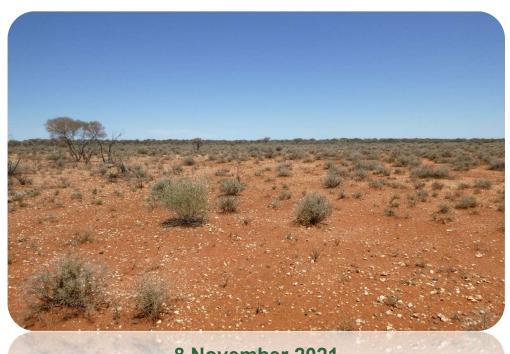
# **SECOND FORTUNE GOLD MINE FLORA AND VEGETATION ASSESSMENT**



8 November 2021



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Cover Photo: Second Fortune Gold Mine, Vegetation Survey October 2021, Acacia sparse shrubland

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### **GLOSSARY**

Acronym	Description
BAM Act	Biosecurity and Agriculture Management Act 2007 (WA)
BC Act	Biodiversity Conservation Act 2016 (WA)
Botanica	Botanica Consulting Pty Ltd.
ВоМ	Bureau of Meteorology.
DAWE	Department of the Agriculture, Water and Environment, Australian Government.
DBCA	Department of Biodiversity, Conservation and Attractions, WA Government.
DMIRS	Department of Mines, Industry Regulation and Safety, WA Government
DPIRD	Department of Primary Industries and Regional Development, WA Government
DWER	Department of Water and Environmental Regulation (formerly EPA, DER and DoW), WA Government.
EP Act	Environmental Protection Act 1986 (WA)
EP Regulations	Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (WA)
EPA	Environmental Protection Authority (WA)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
ESA	Environmentally Sensitive Area.
На	Hectare (10,000 square meters)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union.
JAMBA	Japan Australia Migratory Bird Agreement 1981
Km	Kilometer (1,000 meters)
LGA	Local Government Area
NVIS	National Vegetation Information System
PEC	Priority Ecological Community
TEC	Threatened Ecological Community
WA	Western Australia
WAHERB	Western Australian Herbarium
WAM	Western Australian Museum, WA Government.



#### **EXECUTIVE SUMMARY**

The Second Fortune Gold Mine is an underground mining operation located approximately 200 km northeast of Kalgoorlie-Boulder and approximately 80 km south of Laverton, just south of Lake Carey in the Eastern Goldfields Region of Western Australia (Figure 1-1).

Botanica Consulting (Botanica) was commissioned by Linden Gold Pty Ltd to undertake a reconnaissance flora and vegetation survey of the area surrounding the Evaporation Ponds at the Second Fortune Gold Mine to support an approval under the *Environmental Protection Act 1986* to modify the groundwater monitoring requirements imposed by Prescribed Premises Licence L9012/20103/1.

The Department of Water and Environmental Regulation (DWER) has asked Linden Gold Pty Ltd to submit supporting documentation on the flora and vegetation surrounding the Evaporation Ponds to ensure that implementing a 25 m halo around the Evaporation Ponds to establish an operational footprint for the facility will not result in significant harm to the environment through loss of conservation significant flora and/or vegetation.

Botanica conducted a reconnaissance flora/vegetation survey on the 15<sup>th</sup> October 2021 covering an area of approximately 146 ha, encompassing a 500 m buffer around the Evaporation Ponds on tenements M 39/255, M 39/649 E 39/1539, E 39/2081 and E 39/1970<sup>1</sup> (referred to as the 'survey area').

The survey area lies within the Eastern Murchison (MUR1) subregion of the Murchison Bioregion, as defined by the Interim Biogeographic Regionalisation of Australia (IBRA). The vegetation in the vicinity of the Evaporation Ponds is considered to be typical of the Murchison Bioregion, being dominated by Mulga woodlands and chenopod shrublands, and is well represented outside of the survey area. All vegetation associations retain >99% of their original pre-European vegetation extent.

The field survey identified a total of 59 flora taxa, including three introduced (weed) species, within the survey area. These taxa represented 28 genera across 20 families, with the most diverse families were Chenopodiaceae (16 species), Fabaceae (11 species), and Scrophulariaceae (eight species); equating to 29%,19% and 14% of the total vascular taxa recorded respectively. Dominant genera include *Eremophila* (eight species), *Maireana* (seven species) and *Acacia* (seven species).

No Threatened or Priority flora species or otherwise significant flora were recorded within the survey area

Two broad-scale vegetation communities were identified within the survey area (*Acacia* sparse shrubland and *Acacia* shrubland).

No Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC) or otherwise significant vegetation were identified within the survey area. However, there is one PEC, the 'Mount Linden Range banded ironstone ridge vegetation assemblages' (Priority 3(iii)) approximately 1.8 km north of the survey area.

Native vegetation within the survey area was rated as 'good' to 'completely degraded'. Areas cleared of vegetation, including major tracks and historical mining operations, were categorized as 'completely degraded'.

Based on the outcomes of a desktop assessment and field survey, Botanica consider that implementing a 25 m halo around the Evaporation Ponds to establish an operational footprint for the facility will not result in significant harm to the environment through loss of conservation significant flora and/or vegetation should vegetation within the operational footprint area be impacted.

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<sup>&</sup>lt;sup>1</sup> E 39/1970 is owned by Anglogold Ashanti Australia Limited.



#### 1. INTRODUCTION

Botanica Consulting (Botanica) was commissioned by Linden Gold Pty Ltd to undertake a reconnaissance flora and vegetation survey of the area surrounding the Evaporation Ponds at the Second Fortune Gold Mine. The Second Fortune Gold Mine is an underground mining operation located approximately 200 km northeast of Kalgoorlie-Boulder and approximately 80 km south of Laverton, just south of Lake Carey in the Eastern Goldfields Region of Western Australia (Figure 1-1).

Linden Gold Pty Ltd currently seeking approval under the *Environmental Protection Act 1986* to modify the groundwater monitoring requirements imposed by Prescribed Premises Licence L9012/20103/1, by implementing a 25 m halo around the Evaporation Ponds to establish an operational footprint for the facility within which standing water level limit will not apply.

The Department of Water and Environmental Regulation (DWER) has asked Linden Gold Pty Ltd to submit supporting documentation on the flora and vegetation surrounding the Evaporation Ponds to ensure establishment of the operational footprint will not result in significant harm to the environment through loss of conservation significant flora and/or vegetation.

The survey was conducted on the 15<sup>th</sup> October 2021 covering an area of approximately 146 ha, encompassing a 500 m buffer around the Evaporation Ponds on tenements M 39/255, M 39/649 E 39/1539, E 39/2081 and E 39/1970<sup>2</sup> (referred to as the 'survey area') (Figure 1-2).

#### 1.1 Survey Objectives

The flora and vegetation survey was conducted in accordance with the requirements of a reconnaissance survey as defined in the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016a). The objectives of the survey were to:

- Gather background information on flora/vegetation within the local area (literature review, database and map-based searches);
- Conduct a field survey to verify/ground truth the desktop assessment findings through reconnaissance survey;
- Define and map vegetation communities of the survey area to a scale appropriate for the bioregion and described according to the National Vegetation Information System (NVIS) classification (NVIS Level V – Association);
- Record the species composition of each vegetation community within the survey area and compile a species list for the survey area by vegetation type;
- Identify and record the locations of any conservation significant flora/vegetation within the survey area;
- Identify and record the locations of any introduced flora species (including Declared Pests) within the survey area;
- Determine the local and regional conservation significance of flora and vegetation within the survey area;
- Provide a map showing the distribution of conservation significant flora/vegetation within the survey area;
- Define and map the condition of vegetation within the survey area in accordance with the vegetation condition scale specified in the Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016a); and
- Assess the significance of flora and vegetation in accordance with State environmental legislation.

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<sup>&</sup>lt;sup>2</sup> E 39/1970 is owned by Anglogold Ashanti Australia Limited.



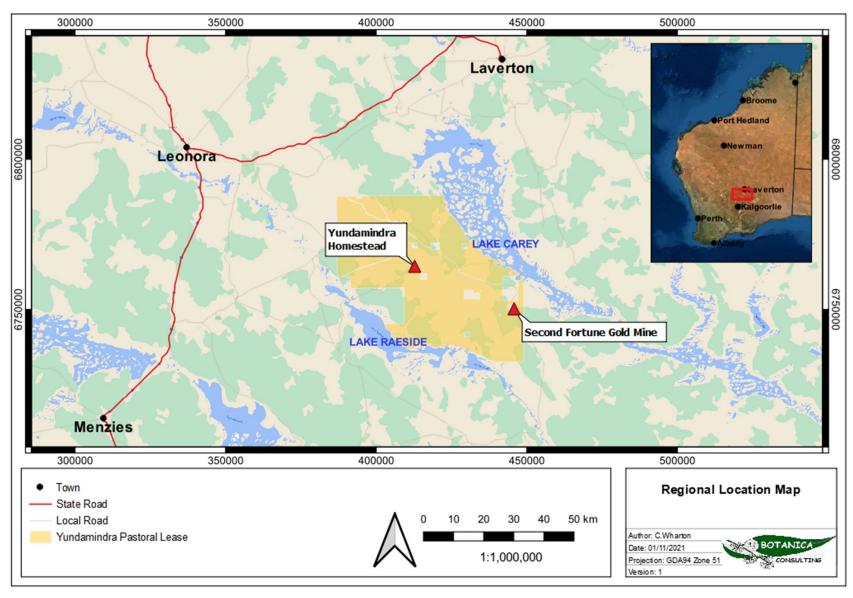


Figure 1-1: Regional Location Map

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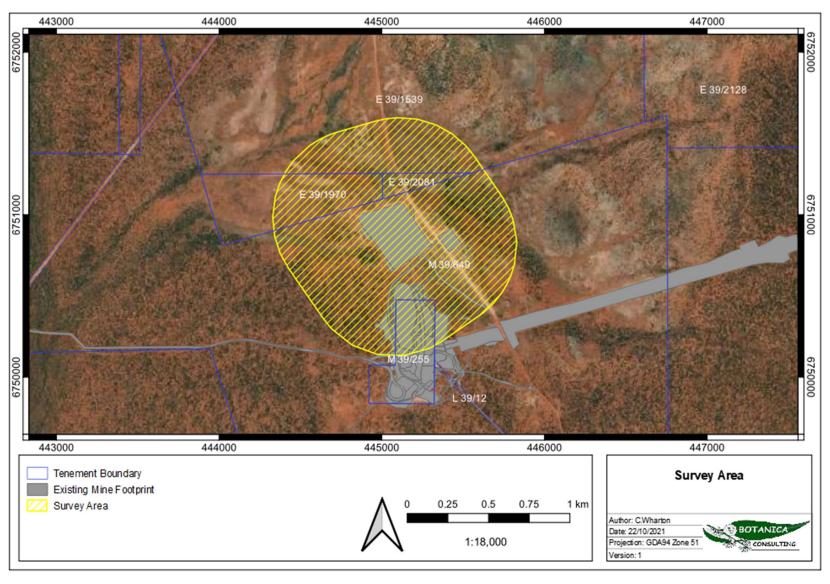


Figure 1-2: Map of Survey Area

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#### 2. BIOPHYSICAL ENVIRONMENT

#### 2.1 Regional Environment

The Second Fortune Gold Mine is located in the East Murchison (MUR1) subregion of the Murchison Bioregion as defined by the Interim Biogeographic Regionalisation for Australia (IBRA) (Figure 2-1).

The Eastern Murchison comprises the northern parts of the craton's Southern Cross and Eastern Goldfields Terrains and is characterised by internal drainage and extensive areas of elevated red desert sandplains with minimal dune development. Salt Lake systems are associated with the occluded paleodrainage system. Broad plains of red-brown soils and breakaways complexes as well as red sandplains are widespread. Vegetation is dominated by Mulga woodlands and is often rich in ephemerals, hummock grasslands, saltbush shrublands and Tecticornia shrublands (Cowan, 2001).

In accordance with Beard (1990), the Murchison region is located in the Austin Botanical District within the Eremaean Province of Western Australia. It is defined by the vegetational expression of geological boundaries of the Yilgarn Block, described as Archaean granite with infolded volcanics and meta-sediments (greenstones) of a like age. The topography is undulating, with occasional ranges of low hills and extensive sandplains in the eastern half. The principal soil type is shallow earthy loam overlying red-brown hardpan, with shallow stony loams on hills and red earthy sands on sandplains. The western half of the region more or less coincides with the basin of the Murchison River, the eastern half embraces the drainage of former rivers, now dry, draining towards the Eucla Basin. Vegetation is predominantly mulga low woodland (*Acacia aneura*) on plains, reduced to scrub on hills, with a tree steppe of *Eucalyptus* spp. and *Triodia basedowii* on sandplains.

The nearest lake system is Lake Carey which is located approximately 10 km to the north; however the project area drains to Lake Raeside which is located 20 km to the south. The area is relatively flat and broad, with poorly defined drainage lines. The region is sparsely populated. Other than mining, the main economic activity occurring in the vicinity of the project is pastoralism.

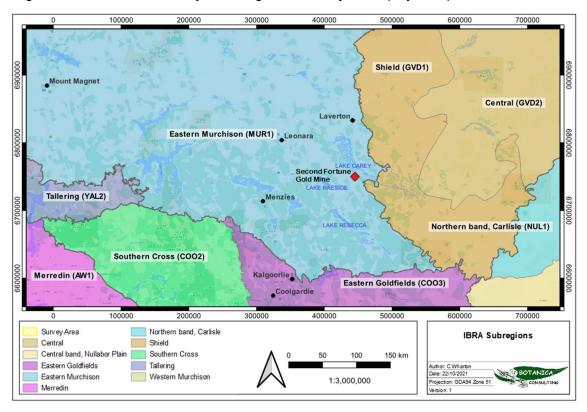


Figure 2-1: Map of IBRA Subregions in the vicinity of the Second Fortune Gold Mine



#### 2.2 Land Use

The dominant land uses of the Eastern Murchison subregion is grazing of native pastures (85.47%), unallocated Crown land (UCL) and Crown Reserves (11.34%), mining (1.79%), and conservation (1.4%) (Cowan, 2001). The survey area is located within the Yundamindra Pastoral Lease.

#### 2.3 Topography and Land Systems

The Eastern Murchison subregion is dominated by Archaean granite-greenstone terrain, with the landscape comprising low hills, mesas of duricrust separated by flat colluvium and alluvial plains. The western half of the bioregion comprises the Murchison Catchment (Australian Natural Resources Atlas, 2009) and drainage occurs westwards towards the Murchison River and south into Lake Austin. This subregion is characterised by its internal drainage and extensive area of elevated red desert sandplains (Cowan, 2001).

Another important feature of the system is the salt lake systems associated with the occluded Paleo within drainage system. Beard (1990) describes the topography of the region as undulating with occasional ranges of low hills and extensive sandplains located in the East. The dominant soil type is a shallow earthy loam, overlying red-brown hardpan. Red earthy sands can be found on the sandplains. The Penny's Find Project is located at 397 m elevation.

The Second Fortune Gold Mine occurs within the Salinaland Plains Zone (279) of the Murchison Province (27). The Salinaland Plains Zone is characterised by sandplains (with hardpan wash plains and some mesas, stony plains and salt lakes) on granitic rocks (and some greenstone) of the Yilgarn Craton. Red sandy earths, Red deep sands, Red shallow loams and Red loamy earths with some Red-brown hardpan shallow loams, Salt lake soils and Red shallow sandy duplexes. Mulga shrublands with spinifex grasslands (and some halophytic shrublands and eucalypt woodlands). Located in the northern Goldfields from Lakes Barlee and Ballard to Wiluna and Laverton (Tille, 2006). The survey area is located within the Rainbow and Gundockerta Land System mapping units (as shown Figure 2-2). A description of the Soil Land Systems is provided in Table 2-1.

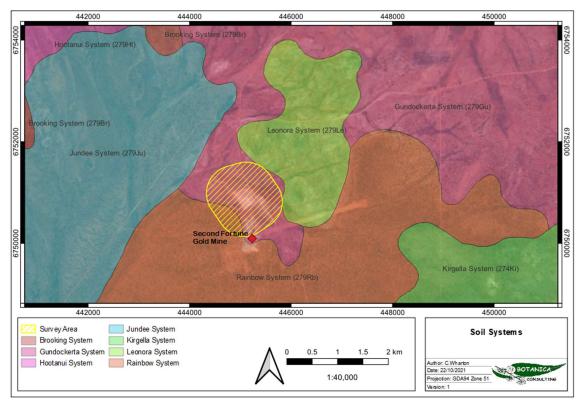


Figure 2-2: Soil Landscape Systems within the Penny's Find Project



Table 2-1: Soil Landscape Systems within the Penny's Find Project

Land System	Mapping Unit	Description
Rainbow	279Rb	Hardpan plains supporting mulga tall shrublands.
Gundockerta	279Gu	Extensive, gently undulating calcareous stony plains supporting bluebush shrublands.

#### 2.4 Climate

The climate of the East Murchison IBRA subregion is described as arid with mainly winter rainfall (Cowan, 2001). The nearest Bureau of Meteorology (BoM) weather station is in Laverton (#12045), located 80 km north of the Second Fortune Gold Mine.

The yearly average maximum and minimum temperatures are 35.8°C in January and 17.8°C in July respectively; for data recorded from 1900 to 1971. The long term mean annual rainfall for Laverton is 235.2 mm; however rainfall varies considerably from year to year with as little as 65.6 mm falling in 1928 and 525.6 mm in 2000. The mean annual evaporation of 2762.5 mm significantly exceeds the mean annual rainfall (BoM, 2021).

Temperature and Rainfall Statistics for the Laverton weather station are presented in (Figure 2-3).

Annual rainfall recorded in 2019, 2020 and 2021 year to date (YTD) is well below the long-term mean recorded from 1900 to 2021 YTD (Figure 2-4). The flora and vegetation survey was conducted following below average rainfall received in the months preceding the October 2021 survey (Figure 2-5).

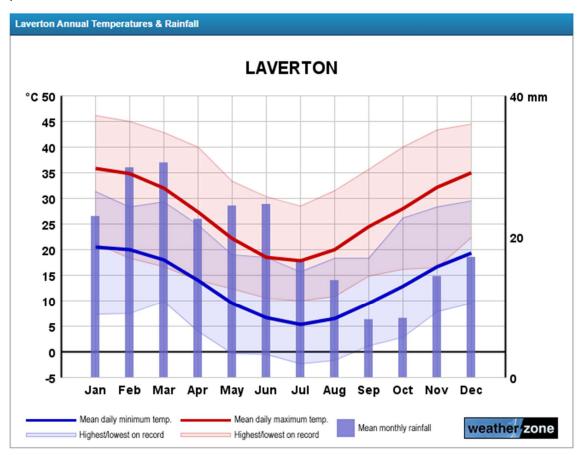


Figure 2-3: Temperature and Rainfall Statistics for the Laverton weather station (#12045)

Retrieved from https://www.farmonlineweather.com.au/climate/station.jsp?lt=site&lc=12045 (20/10/2021).



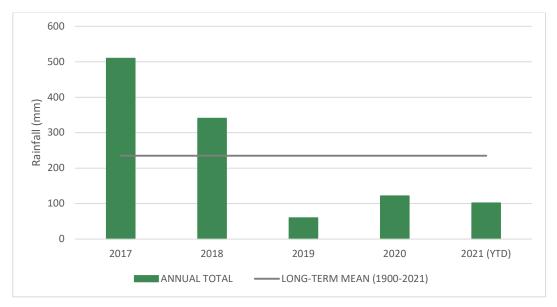


Figure 2-4: Annual rainfall from January 2017 to September 2021 and mean monthly rainfall for the Laverton weather station (#12045) (BoM, 2021)

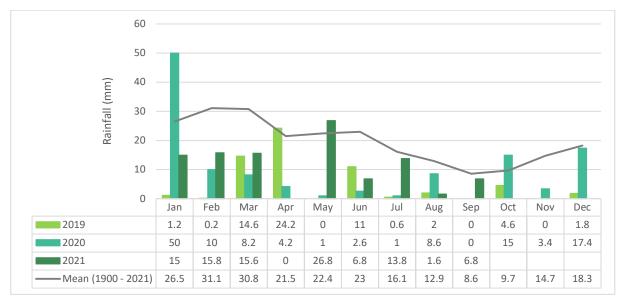


Figure 2-5: Monthly rainfall data from January 2019 to September 2021 and mean monthly rainfall for the Laverton weather station (#12045) (BoM, 2021)



#### 3. SURVEY METHODOLOGY

#### 3.1 Desktop Assessment

Prior to the field assessment a literature review was undertaken of previous flora assessments conducted within the local region. Documents reviewed included:

- MBS (2012). Desktop Flora and Fauna Assessment, Second Fortune Deposit, Linden Gold Project. Prepared for Exterra Resources Limited. October 2012.
- MBS (2012). Desktop Flora and Fauna Assessment, Second Fortune Project. Prepared for Exterra Resources Limited. April 2013.

In addition to the literature review, searches of the following databases were undertaken to aid in the compilation of a list of flora taxa within the survey area:

- DBCA Priority/Threatened Flora spatial data (DBCA, 2019b);
- DBCA NatureMap database (DBCA, 2021); and
- EPBC Protected Matters search tool (DAWE, 2021).

The NatureMap species search and EPBC Protected Matter search were conducted with a 20 km circular buffer from the survey area using centre point 122° 26' 03" E, 29° 22'12" S (i.e. the centre of the Evaporation Ponds).

Significant flora and fauna species identified by the desktop review were assessed with regards to their population extent and distribution and preferred habitat to determine their likelihood of occurrence within the survey area.

The assessment categorised flora species as follows:

- Unlikely- Suitable habitat is not expected to occur and/or the survey area is outside the known range of the species.
- Possible- Suitable habitat may be present, and the area is within the known range of the species. This option is also used when there is insufficient information to determine the preferred habitat of a species.
- Likely- Suitable habitat is expected to occur and there are records within 10 km of the survey area.
- Previously Recorded- A record for this species is located within the survey area. Field survey
  will ground-truth currently occurring individuals and populations.

It should be noted that these databases are based on observations from a broader area (i.e. 20 km radius) and therefore may include taxa not present within the survey area. The databases also often include very old records that may be incorrect or in some cases the taxa in question have become locally or regionally extinct. Information from these sources should therefore be taken as indicative only and local knowledge and information also needs to be taken into consideration when determining what actual species may be present within the specific area being investigated. The conservation significance of flora taxa was assessed using data from the following sources:

- Environment Protection and Biodiversity and Conservation Act 1999 (Cth) (EPBC Act).
   Administered by the Australian Government Department of Agriculture, Water and Environment (DAWE);
- Biodiversity Conservation Act 2016 (WA) (BC Act). Administered by the WA Government Department of Biodiversity, Conservation and Attractions (DBCA);
- Red List produced by the Species Survival Commission (SSC) of the World Conservation
   Union (also known as the IUCN Red List the acronym derived from its former name of the
   International Union for Conservation of Nature and Natural Resources). The Red List has no
   legislative power in Australia but is used as a framework for State and Commonwealth
   categories and criteria; and



 Priority Flora list. A non-legislative list maintained by the DBCA for management purposes (flora list released December 2018).

Descriptions of conservation significant species and communities are provided in APPENDIX A.

The EPBC Act also requires the compilation of a list of migratory species that are recognised under international treaties including the:

- Japan Australia Migratory Bird Agreement 1981 (JAMBA)<sup>3</sup>;
- China Australia Migratory Bird Agreement 1998 (CAMBA);
- Republic of Korea-Australia Migratory Bird Agreement 2007 (ROKAMBA); and
- Bonn Convention 1979 (The Convention on the Conservation of Migratory Species of Wild Animals).

Most but not all migratory bird species listed in the annexes to these bilateral agreements are protected in Australia as Matters of National Environmental Significance under the EPBC Act.

#### 3.2 Field Assessment

Botanica conducted a reconnaissance flora/vegetation survey on the 15<sup>th</sup> October 2021 covering an area of approximately 146 ha, encompassing a 500 m buffer around the Evaporation Ponds at the Second Fortune Gold Mine. The survey area was traversed on foot by two staff members.

#### 3.2.1 Flora Assessment

Prior to the commencement of field work, aerial photography was inspected and obvious differences in the vegetation assemblages were identified. The different vegetation communities identified were then inspected during the field survey to assess their validity. A handheld GPS unit was used to record the coordinates of the boundaries between existing vegetation communities. At each sample point, the following information was recorded:

- GPS location;
- · Photograph of vegetation;
- Dominant taxa for each stratum;
- All vascular taxa (including annual taxa);
- · Landform classification;
- Vegetation condition rating;
- · Collection and documentation of unknown plant specimens; and
- GPS location, photograph and collection of flora of conservation significance if encountered.

Unknown specimens collected during the survey were identified with the aid of samples housed at the Botanica Herbarium and Western Australian Herbarium. Vegetation was classified in accordance with NVIS classifications.

#### 3.2.2 Personnel Involved

Jennifer Jackson (Senior Botanist, BSc (Honours) Environmental Management)

Sarah Campbell (Environmental Consultant, BSc Biology)

#### 3.2.3 Scientific Licences

<sup>&</sup>lt;sup>3</sup> Most but not all species listed under JAMBA are also specially protected under Specially Protected Species of the BC Act.



Table 3-1: Scientific Licences of Botanica Staff coordinating the flora survey

Licensed staff	Permit Number	Valid Until
Jennifer Jackson	FB62000309 - Flora Taking (Biological Assessment) Licence	11/01/2024

#### 3.3 Survey Limitations and Constraints

It is important to note that flora surveys will entail limitations notwithstanding careful planning and design. Potential limitations are listed in Table 3-2.

The conclusions presented in this report are based upon field data and environmental assessments and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of the field assessments. Also, it should be recognised that site conditions can change with time. Information not available at the time of this assessment which may subsequently become available may alter the conclusions presented.

In recognition of survey limitations, a precautionary approach has been adopted for this assessment. Any flora species that would possibly occur within the survey area (or immediately adjacent), as identified through ecological databases, publications, discussions with local experts/residents and the habitat knowledge of the author, has been listed as having the potential to occur.

Table 3-2: Limitations and constraints associated with the survey

Variable	Potential Impact on Survey	Details
Access problems	Not a constraint	The survey was conducted on foot. Numerous tracks were located within the survey area, providing ease of access.
Competency/ Experience	Not a constraint	The Botanica personnel that conducted the survey were regarded as suitably qualified and experienced.
		Coordinating Botanist: Jennifer Jackson
		Data Interpretation: Jennifer Jackson and Catherine Wharton
Timing of survey, weather & season	Not a constraint	Fieldwork was undertaken within the Environmental Protection Authority's (EPA's) recommended supplementary survey period for the Eremaean Province (i.e. after winter rainfall).
Area disturbance	Not a constraint	The area has been disturbed from existing mine and road developments; however, vegetation was mostly intact and comprised of native vegetation.
Survey Effort/ Extent	Not a constraint	Survey intensity was appropriate for the size/significance of the area with a reconnaissance survey completed to identify vegetation types and a targeted survey to identify conservation significant species/communities.
Availability of contextual information at a regional and local scale	Not a constraint	Threatened flora database searches provided by the DBCA were used to identify any potential locations of Threatened/Priority taxa.  BoM, DWER, DPIRD, DBCA and DAWE databases were reviewed to obtain appropriate regional desktop information on the biophysical environment of the local region.  Previous flora and fauna assessments for the Second Fortune Gold Mine (MBS, 2012;2013) have been assessed for pertinent information and environmental context of the regional area.
Completeness	Not a constraint	In the opinion of Botanica, the survey area was covered sufficiently in order to identify vegetation assemblages. All observed flora individuals were able to be identified to species level.  The vegetation types for this study were based on visual descriptions of locations in the field. The distribution of these vegetation communities/ fauna habitats outside the study area is not known, however vegetation types identified were categorised via comparison to vegetation distributions throughout Western Australia specified in the NVIS Major Vegetation Groups (DAWE, 2017).



#### 4. RESULTS

#### 4.1 Desktop Assessment

#### 4.1.1 Flora

The desktop review identified 180 vascular flora species as occurring within 40 km of the survey area; representing 77 genera from 32 families. The most diverse families were Chenopodiaceae (35 species), Fabaceae (24 species) and Asteraceae (19 species). Significant genera were *Acacia* (16 species), *Eremophila* (15 species), and Maireana (12 species). This total includes seven conservation significant flora species and four introduced (weed) species.

#### 4.1.2 Significant Flora

The assessment of the DBCA Priority/Threatened flora data (DBCA, 2019b), NatureMap search (DBCA, 2021b), Protected Matters search (DAWE, 2021a) and previous relevant literature identified seven significant flora species recorded within a 40 km radius of the survey area. These are comprised of two Priority 1, four Priority 3 and one Priority 4 taxa (Figure 4-1).

The seven conservation significant flora species were assessed for distribution and known habitat to determine their likelihood of occurrence within the survey area (Table 4-1).

Table 4-1: Potentially Occurring Significant Flora Species

	<u>-</u>		
DBCA Rank	Species Name	Comment	Likelihood
P1	Tecticornia mellarium	Known from several large salt lake systems in the Goldfields region, growing in dunes adjacent to these lakes.	Unlikely, no large salt lakes and/or systems in the survey area.
	Tecticornia sp. Lake Way (P. Armstrong 05/961)	Known from several large salt lake systems in the Goldfields region, growing in the low lying areas immediately adjacent to these lakes.	Unlikely, no large salt lakes and/or systems in the survey area.
Р3	Acacia eremophila var. Numerous-nerved variant	Known from flats/plains with sandy soils.	Unlikely, no sandy soils present in the survey area.
	Calandrinia sp. Menzies (F. Hort et al. FH 4100)	Known from orange sand/loam/gravel flats/plains with very open mulga tall shrubland with sparse understorey.	Possible.
	Hybanthus floribundus subsp. chloroxanthus	Known from dark red-brown soil, never sandy, that is rich in iron oxide, laterite. Rocky areas, creek banks, along steep banks of drainage lines.	Possible.
	Melaleuca apostiba	Known from low lying salt flats, at the edge of salt lakes in dry red loam sands, that are seasonally inundated.	Unlikely, no suitable habitat in the survey area.
P4	Hemigenia exilis	Known from laterite breakaways and slopes.	Unlikely, no laterite breakaways or slopes in the survey area.



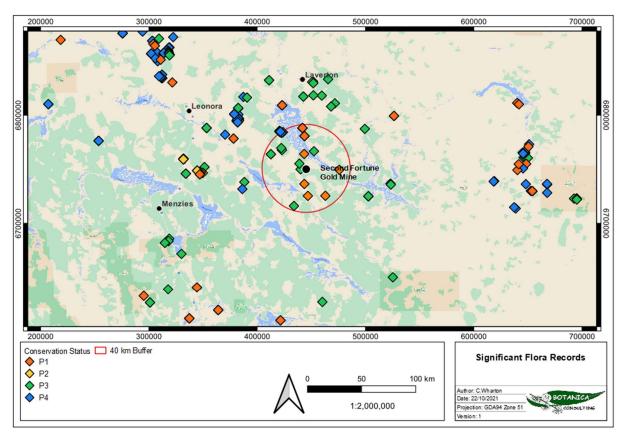


Figure 4-1: Significant Flora Records

#### 4.1.3 Introduced Species

According to NatureMap, four introduced (weed) species have been recorded within a 20 km radius of the survey area (DBCA, 2021), and two introduced (weed) species were identified via the EPBC Protected Matters search tool (as listed in Table 4-2).

None of these species are listed on the Western Australian Organism List (WAOL) under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) (DPIRD, 2021) or as Weeds of National Significance (WONS, 2013).

Table 4-2: Introduced (Weed) Species recorded within 20 km of the Evaporation Ponds

Taxon	Common Name	Declared Pest/WoNS			
NatureMap	NatureMap				
Carpobrotus aequilaterus	Angular Pigface	-			
Cuscuta planiflora	-	-			
Erodium cicutarium	Common Storksbill	-			
Rostraria cristata	Mediterranean hairgrass.	-			
EPBC Protected Matters search tool					
Carrichtera annua	Ward's Weed	-			
Cenchrus ciliaris	Buffel-grass	-			



#### 4.1.4 Vegetation and Ecological Communities

#### 4.1.4.1 Vegetation Associations

The Pre-European vegetation association spatial mapping dataset (DPIRD, 2018) identifies the survey area as occurring within vegetation associations Barlee 18 and Laverton 400 in the East Murchison (MUR1) IBRA subregion (Figure 4-2). The association description and remaining extent, as specified in the 2018 Statewide Vegetation Statistics (DBCA, 2019a) is provided in Table 4-3.

Areas retaining less than 30% of their pre-European vegetation extent generally experience exponentially accelerated species loss, while areas with less than 10% are considered "endangered". Extending the operational footprint of the Evaporation Ponds will not significantly reduce the extent of pre-European vegetation associations.

		_	_			
IBRA Subregion	Vegetation System / Association	Pre- European Extent (ha)	Current Extent (ha)	Pre- European Extent Remaining (%)	% of Current Extent within DBCA Managed Lands	Vegetation Description (Beard, 1990)
MUR1	Barlee/18	3,198,859.57	3,196,467.69	99.93	2.41	Low woodland; mulga (Acacia aneura)
	Laverton/400	40,993.73	40,658.44	99.18	0.00	Succulent steppe with open low woodland; mulga over bluebush

Table 4-3: Remaining Beard Vegetation Associations within the Survey Area

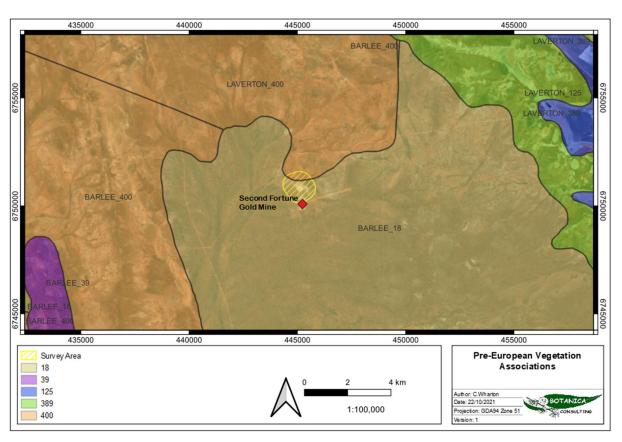


Figure 4-2: Pre-European Vegetation Associations within the survey area



#### 4.1.4.2 Significant Ecological Communities

The EPBC Protected Matters search (DAWE, 2021) did not identify any Threatened Ecological Communities (TECs) as potentially occurring within the survey area. Analysis of the Priority Ecological Communities (PECs) within the Goldfields region (DBCA, 2021b) identified one PEC, the 'Mount Linden Range banded ironstone ridge vegetation assemblages' (Priority 3(iii)) approximately 1.8 km north of the survey area.

#### 4.1.5 Conservation Areas

There are no DBCA managed lands or lands of interest located within the survey area.

There are no Environmentally Sensitive Areas (ESAs) located within the survey area.

There are no Nationally Important or RAMSAR wetlands located within the survey area.

The nearest significant environmental feature is Lake Marmion, located approximately 90 km southwest of the survey area. This area is categorised as a Nationally Important Wetland and as an Environmentally Sensitive Area. Disturbances within the survey area are unlikely to impact these features.

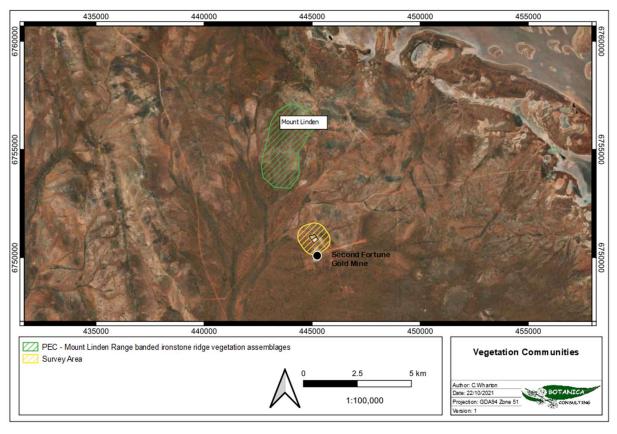


Figure 4-3: Location of PEC (Mount Linden Range banded ironstone ridge vegetation assemblages)

#### 4.2 Field Assessment

#### 4.2.1 Flora

The field survey identified a total of 59 flora taxa, including three introduced (weed) species, within the survey area. These taxa represented 28 genera across 20 families, with the most diverse families were Chenopodiaceae (16 species), Fabaceae (11 species), and Scrophulariaceae (eight species); equating to 29%,19% and 14% of the total vascular taxa recorded respectively. Dominant genera



include *Eremophila* (eight species), *Maireana* (seven species) and *Acacia* (seven species). The full field species inventory is listed in APPENDIX C.

No Threatened or Priority flora species were recorded within the survey area.

#### 4.2.1.1 Introduced Species

Three of the flora taxa recorded within the survey area are introduced (weed) species (Table 4-4). These taxa represent 7% of the total taxa recorded from the survey area.

None of the recorded weed species are on the Western Australian Organism List (WAOL) under Section 11 of the *Biosecurity and Agriculture Management Act 2007* (BAM Act) (DPIRD, 2021) or on the list of Weeds of National Significance (WONS, 2013).

 Weed species
 Common Name
 Family
 Status under the BAM Act

 \*Citrullus amarus
 Wild Melon
 Cucurbitaceae

 \*Salvia verbenaca
 Wild Sage
 Lamiaceae

 \*Lysimachia arvensis
 Scarlet Pimpernel
 Primulaceae

Table 4-4: List of Introduced (Weed) Species

#### 4.2.1.2 Significant Flora

According to the EPA *Environmental Factor Guideline for Flora and Vegetation* (EPA, 2016b) significant flora includes:

- flora being identified as threatened or priority species;
- locally endemic flora or flora associated with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems);
- new species or anomalous features that indicate a potential new species;
- flora representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- unusual species, including restricted subspecies, varieties or naturally occurring hybrids; and
- flora with relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

No Threatened or Priority flora species or otherwise significant flora were recorded within the survey area.

#### 4.2.2 Vegetation Communities

A total of two broad-scale vegetation communities were identified within the survey area. Vegetation community descriptions and extent area listed below in Table 4-5 and illustration spatially in Figure 4-4. Vegetation community description and extents were determined from field survey results, aerial imagery interpretation and extrapolation of the communities.

The most widespread community in the survey area was RP-AS1, occupying 94.33 ha (58%), while the remaining vegetation in the survey area was CLP-AS1, occupying 38.32 ha (23%). The most diverse community was RP-AS1 with 56 species (94.9%), while the least diverse was CLP-AS1 with 22 species (37.3%).



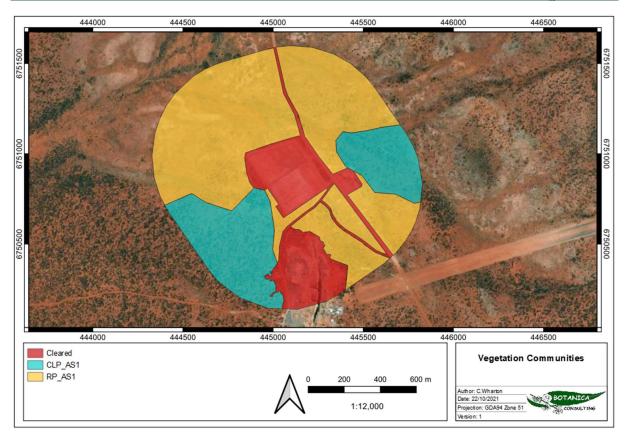


Figure 4-4: Vegetation Communities within the Survey Area



Table 4-5: Vegetation Communities within the Survey Area

		Table 4-5. Vegetation Communities within the Survey Area				
Vegetation Community	Broad Floristic Formation (NVIS III)	Vegetation Description (NVIS V)	Landform	Image		
RP-AS1 94.33 ha (58%)	Acacia sparse shrubland	Acacia incurvaneura, A. craspedocarpa and A. ramulosa sparse tall shrubland over Cratystylis subspinescens and Maireana sedifolia sparse shrubland over Ptilotus obovatus var. obovatus, Maireana georgei and M. trichoptera low sparse chenopod shrubland.	Rocky plain			
38.32 ha (23%)	Acacia shrubland	Acacia incurvaneura, A. mulganeura and Casuarina pauper tall shrubland over Acacia tetragonophylla, Eremophila platycalyx and Senna artemisioides subsp. filifolia open shrubland over Ptilotus obovatus var. obovatus, Maireana triptera, M. georgei and Atriplex bunburyana low open shrubland.	Clay loam plain			

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#### 4.2.3 Vegetation Condition

Based on the vegetation condition scale specified in the *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016a) (APPENDIX B), vegetation ranged from 'completely degraded' to 'good' (Table 4-6; Figure 4-5). 'Good' condition depicts more obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds, and these impacts are typical in the Murchison Bioregion. 'Degraded' areas were closer to the mining activities currently in place.

J		-
Condition Rating	Area (ha)	Area (%)
Good	95.31	58
Degraded	40.25	25
Completely Degraded	28.25	17
Total	163.81	100

Table 4-6: Vegetation Condition within the Survey Area

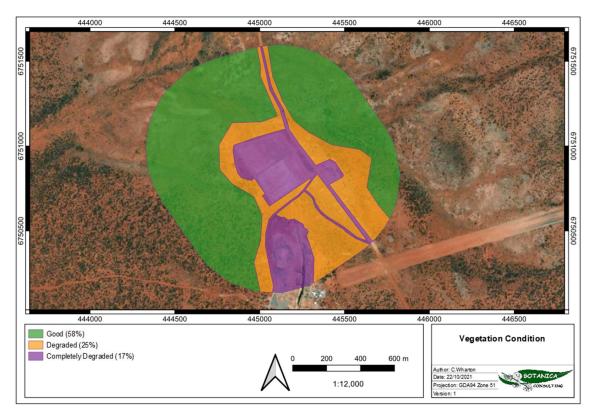


Figure 4-5: Vegetation Condition within the Survey Area

#### 4.2.4 Significant Vegetation

According to the EPA *Environmental Factor Guideline for Flora and Vegetation* (EPA, 2016b) significant vegetation includes:

- vegetation being identified as threatened or priority ecological communities;
- · vegetation with restricted distribution;
- vegetation subject to a high degree of historical impact from threatening processes;
- · vegetation which provides a role as a refuge; and



 vegetation providing an important function required to maintain ecological integrity of a significant ecosystem.

No Threatened or Priority Ecological Communities or otherwise significant vegetation were identified within the survey area.

#### 4.3 Matters of National Environmental Significance

#### 4.3.1 Environment Protection and Biodiversity Conservation Act 1999 (Cth)

The EPBC Act protects matters of national environmental significance and is used by the Commonwealth DAWE to list threatened taxa and ecological communities into categories based on the criteria set out in the EPBC Act (<a href="www.environment.gov.au/epbc/index.html">www.environment.gov.au/epbc/index.html</a>). The EPBC Act provides a national environmental assessment and approval system for proposed developments and enforces strict penalties for unauthorised actions that may affect matters of national environmental significance. Matters of national environmental significance as defined by the Commonwealth EPBC Act include:

- World Heritage Properties
- National Heritage Places
- Wetlands of International Importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed)
- Nationally Threatened Species and Ecological Communities
- Migratory Species
- Commonwealth Marine Areas
- The Great Barrier Reef Marine Park
- Nuclear Actions (including uranium mining)
- a Water Resource, in relation to coal seam gas development and large coal mining development (DOTE, 2013).

No matters of national environmental significance as defined by the Commonwealth EPBC Act were identified within the survey area.

#### 4.4 Matters of State Environmental Significance

#### 4.4.1 Environmental Protection Act 1986 (WA)

The EP Act provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment. The EP Act is administered by the DWER, which is the State Government's environmental regulatory agency.

Under Section 51C of the EP Act and the *Environmental Protection (Clearing of Native Vegetation)* Regulations (Regulations) WA 2004 any clearing of native vegetation in Western Australia that is not eligible for exemption under Schedule 6 of the EP Act 1986 or under the Regulations 2004 requires a clearing permit from the DWER or DMIRS. Under Section 51A of the EP Act 1986 native vegetation includes aquatic and terrestrial vegetation indigenous to Western Australia, and intentionally planted vegetation declared by regulation to be native vegetation, but not vegetation planted in a plantation or planted with commercial intent.

Section 51A of the EP Act 1986 defines clearing as "the killing or destruction of; the removal of; the severing or ringbarking of trunks or stems of; or the doing of substantial damage to some or all of the native vegetation in an area, including the flooding of land, the burning of vegetation, the grazing of stock or an act or activity that results in the above". Exemptions under Schedule 6 of the EP Act



and the Regulations do not apply in ESAs as declared under Section 51B of the EP Act or TECs listed under State and Commonwealth legislation.

No evidence of the survey area containing any TEC or Threatened flora or fauna was found during the survey period. The survey area is not located within an ESA.

#### 4.4.2 Biodiversity Conservation Act 2016

The BC Act is used by the DBCA for the conservation and protection of biodiversity and biodiversity components in Western Australia and to promote the ecologically sustainable use of biodiversity components in the State. Taxa are classified as 'Threatened" when their populations are geographically restricted or are threatened by local processes (see following sections for Threatened definitions). Under the BC Act all native flora and fauna are protected throughout the State. Financial penalties are enforced under the BC Act if threatened species are collected without an appropriate license.

Under Section 54(1) of the BC Act, habitat is eligible for listing as critical habitat if:

- a) it is critical to the survival of a threatened species or a threatened ecological community; and
- b) its listing is otherwise in accordance with the ministerial guidelines.

No threatened species or critical habitat listed under the BC Act were recorded within the survey area.



#### 5. CONCLUSIONS AND RECOMMENDATIONS

The vegetation in the vicinity of the Evaporation Ponds is considered to be typical of the Murchison Bioregion, being dominated by Mulga woodlands and chenopod shrublands, and is well represented outside of the survey area.

All vegetation associations retain >99% of their original pre-European vegetation extent.

No Threatened or Priority flora species or otherwise significant flora were recorded within the survey area.

No TECs or PECs or otherwise significant vegetation were identified within the survey area. However, there is one PEC, the 'Mount Linden Range banded ironstone ridge vegetation assemblages' (Priority 3(iii)) approximately 1.8 km north of the survey area.

Native vegetation within the survey area was rated as 'good' to 'completely degraded'. 'Good' condition depicts more obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds, and these impacts are typical in the Murchison Bioregion. 'Degraded' areas were closer to the mining activities currently in place. Areas cleared of vegetation, including major tracks and historical mining operations, were categorized as 'completely degraded'.

Based on the outcomes from the desktop assessment and field survey, Botanica consider that implementing a 25 m halo around the Evaporation Ponds to establish an operational footprint for the facility will not result in significant harm to the environment through loss of conservation significant flora and/or vegetation should vegetation within the operational footprint area be impacted.



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## APPENDIX A: CONSERVATION RATINGS BC ACT AND EPBC ACT

#### **Definitions of Conservation Significant Species**

Code	Category			
Threaten	ed Species (T)			
section 19	order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under b(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the ty Conservation Act 2016 (BC Act).			
CR	Critically Endangered			
	Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines".			
	Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for critically endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for critically endangered flora.			
EN	Endangered			
	Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines".			
	Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for endangered fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for endangered flora.			
VU	Vulnerable			
	Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines".			
	Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for vulnerable flora.			
Extinct s	Decies			
Listed by	order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.			
EX	Extinct			
	Species where "there is no reasonable doubt that the last member of the species has died", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).			
	Published as presumed extinct under schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018 for extinct fauna or the Wildlife Conservation (Rare Flora) Notice 2018 for extinct flora.			
EW	Extinct in the Wild			
	Species that "is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).			
	Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.			
Specially	protected species			
following o	order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the categories: species of special conservation interest; migratory species; cetaceans; species subject to nal agreement; or species otherwise in need of special protection.			
	Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.			
IA	International Agreement/ Migratory			
	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).			



	Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.  Published as migratory birds protected under an international agreement under schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.		
CD	Species of special conservation interest		
	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).		
	Published as conservation dependent fauna under schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.		
os	Other specially protected species		
	Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).		
	Published as other specially protected fauna under schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.		

#### **Priority species**

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

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

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

#### P1 Priority 1: Poorly-known species Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey. P2 Priority 2: Poorly-known species Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey. P3 Priority 3: Poorly-known species Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey. P4 Priority 4: Rare, Near Threatened and other species in need of monitoring (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

**Extinct** 

EX

Commonwealth categories of threatened species



	Taxa where there is no reasonable doubt that the last member of the species has died.		
EW	Extinct in the Wild  Taxa where it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.		
CR	Critically Endangered  Taxa that are facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.		
EN	Endangered  Taxa which are not critically endangered and is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.		
VU	Vulnerable  Taxa which are not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.		
CD	Conservation Dependent  Taxa which are the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied:  (i) the species is a species of fish;  (ii) the species is the focus of a plan of management that provides for actions necessary to stop the		
	decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;  (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory;  (iv) cessation of the plan of management would adversely affect the conservation status of the species.		

### **Definitions of Conservation Significant Communities**

Category Code	Category			
State catego	State categories of Threatened Ecological Communities (TEC)			
PD	Presumed Totally Destroyed			
	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:			
	records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or;			
	all occurrences recorded within the last 50 years have since been destroyed.			
CR	Critically Endangered			
	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, meeting any one of the following criteria:			
	The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification;			
	The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area;			
	The ecological community is highly modified with potential of being rehabilitated in the immediate future.			
EN	Endangered			
	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. The ecological community must meet any one of the following criteria:			
	The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short-term future, or is unlikely to be substantially rehabilitated in the short-term future due to modification;			



	The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area;		
	The ecological community is highly modified with potential of being rehabilitated in the short-term future.		
VU	Vulnerable		
	An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet any one of the following criteria:		
	The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated;		
	The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution;		
	The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.		
Commor	nwealth categories of Threatened Ecological Communities (TEC)		
CE	Critically Endangered		
	If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).		
EN	Endangered		
	If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).		
VU	Vulnerable		
	If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium–term future (indicative timeframe being the next 50 years).		
Priority I	Ecological Communities (PEC)		
P1	Poorly-known ecological communities		
	Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist.		
P2	Poorly-known ecological communities		
	Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, un-allocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation.		
P3	Poorly known ecological communities		
	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:		
	Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or;		
	Communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing and inappropriate fire regimes.		
P4	<b>Ecological communities that are adequately known, rare but not threatened</b> or meet criteria for near threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.		
P5	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 B: VEGETATION CONDITION SCALE

Vegetation Condition Rating	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor		Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.
Vegetation Conditio	n Scale (adapted from Keighery 1994 and Trudger	n 1988) (EPA, 2016a)



## APPENDIX C: LIST OF ALL SPECIES IDENTIFIED IN THE SURVEY AREA, OCTOBER 2021

Family	Genus	Species	CLP-AS1	RP-AS1
Amaranthaceae	Ptilotus	aervoides	X	
Amaranthaceae	Ptilotus	exaltatus	X	
Amaranthaceae	Ptilotus	obovatus	X	х
Apocynaceae	Leichhardtia	australis	X	х
Asteraceae	Cratystylis	subspinescens	X	
Asteraceae	Siemssenia	capillaris	X	
Casuarinaceae	Casuarina	pauper	X	Х
Chenopodiaceae	Atriplex	bunburyana	X	Х
Chenopodiaceae	Atriplex	codonocarpa	X	
Chenopodiaceae	Atriplex	vesicaria	X	
Chenopodiaceae	Enchylaena	tomentosa	X	
Chenopodiaceae	Maireana	georgei	X	
Chenopodiaceae	Maireana	glomerifolia	X	
Chenopodiaceae	Maireana	pyramidata	X	х
Chenopodiaceae	Maireana	sedifolia	X	Х
Chenopodiaceae	Maireana	tomentosa	X	
Chenopodiaceae	Maireana	trichoptera	X	
Chenopodiaceae	Maireana	triptera	X	х
Chenopodiaceae	Rhagodia	drummondii	X	х
Chenopodiaceae	Sclerolaena	cuneata	X	
Chenopodiaceae	Sclerolaena	densiflora	X	
Chenopodiaceae	Sclerolaena	diacantha	X	
Chenopodiaceae	Sclerolaena	eriacantha	X	
Cucurbitaceae	Citrullus	amarus*	X	
Fabaceae	Acacia	burkittii	X	
Fabaceae	Acacia	caesaneura	X	
Fabaceae	Acacia	craspedocarpa	X	Х
Fabaceae	Acacia	incurvaneura	X	Х
Fabaceae	Acacia	mulganeura		X
Fabaceae	Acacia	oswaldii	X	
Fabaceae	Acacia	ramulosa	X	
Fabaceae	Acacia	tetragonophylla	X	Х
Fabaceae	Senna	artemisioides subsp. artemisioides	X	
Fabaceae	Senna	artemisioides subsp. filifolia	X	Х
Fabaceae	Senna	glutinosa subsp. chatelainiana	X	
Frankeniaceae	Frankenia	cinerea	X	
Goodeniaceae	Scaevola	spinescens	X	х
Lamiaceae	Salvia	verbenaca*	X	
Loranthaceae	Amyema	fitzgeraldii		Х
Malvaceae	Sida	calyxhymenia	X	
Malvaceae	Brachychiton	gregorii		X



Family	Genus	Species	CLP-AS1	RP-AS1
Pittosporaceae	Pittosporum	angustifolium	X	
Poaceae	Eragrostis	dielsii	X	
Primulaceae	Lysimachia	arvensis*	X	
Proteaceae	Hakea	preissii	X	
Rubiaceae	Psydrax	suaveolens	X	х
Santalaceae	Exocarpos	aphyllus	X	
Santalaceae	Santalum	lanceolatum	X	
Santalaceae	Santalum	spicatum	X	
Scrophulariaceae	Eremophila	alternifolia	X	х
Scrophulariaceae	Eremophila	forrestii	X	
Scrophulariaceae	Eremophila	glandulifera	X	
Scrophulariaceae	Eremophila	latrobei		Χ
Scrophulariaceae	Eremophila	longifolia	X	
Scrophulariaceae	Eremophila	oldfieldii subsp. angustifolia	X	х
Scrophulariaceae	Eremophila	pantonii	X	
Scrophulariaceae	Eremophila	platycalyx subsp. Leonora	х	х
Solanaceae	Solanum	lasiophyllum	X	х
Thymelaeaceae	Pimelea	microcephala	х	
* Denotes introduced (w	veed) species	•		



## APPENDIX D: NATUREMAP SPECIES REPORT



# **NatureMap Species Report**

Created By Guest user on 29/10/2021

Current Names Only Yes

Core Datasets Only Yes

Method 'By Circle'

Centre 128° 17' 57" E,25° 03' 13" S

Buffer 40km

Group By Family

Family	Species	Records
Acanthaceae Acanthizidae	1 9	2 92
Accipitridae	9	45
Aegothelidae	1	2
Agamidae	5	9
Amaranthaceae	9	20
Anatidae	4	11 1
Anhingidae Apocynaceae	2	2
Araliaceae	1	1
Araneidae	3	7
Ardeidae	1	3
Artamidae	3	88
Aspleniaceae Asteraceae	1 28	2 54
Bignoniaceae	1	1
Boraginaceae	11	16
Brassicaceae	4	5
Burhinidae	1	2
Cacatuidae	1	1 4
Campanulaceae Campephagidae	3 2	25
Carrimulgidae	1	3
Carphodactylidae	1	4
Casuarinaceae	1	3
Celastraceae	2	3
Centrolepidaceae	1	1
Chenopodiaceae	22	32
Cinclosomatidae Cleomaceae	1 1	1 1
Climacteridae	1	1
Colchicaceae	1	2
Columbidae	4	51
Convolvulaceae	2	2
Corvidae Cracticidae	3	35
Craciidae	3 1	91 13
Cupressaceae	1	13
Cyperaceae	13	18
Dasyuridae	2	10
Desidae	1	4
Dicaeidae	1 3	26 110
Dicruridae Diplodactylidae	4	10
Dipluridae	1	1
Droseraceae	2	7
Elapidae	3	4
Elatinaceae	1	
Estrilidae	2 4	100
Euphorbiaceae Fabaceae	61	4 150
Falconidae	5	73
Filistatidae	1	1
Gekkonidae	3	18
Goodeniaceae	14	24
Gyrostemonaceae	1	1
Halcyonidae	1 2	18 3
Haloragaceae Hirundinidae	2	30
Hypericaceae	1	2
Isoetaceae	1	2
Lamiaceae	10	25
Loganiaceae	1	1
Loranthaceae	3	7
Lycosidae Lythraceae	1 1	2
Lymraceae Maluridae	8	65
Malvaceae	11	31
Marsileaceae	2	2
Meliphagidae	6	183
Meropidae	1	24
	1	1 2
Montiaceae		
Montiaceae Moraceae	1	
Montiaceae Moraceae Muridae	3	12
Montiaceae Moraceae		12 42 2







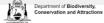
Sylviidae     1     1       Theridiidae     1     2       Thylacomyidae     1     1       Turnicidae     1     18       Typhaceae     1     1       Urodacidae     2     3       Urticaceae     1     1       Varanidae     5     8       Violaceae     1     2       Zodariidae     1     1       Zygophyllaceae     4     5       TOTAL     495     2227	Pachycephalidae Pardalotidae Petroicidae Phasianidae Pholicidae Phyllanthaceae Phyllanthaceae Poaceae Podargidae Podicipedidae Polygalaceae Polygalaceae Porteaceae Porteaceae Proteaceae Pritacidae Pritlonorhynchidae Pygopodidae Rallidae Recurvirostridae Rhamnaceae Rubiaceae Salticidae Santalaceae Salticidae Santalaceae Santalaceae Santalaceae Santalaceae Santalaceae Saltoidae Scrophulariaceae Solanaceae Solanaceae Sparassidae Stylidiaceae	3 2 3 2 1 2 1 34 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	110 34 66 4 4 2 2 2 54 2 6 1 1 1 1 1 1 1 1 3 2 3 3 2 6 6 6 1 7 9 8 1 1 1 1 1 8 1 8 1 8 1 8 1 8 1 8 1 8
TOTAL 495 2227	Theridiidae Thylacomyidae Turnicidae Typhaceae Urodacidae Urticaceae Varanidae Violaceae Zodariidae	1 1 1 2 1 5 1	2 1 18 1 3 1 8 2 1
	TOTAL	495	2227







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
Acouthococo					Alea
Acanthaceae		Rostellularia adscendens var. pogonanthera			
		, totalialana adocentano tan pegenanalora			
Acanthizidae		Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)			
3.		Acanthiza chrysorrhoa (Yellow-rumped Thornbill)			
4.		Acanthiza robustirostris (Slaty-backed Thornbill)			
5.		Acanthiza uropygialis (Chestnut-rumped Thornbill)			
6.	25528	Aphelocephala leucopsis (Southern Whiteface)			
7.	24268	Aphelocephala nigricincta (Banded Whiteface)			
8.	25530	Gerygone fusca (Western Gerygone)			
9.		Pyrrholaemus brunneus (Redthroat)			
10.	30948	Smicrornis brevirostris (Weebill)			
Accipitridae					
11.	25535	Accipiter cirrocephalus (Collared Sparrowhawk)			
12.		Accipiter fasciatus (Brown Goshawk)			
13.		Aquila audax (Wedge-tailed Eagle)			
14.	24289	Circus assimilis (Spotted Harrier)			
15. 16.	24205	Elanus axillaris Haliastur sphenurus (Whistling Kite)			
17.		Hamirostra melanosternon (Black-breasted Buzzard)			
18.		Hieraaetus morphnoides (Little Eagle)			
19.		Milvus migrans (Black Kite)			
Acaetholidea		• •			
Aegothelidae		Aegotheles cristatus (Australian Owlet-nightjar)			
	20044	Acgunoles chistatus (Australian Owiet-nightgar)			
Agamidae					
21.		Ctenophorus caudicinctus subsp. graafi (Ring-tailed Dragon)			
22. 23.		Ctenophorus isolepis (Crested Dragon, Military Dragon) Ctenophorus nuchalis (Central Netted Dragon)			
24.		Moloch horridus (Thorny Devil)			
25.		Tympanocryptis centralis (Central Earless Dragon)			
Amaranthasa		• •			
Amaranthace		Alternanthera nana (Hairy Joyweed)			
27.		Amaranthus mitchellii (Boggabri Weed)			
28.		Ptilotus decipiens			
29.		Ptilotus drummondii (Narrowleaf Mulla Mulla)			
30.	2731	Ptilotus helipteroides (Hairy Mulla Mulla)			
31.	2747	Ptilotus obovatus (Cotton Bush)			
32.	2756	Ptilotus royceanus			
33.		Ptilotus schwartzii			
34.	10809	Ptilotus sessilifolius			
Anatidae					
35.	24312	Anas gracilis (Grey Teal)			
36.		Anas superciliosa (Pacific Black Duck)			
37.		Aythya australis (Hardhead)			
38.	24326	Malacorhynchus membranaceus (Pink-eared Duck)			
Anhingidae					
39.	47414	Anhinga novaehollandiae (Australasian Darter)			
Apocynaceae	•				
40.		Cynanchum viminale subsp. australe			
41.	12949	Marsdenia australis			
Araliaceae					
42.	6242	Hydrocotyle trachycarpa			
Araneidae		Arriona protenca			
43. 44.		Argiope protensa Backobourkia collina			
45.		Nephila edulis			
Ardeidae	2/2/4	Ardea pacifica (Mhito pocked Haran)			
46.	<b>24341</b>	Ardea pacifica (White-necked Heron)			
Artamidae					
47.		Artamus cinereus (Black-faced Woodswallow)			
48.	24355	Artamus minor (Little Woodswallow)			
			Department Conservation	of Biodiversity, an and Attractions	WESTERN







Conservation Code <sup>1</sup>Endemic To Query Area Name ID Species Name Naturalised 24356 Artamus personatus (Masked Woodswallow) **Aspleniaceae** 50. 66 Pleurosorus subglandulosus Asteraceae 7869 Brachyscome blackii 51. 7896 Calocephalus platycephalus (Billybuttons) 52 53. 7904 Calotis latiuscula 7906 Calotis plumulifera 54. 55. 34358 Calotis sp. Carnarvon Range (D.J. Edinger & K.F. Kenneally D 2708 K 12243) 19757 Centipeda minima subsp. minima 56. 57. 12612 Chrysocephalum apiculatum 47153 Chrysocephalum apiculatum subsp. glandulosum 58. 12613 Chrysocephalum eremaeum 60. 12614 Chrysocephalum pterochaetum 61. 19727 Leiocarpa semicalva subsp. semicalva 62. 13258 Leucochrysum stipitatum 8135 Olearia ferresii 63. 64. 8151 Olearia stuartii 19910 Ozothamnus filifolius 65. 66 8189 Pseudognaphalium luteoalbum (Jersey Cudweed) 67. 8191 Pterocaulon serrulatum 69. 41221 Pterocaulon serrulatum var. velutinum 8192 Pterocaulon sphacelatum (Apple Bush, Fruit Salad Plant) 70. 71. 8193 Pterocaulon sphaeranthoides 13299 Rhodanthe tietkensii 72. 73. 8200 Schoenia cassiniana (Schoenia) 9366 Senecio gregorii (Fleshy Groundsel) 74. 8210 Senecio laceratus 75. 76. 12649 Tietkensia corrickiae 77. 13331 Waitzia acuminata var. acuminata 78. 48250 Xerochrysum interiore Bignoniaceae 7117 Pandorea pandorana 79. Boraginaceae 80. 6689 Halgania glabra 81. 6697 Halgania solanacea 82. 30258 Halgania solanacea var. Mt Doreen (G.M. Chippendale 4206) 83. 6700 Heliotropium asperrimum (Rough Heliotrope) 84. 6706 Heliotropium cunninghamii 85. 10992 Heliotropium alabellum 86. 17307 Heliotropium inexplicitum 87. 17308 Heliotropium moorei 88. 17309 Heliotropium pachyphyllum 89 6718 Heliotropium tenuifolium (Mamukata) 90. 6727 Trichodesma zeylanicum (Camel Bush, Kumbalin) **Brassicaceae** 91. 3010 Cuphonotus andraeanus 92 3037 Lepidium phlebopetalum (Veined Peppercress) 93. 3054 Menkea villosula 94. 3074 Stenopetalum anfractum **Burhinidae** 95 24359 Burhinus grallarius (Bush Stone-curlew) Cacatuidae 96. Lophochroa leadbeateri Campanulaceae 97. 7397 Isotoma petraea (Rock Isotome, Tundiwari) 98. Wahlenbergia sp. 7393 Wahlenbergia tumidifructa 99. Campephagidae 100 24361 Coracina maxima (Ground Cuckoo-shrike) 101. 25568 Coracina novaehollandiae (Black-faced Cuckoo-shrike) Caprimulgidae 24368 Eurostopodus argus (Spotted Nightjar)



rement of Biodiversity, ervation and Attractions

WESTERN AUSTRALIA



Name ID Species Name

Conservation Code <sup>1</sup>Endemic To Query Carphodactylidae 103. 24967 Nephrurus levis subsp. levis Casuarinaceae 1723 Allocasuarina decaisneana (Desert Oak) 104. Celastraceae 105. 4731 Stackhousia intermedia 106 19555 Stackhousia muricata subsp. annual (W.R. Barker 2172) Centrolepidaceae 107. 1126 Centrolepis eremica Chenopodiaceae 2456 Atriplex elachophylla 108. 109. 2481 Atriplex vesicaria (Bladder Saltbush) 110 2488 Chenopodium desertorum 111. 11553 Chenopodium desertorum subsp. anidiophyllum 112. 2495 Chenopodium nitrariaceum (Nitre Goosefoot) 11632 Dysphania glomulifera subsp. eremaea 113. 114 2502 Dysphania kalpari (Rat's Tail, Kalpari) 115. 33479 Dysphania melanocarpa (Black Crumbweed) 116 33596 Dysphania melanocarpa forma leucocarpa 117. 11890 Dysphania rhadinostachya subsp. rhadinostachya 118. 33483 Dysphania saxatilis 119. 11704 Einadia nutans subsp. eremaea (Climbing Saltbush) 120. 2544 Maireana georgei (Satiny Bluebush) 121. 2546 Maireana integra 2556 Maireana planifolia (Low Bluebush) 122. 123. 11662 Maireana tomentosa subsp. tomentosa 2569 Maireana triptera (Threewinged Bluebush) 124. 125. 2571 Maireana villosa 126 2582 Rhagodia eremaea (Thorny Saltbush) 127. 2611 Sclerolaena eriacantha (Tall Bindii) 128 2618 Sclerolaena johnsonii 129. 2626 Sclerolaena parviflora (Small-flower Saltbush) Cinclosomatidae 130. 24390 Psophodes occidentalis (Western Wedgebill, Chiming Wedgebill) Cleomaceae 131. 2988 Cleome viscosa (Tickweed, Tjinduwadhu) Climacteridae 132. 25581 Climacteris affinis (White-browed Treecreeper) Colchicaceae 133. 1392 Wurmbea deserticola Columbidae 134. 24401 Geopelia cuneata (Diamond Dove) 135. 24404 Geophaps plumifera (Spinifex Pigeon) 136 24407 Ocyphaps lophotes (Crested Pigeon) 137. 24409 Phaps chalcoptera (Common Bronzewing) Convolvulaceae 138. 11200 Evolvulus alsinoides var. villosicalvx 139. 6633 Ipomoea muelleri (Poison Morning Glory, Yumbu) Corvidae 140. 24416 Corvus bennetti (Little Crow) 141. 25593 Corvus orru (Torresian Crow) 24418 Corvus orru subsp. cecilae (Western Crow) Cracticidae 143. 24420 Cracticus nigrogularis (Pied Butcherbird) 144. 25595 Cracticus tibicen (Australian Magpie) 145. 25596 Cracticus torquatus (Grey Butcherbird) Cuculidae 146. 42307 Cacomantis pallidus (Pallid Cuckoo) Cupressaceae 147. 8466 Callitris columellaris (White Cypress Pine) Cyperaceae 148 12797 Cyperus centralis 149. 12811 Cyperus cunninghamii subsp. cunninghamii NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum

Naturalised







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
150.	789	Cyperus difformis (Rice Sedge)			
151.	798	Cyperus iria			
152.		Cyperus squarrosus			
153.	818	Cyperus vaginatus (Stiffleaf Sedge)			
154.	851	Fimbristylis dichotoma (Eight Day Grass)			
155.	854	Fimbristylis eremophila			
156.	897	Fuirena nudiflora		P3	
157.	911	Isolepis congrua			
158.		Lipocarpha microcephala			
159.		Schoenoplectiella dissachantha			
160.	981	Schoenus centralis		P1	
Dasyuridae					
161.	24094	Ningaui ridei (Wongai Ningaui)			
162.	24120	Sminthopsis youngsoni (Lesser Hairy-footed Dunnart)			
Danislas					
Desidae		Discourse and an invitation			
163.		Phryganoporus nigrinus			
Dicaeidae					
164.	25607	Dicaeum hirundinaceum (Mistletoebird)			
Dicruridae					
	24442	Grallina evanolovca (Magnio, lark)			
165. 166.		Grallina cyanoleuca (Magpie-lark) Rhipidura albiscapa (Grey Fantail)			
167.		Rhipidura leucophrys (Willie Wagtail)			
Diplodactylid	lae				
168.	24982	Rhynchoedura ornata (Western Beaked Gecko)			
169.	24924	Strophurus ciliaris subsp. aberrans			
170.	24927	Strophurus elderi			
171.	24946	Strophurus strophurus			
Dipluridae					
172.		Cethegus fugax			
Droseraceae					
173.	3093	Drosera burmanni (Tropical Sundew)			
174.	43544	Drosera finlaysoniana			
Flanisla a					
Elapidae	40446	Passidanaia manadani (Mastara Prassa Chalca)			
175.		Pseudonaja mengdeni (Western Brown Snake)			
176. 177.		Pseudonaja modesta (Ringed Brown Snake)			
177.	25305	Simoselaps anomalus (Desert Banded Snake)			
Elatinaceae					
Elatinaceae 178.	5187	Elatine gratioloides (Waterwort)			
178.	5187	Elatine gratioloides (Waterwort)			
178. Estrilidae					
178. <b>Estrilidae</b> 179.	24631	Emblema pictum (Painted Finch)			
178. <b>Estrilidae</b> 179. 180.	24631 30870				
178. <b>Estrilidae</b> 179.	24631 30870 <b>ae</b>	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)			
178.  Estrilidae 179. 180.  Euphorbiace: 181.	24631 30870 <b>ae</b> 4620	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch) Euphorbia boophthona (Gascoyne Spurge)			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182.	24631 30870 <b>ae</b> 4620 40100	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge)  Euphorbia centralis			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183.	24631 30870 <b>ae</b> 4620 40100 12097	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge)  Euphorbia centralis  Euphorbia tannensis subsp. eremophila (Desert Spurge)			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182.	24631 30870 <b>ae</b> 4620 40100 12097	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge)  Euphorbia centralis			
178.  Estrilidae 179. 180.  Euphorbiace: 181. 182. 183. 184.	24631 30870 <b>ae</b> 4620 40100 12097	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge)  Euphorbia centralis  Euphorbia tannensis subsp. eremophila (Desert Spurge)			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183.	24631 30870 <b>ae</b> 4620 40100 12097 4664	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora			
178.  Estrilidae 179. 180.  Euphorbiace: 181. 182. 183. 184.  Fabaceae	24631 30870 <b>ae</b> 4620 40100 12097 4664	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge)  Euphorbia centralis  Euphorbia tannensis subsp. eremophila (Desert Spurge)			
178.  Estrilidae 179. 180.  Euphorbiace: 181. 182. 183. 184.  Fabaceae 185.	24631 30870 <b>ae</b> 4620 40100 12097 4664 3194 3198	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta			
178.  Estrilidae 179. 180.  Euphorbiace: 181. 182. 183. 184.  Fabaceae 185. 186.	24631 30870 <b>ae</b> 4620 40100 12097 4664 3194 3198 3205	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens			
178.  Estrilidae 179. 180.  Euphorbiace: 181. 182. 183. 184.  Fabaceae 185. 186. 187.	24631 30870 <b>ae</b> 4620 40100 12097 4664 3194 3198 3205 3217	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia			
178.  Estrilidae 179. 180.  Euphorbiace: 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188.	24631 30870 <b>ae</b> 4620 40100 12097 4664 3194 3198 3205 3217 3234	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari)			
178.  Estrilidae 179. 180.  Euphorbiace: 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189.	24631 30870 ae 4620 40100 12097 4664 3194 3198 3205 3217 3234 3241	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle)			
178.  Estrilidae 179. 180.  Euphorbiace: 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189. 190.	24631 30870 ae 4620 40100 12097 4664 3194 3198 3205 3217 3234 3241 3248	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle) Acacia bivenosa			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189. 190. 191.	24631 30870 ae 4620 40100 12097 4664 3194 3198 3205 3217 3234 3241 3248 15280	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle) Acacia burkittii (Sandhill Wattle) Acacia cuthbertsonii subsp. cuthbertsonii			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189. 190. 191. 192.	24631 30870 <b>ae</b> 4620 40100 12097 4664  3194 3198 3205 3217 3234 3241 3248 15280 3327	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle) Acacia bivenosa Acacia burkittii (Sandhill Wattle)			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189. 190. 191. 192. 193.	24631 30870 <b>ae</b> 4620 40100 12097 4664 3194 3205 3217 3234 3241 3248 15280 3327 3364	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle) Acacia bivenosa Acacia burkittii (Sandhill Wattle) Acacia cuthbertsonii subsp. cuthbertsonii Acacia estrophiolata (Desert Ironwood)			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189. 190. 191. 192. 193. 194.	24631 30870 <b>ae</b> 4620 40100 12097 4664 3194 3198 3205 3217 3234 3241 3248 15280 3327 3364 3370	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle) Acacia bivenosa Acacia burkittii (Sandhill Wattle) Acacia cuthbertsonii subsp. cuthbertsonii Acacia estrophiolata (Desert Ironwood) Acacia helmsiana Acacia hilliana			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195.	24631 30870 ae 4620 40100 12097 4664 3194 3198 3205 3217 3234 3241 3248 15280 3327 3364 3370 3399	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle) Acacia bivenosa Acacia burkittii (Sandhill Wattle) Acacia cuthbertsonii subsp. cuthbertsonii Acacia estrophiolata (Desert Ironwood) Acacia helmsiana			
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196.	24631 30870 <b>ae</b> 4620 40100 12097 4664  3194 3198 3205 3217 3234 3241 3248 15280 3327 3364 3370 3399 3419	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia adrupta Acacia adsurgens Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle) Acacia bivenosa Acacia burkittii (Sandhill Wattle) Acacia cuthbertsonii subsp. cuthbertsonii Acacia estrophiolata (Desert Ironwood) Acacia helmsiana Acacia kempeana (Witchetty Bush, Ilykuwara)			Y
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197.	24631 30870 ae 4620 40100 12097 4664 3194 3198 3205 3217 3234 3241 3248 15280 3327 3364 3370 3399 3419 44100	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle) Acacia bivenosa Acacia burkittii (Sandhill Wattle) Acacia cuthbertsonii subsp. cuthbertsonii Acacia estrophiolata (Desert Ironwood) Acacia helmsiana Acacia kempeana (Witchetty Bush, Ilykuwara) Acacia ligulata (Umbrella Bush, Watarka)			Y
178.  Estrilidae 179. 180.  Euphorbiace 181. 182. 183. 184.  Fabaceae 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198.	24631 30870 ae 4620 40100 12097 4664 3194 3198 3205 3217 3234 3241 3248 15280 3327 3364 3370 3399 3419 44100 44102	Emblema pictum (Painted Finch) Taeniopygia guttata (Zebra Finch)  Euphorbia boophthona (Gascoyne Spurge) Euphorbia centralis Euphorbia tannensis subsp. eremophila (Desert Spurge) Monotaxis luteiflora  Acacia abrupta Acacia acradenia Acacia adsurgens Acacia aneura (Mulga, Wanari) Acacia basedowii (Basedow's Wattle) Acacia bivenosa Acacia burkittii (Sandhill Wattle) Acacia cuthbertsonii subsp. cuthbertsonii Acacia estrophiolata (Desert Ironwood) Acacia helmsiana Acacia kempeana (Witchetty Bush, Ilykuwara) Acacia macdonnellensis			Y

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ľ	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Qu
202.	12952	Acacia minyura			
203.		Acacia monticola (Gawar, Lilwardi)			
204.	3452	Acacia murrayana (Sandplain Wattle)			
205.	15724	Acacia paraneura			
206.	3495	Acacia prainii (Prain's Wattle)			
207.	3500	Acacia pruinocarpa (Gidgee)			
208.	36800	Acacia pteraneura			
209.	3519	Acacia rhodophloia			
210.	8949	Acacia sibirica (Bastard Mulga)			
211.	3553	Acacia spondylophylla			
212.	3563	Acacia strongylophylla (Round-leaf Wattle)			
213.	3568	Acacia subtessarogona			
214.		Acacia tetragonophylla (Kurara, Wakalpuka)			
215.		Acacia walkeri			
216.		Cullen australasicum			
217.		Gastrolobium brevipes			
218.		Glycine canescens (Silky Glycine)			
219.		Gompholobium polyzygum			
220.		Indigofera georgei (Bovine Indigo)			
221.		Indigofera gilesii		P3	
222.		Indigofera hirsuta (Hairy Indigo)			
223.		Indigofera linifolia			
224.		Indigofera psammophila			
225.	3991	Isotropis centralis			
226.	14978	Isotropis winneckei		P1	
227.	4055	Leptosema chambersii			
228.	4061	Lotus cruentus (Redflower Lotus)			
229.	4105	Mirbelia viminalis			
230.	17645	Senna artemisioides			
231.	12281	Senna artemisioides subsp. petiolaris			
232.		Senna artemisioides subsp. x artemisioides			
233.		Senna artemisioides subsp. x sturtii			
234.		Senna glaucifolia			
235.		Senna glutinosa			
		-			
236.		Senna glutinosa subsp. glutinosa			
237.		Senna pleurocarpa			
238.		Swainsona acuticarinata			
239.		Swainsona affinis			
240.		Swainsona microphylla (Small-leaf Swainsona)			
241.		Swainsona phacoides (Dwarf Swainsona)			
242.	13585	Swainsona tenuis			
243.	4252	Templetonia egena (Round Templetonia)			
244.	42482	Tephrosia sp. Central (P.K. Latz 17037)		P3	
245.	43963	Tephrosia sp. deserts (J.R. Maconochie 1403)			
-alaanidaa					
Falconidae	05004	51.4: (8.54.)			
246.		Falco berigora (Brown Falcon)			
247.		Falco cenchroides (Australian Kestrel, Nankeen Kestrel)			
248.	25623	Falco longipennis (Australian Hobby)			
249.		Falco peregrinus (Peregrine Falcon)		S	
250.	24476	Falco subniger (Black Falcon)			
Filistatidae					
251.		Wandella centralis			
£J1.		manaona Conduito			
Gekkonidae					
252.	24957	Gehyra purpurascens			
253.	24959	Gehyra variegata			
254.		Heteronotia binoei (Bynoe's Gecko)			
		• •			
Goodeniacea					
255.	7413	Brunonia australis (Native Cornflower)			
256.	15885	Brunonia australis var. A Kimberley Flora (K.F. Kenneally 5452)			
257.	7426	Dampiera cinerea			
	7469	Dampiera roycei			
258.	7510	Goodenia gibbosa		P3	
258. 259.		Goodenia heterochila			
	1010				
259.		Goodenia mueckeana			
259. 260. 261.	7529				
259. 260. 261. 262.	7529 7558	Goodenia triodiophila			
259. 260. 261. 262. 263.	7529 7558 7560	Goodenia triodiophila Goodenia vilmoriniae			
259. 260. 261. 262.	7529 7558 7560 7582	Goodenia triodiophila			

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ı	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query
266.	7633	Scaevola parvifolia (Camel Weed)			Alea
267.		Scaevola parvifolia subsp. parvifolia			
268.		Velleia connata (Cup Velleia)			
0					
Gyrostemona 269.		Curactoman tannari			
209.	2/69	Gyrostemon tepperi			
Halcyonidae					
270.	42351	Todiramphus pyrrhopygius (Red-backed Kingfisher)			
Haloragaceae	9				
271.		Glischrocaryon angustifolium			
272.	6176	Haloragis odontocarpa (Mulga Nettle)			
Ulmundinidaa					
Hirundinidae 273.	47000	Charamages Jayasatarna (Mhita basked Swallow)			
274.		Cheramoeca leucosterna (White-backed Swallow) Petrochelidon nigricans (Tree Martin)			
		r etiochelidon nighcans (11ee wardin)			
Hypericaceae	•				
275.	5180	Hypericum gramineum (Small St John's Wort)			
Isoetaceae					
276.	14	Isoetes muelleri			
Lamiaceae	0700	Claus dans du um flauib um du um // all transla			
277.		Clerodendrum floribundum (Lollybush)			
278. 279.		Clerodendrum floribundum var. coriaceum  Dicrastylis eysuccosa			
279. 280.		Dicrastylis exsuccosa Dicrastylis gilesii			
281.		Dicrastylis gilesii  Dicrastylis subterminalis		P1	Υ
282.		Newcastelia cladotricha (Lambs Tail)			'
283.		Prostanthera centralis		P3	
284.	6925	Prostanthera striatiflora			
285.	41063	Quoya loxocarpa			
286.	48603	Teucrium teucriiflorum			
Laganiagona					
Loganiaceae	46210	Orienthere controlle			
201.	40210	Orianthera centralis			
Loranthaceae	<del>)</del>				
288.	11614	Amyema gibberula var. gibberula			
289.		Amyema sanguinea var. sanguinea			
290.	12051	Lysiana exocarpi subsp. exocarpi (Harlequin Mistletoe)			
Lycosidae					
291.		Lycosa woonda			
Lythracoao					
Lythraceae	5297	Rotala occultiflora			
292.	3207	Notala occululora			
Maluridae					
293.		Amytornis purnelli (Dusky Grasswren)			
294.		Amytornis purnelli subsp. purnelli (Dusky Grasswren)			
295.		Amytornis striatus (Striated Grasswren)			
296.		Amytornis striatus subsp. striatus (Striated Grasswren (inland))		P4	
297.		Malurus lamberti (Variegated Fairy-wren)  Malurus laucentarus (White winged Fairy-wren)			
298.		Malurus leucopterus (White-winged Fairy-wren)			
299. 300.		Malurus splendens (Splendid Fairy-wren) Stipiturus ruficeps (Rufous-crowned Emu-wren)			
000.	20000	Supra. 30 . Subopo (Maloud Grownod Erna Willi)			
Malvaceae					
301.		Abutilon fraseri subsp. fraseri			
302.		Alyogyne pinoniana (Sand Hibiscus)			
303.		Androcalva loxophylla			
304.		Androcalva luteiflora (Yellow-flowered Rulingia)			
305.		Brachychiton gregorii (Desert Kurrajong, Ngalta)			
306. 307		Gossypium sturtianum var. sturtianum Hannafordia hissillii suhan hissillii			
307. 308.		Hannafordia bissillii subsp. bissillii Hibiscus lentocladus			
308.		Hibiscus leptocladus Hibiscus solanifolius			
310.		Seringia elliptica (Showy fire-bush)			
311.		Sida cardiophylla			
Marsileaceae					
312.		Marsilea exarata			
313.	76	Marsilea hirsuta (Nardoo)			







	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
Meliphagidae	Э				Alou
314.		Acanthagenys rufogularis (Spiny-cheeked Honeyeater)			
315.		Certhionyx variegatus (Pied Honeyeater)			
316.	24570	Epthianura tricolor (Crimson Chat)			
317.	25661	Lichmera indistincta (Brown Honeyeater)			
318.	24583	Manorina flavigula (Yellow-throated Miner)			
319.	42344	Purnella albifrons (White-fronted Honeyeater)			
Meropidae	24598	Merops ornatus (Rainbow Bee-eater)			
NA 12					
Montiaceae		Calandrinia an			
321.		Calandrinia sp.			
Moraceae 322.	19648	Ficus brachypoda			
Muridae					
323.	24224	Notomys alexis (Spinifex Hopping-mouse)			
324.		Pseudomys desertor (Desert Mouse)			
325.		Pseudomys hermannsburgensis (Sandy Inland Mouse)			
Myrtagogo					
Myrtaceae	16770	Conumbia aparrorinia			
326. 327.		Corymbia aparrerinja Corymbia chippendalei			
327.		Corymbia eremaea			
328. 329.		Corymbia eremaea subsp. eremaea			
330.		Corymbia eremaea subsp. oligocarpa			
331.		Eucalyptus camaldulensis subsp. arida			
332.		Eucalyptus camaldulensis subsp. obtusa (Blunt-budded River Red Gum)			
333.		Eucalyptus gamophylla (Twin-leaf Mallee, Warilu)			
334.		Eucalyptus mannensis (Mann Range Mallee)			
335.		Eucalyptus mannensis subsp. mannensis			
336.	5734	Eucalyptus oxymitra (Sharp-capped Mallee)			
337.	5770	Eucalyptus sessilis (River Mallee)			
338.	5773	Eucalyptus socialis (Red Mallee, Altarpa)			
339.	14548	Eucalyptus victrix			
340.	5906	Melaleuca dissitiflora			
341.	15871	Melaleuca fulgens subsp. corrugata			
342.	5915	Melaleuca glomerata			
343.	5995	Micromyrtus flaviflora			
344.	5997	Micromyrtus hymenonema			
345.	48268	Rinzia polystemonea (Desert Rock-myrtle)			
Neosittidae					
346. <b>Otididae</b>	25673	Daphoenositta chrysoptera (Varied Sittella)			
347.	24610	Ardeotis australis (Australian Bustard)			
Pachycephal					
348.		Colluricincla harmonica (Grey Shrike-thrush)			
349.		Oreoica gutturalis (Crested Bellbird)			
350.	∠5680	Pachycephala rufiventris (Rufous Whistler)			
Pardalotidae					
351.		Pardalotus rubricatus (Red-browed Pardalote)			
352.	25682	Pardalotus striatus (Striated Pardalote)			
Petroicidae					
353.	47997	Melanodryas cucullata (Hooded Robin)			
354.		Microeca fascinans (Jacky Winter)			
355.		Petroica goodenovii (Red-capped Robin)			
Phasianidae	24674	Controlling and the file (Chatch to Constitution			
356. 357.		Coturnix pectoralis (Stubble Quail)  Coturnix ypsilophora (Brown Quail)			
	23/01	обшти уранорнога (Бготт «чан)			
Pholcidae 358.		Trichocyclus kurara			Υ
Phyllanthace	eae				
359.		Phyllanthus virgatus			
360.		Poranthera microphylla (Small Poranthera)			
Dittoonerss	20				
Pittosporace		Pittosporum angustifolium			
301.	19/44	i illosporatti arigusulollutti	(da) .		

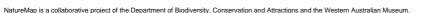
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Department of Biodiversity Conservation and Attraction





	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
Poaceae					
362.		Aristida holathera			
363.		Aristida inaequiglumis (Feathertop Threeawn)			
364.		Aristida obscura (Brush Threeawn)			
365.		Bothriochloa ewartiana (Desert Bluegrass)			
366.		Cenchrus echinatus (Burrgrass)	Y		
367.		Cymbopogon obtectus (Silkyheads)			
368.	290	Dactyloctenium radulans (Button Grass)			
369.		Digitaria brownii (Cotton Panic Grass)			
370.	358	Enneapogon cylindricus (Jointed Nineawn)			
371.	12746	Enneapogon intermedius			
372.		Enneapogon polyphyllus (Leafy Nineawn)			
373.	368	Enteropogon ramosus (Windmill Grass, Curly Windmill Grass)			
374.		Eragrostis cumingii (Cuming's Love Grass)			
375.		Eragrostis dielsii (Mallee Lovegrass)			
376.	380	Eragrostis eriopoda (Woollybutt Grass, Wangurnu)			
377.		Eragrostis falcata (Sickle Lovegrass)			
378.	386	Eragrostis laniflora (Hairy-flowered Woollybutt)			
379.	388	Eragrostis leptocarpa (Drooping Lovegrass)			
380.	391	Eragrostis parviflora (Weeping Lovegrass)			
381.	393	Eragrostis setifolia (Neverfail Grass)			
382.	395	Eragrostis speciosa (Handsome Lovegrass)			
383.	413	Eriachne mucronata (Mountain Wanderrie Grass)			
384.	11011	Eulalia aurea			
385.	503	Panicum decompositum (Native Millet, Kaltu-kaltu)			
386.	518	Paspalidium clementii (Clements Paspalidium)			
387.	546	Perotis rara (Comet Grass)			
388.	674	Thyridolepis mitchelliana (Mulga Grass)			
389.	678	Tragus australianus (Small Burrgrass)			
390.	17877	Triodia melvillei			
391.	696	Triodia pungens (Soft Spinifex)			
392.	17873	Triodia schinzii			
393.	701	Triodia spicata (Spike Flowered Spinifex)			
394.	48319	Tripogonella loliiformis			
395.	706	Triraphis mollis (Needle Grass)			
Podargidae					
396.		Podargus strigoides (Tawny Frogmouth)			
Podicipedid					
397.		Poliocephalus poliocephalus (Hoary-headed Grebe)			
398.		Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)			
Polygalacea		Comesperma viscidulum (Viscid Milkwort)		D4	
399.	4000	Comesperma viscidulum (viscid ivilikwort)		P4	
Polygonace		Duma florulenta			
Pomatoston					
401.	24683	Pomatostomus superciliosus (White-browed Babbler)			
Protococc					
Proteaceae	2004	Gravillas ariastachys (Flama Gravillas Kaliny kalinyna)			
402.		Grevillea eriostachya (Flame Grevillea, Kaliny-kalinypa)			
403.		Grevillea pterosperma			
404.		Grevillea striata (Beefwood)			
405.		Grevillea wickhamii subsp. aprica			
406.		Hakea divaricata (Needlewood, Witjinti)			
407.		Hakea lorea subsp. lorea			
408.	2200	Hakea rhombales			
Psittacidae					
409.		Barnardius zonarius			
410.	24736	Melopsittacus undulatus (Budgerigar)			
411.		Nymphicus hollandicus (Cockatiel)			
Pteridaceae		Obside with a state of the late of the state			
412.		Cheilanthes lasiophylla (Woolly Cloak Fern)			
413.		Cheilanthes sieberi subsp. pseudovellea			
414.	12818	Cheilanthes sieberi subsp. sieberi			
Ptilonorhyne	chidae				
415.		Ptilonorhynchus guttatus			









Conservation Code <sup>1</sup>Endemic To Query Area Name ID Species Name Naturalised Pygopodidae 416. 25001 Delma nasuta Rallidae 417. 25727 Fulica atra (Eurasian Coot) Recurvirostridae 25734 Himantopus himantopus (Black-winged Stilt) Rhamnaceae 419. 16199 Stenanthemum petraeum Rubiaceae 420. 48879 Pomax sp. Sand dunes (P.G. Wilson 752) 421. 18155 Psydrax suaveolens 422. 7363 Synaptantha tillaeacea 423. 13339 Synaptantha tillaeacea var. tillaeacea Salticidae 424 Simaetha paetula Santalaceae 425. 2333 Anthobolus leptomerioides 10765 Exocarpos sparteus (Broom Ballart, Djuk) 426. 427. 2356 Santalum acuminatum (Quandong, Warnga) 428. 2357 Santalum lanceolatum (Northern Sandalwood, Yarnguli) Sapindaceae 429. 4749 Diplopeltis stuartii 430 12023 Diplopeltis stuartii var. stuartii (Desert Pepperflower) 431. 11247 Dodonaea viscosa subsp. angustissima 432. 11674 Dodonaea viscosa subsp. mucronata Scincidae 433. 25025 Ctenotus ariadnae 434. 25461 Ctenotus brooksi 435. 25037 Ctenotus dux 436 25057 Ctenotus nasutus 437. 25463 Ctenotus pantherinus (Leopard Ctenotus) 438 25062 Ctenotus piankai 439. 25076 Ctenotus septenarius 440. 25466 Cyclodomorphus melanops (Slender Blue-tongue) 441. 25090 Cyclodomorphus melanops subsp. melanops (Slender Blue-tongue) 442. 25125 Lerista bipes 443. 25130 Lerista desertorum 444. 25142 Lerista ips 445. 25146 Lerista labialis 446. 25184 Menetia greyii 447. 25495 Morethia ruficauda 25499 Notoscincus ornatus 449. 25202 Tiliqua multifasciata (Central Blue-tongue) Scolopendridae Ethmostiamus rubripes 450 451. Scolopendra morsitans Scrophulariaceae 452. 7203 Eremophila elderi 15052 Eremophila forrestii subsp. forrestii 453. 454. 7213 Eremophila gibsonii 455. 16732 Eremophila gilesii subsp. gilesii 17616 Eremophila goodwinii subsp. goodwinii 456 457. 7222 Eremophila hughesii 458 17172 Eremophila hughesii subsp. hughesii 459. 17169 Eremophila latrobei subsp. glabra 460 7234 Eremophila longifolia (Berrigan, Tulypurpa) 23997 Eremophila tietkensii 461. Solanaceae 462. 6966 Duboisia hopwoodii (Pituri, Kundugu) 463 6971 Nicotiana benthamiana (Tjuntiwari) 464 11331 Nicotiana occidentalis subsp. obliqua 465 11734 Nicotiana rosulata subsp. rosulata 466. 42547 Solanum austropiceum 467. 6995 Solanum centrale (Desert Raisin, Kampurarpa) 468 6997 Solanum chippendalei NatureMap is a collaborative project of the Department of Biodiversity, Conservation and Attractions and the Western Australian Museum





	Name ID	Species Name	Naturalised	Conservation Code	<sup>1</sup> Endemic To Query Area
469.	6998	Solanum cleistogamum			
470.	6999	Solanum coactiliferum (Western Nightshade)			
471.	7018	Solanum lasiophyllum (Flannel Bush, Mindjulu)			
472.	11267	Solanum orbiculatum subsp. macrophyllum			
473.	46734	Solanum pallidifolium			
474.	7036	Solanum sturtianum (Thargomindah Nightshade)			
Sparassidae					
475.		Pediana tenuis			
Stylidiaceae 476.	7739	Stylidium inaequipetalum			
Sylviidae					
477.	24837	Eremiornis carteri (Spinifex-bird)			
Theridiidae 478.		Latrodectus hasseltii			
Thylacomyid	lae				
479.	24169	Macrotis leucura (Lesser Bilby, tjunpi)		X	
Turnicidae 480.	24851	Turnix velox (Little Button-quail)			
Typhaceae					
481.	98	Typha domingensis (Bulrush, Djandjid)			
Urodacidae		Urodacus armatus			
483.		Urodacus yaschenkoi			
Urticaceae		· · · · · · · · · · · · · · · · · · ·			
484.	12670	Parietaria cardiostegia			
Varanidae					
485.	25210	Varanus brevicauda (Short-tailed Pygmy Monitor)			
486.	25212	Varanus eremius (Pygmy Desert Monitor)			
487.	25216	Varanus giganteus (Perentie)			
488.		Varanus gilleni (Pygmy Mulga Monitor)			
489.	25218	Varanus gouldii (Bungarra or Sand Monitor)			
Violaceae 490.	5215	Hybanthus aurantiacus			
Zodariidae		•			
491.		Cavasteron crassicalcar			
Zygophyllac		-			
492.		Roepera eichleri			
493.		Tribulus eichlerianus			
494.		Tribulus macrocarpus			
495.	4383	Tribulus terrestris (Caltrop)	Υ		

Conservation Codes

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

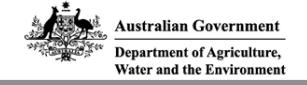
<sup>1</sup> For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource,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







# APPENDIX E: EPBC ACT PROTECTED MATTERS REPORT



## **EPBC Act Protected Matters Report**

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

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

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

Report created: 29/10/21 13:24:05

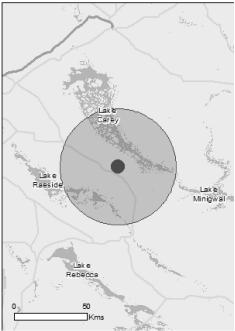
**Summary** 

**Details** 

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

Caveat

<u>Acknowledgements</u>



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates
Buffer: 40.0Km



### Summary

#### Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	7
Listed Migratory Species:	9

### Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

#### Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	10
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

## Details

### Matters of National Environmental Significance

Listed Threatened Species		[ Resource Information ]
Name	Status	Type of Presence
Birds		
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat
		may occur within area
Falco hypoleucos	Mode and bla	0
Grey Falcon [929]	Vulnerable	Species or species habitat
		may occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat
		known to occur within area
Pezoporus occidentalis		
Night Parrot [59350]	Endangered	Species or species habitat
		may occur within area
Delutelia alevandrea		
Polytelis alexandrae	Vulnerable	Charles or angeles habitat
Princess Parrot, Alexandra's Parrot [758]	vuinerable	Species or species habitat likely to occur within area
		likely to occur within area
Mammals		
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat
		may occur within area
Sminthopsis psammophila		
Sandhill Dunnart [291]	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	he FPBC Act - Threatened	
Name	Threatened	Type of Presence
Migratory Marine Birds		31
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat
		likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat
		may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat
reliow wagtali [644]		may occur within area
		may occur within area
Migratory Wetlands Species		

Name	Threatened	Type of Presence
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<u>Calidris melanotos</u>		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		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	ne EPBC Act - Threatened	Species list.
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius veredus		
Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Chrysococcyx osculans		
Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Thinornis rubricollis		
Hooded Plover [59510]		Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

### **Extra Information**

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Mammals		
Camelus dromedarius		
Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus		
Goat [2]		Species or species habitat likely to occur within area
Equus caballus		
Horse [5]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus		
House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Carrichtera annua		
Ward's Weed [9511]		Species or species habitat may occur within

Name	Status	Type of Presence
Cenchrus ciliaris		area
Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area

#### Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

### Coordinates

-29.37 122.43417

### Acknowledgements

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

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

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

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