
Chenopodiaceae	<i>Maireana</i>	<i>appressa</i>	
Chenopodiaceae	<i>Maireana</i>	<i>georgei</i>	
Chenopodiaceae	<i>Maireana</i>	<i>glomerifolia</i>	
Chenopodiaceae	<i>Maireana</i>	<i>pentatropis</i>	
Chenopodiaceae	<i>Maireana</i>	<i>pyramidata</i>	
Chenopodiaceae	<i>Maireana</i>	<i>sedifolia</i>	
Chenopodiaceae	<i>Maireana</i>	<i>trichoptera</i>	
Chenopodiaceae	<i>Maireana</i>	<i>triptera</i>	
Chenopodiaceae	<i>Rhagodia</i>	<i>drummondii</i>	
Chenopodiaceae	<i>Roycea</i>	<i>divaricata</i>	
Chenopodiaceae	<i>Salsola</i>	<i>australis</i>	
Chenopodiaceae	<i>Sclerolaena</i>	<i>cuneata</i>	
Chenopodiaceae	<i>Sclerolaena</i>	<i>diacantha</i>	
Chenopodiaceae	<i>Sclerolaena</i>	<i>obliquicuspis</i>	
Chenopodiaceae	<i>Tecticornia</i>	<i>?doleiformis</i>	
Chenopodiaceae	<i>Tecticornia</i>	<i>indica</i> subsp. <i>bidens</i>	
Chenopodiaceae	<i>Tecticornia</i>	<i>pergranulata</i> subsp. <i>pergranulata</i>	
Convolvulaceae	<i>Convolvulus</i>	<i>remotus</i>	
Fabaceae	<i>Acacia</i>	<i>?aptaneura</i>	
Fabaceae	<i>Acacia</i>	<i>aneura</i>	
Fabaceae	<i>Acacia</i>	<i>burkittii</i>	
Fabaceae	<i>Acacia</i>	<i>erinacea</i>	
Fabaceae	<i>Acacia</i>	<i>hemiteles</i>	
Fabaceae	<i>Acacia</i>	<i>kalgoorliensis</i>	

Family	Genus	Species	Status
Fabaceae	<i>Acacia</i>	<i>tetragonophylla</i>	
Fabaceae	<i>Jacksonia</i>	<i>arida</i>	
Fabaceae	<i>Medicago</i>	<i>laciniata</i>	Introduced
Fabaceae	<i>Medicago</i>	<i>polymorpha</i>	Introduced
Fabaceae	<i>Senna</i>	<i>artemisioides</i> subsp. <i>filifolia</i>	
Fabaceae	<i>Senna</i>	<i>stowardii</i>	
Frankeniaceae	<i>Frankenia</i>	<i>fecunda</i>	
Frankeniaceae	<i>Frankenia</i>	<i>interioris</i> var. <i>interioris</i>	
Frankeniaceae	<i>Frankenia</i>	<i>pauciflora</i>	
Gentianaceae	<i>Centaurium</i>	<i>erythraea</i>	Introduced
Goodeniaceae	<i>Goodenia</i>	<i>pinnatifida</i>	
Goodeniaceae	<i>Scaevola</i>	<i>spinescens</i>	
Hemerocallidaceae	<i>Dianella</i>	<i>revoluta</i> var. <i>divaricata</i>	
Juncaceae	<i>Juncus</i>	<i>aridicola</i>	
Lamiaceae	<i>Salvia</i>	<i>reflexa</i>	Introduced
Lamiaceae	<i>Westringia</i>	<i>rigida</i>	
Malvaceae	<i>Sida</i>	<i>fibulifera</i>	
Malvaceae	<i>Sida</i>	<i>spodochroma</i>	
Myrtaceae	<i>Eucalyptus</i>	? <i>cylindriflora</i>	
Myrtaceae	<i>Eucalyptus</i>	<i>clelandii</i>	
Myrtaceae	<i>Eucalyptus</i>	<i>griffithsii</i>	
Myrtaceae	<i>Eucalyptus</i>	<i>horistes</i>	
Myrtaceae	<i>Eucalyptus</i>	<i>lesouefii</i>	
Myrtaceae	<i>Eucalyptus</i>	<i>rigidula</i>	
Myrtaceae	<i>Eucalyptus</i>	<i>salmonophloia</i>	
Myrtaceae	<i>Eucalyptus</i>	<i>salubris</i>	
Myrtaceae	<i>Eucalyptus</i>	<i>transcontinentalis</i>	
Myrtaceae	<i>Eucalyptus</i>	<i>yilgarnensis</i>	
Myrtaceae	<i>Melaleuca</i>	<i>lateriflora</i>	

Family	Genus	Species	Status
Pittosporaceae	<i>Pittosporum</i>	<i>angustifolium</i>	
Poaceae	<i>Aristida</i>	<i>contorta</i>	
Poaceae	<i>Aristida</i>	sp.	
Poaceae	<i>Austrostipa</i>	<i>elegantissima</i>	
Poaceae	<i>Austrostipa</i>	<i>nitida</i>	
Poaceae	<i>Austrostipa</i>	<i>scabra</i>	
Poaceae	<i>Enneapogon</i>	<i>caerulescens</i>	
Poaceae	<i>Enteropogon</i>	<i>ramosus</i>	
Poaceae	<i>Eragrostis</i>	<i>dielsii</i>	
Poaceae	<i>Paspalidium</i>	sp.	
Poaceae	<i>Rytidosperma</i>	<i>caespitosum</i>	
Poaceae	<i>Triodia</i>	<i>irritans</i>	
Portulacaceae	<i>Calandrinia</i>	<i>polyandra</i>	
Primulaceae	<i>Lysimachia</i>	<i>arvensis</i>	Introduced
Proteaceae	<i>Grevillea</i>	<i>acuaria</i>	
Proteaceae	<i>Hakea</i>	<i>preissii</i>	
Rhamnaceae	<i>Cryptandra</i>	<i>?granitica</i>	
Santalaceae	<i>Exocarpos</i>	<i>aphyllus</i>	
Santalaceae	<i>Santalum</i>	<i>acuminatum</i>	
Santalaceae	<i>Santalum</i>	<i>spicatum</i>	
Sapindaceae	<i>Alectryon</i>	<i>oleifolius</i> subsp. <i>canescens</i>	
Sapindaceae	<i>Dodonaea</i>	<i>lobulata</i>	
Sapindaceae	<i>Dodonaea</i>	<i>viscosa</i> subsp. <i>angustissima</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>alternifolia</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>alternifolia</i> var. <i>alternifolia</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>decipiens</i> subsp. <i>decipiens</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>glabra</i> subsp. <i>glabra</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>granitica</i>	

Family	Genus	Species	Status
Scrophulariaceae	<i>Eremophila</i>	<i>interstans</i> subsp. <i>interstans</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>interstans</i> subsp. <i>virgata</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>miniata</i> subsp. <i>miniata</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>oldfieldii</i> subsp. <i>angustifolia</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>oppositifolia</i> subsp. <i>angustifolia</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>pantonii</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>parvifolia</i> subsp. <i>auricampa</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>pustulata</i>	
Scrophulariaceae	<i>Eremophila</i>	<i>scoparia</i>	
Solanaceae	<i>Lycium</i>	<i>australe</i>	
Solanaceae	<i>Nicotiana</i>	<i>glauca</i>	Introduced
Solanaceae	<i>Solanum</i>	<i>lasiophyllum</i>	
Solanaceae	<i>Solanum</i>	<i>orbiculatum</i>	
Thymelaeaceae	<i>Pimelea</i>	<i>microcephala</i> subsp. <i>microcephala</i>	
Zygophyllaceae	<i>Zygophyllum</i>	<i>eremaeum</i>	
Zygophyllaceae	<i>Zygophyllum</i>	<i>iodocarpum</i>	

**Table 9 Fauna species list**

Species	Common Name	Conservation Status
<b>Birds</b>		
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	
<i>Acanthiza uropygialis</i>	Chestnut-rumped Thornbill	
<i>Anthochaera carunculata</i>	Red Wattlebird	
<i>Ardeotis australis</i>	Australian Bustard	Priority 4
<i>Artamus cinereus</i>	Black faced Wood Swallow	
<i>Barnardius zonarius</i>	Australian Ringneck	
<i>Cacatua roseicapilla subsp. assimilis</i>	Galah	
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	
<i>Corvus bennetti</i>	Little Crow	
<i>Corvus coronoides</i>	Australian Raven	
<i>Cracticus nigrogularis</i>	Pied Butcherbird	
<i>Cracticus tibicen</i>	Australian Magpie	
<i>Cracticus torquatus</i>	Grey Butcherbird	
<i>Dromaius novaehollandiae</i>	Emu	
<i>Falco berigora</i>	Brown Falcon	
<i>Falco cenchroides</i>	Kestrel	
<i>Gerygone fusca</i>	Western Gerygone	
<i>Grallina cyanoleuca</i>	Magpie-lark	
<i>Lichenostomus leucotis</i>	White-eared Honeyeater	
<i>Lichenostomus virescens</i>	Singing Honeyeater	
<i>Lichmera indistincta</i>	Brown Honeyeater	
<i>Malurus leucopterus</i>	White winged Fairy-wren	
<i>Manorina flavigula</i>	Yellow-throated Miner	
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater	
<i>Microeca fascinans</i>	Jack Winter	

Species	Common Name	Conservation Status
<i>Ocyphaps lophotes</i>	Crested Pigeon	
<i>Oreoica gutturalis</i>	Crested Bellbird	
<i>Pardalotus striatus</i>	Striated Pardalote	
<i>Petroica goodenovii</i>	Red-capped Robin	
<i>Podargus strigoides</i>	Tawny Frogmouth	
<i>Pomatostomus temporalis</i>	Grey Crowned Babbler	
<i>Rhipidura leucophrys</i>	Willie Wagtail	
<i>Smicromnis brevirostris</i>	Weebill	
<i>Strepera versicolor</i>	Grey Currawong	
<i>Trybonix ventralis</i>	Black-tailed Native Hen	
<b>Mammals</b>		
<i>Oryctologus cuniculus</i>	Rabbit	Introduced
<i>Felis catus</i>	Cat	Introduced
<i>Canis familiaris</i>	Wild Dog	Introduced
<i>Capra hircus</i>	Goat	Introduced
<i>Bos taurus</i>	Cattle	Introduced
<i>Macropus rufus</i>	Red Kangaroo	
<b>Reptiles</b>		
<i>Tympanocryptis cephalus</i>	Pebble Dragon	
<i>Varanus gouldii</i>	Bungarra or Sand Monitor	
<i>Morethia butleri</i>	Skink	
<i>Menetia greyii</i>	Skink	
<i>Ctenophorus nuchalis</i>	Central netted Dragon	
<i>Ctenophorus reticulatus</i>	Western Netted Dragon	
<i>Ctenotus leonhardii</i>	Leopard Ctenotus (Skink)	
<i>Ctenotus schomburgkii</i>	Ctenotus (Skink)	
<b>Frogs</b>		
<i>Neobatrachus</i> sp.	Frog- Tadpoles only	



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