



Natural Area  
CONSULTING MANAGEMENT SERVICES

**MELconnx**

**Orchid Ave**

**Detailed Flora and Vegetation Survey and  
Basic Fauna Survey**

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Ngala kaaditj Noongar moort keyen kaadak nidja boodja.

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Occupational health and safety management system registered to ISO 45001:2018

<b>Document Title</b>		MELC R Orchid Ave			
<b>Location</b>		MelCONNX (Laing O Rourke)\2023 Quotes\2023 06 087 Orchid Ave\Report			
<b>Draft/Version No.</b>	<b>Date</b>	<b>Changes</b>	<b>Prepared by</b>	<b>Approved by</b>	<b>Status</b>
<b>D1</b>	June 2023	New Document	LC/KG	JW	Draft
<b>V1</b>	July 2023	Comments	KG	JW	Superseded
V2	Aug 2023	Changes to address client's comment	ZS	JW	Released
V3	Aug 2023	Changes to figures		KG	Released

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## 1.0 Introduction

Natural Area Consulting Management Services (Natural Area) was commissioned by MELconnx to conduct a detailed flora and vegetation survey, and basic fauna survey of an area of vegetation along Beechboro Road North, Bennett Springs. Information gathered during the surveys will be used to inform stakeholders of the environmental values of the site in preparation for proposed installation of a Water Corporation sewer drain asset. This survey will also provide supporting information for any future environmental approvals.

### 1.1 Location

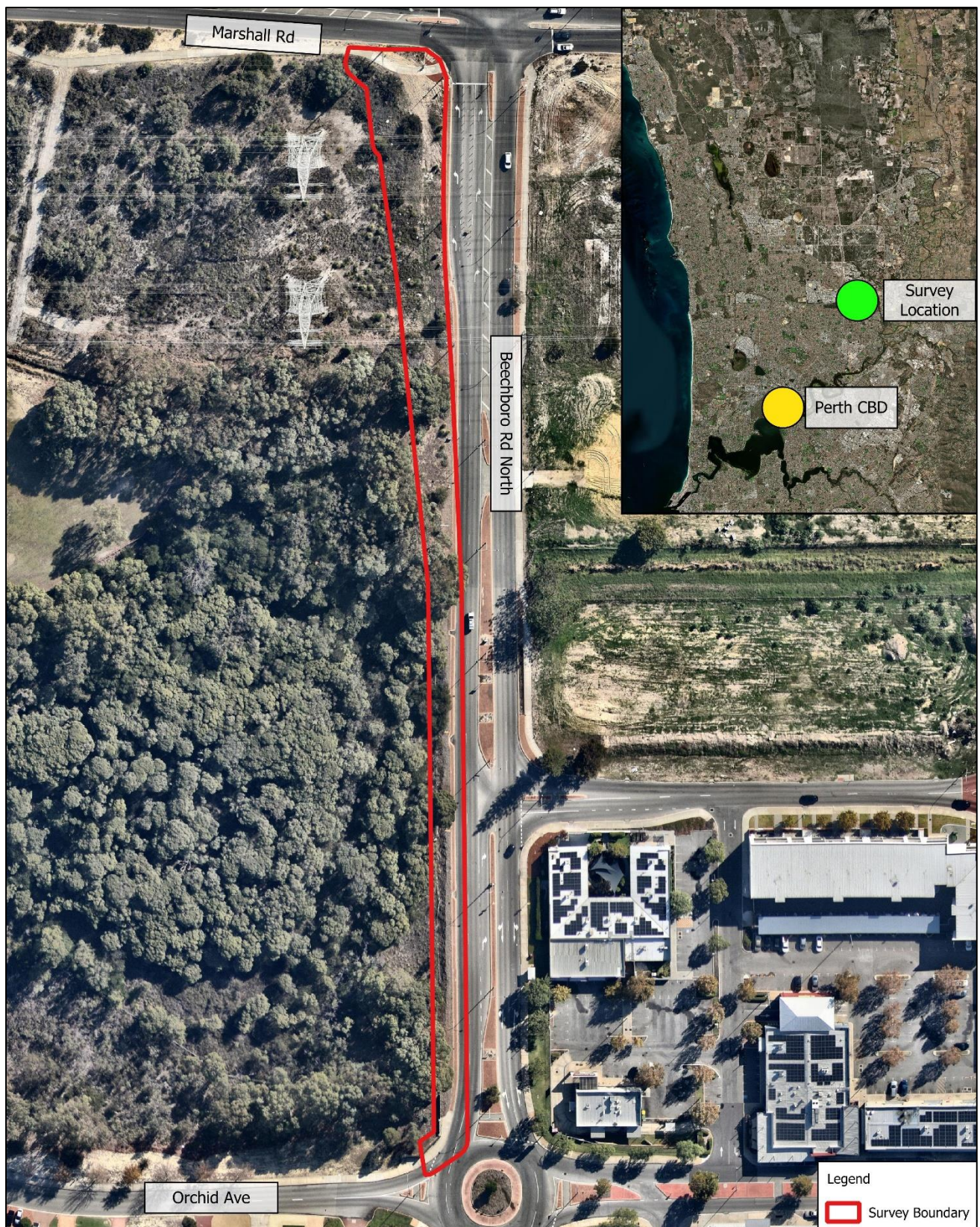
The survey area is located along Beechboro Rd North between Marshall Rd to the north and Orchid Ave to the south in the suburb of Bennett Springs (Figure 1). The survey area is approximately 12 km north-east of the Perth Central Business District (CBD). A portion of the site is located within an environmentally sensitive area (Department of Water and Environmental Regulations (DWER), 2023).

### 1.2 Scope

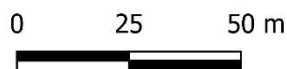
Natural Area undertook an out-of-season detailed flora survey and a basic fauna survey. Activities undertaken included:

- desktop assessment activities to determine potential flora and fauna species, declared rare and priority listed species (DRF) and ecological communities with the potential to be present within the nominated area, including requests for DBCA database searches for flora, fauna and ecological communities
- basic out-of-season flora survey of the area to determine:
  - flora species composition (native and non-native)
  - presence of any priority of threatened flora species
  - vegetation type and condition extent.
- basic fauna survey, opportunistically noting evidence of fauna including scats, tracks, and diggings in accordance with EPA (2020) *Technical Guidance -Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*.
- mapping and reporting outcomes of the survey activities.





**Figure 1:**  
Survey Boundary  
Orchid Ave, Bennett Springs



Client: MelConnx  
Date: Aug 2023  
Created by: K.Grant  
Image Source: Nearmap 2023  
Datum: GDA 2020



## 2.0 Site Characteristics

The characteristics of a site have a strong bearing on the flora, vegetation, fauna, and ecological communities present. The key characteristics of Orchid Avenue are outlined in this section.

### 2.1 Regional Context

The Interim Biogeographic Regionalisation of Australia (IBRA) classifies bioregions within Western Australia based on environmental factors such as climate, geology and vegetation and fauna assemblies. The survey area is within the Swan Coastal Plain 2 (SWA02) IBRA subregion (Department of Primary Industries and Regional Development (DPIRD), 2023). This region is described as a low-lying coastal plain with dominant sandy soils of Tuart or Banksia vegetation, Melaleuca swamps and outwash plains vegetated with *Casuarina obesa*. The plain rises in the East of the region to duricrust Mesozoic sediments dominated by Jarrah woodlands (Mitchell, Williams & Desmond, 2002).

### 2.2 Climate

The climate experienced in the area is Mediterranean, with dry, hot summers and cool, wet winters. According to the Bureau of Meteorology (2023); Perth Airport WA, site number 009021, the region has an average:

- rainfall of 760.1 mm pa, with rain falling predominantly between May and August
- maximum temperature ranging from 18.0 °C in winter to 32 °C in summer, with a maximum recorded temperature of 46.7 °C
- minimum temperatures ranging from 8.1 °C in winter to 17.6 °C in summer, with a minimum recorded temperature of -1.3 °C
- predominant wind direction of year-round morning easterlies except from May to August where north-easterlies dominate. Afternoon south-westerly sea breezes from October to April, turning predominantly to westerly winds from May to September. Monthly afternoon wind speeds of 18.7 km/h with maximum gusts of 124 km/h.

### 2.3 Topography and Soils

Using the NRInfo Portal, two soil types were identified on site, the Bassendean Jandakot phase in the north and south corners of the site and the Bassendean Yanga phase (Bassendean) in the centre (DPIRD, 2023) (Table 1). The site is relatively flat measuring 30 m Australian Height Datum (AHD) from the north to the south (DPRID, 2019) (Figure 2).

**Table 1:** Soil types within Orchid Ave

Name	Symbol	Description
Bassendean Jandakot phase	212Bs_Ja	Low dunes with slopes <10%. Grey sand above pale-yellow sands generally underlain by podsols of humus and iron. Low open Banksia woodland with dense shrub.
Bassendean Yanga phase (Bassendean)	212Bs_Ya	Flat and poorly drained with a mix of deep leached sand, shallow sand over limestone or ferruginous

Name	Symbol	Description
		pan, and saline soils. Dense <i>Melaleuca</i> spp. present in drainage areas.

## 2.4 Vegetation Complex

One vegetation complex exists within the site boundary, the Southern River Complex (Department of Biodiversity, Conservation and Attractions (DBCA), 2018d). The elevated areas are described as having an open Marri-Jarrah-Banksia woodland, with *Eucalyptus rudis* and *Melaleuca raphiophylla* woodland present along drainage lines. Drainage areas south of the Murray River also contain *Agonis flexuosa* (Hedde *et al.* 1980). The pre-European extent of this vegetation complex remaining is:

- 18.43% within the Swan Coastal Plain
- 16.51% within the City of Swan (Government of Western Australia, 2019).

## 2.5 Black Cockatoo Habitat

There is potential for the three threatened Black Cockatoo species and their habitat to occur on site, including the Carnaby's Cockatoo (*Zanda latirostris*) and the Baudin's Black Cockatoo (*Zanda baudinii*) listed as Endangered under the *EPBC Act 1999* (Cwlth), and the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) listed as Vulnerable under the *EPBC Act 1999* (Cwlth). All are listed as Threatened under the *Biodiversity Conservation Act 2016* (WA). According to NationalMap the survey site occurs within an area classified as:

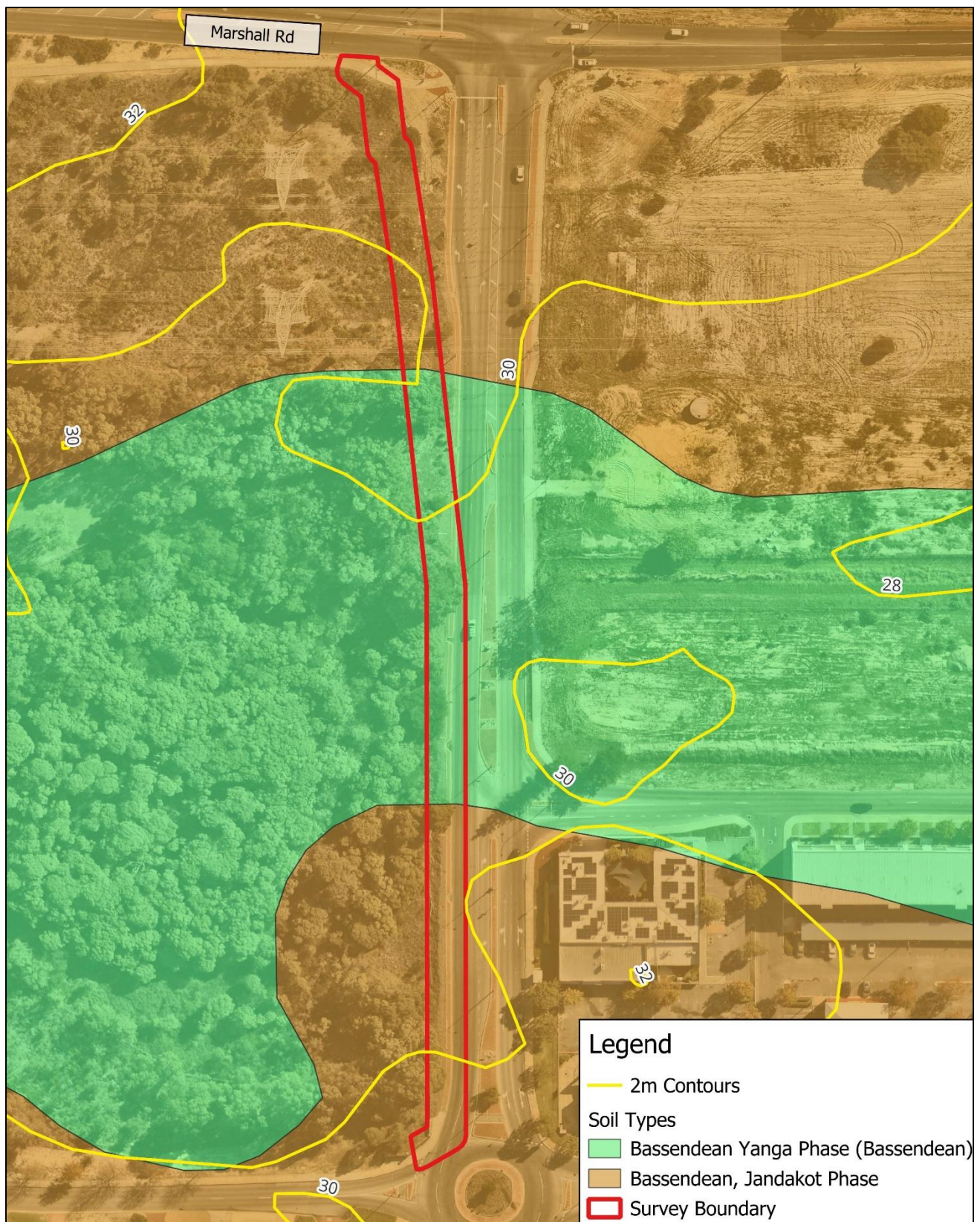
- Carnaby's Cockatoo Areas requiring investigation as feeding habitat in the Swan Coastal Plain IBRA Region (DBCA, 2018a)
- Carnaby's Cockatoo Confirmed Roost Sites Buffered 6 km (DBCA, 2018b)
- Carnaby's Cockatoo Unconfirmed Roost Sites Buffered 6 km (DBCA, 2018c)

## 2.6 Hydrology

The survey area is associated with two geomorphic wetlands, namely the Victoria Road Swamp which is classified as a 'Multiple Use' sumpland, and a 'Conservation' category sumpland known as Orchid Park (DBCA, 2023) (Figure 3).

## 2.7 Heritage Values

No European heritage sites have been recorded within the survey area (Government of Western Australia, 2023). The survey area falls within the extent of one Aboriginal heritage site; 'Bennett Brook: in toto' (site ID 3692), which is recorded as a 'creation/dreaming narrative' place (Department of Planning, Lands and Heritage (DPLH), 2023). The heritage boundary is however, located approximately 2.5 km east of the survey area. Another Aboriginal heritage site, 'Marshall, Beechboro' (site ID 3180), which is recorded as artefacts/scatters within close proximity to the survey area. All heritage areas within or in close proximity to the proposed rail alignment has been previously surveyed.



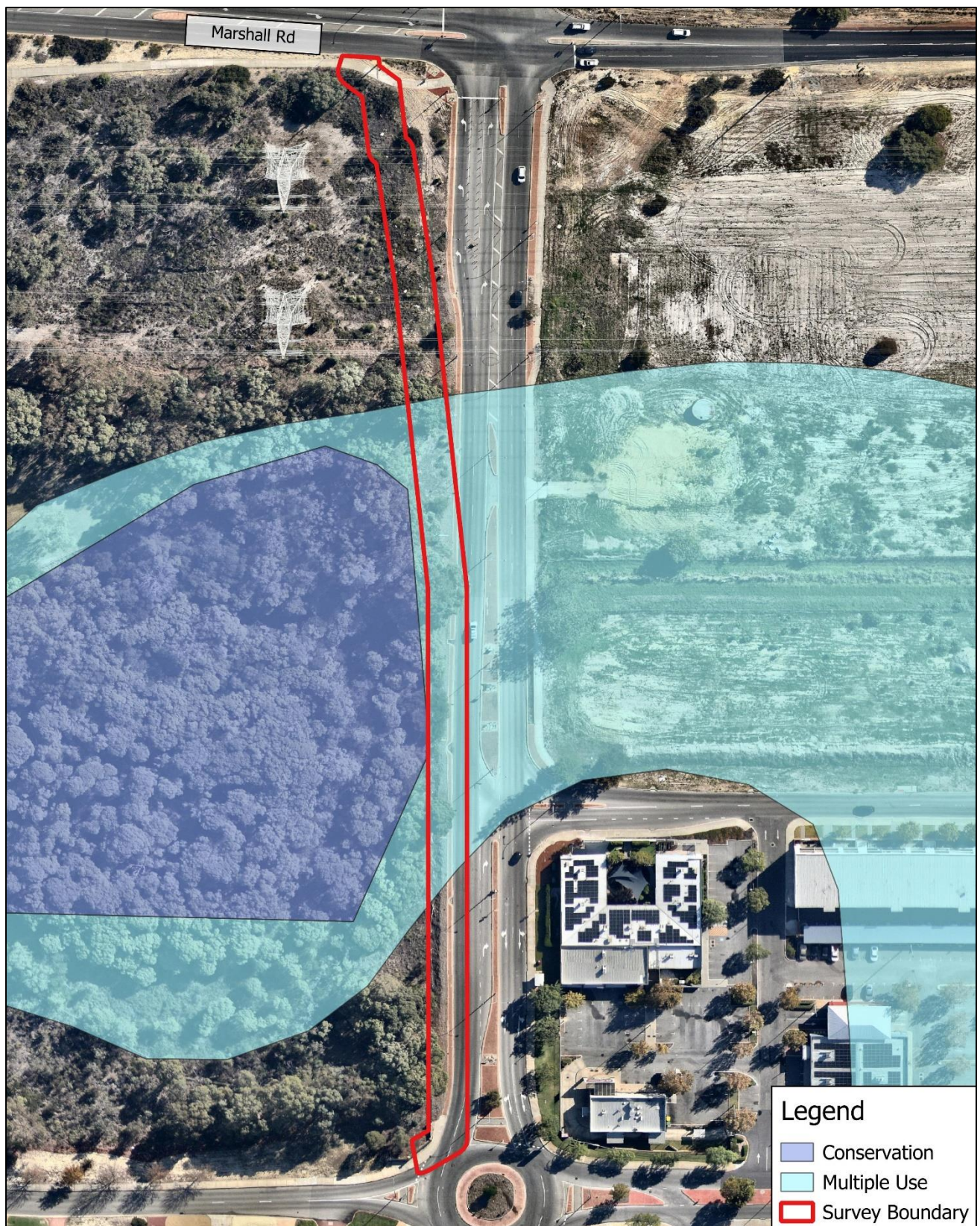
**Figure 2:**  
Soil Types and Contours  
Orchid Ave, Bennett Springs

0 25 50 m



Client: MelConnx  
Date: July 2023  
Created by: K.Grant  
Image Source: Nearmap 2023  
Datum: GDA 2020





**Figure 3:**  
Geomorphic Wetlands  
Orchid Ave, Bennett Springs

0 25 50 m



**Legend**  
■ Conservation  
■ Multiple Use  
■ Survey Boundary

Client: MelConnx  
Date: July 2023  
Created by: K.Grant  
Image Source: Nearmap 2023  
Datum: GDA 2020



## 3.0 Methodology

### 3.1 Desktop and Literature Review

The desktop survey included reviewing online databases to gather contextual knowledge and determine preliminary site characteristics including:

- likely native and non-native flora and fauna species present
- current extent of native vegetation
- general floristic community types
- likely presence of threatened or priority flora and fauna species
- likely presence of any threatened or priority ecological communities.

The following databases were accessed to obtain relevant information:

- NatureMap (Department of Biodiversity, Conservation and Attractions (DBCA), 2023a)
- Protected Matters Search Tool (Department of Climate Change, Energy, the Environment and Water (DCCEEW)), 2023) (Appendix 1)
- FloraBase (WA Herbarium, 1998-)
- Threatened and priority flora/fauna/ecological community database searches (DBCA, 2023b, 2023c, 2023d).

Conservation code definitions for the State and Commonwealth are provided in Appendix 3. Information relating to conservation significant species from database searches were summarised into field reference guides to aid with on-ground flora surveys which is provided in Appendix 2.

### 3.2 On-ground Flora Survey

The flora and vegetation survey was conducted in accordance with *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority (EPA), 2016). Samples were collected, or photographs taken of unfamiliar species to enable later identification.

Natural Area Environmental Scientists undertook the survey on 26 June 2023, with key data recorded using Mappt software on a handheld tablet. Survey activities included:

- setting out a total of three quadrats across the three vegetation types present due to the linear portioning/ size of the survey boundary (Figure 4)
- photographing each quadrat in the north-west corner and recording GPS coordinates using GDA2020 Zone 50 datum
- recording landscape characteristics including soil types/colour, aspect, slope, surface rock, topography and drainage using Natural Area's modified recording sheets based on the NAIA templates developed for the Perth Biodiversity Project
- determining leaf litter depth, percentage cover, and percentage of bare ground
- recording percentage cover, height, number alive/dead stems and life form for each flora species in the quadrats
- marking locations of any conservation significant flora, Declared Pests (DP) and/or Weeds of National Significance (WoNS) identified
- recording vegetation type including dominant over, middle and understorey species (Table 2) and condition using the scale attributed to Keighery (Table 3) (Government of Western Australia, 2000)

- the use of GPS to map significant species and boundaries of differing vegetation type and condition
- recording evidence of disturbance, such as fire.

### 3.2.1 Vegetation Type

The vegetation type was determined using the structural classes described in *Australian Vegetation Manual: National Vegetation information System* (2017). The vegetation structure was described by recording the strata in a vegetation profile assessing the structural and floristic properties.

### 3.2.2 Vegetation Condition

Vegetation condition was assessed using the rating scale attributed to Keighery in *Technical Guidance-Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016) (Table 3). Table 3 provides a description of the rating scale.

**Table 3:** Vegetation condition ratings

Category	Description
1 Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
2 Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
3 Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
4 Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds, partial clearing, dieback and grazing.
5 Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
6 Completely Degraded	The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Source: EPA, 2016

### 3.3 On-ground Fauna Survey

The fauna survey was completed in accordance with a Basic Fauna Survey as outlined in the *Technical Guidance, Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020). Natural Area Environmental Scientists traversed the site on 26 June 2023 and undertook this survey in conjunction with other survey activities. A basic survey is defined as a low-intensity survey, which gathers broad fauna and habitat information including opportunistic fauna observations (EPA, 2020). The fauna survey included



recording opportunistic sightings of fauna species whilst traversing the survey area, along with recording evidence of fauna presence in the form of:

- scats
- tracks
- diggings
- burrows, dens, and warrens
- runnels (vegetative tunnels)
- calls.

### 3.4 Limitations

Potential limitations encountered while conducting survey activities are detailed in Table 4.

**Table 4:** Flora survey limitations

Potential Limitation	Degree of Limitation	Comments
Availability of contextual information	None	Government data on regional and local contextual information are readily available for the survey area.
Competency/experience of team	None	Survey activities were undertaken by experienced Environmental Scientists who have extensive experience undertaking detailed flora surveys/fauna surveys within the Swan Coastal Plain.
Proportion of flora recorded/collected, any identification issues	None	A total of 50 flora species (taxa) were recorded from 21 families during the field survey, comprised of 17 introduced (weeds) and 33 native species. Of these, two species (4%) were unable to be identified to species level due to a lack of diagnostic characteristics present at the time of survey. These species ( <i>Eucalyptus</i> sp.1 and <i>Eucalyptus</i> sp.2) were only able to be identified to genus level. None are considered likely to be conservation significant species due to incompatible habitat requirements.
Survey effort and extent	Minor	A detailed flora survey was undertaken over a period of one day, with the entire survey area traversed and all flora species and vegetation types/conditions within the survey area being adequately surveyed. A total of three quadrats were established to adequately survey the three vegetation types present.
		The fauna survey scope requested a basic survey undertaken by Environmental Scientists during daylight hours. As a result, some faunal groups, such as those which are nocturnal, cryptic, or elusive, are very unlikely to be detected even if present within the survey area. To observe these species, a detailed fauna survey utilising techniques such as trapping and

Potential Limitation	Degree of Limitation	Comments
		<p>motion-sensor cameras, as well as nocturnal surveys, would be required. Fauna habitat within the survey site is limited due to the proximity to live traffic and within an urban matrix.</p> <p>Any opportunistic evidence indicating the presence of Black Cockatoos or suitable habitat was recorded as part of the basic fauna survey. However, a detailed Black Cockatoo habitat assessment including the recording of tree characteristics was not conducted as requested by the client and due to the lack of Black Cockatoo habitat within the survey area.</p>
Access restrictions	None	<p>There were no access restrictions present at the time of survey.</p> <p>The flora survey was conducted outside of the optimal season (spring) for surveys within the Swan Coastal Plain bioregion. This out-of-season survey timing is associated with limitations regarding flora identification as a result of the lack of diagnostic features (i.e. flowers, fruit and seeds) for perennial species and dormancy for annual species. This impacts the recorded species diversity for the survey area and may also exclude a number of conservation significant flora.</p> <p>Of the 29 conservation significant flora species identified in the desktop survey as being likely to occur within the survey area, only two have known flowering periods within the survey period (<i>Lepidium pseudohyssopifolium</i> and <i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>). Of these species:</p> <ul style="list-style-type: none"> <li>▪ A total of 24 are perennial herb, shrub, or sedge species for which other characteristics would be present to enable identification to a minimum of genus level. However, flowers may be required for species level identification.</li> <li>▪ A total of five are annual herbaceous species which are unlikely to be presenting at the time of the survey as the peak flowering and growth periods are around spring.</li> </ul> <p>An in-season (spring) flora survey would be required to confirm or exclude the presence of these species.</p>

Potential Limitation	Degree of Limitation	Comments
		As the basic fauna survey was conducted in winter, cool temperatures limit the capacity to observe some species, such as reptiles, which are more active in warmer conditions.
		No evidence of previous fire events was noted within the survey area.
Disturbances	Minor	Signs of historic clearing were observed within the survey area. This is evidence through Landgate aerial imagery from 2000 and 1970 (Government of Western Australia, 2023a).

## 4.0 Flora Survey Results

### 4.1 Desktop Survey

A desktop survey of online databases indicated the potential for a total of 109 conservation significant species to occur within 10 km of the survey area (Table 5). NatureMap indicated 42 conservation significant flora species listed under the *Biodiversity Conservation Act 2016* (WA) or by the Western Australian Herbarium (1998-), as potentially occurring within 10 km radius of the site (DBCA, 2023a). A review of the Protected Matters Search Tool (PMST) (DCCEEW, 2023) indicated 23 significant flora species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) as potentially occurring within a 10 km radius of the site (Appendix 1). A review of the DBCA (2023d) threatened and priority flora database indicated 96 threatened or priority species have been recorded within 10 km of the site.

Of the conservation significant species potentially found in the area, it was determined that the site conditions (soil type, drainage, location) may be suitable for 29 (highlighted green) of these species (Table 5). Conservation code descriptions are provided in Appendix 3.

**Table 5:** Threatened and Priority flora species listed by NatureMap, PMST and DBCA

Species Name	Cons Code	NatureMap	PMST	DBCA
<i>Acacia aphylla</i>	T			X
<i>Acacia benthamii</i>	P2	X		X
<i>Acacia denticulosa</i>	T			X
<i>Acacia drummondii</i> subsp. <i>affinis</i>	P3			X
<i>Acacia oncinophylla</i> subsp. <i>oncinophylla</i>	P3			X
<i>Alyogyne</i> sp. Great Victoria Desert	P3	X		X
<i>Andersonia gracilis</i>	EN		X	
<i>Angianthus micropodioides</i>	P3			X
<i>Anigozanthos humilis</i> subsp. <i>chrysanthus</i>	P4	X		X
<i>Anigozanthos viridis</i> subsp. <i>terraspectans</i>	VU		X	
<i>Anthocercis gracilis</i>	T			X
<i>Banksia mimica</i>	EN		X	
<i>Banksia pteridifolia</i> subsp. <i>vernalis</i>	P3			X
<i>Beaufortia purpurea</i>	P3			X
<i>Bolboschoenus fluviatilis</i>	P1	X		X
<i>Byblis gigantea</i>	P3	X		X
<i>Caladenia huegelii</i>	T	X	X	X
<i>Calandrinia</i> sp. Bayswater	P1	X		X
<i>Calectasia elegans</i>	P2			X

Species Name	Cons Code	NatureMap	PMST	DBCAs
<i>Calothamnus accedens</i>	P4			X
<i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i>	P4			X
<i>Calothamnus macrocarpus</i>	P2			X
<i>Calytrix breviseta</i> subsp. <i>breviseta</i>	T	X	X	X
<i>Carex tereticaulis</i>	P3	X		X
<i>Chamelaucium lullfitzii</i>	EN		X	
<i>Conospermum undulatum</i>	T	X	X	X
<i>Conostylis bracteata</i>	P3			X
<i>Cyanicula ixiooides</i> subsp. <i>ixiooides</i>	P4			X
<i>Cyathochaeta teretifolia</i>	P3	X		X
<i>Dampiera triloba</i>	P3	X		X
<i>Darwinia pimelioides</i>	P4	X		X
<i>Dicrastylis micrantha</i>	P3			X
<i>Diplolaena andrewsii</i>	T		X	X
<i>Diuris drummondii</i>	T	X	X	X
<i>Diuris micrantha</i>	VU		X	
<i>Diuris purdiei</i>	EN		X	
<i>Dodonaea hackettiana</i>	P4			X
<i>Drakaea elastica</i>	EN		X	
<i>Drakaea micrantha</i>	VU		X	
<i>Drosera micra</i>	P1	X		X
<i>Drosera occidentalis</i>	P4	X		X
<i>Drosera patens</i>	P1	X		X
<i>Drosera x badgerupii</i>	P2			X
<i>Drosera x sidjamesii</i>	P1	X		X
<i>Eleocharis keigheryi</i>	T		X	X
<i>Eryngium pinnatifidum</i> subsp. <i>Palustre</i>	P3			X
<i>Eryngium</i> sp. <i>Subdecumbens</i>	P3	X		X
<i>Eucalyptus argutifolia</i>	VU		X	
<i>Eucalyptus educta</i>	P2			X
<i>Eucalyptus foecunda</i> subsp. <i>foecunda</i>	P4			X
<i>Eucalyptus x balanites</i>	EN		X	
<i>Grevillea christineae</i>	EN		X	

Species Name	Cons Code	NatureMap	PMST	DBCAs
<i>Grevillea curviloba</i>	T		X	X
<i>Grevillea dissectifolia</i>	P3			X
<i>Grevillea ornithopoda</i>	P2			X
<i>Haemodorum loratum</i>	P3			X
<i>Halgania corymbosa</i>	P3			X
<i>Hibbertia leptotheca</i>	P3			X
<i>Hydrocotyle lemnoides</i>	P4	X		X
<i>Hydrocotyle striata</i>	P1	X		X
<i>Hypolaena robusta</i>	P4			X
<i>Isopogon autumnalis</i>	P3	X		X
<i>Jacksonia gracillima</i>	P3			X
<i>Jacksonia sericea</i>	P4	X		X
<i>Johnsonia pubescens</i> subsp. <i>cygnorum</i>	P2	X		X
<i>Lasiopetalum bracteatum</i>	P4			X
<i>Lasiopetalum glutinosum</i> subsp. <i>glutinosum</i>	P3	X		X
<i>Lasiopetalum membranaceum</i>	P3			X
<i>Lepidium pseudohyssopifolium</i>	P1			X
<i>Lepyrodia curvescens</i>	P2			X
<i>Levenhookia preissii</i>	P1	X		X
<i>Macarthuria keigheryi</i>	T	X	X	X
<i>Meionectes tenuifolia</i>	P3	X		X
<i>Melaleuca viminalis</i>	P2			X
<i>Millotia tenuifolia</i> var. <i>laevis</i>	P2	X		X
<i>Myriophyllum echinatum</i>	P3	X		X
<i>Netrostylis</i> sp. <i>Chandala</i>	P2	X		X
<i>Ornduffia submersa</i>	P4			X
<i>Persoonia sulcata</i>	P4			X
<i>Phlebocarya pilosissima</i> subsp. <i>pilosissima</i>	P3			X
<i>Phyllangium palustre</i>	P2	X		X
<i>Pithocarpa corymbulosa</i>	P3			X
<i>Platysace ramosissima</i>	P3			X
<i>Poranthera moorokatta</i>	P2	X		X
<i>Schoenus benthamii</i>	P3			X

Species Name	Cons Code	NatureMap	PMST	DBCA
<i>Schoenus capillifolius</i>	P3			X
<i>Schoenus griffinianus</i>	P4			X
<i>Schoenus pennisetis</i>	P3			X
<i>Schoenus</i> sp. Waroona	P3			X
<i>Senecio gilbertii</i>	P1			X
<i>Senecio leucoglossus</i>	P4			X
<i>Stachystemon exilis</i>	P1	X		X
<i>Stylidium longitubum</i>	P4	X		X
<i>Stylidium paludicola</i>	P3	X		X
<i>Stylidium striatum</i>	P4			X
<i>Stylidium trudgenii</i>	P3			X
<i>Styphelia filifolia</i>	P3	X		X
<i>Synaphea</i> sp. Fairbridge Farm	CR		X	
<i>Tetrateca pilifera</i>	P3	X		X
<i>Thelymitra dedmaniarum</i>	T		X	X
<i>Thelymitra magnifica</i>	T			X
<i>Thelymitra stellata</i>	EN		X	
<i>Thelymitra variegata</i>	P2			X
<i>Thysanotus anceps</i>	P3			X
<i>Thysanotus brachiatus</i>	P2	X		X
<i>Thysanotus glaucus</i>	P4	X		X
<i>Tricostularia drummondii</i>	P3			X
<i>Trithuria occidentalis</i>	T	X	X	X
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	P4	X		X

#### 4.1.1 Threatened and Priority Ecological Communities

A review of the PMST report (DCCEEW, 2023) and threatened and priority ecological communities database (DBCA, 2023b) indicated eight Threatened Ecological Communities (TECs) have been recorded within 10 km of the site. The potential Threatened Ecological Communities within the survey area are outlined in Table 6.

**Table 6:** Potential Threatened and Priority Ecological Communities within the survey area

Name	Status	Presence
Assemblages of plants and invertebrate animals of tumulus (organic mound) springs of the Swan Coastal Plain	Endangered	Community known to occur within area (DCCEEW, 2023)
Banksia Woodlands of the Swan Coastal Plain	Endangered; P3	Community likely to occur within area (DCCEEW, 2023; DBCA, 2023b)
<i>Banksia attenuata</i> woodlands over species rich dense shrublands (floristic community type 20a as originally described in Gibson et al. 1994)	Critically Endangered	Community known to occur within area (DBCA, 2023b)
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area (DCCEEW, 2023)
<i>Corymbia calophylla</i> – <i>Kingia Australis</i> woodlands on heavy soils of the Swan Coastal Plain	Endangered	Community known to occur within area (DCCEEW, 2023)
Shrublands and Woodlands of the eastern Swan Coastal Plain	Vulnerable	Community likely to occur within area (DCCEEW, 2023)
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area (DCCEEW, 2023)
Tuart ( <i>Eucalyptus gomphocephala</i> ) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area (DCCEEW, 2023)


Source: DCCEEW, 2023; DBCA, 2023b

## 4.2 Flora Survey Results



### 4.2.1 Vegetation Types

A total of three vegetation types were recorded within the survey area of Orchid Ave, these included *Adenanthos cygnorum* Shrubland, *Xanthorrhoea preissi* Shrubland, and Mixed *Eucalyptus* spp. Open Woodland. These are described in Table 7 and locations shown in Figure 4.

**Table 7:** Vegetation type within Orchid Ave

Vegetation Type	Description	Photograph
<i>Adenanthos cygnorum</i> Shrubland	A shrubland of <i>Adenanthos cygnorum</i> over Perennial Veldt Grass (* <i>Ehrharta calycina</i> ) and <i>Desmocladius flexuosus</i> .	



Vegetation Type	Description	Photograph
<i>Xanthorrhoea preissi</i> Shrubland	A shrubland of <i>Xanthorrhoea preissi</i> over <i>Calytrix fraseri</i> , <i>Desmocladius flexuosus</i> , and Perennial Veldt Grass (* <i>Ehrharta calycina</i> ).	
Mixed <i>Eucalyptus</i> spp. Open Woodland	An open woodland of mixed <i>Eucalyptus</i> spp. over mixed weeds and <i>Eremophobia glabra</i> .	

#### 4.2.2 Vegetation Condition

Vegetation condition in the survey area ranged from Completely Degraded to Degraded (Table 8, Figure 5).

**Table 8:** Vegetation condition within the survey area

Vegetation Condition	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded	Total
Area (ha)	0	0	0	0	0.27	0.159	0.429
Area (%)	0	0	0	0	62.94	37.06	100





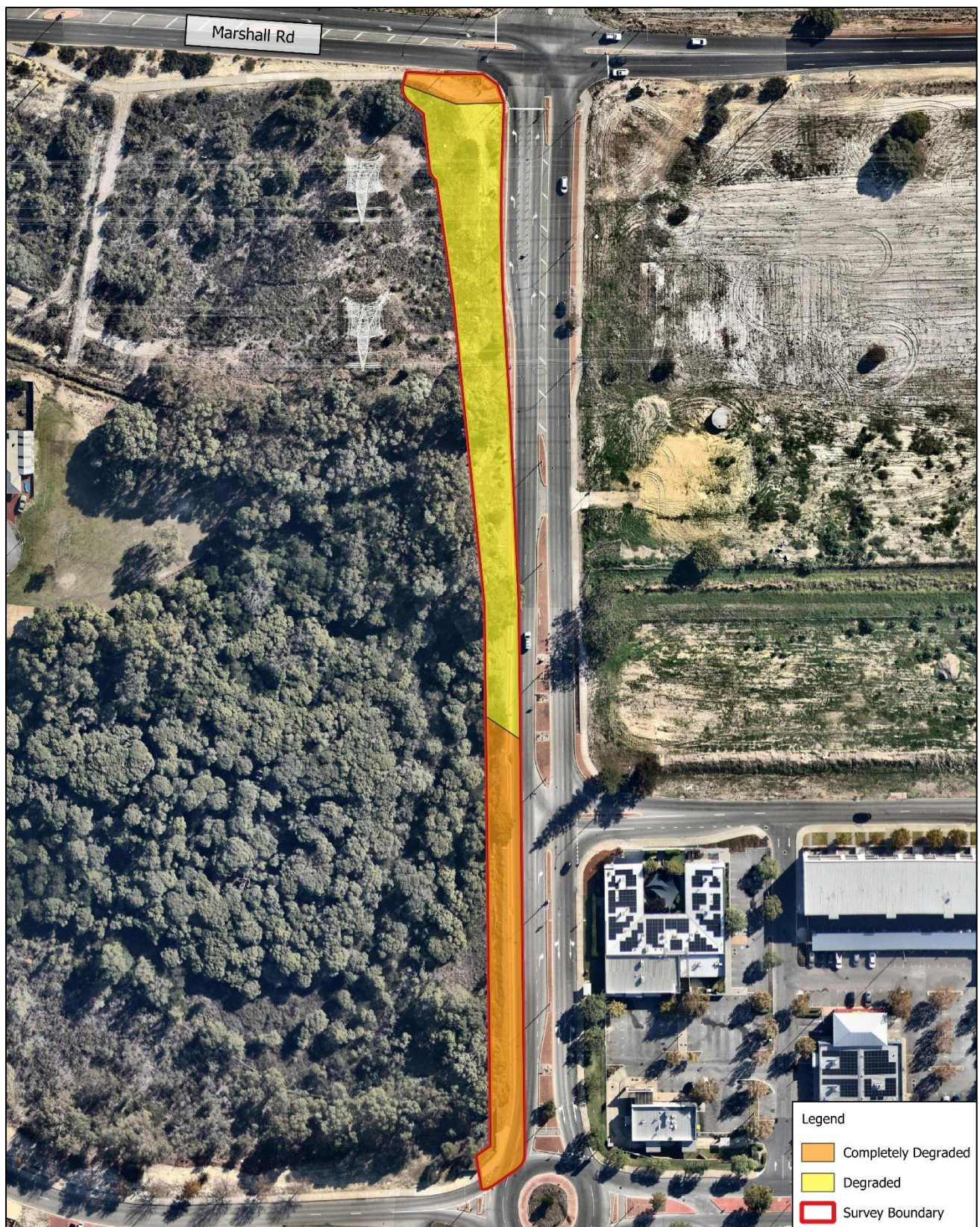
**Figure 4:**  
Vegetation Type  
Orchid Ave, Bennett Springs

0 25 50 m



Client: MelConnx  
Date: Aug 2023  
Created by: K.Grant  
Image Source: Nearmap 2023  
Datum: GDA 2020





**Figure 5:**  
Vegetation Condition  
Orchid Ave, Bennett Springs

0 25 50 m



Legend

- Completely Degraded
- Degraded
- Survey Boundary

Client: MelConnx  
Date: Aug 2023  
Created by: K.Grant  
Image Source: Nearmap 2023  
Datum: GDA 2020

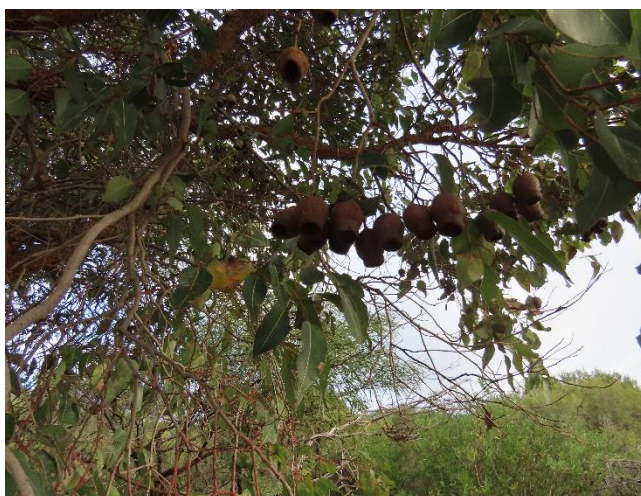


### 4.2.3 Flora

A total of 50 flora species (taxa) were recorded from 21 families during the field survey, this comprised of 17 introduced (weeds) and 33 native species. Examples of native flora species are shown in Figure 6 and weed species in Figure 7. A complete flora species list is provided in Appendix 5 and quadrat data in Appendix 4.

No conservation significant flora species were identified within the survey area at the time of the survey. No declared pests or weeds of national significance were identified within the survey area.

A total of two species (4%) were unable to be identified to species level due to a lack of diagnostic characteristics present at the time of survey. These species (*Eucalyptus* sp.1 and *Eucalyptus* sp.2) were only able to be identified to genus level.



*Corymbia calophylla* (Marri)



*Banksia littoralis* (Swamp Banksia)



*Adenanthos cygnorum* (Common Wollybush)



*Phlebocarya ciliata*

**Figure 6:** Examples of native flora species recorded.





Geraldton Carnation Weed  
(\**Euphorbia terracina*)



Whiteflower Fumitory  
(\**Fumaria capreolata*)

**Figure 7:** Examples of introduced flora species recorded.

#### 4.2.4 Threatened and Priority Communities

Of the eight Threatened Ecological Communities (TEC) identified during the desktop survey to potentially occur within the site, none were identified within the survey boundary. The 'Banksia Woodlands of the Swan Coastal Plain' TEC (Endangered/Priority 3) and 'Banksia attenuata woodlands over species rich dense shrublands' TEC (Critically Endangered) have previously been identified within the survey boundary. However, the *Adenanthos cygnorum* Shrubland and *Xanthorrhoea preissi* Shrubland vegetation types/species composition (particularly the absence of *Banksia attenuata* and *Banksia menziesii*) recorded within the survey boundary is not consistent with the criteria/ requirements for these TECs (DAWE, 2016). The remaining TECs identified in the desktop survey were not identified in the survey area.

## 5.0 Fauna Survey Results

### 5.1 Desktop Survey

A desktop survey of online databases indicated the potential for a total of 24 conservation significant fauna species to occur within 10 km of the survey area (Table 9). NatureMap indicated 22 conservation significant species listed under the *Biodiversity Conservation Act 2016* (WA) as potentially occurring within a 10 km radius of the site (DBCA, 2023a). The Protected Matters Search Tool (PMST) indicated 10 threatened species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) as potentially occurring within a 10 km radius of the site (DCCEEW, 2023) (Appendix 1). A review of the DBCA threatened and priority fauna species database indicated the potential for 22 conservation significant fauna species to occur within a 10 km radius of the site (DBCA, 2023c).

Both abiotic (soil, climate) and biotic (food resources, predator pressure) will determine the suitability of habitats for specific fauna assemblages, based on their ecological requirements. Evaluating the site locality, existing conditions and known home ranges Natural Area determined that the following ten species (highlighted green in Table 9) have the potential to be present within the survey site.

**Table 9:** Threatened and Priority fauna species listed by NatureMap, PMST and DBCA

Species Name	Lifeform	Cons Code	DBCA	PMST	Nature Map
<i>Bettongia penicillata ogilbyi</i>	Mammal	CR	X	X	X
<i>Botaurus poiciloptilus</i>	Bird	EN	X	X	X
<i>Cacatua pastinator pastinator</i>	Bird	CD	X		X
<i>Calidris canutus</i>	Bird	EN	X	X	X
<i>Calidris ferruginea</i>	Bird	CE	X	X	X
<i>Calidris tenuirostris</i>	Bird	CE	X		X
<i>Calyptorhynchus banksii naso</i>	Bird	VU	X	X	X
<i>Chaetura caudacuta</i>	Bird	CE	X		X
<i>Charadrius leschenaultii</i>	Bird	VU		X	
<i>Dasyurus geoffroii</i>	Mammal	VU	X	X	X
<i>Diomedea amsterdamensis</i>	Bird	EN		X	
<i>Diomedea epomophora</i>	Bird	VU		X	
<i>Diomedea exulans</i>	Bird	VU		X	
<i>Elanus scriptus</i>	Bird	P4	X		X
<i>Falco peregrinus</i>	Bird	OS	X		X
<i>Hydromys chrysogaster</i>	Mammal	P4	X		X
<i>Isoodon fusciventer</i>	Mammal	P4	X		X
<i>Ixobrychus flavicollis australis</i>	Bird	P2	X		X

Species Name	Lifeform	Cons Code	DBCA	PMST	Nature Map
<i>Leipoa ocellata</i>	Mammal	VU		X	
<i>Macroderma gigas</i>	Mammal	VU		X	
<i>Macronectes giganteus</i>	Bird	EN		X	
<i>Macronectes halli</i>	Bird	VU		X	
<i>Macrotis lagotis</i>	Mammal	VU	X		X
<i>Merops ornatus</i>	Bird	IA	X		
<i>Myrmecobius fasciatus</i>	Mammal	EN			X
<i>Neelaps calonotos</i>	Reptile	P3	X		X
<i>Notamacropus eugenii derbianus</i>	Mammal	P4	X		X
<i>Notamacropus irma</i>	Mammal	P4	X		X
<i>Numenius madagascariensis</i>	Bird	CE		X	
<i>Oxyura australis</i>	Bird	P4	X		X
<i>Pachyptila turtur subantarctica</i>	Bird	VU		X	
<i>Pandion haliaetus</i>	Bird	IA	X		X
<i>Phascogale tapoatafa wambenger</i>	Mammal	CD	X		X
<i>Pseudemydura umbrina</i>	Reptile	CR	X		X
<i>Pseudocheirus occidentalis</i>	Mammal	CR	X	X	X
<i>Rostratula australis</i>	Bird	EN		X	
<i>Sternula nereis nereis</i>	Bird	VU		X	
<i>Thalassarche cauta</i>	Bird	EN		X	
<i>Thalassarche impavida</i>	Bird	VU		X	
<i>Thalassarche melanophris</i>	Bird	VU		X	
<i>Thalassarche steadi</i>	Bird	VU		X	
<i>Zanda baudinii</i>	Bird	EN	X	X	X
<i>Zanda latirostris</i>	Bird	EN	X	X	X

## 5.2 Fauna Survey Results

### 5.2.1 Basic Fauna Survey

A total of four fauna species (taxa) were recorded from four families during the field survey, all findings comprised of native bird species. Two nests were recorded with a *Corymbia calophylla* (Marri) on site. All species observed are listed in Table 10.

**Table 10:** Fauna observations within the Orchid Ave

<b>Family</b>	<b>Species Name</b>	<b>Common Name</b>
<b>Bird</b>		
Artamidae	<i>Gymnorhina tibicen</i>	Australian Magpie
Cacatuidae	<i>Zanda</i> sp.	White-tailed Black Cockatoo
Corvidae	<i>Corvus coronoides</i>	Australian Raven
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie Wagtail



## 6.0 Implications of Results

The clearing development footprint for this project lies within the surveyed area, the current design runs along the road edge, underneath the powerlines. (Figure 8). The clearing boundary area has evidence of historic clearing along the road edge and underneath the powerlines, the boundary for the proposed works resides in a Degraded to a Completely Degraded vegetation condition.

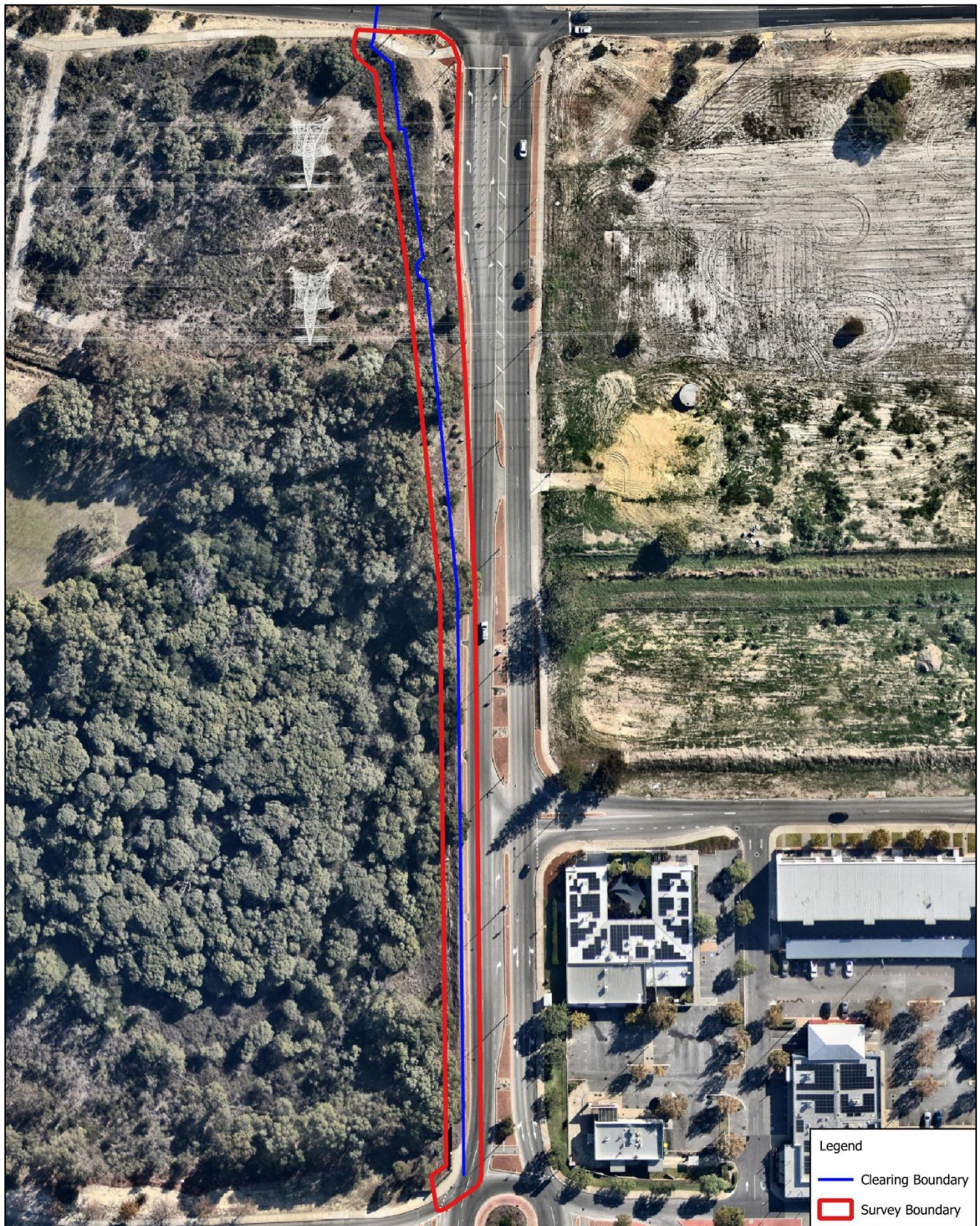
### 6.1 Flora and Vegetation

Three vegetation types were recorded within the survey area, these being *Adenanthos cygnorum* Shrubland, *Xanthorrhoea preissi* Shrubland, and Mixed *Eucalyptus* spp. Open Woodland. Based on Landgate aerial imagery (Government of Western Australia, 2023a), and the middle and understorey species composition recorded in the quadrats, it is considered that the survey area may be historically part of a Banksia woodland. Vegetation condition in the survey area ranged from Completely Degraded to a Degraded condition due to the lack of middle and upper storey present and requires anthropogenic influence to improve this vegetation condition. The current proposed development does not intersect with native vegetation extent due to the development area being previously cleared (Figure 9). The smallest distance between the current proposed development and the native vegetation extent is one metre, it is important that the construction works are undertaken within the metre buffer to mitigate their impact. Evidence of previous clearing in the north of the survey area, likely associated with powerline infrastructure, was evident from Landgate aerial imagery (Government of Western Australia, 2023a).

A total of 50 flora species (taxa) comprising 17 (34%) introduced (weeds) and 33 (66%) native species were recorded in the survey area. No Declared Pests/WoNS were identified within the survey boundary at the time of the survey.

A total of two species (4%) were unable to be identified to species level due to a lack of diagnostic characteristics present at the time of survey. These species were *Eucalypts* and were only able to be identified to genus level. These species were likely planted as the area in which these species were located was previously cleared based on Landgate aerial imagery (Government of Western Australia, 2023a). None are considered likely to be conservation significant species due to incompatible habitat requirements.





**Figure 8:**  
Clearing Boundary  
Orchid Ave, Bennett Springs

0 25 50 m



Legend  
— Clearing Boundary  
□ Survey Boundary

Client: MelConnx  
Date: July 2023  
Created by: K.Grant  
Image Source: Nearmap 2023  
Datum: GDA 2020





**Figure 9:**  
Native Vegetation Extent  
Orchid Ave, Bennett Springs

0 25 50 m



Client: MelConnx  
Date: Aug 2023  
Created by: K.Grant  
Image Source: Nearmap 2023  
Datum: GDA 2020



## 6.2 Significant Flora

Of the 29 conservation significant flora species identified in the desktop survey as being likely to occur within the survey area:

- A total of 24 are perennial herb, shrub, or sedge species for which other characteristics would be present to enable identification to a minimum of genus level. However, flowers may be required for species level identification.
- A total of five are annual herbaceous species which are unlikely to be presenting at the time of the survey as the peak flowering and growth periods are around spring.
- Of these 29 species, only two have known flowering periods within the survey period (*Lepidium pseudohyssopifolium* and *Verticordia lindleyi* subsp. *lindleyi*). These are listed as P1 and P4 respectively under the *Biodiversity Conservation Act 2016* (WA).

No flora species of conservation significance were identified during the survey. The flora survey undertaken in June and is considered an out-of-season flora survey. The optimal timing for flora surveys within the Swan Coastal Plain is during spring, to ensure the presence of diagnostic characteristics for identification. No species recorded during the survey had characteristics that align with the conservation significant perennial herb, shrub or sedge species that could potentially occur within the survey area. An in-season (spring) flora survey would be required to confirm or exclude the presence of the five annual herbaceous species.

The likelihood for the presence of conservation significant flora within the clearing development area is low with the area exhibiting evidence of historic clearing. It is unlikely that the vegetation impacted for the project provides a long-term stable habitat for the preservation of conservation species, this is due to the evidence of clearing and the Degraded to Completely Degraded condition of the site.

## 6.3 Threatened Ecological Communities

Of the eight Threatened and Priority Ecological Communities identified during the desktop survey to potentially occur within the site, none were identified within the survey boundary. The Banksia Woodlands of the Swan Coastal Plain (Endangered/Priority 3) and *Banksia attenuata* woodlands over species rich dense shrublands (Critically Endangered) has previously been identified within the survey boundary. However, the *Adenanthos cygnorum* Shrubland and *Xanthorrhoea preissi* Shrubland vegetation types/species composition (particularly the lack of absence of *Banksia attenuata* and *Banksia menziesii*) recorded within the survey boundary is not consistent with the criteria/ requirements for these TECs. Based on aerial imagery from Landgate, the northern portion of the survey area has been previously cleared in the 1970's (Government of Western Australia, 2023a). In its current state the vegetation types, *Adenanthos cygnorum* Shrubland and *Xanthorrhoea preissi* Shrubland has a low native species diversity, lack of vegetation structure and a large portion of introduced species. This survey area no longer is reflective of its original state and therefore not consistent with the required criteria for classification of the Banksia TECs.

## 6.4 Fauna

A total of four fauna species (taxa) were recorded from four families during the field survey, all findings comprised of native bird species. One conservation significant species, *Zanda* sp. 'White-tailed Black Cockatoo' was sighted within the survey boundary. This is likely to be a Carnaby's Cockatoo (*Zanda latirostris*). No evidence of Black Cockatoo foraging or roosting was observed during the survey area, a detailed Black Cockatoo habitat assessment and dusk survey would be required to confirm.

The survey area provided little suitable fauna habitat for small reptiles, mammals, and amphibian species, this is due to the lack of native middle and understorey structural layers. Limited habitat characteristics and places of refuge including fallen logs and rocks were available in the survey area, limiting the potential for reptiles and small mammals to utilise the habitat including the conservation significant species identified in the desktop survey. The survey area is directly adjacent to the conservation category wetland 'Orchid Park' this wetland is likely to provide better quality and more suitable fauna habitat including foraging resources, a water source, and shelter.

One *Zanda* sp. (White-tailed Black Cockatoo) was sighted in a Marri (*Corymbia calophylla*) tree. This one Marri tree was the only Black Cockatoo habitat tree observed within the survey boundary. Black Cockatoo habitat including roosting and foraging resources are likely to be present in the bushland surrounding the survey area. No suitable Black Cockatoo breeding hollows were recorded during the survey. This identified Marri tree will be avoided in proposed development with the original design altered to avoid the tree, moving the sewer to its most easterly location. To ensure that the tree will not be impacted by the proposed works the identified tree will be flagged and demarcated, an arborist will be present for any required minor trimming, and the construction will only carry out minor topsoil disturbance to not damage the roots or system (Appendix 6).

## 6.5 Assessment Against Clearing Principles

An assessment of the proposed clearing of the site against the ten native vegetation clearing principles suggests that this action is not likely to be at variance with six principles. The clearing may be at variance with three principles (A, C and F). Assessment of all clearing principles is provided in Table 11 below.

**Table 11:** Native vegetation clearing principles and assessment.

Clearing Principle	Comment
A Native vegetation should not be cleared if it comprises a high level of biological diversity.	<p>The proposed area may potentially be at variance with this principle:</p> <ul style="list-style-type: none"> <li>▪ A total of 50 flora species were identified, this comprised of 17 (34%) introduced (weeds) and 33 (66%) native species.</li> <li>▪ No threatened or priority flora species were recorded within the survey boundary, however the survey was undertaken out of season (June).</li> <li>▪ Three vegetation types were identified, <i>Adenanthos cygnorum</i> Shrubland, <i>Xanthorrhoea preissi</i> Shrubland, and Mixed <i>Eucalyptus</i> spp. Open Woodland.</li> <li>▪ The vegetation condition ranged from Degraded to Completely Degraded.</li> <li>▪ The survey area is located within an environmentally sensitive area which requires a native vegetation clearing permit.</li> </ul>
B 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	<p>The proposed area to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> <li>▪ A total of four fauna species, comprising of all native birds were recorded within the survey area.</li> <li>▪ One <i>Zanda</i> sp. 'White-tailed Black Cockatoo' was sighted within the survey boundary.</li> <li>▪ Two nests were recorded with a <i>Corymbia calophylla</i> (Marri)</li> </ul>

Clearing Principle	Comment
indigenous to Western Australia.	<ul style="list-style-type: none"> <li>▪ Very little suitable habitat was identified within the site for other native fauna species, and it is considered unlikely to provide significant habitat for native fauna.</li> <li>▪ Larger areas of higher quality habitat are located in close proximity to the site which are considered to be more suitable for native fauna.</li> </ul>
C Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	<p>The proposed area may potentially be at variance with this principle:</p> <ul style="list-style-type: none"> <li>▪ No threatened or priority flora species were recorded within the survey boundary.</li> <li>▪ There is a low likelihood of conservation significant flora residing within the survey area due to the evidence of historic clearing and the low vegetation condition.</li> <li>▪ Of the 29 conservation significant flora to potentially reside within the survey boundary: <ul style="list-style-type: none"> <li>– A total of 24 are perennial herb, shrub, or sedge species for which other characteristics would need be present to enable identification to a minimum of genus level.</li> <li>– A total of five are annual herbaceous species which are unlikely to be presenting at the time of the survey as the peak flowering and growth periods are around spring.</li> </ul> </li> <li>▪ An in-season (spring) flora survey would be required to confirm or exclude the presence of the five annual herbaceous species.</li> </ul>
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 area to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> <li>▪ No Threatened or Priority Ecological Communities were identified within the survey area.</li> <li>▪ The survey area was observed to be in a Degraded and Completely Degraded condition with many portions of the survey area already been previously cleared.</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 area to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> <li>▪ The survey area is located within the Swan Coastal Plain (Southern River) Complex, of which large portions have been historically cleared for agricultural purposes. Within the Swan Coastal Plain, there is 18.43% of the Southern River Complex remaining and 16.51% remaining within the City of Swan.</li> <li>▪ The clearing development footprint does not intersect with any areas regarded as Native Vegetation Extent.</li> <li>▪ The vegetation within the survey area has been subject to historic clearing. All of the survey area is in a Degraded and Completely Degraded condition with limited vegetation.</li> </ul>
F Native vegetation should not be cleared if it is	<p>The proposed area may potentially be at variance with this principle:</p>

Clearing Principle	Comment
growing in, or in association with, an environment associated with a watercourse or wetland.	<ul style="list-style-type: none"> <li>▪ The survey area is located within a multiple use geomorphic wetland known as 'Victoria Road Swamp', the survey area is also located within close proximity to a conservation category wetland known as 'Orchid Park'.</li> <li>▪ There are no RAMSAR or important wetlands.</li> <li>▪ No watercourses or wetlands were identified directly within the survey area.</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 area to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> <li>▪ The survey area is located in close proximity to native vegetation associated with Orchid Park, this may be impacted by indirect impacts from the clearing activities.</li> <li>▪ The survey area was observed to be in a Degraded and Completely Degraded condition with many portions of the survey area exhibiting evidence of historic clearing.</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 area to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> <li>▪ The survey area is located within a multiple use geomorphic wetland known as 'Victoria Road Swamp'; the survey area is also located within close proximity to a conservation category wetland known as 'Orchid Park'.</li> <li>▪ It is not expected the clearing would have significant impact on the environmental values of this conservation category wetland and adjacent bushland. As the majority of the proposed clearing area includes previously cleared land.</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 underground water.	<p>The proposed area to be cleared is not likely to be at variance with this principle:</p> <ul style="list-style-type: none"> <li>▪ The current vegetation within the surrounding vegetation, include large trees and may already provide a buffer between Beechboro Rd North and Orchid Park. The removal of the vegetation within the survey area is not likely to contribute to an increased infiltration and surface water run-off towards Orchid Park.</li> <li>▪ There is the potential for clearing of the site to impact water quality through road run-off and machinery spills/contamination.</li> <li>▪ These impacts are considered unlikely and are able to be mitigated during the clearing process. The development of a management plan and strategy is recommended to aid with the mitigation of any water quality impacts.</li> </ul>
J Native vegetation should not be cleared if clearing	<p>The proposed area to be cleared is not likely to be at variance with this principle:</p>

<b>Clearing Principle</b>	<b>Comment</b>
the vegetation is likely to cause, or exacerbate, the incidence of flooding.	<ul style="list-style-type: none"><li data-bbox="624 253 1430 450">▪ There is the potential for water run-off to increase as a result of the loss of large, established trees during clearing, however, many are only planned to be trimmed rather than completely cleared. This is not expected to have a significant impact which would result in an increased risk of flooding.</li><li data-bbox="624 461 1430 566">▪ The development of a management plan and strategy is recommended to assist with the management of surface water on site.</li></ul>

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## 7.0 References

Bureau of Meteorology. (2023). *Climate and Weather Statistics – Perth Airport ID 009021*. Retrieved from: [http://www.bom.gov.au/climate/averages/tables/cw\\_009021\\_All.shtml](http://www.bom.gov.au/climate/averages/tables/cw_009021_All.shtml).

*Biodiversity Conservation Act 2016* (WA). Retrieved from [https://www.legislation.wa.gov.au/legislation/statutes.nsf/main\\_mrtitle\\_13811\\_homepage.html](https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_13811_homepage.html)

Department of Agriculture, Water and the Environment (DAWE). (2016). *Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain Ecological Community*. Retrieved from <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/131-conservationadvice.pdf>

Department of Biodiversity Conservation and Attractions (DBCA). (2018a). *Carnaby's Cockatoo Areas requiring investigation as feeding habitat in the Swan Coastal Plain (SCP) IBRA Region (DBCA-057)*. Retrieved from <https://catalogue.data.wa.gov.au/dataset/carnabys-cockatoo-unconfirm-feeding-areas-scp>.

Department of Biodiversity Conservation and Attractions (DBCA). (2018b). *Carnaby's Cockatoo Confirmed Roost Sites Buffered 6km (DBCA-052)*. Retrieved from <https://catalogue.data.wa.gov.au/dataset/carnabys-cockatoo-confirmed-roost-sites-buffered>.

Department of Biodiversity, Conservation and Attractions (DBCA). (2018c). *Carnaby's Cockatoo Unconfirmed Roost Sites Buffered 6km (DBCA-053)*. Retrieved from <https://catalogue.data.wa.gov.au/dataset/carnabys-cockatoo-confirmed-roost-sites-buffered>

Department of Biodiversity, Conservation and Attractions (DBCA). (2018d). *Vegetation Complexes - Swan Coastal Plain (DBCA-046)*. Retrieved from <https://catalogue.data.wa.gov.au/dataset/vegetation-complexes-swan-coastal-plain>.

Department of Biodiversity, Conservation and Attractions (DBCA). (2020). *Conservation Codes*. Retrieved from <https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Conservation%20code%20definitions.pdf>.

Department of Biodiversity, Conservation and Attractions (DBCA). (2023). *Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)*. Retrieved from <https://catalogue.data.wa.gov.au/dataset/geomorphic-wetlands-swan-coastal-plain>

Department of Biodiversity, Conservation and Attractions (DBCA). (2023a). *NatureMap*. Prepared by the Species and Communities program for Karri Grant and Natural Area for a flora survey.

- Department of Biodiversity, Conservation and Attractions (DBCA). (2023b). *Threatened and Priority Ecological Communities Database Search for Beechboro Rd North*, retrieved 9<sup>th</sup> of June 2023. Prepared by the Species and Communities program for Karri Grant and Natural Area for a flora survey.
- Department of Biodiversity, Conservation and Attractions (DBCA). (2023c). *Threatened and Priority Fauna Database Search for Beechboro Rd North*, retrieved 9<sup>th</sup> of June 2023. Prepared by the Species and Communities program for Karri Grant and Natural Area for a flora survey.
- Department of Biodiversity, Conservation and Attractions (DBCA). (2023d). *Threatened and Priority Flora Database Search for Beechboro Rd North*, retrieved 9<sup>th</sup> of June 2023. Prepared by the Species and Communities program for Karri Grant and Natural Area for a flora survey.
- Department of Climate Change, Energy and the Environment (DCCEE). (2023). *Protected Matters Search Tool*. Retrieved from <http://www.environment.gov.au/epbc/pmst/>.
- Department of Planning, Lands and Heritage (DPLH). (2023). *Aboriginal Heritage Inquiry System*. Retrieved from <https://www.dplh.wa.gov.au/ahis>.
- Department of Primary Industries and Regional Development (DPIRD). (2019). *2 metre contours (DPIRD-072)*, accessed 30 June 2023. Retrieved from <https://catalogue.data.wa.gov.au/dataset/dpird-2-metre-contours>.
- Department of Primary Industries and Regional Development (DPIRD). (2023). *NRInfo for Western Australia: map application*. Retrieved from <https://www.agric.wa.gov.au/resource-assessment/nrinfo-western-australia>.
- Department of Water and Environmental Regulation (DWER). (2023). *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*. Retrieved from [https://services.slip.wa.gov.au/public/services/SLIP\\_Public\\_Services/Environment/MapServer/WMS\\_Server](https://services.slip.wa.gov.au/public/services/SLIP_Public_Services/Environment/MapServer/WMS_Server).
- Environment Protection and Biodiversity Conservation Act 1999* (Cwlth). Retrieved from <https://www.legislation.gov.au/Details/C2016C00777>
- Environmental Protection Authority. (2016). *Technical Guidance: Flora and Vegetation survey for Environmental Impact Assessment*. Retrieved from [http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey\\_Dec13.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf).
- Environmental Protection Authority. (2020). *Technical Guidance: Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Retrieved from [https://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EPA-Technical-Guidance-Vertebrate-Fauna-Surveys.pdf](https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA-Technical-Guidance-Vertebrate-Fauna-Surveys.pdf).

Government of Western Australia. (2019). *2018 South West Vegetation Complex Statistics. Current as of March 2019*. Perth, W.A.: Department of Biodiversity, Conservation and Attractions. Retrieved from <https://catalogue.data.wa.gov.au/dataset/dbca>.

Government of Western Australia. (2023). *inHerit -State heritage register*. Retrieved from <http://inherit.stateheritage.wa.gov.au/Public/>.

Government of Western Australia. (2023a). *Landgate – Map Viewer Plus*. Retrieved from <https://www.landgate.wa.gov.au/>

Hedde, E., Loneragan, O., and Havel, J. (1980). *Vegetation Complexes of the Darling System Western Australia. In Atlas of Natural Resources - Darling System, Western Australia* (pp. 37 - 72). Canberra, W.A: Department of Conservation and Environment, Western Australia.

Mitchell, D., Williams, K., & Desmond, A. (2002). *Swan Coastal Plain 2 (SWA2 –Swan Coastal Plain Subregion)*. Retrieved from <http://www.dpaw.wa.gov.au/about-us/science-andresearch/biological-surveys/117-a-biodiversity-audit-of-wa>.

NVIS Technical Working Group (2017) *Australian Vegetation Attribute Manual: National Vegetation Information System, Version 7.0*. Department of the Environment and Energy, Canberra. Prep by Bolton, M.P., deLacey, C. and Bossard, K.B. (Eds).

Western Australian (WA) Herbarium. (1998-). *FloraBase – The Western Australian Flora*. Retrieved from <https://florabase.dpaw.wa.gov.au/>.



## **Appendix 1: PMST Report 10 km**



Australian Government

Department of Climate Change, Energy,  
the Environment and Water

# 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: 09-Jun-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

# Summary

## 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>	60
<a href="#">Listed Migratory Species:</a>	27

## 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>	141
<a href="#">Commonwealth Heritage Places:</a>	1
<a href="#">Listed Marine Species:</a>	31
<a href="#">Whales and Other Cetaceans:</a>	None
<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>	9
<a href="#">Regional Forest Agreements:</a>	1
<a href="#">Nationally Important Wetlands:</a>	3
<a href="#">EPBC Act Referrals:</a>	48
<a href="#">Key Ecological Features (Marine):</a>	None
<a href="#">Biologically Important Areas:</a>	None
<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="#">Assemblages of plants and invertebrate animals of tumulus (organic mound) springs of the Swan Coastal Plain</a>	Endangered	Community known to occur within area	In buffer area only
<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 - Kingia australis woodlands on heavy soils of the Swan Coastal Plain</a>	Endangered	Community known to occur within area	In buffer area only
<a href="#">Shrublands and Woodlands of the eastern Swan Coastal Plain</a>	Endangered	Community known to 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 (<i>Eucalyptus gomphocephala</i>) 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="#">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 may occur within area	In buffer area only
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely 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 likely to 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 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	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<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 may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<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="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Sternula nereis nereis</a> Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Species or species habitat may 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="#">Zanda baudinii listed as Calyptorhynchus baudinii</a> Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Roosting known to occur within area	In buffer area only
<a href="#">Zanda latirostris listed as Calyptorhynchus latirostris</a> Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
<b>FISH</b>			
<a href="#">Galaxiella nigrostriata</a> Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Thunnus maccoyii</a> Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

## INSECT



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Hesperocolletes douglasi</a> Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
<b>MAMMAL</b>			
<a href="#">Bettongia penicillata ogilbyi</a> Woylie [66844]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Dasyurus geoffroi</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Macroderma gigas</a> Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Pseudocheirus occidentalis</a> Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
<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 buffer area only
<b>PLANT</b>			
<a href="#">Andersonia gracilis</a> Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Anigozanthos viridis subsp. terraspectans</a> Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Banksia mimica</a> Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In feature area
<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 feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Calytrix breviseta subsp. breviseta</a> Swamp Starflower [23879]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Chamelaucium lullfitzii listed as Chamelaucium sp. Gingin (N.G.Marchant 6)</a> Gingin Wax [92777]	Endangered (listed as Chamelaucium sp. Gingin)	Species or species habitat may occur within area	In buffer area only
<a href="#">Conospermum undulatum</a> Wavy-leaved Smokebush [24435]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diplolaena andrewsii</a> [6601]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Diuris drummondii</a> Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat likely 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 buffer area only
<a href="#">Diuris purdiei</a> Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to 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 likely to occur within area	In buffer area only
<a href="#">Eleocharis keigheryi</a> Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Eucalyptus argutifolia</a> Yanchep Mallee, Wabbling Hill Mallee [24263]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Eucalyptus x balanites</a> Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Grevillea christineae</a> Christine's Grevillea [64520]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Grevillea curviloba subsp. curviloba</a> Curved-leaf Grevillea [64908]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Grevillea curviloba subsp. incurva</a> Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Macarthuria keigheryi</a> Keighery's Macarthuria [64930]	Endangered	Species or species habitat likely to occur within area	In feature area
<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="#">Thelymitra dedmaniarum</a> Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Thelymitra stellata</a> Star Sun-orchid [7060]	Endangered	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Trithuria occidentalis</a> Swan Hydatella [42224]	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	Species or species habitat known to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

## SHARK

<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 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="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely 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 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	Species or species habitat likely 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Species or species habitat may 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
<b>Migratory Marine Species</b>			
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Mobula alfredi as Manta alfredi</a> Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
<a href="#">Mobula birostris as Manta birostris</a> Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Species or species habitat known to 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 buffer area only

**Migratory Terrestrial Species**

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
<b>Migratory Wetlands Species</b>			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
<a href="#">Calidris canutus</a> Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat likely to occur within area	In feature area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat 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 may occur within area	In feature area
<a href="#">Pandion haliaetus</a> Osprey [952]		Breeding 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 - PALMER BARRACKS - SOUTH GUILDFORD [50180]	WA	In buffer area only
Defence - PALMER BARRACKS - SOUTH GUILDFORD [50176]	WA	In buffer area only
Defence - PALMER BARRACKS - SOUTH GUILDFORD [50177]	WA	In buffer area only
Defence - PALMER BARRACKS - SOUTH GUILDFORD [50179]	WA	In buffer area only
Defence - PALMER BARRACKS - SOUTH GUILDFORD [50178]	WA	In buffer area only
Defence - RAAF CAVERSHAM [50003]	WA	In buffer area only
<b>Unknown</b>		
Commonwealth Land - [50847]	WA	In buffer area only
Commonwealth Land - [50845]	WA	In buffer area only
Commonwealth Land - [50842]	WA	In buffer area only
Commonwealth Land - [50840]	WA	In buffer area only
Commonwealth Land - [50841]	WA	In buffer area only
Commonwealth Land - [51324]	WA	In buffer area only
Commonwealth Land - [51157]	WA	In buffer area only
Commonwealth Land - [51325]	WA	In buffer area only
Commonwealth Land - [50853]	WA	In buffer area only
Commonwealth Land - [51154]	WA	In buffer area only
Commonwealth Land - [51263]	WA	In buffer area only
Commonwealth Land - [51178]	WA	In buffer area only
Commonwealth Land - [51261]	WA	In buffer area only
Commonwealth Land - [51375]	WA	In buffer area only
Commonwealth Land - [51262]	WA	In buffer area only
Commonwealth Land - [51310]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51264]	WA	In buffer area only
Commonwealth Land - [51237]	WA	In buffer area only
Commonwealth Land - [51265]	WA	In buffer area only
Commonwealth Land - [51234]	WA	In buffer area only
Commonwealth Land - [51172]	WA	In buffer area only
Commonwealth Land - [50839]	WA	In buffer area only
Commonwealth Land - [51173]	WA	In buffer area only
Commonwealth Land - [51236]	WA	In buffer area only
Commonwealth Land - [51238]	WA	In buffer area only
Commonwealth Land - [51230]	WA	In buffer area only
Commonwealth Land - [51233]	WA	In buffer area only
Commonwealth Land - [51235]	WA	In buffer area only
Commonwealth Land - [50846]	WA	In buffer area only
Commonwealth Land - [51171]	WA	In buffer area only
Commonwealth Land - [51176]	WA	In buffer area only
Commonwealth Land - [51170]	WA	In buffer area only
Commonwealth Land - [51175]	WA	In buffer area only
Commonwealth Land - [51177]	WA	In buffer area only
Commonwealth Land - [51174]	WA	In buffer area only
Commonwealth Land - [51168]	WA	In buffer area only
Commonwealth Land - [51164]	WA	In buffer area only
Commonwealth Land - [50805]	WA	In buffer area only
Commonwealth Land - [51378]	WA	In buffer area only
Commonwealth Land - [51311]	WA	In buffer area only
Commonwealth Land - [50834]	WA	In buffer area only
Commonwealth Land - [51922]	WA	In buffer area only
Commonwealth Land - [51924]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [50783]	WA	In buffer area only
Commonwealth Land - [51923]	WA	In buffer area only
Commonwealth Land - [50822]	WA	In buffer area only
Commonwealth Land - [50823]	WA	In buffer area only
Commonwealth Land - [51309]	WA	In buffer area only
Commonwealth Land - [51419]	WA	In buffer area only
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Commonwealth Land - [50739]	WA	In buffer area only
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Commonwealth Land - [50829]	WA	In buffer area only
Commonwealth Land - [51367]	WA	In buffer area only
Commonwealth Land - [50801]	WA	In buffer area only
Commonwealth Land - [51366]	WA	In buffer area only
Commonwealth Land - [50806]	WA	In buffer area only
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Commonwealth Land - [50807]	WA	In buffer area only
Commonwealth Land - [51368]	WA	In buffer area only
Commonwealth Land - [51194]	WA	In buffer area only
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Commonwealth Land - [51190]	WA	In buffer area only
Commonwealth Land - [51191]	WA	In buffer area only
Commonwealth Land - [51365]	WA	In buffer area only
Commonwealth Land - [51364]	WA	In buffer area only
Commonwealth Land - [50808]	WA	In buffer area only
Commonwealth Land - [51288]	WA	In buffer area only



Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51977]	WA	In buffer area only
Commonwealth Land - [50803]	WA	In buffer area only
Commonwealth Land - [50884]	WA	In buffer area only
Commonwealth Land - [51284]	WA	In buffer area only
Commonwealth Land - [51289]	WA	In buffer area only
Commonwealth Land - [51203]	WA	In buffer area only
Commonwealth Land - [51132]	WA	In buffer area only
Commonwealth Land - [51133]	WA	In buffer area only
Commonwealth Land - [51910]	WA	In buffer area only
Commonwealth Land - [51915]	WA	In buffer area only
Commonwealth Land - [51362]	WA	In buffer area only
Commonwealth Land - [51361]	WA	In buffer area only
Commonwealth Land - [51226]	WA	In buffer area only
Commonwealth Land - [51134]	WA	In buffer area only
Commonwealth Land - [51916]	WA	In buffer area only
Commonwealth Land - [51363]	WA	In buffer area only
Commonwealth Land - [50773]	WA	In buffer area only
Commonwealth Land - [50804]	WA	In buffer area only
Commonwealth Land - [51186]	WA	In buffer area only
Commonwealth Land - [51185]	WA	In buffer area only
Commonwealth Land - [51422]	WA	In buffer area only
Commonwealth Land - [51187]	WA	In buffer area only
Commonwealth Land - [51188]	WA	In buffer area only
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Commonwealth Land - [51184]	WA	In buffer area only
Commonwealth Land - [51189]	WA	In buffer area only
Commonwealth Land - [51182]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
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Commonwealth Land - [51307]	WA	In buffer area only
Commonwealth Land - [51344]	WA	In buffer area only
Commonwealth Land - [51346]	WA	In buffer area only
Commonwealth Land - [50753]	WA	In buffer area only
Commonwealth Land - [50752]	WA	In buffer area only
Commonwealth Land - [50757]	WA	In buffer area only
Commonwealth Land - [51906]	WA	In buffer area only
Commonwealth Land - [51909]	WA	In buffer area only
Commonwealth Land - [50851]	WA	In buffer area only
Commonwealth Land - [51516]	WA	In buffer area only
Commonwealth Land - [51515]	WA	In buffer area only
Commonwealth Land - [50878]	WA	In buffer area only
Commonwealth Land - [50877]	WA	In buffer area only
Commonwealth Land - [50748]	WA	In buffer area only
Commonwealth Land - [50747]	WA	In buffer area only
Commonwealth Land - [51371]	WA	In buffer area only
Commonwealth Land - [51213]	WA	In buffer area only
Commonwealth Land - [51373]	WA	In buffer area only
Commonwealth Land - [51372]	WA	In buffer area only
Commonwealth Land - [51161]	WA	In buffer area only
Commonwealth Land - [51166]	WA	In buffer area only
Commonwealth Land - [51167]	WA	In buffer area only
Commonwealth Land - [51424]	WA	In buffer area only
Commonwealth Land - [51374]	WA	In buffer area only
Commonwealth Land - [51379]	WA	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [51169]	WA	In buffer area only
Commonwealth Land - [51181]	WA	In buffer area only
Commonwealth Land - [51420]	WA	In buffer area only
Commonwealth Land - [51285]	WA	In buffer area only
Commonwealth Land - [51286]	WA	In buffer area only
Commonwealth Land - [50812]	WA	In buffer area only
Commonwealth Land - [51252]	WA	In buffer area only
Commonwealth Land - [50312]	WA	In buffer area only
Commonwealth Land - [51308]	WA	In buffer area only
Commonwealth Land - [51259]	WA	In buffer area only
Commonwealth Land - [51260]	WA	In buffer area only

### Commonwealth Heritage Places [ [Resource Information](#) ]

Name	State	Status	Buffer Status
Historic			
<a href="#">Inglewood Post Office</a>	WA	Listed place	In buffer area only

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
<a href="#">Actitis hypoleucos</a>			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<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="#">Bubulcus ibis as Ardea ibis</a>			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris acuminata</a>			
Sharp-tailed Sandpiper [874]		Species or species habitat known 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 may occur within area overfly marine area	In buffer area only
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Charadrius leschenaultii</a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to 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 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	Species or species habitat likely to 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="#">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



Scientific Name	Threatened Category	Presence Text	Buffer Status
<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
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
<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]		Breeding 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 known to occur within area overfly marine area	In feature area
<a href="#">Thalassarche cauta</a> Shy Albatross [89224]	Endangered	Species or species habitat may 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Thinornis cucullatus as Thinornis rubricollis</a> Hooded Plover, Hooded Dotterel [87735]		Species or species habitat likely 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

#### Mammal

<a href="#">Neophoca cinerea</a> Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat known to occur within area	In buffer area only
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#### Reptile

<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

#### Extra Information

State and Territory Reserves			[ Resource Information ]
Protected Area Name	Reserve Type	State	Buffer Status
Errina Road	Nature Reserve	WA	In buffer area only
Helena River	Management Area	WA	In buffer area only
Swan River	Management Area	WA	In buffer area only
Unnamed WA1919/893	Management Area	WA	In buffer area only
Unnamed WA33618	Management Area	WA	In buffer area only
Unnamed WA36440	Management Area	WA	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Unnamed WA44853	Nature Reserve	WA	In feature area
Unnamed WA46919	Nature Reserve	WA	In buffer area only
Unnamed WA46920	Nature Reserve	WA	In buffer area only

## Regional Forest Agreements [\[ Resource Information \]](#)

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
<a href="#">South West WA RFA</a>	Western Australia	In buffer area only

## Nationally Important Wetlands [\[ Resource Information \]](#)

Wetland Name	State	Buffer Status
<a href="#">Perth Airport Woodland Swamps</a>	WA	In buffer area only
<a href="#">RAAF Caversham</a>	WA	In buffer area only
<a href="#">Swan-Canning Estuary</a>	WA	In buffer area only

## EPBC Act Referrals [\[ Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<a href="#">Land Clearing for Light Industrial Development</a>	2022/09419		Completed	In buffer area only
<a href="#">Vegetation Clearing Viticulture project</a>	2021/9099		Completed	In buffer area only

### Controlled action

<a href="#">Airport &amp; Freight Access Gateway</a>	2010/5384	Controlled Action	Post-Approval	In buffer area only
<a href="#">East Landsdale Residential Development</a>	2008/4676	Controlled Action	Post-Approval	In buffer area only
<a href="#">East Wanneroo Cell 9 residential subdivision - Lots 50,51,52,154 &amp; 404</a>	2010/5772	Controlled Action	Completed	In buffer area only
<a href="#">Ellenbrook Reliable Water Storage Project, WA</a>	2015/7421	Controlled Action	Post-Approval	In buffer area only
<a href="#">Morley-Ellenbrook Rail Line Part 2, WA</a>	2019/8546	Controlled Action	Post-Approval	In feature area
<a href="#">Natural Gas Pipeline Expansion</a>	2006/2813	Controlled Action	Post-Approval	In buffer area only
<a href="#">Nava-1 Cable System</a>	2001/510	Controlled Action	Completed	In buffer area only
<a href="#">Perth-Darwin National Highway alignment (Swan Valley Section).</a>	2013/7042	Controlled Action	Post-Approval	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Controlled action</b>				
<a href="#">WA</a>				
<a href="#">Primary school, residential development and open space, Lots 9000 Bottlebrush Drive, Kiara, WA</a>	2013/7050	Controlled Action	Post-Approval	In buffer area only
<a href="#">Residential Development 822 Youle-Dean Road, Brabham, WA</a>	2015/7458	Controlled Action	Post-Approval	In buffer area only
<a href="#">Residential Subdivision development</a>	2011/6040	Controlled Action	Post-Approval	In buffer area only
<a href="#">Roe Highway and Great Eastern Highway Bypass Grade Separation Interchange, Hazelmere WA</a>	2020/8784	Controlled Action	Further Information Request	In buffer area only
<a href="#">Sand Mining 70/915 Banksia Road, Wellard, WA</a>	2015/7438	Controlled Action	Post-Approval	In buffer area only
<a href="#">Shenton Park Subdivision</a>	2004/1479	Controlled Action	Completed	In buffer area only
<a href="#">To grade separate three intersections on Tonkin Highway, WA</a>	2014/7385	Controlled Action	Post-Approval	In buffer area only
<b>Not controlled action</b>				
<a href="#">Brabham North residential development, Brabham, WA</a>	2018/8380	Not Controlled Action	Completed	In buffer area only
<a href="#">Cell 2 of Caversham Local Structure Plan</a>	2012/6259	Not Controlled Action	Completed	In buffer area only
<a href="#">Construction of the Perth Stadium and associated infrastructure</a>	2013/6740	Not Controlled Action	Completed	In buffer area only
<a href="#">Development of 39 (Lot 3000) Hardcastle Avenue, Landsdale, WA</a>	2017/8100	Not Controlled Action	Completed	In buffer area only
<a href="#">Development of Crown Towers Five Star Quality Hotel</a>	2012/6695	Not Controlled Action	Completed	In buffer area only
<a href="#">Ellenbrook Bus Rapid Transit Project, WA</a>	2016/7732	Not Controlled Action	Completed	In buffer area only
<a href="#">Eradication of the European House Borer, Perth metropolitan area, WA</a>	2009/5027	Not Controlled Action	Completed	In buffer area only
<a href="#">Forrestfield Airport Link, WA</a>	2015/7399	Not Controlled Action	Completed	In buffer area only
<a href="#">Gnangara Road upgrade project, city of Swan, WA</a>	2013/6966	Not Controlled Action	Completed	In buffer area only
<a href="#">Improving rabbit biocontrol: releasing another strain of RHDV,</a>	2015/7522	Not Controlled Action	Completed	In feature area



Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Not controlled action</b>				
<a href="#"><u>sthrn two thirds of Australia</u></a>				
<a href="#"><u>INDIGO Central Submarine Telecommunications Cable</u></a>	2017/8127	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Landsdale Primary School Development, WA</u></a>	2015/7597	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Landsdale Residential Subdivision Development</u></a>	2011/6027	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Lot 158 Landsdale Rd, Landsdale, WA</u></a>	2012/6403	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Lots 71 &amp; 72 Queensway Rd, East Landsdale</u></a>	2012/6541	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Reid Highway/Malaga Drive interchange upgrade, City of Swan, WA</u></a>	2013/6892	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Residential and commercial development, Lot 1981 Alexander Drive &amp; Lot 152 Gnangara Road, Landsdale,</u></a>	2013/6982	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Residential Development, 50 Lot 2 Driver Road, Darch, Western Australia</u></a>	2020/8677	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Residential development, Landsdale, WA</u></a>	2013/6964	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Residential development, Lot 14143 (16) Harford Way, Girrawheen, WA</u></a>	2016/7819	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Residential Development, Lot 500 Park Street, Brabham, WA</u></a>	2019/8472	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Residential development, Lot 55 Alexander Drive, Landsdale, WA</u></a>	2013/6971	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Residential Subdivision</u></a>	2012/6410	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Residential subdivision - lot 169 Kingsway Road, Landsdale WA</u></a>	2012/6412	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Residential subdivision - Lots 156 and 157 Landsdale Road Landsdale WA</u></a>	2012/6407	Not Controlled Action	Completed	In buffer area only
<a href="#"><u>Telstra PITC O3B Clearing Application</u></a>	2011/6147	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Not controlled action</b>				
<a href="#">Tonkin Highway Upgrade, Guildford Road to Great Eastern Highway, WA</a>	2019/8545	Not Controlled Action	Completed	In buffer area only
<a href="#">Urban Development Project, Lot 55 and 56 Cottonwood Crescent, Dianella, WA</a>	2017/8031	Not Controlled Action	Completed	In buffer area only
<a href="#">Wangara Industrial Extension Area, WA</a>	2012/6501	Not Controlled Action	Completed	In buffer area only
<b>Not controlled action (particular manner)</b>				
<a href="#">Ocean Reef Road Extension Works in Wangara</a>	2010/5388	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
<a href="#">South West Metropolitan Railway Project</a>	2003/1175	Not Controlled Action (Particular Manner)	Post-Approval	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: Significant Species

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Acacia aphylla</i></p> <p>Photos: S.D. Hopper &amp; B.R. Maslin</p>	<p>Leafless Rock Wattle</p>	<p>Divaricately branched, spinescent, glaucous shrub, 0.9-2.5 m high. Fl. Yellow.</p>	<p>Aug to Oct.</p>	<p>Sand, loam, clay loam. Granite outcrops, hills.</p>	<p>T</p>	<p>N</p>	<p>Habitat not suitable</p>

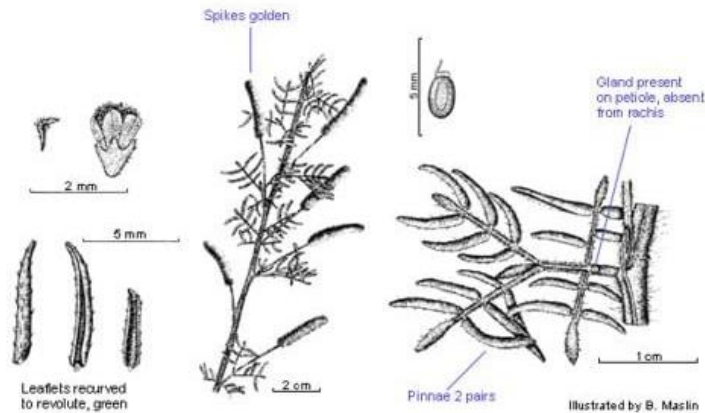
Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="423 798 707 844"><i>Acacia benthami</i> Photo: B.R. Maslin</p>		Shrub, ca 1 m high. Fl. Yellow.	Aug to Sep.	Sand. Typically on limestone breakaways.	P2	N	Habitat not suitable


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Acacia denticulosa</i></p>	Sandpaper Wattle	Erect, diffuse, spindly shrub, 1-4 m high. Fl. yellow	Sep to Oct.	Sand, loam, clay. Granite outcrops, rarely on sandplains.	T	N	Habitat not suitable


Photos: M. Seale & S.D. Hop





Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<i>Acacia drummondii</i> subsp. <i>affinis</i>		Erect shrub, 0.3-1 m high. Fl. yellow	Jul to Aug.	Lateritic gravelly soils.	P3	N	Habitat not suitable







Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="197 890 945 927"><i>Acacia oncinophylla</i> subsp. <i>patulifolia</i> Photos: S.J. Pat</p>		<p data-bbox="1108 502 1310 766">Shrub, 0.5-2.5(-3) m high, 'minni-ritchi' bark, phyllodes 4-9 cm long, 3-6 mm wide. Fl. Yellow.</p>	<p data-bbox="1310 558 1467 710">Aug to Nov or Nov to Dec.</p>	<p data-bbox="1467 582 1691 686">Granitic soils, occasionally on laterite.</p>	<p data-bbox="1691 614 1758 654">P4</p>	<p data-bbox="1758 614 1892 654">N</p>	<p data-bbox="1892 598 2047 670">Habitat not suitable</p>
<p data-bbox="235 965 945 1005"><i>Alyogyne</i> sp. Great Victoria Desert (D.J. Edinger 6212)</p>					<p data-bbox="1691 965 1758 1005">P3</p>	<p data-bbox="1758 965 1892 1005">N</p>	<p data-bbox="1892 933 2047 1037">Geographic range not suitable</p>


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Andersonia gracilis</i></p> <p><small>Photos: K. Atkins &amp; M. Hislop</small></p>		Slender erect or open straggly shrub, 0.1-0.5(-1) m high. Fl. white-pink-purple.	Sep to Nov.	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	T	Y	Habitat suitable
<i>Angianthus micropodioides</i>		Erect or decumbent annual, herb, 0.03-0.15 m high. Fl. yellow-white.	Nov to Dec or Jan to Feb	Saline sandy soils. River edges, saline depressions, claypans.	P3	N	Habitat not suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="241 810 584 842"><i>Anigozanthos humilis</i> subsp. <i>chrysanthus</i></p> <p data-bbox="645 810 891 842">Photos: S.F. Patrick &amp; B. and B. Wells</p>	Golden Catspaw	Rhizomatous, perennial, herb, 0.2-0.4(-0.8) m high. Fl. yellow	Jul to Oct.	Grey or yellow sand.	P4	N	Habitat not suitable
 <p data-bbox="197 1369 680 1402"><i>Anigozanthos viridis</i> subsp. <i>terraspectans</i></p> <p data-bbox="786 1369 945 1402">Photo: B. &amp; B. W</p>	Dwarf Green Kangaroo Paw	Rhizomatous, perennial, herb, 0.05-0.2 m high. Fl. green/yellow- green	Aug to Sep.	Grey sand, clay loam. Winter- wet depressions.	T	N	Geographic range not suitable




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="215 837 427 874"><i>Anthocercis gracilis</i></p> <p data-bbox="667 837 918 874">Photos: S.D. Hopper &amp; J.L. Robson</p>	Slender Tailflower	Erect, spindly shrub, to 0.6(-1) m high. Fl. yellow-green.	Sep to Oct.	Sandy or loamy soils. Granite outcrops.	T	N	Habitat not suitable
 <p data-bbox="215 1375 387 1407"><i>Banksia mimica</i></p> <p data-bbox="658 1375 918 1407">Photos: A.P. Brown &amp; S. Patrick</p>	Summer Honeypot	Prostrate, lignotuberous shrub, 0.15-0.4 m high. Fl. yellow-brown.	Jan to Feb.	White or grey sand over laterite, sandy loam.	T	N	Soil type not suitable


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
		Prostrate, lignotuberous shrub, to 0.4 m high. Fl. cream-white/yellow.	Sep to Oct	White/grey sand over laterite	P3	N	Soil type not suitable
	Purple Beaufortia	Erect or spreading shrub, 0.3-1.5 m high. Fl. red-purple.	Oct to Dec or Jan to Feb.	Lateritic or granitic soils. Rocky slopes.	P3	N	Habitat not suitable


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<i>Bolboschoenus fluviatilis</i>		No info.			P1		No Info
 <p><i>Byblis gigantea</i></p> <p>Photos: B.A. Fuhrer &amp; J. Hort</p>	Rainbow Plant	Small, branched perennial, herb (or sub-shrub), to 0.45 m high. Fl. pink-purple/white.	Sep to Dec or Jan.	Sandy-peat swamps. Seasonally wet areas.	P3	Y	Habitat suitable




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Caladenia huegelii</i> Photos: I. &amp; M. Greeve &amp; J.L. Robson</p>	Grand Spider Orchid	Tuberous, perennial, herb, 0.25-0.6 m high. Fl. green & cream & red.	Sep to Oct.	Grey or brown sand, clay loam.	T	N	Habitat not suitable
<i>Calandrinia</i> sp. Bayswater (C. Andrews s.n. 11/1902)							No Info
<i>Calectasia elegans</i>	Elegant Tinsel Lily				P2		No Info
<i>Calothamnus accedens</i>		Erect & slender shrub, to 1.8 m high. Fl. pink-red.	No info.	Sandy soils over laterite. Road verge.	P4	N	Habitat not suitable



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="217 837 920 873"><i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i> Photos: A. D. Crawford, M. Hancock &amp; W. McGrath</p>		Erect, multi-stemmed shrub, 1-2 m high. Fl. Red.	Jun to Aug.	Clay over granite, lateritic soils. Hillsides.	P4	N	Habitat not suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="217 837 499 871"><i>Calothamnus macrocarpus</i></p> <p data-bbox="757 837 918 871">Photos: J.A. Cochrane</p>		Erect shrub, 0.4-2(-3) m high. Fl. red	Feb or Apr or Aug to Dec.	Rocky quartzite soils, sand. Slopes.	P2	N	Habitat not suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Calytrix breviseta</i> subsp. <i>breviseta</i> Photos: A.P. Brown, D. Coates &amp; E. Holland</p>		Shrub, 0.4-1 m high. Fl. purple-blue.	Oct to Nov.	Sandy clay. Swampy flats	T	Y	Habitat suitable

*Carex tereticaulis*



Monoecious, rhizomatous, tufted perennial, grass-like or herb (sedge), 0.7 m high. Fl. Brown.



Sep to Oct.

Black peaty sand.


P3



N

Soil type not suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="215 837 459 869"><i>Chamelaucium lullfitzii</i></p> <p data-bbox="660 837 916 869">Photos: A.P. Brown &amp; J.A. Cochrane</p>		<p data-bbox="1120 534 1299 678">Erect, open, straggly shrub, to 2 m high. Fl. white</p>	<p data-bbox="1344 566 1433 646">Sep to Dec.</p>	<p data-bbox="1467 470 1668 742">White or yellow sand, leaf litter. Plains, hilltops, crests and lower slopes of scarp, rises, road verges.</p>	<p data-bbox="1702 590 1736 614">T</p>	<p data-bbox="1803 590 1836 614">N</p>	<p data-bbox="1904 550 2038 662">Geographic range not suitable</p>
 <p data-bbox="230 1353 492 1385"><i>Conospermum undulatum</i></p> <p data-bbox="649 1353 902 1385">Photos: A.D. Crawford &amp; K.R. Thiele</p>		<p data-bbox="1120 1061 1299 1204">Erect, compact shrub, 0.6-2 m high. Fl. white-other.</p>	<p data-bbox="1344 1093 1433 1173">May to Oct.</p>	<p data-bbox="1467 1077 1668 1189">Grey or yellow-orange clayey sand.</p>	<p data-bbox="1702 1117 1736 1141">T</p>	<p data-bbox="1803 1117 1836 1141">N</p>	<p data-bbox="1915 1077 2027 1189">Soil type not suitable</p>




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<i>Conostylis bracteata</i>		Rhizomatous, tufted or shortly proliferous perennial, grass-like or herb	Fl. yellow Aug to Sep.	Sand, limestone. Consolidated sand dunes.	P3	N	Habitat not suitable
 <p><i>Cyanicula ixioides</i> subsp. <i>ixioides</i> Photos: I. &amp; M. Greeve &amp; G. Brunnbauer</p>	Yellow China Orchid	Tuberous, perennial, herb, 0.05-0.15 m high. Fl. yellow	Aug to Oct.	Laterite, gravel.	P4	N	Habitat not suitable
<i>Cyathochaeta teretifolia</i>		Rhizomatous, clumped, robust perennial, grass-like or herb (sedge), to 2 m high, to 1.0 m wide. Fl. brown.		Grey sand, sandy clay. Swamps, creek edges.	P3	Y	Habitat suitable
<i>Dampiera triloba</i>		Erect perennial, herb or shrub,	Aug to Dec				No Info

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
		<p>Erect shrub, 0.25-0.5(-1) m high. Fl. red/pink &amp; green,</p>	<p>Sep to Oct.</p>	<p>Loam, sandy loam. Granite outcrops.</p>	<p>P4</p>	<p>N</p>	<p>Habitat not suitable</p>



*Darwinia pimelioides*

Photos: S.D. Hopper & S.F. Patrick

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
		<p>Spreading shrub, 0.4-1 m high, stem hairs dentritic, to 1.3 mm long, with a single terminal gland and sub-basal whorl of branches. Fl. white,</p>	<p>Sep to Dec.</p>	<p>Red sand. Sandplains.</p>	<p>P3</p>	<p>N</p>	<p>Habitat not suitable</p>

*Dicrastylis micrantha*

Photo: K.F. Kenneally

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
		<p>Erect shrub, 0.5-1 m high, inner involucral bracts glabrous, leaves broadly cordate. Fl. Red.</p>	<p>Jul to Oct.</p>	<p>Loam, clay. Granite outcrops &amp; hillsides.</p>	<p>T</p>	<p>N</p>	<p>Habitat not suitable</p>
	<p>Tall Donkey Orchid</p>	<p>Tuberous, perennial, herb, 0.5-1.05 m high. Fl. Yellow.</p>	<p>Nov to Dec or Jan.</p>	<p>Low-lying depressions, swamps.</p>	<p>T</p>	<p>Y</p>	<p>Habitat suitable</p>



*Diplolaena andrewsii*



Photo: V.T. Clarke


*Diuris drummondii*

Photos: A. P. Brown and I & M Greeve




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="212 837 907 869"><i>Diuris micrantha</i> Photos: A.P. Brown, I. &amp; M. Greeve &amp; B. Jackson</p>		<p data-bbox="1108 510 1310 702">Tuberous, perennial, herb, 0.3-0.6 m high. Fl. yellow &amp; brown.</p>	<p data-bbox="1310 566 1467 646">Sep to Oct.</p>	<p data-bbox="1467 534 1691 678">Brown loamy clay. Winter-wet swamps, in shallow water.</p>	<p data-bbox="1691 590 1758 614">T</p>	<p data-bbox="1758 590 1892 614">Y</p>	<p data-bbox="1892 566 2038 646">Habitat suitable</p>
 <p data-bbox="212 1380 907 1404"><i>Diuris purdiei</i> Photos: I. &amp; M. Greeve &amp; S.D. Hopper</p>	<p data-bbox="918 1085 1108 1197">Purdie's Donkey Orchid</p>	<p data-bbox="1108 1069 1310 1220">Tuberous, perennial, herb, 0.15-0.35 m high. Fl. Yellow.</p>	<p data-bbox="1310 1109 1467 1189">Sep to Oct.</p>	<p data-bbox="1467 1093 1691 1204">Grey-black sand, moist. Winter-wet swamps.</p>	<p data-bbox="1691 1125 1758 1149">T</p>	<p data-bbox="1758 1125 1892 1149">Y</p>	<p data-bbox="1892 1109 2038 1189">Habitat suitable</p>


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="215 837 456 871"><i>Dodonaea hackettiana</i></p> <p data-bbox="607 847 920 871">Photos: D. Bright, I.R. Dixon &amp; S.J. Patrick</p>	Hackett's Hopbush	Erect shrub or tree, 1-5 m high. Fl. yellow-green/red.	Mainly Jul to Oct.	Sand. Outcropping limestone.	P4	N	Habitat not suitable
 <p data-bbox="215 1369 371 1398"><i>Drakaea elastica</i></p> <p data-bbox="689 1374 920 1398">Photos: A. Brown &amp; S.D. Hopper</p>	Glossy-leaved Hammer Orchid	Tuberous, perennial, herb, 0.12-0.3 m high. Fl. red & green & yellow	Oct to Nov.	White or grey sand. Low-lying situations adjoining winter-wet swamps.	T	Y	Habitat suitable


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="235 821 436 853"><i>Drakaea micrantha</i></p> <p data-bbox="560 821 907 853">Photos: S.D. Hopper, A.P.Brown &amp; I. &amp; M. Greeve</p>		<p data-bbox="1120 526 1310 670">Tuberous, perennial, herb, 0.15-0.3 m high. Fl. red &amp; yellow.</p>	<p data-bbox="1355 566 1433 630">Sep to Oct.</p>	<p data-bbox="1512 566 1635 630">White-grey sand.</p>	<p data-bbox="1702 582 1724 606">T</p>	<p data-bbox="1803 582 1825 606">N</p>	<p data-bbox="1904 566 2038 630">Habitat not suitable</p>
<p data-bbox="481 861 660 885"><i>Drosera micra</i></p>						<p data-bbox="1803 869 1848 893">P1</p>	<p data-bbox="1926 869 2027 893">No Info</p>






Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Drosera occidentalis</i></p> <p>Photos: S.D. Hopper &amp; J.L. Robson</p>	Western Sundew	Fibrous-rooted, rosetted perennial, herb, to 0.025 m high. Fl. pink/white.	Oct to Dec or Jan.		P4	Y	Habitat suitable
<i>Drosera patens</i>		Fibrous-rooted, rosetted perennial, herb, to 0.05 m high. Fl. white,	Dec or Feb	Sandy soils. Margins of winter-wet depressions, swamps and lakes.	P1	Y	Habitat suitable
<i>Drosera x badgerupii</i>		Rosetted, short-lived perennial, herb. Fl. yellow-green.			P2		No Info
<i>Drosera x sidjamesii</i>		Fibrous-rooted perennial, herb, to 0.06 m high. Fl. green-pink,	Nov to Dec or Jan to Mar.	Peaty sand. Along lake margins, close	P1	N	Habitat not suitable



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="421 861 710 906"><i>Eleocharis keigheryi</i> Photo: G.J. Keighery</p>		Rhizomatous, clumped perennial, grass-like or herb (sedge), to 0.4 m high. Fl. Green.	Aug to Nov.	Clay, sandy loam. Emergent in freshwater: creeks, claypans.	T	N	Habitat not suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="224 821 907 853"><i>Eryngium pinnatifidum</i> subsp. <i>palustre</i> Photo: B.A.Fuhrer &amp; G. Keighery</p>		Erect perennial, herb, 0.15-0.5 m high. Fl. white/blue,	Oct to Nov.	Clay, sandy clay. Claypans, seasonally wet flats.	P3	Y	Habitat suitable
<i>Eryngium</i> sp. <i>Subdecumbens</i> (G.J. Keighery 5390)					P3		No Info


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Eucalyptus arguitifolia</i></p> <p><small>Photos: A.D. Crawford, S.D. Hopper &amp; J.L. Robson</small></p>	Wabling Hill Mallee	(Mallee), 1.5-4 m high, bark smooth. Fl. white,	Mar to Apr..	Shallow soils over limestone. Slopes or gullies of limestone ridges, outcrops	T	N	Geographic range not suitable
<i>Eucalyptus educta</i>		spreading mallee, 3-5 m high, bark rough, 'minni-ritchi'. Fl. cream-yellow,	Apr. Shallow soils.	Granite rocks.	P2	N	Habitat not suitable
<i>Eucalyptus foecunda</i> subsp. <i>foecunda</i>					P4		No Info

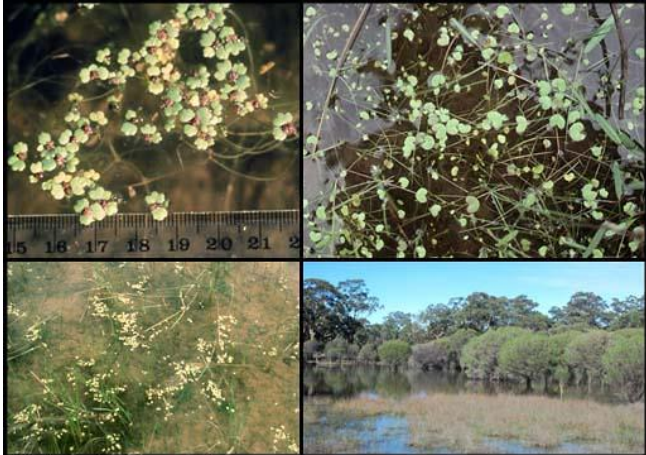
Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="228 826 907 853"><i>Eucalyptus balanites</i> Photos: R. Cranfield, L. Sweedman &amp; S.D. Hopper</p>	<p data-bbox="952 566 1086 630">Cadda Road Mallee</p>	<p data-bbox="1120 526 1310 670">(Mallee), to 5 m high, bark rough, flaky. Fl. White.</p>	<p data-bbox="1332 550 1456 646">Oct to Dec or Jan to Feb.</p>	<p data-bbox="1478 566 1668 630">Sandy soils with lateritic gravel.</p>	<p data-bbox="1713 582 1736 614">T</p>	<p data-bbox="1803 582 1825 614">N</p>	<p data-bbox="1904 566 2038 630">Habitat not suitable</p>
 <p data-bbox="228 1348 907 1375"><i>Grevillea christineae</i> Photos: S.F. Patrick</p>		<p data-bbox="1120 1061 1310 1204">Erect, wiry shrub, 0.5-0.6 m high. Fl. white-cream.</p>	<p data-bbox="1355 1093 1444 1173">Aug to Sep.</p>	<p data-bbox="1478 1093 1668 1173">Clay loam, sandy clay, often moist</p>	<p data-bbox="1713 1117 1736 1149">T</p>	<p data-bbox="1803 1117 1825 1149">N</p>	<p data-bbox="1904 1077 2038 1189">Geographic range not suitable</p>




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<i>Grevillea curviloba</i>		Prostrate to erect shrub, 0.1-2.5 m high. Fl. white-cream.	Aug to Oct.	Grey sand, sandy loam. Winter-wet heath.	T	Y	Habitat suitable
						P3	No Info
						P2	No Info
<i>Haemodorum loratum</i>		Bulbaceous, perennial, herb, 0.45-1.2(-2) m high. Fl. black/brown-black/green,	Nov.	Grey or yellow sand, gravel.	P3	N	Habitat not suitable




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="380 877 750 909"><i>Halgania corymbosa</i> Photo: H. Bowler</p>		Erect shrub, 0.35-1 m high. Fl. blue-purple.	Aug to Nov.	Gravelly soils, soils over granite.	P3	N	Habitat not suitable
<i>Hibbertia leptotheca</i>					P3		No Info


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="244 798 470 826"><i>Hydrocotyle lemnoides</i></p> <p data-bbox="658 798 887 826">Photos: S.D. Hopper &amp; J.L. Robson</p>	Aquatic Pennywort	Aquatic, floating annual, herb. Fl. purple,	Aug to Oct.	Swamps	P4	N	Habitat not suitable
<i>Hydrocotyle striata</i>		Herb. Clay. Springs			P1	N	Habitat not suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Hypolaena robusta</i> Photos: A.D. Crawford</p>		Dioecious rhizomatous, perennial, herb, ca 0.5 m high.	Fl. Sep to Oct.	White sand. Sandplains	P4	Y	Habitat suitable
<i>Isopogon autumnalis</i>	Autumn Isopogon				P3		No Info




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="241 804 450 831"><i>Jacksonia gracillima</i></p> <p data-bbox="779 804 891 831">Photos: R. Davis</p>					P3		No Info
 <p data-bbox="253 1321 439 1345"><i>Jacksonia sericea</i></p> <p data-bbox="757 1321 880 1345">Photo: I.R. Dixon</p>		Low spreading shrub, to 0.6 m high. Fl. Orange.	Usually Dec or Jan to Feb.	Calcareous & sandy soils.	P4	N	Habitat not suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<i>Johnsonia pubescens</i> subsp. <i>cygnorum</i>		Tufted perennial, herb, 0.15-0.25 m high. Fl. white-green.	Sep.	Grey-white-yellow sand. Flats, seasonally-wet sites.	P2	Y	Habitat suitable
 <p><i>Lasiopetalum bracteatum</i></p> <p>Photos: B.A. Fuhrer and A. Ireland</p>	Helena Velvet Bush	Erect, open shrub, 0.4-1.5 m high. Fl. pink-purple,	Aug to Nov.	Sandy clay, clay, lateritic gravel. Along drainage lines, creeks, gullies, granite outcrops.	P4	N	Habitat not suitable
<i>Lasiopetalum glutinosum</i> subsp. <i>glutinosum</i>					P3		No Info
<i>Lasiopetalum membranaceum</i>		Multi-stemmed shrub, 0.2-1 m high. Fl. pink-blue-purple,	Sep to Dec.	Sand over limestone.	P3	N	Habitat not suitable
<i>Lepidium pseudohyssopifolium</i>		Erect annual or perennial, herb,	Fl. Jun to Sep.	Swampy ground.	P1	Y	Habitat suitable


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
		to 0.4(-0.6) m high.					
<i>Lepyrodia curvescens</i>		Dioecious, shortly creeping, tufted rhizomatous, herb, 0.24-0.4 m high, rhizomes on surface or to 1 cm deep.	Fl. Sep to Nov.	Sand, laterite. Seasonally inundated swampland.	P2	Y	Habitat suitable
	Preiss's Stylewort	Annual (ephemeral), herb, 0.03-0.17 m high. Fl. pink-red.	Sep to Dec or Jan.	Grey or black, peaty sand. Swamps.	P1	Y	Habitat suitable

*Levenhookia preissii*

Photo: J. Stevens

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Macarthuria keigheryi</i> Photos: G.J. Keighery</p>		Erect or spreading perennial, herb or shrub, 0.2-0.4 m high, 0.3-0.6 m wide.	Sep to Dec or Feb to Mar.	White or grey sand.	T	Y	Habitat suitable
<i>Meionectes tenuifolia</i>					P3		No Info
<i>Melaleuca viminalis</i>					P2		No Info
<i>Millotia tenuifolia var. laevis</i>		Ascending to erect annual, herb, 0.02-0.1 m high.	Fl. yellow, Sep to Oct.	Granite or laterite soils.	P2	N	Habitat not suitable
<i>Myriophyllum echinatum</i>		Erect annual, herb, 0.02-0.03 m high.	Fl. red, Nov.	Clay. Winter-wet flats.	P3	Y	Habitat suitable
<i>Netrostylis</i> sp. Chandala (G.J. Keighery 17055)					P2		No Info
<i>Ornduffia submersa</i>					P4		No Info




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<i>Persoonia sulcata</i>		Erect, spreading to decumbent shrub, 0.2-1 m high. Fl. yellow,	Sep to Nov.	Lateritic or granitic soils.	P4	N	Habitat not suitable
		Shortly rhizomatous, compactly tufted perennial, grass-like or herb, 0.15-0.4 m high. Fl. cream-white,	Aug to Oct.	White or grey sand, lateritic gravel.	P3	N	Habitat not suitable

*Phlebocarya pilosissima* subsp. *pilosissima* Photo: G.J. Keighery


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="237 810 450 836"><i>Phyllangium palustre</i></p> <p data-bbox="797 815 898 836">Photos: J. Hort</p>		Erect, succulent annual, herb, ca 0.02 m high. Fl. white	Oct to Nov.	Clay. Winter-wet claypans, low-lying seasonal wetlands	P2	Y	Habitat suitable
 <p data-bbox="237 1326 479 1351"><i>Pithocarpa corymbulosa</i></p> <p data-bbox="775 1331 898 1351">Photos: A. Cawley</p>	Corymbose Pithocarpa	Erect to scrambling perennial, herb, 0.5-1 m high. Fl. white,	Jan to Apr.	Gravelly or sandy loam. Amongst granite outcrops	P3	N	Habitat not suitable


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<i>Platysace ramosissima</i>		Perennial, herb, to 0.3 m high. Fl. white-cream,	Oct to Nov.	Sandy soils.	P3	N	Habitat not suitable
<i>Poranthera moorokatta</i>					P2		No Info





Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<p><i>Schoenus benthamii</i></p> 		<p>Tufted perennial, grass-like or herb (sedge), 0.15-0.45 m high. Fl. Brown.</p>	<p>Oct to Nov.</p>	<p>White, grey sand, sandy clay. Winter-wet flats, swamps.</p>	<p>P3</p>	<p>Y</p>	<p>Habitat suitable</p>
<p><i>Schoenus capillifolius</i></p>		<p>Semi-aquatic tufted annual, grass-like or herb (sedge), 0.05 m high. Fl. Green.</p>	<p>Oct to Nov.</p>	<p>Brown mud. Claypans.</p>	<p>P3</p>	<p>N</p>	<p>Habitat not suitable</p>
<p><i>Schoenus griffinianus</i></p>		<p>Small, tufted perennial, grass-like or herb</p>	<p>Fl. Sep to Oct.</p>	<p>White sand</p>	<p>P4</p>	<p>N</p>	<p>Habitat not suitable</p>



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
		(sedge), to 0.1 m high.					
<i>Schoenus pennisetis</i>		 <p>Tufted annual, grass-like or herb (sedge), 0.05-0.15 m high. Fl. purple-black.</p>	Aug to Sep.	Grey or peaty sand, sandy clay. Swamps, winter-wet depressions.	P3	Y	Habitat suitable
<i>Schoenus</i> sp. Waroona (G.J. Keighery 12235)		Tufted annual, grass-like or herb (sedge), 0.02-0.06 m high.	Fl. brown-red-green, Oct to Nov.	Clay or sandy clay. Winter-wet flats	P3	Y	Habitat suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Senecio gilbertii</i> Photo: S.J. Patrick</p>		Erect, slender perennial, herb, to 1.5 m high. Fl. yellow,	Sep to Nov	Peaty sand. Swamps, slopes.	P1	Y	Habitat suitable
<i>Senecio leucoglossus</i>		Erect annual, herb, to 1.3 m high.	Fl. white, Aug to Dec.	Gravelly lateritic or granitic soils. Granite outcrops, slopes.	P4	N	Habitat not suitable
<i>Stachystemon exilis</i>	Slender Stachystemon				P1		No Info

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="219 837 537 869"><i>Stylidium longitubum</i></p> <p data-bbox="537 837 913 869">Photos: M. Hislop and P.G. Armstrong</p>	<p data-bbox="974 566 1075 638">Jumping Jacks</p>	<p data-bbox="1120 534 1299 678">Erect annual (ephemeral), herb, 0.05-0.12 m high. Fl. Pink.</p>	<p data-bbox="1355 566 1433 638">Oct to Dec.</p>	<p data-bbox="1478 550 1668 662">Sandy clay, clay. Seasonal wetlands.</p>	<p data-bbox="1702 590 1736 614">P4</p>	<p data-bbox="1803 590 1836 614">Y</p>	<p data-bbox="1915 566 2027 638">Habitat suitable</p>
<p data-bbox="436 1109 683 1141"><i>Stylidium paludicola</i></p>		<p data-bbox="1120 877 1299 1372">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.</p>	<p data-bbox="1355 1093 1433 1165">Oct to Dec.</p>	<p data-bbox="1478 997 1668 1260">Peaty sand over clay. Winter wet habitats. Marri and Melaleuca woodland, Melaleuca shrubland.</p>	<p data-bbox="1702 1109 1736 1133">P3</p>	<p data-bbox="1803 1109 1836 1133">Y</p>	<p data-bbox="1915 1093 2027 1165">Habitat suitable</p>

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment	
		Scape mostly glabrous, inflorescence axis glandular. Inflorescence racemose. Fl. Pink.						
 <p data-bbox="192 1219 416 1254"><i>Stylidium striatum</i></p> <p data-bbox="846 1219 949 1254">Photos: J. W</p>		Fan-leaved Triggerplant	Rosetted perennial, herb, 0.15-0.55 m high, Leaves erect, oblanceolate to spatulate, 1.5-4 cm long, 1.5-6 mm wide, apex acute to acuminate, margin entire, glabrous, striate. Scape sparingly glandular on inflorescence axis, glabrous below.	Fl. yellow, Oct to Nov.	Brown clay loam over laterite. Hillslopes. Jarrah/Marri forest, Wandoo woodland.	P4	N	Habitat not suitable




Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<i>Stylidium trudgenii</i>		Caespitose perennial, herb, 0.05-0.5 m high.		Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions.	P3	Y	Habitat suitable


*Styphelia filifolia*





P3


No Info



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="235 805 896 837"><i>Synaphea</i> sp. Fairbridge Farm (D. Papenfus 696) Photos: R. Butcher</p>		<p data-bbox="1108 518 1310 662">Dense, clumped shrub, to 0.3 m high, to 0.4 m wide. Fl. Yellow.</p>	<p data-bbox="1355 574 1422 606">Oct.</p>	<p data-bbox="1467 478 1691 702">Sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses.</p>	<p data-bbox="1691 574 1736 606">T</p>	<p data-bbox="1803 574 1848 606">Y</p>	<p data-bbox="1904 558 2027 622">Habitat suitable</p>


Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
		Spreading shrub, 0.1-0.3 m high. Fl. purple,	Aug to Oct.	Gravelly soils.	P3	N	Habitat not suitable



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="219 831 488 863"><i>Theelymitra dedmanianum</i></p> <p data-bbox="577 831 913 863">Photos: A.P. Brown, N. Hoffman &amp; J.L. Robson</p>	Cinnamon Sun Orchid	Tuberous, perennial, herb, to 0.8 m high.	Fl. yellow, Nov to Dec or Jan.	Granite.	T	N	Habitat not suitable
 <p data-bbox="219 1369 488 1401"><i>Theelymitra magnifica ms</i></p> <p data-bbox="801 1369 913 1401">Photos: J. Brown</p>	Crystal Brook Star Orchid	Perennial, herb.		Stony ridges.	T	N	Habitat not suitable



Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="215 842 414 873"><i>Thelymitra stellata</i></p> <p data-bbox="658 842 920 873">Photos: A.P. Brown &amp; I. &amp; M. Greeve</p>	Star Orchid	Tuberous, perennial, herb, 0.15-0.25 m high. Fl. yellow & brown.	Oct to Nov.	Sand, gravel, lateritic loam.	T	N	Habitat not suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p data-bbox="215 837 432 871"><i>Thelymitra variegata</i></p> <p data-bbox="651 837 920 871">Photos: S.D. Hopper &amp; G. Brunnbauer</p>	Queen of Sheba	Tuberous, perennial, herb, 0.1-0.35 m high. Fl. orange & red & purple & pink,	Jun to Sep.	Sandy clay, sand, laterite.	P2	N	Habitat not suitable
 <p data-bbox="259 1332 432 1361"><i>Thysanotus anceps</i></p> <p data-bbox="757 1332 875 1361">Photos: A. Ireland</p>		Rhizomatous, leafless perennial, herb, to 0.4 m high	Fl. purple, Oct to Dec.	White or grey sand, lateritic gravel, laterite.	P3	N	Habitat not suitable

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
<i>Thysanotus brachiatus</i>		Rhizomatous, leafless perennial, herb, to 0.3 m high.	Fl. purple Nov to Dec.	Grey sand.	P2	N	Geographic range not suitable
 <p><i>Thysanotus glaucus</i> Photos: N.H. Brittan</p>		Caespitose, glaucous perennial, herb, 0.1-0.2 m high. Fl. purple	Oct to Dec or Jan to Mar.	White, grey or yellow sand, sandy gravel.	P4	N	Habitat not suitable
<i>Tricostularia drummondii</i>	Drummond's Tricostularia				P3		No Info

Species Name	Common Name	Description	Flowering Period	Habitat Type	Cons code	Likelihood (Y/N)	Comment
 <p><i>Trithuria occidentalis</i></p> <p>Photo: G.J. Keighery</p>	<p>Swan Hydatella</p>				<p>T</p>		<p>No Info</p>
 <p><i>Verticordia lindleyi</i> subsp. <i>lindleyi</i></p> <p>Photos: G. Cockerton</p>		<p>Erect shrub, 0.2-0.75 m high. Fl. Pink.</p>	<p>May or Nov to Dec or Jan.</p>	<p>Sand, sandy clay. Winter-wet depressions.</p>	<p>P4</p>	<p>Y</p>	<p>Habitat suitable</p>



## Appendix 3: Conservation Codes

### Western Australia

Conservation Code	Name	Description
T	Threatened	Flora or fauna that is rare or likely to become extinct, ranked according to their level of threat using IUCN Red List criteria (Schedules 1-3 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
CR	Critically endangered	Species considered to be facing an extremely high risk of extinction within the wild in the immediate future
EN	Endangered	Species considered to be facing a very high risk of extinction in the wild in the near future
VU	Vulnerable	Species considered to be facing a high risk of extinction in the wild in the medium-term future
EX	Extinct Species	Species where 'there is no reasonable doubt that the last member of the species has died (Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice or the Wildlife Conservation (Rare Flora) Notice)
EW	Extinct in the Wild	Species that are known to only survive in cultivation, in captivity, or as a naturalised population well outside its past range; and it has not been recorded in its known or expected habitat at appropriate seasons anywhere in its past range, despite surveys over a timeframe appropriate to its life cycle and form
MI	Migratory Species	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 (Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice)
CD	Conservation Dependent	Species of special conservation interest (conservation dependent fauna), being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened (Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice)
OS	Specially Protected	Fauna otherwise in need of special protection to ensure their conservation (Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice)
P	Priority Species	Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora. Species that are adequately known, are rare but not threatened, or

Conservation Code	Name	Description
		meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.
P1	Priority One	Poorly known species – Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either very small or on lands not managed for conservation, such as road verges, urban areas, farmland, active mineral lease and under threat of habitat destruction or degradation.
2	Priority Two	Poorly known species – Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, such as national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves and similar.
3	Priority Three	Poorly known species – Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat
4	Priority Four	Rare or near threatened and other species in need of monitoring.

(Source: DBCA, 2020)

#### Commonwealth

Category	Description
<b>Critically Endangered</b>	Species facing an extremely high risk of extinction in the wild in the immediate future
<b>Endangered</b>	Species facing a very high risk of extinction in the wild in the near future
<b>Vulnerable</b>	Species facing a high risk of extinction in the wild in the medium term

(Source: DBCA, 2020)

## Appendix 4: Quadrat Data

Quadrat No.:	Q1
Survey Date:	23/06/2023
Personnel:	KG, JVS
Latitude:	-31.855825
Longitude:	115.924475
Topography:	Slight Slope
Aspect:	Southwest
Slope:	1-3%
Soil:	Brown- grey sand
Gravel:	0%
Rock:	0%
Leaf Litter:	5%
Bare Ground:	5%
Drainage:	Well
Condition:	Degraded



Notes: *Adenanthos cygnorum* Shrubland

Species	Cover (%)	Height (m)
<i>*Acacia longifolia</i> subsp. <i>sophorae</i>	5	2.5
<i>*Ehrharta calycina</i>	10	0.3
<i>*Ehrharta longiflora</i>	1	0.2
<i>*Euphorbia terracina</i>	1	0.1
<i>*Gladiolus caryophyllaceus</i>	1	0.1
<i>*Sonchus oleraceus</i>	0.1	0.1
<i>Acacia stenoptera</i>	1	0.1
<i>Adenanthos cygnorum</i>	30	2
<i>Bossiaea eriocarpa</i>	1	0.2
<i>Calytrix fraseri</i>	5	1
<i>Daviesia triflora</i>	1	0.5
<i>Desmocladus flexuosus</i>	30	0.1
<i>Hibbertia hypericoides</i>	1	0.2
<i>Jacksonia floribunda</i>	1	0.5

<b>Species</b>	<b>Cover (%)</b>	<b>Height (m)</b>
<i>Laxmannia squarrosa</i>	1	0.1
<i>Patersonia occidentalis</i>	1	0.3
<i>Phlebocarya ciliata</i>	30	0.2
<i>Stirlingia latifolia</i>	1	0.2

Note: \*denotes introduced species.



**Quadrat No.: Q2**

Survey Date: 23/06/2023  
 Personnel: KG, JVS  
 Latitude: -31.856248  
 Longitude: 115.924555  
 Topography: Slight Slope  
 Aspect: Southwest  
 Slope: 1-3%  
 Soil: Brown- grey sand  
 Gravel: 0%  
 Rock: 0%  
 Leaf Litter: 0%  
 Bare Ground: 5%  
 Drainage: Well  
 Condition: Degraded

Notes: *Xanthorrhoea preissii* Shrubland

Species	Cover (%)	Height (m)
<i>*Ehrharta calycina</i>	10	0.3
<i>*Erigeron bonariensis</i>	1	0.2
<i>*Euphorbia terracina</i>	1	0.1
<i>*Gladiolus caryophyllaceus</i>	1	0.1
<i>*Sonchus oleraceus</i>	1	0.1
<i>Bossiaea eriocarpa</i>	1	0.1
<i>Calytrix fraseri</i>	10	1
<i>Desmodium flexuosus</i>	30	0.1
<i>Eremaea pauciflora</i>	20	0.3
<i>Gompholobium tomentosum</i>	1	0.2
<i>Hibbertia hypericoides</i>	1	0.2
<i>Jacksonia floribunda</i>	1	1
<i>Lechenaultia floribunda</i>	2	0.2
<i>Lyginia imberbis</i>	1	0.3
<i>Xanthorrhoea preissii</i>	15	0.7

**Quadrat No.: Q3**

Survey Date: 23/06/2023  
 Personnel: KG, JVS  
 Latitude: -31.856879  
 Longitude: 115.924608  
 Topography: Slight Slope  
 Aspect: Southwest  
 Slope: 1-3%  
 Soil: Brown sand  
 Gravel: 0%  
 Rock: 0%  
 Leaf Litter: 50%  
 Bare Ground: 50%  
 Drainage: Well  
 Condition: Degraded



Notes: Mixed *Eucalyptus* spp. Open Woodland (Landscaped, Mulching understorey)

Species	Cover (%)	Height (m)
<i>*Brassica tournefortii</i>	0.1	0.1
<i>*Ehrharta longiflora</i>	0.1	0.1
<i>*Euphorbia terracina</i>	0.1	0.1
<i>*Gladiolus undulatus</i>	0.2	0.2
<i>*Sonchus oleraceus</i>	0.1	0.1
<i>Agonis flexuosa</i>	1	3
<i>Corymbia calophylla</i>	10	10
<i>Eremophila glabra</i>	0.2	0.2
<i>Eucalyptus rudis</i>	15	15
<i>Eucalyptus</i> sp. 2	3.5	5

## Appendix 5: Species List

The complete flora list for the site is provided in the table below with flora listed by species, and vegetation type they occurred within indicated. \*Denotes introduced species

Family	Species Name	Common Name
Brassicaceae	* <i>Brassica tournefortii</i>	Mediterranean Turnip
Poaceae	* <i>Ehrharta calycina</i>	Perennial Veldt Grass
Poaceae	* <i>Ehrharta longiflora</i>	Annual Veldt Grass
Poaceae	* <i>Eragrostis curvula</i>	African Lovegrass
Asteraceae	* <i>Erigeron bonariensis</i>	
Geraniaceae	* <i>Erodium botrys</i>	Long Storksbill
Euphorbiaceae	* <i>Euphorbia terracina</i>	Geraldton Carnation Weed
Papaveraceae	* <i>Fumaria capreolata</i>	Whiteflower Fumitory
Iridaceae	* <i>Gladiolus caryophyllaceus</i>	Wild Gladiolus
Iridaceae	* <i>Gladiolus undulatus</i>	Wild Gladiolus
Oxalidaceae	* <i>Oxalis pes-caprae</i>	Soursob
Geraniaceae	* <i>Pelargonium capitatum</i>	Rose Pelargonium
Poaceae	* <i>Poa annua</i>	Winter Grass
Asteraceae	* <i>Sonchus oleraceus</i>	Common Sowthistle
Asteraceae	* <i>Ursinia anthemoides</i>	Ursinia
Fabaceae	* <i>Vicia sativa</i>	Common Vetch
Fabaceae	<i>Acacia applanata</i>	
Fabaceae	<i>Acacia pulchella</i>	Prickly Moses
Fabaceae	<i>Acacia saligna</i>	Orange Wattle
Fabaceae	<i>Acacia stenoptera</i>	Narrow Winged Wattle
Proteaceae	<i>Adenanthos cygnorum</i>	Common Woollybush
Myrtaceae	<i>Agonis flexuosa</i>	Peppermint
Restionaceae	<i>Alexgeorgea nitens</i>	
Casuarinaceae	<i>Allocasuarina humilis</i>	Dwarf Sheoak
Proteaceae	<i>Banksia littoralis</i>	Swamp Banksia
Fabaceae	<i>Bossiaea eriocarpa</i>	Common Brown Pea
Myrtaceae	<i>Calytrix fraseri</i>	Pink Summer Calytrix
Myrtaceae	<i>Corymbia calophylla</i>	Marri
Fabaceae	<i>Daviesia triflora</i>	

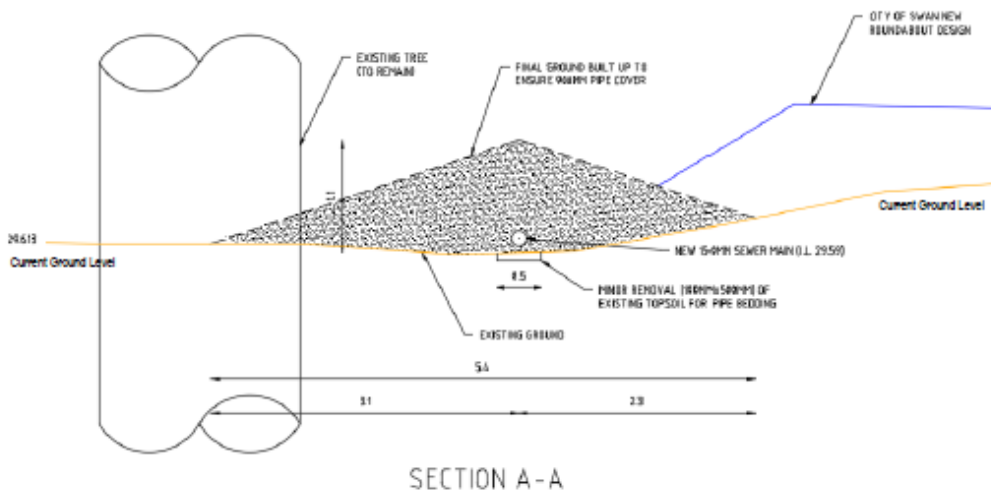
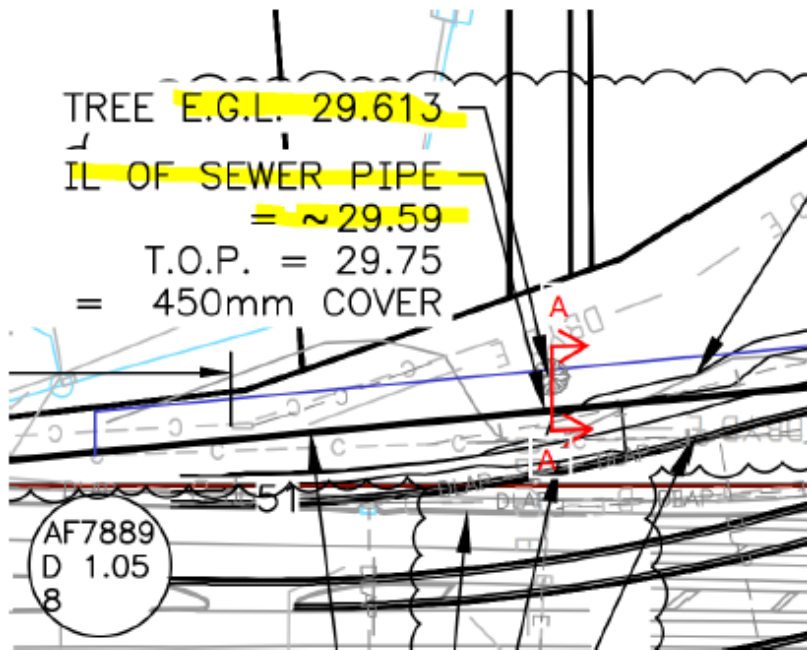
<b>Family</b>	<b>Species Name</b>	<b>Common Name</b>
Restionaceae	<i>Desmocladus flexuosus</i>	
Myrtaceae	<i>Eremaea pauciflora</i>	
Scrophulariaceae	<i>Eremophila glabra</i>	Tar Bush
Myrtaceae	<i>Eucalyptus rudis</i>	Flooded Gum
Myrtaceae	<i>Eucalyptus</i> sp. 1	
Myrtaceae	<i>Eucalyptus</i> sp. 2	
Fabaceae	<i>Gompholobium tomentosum</i>	Hairy Yellow Pea
Dilleniaceae	<i>Hibbertia hypericoides</i>	Yellow Buttercups
Restionaceae	<i>Hypolaena exsulca</i>	
Fabaceae	<i>Jacksonia floribunda</i>	Holly Pea
Asparagaceae	<i>Laxmannia squarrosa</i>	Paper Lily
Goodeniaceae	<i>Lechenaultia floribunda</i>	Free-flowering Leschenaultia
Anarthriaceae	<i>Lyginia imberbis</i>	
Myrtaceae	<i>Melaleuca raphiophylla</i>	Swamp Paperbark
Iridaceae	<i>Patersonia occidentalis</i>	Purple Flag
Haemodoraceae	<i>Phlebocarya ciliata</i>	
Myrtaceae	<i>Regelia ciliata</i>	
Proteaceae	<i>Stirlingia latifolia</i>	Blueboy
Ericaceae	<i>Styphelia pallida</i>	Kick Bush
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>	Grass tree



## **Appendix 6: Malaga Sewer Methodology – Adjacent Tree**

MALAGA SEWER METHODOLOGY – ADJACENT TREE

- The identified tree will be flagged and demarcated during works
- Remove existing vegetation along the proposed alignment will be completed using a 14T excavator. An arborist will be used as required for minor trimming. (Refer image on 2<sup>nd</sup> page).
- The sewer pipe has been moved to its extreme point in the design. To its most easterly location to avoid the tree.
- Remove topsoil (approx 5.4m width) with 14T excavator.
- Carry out minor topsoil disturbance for leveling (~100mm D x 500mm W) under the proposed sewer pipe for the placement of bedding material and leveling ground.
- Install new pipe at current ground level.
- The new pipe will be backfill as per Section A-A (below) using 14T. Placing and compacting the fill material.



**MALAGA SEWER METHODOLOGY – ADJACENT TREE**

The planned works propose to leave the large old growth tree, with no damage to the roots or system.

