




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# Dodson Road Bridge Flora, Vegetation and Targeted Fauna Survey, Bunbury

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Revision Number 0.00

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# 1 Introduction

Arc Infrastructure (Arc) aims to undertake the renewal of the existing railway bridge deck located on the Bunbury Railway (Line 2), where the rail intersects with a watercourse in Bunbury, Western Australia. The project will involve the removal of the existing structure, including the rail, ballast and bridge deck, and replacement with a new bridge structure. These works are necessary to maintain the functioning and safety of the rail line.

In order to undertake the replacement works, a small number of trees and some native vegetation will need to be cleared to allow access for machinery and provide space for materials laydown. Therefore, a reconnaissance and targeted flora and vegetation survey and targeted tree and fauna assessment was undertaken by Arc's Ecologist to determine the biological values of the vegetation present within the site.

## 1.1 Background

The bridge which crosses over the watercourse near Dodson Road, Bunbury was constructed in the 1920's and is a 13m 4-span timber ballasted deck with timber piers and abutments. The bridge has undergone maintenance works since construction, however much of the materials are currently in a deteriorated condition and the structure has reached end-of-life. This has resulted in high ongoing maintenance costs and a high risk of bridge failure. The proposed replacement will be a single-span steel ballasted deck, which will provide a better service life, reduce maintenance costs, and improve reliability and structural capacity of the deck.

## 1.2 Site Location

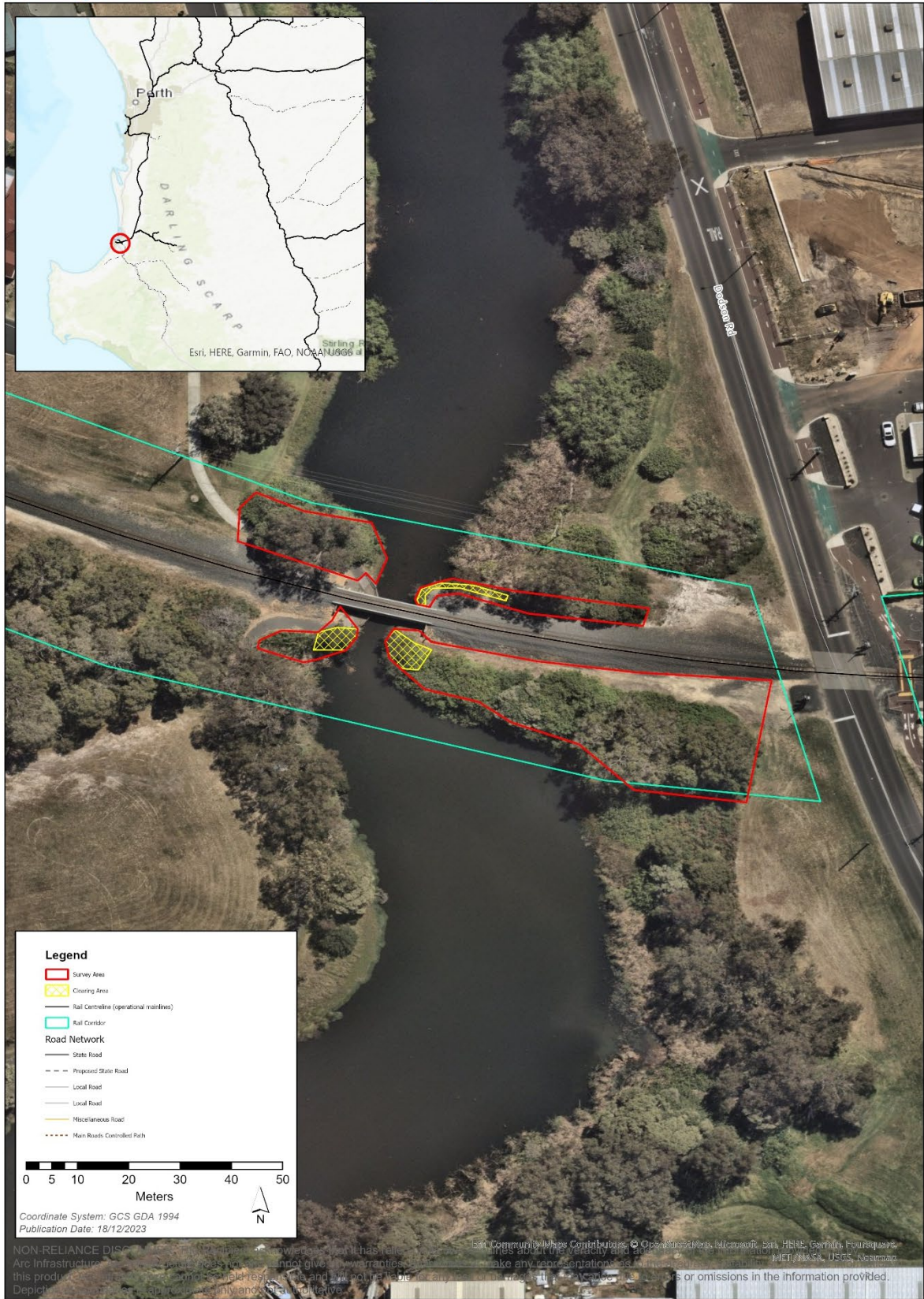
The bridge tower to be replaced is located in Bunbury, within the City of Bunbury, approximately 155km south-west of the Perth Central Business District (CBD) (Plate 1). The survey area is situated within rail corridor land, leased from the Public Transport Authority (PTA) by Arc Infrastructure, within lot number P001961 89. The total survey area, which is more extensive than the proposed clearing area, is approximately 0.15ha in size. The proposed clearing area is 76.9m<sup>2</sup> (0.008ha) and is comprised of sections on the northeast, southeast and northwest banks of the bridge crossing over the watercourse.

## 1.3 Scope

The scope of this project included:

- Desktop assessment of potential conservation significant values for the clearing area using ArcGIS.
- Flora and vegetation assessment within the survey area as per the *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority (EPA), 2016).
- Targeted fauna assessment for Black Cockatoo habitat and foraging sources within the clearing area as per the *Referral guideline for 3 WA threatened black cockatoo species* (Department of Agriculture, Water and the Environment (DAWE), 2022).
- Preparation of a report with the outcomes of the survey.
- Preparation of GIS shapefiles in the Index of Biodiversity Surveys for Assessments (IBSA) format.

# Arc Infrastructure Survey Area: Dodson Road Bridge - Line 2, 178.6km



**Plate 1: Survey Area Location at the Dodson Road Bridge, Bunbury**



## 2 Desktop Assessment

### 2.1 Climate

The climate experienced at the survey area is semi-arid Mediterranean with hot, dry summers, and cool, wet winters.

### 2.2 Geology and Soils

The survey area is located on the banks of a waterway, and therefore sits at low elevation. The entirety of the survey area has an elevation of 6m above sea level (Department of Primary Industries and Regional Development (DPIRD), 2023a).

Two soil type are recorded to be present within the survey area, the Bassendean B1a phase and the Sw – Swamp (Bassendean) (DPIRD, 2023b). Descriptions of each of these soil types are provided in Table 1 below.

**Table 1: Soil types within the survey area**

System Name	System Symbol	Description
Bassendean B1a phase	212Bs_B1a	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands with an intensely coloured yellow B horizon occurring within 1 m of the surface; marri and jarrah dominant.
Sw – Swamp (Bassendean)	212BsW_SWAMP	Swamp.

Source: DPIRD, 2023b

### 2.3 Hydrology

The survey area does not occur within a Public Drinking Water Source Area or Rights in Water and Irrigation (RIWI) Act 1914 Proclaimed Surface Water Area. It is, however, within a RIWI Act Proclaimed Groundwater Area and a Waterways Conservation Act Management Area. The bridge to be replaced provides railway passage over a minor, non-perennial watercourse, which was previously known as Eadle's Creek/Gully.

The survey area is located within an area not assessed as a Geomorphic Wetland within the Swan Coastal Plain, being classified as an artificial lake (Department of Biodiversity, Conservation and Attractions (DBCA), 2023a). It is not located within, or in close proximity to, any wetlands listed under the Convention on Wetlands of International Importance (Ramsar Convention) or under the Directory of Important Wetlands in Australia, with the nearest occurrences being approximately 28km north and 24km northeast respectively (DBCA, 2023b; 2023c).

### 2.4 Remnant Vegetation

The survey area occurs within the Perth subregion of the Swan Coastal Plain Interim Biogeographic Regionalisation for Australia (IBRA) Region (SWA2). This subregion is described as being a coastal plain of low elevation, comprised of three main vegetation types; Heath and/or Tuart (*Eucalyptus gomphocephala*) woodlands on limestone soils, *Banksia* and Jarrah (*Eucalyptus marginata*) – *Banksia* woodlands on marine dunes and Marri (*Corymbia calophylla*) on colluvial and alluvial soils (Department of Conservation and Land Management, 2003).

The survey area contains one vegetation complex, being part of the Southern River Complex (mapping unit 42) (DBCA, 2023d). This system is described as an open woodland comprised of Marri

(*Corymbia calophylla*) – Jarrah (*Eucalyptus marginata*) - *Banksia* species on areas of higher elevation, with a fringing woodland of Flooded Gum (*Eucalyptus rudis*) – Swamp Paperbark (*Melaleuca raphiophylla*) along creek beds (Webb et al., 2016). The pre-European extent of this vegetation complex remaining is:

- 18.48% within the Swan Coastal Plain IBRA region
- 28.83% within the City of Bunbury (Government of Western Australia, 2019).

## 2.5 Habitat Connectivity

The survey area is centrally located within a thin corridor of riparian vegetation along the minor, non-perennial watercourse which was previously known as Eadle's Creek/Gully. This corridor is frequently interrupted by cleared areas associated with infrastructure and open spaces, and is also fragmented from the nearby Manea Park, a large area of remnant native vegetation, by the South Western Highway. As such, the vegetation within the survey area is unlikely to provide a valuable ecological linkage for terrestrial fauna within the area. The proposed clearing of approximately 76.9m<sup>2</sup> of degraded vegetation containing a high coverage of introduced flora species is unlikely to impact upon the habitat connectivity or linkages of vegetation in this region.

## 2.6 Environmentally Sensitive Areas

The survey area is not located within an Environmentally Sensitive Area (Department of Water and Environmental Regulation (DWER), 2023).

## 2.7 Heritage

The survey area is not located within any Aboriginal or European Heritage sites (Department of Planning, Lands and Heritage (DPLH), 2023a; 2023b). A due diligence assessment undertaken in terms of the Aboriginal Cultural Heritage Act 2021 shows no known Aboriginal Heritage sites impacting on survey area.

# 3 Methodology

## 3.1 Desktop Assessment

### 3.1.1 Flora and Vegetation

A desktop assessment was undertaken to determine the potential for any conservation significant flora species or ecological communities to occur within the site by examining relevant literature and databases for records within 10km of the site. This was done using the following databases:

- Protected Matters Search Tool (Department of Climate Change, Energy the Environment and Water (DCCEE), 2023a);
- DBCA Threatened and priority flora database (DBCA, 2023e); and
- DBCA Threatened and priority ecological communities database (DBCA, 2023e).

### 3.1.2 Fauna

Desktop assessment for Black Cockatoo habitat consisted of reviewing DBCA locational records and a range of publicly available datasets relevant to Black Cockatoo breeding, roosting and foraging areas. These included:

- Distribution maps for Black Cockatoos within the Referral Guidelines for Three Threatened Black Cockatoo Species (DAWE, 2022);
- Carnaby's Cockatoo Confirmed (DBCA, 2023f) and Unconfirmed Roost Sites (DBCA, 2023g);
- Carnaby's Cockatoo Confirmed (DBCA, 2023h) and Unconfirmed Roost Sites Buffered 6km (DBCA, 2023i);

- Carnaby's Cockatoo Confirmed (DBCA, 2023j) and Unconfirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IRA Regions (DBCA, 2023k);
- Black Cockatoo Breeding Sites - Buffered (DBCA, 2023l); and
- Black Cockatoo Roosting Sites – Buffered (DBCA, 2023m).

### 3.2 Field Survey

An on-ground reconnaissance and targeted flora, fauna and vegetation survey was undertaken on the 27<sup>th</sup> of October 2023. The entire site was traversed with the following parameters recorded:

- vegetation community (as per *Bush Forever Volume 2* (Government of Western Australia, 2000)) (Table 2);
- floristic species composition;
- vegetation condition (as per Keighery (1994) scale); and
- trees present – including GPS location, species, diameter at breast height (DBH), photograph of each tree.

**Table 2: Vegetation community structural units**

Life Form/ Height Class	Canopy Cover			
	100 - 70%	70 – 30%	30 – 10%	10 – 2%
Trees over 30m	Tall Closed Forest	Tall Open Forest	Tall Woodland	Tall Open Woodland
Trees 10 – 30m	Closed Forest	Open Forest	Woodland	Open Woodland
Trees under 10m	Low Closed Forest	Low Open Forest	Low Woodland	Low Open Woodland
Tree Mallee	Closed Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
Shrub Mallee	Closed Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
Shrubs over 2m	Closed Tall Scrub	Open Tall Scrub	Tall Shrubland	Tall Open Shrubland
Shrubs 1 – 2m	Closed Heath	Open Heath	Shrubland	Open Shrubland
Shrubs under 1m	Closed Low Heath	Open Low Heath	Low Shrubland	Low Open Shrubland
Grasses	Closed Grassland	Grassland	Open Grassland	Very Open Grassland
Herbs	Closed Herbland	Herbland	Open Herbland	Very Open Herbland

Source: Government of Western Australia, 2000.



### 3.3 Limitations

An assessment of potential limitations was undertaken in accordance with the Environmental Protection Authority (EPA) document *Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment* (2016) (Table 3).

Limitations were all nil to minor in nature and did not affect the validity of results obtained from the survey.

**Table 3: Assessment of potential survey limitations**

Potential Limitation	Significance	Comment
Availability of contextual information	Minor	<p>Publicly available contextual information is available for the region. Database searches were also conducted through DBCA providing more comprehensive content.</p> <p>Of the 34 conservation significant flora species identified during the desktop assessment, five are data deficient, inhibiting assessment of flowering period and likelihood of presence. During the survey, for any species present within the survey area bearing similarities, precautionary principles during identification were applied. Of these species, three are shrubs or perennial herbs, for which sufficient diagnostic characteristics to enable identification, to a minimum of genus level, would have been present in the absence of flowering characteristics. The remaining two species, <i>Adelphacme minima</i> and <i>Microtis quadrata</i>, are considered highly unlikely to occur within the survey area due to the identification of unsuitable habitat type and vegetation composition and/or structure during the survey.</p> <p>Of the 15 Threatened and Priority Ecological Communities (TEC and PEC's) identified during the desktop assessment, two PEC's are data limited, reducing the ability to assess their presence within the survey area. These are the Relictual White Mangrove Community (Leschenault Inlet), which is listed as Priority 1, and Shrublands on calcareous silts of the Swan Coastal Plain, which is listed as Critically Endangered under the Biodiversity Conservation Act (BC Act) 2016. Analysis of these PEC's was undertaken utilising occurrence data (DBCA, 2023b) and community descriptions in Gibson et al. (1994). Neither PEC is considered to be present within the survey area due to inconsistencies in location and species composition and structure.</p>
Experience of personnel	Nil	<p>Flora, fauna and vegetation surveys were undertaken by Arc's Ecologist Shelley Hill.</p> <p>Shelley Hill has over 2 years' experience conducting targeted, reconnaissance and detailed flora surveys and fauna habitat assessments within Western Australia, including the Avon Wheatbelt bioregion, and is competent in taxonomic identification and assessment of vegetation in these areas.</p>

Potential Limitation	Significance	Comment
Survey timing	Minor	<p>The flora and vegetation survey was undertaken in October, which is within of the recommended survey timing (Spring) for the South-West Botanical Province (EPA, 2016).</p> <p>Of the 34 conservation significant flora species identified during the desktop assessment, 61.8% (21 species) exhibit flowering periods consistent with the survey timing. A total of eight species are known to exhibit flowering periods inconsistent with the survey timing. Of these, six are tree, shrub or perennial herb species for which sufficient diagnostic characteristics to enable identification to a minimum of genus level would have been present in the absence of flowering characteristics. The remaining two species, <i>Diuris drummondii</i> and <i>Thelymitra variegata</i>, are considered highly unlikely to occur within the survey area due to the unsuitable habitat type, degradation and high introduced species coverage observed.</p> <p>Five species are data deficient and do not have known flowering periods. Of these species, three are shrubs or perennial herbs, for which sufficient diagnostic characteristics to enable identification, to a minimum of genus level, would have been present in the absence of flowering characteristics. The remaining two species, <i>Adelphacme minima</i> and <i>Microtis quadrata</i>, are considered highly unlikely to occur within the survey area due to the identification of unsuitable habitat type and vegetation composition and/or structure during the survey.</p>
Survey effort and extent	Nil	The entirety of the site was traversed on foot, with all species observed being recorded. The total area of the survey area is approximately 0.15ha and therefore quadrats were not established as the basic survey was sufficient to capture all species.
Access restrictions	Nil	No access restrictions were encountered during the survey.
Proportion of flora identified	Nil	All flora on site was identified to species level at the time of the survey. A low species diversity was observed as it was a highly disturbed site, with minimal native understorey present.
Disturbances that may affect results	Nil	No recent disturbances have occurred within the survey area which could have affected the results of the survey. All disturbances within the area are historical and continuous relating to the infrastructure owned and managed by multiple stakeholders and are unlikely to have created any limitations in detection of species during the survey period.

## 4 Results

### 4.1 Desktop assessment

#### 4.1.1 Threatened and Priority Flora

A desktop assessment of online databases indicated the potential for a total of 34 conservation significant species to occur within 10 km of the survey area (Table 4). A review of the Protected Matters Search Tool (PMST) (DCCEEW, 2023a) indicated four significant flora species listed under the Environment Protection and Biodiversity Conservation Act 1999 (Cwlth) as potentially occurring within a 10 km radius of the survey area (Appendix 1). A review of the DBCA (2023e) Threatened and Priority flora database indicated that 31 species have been recorded within 10 km of the survey area.

As the desktop assessment area was much larger than the specific survey area, it may include species that are unlikely to occur within the survey area due to a lack of suitable habitat. These databases also contain very old records of species that may have since become locally or regionally extinct. Of the conservation significant species potentially found within the area, it was determined that the site conditions (soil type, drainage, location) may be suitable for 15 (highlighted green) of these species (Table 4).

A summary of conservation significant flora with the potential to occur within the site was created for reference during the survey (Appendix 2). Conservation code definitions are provided in Appendix 3.

**Table 4: Threatened and Priority Flora species identified in desktop assessment**

Species Name	Cons. Code	PMST	DBCA	WA Herbarium
<i>Acacia flagelliformis</i>	P4		X	X
<i>Acacia semitrullata</i>	P4		X	X
<i>Adelphacme minima</i>	P3			X
<i>Angianthus drummondii</i>	P3			X
<i>Aponogeton hexatepalus</i>	P4		X	X
<i>Austrostipa bronweniae</i>	E		X	X
<i>Austrostipa jacobiana</i>	CR		X	
<i>Banksia squarrosa</i> subsp. <i>argillacea</i>	V	X		
<i>Boronia tetragona</i>	P3			X
<i>Caladenia speciosa</i>	P4		X	X
<i>Carex tereticaulis</i>	P3			X
<i>Chamaescilla gibsonii</i>	P3			X
<i>Chamelaucium erythrochlorum</i>	P4			X
<i>Chamelaucium roycei</i>	V	X		
<i>Diuris drummondii</i>	V	X		X
<i>Drakaea micrantha</i>	V			X

Species Name	Cons. Code	PMST	DBCA	WA Herbarium
<i>Eleocharis keigheryi</i>	V	X		X
<i>Eucalyptus rudis</i> subsp. <i>cratyantha</i>	P4			X
<i>Franklandia triaristata</i>	P4			X
<i>Gastrolobium whicherense</i>	P2			X
<i>Lasiopetalum membranaceum</i>	P3			X
<i>Leptomeria furtiva</i>	P3			X
<i>Leucopogon</i> sp. Busselton	P2			X
<i>Microtis quadrata</i>	P4			X
<i>Puccinellia vassica</i>	P1			X
<i>Pultenaea skinneri</i>	P4			X
<i>Schoenus benthamii</i>	P3			X
<i>Schoenus capillifolius</i>	P3			X
<i>Schoenus loliaceus</i>	P2			X
<i>Stylidium longitubum</i>	P4			X
<i>Stylidium paludicola</i>	P3			X
<i>Synaphea odocoileops</i>	P1			X
<i>Thelymitra variegata</i>	T			X
<i>Verticordia attenuata</i>	P3			X

#### 4.1.2 Threatened and Priority Ecological Communities

A review of both the Protected Matters Search Tool (DCCEEW, 2023a) and DBCA's Threatened and priority communities database (DBCA, 2023e) indicated the potential for 15 Threatened or Priority Ecological Community (TEC's or PEC's) to exist within 10km of the survey area (Table 5). The survey area itself does not contain any known records of TEC's or PEC's.

**Table 5:** Threatened and Priority Ecological Communities identified in desktop assessment

Community Name	Cons. Code		PMST	DBCA
	State	Cwith		
<i>Banksia</i> Woodlands of the Swan Coastal Plain ecological community	Priority 3	Endangered	X	X
Clay Pans of the Swan Coastal Plain		Critically Endangered	X	
<i>Corymbia calophylla</i> — <i>Xanthorrhoea preissii</i> woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson et al. 1994)	Endangered	Endangered	X	X
<i>Corymbia calophylla</i> woodlands on heavy soils of the southern Swan Coastal Plain (floristic community type 1b as originally described in Gibson et al. 1994)	Critically Endangered			X
Dense shrublands on clay flats (floristic community type 9 as originally described in Gibson et al. 1994)	Endangered	Critically Endangered		X
<i>Empodisma</i> peatlands of southwestern Australia		Endangered	X	
Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. 1994)	Endangered	Critically Endangered		X
Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. 1994)	Endangered	Critically Endangered		X
Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion		Critically Endangered	X	
Relictual White Mangrove Community (Leschenault Inlet)	Priority 1			X
Sedgeland in Holocene dune swales of the southern Swan Coastal Plain (floristic community type 19 as originally described in in Gibson et al. 1994)	Critically Endangered	Endangered		X
Shrublands on calcareous silts of the Swan Coastal Plain (floristic community type 18 as originally described in Gibson et al. 1994)	Critically Endangered			X
Shrublands on dry clay flats (floristic community type 10a as originally described in Gibson et al. 1994)	Endangered	Critically Endangered		X
Subtropical and Temperate Coastal Saltmarsh	Priority 3	Vulnerable	X	X
Tuart ( <i>Eucalyptus gomphocephala</i> ) woodlands and forests of the Swan Coastal Plain	Priority 3	Critically Endangered	X	X



#### 4.1.4 Threatened and Priority Fauna

The results of the desktop assessment indicated that the survey area has the potential for all three Black Cockatoo species to occur within the survey area (DCCEEW, 2023a). A review of State data identified that the survey area does not contain any confirmed areas of Black Cockatoo breeding or foraging, however it is located within a mapped Carnaby's Cockatoo unconfirmed breeding area (DBCA, 2023k) and within the buffer zone of a confirmed roosting site (DBCA, 2023h).

## 4.2 Field Survey

### 4.2.1 Floristic Composition and Vegetation Community

One vegetation type was present within the survey area, being a *Eucalyptus rudis* low open woodland over open tall scrub of \* *Schinus terebinthifolia* over open shrubland of mixed native and introduced species over open grassland of introduced species dominated by \**Cynodon dactylon*. The survey area occurs in an area of previous historical clearing and disturbance. The vegetation type and composition are presented in Plate 2.

A total of 27 species from 13 families were identified within the survey area, comprised of 20 introduced species and seven native species. All species were able to be identified and a complete species list is provided in Table 6 below. No Declared pests, Weeds of National Significance or species of conservation significance were identified. The species recorded to exhibit the highest vegetative cover were the introduced tree species \**Schinus terebinthifolia* and the native Flooded Gum (*Eucalyptus rudis*). The overall density of introduced species was observed to be approximately 78.7% across the entire survey area (see Appendix 4).

Whilst the desktop assessment identified the potential for 15 Threatened or Priority Ecological Communities (TEC's and PEC's) to occur within the survey area, none were determined to be present following analysis of the survey results. The survey area was inconsistent with all 15 TEC and PEC's as a result of factors including species composition, species richness, vegetation structure, vegetation condition, soil type, hydrology and landform. A summary of the analysis for each TEC/PEC is shown in Table 7 below.



**Plate 2: Vegetation within the Dodson Road Bridge Survey Area, Bunbury. Top: southwest bank. Centre: southeast bank. Bottom: northeast bank.**



**Table 6: Flora species recorded within the survey area**

Family	Species Name	Common Name
Fabaceae	* <i>Acacia longifolia</i>	
Poaceae	* <i>Avena barbata</i>	Bearded Oat
Poaceae	* <i>Bromus diandrus</i>	Great Brome
Poaceae	* <i>Cynodon dactylon</i>	Couch
Cyperaceae	* <i>Cyperus rotundus</i>	Nut Grass
Poaceae	* <i>Eragrostis curvula</i>	African Lovegrass
Moraceae	* <i>Ficus carica</i>	Common Fig
Rubiaceae	* <i>Galium murale</i>	Small Goosegrass
Poaceae	* <i>Lagurus ovatus</i>	Hare's Tail Grass
Poaceae	* <i>Lolium rigidum</i>	Wimmera Ryegrass
Fabaceae	* <i>Lupinus angustifolius</i>	Narrowleaf Lupin
Fabaceae	* <i>Medicago polymorpha</i>	Burr Medic
Oleaceae	* <i>Olea europaea</i>	Olive
Poaceae	* <i>Paspalum dilatatum</i>	
Pittosporaceae	* <i>Pittosporum undulatum</i>	
Plantaginaceae	* <i>Plantago lanceolata</i>	Ribwort Plantain
Polygonaceae	* <i>Rumex crispus</i>	Curled Dock
Anacardiaceae	* <i>Schinus terebinthifolia</i>	
Fabaceae	* <i>Trifolium campestre</i>	Hop Clover
Fabaceae	* <i>Vicia sativa</i>	Common Vetch
Myrtaceae	<i>Eucalyptus rudis</i>	Flooded Gum
Cyperaceae	<i>Machaerina rubiginosa</i>	
Myrtaceae	<i>Melaleuca raphiophylla</i>	Swamp Paperbark
Myrtaceae	<i>Melaleuca viminalis</i>	
Polygonaceae	<i>Persicaria decipiens</i>	
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Bracken
Typhaceae	<i>Typha orientalis</i>	Bulrush

**Note:** \* Denotes introduced species

**Table 7: Analysis of presence of Threatened and Priority Ecological Communities**

Community Name	Analysis
<i>Banksia</i> Woodlands of the Swan Coastal Plain ecological community	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Vegetation structure inconsistent</li> </ul>
Clay Pans of the Swan Coastal Plain	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Vegetation condition too low</li> </ul>
<i>Corymbia calophylla</i> — <i>Xanthorrhoea preissii</i> woodlands and shrublands, Swan Coastal Plain (floristic community type 3c as originally described in Gibson et al. 1994)	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> </ul>
<i>Corymbia calophylla</i> woodlands on heavy soils of the southern Swan Coastal Plain (floristic community type 1b as originally described in Gibson et al. 1994)	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> </ul>
Dense shrublands on clay flats (floristic community type 9 as originally described in Gibson et al. 1994)	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Species richness inconsistent</li> </ul>
<i>Empodisma</i> peatlands of southwestern Australia	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Soil type inconsistent</li> </ul>
Herb rich saline shrublands in clay pans (floristic community type 7 as originally described in Gibson et al. 1994)	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Species richness inconsistent</li> </ul>
Herb rich shrublands in clay pans (floristic community type 8 as originally described in Gibson et al. 1994)	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Species richness inconsistent</li> </ul>
Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Soil type inconsistent</li> <li>Vegetation type inconsistent</li> <li>Species richness inconsistent</li> </ul>
Relictual White Mangrove Community (Leschenault Inlet)	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Location inconsistent</li> </ul>
Sedgeland in Holocene dune swales of the southern Swan Coastal Plain (floristic community type 19 as originally described in Gibson et al. 1994)	<ul style="list-style-type: none"> <li>Landform inconsistent</li> <li>Soil type inconsistent</li> <li>Only two characteristic species present (<i>Eucalyptus rudis</i> and <i>Melaleuca raphiophylla</i>)</li> </ul>
Shrublands on calcareous silts of the Swan Coastal Plain (floristic community type 18 as originally described in Gibson et al. 1994)	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Species richness inconsistent</li> </ul>
Shrublands on dry clay flats (floristic community type 10a as originally described in Gibson et al. 1994)	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Species richness inconsistent</li> </ul>
Subtropical and Temperate Coastal Saltmarsh	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Landform inconsistent</li> <li>Hydrology inconsistent</li> </ul>
Tuart ( <i>Eucalyptus gomphocephala</i> ) woodlands and forests of the Swan Coastal Plain	<ul style="list-style-type: none"> <li>Diagnostic species not present</li> <li>Vegetation structure inconsistent</li> </ul>

**Source:** DCCEEW (2023b); DCCEEW (2023c); DCCEEW (2023d); Department of Sustainability, Environment, Water, Population and Communities (2013); Department of the Environment and Energy (DoEE) (2016); DoEE (2017); DoEE (2019); Gibson et al. (1994) and Threatened Species Scientific Committee (2012).

## 4.2.2 Vegetation Condition

The entirety of the vegetation within the site was recorded to be in a Degraded condition, as per the Keighery (1994) scale, exhibiting signs of previous clearing, disturbance and subsequent regeneration. This is evident due to the high coverage of introduced weed species, including grasses, herbs and woody weeds, and the lack of mature trees.

## 4.2.3 Trees and Fauna Habitat

The survey identified a total of six trees within the proposed clearing area (Table 8). All trees were from two species, Flooded Gum (*Eucalyptus rudis*) and Swamp Paperbark (*Melaleuca raphiophylla*). Of these trees, none meet the criteria for potential breeding habitat for Black Cockatoos as all were identified to have a diameter at breast height (DBH) of less than 300mm (DAWE, 2022). No suitable foraging habitat for Black Cockatoos was identified (Department of Environment and Conservation (DEC), 2011).

**Table 8: Trees identified within the survey area**

Species Name	Diameter at Breast Height	Location
<i>Eucalyptus rudis</i>	150 mm	Northeast bank -33.3545134, 115.6751607
<i>Eucalyptus rudis</i>	200 mm	Northeast bank -33.3545053, 115.675245
<i>Eucalyptus rudis</i>	150 mm	Northeast bank -33.3545225, 115.6753023
<i>Eucalyptus rudis</i>	150 mm	Southeast bank -33.3546181, 115.6751329
<i>Eucalyptus rudis</i>	150 mm	Southwest bank -33.3545892, 115.675022
<i>Melaleuca raphiophylla</i>	150 mm	Southwest bank -33.3546088, 115.6751628



# Arc Infrastructure

## Tree Locations: Dodson Road Bridge - Line 2, 178.6km



**Plate 3: Tree Locations within the Dodson Road Bridge Clearing Area, Bunbury**

## 5 Discussion

### 5.1 Vegetation, Threatened and Priority Flora and Ecological Communities

One vegetation type was present within the survey area, being a *Eucalyptus rudis* low open woodland over open tall scrub of \* *Schinus terebinthifolia* over open shrubland of mixed native and introduced species over open grassland of introduced species dominated by \**Cynodon dactylon*. The area shows evidence of historical clearing and disturbance, likely as a result of the initial construction of the bridge structure. The survey area is not considered to form part of any TEC or PEC's identified in the desktop assessment.

No conservation significant flora was identified at the time of survey. Of the 34 conservation significant flora species identified during the desktop assessment, the majority (21) exhibit flowering periods consistent with the time of survey. Those remaining species either exhibit flowering periods inconsistent with the time of survey or possess insufficient data to determine flowering periods. Of these, 69% (9) are tree, shrub and perennial herb species for which sufficient diagnostic characteristics to enable identification, to a minimum of genus level, would have been present in the absence of flowering characteristics. As a precaution, any species within these genera were marked in the field and confirmation of identification was made post-survey. Only one similar species was identified, *Eucalyptus rudis*, however this was determined not to be *Eucalyptus rudis* subsp. *cratyantha* as a result of inconsistent morphological characteristics. The remaining four conservation significant species were annual herb species, for which detection and/or identification are more likely to be impacted by an inconsistent survey period. The presence of these species within the survey area is considered highly unlikely, due to the high level of degradation and disturbance. An analysis of the likelihood of each species is shown in Table 9 below.

**Table 9: Analysis of the likelihood of the presence of annual herb species identified in the desktop assessment with flowering periods inconsistent with survey timing or unknown**

Species Name	Cons. Code	Fl. Period	Likelihood analysis
<i>Adelphacme minima</i>	P3	Unknown	There are no known records in survey area. The nearest record is approximately 8km south within a large area of remnant vegetation. This record is associated with a swamp vegetation type containing a higher native mid- and understorey diversity than was observed within the survey area. No other known records of this species contain vegetation types similar to that observed within the survey area (DBCA, 2023e). Therefore, this species is not considered likely to be present.
<i>Diuris drummondii</i>	V	Nov - Jan	There are no known records in survey area. The nearest record is approximately 3.3km southeast within a large area of remnant vegetation. This species is known to occur within depressions, damp bushland and swamps (DBCA, 2023e; Western Australian Herbarium, 1998-). Whilst a section of the survey area was identified to contain an area of swamp associated soil type, the limited native vegetation observed during the survey was identified to be more riparian in nature. Therefore, this species is not considered likely to be present.

Species Name	Cons. Code	Fl. Period	Likelihood analysis
<i>Microtis quadrata</i>	P4	Unknown	There are no known records in survey area. The nearest record is approximately 1.6km southwest within a large area of remnant vegetation. The majority of known records of this species are associated with swamps and seasonally wet areas containing a dominance of <i>Melaleuca</i> species over native shrubs. This is not consistent with the habitat type and species structure and composition identified within the survey area. Therefore, this species is not considered likely to be present.
<i>Thelymitra variegata</i>	T	Jun - Sep	There are no known records in survey area. The nearest record is approximately 2.7km southwest within a large area of remnant vegetation. This species is known to occur in open grasslands or shrublands on well-drained sandy soils (Jeanes, 2009). This is consistent with known records in the area (DBCA, 2023e). The vegetation within the survey area contained a dense understorey of introduced herbs and the soil type was not observed to be well draining. Therefore, this species is not considered likely to be present.

## 5.2 Tree Assessment

No suitable breeding, roosting or foraging habitat for Black Cockatoos was identified. All trees were below the minimum DBH to be considered as potential habitat trees in the Swan Coastal Plain (DAWE, 2022) and none of the flora species identified provide high-value foraging resources (Department of Environment and Conservation (DEC), 2011). Additionally, no evidence of Black Cockatoo nesting, roosting or foraging were observed within the survey area and surrounding vegetation at the time of survey.

## 5.3 Referral and Approvals

As native vegetation is proposed to be cleared to undertake bridge replacement works, it is recommended that a native vegetation clearing permit as regulated under the WA Environmental Protection Act 1986 is undertaken prior to disturbance. An assessment of the data obtained from the 2023 survey of the proposed clearing area has been made against the Western Australian clearing principles (Table 10). The clearing application is not likely to be at variance with eight of the ten principles and may be at variance with two (Principles G & I). The clearing for this site is considered necessary as the age and deterioration of the bridge infrastructure is leading to reduced structural integrity, and the current structure is considered to present a high risk of failure.

Table 10: An assessment of the proposed clearing against clearing principles

Clearing Principle	Comment
<p>A</p> <p>Native vegetation should not be cleared if it comprises a high level of biological diversity</p>	<p>The proposed clearing area is not likely to be at variance with this clearing principle:</p> <ul style="list-style-type: none"> <li>▪ a single vegetation type was present; <i>Eucalyptus rudis</i> low open woodland over open tall scrub of <i>Schinus terebinthifolia</i> over open shrubland of mixed native and introduced species over open grassland of introduced species dominated by <i>Cynodon dactylon</i></li> <li>▪ the entirety of the vegetation within the proposed clearing area was recorded to be in a Degraded condition as per the Keighery (1994) scale</li> <li>▪ a total of 27 species from 13 families were identified within the proposed clearing area, comprised of predominantly introduced species (20 species), with low native species diversity (7 species)</li> <li>▪ no species of conservation significance were identified.</li> </ul>
<p>B</p> <p>Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia</p>	<p>The proposed clearing area is not likely to be at variance with this clearing principle:</p> <ul style="list-style-type: none"> <li>▪ it is not within 6km of any confirmed areas of Black Cockatoo breeding areas</li> <li>▪ no potential habitat trees (DBH ≥ 300mm) were recorded</li> <li>▪ no Black Cockatoo individuals or evidence of feeding were observed during survey activities</li> <li>▪ no suitable foraging habitat for Black Cockatoos was identified</li> <li>▪ the habitat within the proposed clearing area is not likely to provide high value habitat for other fauna species due to the level of degradation, ongoing disturbance and low diversity of native flora species.</li> </ul>
<p>C</p> <p>Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora</p>	<p>The proposed clearing area is not likely to be at variance with this clearing principle:</p> <ul style="list-style-type: none"> <li>▪ no species of conservation significance were identified within the proposed clearing area</li> <li>▪ the desktop assessment identified the potential for 34 conservation significant species to occur within the proposed clearing area <ul style="list-style-type: none"> <li>- 30 species either exhibit flowering periods consistent with the survey timing or are tree, shrub or perennial herb species for which sufficient diagnostic characteristics to enable identification to a minimum of genus level would have been present in the absence of flowering characteristics</li> <li>- the remaining four annual herb species, <i>Diuris drummondii</i>, <i>Thelymitra variegata</i>, <i>Adelphacme minima</i> and <i>Microtis quadrata</i>, are considered highly unlikely to occur within</li> </ul> </li> </ul>



Clearing Principle	Comment
	the survey area due to the unsuitable habitat type, poor vegetation structure, low native species diversity, degradation and high introduced species coverage observed.
D Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community	<p>The proposed clearing area is not likely to be at variance with this clearing principle:</p> <ul style="list-style-type: none"> <li>▪ the desktop assessment indicated the potential for 15 Threatened and/or Priority Ecological Communities (TEC's/PEC's) to exist within 10km of the site</li> <li>▪ no TEC's or PEC's were identified during the desktop assessment to occur within the proposed clearing area</li> <li>▪ the vegetation within the site was not determined to be representative of any of the 13 TEC's and/or PEC's due to factors including species composition, species richness, vegetation structure, vegetation condition, soil type, hydrology and landform.</li> </ul>
E Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared	<p>The proposed clearing area is not likely to be at variance with this clearing principle:</p> <ul style="list-style-type: none"> <li>▪ the proposed clearing area resides within the Perth subregion of the Swan Coastal Plain IBRA Region and consists of one vegetation complex, the Southern River Complex</li> <li>▪ the pre-European extent of this vegetation complex remaining is: <ul style="list-style-type: none"> <li>- 18.48% within the Swan Coastal Plain</li> <li>- 28.83% within the City of Bunbury</li> </ul> </li> <li>▪ the proposed clearing area is not considered to be a good representation of this vegetation complex as it is highly degraded and contains a high coverage of introduced species</li> <li>▪ the proposed clearing area is not considered to be significant as a remnant of native vegetation within the area, with better quality vegetation located within a 5km radius of the proposed clearing area, a number of which also contain the Southern River vegetation complex</li> <li>▪ revegetation using native riparian species will be undertaken along the banks of the waterway following the completion of works to offset the loss of native vegetation.</li> </ul>
F Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland	<p>The proposed clearing area may be at variance with this clearing principle:</p> <ul style="list-style-type: none"> <li>▪ it occurs adjacent to a minor, non-perennial watercourse</li> <li>▪ the vegetation present within the proposed clearing area is not considered to be good quality riparian vegetation as: <ul style="list-style-type: none"> <li>- the size of the trees (all <math>\leq 200</math>mm DBH) comparative to those outside of the proposed clearing area is indicative of historical clearing within this area</li> </ul> </li> </ul>



Clearing Principle		Comment
		<ul style="list-style-type: none"> <li>- there is a high diversity and coverage of introduced species and low diversity of native species</li> <li>- revegetation using native riparian species will be undertaken along the banks of the waterway following the completion of works to offset the loss of native vegetation.</li> </ul>
G	Native Vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation	<p>The proposed clearing area may be at variance with this clearing principle:</p> <ul style="list-style-type: none"> <li>▪ the vegetation within the proposed clearing area was entirely Degraded</li> <li>▪ the vegetation surrounding the proposed clearing area was also in Degraded condition and therefore unlikely to be significantly impacted by further disturbance</li> <li>▪ the proposed clearing area is located in an area of high to moderate risk of Acid Sulfate Soil occurrence within 3m of the natural soil surface, however Acid Sulfate Soil and Emergency Response Management Plans will be prepared to minimise and mitigate the impacts associated with the clearing, removal and construction</li> <li>▪ revegetation using native riparian species will be undertaken along the banks of the waterway following the completion of works to offset the loss of native vegetation.</li> </ul>
H	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area	<p>The proposed clearing area is not likely to be at variance with this clearing principle:</p> <ul style="list-style-type: none"> <li>▪ it is not located within any wetlands listed under the Ramsar Convention or Directory of Important Wetlands in Australia, or a Geomorphic Wetland classified as 'conservation category' or 'resource enhancement'</li> <li>▪ it is not located within a Bush Forever reserve, an Environmental Protection Policy area, DBCA land, a Regional Open Space or conservation vested land</li> <li>▪ it is not located in close proximity to any aforementioned areas and is predominantly bordered by cleared recreational, transport corridor and industrial land-uses.</li> </ul>
I	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or groundwater	<p>The proposed clearing area may be at variance with this clearing principle:</p> <ul style="list-style-type: none"> <li>▪ the proposed clearing area is alongside a minor, non-perennial watercourse</li> <li>▪ the clearing of a very small area (0.008 ha) of predominantly introduced vegetation is unlikely to have a notable impact on water quality</li> <li>▪ revegetation with native species will be undertaken following the completion of bridge replacement works to mitigate erosion.</li> </ul>

Clearing Principle	Comment
J Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	The proposed clearing area is not likely to be at variance with this clearing principle: <ul style="list-style-type: none"><li>▪ it is very small in size (0.008 ha) and is highly unlikely to contribute to altered surface water flows</li><li>▪ there are a large number of mature trees (DBH &gt;300mm) surrounding the proposed clearing area which will not be removed.</li></ul>

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## Appendix

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## Appendix 1 – Protected Matters Search Tool



# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 12-Dec-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

## Matters of National Environment Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance (Ramsar)</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	7
<a href="#">Listed Threatened Species:</a>	69
<a href="#">Listed Migratory Species:</a>	47

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Lands:</a>	15
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	70
<a href="#">Whales and Other Cetaceans:</a>	13
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None
<a href="#">Habitat Critical to the Survival of Marine Turtles:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	6
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">EPBC Act Referrals:</a>	50
<a href="#">Key Ecological Features (Marine):</a>	None
<a href="#">Biologically Important Areas:</a>	9
<a href="#">Bioregional Assessments:</a>	None
<a href="#">Geological and Bioregional Assessments:</a>	None

# Details

## Matters of National Environmental Significance

### Listed Threatened Ecological Communities

[\[ Resource Information \]](#)

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.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Banksia Woodlands of the Swan Coastal Plain ecological community</a>	Endangered	Community likely to occur within area	In feature area
<a href="#">Clay Pans of the Swan Coastal Plain</a>	Critically Endangered	Community likely to occur within area	In buffer area only
<a href="#">Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain</a>	Endangered	Community known to occur within area	In buffer area only
<a href="#">Empodisma peatlands of southwestern Australia</a>	Endangered	Community may occur within area	In buffer area only
<a href="#">Honeymyrtle shrubland on limestone ridges of the Swan Coastal Plain Bioregion</a>	Critically Endangered	Community may occur within area	In buffer area only
<a href="#">Subtropical and Temperate Coastal Saltmarsh</a>	Vulnerable	Community likely to occur within area	In buffer area only
<a href="#">Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community</a>	Critically Endangered	Community likely to occur within area	In feature area

### Listed Threatened Species

[\[ Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>BIRD</b>			
<a href="#">Anous tenuirostris melanops</a> Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area



SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calyptorhynchus banksii naso</a> Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Halobaena caerulea</a> Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only

SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Limosa lapponica menzbieri</a> Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Pachyptila turtur subantarctica</a> Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Phoebastria fusca</a> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Pterodroma mollis</a> Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Zanda baudinii listed as Calyptorhynchus baudinii</a> Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding known to occur within area	In feature area
<a href="#">Zanda latirostris listed as Calyptorhynchus latirostris</a> Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
<b>FISH</b>			
<a href="#">Nannatherina balstoni</a> Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Thunnus maccoyii</a> Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
<b>MAMMAL</b>			
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In buffer area only

SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Breeding known to occur within area	In feature area
<a href="#">Setonix brachyurus</a> Quokka [229]	Vulnerable	Species or species habitat known to occur within area	In feature area
<b>OTHER</b>			
<a href="#">Westralunio carteri</a> Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area	In feature area
<b>PLANT</b>			
<a href="#">Andersonia gracilis</a> Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Austrostipa bronweniae listed as Austrostipa bronwenae</a> [92773]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Austrostipa jacobsiana</a> [87809]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Banksia mimica</a> Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Banksia nivea subsp. uliginosa</a> Swamp Honeypot [82766]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Banksia squarrosa subsp. argillacea</a> Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Brachyscias verecundus</a> Ironstone Brachyscias [81321]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Caladenia huegelii</a> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Chamelaucium sp. S coastal plain (R.D.Royce 4872)</a> Royce's Waxflower [87814]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Diuris drummondii</a> Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Diuris micrantha</a> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Diuris purdiei</a> Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Drakaea elastica</a> Glossy-leaved Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Drakaea micrantha</a> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Eleocharis keigheryi</a> Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Lambertia echinata subsp. occidentalis</a> Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Petrophile latericola</a> Laterite Petrophile [64532]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Synaphea sp. Fairbridge Farm (D.Papenfus 696)</a> Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Synaphea sp. Pinjarra Plain (A.S.George 17182)</a> [86878]	Endangered	Species or species habitat may occur within area	In buffer area only



SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Synaphea sp. Serpentine (G.R.Brand 103)</a> [86879]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Synaphea stenoloba</a> Dwellingup Synaphea [66311]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<b>REPTILE</b>			
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<b>SHARK</b>			
<a href="#">Carcharias taurus (west coast population)</a> Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Galeorhinus galeus</a> School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
<a href="#">Pristis pristis</a> Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Rhincodon typus</a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Sphyrna lewini</a> Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Migratory Marine Birds</b>			
<a href="#">Anous stolidus</a> Common Noddy [825]		Species or species habitat may occur within area	In buffer area only
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
<a href="#">Ardenna carneipes</a> Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Ardenna grisea</a> Sooty Shearwater [82651]		Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea amsterdamensis</a> Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea dabbenena</a> Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea epomophora</a> Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Hydroprogne caspia</a> Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Onychoprion anaethetus</a> Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Phoebastria fusca</a> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<b>Migratory Marine Species</b>			
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
<a href="#">Carcharhinus longimanus</a> Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
<a href="#">Carcharodon carcharias</a> White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
<a href="#">Eubalaena australis as Balaena glacialis australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
<a href="#">Lagenorhynchus obscurus</a> Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only

## SCIENTIFIC NAME

## Threatened Category

## Presence Text

## Buffer Status

[Megaptera novaeangliae](#)

Humpback Whale [38]

Congregation or aggregation known to occur within area

In buffer area only

[Mobula alfredi as Manta alfredi](#)

Reef Manta Ray, Coastal Manta Ray [90033]

Species or species habitat may occur within area

In buffer area only

[Mobula birostris as Manta birostris](#)

Giant Manta Ray [90034]

Species or species habitat may occur within area

In buffer area only

[Natator depressus](#)

Flatback Turtle [59257]

Vulnerable

Foraging, feeding or related behaviour known to occur within area

In buffer area only

[Orcinus orca](#)

Killer Whale, Orca [46]

Species or species habitat may occur within area

In buffer area only

[Pristis pristis](#)

Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]

Vulnerable

Species or species habitat may occur within area

In feature area

[Rhincodon typus](#)

Whale Shark [66680]

Vulnerable

Species or species habitat may occur within area

In buffer area only

## Migratory Terrestrial Species

[Motacilla cinerea](#)

Grey Wagtail [642]

Species or species habitat may occur within area

In feature area

## Migratory Wetlands Species

[Actitis hypoleucos](#)

Common Sandpiper [59309]

Species or species habitat known to occur within area

In feature area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Species or species habitat known to occur within area

In feature area

[Calidris canutus](#)

Red Knot, Knot [855]

Endangered

Species or species habitat known to occur within area

In feature area



SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

## Other Matters Protected by the EPBC Act

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

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
<b>Defence</b>		
Defence - BUNBURY TRAINING DEPOT [50142]	WA	In buffer area only
<b>Unknown</b>		
Commonwealth Land - [51490]	WA	In buffer area only
Commonwealth Land - [51108]	WA	In buffer area only
Commonwealth Land - [50397]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51107]	WA	In buffer area only
Commonwealth Land - [50409]	WA	In buffer area only
Commonwealth Land - [50607]	WA	In buffer area only
Commonwealth Land - [50400]	WA	In buffer area only
Commonwealth Land - [50403]	WA	In buffer area only
Commonwealth Land - [50399]	WA	In buffer area only
Commonwealth Land - [50398]	WA	In buffer area only
Commonwealth Land - [51110]	WA	In buffer area only
Commonwealth Land - [50411]	WA	In buffer area only
Commonwealth Land - [50407]	WA	In buffer area only
Commonwealth Land - [50406]	WA	In buffer area only

### Listed Marine Species [ Resource Information ]

Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Bird</b>			
<a href="#">Actitis hypoleucos</a>			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<a href="#">Anous stolidus</a>			
Common Noddy [825]		Species or species habitat may occur within area	In buffer area only
<a href="#">Anous tenuirostris melanops</a>			
Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Apus pacificus</a>			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Ardena carneipes as Puffinus carneipes</a>			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area	In buffer area only

## SCIENTIFIC NAME

[Ardena grisea as Puffinus griseus](#)

Sooty Shearwater [82651]

## Threatened Category

## Presence Text

## Buffer Status

Species or species habitat may occur within area

In buffer area only

[Bubulcus ibis as Ardea ibis](#)

Cattle Egret [66521]

Species or species habitat may occur within area overfly marine area

In feature area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Species or species habitat known to occur within area

In feature area

[Calidris canutus](#)

Red Knot, Knot [855]

Endangered

Species or species habitat known to occur within area overfly marine area

In feature area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat known to occur within area overfly marine area

In feature area

[Calidris melanotos](#)

Pectoral Sandpiper [858]

Species or species habitat may occur within area overfly marine area

In feature area

[Charadrius leschenaultii](#)

Greater Sand Plover, Large Sand Plover [877]

Vulnerable

Species or species habitat known to occur within area

In feature area

[Diomedea amsterdamensis](#)

Amsterdam Albatross [64405]

Endangered

Species or species habitat may occur within area

In buffer area only

[Diomedea dabbenena](#)

Tristan Albatross [66471]

Endangered

Species or species habitat may occur within area

In buffer area only

[Diomedea epomophora](#)

Southern Royal Albatross [89221]

Vulnerable

Species or species habitat may occur within area

In buffer area only

SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Diomedea exulans</a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Diomedea sanfordi</a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
<a href="#">Halobaena caerulea</a> Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Hydroprogne caspia as Sterna caspia</a> Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Limosa lapponica</a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Macronectes giganteus</a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Macronectes halli</a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area

SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Onychoprion anaethetus as Sterna anaethetus</a> Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Pachyptila turtur</a> Fairy Prion [1066]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat known to occur within area	In buffer area only
<a href="#">Phoebastria fusca</a> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Pterodroma mollis</a> Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Puffinus assimilis</a> Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Rostratula australis as Rostratula benghalensis (sensu lato)</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only
<a href="#">Stercorarius antarcticus as Catharacta skua</a> Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche carteri</a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only



SCIENTIFIC NAME	Threatened Category	Presence Text	Buffer Status
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche impavida</a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thalassarche melanophris</a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#">Thalassarche steadi</a> White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Thinornis cucullatus as Thinornis rubricollis</a> Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In buffer area only
<a href="#">Tringa nebularia</a> Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area
<b>Fish</b>			
<a href="#">Acentronura australe</a> Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In buffer area only
<a href="#">Campichthys galei</a> Gale's Pipefish [66191]		Species or species habitat may occur within area	In buffer area only
<a href="#">Heraldia nocturna</a> Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
<a href="#">Hippocampus angustus</a> Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In buffer area only

[Hippocampus breviceps](#)

Short-head Seahorse, Short-snouted  
Seahorse [66235]

Species or species  
habitat may occur  
within area

In buffer area only

[Hippocampus subelongatus](#)

West Australian Seahorse [66722]

Species or species  
habitat may occur  
within area

In buffer area only

[Histiogamphelus cristatus](#)

Rhino Pipefish, Macleay's Crested  
Pipefish, Ring-back Pipefish [66243]

Species or species  
habitat may occur  
within area

In buffer area only

[Lissocampus caudalis](#)

Australian Smooth Pipefish, Smooth  
Pipefish [66249]

Species or species  
habitat may occur  
within area

In buffer area only

[Lissocampus fatiloquus](#)

Prophet's Pipefish [66250]

Species or species  
habitat may occur  
within area

In buffer area only

[Lissocampus runa](#)

Javelin Pipefish [66251]

Species or species  
habitat may occur  
within area

In buffer area only

[Maroubra perserrata](#)

Sawtooth Pipefish [66252]

Species or species  
habitat may occur  
within area

In buffer area only

[Mitotichthys meraculus](#)

Western Crested Pipefish [66259]

Species or species  
habitat may occur  
within area

In buffer area only

[Nannocampus subosseus](#)

Bonyhead Pipefish, Bony-headed  
Pipefish [66264]

Species or species  
habitat may occur  
within area

In buffer area only

[Phycodurus eques](#)

Leafy Seadragon [66267]

Species or species  
habitat may occur  
within area

In buffer area only

[Phyllopteryx taeniolatus](#)

Common Seadragon, Weedy Seadragon  
[66268]

Species or species  
habitat may occur  
within area

In buffer area only

## SCIENTIFIC NAME

## Threatened Category

## Presence Text

## Buffer Status

[Pugnaso curtirostris](#)

Pugnose Pipefish, Pug-nosed Pipefish  
[66269]

Species or species  
habitat may occur  
within area

In buffer area only

[Solegnathus lettiensis](#)

Gunther's Pipehorse, Indonesian  
Pipefish [66273]

Species or species  
habitat may occur  
within area

In buffer area only

[Stigmatopora argus](#)

Spotted Pipefish, Gulf Pipefish, Peacock  
Pipefish [66276]

Species or species  
habitat may occur  
within area

In buffer area only

[Stigmatopora nigra](#)

Widebody Pipefish, Wide-bodied  
Pipefish, Black Pipefish [66277]

Species or species  
habitat may occur  
within area

In buffer area only

[Urocampus carinirostris](#)

Hairy Pipefish [66282]

Species or species  
habitat may occur  
within area

In buffer area only

[Vanacampus margaritifer](#)

Mother-of-pearl Pipefish [66283]

Species or species  
habitat may occur  
within area

In buffer area only

[Vanacampus phillipi](#)

Port Phillip Pipefish [66284]

Species or species  
habitat may occur  
within area

In buffer area only

[Vanacampus poecilolaemus](#)

Longsnout Pipefish, Australian Long-  
snout Pipefish, Long-snouted Pipefish  
[66285]

Species or species  
habitat may occur  
within area

In buffer area only

## Mammal

[Arctocephalus forsteri](#)

Long-nosed Fur-seal, New Zealand Fur-  
seal [20]

Species or species  
habitat may occur  
within area

In buffer area only

[Neophoca cinerea](#)

Australian Sea-lion, Australian Sea Lion  
[22] Endangered

Species or species  
habitat may occur  
within area

In buffer area only

## Reptile

[Caretta caretta](#)

Loggerhead Turtle [1763]

Endangered

Foraging, feeding or  
related behaviour  
known to occur within  
area

In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In buffer area only
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

## Whales and Other Cetaceans

[ Resource Information ]

Current Scientific Name	Status	Type of Presence	Buffer Status
<b>Mammal</b>			
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
<a href="#">Balaenoptera edeni</a> Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
<a href="#">Balaenoptera musculus</a> Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Caperea marginata</a> Pygmy Right Whale [39]		Species or species habitat may occur within area	In buffer area only
<a href="#">Delphinus delphis</a> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
<a href="#">Eubalaena australis</a> Southern Right Whale [40]	Endangered	Breeding known to occur within area	In buffer area only
<a href="#">Grampus griseus</a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
<a href="#">Lagenorhynchus obscurus</a> Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]		Congregation or aggregation known to occur within area	In buffer area only
<a href="#">Orcinus orca</a> Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
<a href="#">Stenella attenuata</a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

## Extra Information

State and Territory Reserves			[ Resource Information ]
Protected Area Name	Reserve Type	State	Buffer Status
Leschenault Peninsula	Conservation Park	WA	In buffer area only
Morangarel	Nature Reserve	WA	In buffer area only
NTWA Bushland covenant (0022)	Conservation Covenant	WA	In buffer area only
Unnamed WA40552	5(1)(h) Reserve	WA	In buffer area only
Unnamed WA46108	Nature Reserve	WA	In buffer area only
Unnamed WA53600	Nature Reserve	WA	In buffer area only

EPBC Act Referrals				[ Resource Information ]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<a href="#">Lillydale Road Widening</a>	2023/09476		Completed	In buffer area only

Title of Referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<a href="#">Residential development, Dalyellup, WA</a>	2023/09550		Assessment	In buffer area only
<a href="#">VV Walsh Cold Stores Expansion</a>	2021/8902		Post-Approval	In buffer area only
<b>Controlled action</b>				
<a href="#">313-316 Mimminup Road, Dalyellup</a>	2012/6274	Controlled Action	Post-Approval	In buffer area only
<a href="#">Bunbury Outer Ring Road Northern and Central Section Project, WA</a>	2019/8471	Controlled Action	Post-Approval	In buffer area only
<a href="#">Bunbury Outer Ring Road Southern Section</a>	2012/6652	Controlled Action	Completed	In buffer area only
<a href="#">Bunbury Outer Ring Road Southern Section project, WA</a>	2019/8543	Controlled Action	Final PD	In buffer area only
<a href="#">Bunbury Port Berth 14A Expansion &amp; Coal Storage &amp; Loading Facility, WA</a>	2014/7200	Controlled Action	Post-Approval	In buffer area only
<a href="#">Clearing for Bunbury Airport Expansion, WA</a>	2013/6872	Controlled Action	Post-Approval	In buffer area only
<a href="#">Construction of new sporting field</a>	2007/3333	Controlled Action	Post-Approval	In buffer area only
<a href="#">Dalyellup Beach Estate - Residential Development</a>	2007/3361	Controlled Action	Post-Approval	In buffer area only
<a href="#">Koppers Wood Products Wood Processing Facility</a>	2012/6691	Controlled Action	Post-Approval	In buffer area only
<a href="#">Preston Industrial Park</a>	2012/6312	Controlled Action	Completed	In buffer area only
<a href="#">Remove 1.87ha of degraded parkland cleared vegetation to utilising the area for</a>	2010/5661	Controlled Action	Post-Approval	In buffer area only
<a href="#">Residential development, College Grove, WA</a>	2015/7579	Controlled Action	Completed	In buffer area only
<a href="#">Sand and limestone extraction</a>	2003/1284	Controlled Action	Completed	In buffer area only
<a href="#">Sand and Limestone Extraction on Lots 313 and 314, Harewoods Road</a>	2005/2291	Controlled Action	Completed	In buffer area only
<a href="#">Sand Extraction Project, Lot 1 Southwest Highway, Boyanup, WA</a>	2015/7449	Controlled Action	Assessment Approach	In buffer area only



Title of Referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Controlled action</b>				
<a href="#">Somerville Drive Extension</a>	2011/6153	Controlled Action	Post-Approval	In buffer area only
<a href="#">Stage 2 of the Bunbury Port Access Project</a>	2010/5768	Controlled Action	Post-Approval	In buffer area only
<a href="#">Urban development subdivision</a>	2013/6955	Controlled Action	Post-Approval	In buffer area only
<a href="#">Yarragadee Water Supply Development</a>	2005/2073	Controlled Action	Completed	In buffer area only
<b>Not controlled action</b>				
<a href="#">Bunbury Water Resources Recovery Scheme-Recycled Water Treatment Plant</a>	2021/8986	Not Controlled Action	Completed	In buffer area only
<a href="#">Clearing 5.4ha of native vegetation for sand extraction</a>	2012/6592	Not Controlled Action	Completed	In buffer area only
<a href="#">Extension of Brittain Road to connect with the South Western Hwy/Robertson Drive intersection</a>	2007/3707	Not Controlled Action	Completed	In buffer area only
<a href="#">Extension of commercial sand extraction operation, Shire of Capel WA</a>	2003/1250	Not Controlled Action	Completed	In buffer area only
<a href="#">Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia</a>	2015/7522	Not Controlled Action	Completed	In feature area
<a href="#">INDIGO Central Submarine Telecommunications Cable</a>	2017/8127	Not Controlled Action	Completed	In feature area
<a href="#">New automotive centre at the Southwest Institute of Technology, Bunbury, WA</a>	2010/5766	Not Controlled Action	Completed	In buffer area only
<a href="#">Proposal to widen Harris Road within the Shire of Dardanup, WA</a>	2013/6934	Not Controlled Action	Completed	In buffer area only
<a href="#">Proposed Fuel Reduction Burn, Loughton Park, Bunbury, WA</a>	2014/7148	Not Controlled Action	Completed	In buffer area only
<a href="#">Residential development, Lot 54 Vittoria Road, Glen Iris, WA</a>	2018/8308	Not Controlled Action	Completed	In buffer area only
<a href="#">Residential development, Lots 120-121 Minninup Road, Dalyellup WA</a>	2018/8254	Not Controlled Action	Completed	In buffer area only
<a href="#">Residential Development - Assorted Lots Parade Rd, Washington Av &amp; Bussell Hwy, Usher WA</a>	2013/6935	Not Controlled Action	Completed	In buffer area only

Reference	Referral Outcome	Assessment Status	Buffer Status	
<b>Not controlled action</b>				
<a href="#">Residential Subdivision on Lot 5 Garvey Road, Crooked Brook</a>	2012/6690	Not Controlled Action	Completed	In buffer area only
<a href="#">Sand Extraction, Lot 265 Ducane Road, Gelorup, WA</a>	2012/6616	Not Controlled Action	Completed	In buffer area only
<a href="#">South Western Highway Reconstruction between Waterloo and Hynes Roads, Waterloo</a>	2010/5617	Not Controlled Action	Completed	In buffer area only
<a href="#">Twin Rivers Residential Subdivision</a>	2005/2168	Not Controlled Action	Completed	In buffer area only
<a href="#">Vegetation clearing for industrial development</a>	2013/6960	Not Controlled Action	Completed	In buffer area only
<a href="#">Western Extension to the Dardanup Mineral Sands Project</a>	2008/4673	Not Controlled Action	Completed	In buffer area only
<a href="#">Woodcrest Rise Estate Residential Development</a>	2007/3794	Not Controlled Action	Completed	In buffer area only
<b>Not controlled action (particular manner)</b>				
<a href="#">Construction of new bridge (Bridge 5370) across the Collie River, Eaton, WA</a>	2016/7657	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
<a href="#">Dalyellup Beach Estate Stages 12 and 14, near Bunbury</a>	2004/1726	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
<a href="#">Dalyellup Beach Estate - Stages 13 and 16</a>	2006/3075	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
<a href="#">INDIGO Marine Cable Route Survey (INDIGO)</a>	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
<a href="#">Sand and Limestone Extraction on Lots 313 and 314, Harewoods Road</a>	2005/2346	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
<a href="#">Waterloo to Busselton 132kV Transmission Line</a>	2002/816	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
<b>Referral decision</b>				
<a href="#">Bunbury Port Berth 14 Development, Bunbury Port Inner Harbour</a>	2011/6023	Referral Decision	Completed	In buffer area only

Title of Referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Referral decision</b>				
<a href="#">Bunbury Water Resource Recovery Scheme - Stage 2 Pipeline</a>	2022/9145	Referral Decision	Referral Publication	In buffer area only
<a href="#">Bunbury WRRS - Stage 2 Pipeline</a>	2021/9092	Referral Decision	Completed	In buffer area only

## Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
<b>Seabirds</b>			
<a href="#">Ardena pacifica</a> Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur	In buffer area only
<a href="#">Eudyptula minor</a> Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In buffer area only
<a href="#">Onychoprion anaethetus</a> Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In buffer area only
<a href="#">Puffinus assimilis tunneyi</a> Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In buffer area only
<a href="#">Sternula nereis</a> Fairy Tern [82949]	Foraging (in high numbers)	Known to occur	In buffer area only
<b>Whales</b>			
<a href="#">Balaenoptera musculus brevicauda</a> Pygmy Blue Whale [81317]	Distribution	Known to occur	In buffer area only
<a href="#">Balaenoptera musculus brevicauda</a> Pygmy Blue Whale [81317]	Migration	Known to occur	In buffer area only
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Migration (north and south)	Known to occur	In buffer area only
<a href="#">Megaptera novaeangliae</a> Humpback Whale [38]	Migration (south)	Known to occur	In buffer area only

# Caveat

## 1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

## 2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

## 3 DATA SOURCES

### Threatened ecological communities

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

### Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

## 4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

# Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact us](#) page.

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## Appendix 2 – Conservation Significant Flora Field Guide


Species	Description	Habitat
<p style="text-align: center;"><i>Acacia flagelliformis</i></p> 	<p>Rush-like, erect or sprawling shrub, 0.3-0.75(-1.6) m high.</p> <p>Fl. yellow, May to Sep.</p> <p>P4</p>	<p>Sandy soils. Winter-wet areas.</p>

Species	Description	Habitat
<p data-bbox="398 261 622 288"><i>Acacia semitrullata</i></p>  <p data-bbox="215 724 416 746"><i>Acacia semitrullata</i></p> <p data-bbox="674 724 815 746">Photos: S.D. Hopper</p>	<p data-bbox="846 411 1205 475">Slender, erect, pungent shrub, (0.1-)0.2-0.7(-1.5) m high.</p> <p data-bbox="857 507 1193 534">Fl. cream-white, May to Oct.</p> <p data-bbox="1003 566 1048 593">P4</p>	<p data-bbox="1227 475 2036 534">White/grey sand, sometimes over laterite, clay. Sandplains, swampy areas.</p>
<p data-bbox="389 772 631 799"><i>Adelphacme minima</i></p>	<p data-bbox="1003 772 1048 799">P3</p>	<p data-bbox="1570 772 1693 799">Unknown.</p>
<p data-bbox="367 906 654 933"><i>Angianthus drummondii</i></p>	<p data-bbox="857 826 1193 890">Erect annual, herb, to 0.1 m high.</p> <p data-bbox="891 922 1160 949">Fl. yellow, Oct to Dec.</p> <p data-bbox="1003 981 1048 1008">P3</p>	<p data-bbox="1294 906 1966 933">Grey or brown clay soils, ironstone. Seasonally wet flats.</p>



Species	Description	Habitat
<p data-bbox="360 261 663 288"><i>Aponogeton hexatepalus</i></p>  <p data-bbox="210 722 432 743"><i>Aponogeton hexatepalus</i></p> <p data-bbox="600 722 813 743">Photos: J.L. Robson &amp; A.P. Brown</p>	<p data-bbox="869 397 1178 488">Rhizomatous or cormous, aquatic perennial, herb, leaves floating.</p> <p data-bbox="869 520 1178 547">Fl. green-white, Jul to Oct.</p> <p data-bbox="1003 579 1043 606">P4</p>	<p data-bbox="1581 488 1675 515">Aquatic.</p>
<p data-bbox="367 866 651 893"><i>Austrostipa bronweniae</i></p>	<p data-bbox="1003 882 1043 909">EN</p>	<p data-bbox="1238 775 2022 898">Perennial rhizomatous grass to 1.5 metres tall (with flower spikes). Leaves to 45 cm long, terete, rolled or involute, abaxial surface not ribbed. Inflorescence 10-20 cm long.</p> <p data-bbox="1435 930 1821 986">Flowering from October through November.</p>
<p data-bbox="374 1106 645 1133"><i>Austrostipa jacobiana</i></p>	<p data-bbox="1003 1121 1043 1149">CE</p>	<p data-bbox="1238 1015 2022 1169">Perennial rhizomatous grass to 1.2 metres tall (with flower spikes). Leaves to 45 cm long, folded and swollen giving a terete appearance, abaxial surface strongly ribbed. Inflorescence 10-20 cm long.</p> <p data-bbox="1391 1201 1865 1228">Flowering in October through November.</p>


Species	Description	Habitat
<p><i>Banksia squarrosa</i> subsp. <i>argillacea</i></p>  <p><i>Banksia squarrosa</i> subsp. <i>argillacea</i> Photos: M. Pieroni</p>	<p>Erect, open, non-lignotuberous shrub, 1.2-4 m high.</p> <p>Fl. yellow, Jun to Nov.</p> <p>VU</p>	<p>White/grey sand, gravelly clay or loam. Winter-wet flats, clay flats.</p>
<p><i>Boronia tetragona</i></p>	<p>Perennial, herb, 0.3-0.7 m high, leaves sessile, entire, with papillate margins, branches quadrangular, sepals ciliate.</p> <p>Fl. pink &amp; red, Oct to Dec.</p> <p>P3</p>	<p>Black/white sand, laterite, brown sandy loam. Winter-wet flats, swamps, open woodland.</p>


Species	Description	Habitat
<p><i>Caladenia speciosa</i></p>  <p><i>Caladenia speciosa</i> Photos: A.P.Brown</p>	<p>Tuberous, perennial, herb, 0.35-0.6 m high.</p> <p>Fl. white-pink, Sep to Oct.</p> <p>P4</p>	<p>White, grey or black sand.</p>
<p><i>Carex tereticaulis</i></p>	<p>Monoecious, rhizomatous, tufted perennial, grass-like or herb (sedge), 0.7 m high.</p> <p>Fl. brown, Sep to Oct.</p> <p>P3</p>	<p>Black peaty sand.</p>
<p><i>Chamaescilla gibsonii</i></p>	<p>Clumped tuberous, herb.</p> <p>Fl. blue, Sep.</p> <p>P3</p>	<p>Clay to sandy clay. Winter-wet flats, shallow water-filled claypans.</p>
<p><i>Chamelaucium erythrochlorum</i></p>	<p>P4</p>	<p>Unknown.</p>

Species	Description	Habitat
<p><i>Chamelaucium roycei</i></p>	<p>An intricately branched, spreading shrub up to 120 cm tall and 60 cm across.</p> <p>It has inconspicuous, greenish-white flowers and young branches are coloured fawn to reddish.</p> <p>VU</p>	<p>Confined to swamp margins in open Dryandra shrubland in winter-wet sandy clay sites on a coastal plain. It occurs in low woodlands of <i>Eucalyptus rudis</i>, <i>Melaleuca raphiophylla</i>, <i>Astartea fascicularis</i>, or Proteaceous heaths.</p>
<p><i>Diuris drummondii</i></p>  <p><i>Diuris drummondii</i> Photos: A. P. Brown and I &amp; M Greeve</p>	<p>Tuberous, perennial, herb, 0.5-1.05 m high.</p> <p>Fl. yellow, Nov to Dec or Jan.</p> <p>VU</p>	<p>Low-lying depressions, swamps.</p>






Species	Description	Habitat
<p data-bbox="398 261 629 288"><i>Drakaea micrantha</i></p>  <p data-bbox="210 719 389 743"><i>Drakaea micrantha</i></p> <p data-bbox="506 724 815 743">Photos: S.D. Hopper, A.P. Brown &amp; I. &amp; M. Greeve</p>	<p data-bbox="864 411 1182 475">Tuberous, perennial, herb, 0.15-0.3 m high.</p> <p data-bbox="855 504 1191 536">Fl. red &amp; yellow, Sep to Oct.</p> <p data-bbox="1003 564 1043 596">VU</p>	<p data-bbox="1527 488 1733 520">White-grey sand.</p>
<p data-bbox="389 772 636 799"><i>Eleocharis keigheryi</i></p>  <p data-bbox="376 1214 551 1238"><i>Eleocharis keigheryi</i></p> <p data-bbox="506 1238 647 1257">Photo: G.J. Keighery</p>	<p data-bbox="855 906 1191 1002">Rhizomatous, clumped perennial, grass-like or herb (sedge), to 0.4 m high.</p> <p data-bbox="891 1031 1155 1062">Fl. green, Aug to Nov.</p> <p data-bbox="1003 1091 1043 1123">VU</p>	<p data-bbox="1272 999 1989 1031">Clay, sandy loam. Emergent in freshwater: creeks, claypans.</p>

Species	Description	Habitat
<p><i>Eucalyptus rudis</i> subsp. <i>cratyantha</i></p>	<p>Tree, 5-20 m high, bark rough, box-type.</p> <p>Fl. white, Jul to Sep.</p> <p>P4</p>	<p>Loam. Flats, hillsides.</p>
<p><i>Franklandia triaristata</i></p>  <p><i>Franklandia triaristata</i></p> <p>Photos: I.R. Dixon &amp; A.S. George</p>	<p>Erect, lignotuberous shrub, 0.2-1 m high.</p> <p>Fl. white-cream-yellow/brown-purple, Aug to Oct.</p> <p>P4</p>	<p>White or grey sand.</p>

Species	Description	Habitat
<p data-bbox="353 261 672 288"><i>Gastrolobium whicherense</i></p>  <p data-bbox="210 719 450 740"><i>Gastrolobium whicherense</i></p> <p data-bbox="674 724 813 740">Photos: A.D. Crawford</p>	<p data-bbox="846 411 1200 475">Slender, open shrub, to 1.6 m high.</p> <p data-bbox="864 504 1182 536">Fl. orange/yellow/red, Oct.</p> <p data-bbox="1003 564 1043 592">P2</p>	<p data-bbox="1283 491 1980 518">Red-grey sandy clay over quartzite. Steep westerly slopes.</p>
<p data-bbox="331 863 694 890"><i>Lasiopetalum membranaceum</i></p>	<p data-bbox="846 770 1200 834">Multi-stemmed shrub, 0.2-1 m high.</p> <p data-bbox="864 863 1182 927">Fl. pink-blue-purple, Sep to Dec.</p> <p data-bbox="1003 956 1043 983">P3</p>	<p data-bbox="1507 863 1756 890">Sand over limestone.</p>
<p data-bbox="398 1086 622 1114"><i>Leptomeria furtiva</i></p>	<p data-bbox="846 1011 1200 1075">Lax, sprawling shrub, 0.2-0.45 m high.</p> <p data-bbox="846 1104 1200 1136">Fl. orange-brown, Aug to Oct.</p> <p data-bbox="1003 1165 1043 1192">P3</p>	<p data-bbox="1384 1086 1883 1114">Grey or black peaty sand. Winter-wet flats.</p>
<p data-bbox="353 1219 672 1246"><i>Leucopogon</i> sp. Busselton</p>	<p data-bbox="1003 1219 1043 1246">P2</p>	<p data-bbox="1574 1219 1688 1246">Unknown.</p>
<p data-bbox="409 1278 616 1305"><i>Microtis quadrata</i></p>	<p data-bbox="1003 1278 1043 1305">P4</p>	<p data-bbox="1574 1278 1688 1305">Unknown.</p>

Species	Description	Habitat
<i>Puccinellia vassica</i>	Caespitose annual or perennial, grass-like or herb, 0.41-0.55 m high. P1	Saline soils. On the outer margins of coastal saltmarshes.
<i>Pultenaea skinneri</i>	Slender shrub, 1-2 m high. Fl. yellow/orange & red, Jul to Sep. P4	Sandy or clayey soils. Winter-wet depressions.
<i>Schoenus benthamii</i>	Tufted perennial, grass-like or herb (sedge), 0.15-0.45 m high. Fl. brown, Oct to Nov. P3	White, grey sand, sandy clay. Winter-wet flats, swamps.
<i>Schoenus capillifolius</i>	Semi-aquatic tufted annual, grass-like or herb (sedge), 0.05 m high. Fl. green, Oct to Nov. P3	Brown mud. Claypans.
<i>Schoenus loliaceus</i>	Annual, grass-like or herb (sedge), 0.03-0.06 m high. Fl. Aug to Nov. P2	Sandy soils. Winter-wet depressions.

Species	Description	Habitat
<p data-bbox="389 261 636 288"><i>Stylidium longitubum</i></p>  <p data-bbox="210 719 405 743"><i>Stylidium longitubum</i></p> <p data-bbox="577 719 813 743">Photos: M. Hislop and P.G. Armstrong</p>	<p data-bbox="869 411 1178 472">Erect annual (ephemeral), herb, 0.05-0.12 m high.</p> <p data-bbox="904 504 1142 531">Fl. pink, Oct to Dec.</p> <p data-bbox="1003 563 1043 590">P4</p>	<p data-bbox="1413 488 1850 515">Sandy clay, clay. Seasonal wetlands.</p>
<p data-bbox="389 959 636 986"><i>Stylidium paludicola</i></p>	<p data-bbox="846 775 1200 1046">Reed-like perennial, herb, 0.35-1 m high, Leaves tufted, linear or subulate or narrowly oblanceolate, 0.5-4 cm long, 0.5-1.5 mm wide, apex acute, margin entire, glabrous. Scape mostly glabrous, inflorescence axis glandular. Inflorescence racemose.</p> <p data-bbox="904 1078 1142 1106">Fl. pink, Oct to Dec.</p> <p data-bbox="1003 1137 1043 1165">P3</p>	<p data-bbox="1256 943 2007 1003">Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.</p>

Species	Description	Habitat
<p data-bbox="376 261 651 288"><i>Synaphea odocoileops</i></p>  <p data-bbox="210 719 416 743"><i>Synaphea odocoileops</i></p> <p data-bbox="696 724 813 743">Photos: R. Butcher</p>	<p data-bbox="860 411 1189 472">Tufted, compact shrub, 0.2-0.5 m high.</p> <p data-bbox="891 504 1158 534">Fl. yellow, Aug to Oct.</p> <p data-bbox="1003 564 1043 592">P1</p>	<p data-bbox="1261 475 2007 536">Brown-orange loam &amp; sandy clay, granite. Swamps, winter-wet areas.</p>
<p data-bbox="389 772 636 799"><i>Thelymitra variegata</i></p>  <p data-bbox="210 1230 398 1254"><i>Thelymitra variegata</i></p> <p data-bbox="584 1235 813 1254">Photos: S.D. Hopper &amp; G. Brunnbauer</p>	<p data-bbox="864 906 1182 967">Tuberous, perennial, herb, 0.1-0.35 m high.</p> <p data-bbox="860 999 1189 1059">Fl. orange &amp; red &amp; purple &amp; pink, Jun to Sep.</p> <p data-bbox="1010 1091 1037 1118">T</p>	<p data-bbox="1473 999 1783 1029">Sandy clay, sand, laterite.</p>



Species	Description	Habitat
<i>Verticordia attenuata</i>	Shrub, 0.4-1 m high. Fl. pink, Dec or Jan to May. P3	White or grey sand. Winter-wet depressions.

## Appendix 3 – Conservation Code Definitions

**Table A3.1: Conservation code definitions for flora and fauna as listed as Threatened or specially protected**

Threat Category	Definition
Threatened – Vulnerable (V)	Facing a high risk of extinction in the wild in the medium-term future.
Threatened – Endangered (E)	Facing a very high risk of extinction in the wild in the near future.
Threatened – Critically Endangered (CR)	Facing an extremely high risk of extinction in the wild in the immediate future.
Threatened – Extinct in the Wild (EW)	Species 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.
Threatened – Extinct (EX)	There is no reasonable doubt that the last member of the species has died.
Specially Protected Species – Migratory Species (MI)	<p>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.</p> <p>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.</p>
Specially Protected Species – Conservation Dependent (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened.
Specially Protected Species – Other specially protected species (OS)	Fauna otherwise in need of special protection to ensure their conservation.

**Table A3.2: Conservation code definitions for flora and fauna as listed as Priority**

Threat Category	Definition
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.
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.
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.
Priority 4: Rare, Near Threatened and other species in need of monitoring	<p>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.</p> <p>(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.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>

**Table A3.3: Conservation code definitions for ecological communities listed as threatened (TEC)**

Threat Category	Definition
Presumed Totally Destroyed (PD)	An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.
Critically Endangered (CR)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.
Endangered (EN)	An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its

Threat Category	Definition
	range or severe modification or destruction over most of its range in the near future.
Vulnerable (VU)	An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

**Table A3.4: Conservation code definitions for ecological communities listed as priority (PEC)**

Threat Category	Definition
Priority One (P1)	Ecological communities that are known from very few occurrences with a very restricted distribution (generally $\leq 5$ occurrences or a total area of $\leq 100$ ha), and appear to be under immediate threat.
Priority Two (P2)	Communities that are known from few occurrences with a restricted distribution (generally $\leq 10$ occurrences or a total area of $\leq 200$ ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation.
Priority Three (P3)	(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:  (ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;  (iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.
Priority Four (P4)	Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.
Priority Five (P5)	Conservation Dependent 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 4 – Survey Data

<b>Date</b>	27/10/2023
<b>Location</b>	-33.3545837, 115.6751515
<b>Recorders</b>	Shelley Hill, Claire Hamersley
<b>Condition</b>	Degraded
<b>Aspect</b>	-
<b>Slope</b>	Flat
<b>Landform</b>	Riparian Bank
<b>Drainage</b>	Poor

Family	Species	Common Name	Cover (%)	Height (m)
Fabaceae	* <i>Acacia longifolia</i>		2	1
Poaceae	* <i>Avena barbata</i>	Bearded Oat	1	0.3
Poaceae	* <i>Bromus diandrus</i>	Great Brome	1	0.3
Poaceae	* <i>Cynodon dactylon</i>	Couch	10	0.2
Cyperaceae	* <i>Cyperus rotundus</i>	Nut Grass	5	0.4
Poaceae	* <i>Eragrostis curvula</i>	African Lovegrass	10	0.5
Moraceae	* <i>Ficus carica</i>	Common Fig	0.5	1
Rubiaceae	* <i>Galium murale</i>	Small Goosegrass	0.5	0.1
Poaceae	* <i>Lagurus ovatus</i>	Hare's Tail Grass	1	0.2
Poaceae	* <i>Lolium rigidum</i>	Wimmera Ryegrass	2	0.3
Fabaceae	* <i>Lupinus angustifolius</i>	Narrowleaf Lupin	0.1	0.2
Fabaceae	* <i>Medicago polymorpha</i>	Burr Medic	0.5	0.1
Oleaceae	* <i>Olea europaea</i>	Olive	1	1
Poaceae	* <i>Paspalum dilatatum</i>		2	0.2
Pittosporaceae	* <i>Pittosporum undulatum</i>		0.5	1
Plantaginaceae	* <i>Plantago lanceolata</i>	Ribwort Plantain	0.5	0.2
Polygonaceae	* <i>Rumex crispus</i>	Curled Dock	0.5	0.4
Anacardiaceae	* <i>Schinus terebinthifolia</i>		40	4

Family	Species	Common Name	Cover (%)	Height (m)
Fabaceae	<i>*Trifolium campestre</i>	Hop Clover	0.5	0.1
Fabaceae	<i>*Vicia sativa</i>	Common Vetch	0.1	0.1
Myrtaceae	<i>Eucalyptus rudis</i>	Flooded Gum	30	10
Cyperaceae	<i>Machaerina rubiginosa</i>		5	2
Myrtaceae	<i>Melaleuca raphiophylla</i>	Swamp Paperbark	10	5
Myrtaceae	<i>Melaleuca viminalis</i>		0.5	1.5
Polygonaceae	<i>Persicaria decipiens</i>		0.1	0.2
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Bracken	2	0.6
Typhaceae	<i>Typha orientalis</i>	Bulrush	5	1.2