Natural Area
CONSULTING MANAGEMENT SERVICES

Department of Planning, Lands and Heritage

Breakwater Flora, Vegetation and Black Cockatoo Habitat Assessment

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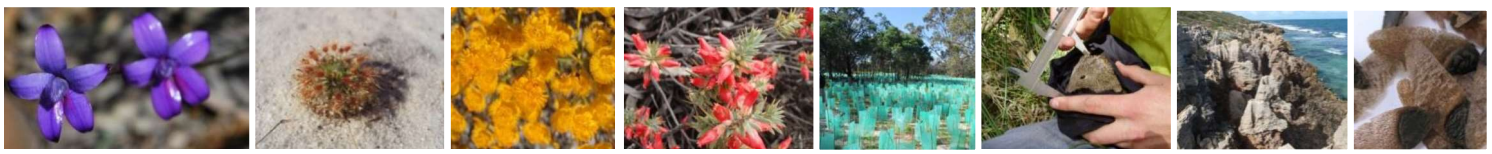

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Executive Summary

Natural Area Consulting Management Services (Natural Area) was commissioned by the Department of Planning, Lands and Heritage to undertake a basic flora and vegetation survey along with a black cockatoo assessment for a proposed fence installation along Breakwater Drive in Two Rocks, within the City of Wanneroo. Outcomes of the survey activities will inform a clearing permit application associated approvals for the proposed works.

Survey outcomes confirmed:

- a total of 65 flora species present from 29 families
- a total of 50 native flora species and 15 non-native species (weeds)
- one Priority 2 flora species (*Acacia benthamii)*
- three vegetation types, namely Tuart Woodland, Banksia Woodland and Coastal Shrubland
- vegetation condition ranging from Completely Degraded to Good, with majority of the site being Completely Degraded
- no Threatened or Priority Ecological Communities present
- a total of 11 Tuart trees assessed to be potential habitat trees, with diameter at breast height (DBH) greater than 500 mm
- two habitat trees with hollows that are of a suitable size to be utilised by black cockatoos, and one with small hollows that could potentially grow to a suitable size in the future
- no black cockatoo nesting or roosting activities were observed.

Given the low impact of the proposed works and ability to avoid conservation significant flora and mature trees, loss of black cockatoo habitat is unlikely and impacts to the environment will be minimal. The upgrading of the existing fence will also provide an additional barrier against anthropogenic disturbance and provide better land management through controlled access.

The proposed fence can be constructed around the one individual *Acacia benthamii,* found within the survey area. Spacing and alignment between the fence posts can accommodate the small shrub without sacrificing its function or damage the flora.

Contents

1.0 Introduction

Natural Area Consulting Management Services (Natural Area) was commissioned by the Department of Planning, Lands and Heritage to undertake the preparation and submission of a clearing permit, for the purpose of installing and upgrading the fence-line along Breakwater Drive, Two Rocks. Works included a basic flora survey to provide an overview of the flora and vegetation values present, as well as black cockatoo habitat assessment to inform the clearing permit application process.

1.1 Location

Breakwater Drive is situated in the suburb of Two Rocks within the City of Wanneroo, approximately 60 km north of the Perth Central Business District. The proposed site covers approximately 0.6 ha and extends in a linear fashion along Breakwater Drive, before extending along an existing fence adjacent to firebreaks, following the western edge of Breakwater Estate (Figure 1). The southern alignment terminates just south of Cinnamon Park (Lot No. 1003), while the northern fence alignment runs along Breakwater Drive and Birdsong Gate, before following an existing firebreak and terminating west of Harvest Park (Lot 15473).

1.2 Scope

Activities undertaken by Natural Area included:

- desktop database searches to identify potential conservation significant flora and fauna species, along with any ecological communities occurring within the proposed alignment
- a basic flora and vegetation assessment to determine vegetation type and condition, and flora species present, including the presence of any threatened and/or priority species
- a black cockatoo assessment to record sightings of threatened black cockatoos and/or evidence of their presence and habitats
- reporting outcomes of the assessment activities.

1.3 Objectives

The objective of the survey was to collect sufficient data to adequately to support a clearing permit application, to be submitted to the Department of Water and Environmental Regulation under the Environmental Protection (Native Vegetation) Regulations 2004 ahead of the proposed fence installation along Breakwater Drive.

The flora survey aimed to determine:

- the extent and boundaries of vegetation types and condition
- flora species (native and introduced) present
- the location of declared rare or priority flora
- presence of any Threatened and/or Priority Ecological Communities.

The black cockatoo assessment aimed to determine:

- presence of black cockatoos and/or black cockatoo habitat
- the presence of foraging and nesting habitat (trees with a diameter at breast height (DBH) >500 mm) for threatened black cockatoos.

2.0 Site Characteristics

The characteristics of a site have a strong bearing on the flora, vegetation, fauna, and ecological communities present. Key characteristics such as climate, topography and soil types are outlined in this section.

2.1 Regional Context

According to the Interim Biogeographical Regionalisation of Australia (IBRA) descriptions, the proposed site is located within the Swan Coastal Plain. This area is described as a low-lying coastal plain with sands of colluvial and aeolian origin, as well as alluvial river flats and coastal limestone. The region is dominated by *Banksia* and/or Jarrah Woodland over sandy soils associated with the dune systems, with Paperbark (*Melaleuca*) in swampy/damp areas and Jarrah Woodland to the east where the Swan Coastal Plain rises (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 (2021); Gingin Aero, site number 009178 (2021), the region has an average:

- Rainfall of 620.7 mm pa, with rain falling predominantly between June and August
- Maximum temperature ranging from 18.4 ^{o}C in winter to 33.1 ^{o}C in summer, with a maximum Recorded temperature of 46.3 ^{o}C
- Minimum temperatures ranging from 6.4 ^{o}C in winter to 17.1 ^{o}C in summer, with a minimum recorded temperature of -3.7 ^{o}C
- Predominant wind directions include morning easterlies and westerly sea breezes during the summer months, with an average wind speed of 19.3 km/h and gusts of more than 90 km/h during storm events.

2.3 Topography and Soils

Five soil types are present on site and identified using the National Resource Info (NRInfo) Portal (Department of Primary Industries and Regional Development, 2020) (Table 1 and Figure 2 - 4). Site contours range from 16 Australian Height Datum (AHD) in the south and rises to 46 AHD to the north, with undulations (14 - 42 AHD) along Breakwater Drive (Figures 2 - 4).

Table 1: Soil Types

Name	Symbol	Description
Karrakatta Sand Yellow Phase	211Sp_Ky	Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. *Banksia spp*. woodland with scattered emergent *E. gomphocephala* and *E. marginata* and a dense shrub layer.
Karrakatta shallow soils Phase	211Sp_Kls	Low hills and ridges. Bare limestone or shallow siliceous or calcareous sand over limestone. Dense low shrub dominated by *Banksia sessilis*, *Melaleuca huegelii* and *Grevillea spp*.

Name	Symbol	Description
Quindalup South oldest dune Phase	211Qu_Q1	The oldest phase. Dunes or remnants with low relief. Calcareous sands have organic staining to about 30 cm, overlying pale brown sand with definite cementation below 1 m.
Quindalup South shallow sand flat phase	211Qu_Qs	Undulating landscapes with shallow calcareous sands over limestone and much rock outcrop.
Spearwood Sand Phase	211Sp_Sp	Irregular banks of karst depressions. Some limestone outcrops. Shallow brown sands. *Banksia spp*. Woodland with emergent *E. gomphocephala* and *E. marginata*; dense shrub layer.

2.4 Vegetation Complex

Two vegetation complexes, as described by Heddle et al (1980), were identified within the survey area. They include the Cottesloe Complex-North and Quindalup Complex vegetation complexes (Table 2).

Table 2: Vegetation Complexes

Name	Description
Cottesloe Complex - North	Predominantly low open forest and low woodland of *B. attenuate – B. menziesii – E. todtiana*; closed heath on the limestone outcrops
Quindalup Complex	Coastal dune complex consisting mainly of two alliances – the strand and fore dune alliance and the mobile and stable dune alliance. Local variations include the low closed forest of *M. lanceolata – Callitris preissii* and the closed scrub of *Acacia rostellifera.*

Source: Western Australian Local Government Association, 2020

2.5 Tenure and Current Land Use

According to the District Planning Scheme (DPS) Number 2 (City of Wanneroo 2021), the proposed area lies on the boundary of Lot No. 203, which is zoned as Regional Parks and Recreation. Lot 203 also forms part of Bush Forever Site 284, which form the south-west Link from Wilbinga to Yanchep National Park (Government of Western Australia. 2000).

Figure 1:
Site Location
Breakwater Drive, Two Rocks

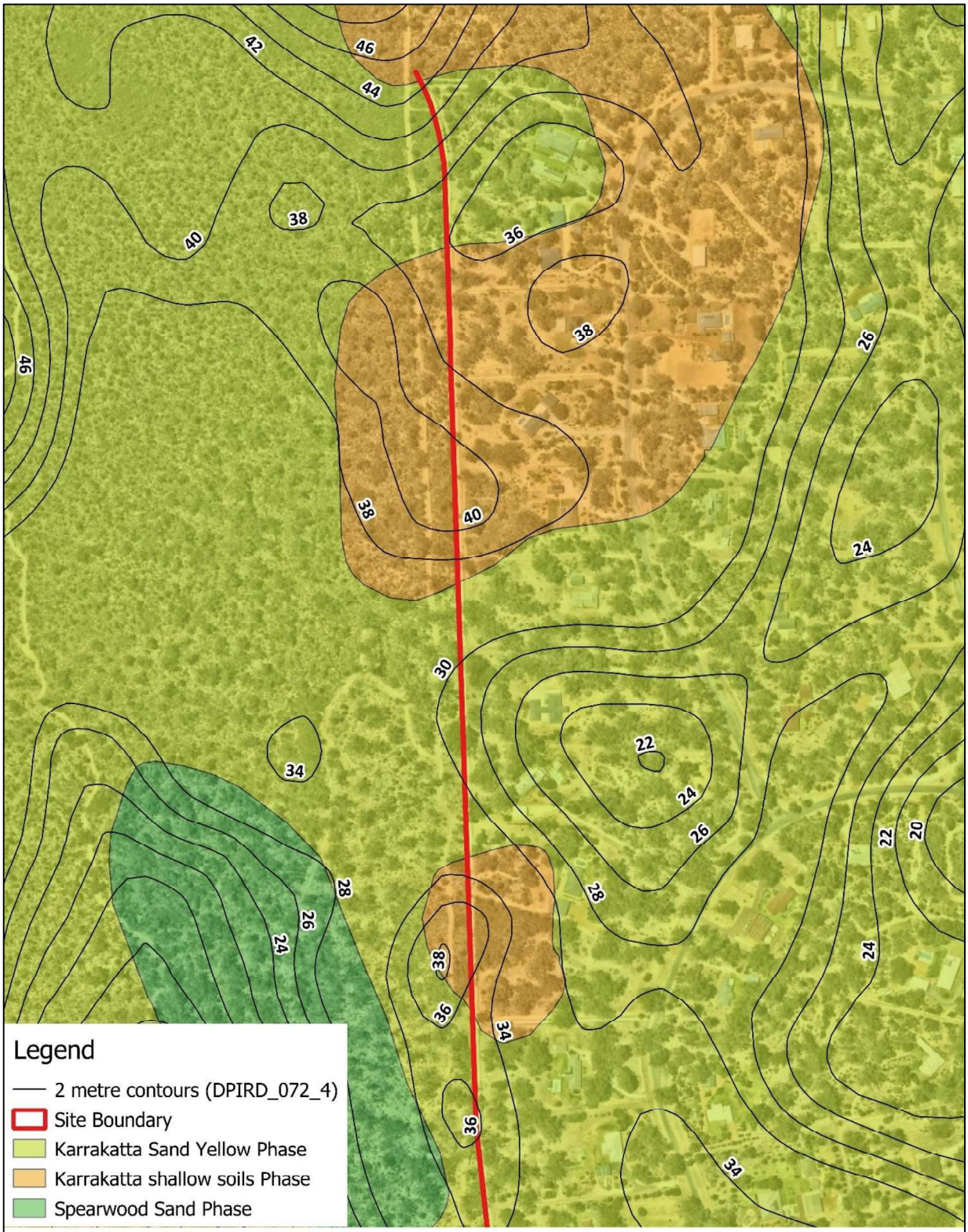


Figure 2:
Soil Types and Contours
Breakwater Drive, Two Rocks

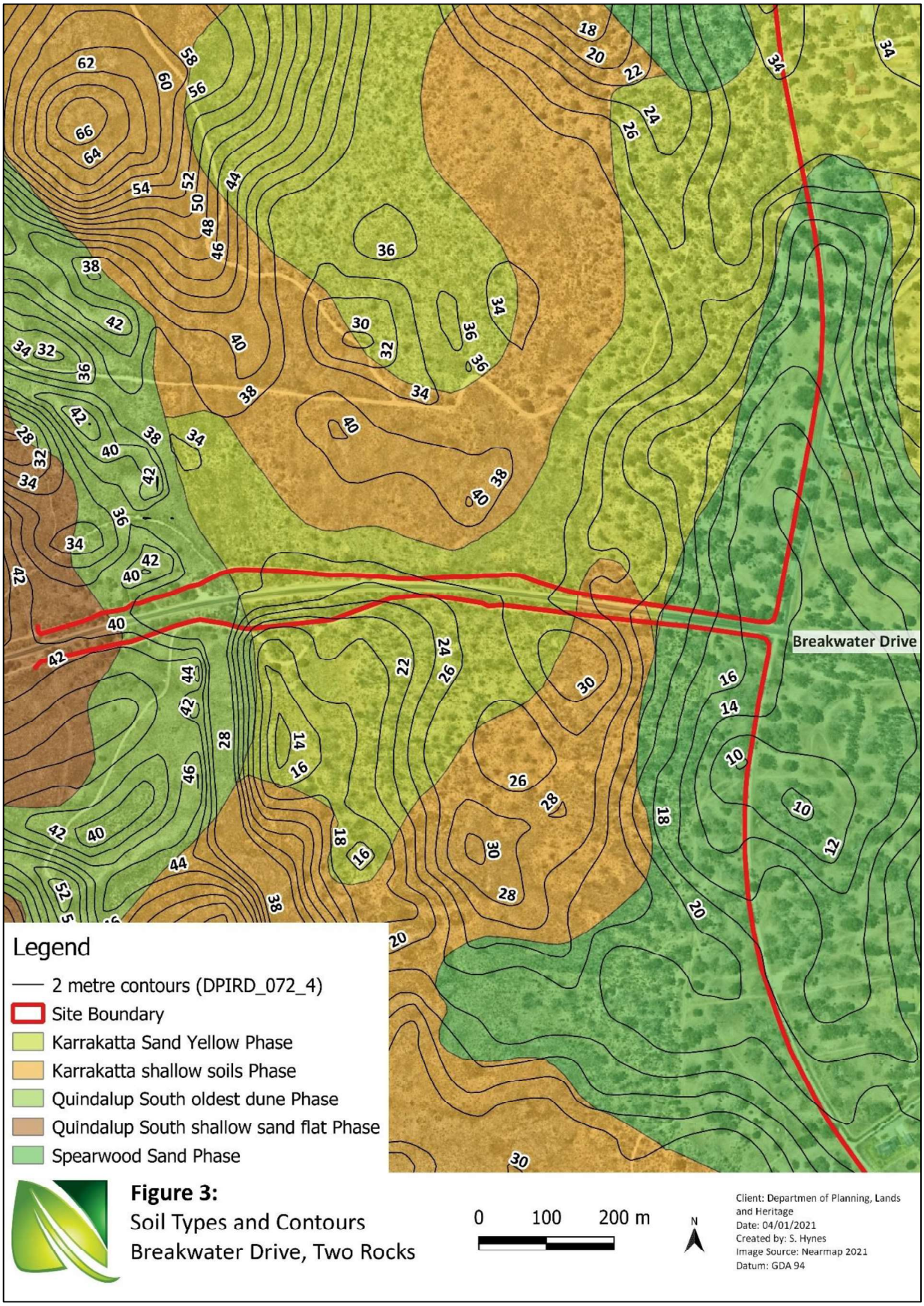


Figure 3:
Soil Types and Contours
Breakwater Drive, Two Rocks

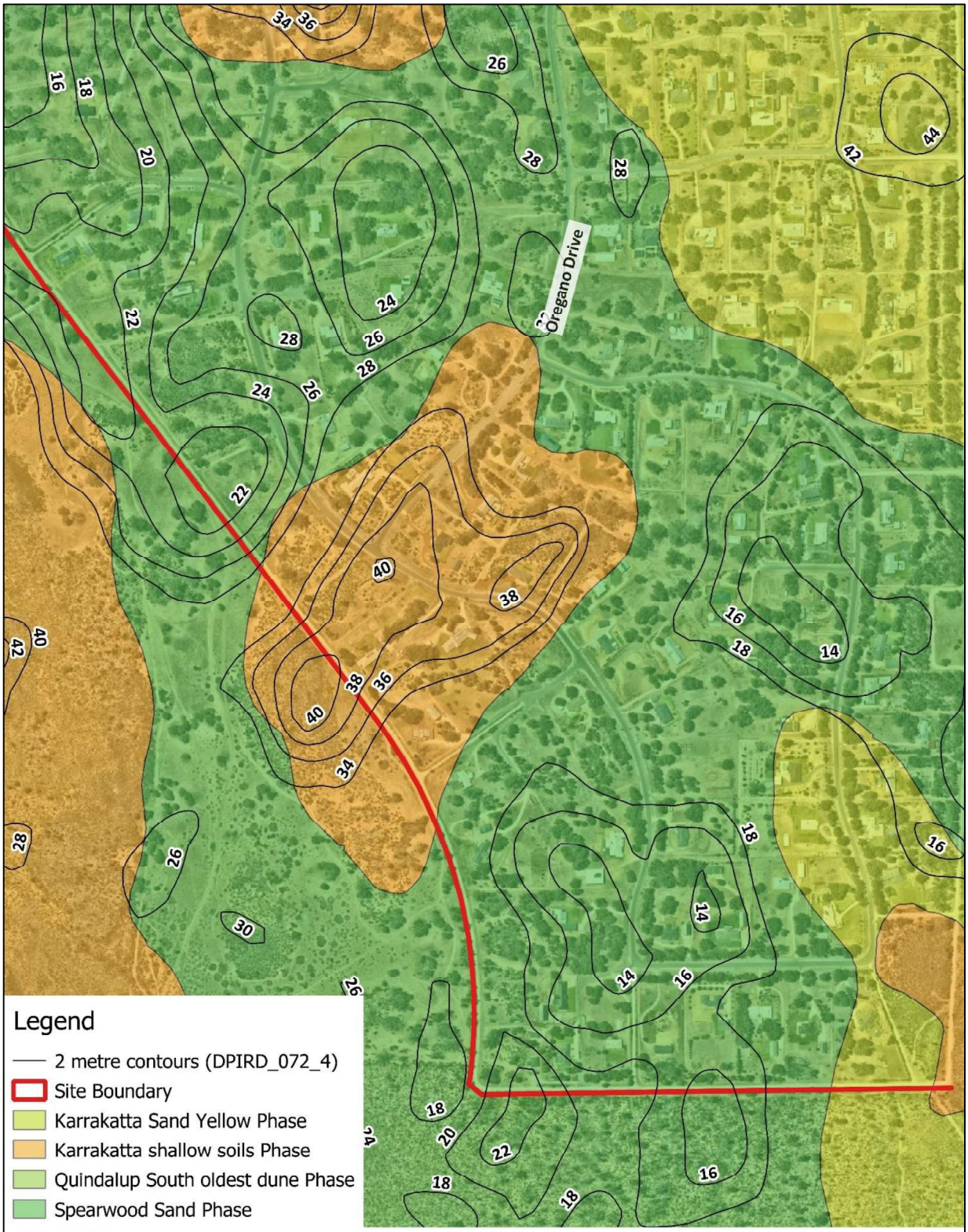


Figure 4:
Soil Types and Contours
Breakwater Drive, Two Rocks

3.0 Methodology

The basic flora and vegetation survey along with the black cockatoo habitat assessment methodologies undertaken by Natural Area are outlined in this section.

3.1 Desktop and Literature Review

Desktop surveys were undertaken to determine:

- 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, 2021b) (Appendix 1)
- Protected Matters Search Tool (Department of Agriculture, Water and the Environment, 2021), (Appendix 2)
- National Map to determine to determine soil types (Department of Primary Industries and Regional Development, 2021), IBRA subregions
- FloraBase (Department of Biodiversity, Conservation and Attractions, 2021a).

3.2 On-ground Flora Survey

Natural Area [redacted] surveyed the site on 20 January 2021, with key GPS data recorded using Mappt software on a handheld tablet. Field activities included:

- walking the site and identifying flora species present, including targeting declared rare and priority species indicated as potentially present during desktop assessments
- assessing vegetation condition across the site
- using a GPS to map significant species and boundaries of differing vegetation types and condition
- determining the presence of any further threatened or priority listed flora species and/or ecological communities listed under the *Biodiversity and Conservation Act 2016* (WA) and/or the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).

The flora and vegetation surveys were carried out in accordance with *EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (Environmental Protection Authority, 2016). Samples were collected and any unfamiliar species were recorded and photographed to enable later identification.

3.2.1 Vegetation Type

The vegetation type was determined using the structural classes described in *Bush Forever Volume 2* (Government of Western Australia, 2000), and records dominant over, middle and understorey species (Table 3).

Table 3: Vegetation structural classes

Life Form/Height Class	**Canopy Percentage Cover**			
	100 – 70%	**70 – 30%**	**30 – 10%**	**10 – 2 %**
Trees over 30 m	Tall closed forest	Tall open forest	Tall woodland	Tall open woodland
Trees 10 – 30 m	Closed forest	Open forest	Woodland	Open woodland
Trees under 10 m	Low closed forest	Low open forest	Low woodland	Low open woodland
Tree Mallee	Closed tree mallee	Tree mallee	Open tree mallee	Very open tree mallee
Shrub Mallee	Closed shrub mallee	Shrub mallee	Open shrub mallee	Very open shrub mallee
Shrubs over 2 m	Closed tall scrub	Tall open scrub	Tall shrubland	Tall open shrubland
Shrubs 1 – 2 m	Closed heath	Open heath	Shrubland	Open shrubland
Shrubs under 1 m	Closed low heath	Open low heath	Low shrubland	Low open shrubland
Grasses	Closed grassland	Grassland	Open grassland	Very open grassland
Herbs	Closed herbland	Herbland	Open herbland	Very open herbland
Sedges	Closed sedgeland	Sedgeland	Open sedgeland	Very open sedgeland

(Source: Government of Western Australia, 2000)

3.2.2 Vegetation Condition

Vegetation condition was assessed using the rating scale attributed to Keighery in *Bush Forever Volume 2* (Table 4) (Government of Western Australia, 2000).

Table 4: Vegetation condition ratings

Category		**Description**
1	Pristine	Pristine or nearly so, no obvious signs of disturbance.
2	Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
3	Very Good	Vegetation structure altered, obvious signs of disturbance. For example, 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. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, 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. For example, disturbance to vegetation structure caused by

Category		Description
		very frequent fires, the presence of very aggressive weeds, 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: Government of Western Australia, 2000)

3.3 On-ground Fauna Survey

A black cockatoo habitat assessment was undertaken in conjunction with the basic flora and vegetation survey. GPS data was recorded using Mappt software on a handheld tablet. The following data was collected and recorded:

- locations of habitat trees with a diameter at breast height (DBH) of > 500 mm
- location of habitat trees with the potential to provide foraging, roosting or hollows for threatened black cockatoos
- recording of the species of the habitat trees
- recording direct sightings of birds within the survey area
- a photograph of each habitat tree and its canopy.

The black cockatoo habitat assessment was carried out in accordance with *EPBC Act referral guidelines for three threatened black cockatoo species* guidelines (Department of Sustainability, Environment, Water, Population and Communities, 2012).

3.4 Limitations

Several limitations associated with both desktop and on-ground flora and fauna surveys exist, including:

- database searches provide an indication of what flora species may be present, with on ground surveys required to confirm those present
- information on flora species provided on some databases include out-of-date species names, meaning that names need to be checked for currency
- herbarium records are largely limited to vouchered specimens
- plant species flower at different times and are not always able to be identified
- on-ground surveys indicate species present at the time of the assessment, with species flowering at different times not always able to be identified
- not all species flower annually
- the differing databases are reliant on information submitted via various reporting mechanisms, so all records of a particular species or ecological community within a specified area may not be complete
- survey was carried out in summer, which is not the optimal period to carry out flora surveys in the Swan Coastal Plain, as most species will not be flowering and annual species may not present.

Despite these limitations, Natural Area estimates that 80 – 90% of flora species within the survey area were identified.

4.0 Results

Survey works for the proposed Breakwater fence included both desktop and field activities, with outcomes presented in this section.

4.1 Flora Desktop Survey

A review of the NatureMap report (Department of Biodiversity, Conservation and Attractions, 2021b) (Appendix 1) indicated the potential for 279 flora species to occur within 5 km of the Breakwater Drive site, comprising:

- 213 dicotyledons
- 66 monocotyledons.

4.1.1 Significant Flora Species

Of the flora species identified, NatureMap indicated the potential for nine conservation significant flora species listed under the *Biodiversity Conservation Act 2016* (WA) to occur within 5 km of the site (Department of Biodiversity Conservation and Attractions, 2021b). A review of the Protected Matters Search Tool (PMST) (Department of Agriculture, Water and the Environment, 2021) indicated the potential for 3 flora species listed as Matters of National Environmental Significance, under the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) (Cwlth), to occur within a 5 km radius of the site.

Table 5 provides a list of conservation significant species with the potential to be present, along with their conservation code and corresponding database source. Conservation code definitions for the State and Commonwealth are provided in Appendix 3.

Table 5: Potential threatened and priority species

Species	Common Name	Conservation Code	NatureMap	PMST
Acacia benthamii		P2	x	
Calandrinia oraria		P3	x	
Conostylis pauciflora subsp. *eutyrhipis*		P4	x	
Conostylis pauciflora subsp. *pauciflora*		P4	x	
Diuris micrantha	Dwarf Bee-orchid	VU		x
Drakaea elastic	Glossy-leafed Hammer Orchid	EN		x
Eucalyptus argutifolia	Wabling Hill Malee	T/VU	x	x
Leucopogon maritimus		P1	x	
Stenanthemum limitatum		P2	x	
Stylidium maritimum		P3	x	
Styphelia filifolia		P3	x	

4.1.2 Threatened and Priority Ecological Communities

A review of the PMST report (Department of Agriculture, Water and the Environment, 2021) (Appendix 2) indicated that three Threatened Ecological Communities (TEC) may potentially occur within the survey site, namely:

- Banksia Woodlands of the Swan Coastal Plain ecological community (T, EN)
- Sedgelands in Holocene dune swales of the southern Swan Coastal Plain (CR, EN)
- Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community (CR).

4.2 Fauna Desktop Survey

A review of the NatureMap report (Department of Biodiversity, Conservation and Attractions, 2020b) (Appendix 1) indicated the potential for 72 fauna species to occur within 5 km of the Breakwater Drive site, comprising:

- 51 birds
- 13 reptiles
- three mammals
- three amphibians
- two invertebrates.

Of the 72 fauna species, 13 are of conservation significance, as listed under the *Biodiversity Conservation Act 2016* (WA) and *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) (Cwlth). Table 6 provides a list of conservation significant species with the potential to be present, along with the conservation code and corresponding database source.

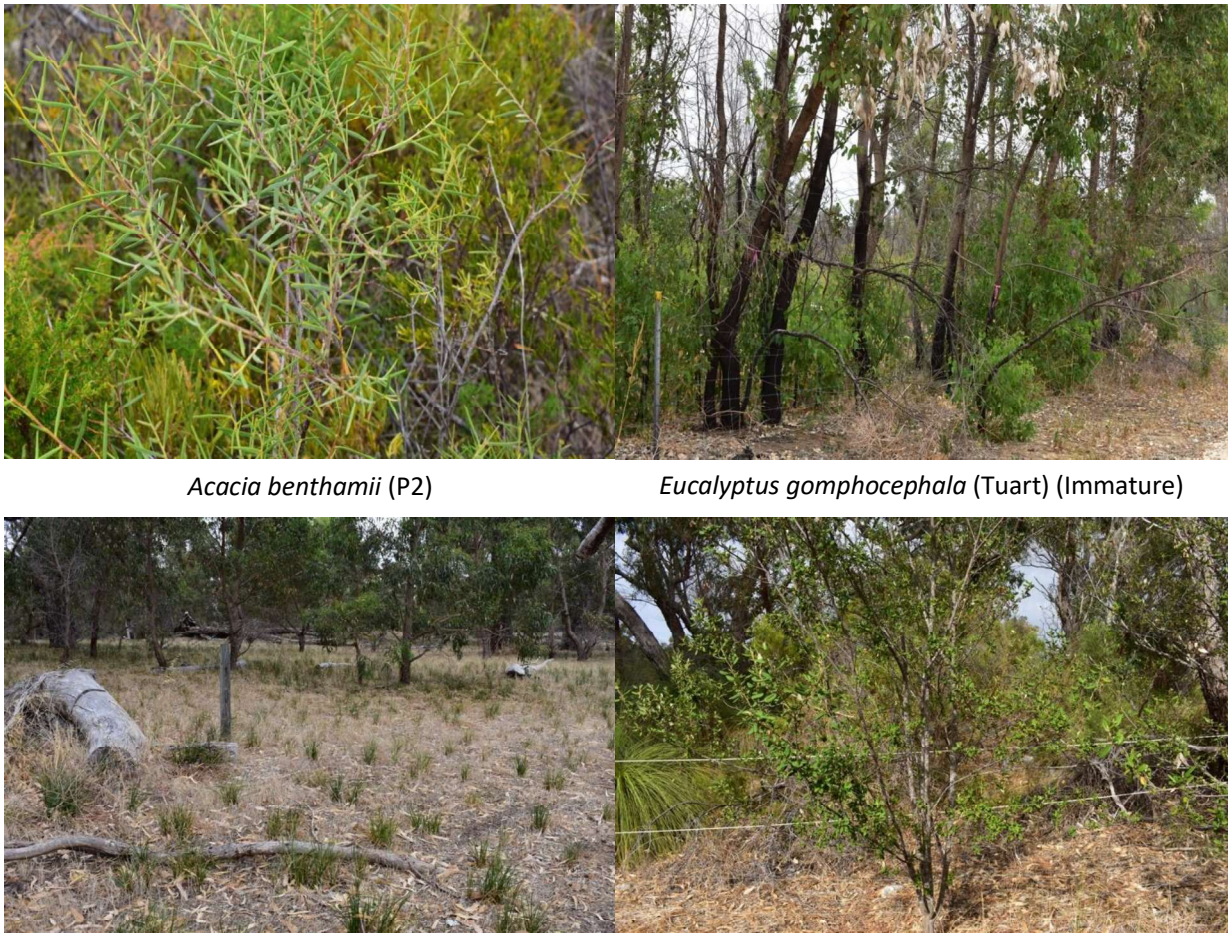
Table 6: Conservation Significant Fauna

Species	Common Name	Conservation Code	NatureMap	PMST
Calidris canutus	Red Knot	EN		x
Calidris ferruginea	Curlew Sandpiper	CR		x
Calyptorhynchus latirostris	Carnaby's Cockatoo	T/ EN	x	x
Dasyurus geoffroii	Chuditch	VU		x
Hesperocolletes douglasi	Rottnest Bee	CR		x
Isoodon fusciventer	Quenda	P4	x	
Leipoa ocellata	Mallefowl	VU		x
Limosa lapponica menzbieri	Bar-tailed Godwit	CR		x
Numenius madagascariensis	Eastern Curlew	CR		x
Pachyptila turtur subantarcita	Fairy Prion	VU		x
Rostralua australis	Australian Painted Snipe	VU		x
Sternula nereis nereis	Australian Fairy Tern	VU		x
Synemon gratiosa	Graceful Sunmoth	P4	x	

4.3 Flora On-ground Survey

The survey confirmed the presence of 65 flora species from 29 families, including 50 native species, 15 introduced species (weeds) and one Priority 2 flora species.

Acacia benthamii, a Priority 2 species, as listed under the *Biodiversity Conservation Act 2016* (WA), was recorded along the northern alignment, west of the Breakwater Estate (Figure 7). A population of 20 individual plants were in the vicinity with only 1 individual within the proposed clearing area. Photos of the flora species, including the Priority 2 *Acacia benthamii,* are illustrated in Figure 5.



Acacia benthamii (P2) | *Eucalyptus gomphocephala* (Tuart) (Immature)

**Trachyandra divaricata* | *Spyridium globulosum* (Basket Bush)

Figure 5: Examples of flora species recorded on site. * denoted introduced weeds.

4.3.1 Vegetation Type

Three vegetation types were recorded within the survey area, namely:

- Tuart Woodland – with an open woodland of *Eucalyptus gomphocephala* (Tuart) trees over sparse shrubs and an understorey of introduced grasses and herbs
- Coastal Shrubland – A shrubland of mixed coastal shrubs over a weedy understorey of introduced grasses and herbs

- Banksia Woodland – a woodland of *Banksia attenuata* over *Hibbertia hypericoides* and mixed shrubs, over an understorey of mixed native and introduced sedges and herbs.

Tuart (*Eucalyptus gomphocephala*) Woodland is the dominant vegetation type across the survey site with short sections of Coastal Shrubland along Breakwater Drive and Bankia Woodland in the northern limit of the site. Photographs of the vegetation types are provided in Figure 6, with spatial representations of the three different vegetation types and their boundaries shown in Figure 7 – 9.

Tuart Woodland

Coastal Shrubland

Banksia Woodland

Figure 6: Vegetation types present along the proposed fence line

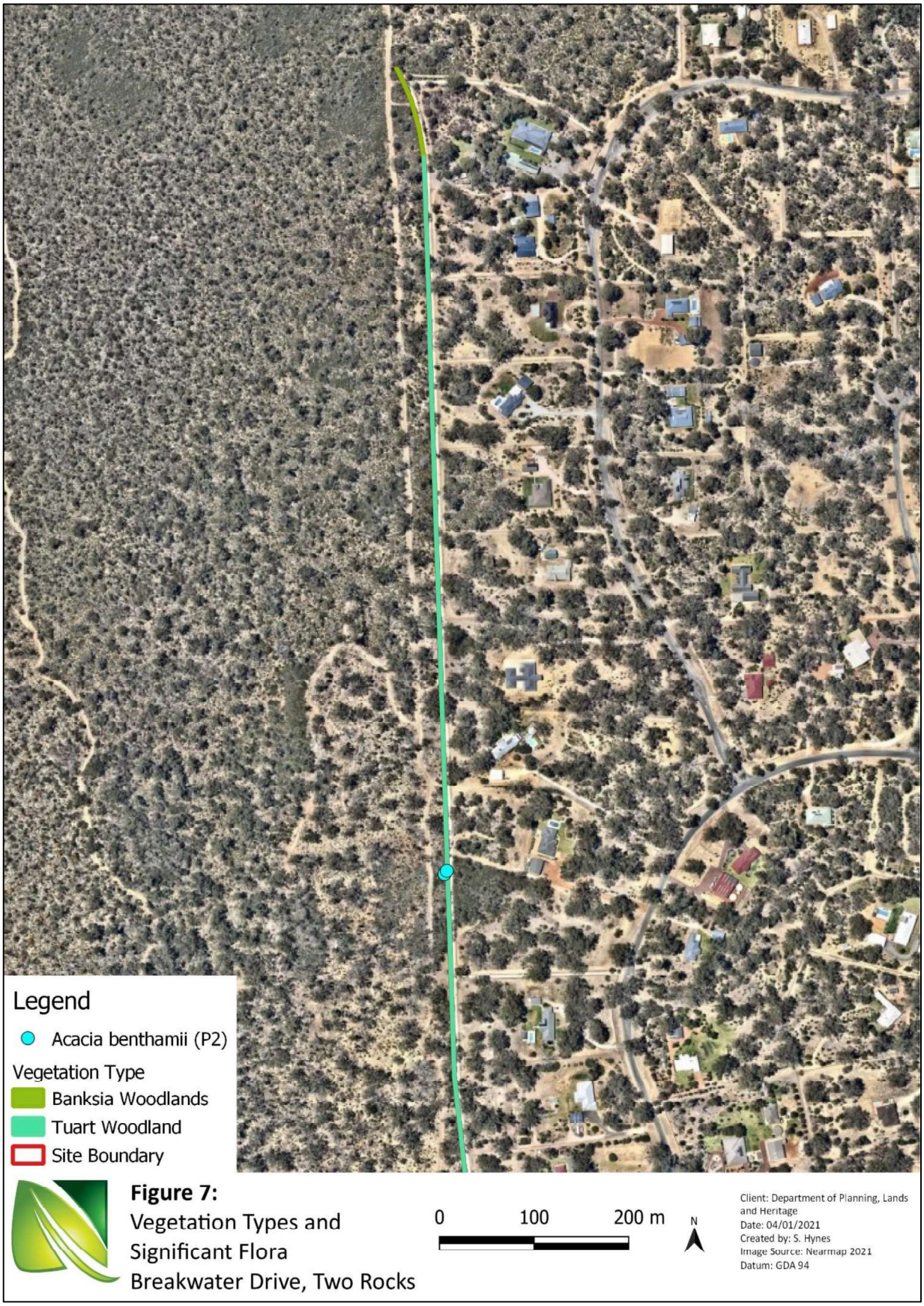


Figure 7:
Vegetation Types and Significant Flora
Breakwater Drive, Two Rocks

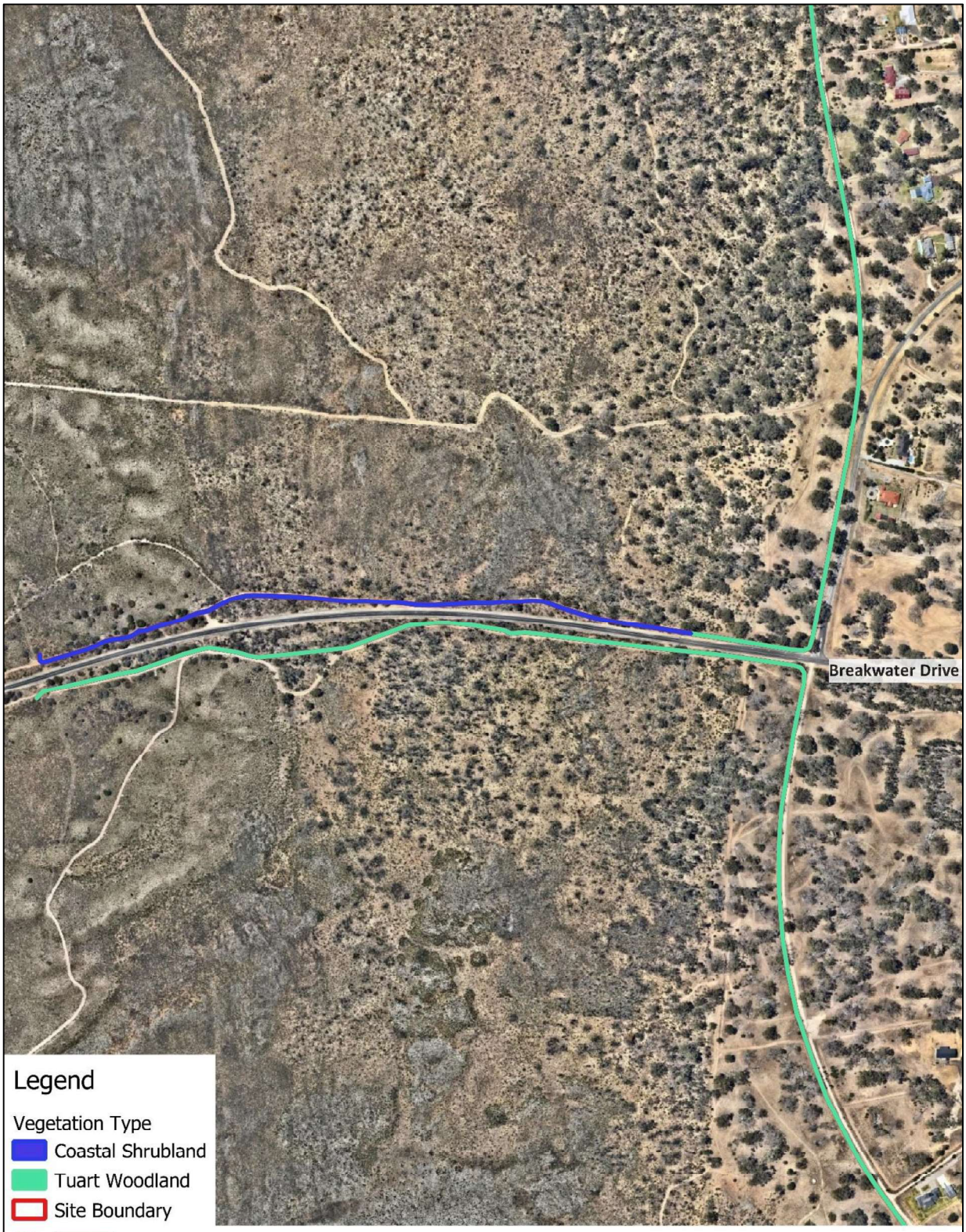


Figure 8:
Vegetation Types
Breakwater Drive, Two Rocks

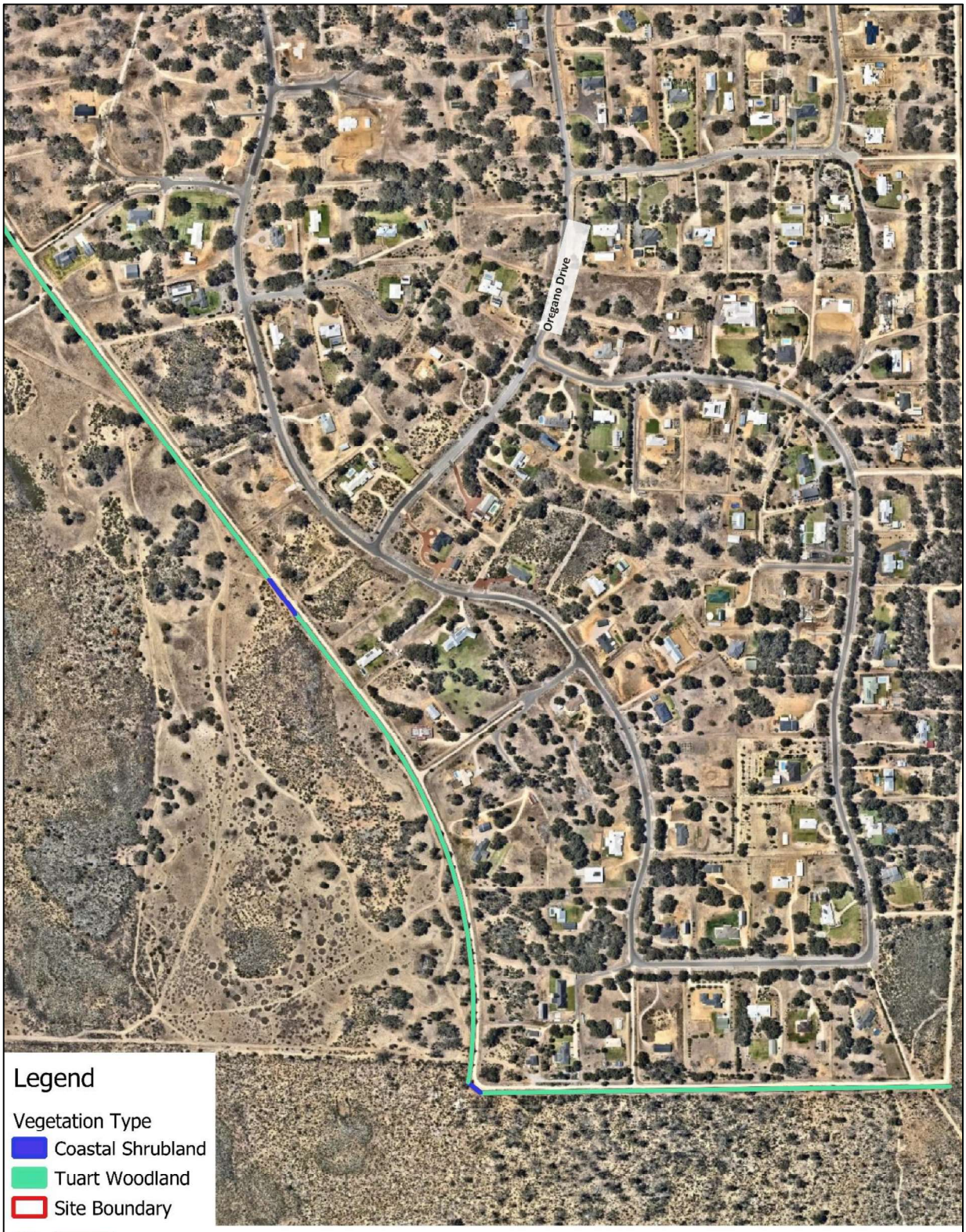


Figure 9:
Vegetation Types
Breakwater Drive, Two Rocks

4.3.2 Vegetation Condition

Vegetation condition across the site ranges from Completed Degraded to Good, with the majority of the site classed as Degraded to Completely Degraded, as it runs along an existing fence and adjacent to a firebreak (Table 7, Figure 10-). The existing firebreak indicates that the area has been previously cleared and maintained to be a zone of low fire fuel load, resulting in the loss of flora diversity and vegetative structure. Vegetation has also been altered with the development of surrounding rural areas.

Table 7: Vegetation Condition

Vegetation Condition	Pristine	Excellent	Very Good	Good	Degraded	Completely Degraded	Totals
Area (ha)	0	0	0	0.02	0.23	0.35	0.6
Area (%)	0	0	0	3.3	38.3	58.4	100

Completely Degraded vegetation from past clearing and proximity to firebreaks

Good condition of Banksia Woodland in northern section

Figure 10: Vegetation Condition

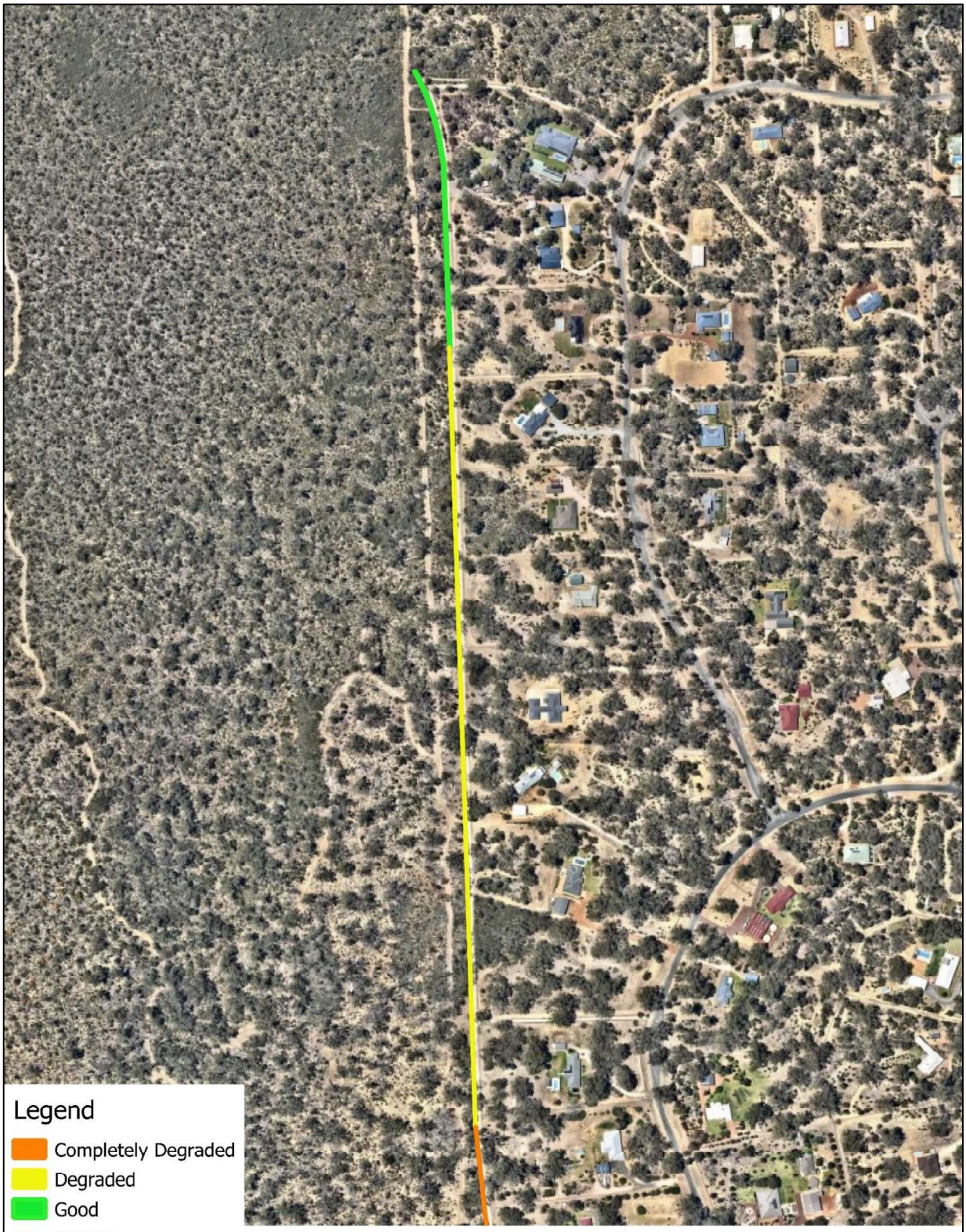


Figure 11:
Vegetation Condition
Breakwater Drive, Two Rocks

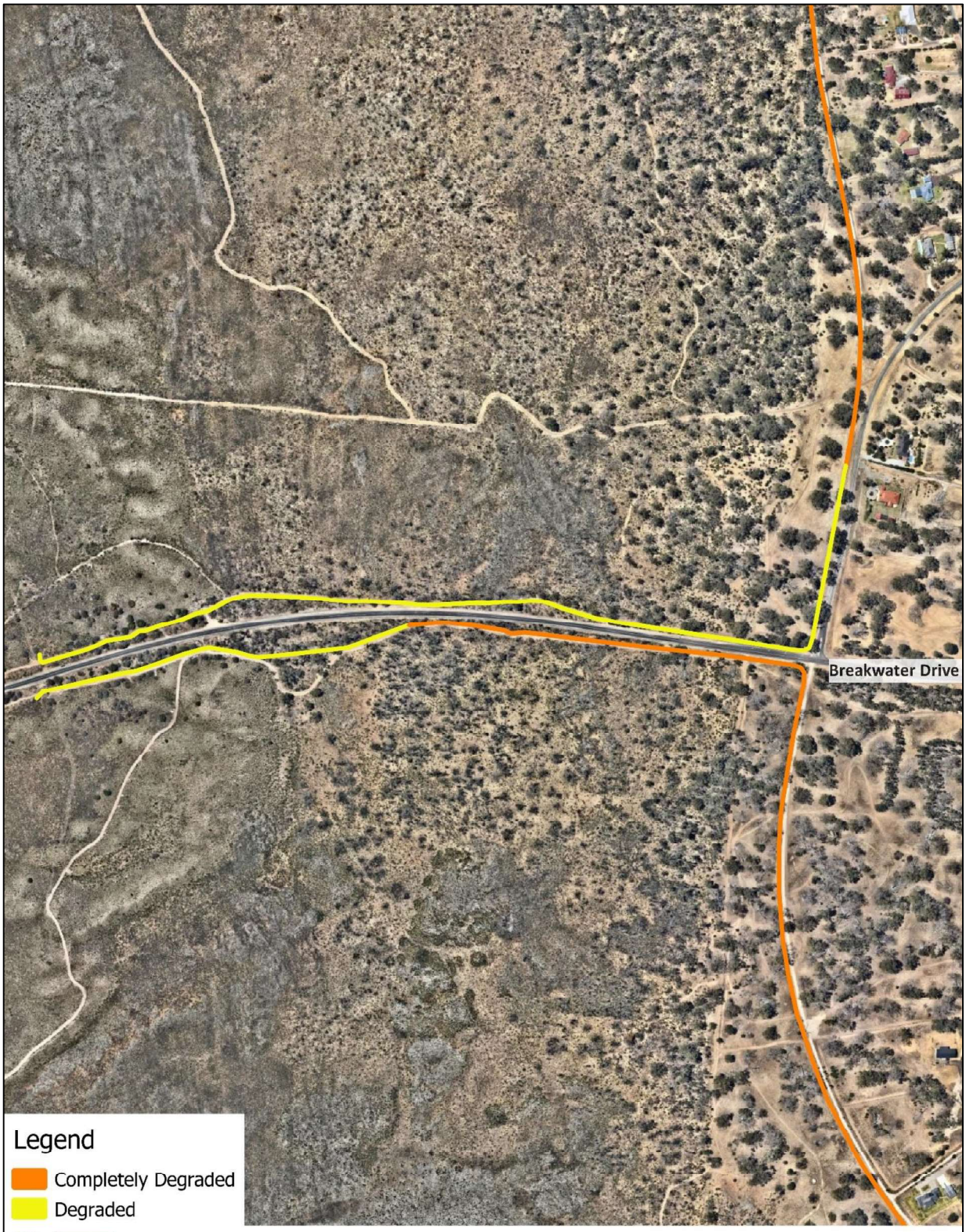


Figure 12:
Vegetation Condition
Breakwater Drive, Two Rocks

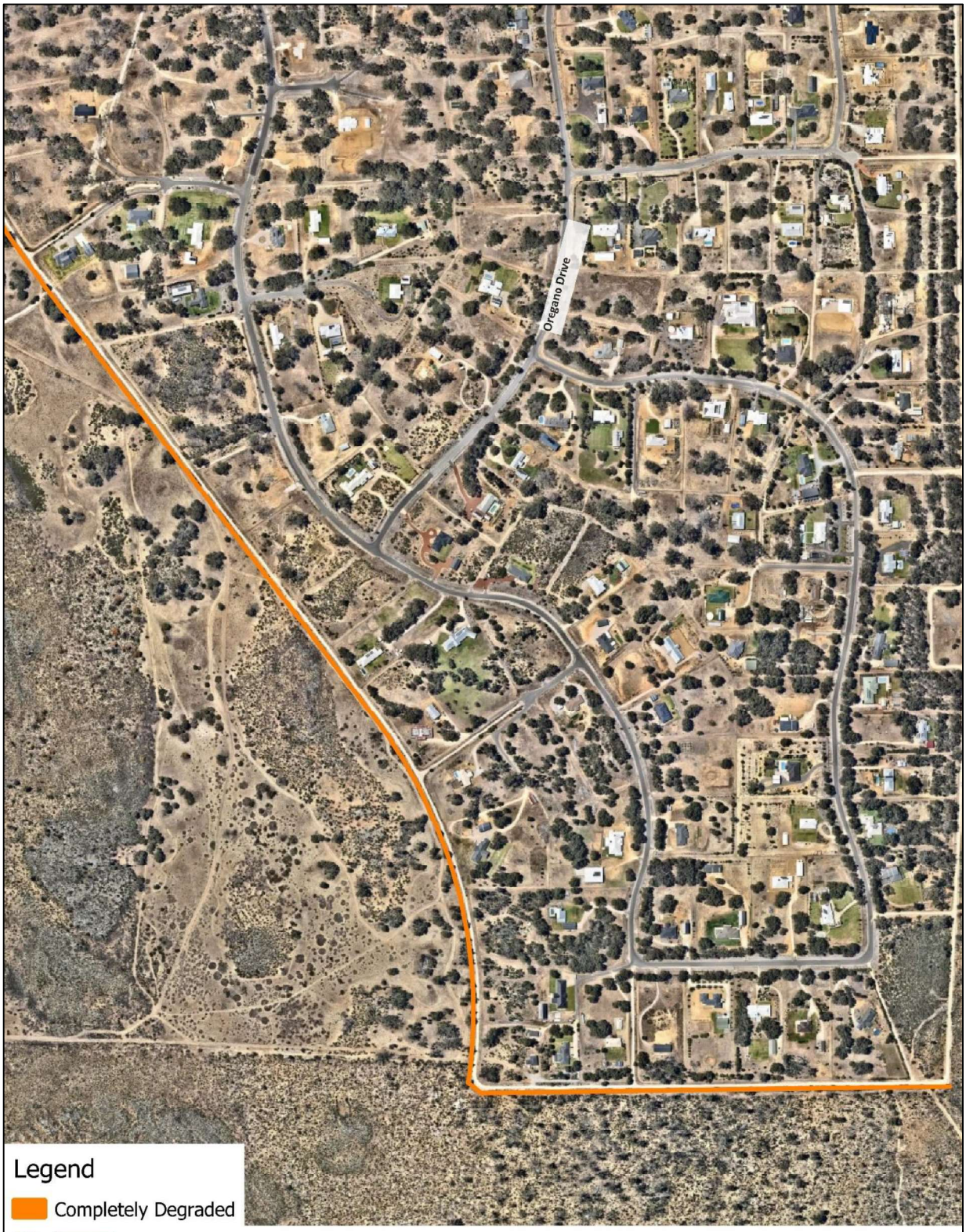


Figure 13:
Vegetation Condition
Breakwater Drive, Two Rocks

4.3.3 Threatened and Priority Ecological Communities

Whilst no TECs or PECs were found to be within the survey site, the critically endangered Tuart (*Eucalyptus gomphocephala*) woodlands and forest of the Swan Coastal Plain ecological community is most likely to occur in the greater area beyond the survey site, based on the key diagnostic characteristics and online databases records. The Banksia Woodland at the north of the site does not cover the minimum patch size for a good condition area to meet the TEC criteria for the threatened Banksia woodlands on the Swan Coastal Plain ecological community, as the area is only 0.02 ha in size, well below the 2 ha specified in the conservation listing advice for Good condition vegetation.

Although the survey sites meet the key diagnostic characteristics for the Tuart Woodland TEC, it is not considered to be part of the TEC as it is less than 0.5 ha. Established Tuarts (≥15 cm diameter DBH) are located mainly along the centre of the fence alignment, near Breakwater Drive and Birdsong Gate, but with patches smaller than 0.5 ha, it is not considered part of the nationally protected ecological community.

4.4 Black Cockatoo Habitat Assessment

A total of 11 habitat trees with a diameter at breast height (DBH) greater than 500 mm were recorded within the survey area, with Tuart (*Eucalyptus gomphocephala*) being the only species (Figures 14 and 15). Three of the 11 habitat trees exhibited hollows, with two hollows noted to present as a suitable black cockatoo nesting and/or breeding site based on the size and angle of the hollow entrances. No nesting activities from black cockatoos or any other avian species was noted during the survey. This is may also be attributed to the survey being conducted in mid-summer, outside of peak breeding season for many avian species.

Tuart with DBH > 500 mm as potential habitat trees

Potential nesting hollow

Figure 14: Potential habitat trees

Figure 15:
Habitat Trees
Breakwater Drive, Two Rocks

5.0 Implications of Results

5.1 Flora and Vegetation

A total of 65 species, including 50 (77%) native and 15 (23%) introduced were recorded on site. As the proposed area consists of an existing fence and is adjacent to a firebreak, flora diversity is relatively low due to previous clearing (likely undertaken as part of original fence installation) and firebreak maintenance (low fuel load area). Similarly, the survey area is classed as Degraded to Completely Degraded due to the nature of the remnant vegetation present.

The proposed pruning of vegetation, to 0.5 m on either side of the fence, totalling 0.6 ha, will facilitate the installation and upgrading of the current fence. The alignment of the new fence will be installed to accommodate any mature trees within the alignment. As the proposed style of fencing will be ring-lock with star-pickets, no excavation is required during the construction phase, with star pickets and box braces driven directly into the ground, resulting in lesser soil disturbance and limiting potential erosion.

Furthermore, the upgrading of the fence will provide a barrier to better protect the surrounding remnant bushland from anthropogenic disturbances such as illegal off-roading and camping, which may give rise to a series of environmental issues including spreading weeds and Phytophthora (dieback).

5.2 Significant Flora

Acacia benthamii, a Priority 2 flora species, was recorded within the northern alignment of the survey site. This species is a low shrub which grows up to 1 m in height and typically occurs on limestone breakaways (Department of Biodiversity, Conservations and Attractions, 2021a).

The proposed fence can be constructed around the one individual *Acacia benthamii,* found within the survey area. Spacing and alignment between the fence posts in this area can accommodate the small shrub without sacrificing its function or causing damage. Upgrading of the fence will also provide an additional physical barrier and provide protection of this Priority flora species population from anthropogenic activities.

5.3 Black Cockatoo

While 11 habitat trees were recorded within or in close proximity to the survey site, the low impact and flexible construction alignment of the new fence will allow for the safe retention of all potential habitat trees. Spacing between posts and alignment of the proposed fence will enable all trees to be avoided. Minor pruning of lower branches may be undertaken to facilitate the fence installation without damaging any mature Tuarts; this will have the added benefit of reducing fuel loads close to ground level.

As such, impacts to black cockatoos are not deemed significant, with the construction of the fence promoting better management and control of illegal access into the surrounding bushland.

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Appendix 1: NatureMap Report

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 04/02/2021

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 38' 18" E,31° 28' 27" S
Buffer 5km
Group By Species Group

Species Group	Species	Records
Amphibian	3	30
Bird	51	198
Bryopsid (Moss)	2	2
Dicotyledon	213	330
Fungus	1	1
Hepatic (Liverwort)	1	1
Invertebrate	2	6
Lichen	1	1
Mammal	3	3
Monocotyledon	66	84
Reptile	13	183
TOTAL	**356**	**839**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Amphibian					
1.	25410	*Heleioporus eyrei (Moaning Frog)*			
2.	25412	*Heleioporus psammophilus (Sand Frog)*			
3.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
Bird					
4.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
5.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
6.	24262	*Acanthiza inornata (Western Thornbill)*			
7.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
8.	25536	*Accipiter fasciatus (Brown Goshawk)*			
9.	24312	*Anas gracilis (Grey Teal)*			
10.	24313	*Anas platyrhynchos (Mallard)*			
11.	24316	*Anas superciliosa (Pacific Black Duck)*			
12.	24561	*Anthochaera carunculata (Red Wattlebird)*			
13.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
14.		*Barnardius zonarius*			
15.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
16.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
17.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
18.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
19.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
20.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
21.	25592	*Corvus coronoides (Australian Raven)*			
22.	25595	*Cracticus tibicen (Australian Magpie)*			
23.	25596	*Cracticus torquatus (Grey Butcherbird)*			
24.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
25.		*Elanus axillaris*			
26.		*Eolophus roseicapillus*			
27.	25623	*Falco longipennis (Australian Hobby)*			
28.	25727	*Fulica atra (Eurasian Coot)*			
29.	25530	*Gerygone fusca (Western Gerygone)*			
30.	24443	*Grallina cyanoleuca (Magpie-lark)*			
31.	24295	*Haliastur sphenurus (Whistling Kite)*			
32.	25734	*Himantopus himantopus (Black-winged Stilt)*			
33.	24367	*Lalage tricolor (White-winged Triller)*			
34.	25661	*Lichmera indistincta (Brown Honeyeater)*			
35.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
36.	24544	*Malurus lamberti subsp. assimilis (Variegated Fairy-wren)*			
37.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
38.	25654	*Malurus splendens (Splendid Fairy-wren)*			
39.	24598	*Merops ornatus (Rainbow Bee-eater)*			
40.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
41.	25682	*Pardalotus striatus (Striated Pardalote)*			
42.	48066	*Petroica boodang (Scarlet Robin)*			
43.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
44.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
45.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
46.	48096	*Rhipidura albiscapa (Grey Fantail)*			
47.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
48.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
49.	24279	*Sericornis frontalis subsp. maculatus (White-browed Scrubwren)*			
50.	30948	*Smicrornis brevirostris (Weebill)*			
51.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
52.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
53.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
54.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			
Bryopsid (Moss)					
55.	32370	*Funaria hygrometrica*			
56.	32380	*Gemmabryum pachythecum*			
Dicotyledon					
57.	15430	*Acacia alata var. tetrantha*			
58.	3237	*Acacia benthamii*		P2	
59.	3374	*Acacia huegelii*			
60.	3409	*Acacia lasiocarpa (Panjang)*			
61.	11611	*Acacia lasiocarpa var. lasiocarpa*			
62.	3502	*Acacia pulchella (Prickly Moses)*			
63.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
64.	3584	*Acacia truncata*			
65.	6295	*Acrotriche cordata (Coast Ground Berry)*			
66.	48513	*Aizoon pubescens*	Y		
67.	1728	*Allocasuarina fraseriana (Sheoak, Kondil)*			
68.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
69.	4906	*Alyogyne huegelii (Lilac Hibiscus)*			
70.	6314	*Andersonia lehmanniana*			
71.	6949	*Anthocercis littorea (Yellow Tailflower)*			
72.	2463	*Atriplex isatidea (Coast Saltbush)*			
73.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
74.	32580	*Banksia dallanneyi subsp. dallanneyi var. dallanneyi*			
75.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
76.	1834	*Banksia menziesii (Firewood Banksia)*			
77.	32202	*Banksia nivea (Honeypot Dryandra, Pudjarn)*			
78.	1842	*Banksia prionotes (Acorn Banksia)*			
79.	32077	*Banksia sessilis var. cygnorum*			
80.	7046	*Bellardia trixago (Bellardia)*	Y		
81.	11381	*Boronia ramosa subsp. anethifolia*			
82.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
83.	7867	*Brachyscome bellidioides*			
84.	3000	*Brassica tournefortii (Mediterranean Turnip)*	Y		
85.	2848	*Calandrinia corrigioloides (Strap Purslane)*			
86.	2854	*Calandrinia granulifera (Pygmy Purslane)*			
87.	2856	*Calandrinia liniflora (Parakeelya)*			
88.	44226	*Calandrinia oraria*		P3	
89.	40827	*Calandrinia tholiformis*			
90.	5426	*Calothamnus quadrifidus (One-sided Bottlebrush, Kwowdjard)*			
91.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
92.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
93.	5439	*Calytrix angulata (Yellow Starflower)*			
94.	5458	*Calytrix flavescens (Summer Starflower)*			
95.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
96.	2798	*Carpobrotus virescens (Coastal Pigface, Kolboko, Bain)*			
97.	11501	*Cassytha glabella forma casuarinae*			
98.	2957	*Cassytha racemosa (Dodder Laurel)*			
99.	2889	*Cerastium glomeratum (Mouse Ear Chickweed)*	Y		
100.	10804	*Clematis linearifolia*			
101.	44593	*Coleonema pulchellum*	Y		
102.	4550	*Comesperma calymega (Blue-spike Milkwort)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
103.	4564	*Comesperma virgatum (Milkwort)*			
104.	15516	*Conospermum canaliculatum subsp. canaliculatum*			
105.	1882	*Conospermum stoechadis (Common Smokebush)*			
106.	1885	*Conospermum triplinervium (Tree Smokebush)*			
107.	6348	*Conostephium pendulum (Pearl Flower)*			
108.	6349	*Conostephium preissii*			
109.	20074	*Conyza sumatrensis*	Y		
110.	7947	*Cotula turbinata (Funnel Weed)*	Y		
111.	11563	*Crassula colorata var. colorata*			
112.	3140	*Crassula glomerata*	Y		
113.	4802	*Cryptandra mutila*			
114.	4809	*Cryptandra pungens*			
115.	6218	*Daucus glochidiatus (Australian Carrot)*			
116.	19747	*Daviesia decurrens subsp. decurrens*			
117.	18560	*Daviesia divaricata subsp. divaricata*			
118.	18541	*Diplopeltis huegelii subsp. huegelii*			
119.	7054	*Dischisma arenarium*	Y		
120.	7961	*Dittrichia graveolens (Stinkwort)*	Y		
121.	48751	*Drosera drummondii*			
122.	3095	*Drosera erythrorhiza (Red Ink Sundew)*			
123.	3118	*Drosera pallida (Pale Rainbow)*			
124.	13950	*Eremaea asterocarpa subsp. asterocarpa*			
125.	5541	*Eremaea pauciflora*			
126.	14104	*Eremaea pauciflora var. pauciflora*			
127.	4333	*Erodium cicutarium (Common Storksbill)*	Y		
128.	4335	*Erodium cygnorum (Blue Heronsbill)*			
129.	6219	*Eryngium pinnatifidum (Blue Devils)*			
130.	13091	*Eucalyptus argutifolia (Wabling Hill Mallee)*		T	
131.	5615	*Eucalyptus decipiens (Limestone Marlock, Moit)*			
132.	5649	*Eucalyptus foecunda (Narrow-leaved Red Mallee)*			
133.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
134.	4648	*Euphorbia terracina (Geraldton Carnation Weed)*	Y		
135.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
136.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
137.	31532	*Fumaria muralis subsp. muralis*	Y		
138.	7323	*Galium murale (Small Goosegrass)*	Y		
139.	20483	*Gastrolobium linearifolium*			
140.	20482	*Gastrolobium nervosum*			
141.	16311	*Gazania linearis*	Y		
142.	4339	*Geranium molle (Dove's Foot Cranesbill)*	Y		
143.	10909	*Gompholobium confertum*			
144.	3956	*Gompholobium shuttleworthii*			
145.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
146.	15839	*Grevillea preissii subsp. preissii*			
147.	12824	*Grevillea vestita subsp. vestita*			
148.	5011	*Guichenotia ledifolia*			
149.	2146	*Hakea costata (Ribbed Hakea)*			
150.	2175	*Hakea lissocarpha (Honey Bush)*			
151.	2197	*Hakea prostrata (Harsh Hakea)*			
152.	2203	*Hakea ruscifolia (Candle Hakea)*			
153.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
154.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
155.	3016	*Heliophila pusilla*	Y		
156.	5112	*Hibbertia aurea*			
157.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
158.	45534	*Hibbertia hypericoides subsp. hypericoides*			
159.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
160.	48381	*Hibbertia striata*			
161.	6222	*Homalosciadium homalocarpum*			
162.	3968	*Hovea trisperma (Common Hovea)*			
163.	6229	*Hydrocotyle diantha*			
164.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
165.	9352	*Hypochaeris radicata (Flat Weed, Cats-ear)*	Y		
166.	19700	*Isotropis cuneifolia subsp. cuneifolia*			
167.	14783	*Jacksonia calcicola*			
168.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
169.	4029	*Jacksonia sternbergiana (Stinkwood, Kapur)*			
170.	4044	*Kennedia prostrata (Scarlet Runner)*			
171.	15498	*Kunzea glabrescens (Spearwood)*			
172.	18585	*Lagenophora huegelii*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
173.	7580	*Lechenaultia linarioides (Yellow Leschenaultia)*			
174.	44490	*Leontodon rhagadioloides*	Y		
175.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		
176.	5857	*Leptospermum spinescens*			
177.	6405	*Leucopogon insularis*			
178.	40801	*Leucopogon maritimus*		P1	
179.	6427	*Leucopogon parviflorus (Coast Beard-heath)*			
180.	6434	*Leucopogon polymorphus*			
181.	6436	*Leucopogon propinquus*			
182.	6440	*Leucopogon racemulosus*			
183.	7677	*Levenhookia stipitata (Common Stylewort)*			
184.	7403	*Lobelia heterophylla (Wing-seeded Lobelia)*			
185.	7408	*Lobelia tenuior (Slender Lobelia)*			
186.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
187.	34736	*Lysinema pentapetalum*			
188.	5887	*Melaleuca cardiophylla (Tangling Melaleuca)*			
189.	18598	*Melaleuca systena*			
190.	8105	*Millotia myosotidifolia*			
191.	8106	*Millotia tenuifolia (Soft Millotia)*			
192.	7289	*Myoporum caprarioides (Slender Myoporum)*			
193.	2365	*Olax benthamiana*			
194.	18255	*Opercularia vaginata (Dog Weed)*			
195.	7122	*Orobanche minor (Lesser Broomrape)*	Y		
196.	30375	*Oxalis exilis*			
197.	4356	*Oxalis pes-caprae (Soursob)*	Y		
198.	1762	*Parietaria debilis (Pellitory)*			
199.	4343	*Pelargonium capitatum (Rose Pelargonium)*	Y		
200.	4346	*Pelargonium littorale*			
201.	2258	*Persoonia comata*			
202.	20368	*Petrophile axillaris*			
203.	2286	*Petrophile brevifolia*			
204.	48781	*Petrophile brevifolia subsp. brevifolia*			
205.	2299	*Petrophile linearis (Pixie Mops)*			
206.	2301	*Petrophile macrostachya*			
207.	19825	*Petrorhagia dubia*	Y		
208.	4675	*Phyllanthus calycinus (False Boronia)*			
209.	5232	*Pimelea argentea (Silvery Leaved Pimelea)*			
210.	5243	*Pimelea ferruginea*			
211.	5244	*Pimelea floribunda*			
212.	5268	*Pimelea sulphurea (Yellow Banjine)*			
213.	18353	*Pithocarpa pulchella var. pulchella*			
214.	7303	*Plantago lanceolata (Ribwort Plantain)*	Y		
215.	8177	*Podolepis lessonii*			
216.	8182	*Podotheca angustifolia (Sticky Longheads)*			
217.	8183	*Podotheca chrysantha (Yellow Podotheca)*			
218.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
219.	8189	*Pseudognaphalium luteoalbum (Jersey Cudweed)*			
220.	2718	*Ptilotus drummondii (Narrowleaf Mulla Mulla)*			
221.	2742	*Ptilotus manglesii (Pom Poms, Mulamula)*			
222.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
223.	40841	*Ptilotus stirlingii subsp. stirlingii*			
224.	3061	*Raphanus raphanistrum (Wild Radish)*	Y		
225.	19183	*Retama raetam*	Y		
226.	7368	*Scabiosa atropurpurea (Purple Pincushion)*	Y		
227.	7603	*Scaevola canescens (Grey Scaevola)*			
228.	48834	*Schinus terebinthifolia*	Y		
229.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
230.	20161	*Senecio pinnatifolius*			
231.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
232.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
233.	17551	*Sphaerolobium drummondii*			
234.	4828	*Spyridium globulosum (Basket Bush)*			
235.	9070	*Stackhousia pubescens (Downy Stackhousia)*			
236.	2918	*Stellaria media (Chickweed)*	Y		
237.	14236	*Stenanthemum limitatum*		P2	
238.	15066	*Stenanthemum notiale subsp. chamelum*			
239.	19403	*Stenopetalum gracile*			
240.	2316	*Stirlingia latifolia (Blueboy)*			
241.	30278	*Stylidium androsaceum*			
242.	7709	*Stylidium crossocephalum (Posy Triggerplant)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
243.	7710	*Stylidium cygnorum*			
244.	7716	*Stylidium diuroides (Donkey Triggerplant)*			
245.	13127	*Stylidium maritimum*		P3	
246.	25829	*Stylidium neurophyllum (Coastal Plain Triggerplant)*			
247.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
248.	25806	*Stylidium scariosum*			
249.	7798	*Stylidium schoenoides (Cow Kicks)*			
250.		*Stylidium sp.*			
251.	48297	*Styphelia filifolia*		P3	
252.	15532	*Synaphea spinulosa subsp. spinulosa*			
253.	4256	*Templetonia retusa (Cockies Tongues)*			
254.	5077	*Thomasia cognata*			
255.	5105	*Thomasia triphylla*			
256.	6266	*Trachymene coerulea (Blue Lace Flower)*			
257.	6280	*Trachymene pilosa (Native Parsnip)*			
258.	4292	*Trifolium campestre (Hop Clover)*	Y		
259.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
260.	11665	*Trymalium ledifolium var. ledifolium*			
261.	8255	*Ursinia anthemoides (Ursinia)*	Y		
262.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
263.	7109	*Veronica calycina (Cup Speedwell)*			
264.	6101	*Verticordia nitens (Morrison Featherflower, Kodjeningara)*			
265.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
266.	7389	*Wahlenbergia preissii*			
267.	13333	*Waitzia suaveolens var. suaveolens*			
268.	6939	*Westringia dampieri*			
269.	6289	*Xanthosia huegelii*			
Fungus					
270.	38805	*Lentinellus pulvinulus*			
Hepatic (Liverwort)					
271.		*Riccia bifurca*			
Invertebrate					
272.		*Aname tepperi*			
273.	33992	*Synemon gratiosa (Graceful Sunmoth)*		P4	
Lichen					
274.	27598	*Buellia dissa*			
Mammal					
275.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
276.	24223	*Mus musculus (House Mouse)*	Y		
277.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
Monocotyledon					
278.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
279.	1374	*Allium ampeloprasum*	Y		
280.	11434	*Anigozanthos humilis subsp. humilis*			
281.	11261	*Anigozanthos manglesii subsp. manglesii*			
282.	244	*Briza maxima (Blowfly Grass)*	Y		
283.	247	*Bromus arenarius (Sand Brome)*			
284.	249	*Bromus diandrus (Great Brome)*	Y		
285.	12770	*Burchardia congesta*			
286.	15330	*Caladenia arenicola*			
287.	15348	*Caladenia flava subsp. flava*			
288.	1599	*Caladenia latifolia (Pink Fairy Orchid)*			
289.	19309	*Calectasia narragara*			
290.	1125	*Centrolepis drummondiana*			
291.	11513	*Conostylis aculeata subsp. cygnorum*			
292.	11388	*Conostylis pauciflora subsp. euryrhipis*		P4	
293.	11657	*Conostylis pauciflora subsp. pauciflora*		P4	
294.	11543	*Conostylis teretifolia subsp. planescens*			
295.	11870	*Conostylis teretifolia subsp. teretifolia*			
296.	17663	*Desmocladus asper*			
297.	11636	*Dianella revoluta var. divaricata*			
298.	1287	*Dichopogon capillipes*			
299.	1635	*Diuris longifolia (Common Donkey Orchid)*			
300.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
301.	376	*Eragrostis curvula (African Lovegrass)*	Y		
302.	1515	*Ferraria crispa (Black Flag)*	Y		
303.	20216	*Ficinia nodosa (Knotted Club Rush)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
304.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
305.	1468	*Haemodorum laxum*			
306.	467	*Lagurus ovatus (Hare's Tail Grass)*	Y		
307.	11464	*Laxmannia sessiliflora subsp. australis*			
308.	18074	*Lepidobolus preissianus subsp. preissianus*			
309.	925	*Lepidosperma angustatum*			
310.	42742	*Lepidosperma calcicola*			
311.	933	*Lepidosperma gladiatum (Coast Sword-sedge, Kerbin)*			
312.	15418	*Leptoceras menziesii*			
313.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
314.	1231	*Lomandra maritima*			
315.	1239	*Lomandra preissii*			
316.	1243	*Lomandra sericea (Silky Mat Rush)*			
317.	1246	*Lomandra suaveolens*			
318.	954	*Mesomelaena preissii*			
319.	955	*Mesomelaena pseudostygia*			
320.	485	*Microlaena stipoides (Weeping Grass)*			
321.	19179	*Moraea flaccida (One-leaf Cape Tulip)*	Y		
322.	11749	*Orthrosanthus laxus var. laxus (Morning Iris)*			
323.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
324.	573	*Poa drummondiana (Knotted Poa)*			
325.	1668	*Prasophyllum brownii*			
326.	1672	*Prasophyllum fimbria (Fringed Leek Orchid)*			
327.		*Pterostylis sp.*			
328.	1698	*Pterostylis vittata (Banded Greenhood)*			
329.	11544	*Romulea rosea var. australis (Guildford Grass)*	Y		
330.	982	*Schoenus clandestinus*			
331.	992	*Schoenus grandiflorus (Large Flowered Bogrush)*			
332.	998	*Schoenus latitans*			
333.	1007	*Schoenus pedicellatus*			
334.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
335.	1319	*Thysanotus arenarius*			
336.	1338	*Thysanotus manglesianus (Fringed Lily)*			
337.	1343	*Thysanotus patersonii*			
338.	1351	*Thysanotus sparteus*			
339.	1357	*Thysanotus thyrsoideus*			
340.	1368	*Trachyandra divaricata*	Y		
341.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			
342.	152	*Triglochin trichophora*			
343.	1398	*Wurmbea monantha*			
Reptile					
344.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
345.	24980	*Christinus marmoratus (Marbled Gecko)*			
346.	25020	*Cryptoblepharus plagiocephalus*			
347.	25027	*Ctenotus australis*			
348.	25039	*Ctenotus fallens*			
349.	25100	*Egernia napoleonis*			
350.	25119	*Hemiergis quadrilineata*			
351.	25133	*Lerista elegans*			
352.	25184	*Menetia greyii*			
353.	25192	*Morethia obscura*			
354.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
355.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
356.	24942	*Strophurus spinigerus subsp. spinigerus*			

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

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

Appendix 2: PMST Report

Australian Government
Department of Agriculture, Water and the Environment

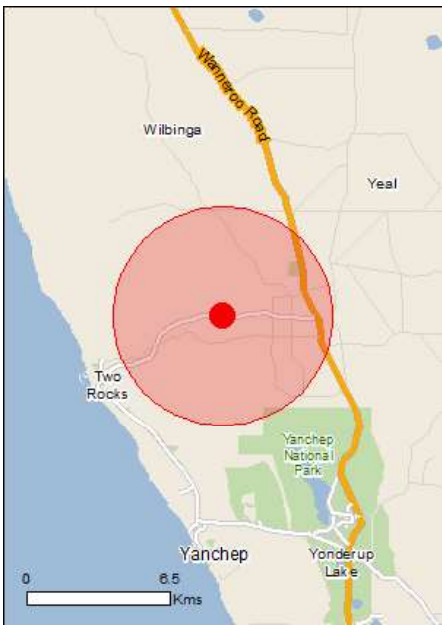
EPBC Act Protected Matters Report

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

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

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

Report created: 04/02/21 16:21:28



Coordinates
Buffer: 5.0Km

Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	14
Listed Migratory Species:	14

Other Matters Protected by the EPBC Act

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

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

A 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.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	21
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	33
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	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.

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Sedgelands in Holocene dune swales of the southern Swan Coastal Plain	Endangered	Community known to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Insects		

Name	Status	Type of Presence
Hesperocolletes douglasi		
Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Diuris micrantha		
Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
Drakaea elastica		
Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
Eucalyptus argutifolia		
Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Species or species habitat likely to occur within area
Onychoprion anaethetus		
Bridled Tern [82845]		Breeding known to occur within area
Sterna dougallii		
Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus		
Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Limosa lapponica		
Bar-tailed Godwit [844]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Sterna anaethetus Bridled Tern [814]		Breeding known to occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Unnamed WA49994	WA
Yanchep	WA

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-31.47416 115.63821

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 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

Conservation Code	Name	Description
		flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.
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: Department of Biodiversity, Conservation and Attractions, 2019)

Commonwealth

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

(Source: Department of Agriculture, Water, and the Environment, 2020)

Appendix 4: Flora List

The complete flora list is provided below split into two areas north and south of the Breakwater Drive. They are listed in alphabetical order by species with introduced species listed first then native species. * Denotes introduced flora species

Species list north of Breakwater Drive		**Species list south of Breakwater Drive**	
Family	***Species***	**Family**	***Species***
Poaceae	**Avena barbata*	Poaceae	**Avena barbata*
Asphodelaceae	**Trachyandra divaricata*	Brassicaceae	**Brassica tournefortii*
Fabaceae	*Acacia benthamii* (P2)	Aizoaceae	**Carpobrotus edulis*
Fabaceae	*Acacia cyclops*	Asteraceae	**Conyza bonariensis*
Fabaceae	*Acacia pulchella*	Poaceae	**Ehrharta calycina*
Fabaceae	*Acacia rostellifera*	Poaceae	**Eragrostis curvula*
Fabaceae	*Acacia saligna*	Iridaceae	**Gladiolus caryophyllaceus*
Fabaceae	*Acacia truncata*	Onagraceae	**Oenothera drummondii*
Casuarinaceae	*Allocasuarina fraseriana*	Geraniaceae	**Pelargonium capitatum*
Casuarinaceae	*Allocasuarina lehmanniana*	Euphorbiaceae	**Ricinus communis*
Poaceae	*Austrostipa flavescens*	Solanaceae	**Solanum nigrum*
Proteaceae	*Banksia attenuata*	Solanaceae	**Solanum linnaeanum*
Proteaceae	*Banksia dallanneyi*	Solanaceae	**Solanum nigrum*
Proteaceae	*Banksia grandis*	Asphodelaceae	**Trachyandra divaricata*
Proteaceae	*Banksia sessilis*	Asteraceae	**Verbesina encelioides*
Fabaceae	*Daviesia divaricata*	Fabaceae	*Acacia rostellifera*
Hemerocallidaceae	*Dianella revoluta*	Fabaceae	*Acacia saligna*
Proteaceae	*Grevillea preissii*	Casuarinaceae	*Allocasuarina lehmanniana*
Haemodoraceae	*Haemodorum paniculatum*	Poaceae	*Austrostipa flavescens*
Proteaceae	*Hakea lissocarpha*	Proteaceae	*Banksia attenuata*
Proteaceae	*Hakea prostrata*	Haemodoraceae	*Conostylis candicans*
Proteaceae	*Hakea trifurcata*	Myrtaceae	*Eucalyptus gomphocephala*
Fabaceae	*Hardenbergia comptoniana*	Proteaceae	*Hakea trifurcata*
Dilleniaceae	*Hibbertia hypericoides*	Fabaceae	*Hardenbergia comptoniana*
Fabaceae	*Jacksonia calcicola*	Dilleniaceae	*Hibbertia hypericoides*
Fabaceae	*Jacksonia furcellata*	Fabaceae	*Jacksonia calcicola*

Fabaceae	*Jacksonia sternbergiana*	Fabaceae	*Jacksonia sternbergiana*
Ericaceae	*Leucopogon nutans*	Fabaceae	*Kennedia prostrata*
Asparagaceae	*Lomandra maritima*	Asteraceae	*Lactuca serriola*
Zamiaceae	*Macrozamia riedlei*	Goodeniaceae	*Lechenaultia linarioides*
Myrtaceae	*Melaleuca huegelii*	Zamiaceae	*Macrozamia riedlei*
Cyperaceae	*Mesomelaena pseudostygia*	Cyperaceae	*Mesomelaena pseudostygia*
Loranthaceae	*Nuytsia floribunda*	Iridaceae	*Patersonia occidentalis*
Iridaceae	*Patersonia occidentalis*	Amaranthaceae	*Ptilotus polystachyus*
Proteaceae	*Persoonia elliptica*	Chenopodiaceae	*Rhagodia baccata*
Proteaceae	*Petrophile macrostachya*	Cyperaceae	*Schoenus grandiflorus*
Thymelaeaceae	*Pimelea argentea*	Xanthorrhoeaceae	*Xanthorrhoea preissii*
Thymelaeaceae	*Pimelea sulphurea*		
Amaranthaceae	*Ptilotus manglesii*		
Chenopodiaceae	*Rhagodia baccata*		
Goodeniaceae	*Scaevola thesioides*		
Rhamnaceae	*Spyridium globulosum*		
Rhamnaceae	*Trymalium ledifolium* var. *ledifolium*		
Xanthorrhoeaceae	*Xanthorrhoea preissii*		