

Satterley Property Group
Native Vegetation Clearing Permit Application
[Purpose Permit] – Supporting Documentation

Landbeach Boulevard
Part of 15 Tobermory Crescent, Butler

22 January 2020

JBSG57328-126277 (Rev. 0)

JBS&G Australia Pty Ltd T/A Strategen-JBS&G

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1. Introduction

1.1 Project background and scope

This document provides supporting information for a Native Vegetation Clearing Permit (NVCP) application for a 'Purpose Permit' to clear native vegetation.

Satterley Property Group (Satterley) are currently constructing a commercial development (the development) on Landbeach Boulevard in Butler Western Australia. The development has received a Development Approval (DA) from the Western Australian Planning Commission (WAPC), as a condition of the DA, a Bushfire Management Plan (BMP) was required to address the bushfire risk of the adjacent vegetation. To meet adequate Bushfire Assessment Levels (BALs) for construction, the BMP states that the development requires the creation of an Asset Protection Zone (APZ), whereby the vegetation within 25 m of the commercial lots is required to be removed.

Satterley are proposing to clear 0.1 ha of native vegetation adjacent to the development within a footprint totalling 1.2 ha (the Project Area; Figure 1.1), for the purpose of constructing an APZ around the infrastructure proposed for the development. Satterley have been granted permission by the landowner (Western Australian Planning Commission) to access the land for the purposes stated in this application (Appendix A). The Project Area occurs with a proposed freeway reserve and according to the Main Roads website, this area will be subject to significant clearing as a result of the planned Mitchel Freeway extension in early 2021 (Main Roads 2020).

This document has been prepared to support the NVCP application for the development, for assessment under s51E of the *Environmental Protection Act 1986* (EP Act), and includes the following information relating the clearing impacts:

- An overview of the existing environmental conditions and values of the Project Area
- An evaluation of the proposed clearing against the "10 Clearing Principles" listed under Schedule 5 of the EP Act
- Environmental approvals and management requirements.

1.2 Clearing footprint

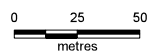
A maximum of 0.1 ha of native vegetation in Very Good condition is proposed to be cleared to meet adequate BALs for construction, with creation of an APZ, whereby vegetation is to be cleared within 25 m of the development.



Legend:

- Project area (1.2 ha)
- Cadastral boundary
- Roads (MRWA)

Scale 1:3,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 57328

Client: Satterley Property Group

Version: A

Date: 17-Dec-2019

Drawn By: cthatcher

Checked By: AH

**Landbeach Boulevard
Butler, WA**

PROJECT AREA

FIGURE 1.1



2. Overview of existing environment

2.1 Geomorphology and topography

The Project Area is located within the Swan Coastal Plain 2 (SWA2 – Swan Coastal Plain subregion) of Western Australia (Mitchell et al. 2002). The Swan Coastal Plain comprises five major geomorphologic systems that lie parallel to the coast, namely (from west to east) the Quindalup Dunes, Spearwood Dunes, Bassendean Dunes, Pinjarra Plain and Ridge Hill Shelf (Churchward & McArthur 1980; Gibson et al. 1994). Each major system is composed of further subdivisions in the form of detailed geomorphologic units (Churchward & McArthur 1980; Semeniuk 1990; Gibson et al. 1994).

Department of Primary Industries and Regional development (DPIRD) mapping indicates the Project Area occurs with the Spearwood Dunes (DPIRD 2018). Further delineation identifies two spoil types within the Project Area:

- 211Sp_kls – Karakata shallow soils Phase: Low hills and ridges with bare limestone or shallow siliceous or calcareous sand over limestone
- 211Sp_Ky – Karakatta Sand Yellow Phase: Low hilly to gently undulating terrain with yellow sand over limestone at 1-2 m (DPIRD 2018).

Topographically, the Project Area is largely flat with a gentle slope from west to east, the western portion of the Project Area is approximately 40 m Australian Height Datum (AHD), while the south eastern portion of the Project Area is approximately 38 mAHD (DAFWA 2001).

2.2 Hydrology

2.2.1 Groundwater

The Project Area is situated within the Perth groundwater area and the Eglington/Perth North Confined Subarea, and is underlain by three aquifers, listed below in descending order of depth from the natural surface:

- Superficial Swan
- Leederville (confined)
- Yarragadee North

Regional historical maximum groundwater contour mapping indicates that the groundwater level may reach up to 3 mAHD (DWER 1997). Based on regional topographic contour mapping, the depth to groundwater is approximately 37 m below the ground surface. Ground water levels are subject to seasonal variability determined largely by rainfall and local characteristics (ie. topography); consequently, actual depth to groundwater will vary across localities.

The Project Area is situated within a Priority 3 Public Drinking Water Source Area (PDWSA), namely the Perth Coastal and Gwelup Underground Water Pollution Control Area.

2.2.2 Surface water and wetlands

There are no surface water features or geomorphic wetlands present within 1 km of the Project Area.

2.3 Vegetation and flora

2.3.1 Vegetation system associations and vegetation complexes

Regional vegetation

Vegetation occurring within the region was initially mapped at a broad scale (1:1 000 000) by Beard during the 1970s. This dataset has formed the basis of several regional mapping systems, including physiographic regions defined by Beard (1981); System 6 Vegetation Complex mapping undertaken

by Heddle et al. (1980); the biogeographical region dataset (Interim Biogeographic Regionalisation for Australia, IBRA) for Western Australia (DEE 2016).

Beard (1990) Botanical Subdistrict

The Project Area occurs within the Drummond Botanical Subdistrict which is characterised by low *Banksia* woodlands on leached sands; *Melaleuca* swamps on poorly-drained depressions; and *Eucalyptus gomphocephala* (Tuart), *Eucalyptus marginata* (Jarrah) and *Corymbia calophylla* (Marri) woodlands on less leached soils (Beard 1990).

IBRA subregion

IBRA describes a system of 85 'biogeographic regions' (bioregions) and 403 subregions covering the entirety of the Australian continent (Thackway & Cresswell 1995). Bioregions are defined on the basis of climate, geology, landforms, vegetation and fauna.

The proposed clearing area occurs within the Swan Coastal Plain 2 IBRA subregion which is dominated by *Banksia* or Tuart on sandy soils, *Casuarina obesa* on outwash plains and paperbark (*Melaleuca*) in swampy areas (Mitchell et al. 2002).

System 6 mapping

System 6 mapping refers to vegetation mapping undertaken at a Vegetation Complex scale by Heddle *et al.* (1980). This is the primary source of information used to calculate potential impacts of proposals to clear native vegetation on the Swan Coastal Plain. Table 2.1 below, identifies the extent of Pre-European vegetation complex which occurs within the Project Area (GoWA 2019).

Table 2.1: Extent of Pre-European vegetation remaining (GoWA 2019)

Vegetation Complex	Description	Current extent on SCP (ha)	Pre-European extent remaining (%)
Cottesloe Complex - Central and South	Mosaic of woodland of <i>E. gomphocephala</i> and open forest of <i>E. gomphocephala</i> – <i>E. marginata</i> – <i>E. calophylla</i> ; closed heath on the limestone outcrops	14,567	32



Legend: <div><div></div> Project area</div> <div>Vegetation complexes (DBCA) <div>Cottesloe Complex</div><div>Central and South</div></div>	Scale 1:3,000 at A4		<div><div>02550</div><div>metres</div></div>	Landbeach Boulevard Butler, WA
	Coord. Sys. GDA 1994 MGA Zone 50		<div><div></div></div>	REGIONAL VEGETATION
	Job No: 57328			
	Client: Satterley Property Group			
	Version: A	Date: 06-Jan-2020		<div><div><div></div></div><div>strategen</div><div>JBS&G</div></div>
	Drawn By: cthatcher	Checked By: AH		

2.3.2 Conservation significant vegetation

2.3.2.1 Conservation significant flora

A desktop assessment was conducted using the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool (PMST) and NatureMap database to identify conservation significant, threatened and priority flora listed under the EPBC Act and Biodiversity Conservation Act 2016 (BC Act) with potential to occur within a 10 km radius of the Project Area (Appendix B).

A database search request was also submitted to the Flora Branch of Parks and Wildlife to identify any conservation significant flora within 10 km of the Project Area.

No Threatened flora species or Priority flora species were considered to have the potential to occur within the Project Area based on specific habitat requirements (Figure 2.2).

2.3.2.2 Threatened and Priority Ecological Communities

A search of the EPBC PMST indicates that four EPBC listed Threatened Ecological Communities (TECs) have the potential to occur within a 10 km radius of the Project Area:

- Aquatic Root Mat Community in Caves of the Swan Coastal Plain – Endangered
- Banksia Woodlands of the Swan Coastal Plain ecological community – Endangered
- Sedgeland in Holocene dune swales of the southern Swan Coastal Plain - Endangered
- Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community – Critically Endangered (Appendix B).

A database search request was also submitted to the Threatened Communities Branch of the Department of Biodiversity Conservation and Attractions (DBCA), to identify any potential TECs or PECs within 10 km of the Project Area.

The *Banksia Woodlands of the Swan Coastal Plain* is considered to be the only TEC that has the potential to occur in the area, as all other identified communities are located greater than 1 km from the Project Area (Figure 2.2).

2.3.2.3 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are boundaries declared in the *Environmental Protection Notice 2005* and relate to defined environmental and world heritage areas of important conservation value.

No ESAs are located within the Project Area. The closest ESA is located approximately 160 m to the east in association with Bush Forever Site 383 (see below).

2.3.2.4 Bush Forever

There are no Bush Forever sites situated within the Project Area. Bush Forever site 383 is located approximately 160 m to the east of the Project Area (Figure 2.2). Bush Forever site 383 consists of Neerabup National Park, Lake Gnowergup Nature Reserve and Adjacent Bushland, Neerabup.

Bush Forever site 383 is comprised of the Spearwood Dunes, Cottesloe Complex – Central and South and include areas of the vegetation community, *Melaleuca huegelii* – *M. acerosa* shrublands on limestone ridges (FCT 26a).



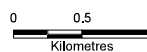
Legend:

- Project area
- 5km buffer
- Bush Forever site (DOP)
- Legislated Lands and Waters (DBCA)**
- National Park
- Section 5(1)(g) Reserve
- Nature Reserve
- State Forest

Conservation significant flora

- Priority 1
- Priority 2
- Priority 3
- Priority 4
- Threatened

Scale 1:55,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50



Job No: 57328

Client: Satterley Property Group

Version: A

Date: 17-Dec-2019

Drawn By: cthatcher

Checked By: AH

**Landbeach Boulevard
Butler, WA**

CONSERVATION SIGNIFICANCE

FIGURE 2.2



2.3.3 Vegetation and flora field assessment

Strategen-JBS&G attended the Project Area in November 2019 to undertake a Reconnaissance flora and vegetation survey. A survey area was established, encompassing the Project Area (Figure 2.3) by a Senior Botanist from Strategen-JBS&G. The survey defined and mapped three vegetation types (VTs) within the Project Area (Table 2.2; Figure 2.3). Cleared areas have not been counted as unique native VTs.

A total of 37 native vascular plant taxa, and seven introduced (exotic) taxa were recorded from four quadrats surveyed in the Project Area. The relatively low number of plant genera recorded reflects the disturbed nature of the Project Area and is also representative of vegetation in immediately adjacent land.

Rubbish and informal recreation tracks including four-wheel driving and trail biking exhibited evidence of historical disturbance throughout the Project Area. Vegetation types (VT) 2 and 3 are both revegetated landscapes occurring on manmade slopes/batter. The revegetation was undertaken by the Satterley in winter 2016 for the purpose of creating an aesthetically acceptable slope and batter; consequently, these VTs are not considered native vegetation under the *Environmental Protection Act 1986*. Vegetation condition within the Project Area was rated as 'Completely Degraded' along the cleared tracks to 'Very Good' within the remnant native vegetation (Keighery 1994).

VT1 is remanent bushland which shows minor signs of disturbance along the edge from former clearing activities and unauthorised access by four wheel drives and motorbikes. VT1 is in contiguous connection with better quality vegetation to the east which forms part of Bush Forever Site 383 (160 m to the east).

Table 2.2: Vegetation types and condition within the Project Area

Vegetation type	Description	Vegetation condition	Area (ha)
VT1	Very open woodland of <i>Banksia attenuata</i> and <i>Eucalyptus gomphocephala</i> and occasionally <i>Eucalyptus marginata</i> over heath of <i>Hibbertia hypericoides</i> , <i>Xanthorrhoea preissii</i> and <i>Acacia pulchella</i> over herbland of mixed native species on grey sandy soils.	Very Good	0.1
VT2	Mature revegetation. Closed shrubland of <i>Acacia rostellifera</i> and <i>Acacia saligna</i> over heath of mixed native species on yellow sand on manmade batter slopes.	Good	0.18
VT3	Recent revegetation. Open shrubland of <i>Acacia rostellifera</i> , <i>Templetonia retusa</i> , and <i>Rhagodia baccata</i> over open herbland of mixed native species on yellow sand on manmade batter slopes.	Good	0.37
Total			0.65

In addition to the Reconnaissance Survey undertaken across the Project Area in November 2019, Strategen Environmental Consultants (now Strategen-JBS&G), completed a Flora, Vegetation and Black Cockatoo habitat assessment in 2016 which included of a portion of the Project Area prior to the development of the site (Appendix C). Results of the survey conducted in 2016, identified three native VTs within the Project Area in Very Good condition.

2.4 Conservation significant vegetation

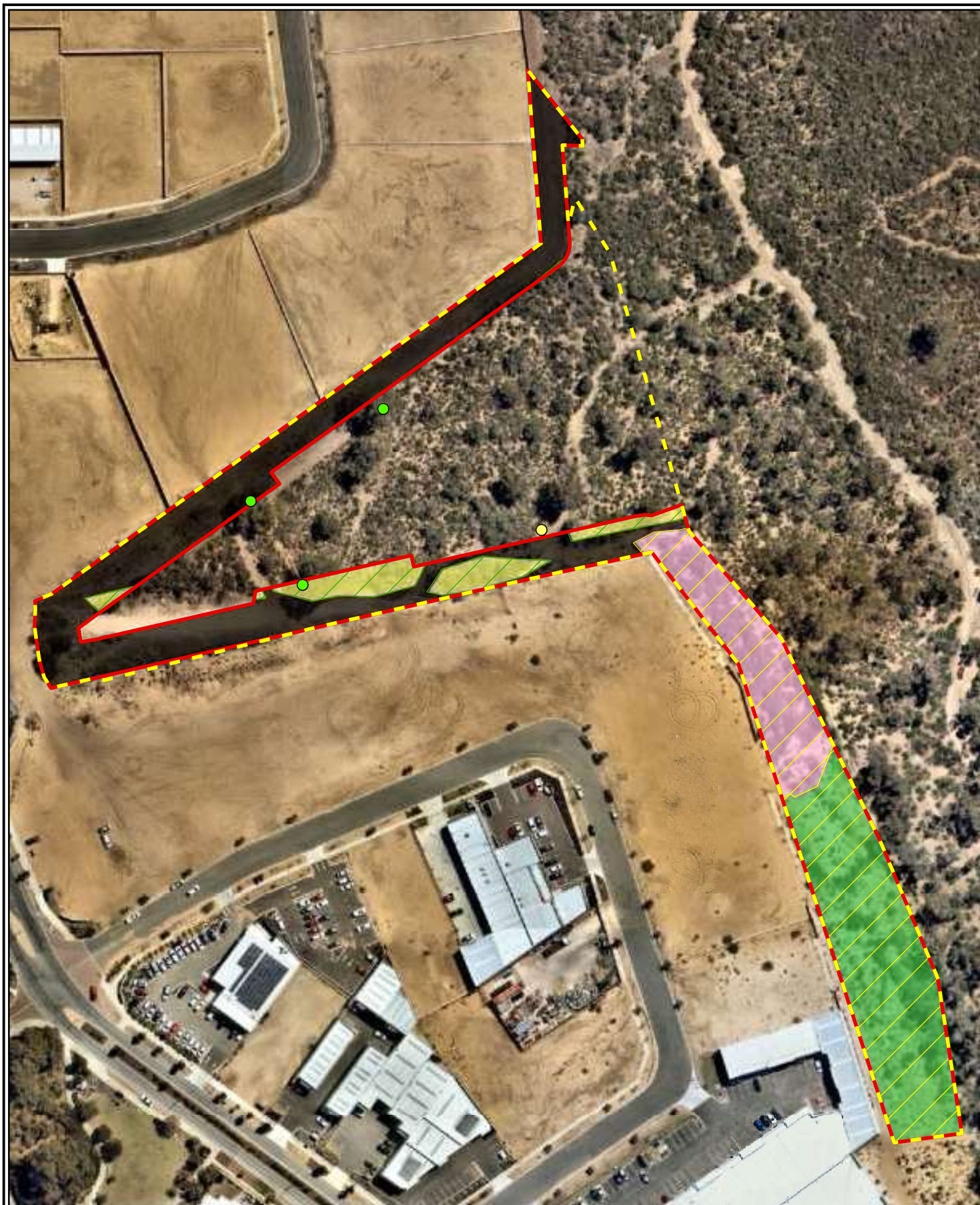
During the survey, no Threatened flora species as listed under section 178 of the EPBC Act or pursuant to Schedule 1 of the BC Act were recorded within the survey area. Also, no Priority flora species as listed by Western Australian Herbarium (1998-) were recorded within the survey area. Previous surveys undertaken in October 2016 did not identify any Threatened or Priority flora species within the Project Area.












Due to the clearing history and degraded nature of the Project Area, it is considered unlikely that any conservation significant flora occurs within the Project Area.

DBCA mapping of the 'Banksia Woodlands of the Swan Coastal Plain' Priority Ecological Community (PEC), corresponding with the Commonwealth listed Threatened Ecological Community (TEC), indicates that the PEC/TEC lies within the Project Area and its vicinity. While there is insufficient species recorded to undertake a Floristic Community Type (FCT) analysis within the Project Area, largely due to the size of the Project Area, VT1 demonstrates similarity to and shows indicator species for Banksia Woodlands of the Swan Coastal Plain TEC and PEC. Therefore, VT1 is considered Banksia Woodlands of the Swan Coastal Plain TEC and PEC.

The DBCA has undertaken landscape mapping of Tuart Woodlands with the Swan Coastal Plain. Tuart Woodlands and Forests of the Swan Coastal Plain was listed as a TEC under the EPBC Act in 2019. Tuart Woodlands are identified as a PEC under the BC act. A portion of the Project Area intersects with the landscape mapping undertaken by the DBCA and two confirmed Tuarts were identified within the Project Area with another tree nearby and a stag suspected to be a Tuart was also identified (Figure 2.3). No trees within the Project area will be cleared and all Tuarts will remain in-situ as part of this proposed works.

The flora survey conducted 2016 also identified Banksia Woodlands of the Swan Coastal Plain as the only TEC and PEC within the Project Area (Appendix C).



Legend:		Scale 1:1,750 at A4		Landbeach Boulevard Butler, WA	
 Project area	Vegetation condition			VEGETATION TYPES AND CONDITION	
 Survey area	 Very good	Coord. Sys. GDA 1994 MGA Zone 50			
Fauna habitat		Job No: 57328		FIGURE 2.3	
 <i>Eucalyptus gomphocephala</i> (Healthy)	Vegetation type	Client: Satterley Property Group			
 <i>Eucalyptus</i> sp. (Dead)	 VT1	Version: A			
	 VT2	Date: 18-Dec-2019			
	 VT3	Drawn By: cthatcher			
	 Cleared (0.66 ha)	Checked By: AH			

2.5 Black cockatoo habitat assessment

A Level 1 Black Cockatoo Survey was undertaken across the survey area to identify potential breeding, roosting and foraging habitat for the three threatened Black Cockatoo species, however, species distribution maps provided by the Department of Environment and Energy (DEE) indicate that only two species have the potential to occur within the Project Area, Carnaby's Black Cockatoo (CBC) and Forest Red-tailed Black Cockatoo (FRTBC) (DSEWPac 2011). The quality of foraging habitat was determined based on parameters outlined in the *Draft revised referral guideline for three threatened black cockatoo species: Carnaby's Black Cockatoo, Baudin's Cockatoo, Forest Red-tailed Black Cockatoo* (DEE 2017).

The Project Area contains three different vegetation types, as outlined in Table 2.2. Only two VTs contain flora species which are considered to be utilised by CBC and FRTBC for foraging; this equates to 0.28 ha of potential foraging habitat for CBC and FRTBC occurs within the Project Area (Groom 2011, Johnstone 2010b, Johnstone *et al.* 2011).

Foraging habitat for black cockatoos is generally defined as the availability of plant food sources within an area (Finn 2012). Food availability for black-cockatoos is a function of the diversity, abundance, distribution, energetic and nutritional qualities, and seasonality (phenology) of the food sources within a particular area. Table 2.3 summarises the value of each VT in terms of the quality of foraging habitat provided for black cockatoos. Table 2.4 provides a justification for how foraging values were defined.

The highest quality foraging habitat for black cockatoos was noted within VT1 which contained 'Moderate' quality CBC food species including *Banksia attenuata*, *Eucalyptus gomphocephala*, *Eucalyptus marginata*, *Hakea lissocarpa* and *Xanthorrhoea preissii* at canopy and midstorey levels; VT1 contained 'Very poor' quality FRTBC food species including *Eucalyptus marginata* and *Hakea lissocarpa*. The lowest quality foraging habitat for black cockatoos (not including cleared areas) was noted within VT2 which contained *Acacia saligna*, *Banksia menziesii*, *Hakea lissocarpa* and *Hakea prostrata* (planted vegetation in winter 2016), which provides limited food resources for CBC and FRTBC; VT3 did not contain any foraging resources for Black Cockatoos.

Based on the results of the foraging assessment, the Project Area is considered to contain 0.1 ha of 'Moderate' quality foraging habitat for CBCs.

No evidence of foraging was observed within the Project Area.

Table 2.3: Vegetation types and black cockatoo foraging species within the Project Area

Vegetation type	Black cockatoo foraging species	Foraging quality	Area (ha)
1	CBC – <i>Banksia attenuata</i> , <i>Eucalyptus gomphocephala</i> , <i>Eucalyptus marginata</i> , <i>Hakea lissocarpa</i> , <i>Xanthorrhoea preissii</i> FRTBC – <i>Eucalyptus marginata</i> , <i>Hakea lissocarpa</i>	CBC – Moderate FRTBC – Very poor	0.1
2	CBC – <i>Acacia saligna</i> , <i>Banksia menziesii</i> , <i>Hakea lissocarpa</i> , <i>Hakea prostrata</i> FRTBC – <i>Hakea lissocarpa</i>	CBC – Very poor FRTBC – Very poor	0.18
3	CBC – nil FRTBC – nil	CBC – nil FRTBC – nil	0.37

Table 2.4: Definition of black cockatoo foraging habitat within the survey area

Foraging quality	Justification
Excellent	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) and presence of food sources at several strata (i.e. canopy, midstorey and understorey).
Good	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) but food sources only present at one or two strata (i.e. canopy and midstorey).
Moderate	Moderate foraging value density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 20-40%) and food sources only present at one or two strata (i.e. canopy and midstorey).
Poor	Low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 10-20%) and presence of food sources at only one stratum (i.e. canopy).
Very poor	Very low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species <10%) and presence of food sources at only one stratum (i.e. canopy).
Nil	Cleared areas - no suitable vegetation present.

An assessment of black cockatoo roosting and breeding habitat was also undertaken within the survey area to identify potential black cockatoo roosting and breeding trees. "Breeding habitat" for black cockatoos is defined in DSEWPaC (2012) as trees of a species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable Diameter at Breast Height (DBH), to develop a nest hollow (>300 mm for salmon gum and wandoo, and >500 mm for other species).

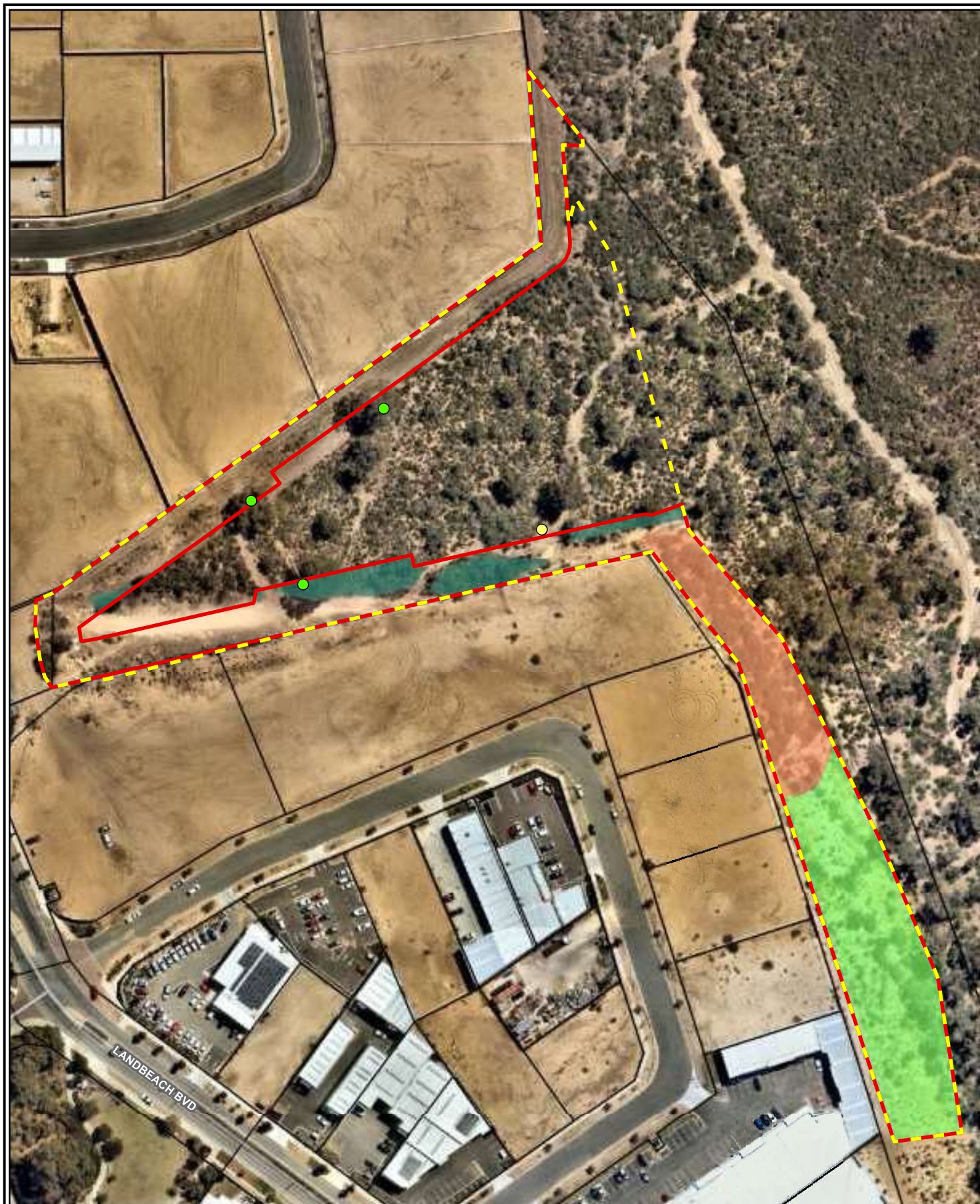
Trees of this size may also be large enough to provide roosting habitat (i.e. trees which provide a roost or rest area for the birds). Significant trees which contain hollows that have an entrance chamber of more than 100 mm are suitable for use by black cockatoos (Whitford and Williams 2002).

Mapping undertaken by the DBCA identified the Project Area is within the confirmed breeding range for CBCs (DBCA 2011), the nearest confirmed roots site is approximately 2 km to the east (Birdlife 2018). DBCA mapping also indicates the Project Area is with confirmed CBC breeding area (DBCA 2011)

During the habitat assessment, four potential breeding trees were recorded within the Project Area (Figure 2.4), one of these trees had two small hollows which were not of sufficient size for Black Cockatoos, and bees were observed in one of the hollows.

No black cockatoos were seen or heard in the survey area or adjacent whilst on site.

Results of the 2019 Black Cockatoo assessment were consistent with the results of the 2016 assessment (Appendix C).



Legend:

- Project area
- Survey area
- Cadastral boundary
- Black Cockatoo foraging quality
- CBC – moderate / FRTBC – very poor
- CBC – nil / FRTBC – nil
- CBC – very poor / FRTBC – very poor
- *Eucalyptus gomphocephala* (Healthy)
- *Eucalyptus* sp. (Dead)
- Roads (MRWA)

Scale 1:1,750 at A4

0 10 20
metres

Coord. Sys. GDA 1994 MGA Zone 50



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**Landbeach Boulevard
Butler, WA**

BLACK COCKATOO HABITAT

FIGURE 2.4



3. Assessment against the ten clearing principles

An assessment of the proposed clearing against the ten clearing principles, as outlined in Schedule 5 of the EP Act, is provided in Table 3.1. The assessment has been undertaken in accordance with the guidelines set out by DWER.

Table 3.1: Assessment of proposed native vegetation clearing in accordance with the ten clearing principles

Clearing principle	Assessment	Conclusion
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity	<p>Clearing will result in the loss of 0.1 ha of native vegetation.</p> <p>Although clearing will occur on the edge of a patch of vegetation than is considered 'Banksia Woodlands of the Swan Coastal Plain' TEC, the majority of the patch will remain in contiguous connection to better quality vegetation contained within Bush Forever Site 383.</p> <p>The flora survey conducted in 2019 identified there was insufficient species diversity within the Project Area, to complete a Floristic Community Type analysis. Therefore, the Project will not result in clearing of native vegetation representative of an area of high biodiversity, or that has a higher diversity than other examples of the vegetation in the region.</p> <p>The Project is not expected to result in clearing of rare or priority flora.</p>	The proposed clearing is unlikely to be at variance with this principle.
(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 indigenous to Western Australia	<p>Given the high level of historical disturbance within and adjacent to the Project Area, the Project Area is not considered to contain a significant area of fauna habitat. The proposed clearing will retain the four established Eucalypts as potential CBC roosting habitat for conservation management purposes.</p> <p>The Project Area is located adjacent to large areas of intact fauna habitat associated with the Bush Forever site 383, 160 m to the east.</p> <p>Clearing will occur on the edge of already cleared and degraded vegetation, any fauna potential utilising the vegetation within the Project Area will be capable of migrating further into the better quality bushland to the east.</p>	The proposed clearing is unlikely to be at variance with this principle.
(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora	<p>Specific flora surveys have been undertaken with the Project Area which were undertaken at the optimal time of year to detect the maximum number of species. No rare flora were identified within the Project Area.</p> <p>Due to the high level of disturbance the Project is not expected to result in clearing of rare flora.</p>	Removal of vegetation within the Project Area is unlikely to be at variance with this principle.
(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 Project will result in clearing 0.1 ha of 'Banksia Woodlands of the Swan Coastal Plain' TEC.</p> <p>The clearing will occur on the edge of the 'Banksia Woodlands of the Swan Coastal Plain' TEC patch which is located throughout the Bush Forever site 383 (1736.1 ha, 160 m to the east) and will leave the majority of the patch in contiguous connection to Bush Forever Site 383.</p> <p>The removal of 0.1 ha of Banksia Woodland TEC will not impact the maintenance of this TEC.</p>	The proposed clearing may be at variance with this principle.

Clearing principle	Assessment	Conclusion
(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	The majority of the adjacent area has been historically disturbed by clearing for residential and commercial development. Clearing for the development will occur along the edge of remanent vegetation which is in direct connection with substantial amounts of native remnant vegetation vested as Bush Forever Site 383. A total of 0.1 ha of remnant vegetation along the edge of previously cleared tracks, is unlikely to represent a significant remnant of native vegetation when expansive extents of similar vegetation remains in Bush Forever Site 383, with is 160 m to the east of the Project Area.	The total loss of vegetation does not represent a significant impact to any of the surrounding vegetation types. Removal of vegetation within the Project Area is unlikely to be at variance with this principle.
(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland	Vegetation within the Project Area is not associated with a watercourse or wetland.	Removal of vegetation in the Project Area is unlikely to be at variance with this principle.
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation	Clearing for the development will occur adjacent to already cleared tracks and will result in 0.1 ha of vegetation being removed. While vegetation condition with the Project Area is very good, the vegetation adjacent to the Project Area contains informal tracks from frequent access by off-road vehicles; consequently, clearing an additional 0.1 ha within the Project Area is unlikely to cause any additional land degradation.	Removal of vegetation in the Project Area is unlikely to be at variance with this principle.
(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	No conservation areas are present within the Project Area. Bush Forever Site 383 is 160 m to the east of the Project Area and contains vegetation in similar or better condition to the Project Area. Clearing 0.1 ha of vegetation on the edge of cleared tracks with a separation of 160 m to the nearest conservation area, is unlikely to create any additional impact on the environmental values of Bush Forever Site 383.	Removal of vegetation in the Project Area is unlikely to be at variance with this principle.
(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	The clearing is not expected to result in sediment or nutrient impacts to wetlands, soil acidity, or increased salinity. Clearing within the Project Area will remove 0.1 ha of vegetation. This is highly unlikely to result in impacts to surface or groundwater quality.	Removal of vegetation in the Project Area is not expected to cause any deterioration in the quality of surface or underground water as the Project will not be undertaken near wetlands or drainage channels; therefore, the proposed clearing is unlikely to be at variance with this principle.
(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	The site has long been subjected to disturbance due to its proximity to established residential and commercial areas, nearby clearing for subdivision works and rubbish dumping. Additionally, the site proposed to be cleared is relatively small. Proposed clearing of the Project Area is consequently unlikely to result in additional flood risk or exacerbation of flooding intensity.	Removal of vegetation within the Project Area is unlikely to be at variance with this principle as the vegetation clearing proposed will not cause or exacerbate the incidence of flooding.

4. Environmental approvals, management and conclusion

4.1 Environmental approvals

Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community is identified as a Matter of National Environmental Significance (MNES), which is protected under the EPBC Act. The DEE have provided guidance on the impact threshold required before impacts to Banksia Woodland TEC requires referral under the EPBC Act (TSSC 2016). Advice provided by the conservation advice for Banksia Woodland states that the minimum patch size requiring referral for Very Good Vegetation is 1 ha (TSSC 2016).

CBCs are protected under the EPBC Act as MNES, the DEE have provided guidance on the thresholds for referral for impacts to CBCs (DSEWPaC 2012).

Given the small extent of Very Good TEC and moderate quality CBC foraging habitat within the Project Area, clearing 0.1 ha is unlikely to represent a significant impact to the MNES identified above; therefore, this clearing will not be referred to the DEE for assessment under the EPBC Act. Furthermore, Bush Forever Site 160 m to the east of the Project Area is likely to provide much larger extents of better quality vegetation representing the MNES values within the Project Area.

4.2 Environmental management

The proposed clearing will be undertaken in a manner which will avoid impacts to surrounding vegetation through clearly demarcating prior to clearing activities, not more than seven days prior to clearing commencing.

4.3 Conclusion

The proposed clearing will result in the removal of up to 0.1 ha of native vegetation assessed to be in very good condition. An assessment against the ten clearing principles listed in Schedule 5 of the *Environmental Protection Act 1986*, indicates that the proposed clearing maybe at variance with principles (a) and (d) and is unlikely to be at variance with the remaining principles.

Limitations

Scope of services

This report ("the report") has been prepared by Strategen-JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen-JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen-JBS&G has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen-JBS&G has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen-JBS&G has also not attempted to determine whether any material matter has been omitted from the data. Strategen-JBS&G will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen-JBS&G. The making of any assumption does not imply that Strategen-JBS&G has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen-JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

Strategen-JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by Strategen-JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

5. References

- Beard, J. S. (1981). Swan, 1:1000000 vegetation series: explanatory notes to sheet 7: the vegetation of the Swan area, University of Western Australia Press, Nedlands, Western Australia.
- Birdlife Australia (Birdlife). (2018). Western Australia's black-cockatoo roost sites with Great Cocky Count survey records. Perth, Western Australia.
- Churchward HM & McArthur WM 1980, 'Landforms and Soils of the Darling System', in *Atlas of Natural Resources, Darling System, Western Australia*, eds Department of Conservation and Environment, Perth, pp. 25-33.
- Department of Agriculture and Food (DAFWA). (2001). 2 m and 10 m contours derived from the Land Monitor DEM product. Government of Western Australia.
- Department of Biodiversity Conservation and Attractions (DBCA). (2011). Black Cockatoo habitat mapping. Government of Western Australia.
- Department of Environment and Energy (DEE), 2016. Interim Biogeographic Regionalisation for Australia, Version 7. Government of Western Australia. Available from: <https://www.environment.gov.au/system/files/pages/5b3d2d31-2355-4b60-820c-e370572b2520/files/bioregions-new.pdf>
- Department of Environment and Energy (DEE). (2017). Species Profile and Threats (SPRAT) database. Website accessed November 2019 at <http://www.environment.gov.au/cgibin/sprat/public/sprat.pl>
- Department of Primary Industries and Regional Development (DPIRD). (2018). Natural resources Information Western Australia. Government of Western Australia.
- Department of Sustainability, Environment, Water Population and Communities (DSEWPC). (2011). Modelled Distribution of three species of Black Cockatoos. Government of Australia.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPac) (2012). Environment Protection and Biodiversity Conservation Act 1999 referral guidelines for three black cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest Red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso*. Australian Government, Canberra.
- Department of Water and Environmental Regulation (DWER). (1997). Perth Groundwater Map. [Online]. Available from: <https://maps.water.wa.gov.au/#/webmap/gwm> [5 December 2019].
- Finn H 2012, Assessment of habitat values for black-cockatoos within selected sites at Newmont Boddington Gold Mine, report prepared for Newmont Boddington Gold Pty Ltd.
- Gibson N, Keighery B, Keighery G, Burbidge A & Lyons M 1994, *A Floristic survey of the southern Swan Coastal Plain*, report prepared for the Australian Heritage Commission, 1994.
- Government of Western Australia (GoWA). (2019). 2019 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report), Department of Parks and Wildlife, Perth.
- Groom C. 2011 Plants Used by Carnaby's Black Cockatoo Department of Environment and Conservation, Perth
- Hedde EM, Lonergan DW, & Havel JJ. (1980). 'Vegetation complexes of the Darling System, Western Australia'. In: *Atlas of natural resources of the Darling System, Western Australia*, Perth, Western Australia.
- Johnstone R 2010b, Information sheet: Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*), Western Australian Museum, Perth

- Keighery B. (1994). *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*, Wildflower Society, Floreat.
- Main Roads. (2020). *Future Major Works Infrastructure Delivery Plan*. Viewed on 22 January 2020. Available at:
<https://www.mainroads.wa.gov.au/BuildingRoads/Contracting/FutureMajorWorks/Pages/Future.aspx>
- Mitchell D, Williams K & Desmond A 2002, 'Swan Coastal Plain 2 (SWA2 – Swan Coastal Plain subregion)', in *A biodiversity audit of Western Australia's 53 Biogeographical Subregions in 2002*, eds Department of Conservation and Land Management, Perth, pp. 606-623.
- Semeniuk V 1990, 'The geomorphology and soils of Yoongarillup Plain, in the Mandurah-Bunbury coastal zone, southwestern Australia: a critical appraisal', *Journal of the Royal Society of Western Australia*, vol. 73, pp. 1-7.
- Thackway & Cresswell. (1995). *An Interim Biogeographic Regionalisation for Australia: A framework for setting priorities in the National Reserves System Cooperative Program Version 4*, Australian Nature Conservation Agency, Canberra.
- Whitford K.R. and William M.R. (2002). Hollows in jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) trees: II. Selecting trees to retain for hollow dependant fauna. *Forest Ecology and Management* 160: 215-232



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: 03/12/19 17:48:34

[Summary](#)

[Details](#)

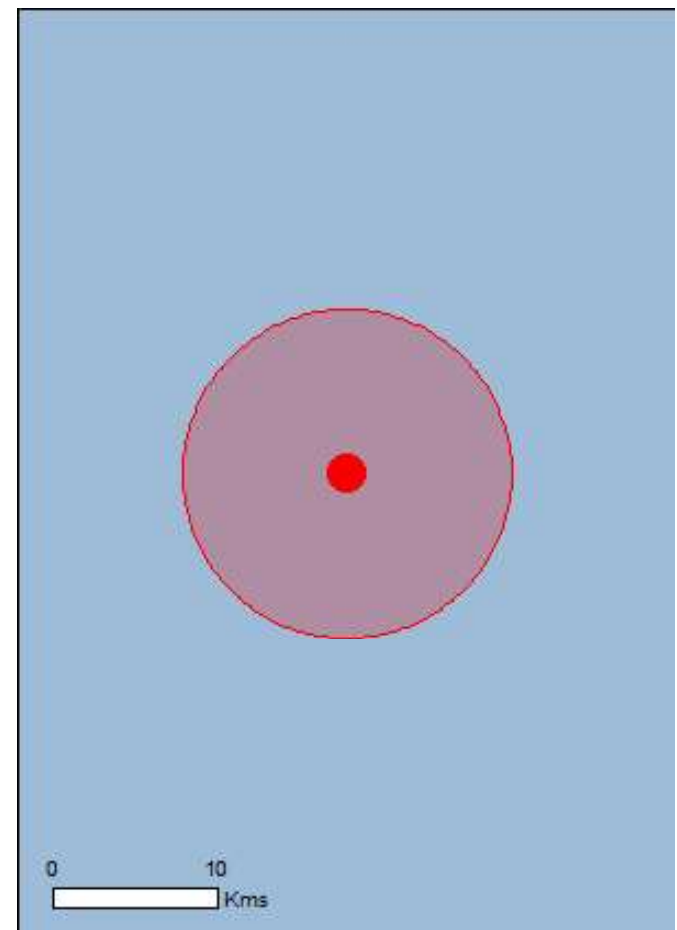
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

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[Coordinates](#)

Buffer: 10.0Km



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:	4
Listed Threatened Species:	52
Listed Migratory Species:	43

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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	71
Whales and Other Cetaceans:	12
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:	3
Regional Forest Agreements:	None
Invasive Species:	35
Nationally Important Wetlands:	1
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
Aquatic Root Mat Community in Caves of the Swan Coastal Plain	Endangered	Community known to occur within area
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		
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	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 likely to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area

Name	Status	Type of Presence
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may 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
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	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
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may 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	Foraging, feeding or related behaviour known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta cauta Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Fish		
Galaxiella nigrostriata Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Insects		
Hesperocolletes douglasi Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat known to occur within area
Plants		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Anigozanthos viridis subsp. terraspectans Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat likely to occur within area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	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
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat may occur within area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat may occur within area
Eucalyptus argutifolia Yanchep Mallee, Wabling Hill Mallee [24263]	Vulnerable	Species or species habitat likely to occur within area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area
Marianthus paralius [83925]	Endangered	Species or species habitat known to occur within area
Melaleuca sp. Wanneroo (G.J. Keighery 16705) [89456]	Endangered	Species or species habitat known to occur

Name	Status	Type of Presence within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sharks		
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may 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		
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
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
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Hydroprogne caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Onychoprion anaethetus Bridled Tern [82845]		Foraging, feeding or related behaviour likely to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche cauta Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Breeding known to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may 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 known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to 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 likely to 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
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 known to 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

Commonwealth Land

[\[Resource Information \]](#)

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.

Name

Commonwealth Land -

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 known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	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]		Species or species habitat 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 likely to 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 likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area
Larus novaehollandiae Silver Gull [810]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Foraging, feeding or related behaviour may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
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 known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to 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]		Foraging, feeding or

Name	Threatened	Type of Presence
Sterna caspia Caspian Tern [59467]		related behaviour likely to occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Foraging, feeding or related behaviour likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area
Fish		
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species

Name	Threatened	Type of Presence
Mitotichthys meraculus Western Crested Pipefish [66259]		habitat may occur within area Species or species habitat may occur within area
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammals		
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat known to occur within area
Reptiles		
Aipysurus pooleorum Shark Bay Seasnake [66061]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area

Name	Threatened	Type of Presence
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [\[Resource Information \]](#)

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Neerabup	WA
Neerabup	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
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

Name	Status	Type of Presence
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
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
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 linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		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
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		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

Name	Status	Type of Presence
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii		within area
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

Nationally Important Wetlands		[Resource Information]
Name		State
Loch McNess System		WA

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

-31.63397 115.70883

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.

NatureMap Species Report 57328

Created By Guest user on 03/12/2019

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 42' 32" E, 31° 38' 02" S
Buffer 10km
Group By Species Group

Species Group	Species	Records
Alga	61	82
Amphibian	7	90
Bird	193	3139
Bryopsid (Moss)	6	12
Dicotyledon	410	1604
Fish	12	24
Fungus	19	28
Gymnosperm	1	18
Invertebrate	60	665
Lichen	1	1
Mammal	35	226
Monocotyledon	169	688
Pteridophyte (Fern)	1	1
Reptile	60	953
Slime Mould	6	7
TOTAL	1041	7538

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Alga				
1.	26458 <i>Amphiroa anceps</i>			
2.	26471 <i>Antithamnion armatum</i>			
3.	26475 <i>Antithamnion hanovioides</i>			
4.	26486 <i>Asparagopsis taxiformis</i>			
5.	48503 <i>Betaphycus speciosus</i>			
6.	26511 <i>Bornetia binderiana</i>			
7.	26535 <i>Callophycus harveyanus</i>			
8.	26536 <i>Callophycus oppositifolius</i>			
9.	26562 <i>Caulerpa fergusonii</i>			
10.	26570 <i>Caulerpa obscura</i>			
11.	46993 <i>Caulerpa taxifolia</i> var. <i>distichophylla</i>			
12.	26600 <i>Ceramium pusillum</i>			
13.	26621 <i>Champia zostericola</i>			
14.	26665 <i>Clavicornium ovatum</i>			
15.	26672 <i>Codium galeatum</i>			
16.	26709 <i>Cryptonemia undulata</i>			
17.	26752 <i>Dasyclonium incisum</i>			
18.	26761 <i>Dictyomenia harveyana</i>			
19.	26762 <i>Dictyomenia sonderi</i>			
20.	26763 <i>Dictyomenia tridens</i>			
21.	26767 <i>Dictyopteris plagiogramma</i>			
22.	27392 <i>Dictyota dichotoma</i> var. <i>intricata</i>			
23.	26778 <i>Dictyota furcellata</i>			
24.	26850 <i>Gelinaria ulvoidea</i>			
25.	26876 <i>Gracilaria verrucosa</i>			
26.	26884 <i>Griffithsia ovalis</i>			
27.	26915 <i>Hennedya crispa</i>			
28.	26919 <i>Herposiphonia rostrata</i>			
29.	26922 <i>Herposiphonia versicolor</i>			
30.	26942 <i>Hirsutithalia larinia</i>			
31.	26946 <i>Hormophysa cuneiformis</i>			
32.	26960 <i>Hymenocladia chondricola</i>			
33.	35898 <i>Hypnea musciformis</i>			
34.	26971 <i>Hypnea ramentacea</i>			
35.	26985 <i>Jania micrarthrodia</i>			

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
36.	26995	<i>Kuetzingia canaliculata</i>			
37.	26998	<i>Laurencia brongniartii</i>			
38.	27001	<i>Laurencia filiformis</i>			
39.	27011	<i>Lenormandia latifolia</i>			
40.	27015	<i>Leptosomia rosea</i>			
41.	27043	<i>Lobophora variegata</i>			
42.	27044	<i>Lobospira bicuspidata</i>			
43.	27068	<i>Metagoniolithon radiatum</i>			
44.	27107	<i>Osmundaria prolifera</i>			
45.	27108	<i>Osmundaria spiralis</i>			
46.	27126	<i>Petalonia fascia</i>			
47.	27144	<i>Platoma cyclocolpum</i>			
48.	27149	<i>Platysiphonia mutabilis</i>			
49.	27155	<i>Plocamium cartilagineum</i>			
50.	27156	<i>Plocamium mertensii</i>			
51.	27173	<i>Polysiphonia decipiens</i>			
52.	27190	<i>Protokuetzingia australasica</i>			
53.	27238	<i>Sargassum distichum</i>			
54.	27249	<i>Sargassum linearifolium</i>			
55.	27260	<i>Sargassum tristichum</i>			
56.	29957	<i>Sargassum vestitum</i>			
57.	35911	<i>Scytosiphon lomentaria</i>			
58.	42785	<i>Sirophysalis trinodis</i>			
59.	44731	<i>Sonderophycus capensis</i>			
60.	48423	<i>Stauromenia lacerata</i>			
61.	27347	<i>Tylotus obtusatus</i>			

Amphibian

62.	25400	<i>Crinia insignifera</i> (Squelching Froglet)			
63.	25410	<i>Heleioporus eyrei</i> (Moaning Frog)			
64.	25415	<i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
65.	25378	<i>Litoria adelaidensis</i> (Slender Tree Frog)			
66.	25388	<i>Litoria moorei</i> (Motorbike Frog)			
67.	25420	<i>Myobatrachus gouldii</i> (Turtle Frog)			
68.	25433	<i>Pseudophryne guentheri</i> (Crawling Toadlet)			

Bird

69.	24559	<i>Acanthagenys rufogularis</i> (Spiny-cheeked Honeyeater)			
70.	24260	<i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
71.	24261	<i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
72.	24262	<i>Acanthiza inornata</i> (Western Thornbill)			
73.	24560	<i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
74.	25535	<i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
75.	25536	<i>Accipiter fasciatus</i> (Brown Goshawk)			
76.	24282	<i>Accipiter fasciatus</i> subsp. <i>fasciatus</i> (Brown Goshawk)			
77.	25755	<i>Acrocephalus australis</i> (Australian Reed Warbler)			
78.	24831	<i>Acrocephalus australis</i> subsp. <i>gouldi</i> (Australian Reed Warbler)			
79.	41323	<i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
80.	25544	<i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
81.	24310	<i>Anas castanea</i> (Chestnut Teal)			
82.	24312	<i>Anas gracilis</i> (Grey Teal)			
83.	24313	<i>Anas platyrhynchos</i> (Mallard)			
84.	24315	<i>Anas rhynchotis</i> (Australasian Shoveler)			
85.	24316	<i>Anas superciliosa</i> (Pacific Black Duck)			
86.	47414	<i>Anhinga novaehollandiae</i> (Australasian Darter)			
87.	24506	<i>Anous tenuirostris</i> subsp. <i>melanops</i> (Australian Lesser Noddy)		T	
88.	24561	<i>Anthochaera carunculata</i> (Red Wattlebird)			
89.	24562	<i>Anthochaera lunulata</i> (Western Little Wattlebird)			
90.	24599	<i>Anthus australis</i> subsp. <i>australis</i> (Australian Pipit)			
91.	25554	<i>Apus pacificus</i> (Fork-tailed Swift, Pacific Swift)		IA	
92.	24285	<i>Aquila audax</i> (Wedge-tailed Eagle)			
93.	41324	<i>Ardea modesta</i> (great egret, white egret)			
94.	24340	<i>Ardea novaehollandiae</i> (White-faced Heron)			
95.	24341	<i>Ardea pacifica</i> (White-necked Heron)			
96.	25736	<i>Arenaria interpres</i> (Ruddy Turnstone)		IA	
97.	25566	<i>Artamus cinereus</i> (Black-faced Woodswallow)			
98.	24353	<i>Artamus cyanopterus</i> (Dusky Woodswallow)			
99.	24356	<i>Artamus personatus</i> (Masked Woodswallow)			
100.	24318	<i>Aythya australis</i> (Hardhead)			
101.		<i>Barnardius zonarius</i>			
102.	24319	<i>Biziura lobata</i> (Musk Duck)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
103.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
104.	25715 <i>Cacatua roseicapilla</i> (Galah)			
105.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
106.	24727 <i>Cacatua sanguinea</i> subsp. <i>westralensis</i> (Little Corella)			
107.	24729 <i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	Y		
108.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
109.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
110.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
111.	25738 <i>Calidris canutus</i> (Red Knot, knot)		IA	
112.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
113.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
114.	24789 <i>Calidris subminuta</i> (Long-toed Stint)		IA	
115.	24790 <i>Calidris tenuirostris</i> (Great Knot)		T	
116.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
117.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		T	
118.	48400 <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		T	
119.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
120.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
121.	47909 <i>Cheramoeca leucosterna</i> (White-backed Swallow)			
122.	<i>Chroicocephalus novaehollandiae</i>			
123.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
124.	24288 <i>Circus approximans</i> (Swamp Harrier)			
125.	24289 <i>Circus assimilis</i> (Spotted Harrier)			
126.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
127.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
128.	24613 <i>Colluricincla harmonica</i> subsp. <i>rufiventris</i> (Grey Shrike-thrush)			
129.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
130.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
131.	24416 <i>Corvus bennetti</i> (Little Crow)			
132.	25592 <i>Corvus coronoides</i> (Australian Raven)			
133.	24417 <i>Corvus coronoides</i> subsp. <i>perplexus</i> (Australian Raven)			
134.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
135.	25701 <i>Coturnix ypsilophora</i> (Brown Quail)			
136.	24420 <i>Cracticus nigrogularis</i> (Pied Butcherbird)			
137.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
138.	24422 <i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed Magpie)			
139.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
140.	24424 <i>Cracticus torquatus</i> subsp. <i>torquatus</i> (Grey Butcherbird)			
141.	24322 <i>Cygnus atratus</i> (Black Swan)			
142.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
143.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
144.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
145.	24470 <i>Dromaius novaehollandiae</i> (Emu)			
146.	<i>Egretta garzetta</i>			
147.	<i>Egretta novaehollandiae</i>			
148.	<i>Elanus axillaris</i>			
149.	24290 <i>Elanus caeruleus</i> subsp. <i>axillaris</i> (Australian Black-shouldered Kite)			
150.	<i>Eolophus roseicapillus</i>			
151.	24651 <i>Eopsaltria australis</i> subsp. <i>griseogularis</i> (Western Yellow Robin)			
152.	24652 <i>Eopsaltria georgiana</i> (White-breasted Robin)			
153.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
154.	24379 <i>Erythronyx cinctus</i> (Red-kneed Dotterel)			
155.	24818 <i>Eudyptula minor</i> subsp. <i>novaehollandiae</i> (Little Penguin)			
156.	24368 <i>Eurostopodus argus</i> (Spotted Nightjar)			
157.	25621 <i>Falco berigora</i> (Brown Falcon)			
158.	24471 <i>Falco berigora</i> subsp. <i>berigora</i> (Brown Falcon)			
159.	25622 <i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
160.	25623 <i>Falco longipennis</i> (Australian Hobby)			
161.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
162.	25727 <i>Fulica atra</i> (Eurasian Coot)			
163.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
164.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
165.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
166.	42314 <i>Gavialis virescens</i> (Singing Honeyeater)			
167.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
168.	24271 <i>Gerygone fusca</i> subsp. <i>fusca</i> (Western Gerygone)			
169.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
170.	24487 <i>Haematopus longirostris</i> (Pied Oystercatcher)			
171.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
172.	24689	<i>Halobaena caerulea</i> (Blue Petrel)			
173.	47965	<i>Hieraaetus morphnoides</i> (Little Eagle)			
174.	25734	<i>Himantopus himantopus</i> (Black-winged Stilt)			
175.	24491	<i>Hirundo neoxena</i> (Welcome Swallow)			
176.	24367	<i>Lalage tricolor</i> (White-winged Triller)			
177.	24511	<i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
178.	25638	<i>Larus pacificus</i> (Pacific Gull)			
179.	25661	<i>Lichmera indistincta</i> (Brown Honeyeater)			
180.	24582	<i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater)			
181.	30932	<i>Limosa lapponica</i> (Bar-tailed Godwit)		IA	
182.	24326	<i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
183.	25651	<i>Malurus lamberti</i> (Variegated Fairy-wren)			
184.	24544	<i>Malurus lamberti</i> subsp. <i>assimilis</i> (Variegated Fairy-wren)			
185.	25652	<i>Malurus leucopterus</i> (White-winged Fairy-wren)			
186.	24549	<i>Malurus leucopterus</i> subsp. <i>leuconotus</i> (White-winged Fairy-wren)			
187.	25654	<i>Malurus splendens</i> (Splendid Fairy-wren)			
188.	24552	<i>Malurus splendens</i> subsp. <i>splendens</i> (Splendid Fairy-wren)			
189.	24583	<i>Manorina flavigula</i> (Yellow-throated Miner)			
190.	25758	<i>Megalurus gramineus</i> (Little Grassbird)			
191.	24838	<i>Megalurus gramineus</i> subsp. <i>gramineus</i> (Little Grassbird)			
192.	25663	<i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
193.	24598	<i>Merops ornatus</i> (Rainbow Bee-eater)			
194.		<i>Microcarbo melanoleucos</i>			
195.	25693	<i>Microeca fascians</i> (Jacky Winter)			
196.	48008	<i>Morus serrator</i> (Australasian Gannet)			
197.	24738	<i>Neophema elegans</i> (Elegant Parrot)			
198.	25564	<i>Nycticorax caledonicus</i> (Rufous Night Heron)			
199.	24407	<i>Ocyphaps lophotes</i> (Crested Pigeon)			
200.	24328	<i>Oxyura australis</i> (Blue-billed Duck)		P4	
201.	25680	<i>Pachycephala rufiventris</i> (Rufous Whistler)			
202.	24624	<i>Pachycephala rufiventris</i> subsp. <i>rufiventris</i> (Rufous Whistler)			
203.	48591	<i>Pandion cristatus</i> (Osprey, Eastern Osprey)		IA	
204.	25681	<i>Pardalotus punctatus</i> (Spotted Pardalote)			
205.	25682	<i>Pardalotus striatus</i> (Striated Pardalote)			
206.	24630	<i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote)			
207.	24648	<i>Pelecanus conspicillatus</i> (Australian Pelican)			
208.	48061	<i>Petrochelidon nigricans</i> (Tree Martin)			
209.	48066	<i>Petroica boodang</i> (Scarlet Robin)			
210.	24659	<i>Petroica goodenovii</i> (Red-capped Robin)			
211.	25697	<i>Phalacrocorax carbo</i> (Great Cormorant)			
212.	25698	<i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
213.	24666	<i>Phalacrocorax melanoleucos</i> subsp. <i>melanoleucos</i> (Little Pied Cormorant)			
214.	24667	<i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
215.	25699	<i>Phalacrocorax varius</i> (Pied Cormorant)			
216.	24409	<i>Phaps chalcoptera</i> (Common Bronzewing)			
217.	25587	<i>Phaps elegans</i> (Brush Bronzewing)			
218.	48071	<i>Phylidonyris niger</i> (White-cheeked Honeyeater)			
219.	24596	<i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
220.	24841	<i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
221.	25720	<i>Platycercus icterotis</i> (Western Rosella)			
222.	24747	<i>Platycercus spurius</i> (Red-capped Parrot)			
223.	25721	<i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
224.	24750	<i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
225.	24383	<i>Pluvialis squatarola</i> (Grey Plover)		IA	
226.	25703	<i>Podargus strigoides</i> (Tawny Frogmouth)			
227.	24679	<i>Podargus strigoides</i> subsp. <i>brachypterus</i> (Tawny Frogmouth)			
228.	25704	<i>Podiceps cristatus</i> (Great Crested Grebe)			
229.	24681	<i>Poliiocephalus poliocephalus</i> (Hoary-headed Grebe)			
230.	25722	<i>Polytelis anthopeplus</i> (Regent Parrot)			
231.	25731	<i>Porphyrio porphyrio</i> (Purple Swamphen)			
232.	24767	<i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
233.	24770	<i>Porzana pusilla</i> subsp. <i>palustris</i> (Baillon's Crake)			
234.	24771	<i>Porzana tabuensis</i> (Spotless Crake)			
235.	24702	<i>Pterodroma brevirostris</i> (Kerguelen Petrel)			
236.	24716	<i>Puffinus pacificus</i> (Wedge-tailed Shearwater)		IA	
237.		<i>Purpureicephalus spurius</i>			
238.	24776	<i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
239.	48096	<i>Rhipidura albiscapa</i> (Grey Fantail)			
240.	25614	<i>Rhipidura leucophrys</i> (Willie Wagtail)			
241.	24454	<i>Rhipidura leucophrys</i> subsp. <i>leucophrys</i> (Willie Wagtail)			

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242.	25534	<i>Sericornis frontalis</i> (White-browed Scrubwren)			
243.	30948	<i>Smicromis brevirostris</i> (Weebill)			
244.	24522	<i>Sterna bergii</i> (Crested Tern)			
245.	25597	<i>Strepera versicolor</i> (Grey Currawong)			
246.	25589	<i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
247.	25590	<i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
248.	25705	<i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
249.	24682	<i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
250.	24331	<i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
251.	48597	<i>Thalasseus bergii</i> (Crested Tern)		IA	
252.	24845	<i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
253.	25549	<i>Todiramphus sanctus</i> (Sacred Kingfisher)			
254.	48141	<i>Tribonyx ventralis</i> (Black-tailed Native-hen)			
255.	25723	<i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
256.	24808	<i>Tringa nebularia</i> (Common Greenshank, greenshank)		IA	
257.	24851	<i>Turnix velox</i> (Little Button-quail)			
258.	25762	<i>Tyto alba</i> (Barn Owl)			
259.	24855	<i>Tyto novaehollandiae</i> subsp. <i>novaehollandiae</i> (Masked Owl (southwest))		P3	
260.	24386	<i>Vanellus tricolor</i> (Banded Lapwing)			
261.	25765	<i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereye)			

Bryopsid (Moss)

262.	32346	<i>Didymodon torquatus</i>			
263.	20162	<i>Fabronia hampeana</i>		P2	
264.	32380	<i>Gemmabryum pachythecum</i>			
265.	32384	<i>Gigaspermum repens</i>			
266.	32480	<i>Racopilum cuspidigerum</i> var. <i>convolutaceum</i>			
267.	32486	<i>Thuidium sparsum</i> var. <i>hastatum</i>			

Dicotyledon

268.	15430	<i>Acacia alata</i> var. <i>tetrantha</i>			
269.	15466	<i>Acacia applanata</i>			
270.	15470	<i>Acacia barbinervis</i> subsp. <i>borealis</i>			
271.	3237	<i>Acacia benthamii</i>		P2	
272.	3262	<i>Acacia cochlearis</i> (Rigid Wattle)			
273.	3282	<i>Acacia cyclops</i> (Coastal Wattle)			
274.	3374	<i>Acacia huegelii</i>			
275.	3409	<i>Acacia lasiocarpa</i> (Panjang)			
276.	11611	<i>Acacia lasiocarpa</i> var. <i>lasiocarpa</i>			
277.	3502	<i>Acacia pulchella</i> (Prickly Moses)			
278.	15481	<i>Acacia pulchella</i> var. <i>glaberrima</i>			
279.	15482	<i>Acacia pulchella</i> var. <i>goadbyi</i>			
280.	3525	<i>Acacia rostellifera</i> (Summer-scented Wattle)			
281.	3527	<i>Acacia saligna</i> (Orange Wattle, Kudjong)			
282.	30032	<i>Acacia saligna</i> subsp. <i>saligna</i>			
283.	3541	<i>Acacia sessilis</i>			
284.	3557	<i>Acacia stenoptera</i> (Narrow Winged Wattle)			
285.	3584	<i>Acacia truncata</i>			
286.	3602	<i>Acacia willdenowiana</i> (Grass Wattle)			
287.	3604	<i>Acacia xanthina</i> (White-stemmed Wattle)			
288.	6295	<i>Acrotriche cordata</i> (Coast Ground Berry)			
289.	7818	<i>Actites megalocarpus</i> (Dune Thistle)			
290.	1728	<i>Allocasuarina fraseriana</i> (Sheoak, Kondil)			
291.	1732	<i>Allocasuarina humilis</i> (Dwarf Sheoak)			
292.	4906	<i>Alyogyne huegelii</i> (Lilac Hibiscus)			
293.	2668	<i>Amaranthus powellii</i> (Powell's Amaranth)	Y		
294.	2671	<i>Amaranthus viridis</i> (Green Amaranth)	Y		
295.	6311	<i>Andersonia heterophylla</i>			
296.	6314	<i>Andersonia lehmanniana</i>			
297.	11471	<i>Andersonia lehmanniana</i> subsp. <i>lehmanniana</i>			
298.	11725	<i>Anthocercis ilicifolia</i> subsp. <i>ilicifolia</i>			
299.	6949	<i>Anthocercis littorea</i> (Yellow Tailflower)			
300.	3692	<i>Aotus procumbens</i>			
301.	6210	<i>Apium annuum</i>			
302.	20283	<i>Astartea scoparia</i> (Common Astartea)			
303.	7851	<i>Asteridea pulverulenta</i> (Common Bristle Daisy)			
304.	6323	<i>Astroloma ciliatum</i> (Candle Cranberry)			
305.	6331	<i>Astroloma microcalyx</i> (Native Cranberry)			
306.	6334	<i>Astroloma pallidum</i> (Kick Bush)			
307.	34161	<i>Baeckea</i> sp. <i>Limestone</i> (N. Gibson & M.N. Lyons 1425)		P1	

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308.	1800 <i>Banksia attenuata</i> (Slender Banksia, Piara)			
309.	1819 <i>Banksia grandis</i> (Bull Banksia, Pulgarla)			
310.	11386 <i>Banksia leptophylla</i> var. <i>melletica</i>			
311.	1834 <i>Banksia menziesii</i> (Firewood Banksia)			
312.	32076 <i>Banksia sessilis</i> (Parrot Bush, Pudjak)			
313.	32077 <i>Banksia sessilis</i> var. <i>cygnorum</i>			
314.	5382 <i>Beaufortia elegans</i> (Elegant Beaufortia)			
315.	7046 <i>Bellardia trixago</i> (Bellardia)	Y		
316.	25788 <i>Billardiera fraseri</i> (Elegant Pronaya)			
317.	17665 <i>Boronia purdieana</i> subsp. <i>purdieana</i>			
318.	3710 <i>Bossiaea eriocarpa</i> (Common Brown Pea)			
319.	7867 <i>Brachyscome bellidioides</i>			
320.	7878 <i>Brachyscome iberidifolia</i>			
321.	11187 <i>Brassica barrelieri</i> subsp. <i>oxyrrhina</i> (Smooth-stem Turnip)	Y		
322.	3000 <i>Brassica tournefortii</i> (Mediterranean Turnip)	Y		
323.	2845 <i>Calandrinia brevipedata</i> (Short-stalked Purslane)			
324.	2848 <i>Calandrinia corrigioloides</i> (Strap Purslane)			
325.	2854 <i>Calandrinia granulifera</i> (Pygmy Purslane)			
326.	2856 <i>Calandrinia liniflora</i> (Parakeelya)			
327.	40827 <i>Calandrinia tholiformis</i>			
328.	5415 <i>Calothamnus lateralis</i>			
329.	5426 <i>Calothamnus quadrifidus</i> (One-sided Bottlebrush, Kwowdjard)			
330.	35816 <i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i>			
331.	5429 <i>Calothamnus sanguineus</i> (Silky-leaved Blood flower, Pindak)			
332.	5439 <i>Calytrix angulata</i> (Yellow Starflower)			
333.	5458 <i>Calytrix flavescens</i> (Summer Starflower)			
334.	5476 <i>Calytrix sapphirina</i>			
335.	5479 <i>Calytrix strigosa</i>			
336.	7909 <i>Carduus pycnocephalus</i> (Slender Thistle)	Y		
337.	2798 <i>Carpobrotus virescens</i> (Coastal Pigface, Kolboko, Bain)			
338.	2951 <i>Cassytha flava</i> (Dodder Laurel)			
339.	2952 <i>Cassytha glabella</i> (Tangled Dodder Laurel)			
340.	2957 <i>Cassytha racemosa</i> (Dodder Laurel)			
341.	11799 <i>Cassytha racemosa</i> forma <i>racemosa</i>			
342.	6539 <i>Centaurium erythraea</i> (Common Centaury)	Y		
343.	2889 <i>Cerastium glomeratum</i> (Mouse Ear Chickweed)	Y		
344.	5498 <i>Chamelaucium uncinatum</i> (Geraldton Wax)			
345.	2483 <i>Chenopodium album</i> (Fat Hen)	Y		
346.	7937 <i>Cirsium vulgare</i> (Spear Thistle, Scotch Thistle)	Y		
347.	10804 <i>Clematis linearifolia</i>			
348.	2929 <i>Clematis pubescens</i> (Common Clematis)			
349.	4550 <i>Comesperma calymega</i> (Blue-spike Milkwort)			
350.	4552 <i>Comesperma confertum</i>			
351.	4554 <i>Comesperma flavum</i>			
352.	15516 <i>Conospermum canaliculatum</i> subsp. <i>canaliculatum</i>			
353.	1876 <i>Conospermum incurvum</i> (Plume Smokebush)			
354.	1882 <i>Conospermum stoechadis</i> (Common Smokebush)			
355.	15611 <i>Conospermum stoechadis</i> subsp. <i>stoechadis</i> (Common Smokebush)			
356.	1885 <i>Conospermum triplinervium</i> (Tree Smokebush)			
357.	6347 <i>Conostephium minus</i> (Pink-tipped Pearl flower)			
358.	6348 <i>Conostephium pendulum</i> (Pearl Flower)			
359.	6349 <i>Conostephium preissii</i>			
360.	20074 <i>Conyza sumatrensis</i>	Y		
361.	17104 <i>Corymbia calophylla</i> (Marr)			
362.	7943 <i>Cotula australis</i> (Common Cotula)			
363.	42009 <i>Craspedia</i> sp. Yalgorup National Park (G.J. Keighery 14449)			
364.	3137 <i>Crassula colorata</i> (Dense Stonecrop)			
365.	11709 <i>Crassula colorata</i> var. <i>acuminata</i>			
366.	4802 <i>Cryptandra mutila</i>			
367.	4809 <i>Cryptandra pungens</i>			
368.	4810 <i>Cryptandra scoparia</i>			
369.	25825 <i>Cucurbita pepo</i>	Y		
370.	11021 <i>Cuscuta planiflora</i>	Y		
371.	7451 <i>Dampiera lavandulacea</i>			
372.	7454 <i>Dampiera linearis</i> (Common Dampiera)			
373.	6218 <i>Daucus glochidiatus</i> (Australian Carrot)			
374.	3793 <i>Daviesia angulata</i>			
375.	3805 <i>Daviesia decurrens</i> (Prickly Bitter-pea)			
376.	19747 <i>Daviesia decurrens</i> subsp. <i>decurrens</i>			
377.	3807 <i>Daviesia divaricata</i> (Marno)			

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378.	18560	<i>Daviesia divaricata</i> subsp. <i>divaricata</i>			
379.	3824	<i>Daviesia nudiflora</i>			
380.	16585	<i>Daviesia nudiflora</i> subsp. <i>nudiflora</i>			
381.	3832	<i>Daviesia physodes</i>			
382.	3833	<i>Daviesia podophylla</i>			
383.	3845	<i>Daviesia triflora</i>			
384.	4453	<i>Diplolaena angustifolia</i> (Yanchep Rose)			
385.	4746	<i>Diplopeltis huegelii</i>			
386.	18541	<i>Diplopeltis huegelii</i> subsp. <i>huegelii</i>			
387.	7054	<i>Dischisma arenarium</i>	Y		
388.	48751	<i>Drosera drummondii</i>			
389.	3095	<i>Drosera erythrorhiza</i> (Red Ink Sundew)			
390.	48769	<i>Drosera indumenta</i>			
391.	3106	<i>Drosera macrantha</i> (Bridal Rainbow)			
392.	3109	<i>Drosera menziesii</i> (Pink Rainbow)			
393.	3118	<i>Drosera pallida</i> (Pale Rainbow)			
394.	11570	<i>Epilobium billardiareanum</i> subsp. <i>billardiareanum</i> (Smooth Willow Herb)			
395.	11992	<i>Epilobium billardiareanum</i> subsp. <i>intermedium</i>			
396.	6132	<i>Epilobium ciliatum</i>	Y		
397.	6133	<i>Epilobium hirtigerum</i> (Hairy Willow Herb)			
398.	14289	<i>Epilobium tetragonum</i> subsp. <i>tetragonum</i>	Y		
399.	13950	<i>Eremaea asterocarpa</i> subsp. <i>asterocarpa</i>			
400.	5540	<i>Eremaea fimbriata</i>			
401.	5541	<i>Eremaea pauciflora</i>			
402.	7215	<i>Eremophila glabra</i> (Tar Bush)			
403.	17175	<i>Eremophila glabra</i> subsp. <i>albicans</i>			
404.	4332	<i>Erodium botrys</i> (Long Storksbill)	Y		
405.	4333	<i>Erodium cicutarium</i> (Common Storksbill)	Y		
406.	4336	<i>Erodium moschatum</i> (Musky Crowfoot)	Y		
407.	6219	<i>Eryngium pinnatifidum</i> (Blue Devils)			
408.	15446	<i>Eryngium pinnatifidum</i> subsp. <i>pinnatifidum</i>			
409.	13091	<i>Eucalyptus argutifolia</i> (Wabbling Hill Mallee)		T	
410.	5615	<i>Eucalyptus decipiens</i> (Limestone Marlock, Moit)			
411.	5649	<i>Eucalyptus foecunda</i> (Narrow-leaved Red Mallee)			
412.	5659	<i>Eucalyptus gomphocephala</i> (Tuart, Duart)			
413.	5708	<i>Eucalyptus marginata</i> (Jarrah, Djara)			
414.	13547	<i>Eucalyptus marginata</i> subsp. <i>marginata</i> (Jarrah)			
415.	20808	<i>Eucalyptus petiolaris</i>	Y		
416.	13541	<i>Eucalyptus petrensis</i>			
417.	13511	<i>Eucalyptus rudis</i> subsp. <i>rudis</i>			
418.	5790	<i>Eucalyptus todtiana</i> (Coastal Blackbutt)			
419.	1747	<i>Ficus carica</i> (Common Fig)	Y		
420.	5209	<i>Frankenia pauciflora</i> (Seaheath)			
421.	7976	<i>Galinsoga parviflora</i> (Potato Weed)	Y		
422.	7323	<i>Galium murale</i> (Small Goosegrass)	Y		
423.	20483	<i>Gastrolobium linearifolium</i>			
424.	16311	<i>Gazania linearis</i>	Y		
425.	4339	<i>Geranium molle</i> (Dove's Foot Cranesbill)	Y		
426.	33620	<i>Glischrocaryon angustifolium</i>			
427.	6143	<i>Glischrocaryon aureum</i> (Common Popflower)			
428.	3945	<i>Gompholobium aristatum</i>			
429.	3950	<i>Gompholobium knightianum</i>			
430.	19295	<i>Gompholobium pungens</i>			
431.	11083	<i>Gompholobium scabrum</i>			
432.	3957	<i>Gompholobium tomentosum</i> (Hairy Yellow Pea)			
433.	6161	<i>Gonocarpus pithyoides</i>			
434.	19286	<i>Goodenia pulchella</i> subsp. <i>Coastal Plain A</i> (M. Hislop 634)			
435.	15839	<i>Grevillea preissii</i> subsp. <i>preissii</i>			
436.	2119	<i>Grevillea vestita</i>			
437.	12824	<i>Grevillea vestita</i> subsp. <i>vestita</i>			
438.	2784	<i>Gyrostemon ramulosus</i> (Corkybark)			
439.	2146	<i>Hakea costata</i> (Ribbed Hakea)			
440.	2175	<i>Hakea lissocarpha</i> (Honey Bush)			
441.	2197	<i>Hakea prostrata</i> (Harsh Hakea)			
442.	2203	<i>Hakea ruscifolia</i> (Candle Hakea)			
443.	2214	<i>Hakea trifurcata</i> (Two-leaf Hakea)			
444.	2216	<i>Hakea varia</i> (Variable-leaved Hakea)			
445.	3961	<i>Hardenbergia comptoniana</i> (Native Wisteria)			
446.	3016	<i>Heliophila pusilla</i>	Y		
447.	16933	<i>Hemiandra glabra</i>			

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448.	6839	<i>Hemiandra pungens</i> (Snakebush)			
449.	6871	<i>Hemigenia sericea</i> (Silky Hemigenia)			
450.	41020	<i>Hemiphora bartlingii</i> (Woolly Dragon)			
451.	5112	<i>Hibbertia aurea</i>			
452.	5134	<i>Hibbertia huegelii</i>			
453.	5135	<i>Hibbertia hypericoides</i> (Yellow Buttercups)			
454.	45534	<i>Hibbertia hypericoides</i> subsp. <i>hypericoides</i>			
455.	5162	<i>Hibbertia racemosa</i> (Stalked Guinea Flower)			
456.	43280	<i>Hibbertia sericosepala</i>			
457.	11461	<i>Hibbertia spicata</i> subsp. <i>leptotheca</i>		P3	
458.	48381	<i>Hibbertia striata</i>			
459.	5173	<i>Hibbertia subvaginata</i>			
460.	6222	<i>Homalosciadium homalocarpum</i>			
461.	3966	<i>Hovea pungens</i> (Devil's Pins, Puyenak)			
462.	3968	<i>Hovea trisperma</i> (Common Hovea)			
463.	12859	<i>Hovea trisperma</i> var. <i>trisperma</i>			
464.	12741	<i>Hyalosperma cotula</i>			
465.	5216	<i>Hybanthus calycinus</i> (Wild Violet)			
466.	12007	<i>Hybanthus floribundus</i> subsp. <i>floribundus</i>			
467.	6224	<i>Hydrocotyle blepharocarpa</i>			
468.	6226	<i>Hydrocotyle callicarpa</i> (Small Pennywort)			
469.	6229	<i>Hydrocotyle diantha</i>			
470.	6232	<i>Hydrocotyle hispidula</i>			
471.	8086	<i>Hypochaeris glabra</i> (Smooth Catsear)	Y		
472.	9352	<i>Hypochaeris radicata</i> (Flat Weed, Cats-ear)	Y		
473.	3992	<i>Isotropis cuneifolia</i> (Granny Bonnets)			
474.	19700	<i>Isotropis cuneifolia</i> subsp. <i>cuneifolia</i>			
475.	14783	<i>Jacksonia calcicola</i>			
476.	4012	<i>Jacksonia furcellata</i> (Grey Stinkwood)			
477.	20462	<i>Jacksonia gracillima</i>		P3	
478.	4027	<i>Jacksonia sericea</i> (Waldjumi)		P4	
479.	4029	<i>Jacksonia sternbergiana</i> (Stinkwood, Kapur)			
480.	4044	<i>Kennedia prostrata</i> (Scarlet Runner)			
481.	15498	<i>Kunzea glabrescens</i> (Spearwood)			
482.	29046	<i>Lactuca serriola</i> forma <i>serriola</i>	Y		
483.	18585	<i>Lagenophora huegelii</i>			
484.	7568	<i>Lechenaultia biloba</i> (Blue Leschenaultia)			
485.	7574	<i>Lechenaultia floribunda</i> (Free-flowering Leschenaultia)			
486.	7577	<i>Lechenaultia hirsuta</i> (Hairy Leschenaultia)			
487.	7580	<i>Lechenaultia linarioides</i> (Yellow Leschenaultia)			
488.	7586	<i>Lechenaultia stenosepala</i> (Narrow-sepaled Leschenaultia)			
489.	3042	<i>Lepidium pseudotasmanicum</i>		P4	
490.	2344	<i>Leptomeria empetriformis</i>			
491.	2350	<i>Leptomeria pauciflora</i> (Sparse-flowered Currant Bush)			
492.	2352	<i>Leptomeria preissiana</i>			
493.	17852	<i>Leptorhynchus scaber</i> (Lanky Buttons)			
494.	5850	<i>Leptospermum laevigatum</i> (Coast Teatree)	Y		
495.	5857	<i>Leptospermum spinescens</i>			
496.	6405	<i>Leucopogon insularis</i>			
497.	40801	<i>Leucopogon maritimus</i>		P1	
498.	6425	<i>Leucopogon oxycedrus</i>			
499.	6427	<i>Leucopogon parviflorus</i> (Coast Beard-heath)			
500.	6434	<i>Leucopogon polymorphus</i>			
501.	6436	<i>Leucopogon propinquus</i>			
502.	6440	<i>Leucopogon racemosus</i>			
503.	19460	<i>Leucopogon</i> sp. <i>Yanchep</i> (M. Hislop 1986)		P3	
504.	7676	<i>Levenhookia pusilla</i> (Midget Stylewort)			
505.	7677	<i>Levenhookia stipitata</i> (Common Stylewort)			
506.	4362	<i>Linum marginale</i> (Wild Flax)			
507.	7408	<i>Lobelia tenuior</i> (Slender Lobelia)			
508.	6515	<i>Logania vaginalis</i> (White Spray)			
509.	4066	<i>Lupinus cosentinii</i>	Y		
510.	6456	<i>Lysinema ciliatum</i> (Curry Flower)			
511.	34736	<i>Lysinema pentapetalum</i>			
512.	2838	<i>Macarthuria apetala</i>			
513.	2839	<i>Macarthuria australis</i>			
514.	25819	<i>Marianthus paralius</i>		T	
515.	3049	<i>Matthiola incana</i> (Common Stock)	Y		
516.	4075	<i>Medicago littoralis</i> (Strand Medic)	Y		
517.	5887	<i>Melaleuca cardiophylla</i> (Tangling Melaleuca)			

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518.	5920	<i>Melaleuca huegelii</i> (Chenille Honey myrtle)			
519.	13271	<i>Melaleuca huegelii</i> subsp. <i>huegelii</i>			
520.	5952	<i>Melaleuca preissiana</i> (Moonah)			
521.	5959	<i>Melaleuca raphiophylla</i> (Swamp Paperbark)			
522.	33022	<i>Melaleuca</i> sp. <i>Wanneroo</i> (G.J. Keighery 16705)		T	
523.	18598	<i>Melaleuca systema</i>			
524.	5978	<i>Melaleuca teretifolia</i> (Banbar)			
525.	5983	<i>Melaleuca trichophylla</i>			
526.	5986	<i>Melaleuca urceolaris</i>			
527.	4085	<i>Melilotus indicus</i>	Y		
528.	15994	<i>Mentha x piperita</i> var. <i>citrata</i>	Y		
529.	8106	<i>Millotia tenuifolia</i> (Soft Millotia)			
530.	16693	<i>Minuartia mediterranea</i>	Y		
531.	7289	<i>Myoporum caprarioides</i> (Slender Myoporum)			
532.	2401	<i>Nuytsia floribunda</i> (Christmas Tree, Mudja)			
533.	8127	<i>Olearia axillaris</i> (Coastal Daisybush)			
534.	8149	<i>Olearia rudis</i> (Rough Daisybush)			
535.	7348	<i>Opercularia hispidula</i> (Hispid Stinkweed)			
536.	18255	<i>Opercularia vaginata</i> (Dog Weed)			
537.	7122	<i>Orobancha minor</i> (Lesser Broomrape)	Y		
538.	4356	<i>Oxalis pes-caprae</i> (Soursob)	Y		
539.	7089	<i>Parentucellia latifolia</i> (Common Bartsia)	Y		
540.	12670	<i>Parietaria cardiostegia</i>			
541.	1762	<i>Parietaria debilis</i> (Pellitory)			
542.	5225	<i>Passiflora filamentosa</i>	Y		
543.	4343	<i>Pelargonium capitatum</i> (Rose Pelargonium)	Y		
544.	4346	<i>Pelargonium littorale</i>			
545.	13911	<i>Persicaria decipiens</i>			
546.	2258	<i>Persoonia comata</i>			
547.	2273	<i>Persoonia saccata</i> (Snottygobble)			
548.	20368	<i>Petrophile axillaris</i>			
549.	2286	<i>Petrophile brevifolia</i>			
550.	2299	<i>Petrophile linearis</i> (Pixie Mops)			
551.	2301	<i>Petrophile macrostachya</i>			
552.	2309	<i>Petrophile serruriae</i>			
553.	19825	<i>Petrorhagia dubia</i>	Y		
554.	16177	<i>Phyllangium paradoxum</i>			
555.	4675	<i>Phyllanthus calycinus</i> (False Boronia)			
556.	2793	<i>Phytolacca octandra</i> (Red Ink Plant)	Y		
557.	5232	<i>Pimelea argentea</i> (Silvery Leaved Pimelea)			
558.	5237	<i>Pimelea calcicola</i>		P3	
559.	5243	<i>Pimelea ferruginea</i>			
560.	5251	<i>Pimelea imbricata</i>			
561.	11402	<i>Pimelea imbricata</i> var. <i>piligera</i>			
562.	5254	<i>Pimelea leucantha</i>			
563.	18117	<i>Pimelea rosea</i> subsp. <i>rosea</i>			
564.	5268	<i>Pimelea sulphurea</i> (Yellow Banjine)			
565.	5272	<i>Pimelea villifera</i>			
566.	42281	<i>Pithocarpa cordata</i>			
567.	8163	<i>Pithocarpa corymbulosa</i> (Corymbose Pithocarpa)		P3	
568.	4524	<i>Platytheca galioides</i>			
569.	8175	<i>Podolepis gracilis</i> (Slender Podolepis)			
570.	8177	<i>Podolepis lessonii</i>			
571.	8183	<i>Podotheca chrysantha</i> (Yellow Podotheca)			
572.	8184	<i>Podotheca gnaphalioides</i> (Golden Long-heads)			
573.	2905	<i>Polycarpon tetraphyllum</i> (Fourleaf Allseed)	Y		
574.	4691	<i>Poranthera microphylla</i> (Small Poranthera)			
575.	8189	<i>Pseudognaphalium luteoalbum</i> (Jersey Cudweed)			
576.	2718	<i>Ptilotus drummondii</i> (Narrowleaf Mulla Mulla)			
577.	11260	<i>Ptilotus drummondii</i> var. <i>drummondii</i> (Pussytail)			
578.	2742	<i>Ptilotus manglesii</i> (Pom Poms, Mulamula)			
579.	2751	<i>Ptilotus polystachyus</i> (Prince of Wales Feather)			
580.	40841	<i>Ptilotus stirlingii</i> subsp. <i>stirlingii</i>			
581.	4181	<i>Pultenaea reticulata</i>			
582.	8195	<i>Quinetia urvillei</i>			
583.	2932	<i>Ranunculus colonorum</i> (Common Buttercup)			
584.	2933	<i>Ranunculus muricatus</i> (Sharp Buttercup)	Y		
585.	6012	<i>Regelia ciliata</i>			
586.	18547	<i>Rhadinothamnus anceps</i>			
587.	2578	<i>Rhagodia baccata</i> (Berry Saltbush)			

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588.	11341	<i>Rhagodia baccata</i> subsp. <i>baccata</i>			
589.	15035	<i>Rhodanthe corymbosa</i>			
590.	2967	<i>Romneya coulteri</i> (California Tree Poppy)	Y		
591.	2433	<i>Rumex crispus</i> (Curled Dock)	Y		
592.	2440	<i>Rumex pulcher</i> (Fiddle Dock)	Y		
593.	2906	<i>Sagina apetala</i> (Annual Pearlwort)	Y		
594.	2356	<i>Santalum acuminatum</i> (Quandong, Warrnga)			
595.	17543	<i>Sarcozona bicarinata</i>		P3	
596.	7368	<i>Scabiosa atropurpurea</i> (Purple Pincushion)	Y		
597.	7603	<i>Scaevola canescens</i> (Grey Scaevola)			
598.	7606	<i>Scaevola crassifolia</i> (Thick-leaved Fan-flower)			
599.	13181	<i>Scaevola repens</i> var. <i>angustifolia</i>			
600.	13182	<i>Scaevola repens</i> var. <i>repens</i>			
601.	7647	<i>Scaevola thesioides</i>			
602.	13152	<i>Scaevola thesioides</i> subsp. <i>thesioides</i>			
603.	6033	<i>Scholtzia involucrata</i> (Spiked Scholtzia)			
604.	25884	<i>Senecio pinnatifolius</i> var. <i>latilobus</i>			
605.	8218	<i>Senecio ramosissimus</i> (Auricled Groundsel)			
606.	2909	<i>Silene gallica</i> (French Catchfly)	Y		
607.	2910	<i>Silene nocturna</i> (Mediterranean Catchfly)	Y		
608.	8225	<i>Siloxerus humifusus</i> (Procumbent Siloxerus)			
609.	6988	<i>Solanum americanum</i> (Glossy Nightshade)	Y		
610.	7022	<i>Solanum nigrum</i> (Black Berry Nightshade)	Y		
611.	8230	<i>Sonchus asper</i> (Rough Sowthistle)	Y		
612.	9367	<i>Sonchus hydrophilus</i> (Native Sowthistle)			
613.	8231	<i>Sonchus oleraceus</i> (Common Sowthistle)	Y		
614.	20348	<i>Sphaerolobium calcicola</i>		P3	
615.	4207	<i>Sphaerolobium medium</i>			
616.	4828	<i>Spyridium globulosum</i> (Basket Bush)			
617.	9069	<i>Stackhousia huegelii</i>			
618.	4733	<i>Stackhousia monogyna</i>			
619.	9070	<i>Stackhousia pubescens</i> (Downy Stackhousia)			
620.	2918	<i>Stellaria media</i> (Chickweed)	Y		
621.	15066	<i>Stenanthemum notiale</i> subsp. <i>chamelum</i>			
622.	3080	<i>Stenopetalum robustum</i>			
623.	2316	<i>Stirlingia latifolia</i> (Blueboy)			
624.	30278	<i>Stylidium androsaceum</i>			
625.	7693	<i>Stylidium brunonianum</i> (Pink Fountain Triggerplant)			
626.	7694	<i>Stylidium bulbiferum</i> (Circus Triggerplant)			
627.	7696	<i>Stylidium calcaratum</i> (Book Triggerplant)			
628.	7709	<i>Stylidium crossocephalum</i> (Posy Triggerplant)			
629.	7710	<i>Stylidium cygnorum</i>			
630.	7713	<i>Stylidium dichotomum</i> (Pins-and-needles)			
631.	7717	<i>Stylidium divaricatum</i> (Daddy-long-legs)			
632.	25801	<i>Stylidium hesperium</i>			
633.	7745	<i>Stylidium junceum</i> (Reed Triggerplant)			
634.	13127	<i>Stylidium maritimum</i>		P3	
635.	25829	<i>Stylidium neurophyllum</i> (Coastal Plain Triggerplant)			
636.	7774	<i>Stylidium piliferum</i> (Common Butterfly Triggerplant)			
637.	25837	<i>Stylidium purpureum</i> (Purple Fountain Triggerplant)			
638.	7785	<i>Stylidium repens</i> (Matted Triggerplant)			
639.	20521	<i>Stylidium rigidulum</i>			
640.	7798	<i>Stylidium schoenoides</i> (Cow Kicks)			
641.	2329	<i>Synaphea spinulosa</i>			
642.	15532	<i>Synaphea spinulosa</i> subsp. <i>spinulosa</i>			
643.	4256	<i>Templetonia retusa</i> (Cockies Tongues)			
644.	2791	<i>Tersonia cyathiflora</i> (Button Creeper)			
645.	2820	<i>Tetragonia decumbens</i> (Sea Spinach)	Y		
646.	5105	<i>Thomasia triphylla</i>			
647.	19041	<i>Trachymene coerulea</i> subsp. <i>coerulea</i>			
648.	6280	<i>Trachymene pilosa</i> (Native Parsnip)			
649.	4292	<i>Trifolium campestre</i> (Hop Clover)	Y		
650.	17763	<i>Trifolium campestre</i> var. <i>campestre</i> (Hop Clover)	Y		
651.	4295	<i>Trifolium dubium</i> (Suckling Clover)	Y		
652.	4297	<i>Trifolium glomeratum</i> (Cluster Clover)	Y		
653.	4309	<i>Trifolium scabrum</i> (Rough Clover)	Y		
654.	4310	<i>Trifolium spumosum</i> (Bladder Clover)	Y		
655.	4737	<i>Tripterococcus brunonis</i> (Winged Stackhousia)			
656.	11665	<i>Trymalium ledifolium</i> var. <i>ledifolium</i>			
657.	33418	<i>Trymalium odoratissimum</i> subsp. <i>odoratissimum</i>			

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658.	8254	<i>Urospermum picroides</i> (False Hawkbit)	Y		
659.	8255	<i>Ursinia anthemoides</i> (Ursinia)	Y		
660.	38388	<i>Ursinia anthemoides</i> subsp. <i>anthemoides</i>	Y		
661.	7125	<i>Utricularia australis</i>			
662.	15725	<i>Verbesina encelioides</i>	Y		
663.	7110	<i>Veronica distans</i>			
664.	12411	<i>Verticordia densiflora</i> var. <i>cespitosa</i>			
665.	15432	<i>Verticordia densiflora</i> var. <i>densiflora</i>			
666.	6101	<i>Verticordia nitens</i> (Morrison Featherflower, Kodjeningara)			
667.	4322	<i>Vicia sativa</i> (Common Vetch)	Y		
668.	11474	<i>Vicia sativa</i> subsp. <i>nigra</i>	Y		
669.	4325	<i>Viminaria juncea</i> (Swishbush, Koweda)			
670.	17042	<i>Vitis vinifera</i>	Y		
671.	7384	<i>Wahlenbergia capensis</i> (Cape Bluebell)	Y		
672.	7389	<i>Wahlenbergia preissii</i>			
673.	13328	<i>Waitzia nitida</i>			
674.	8282	<i>Waitzia suaveolens</i> (Fragrant Waitzia)			
675.	6939	<i>Westringia dampieri</i>			
676.	6289	<i>Xanthosia huegelii</i>			
677.	44861	<i>Xerochrysum macranthum</i>			

Fish

678.		<i>Aetapcus maculatus</i>			
679.		<i>Bostockia porosa</i>			
680.	34034	<i>Carcharias taurus</i> (Grey Nurse Shark)		T	
681.		<i>Cleidopus gloriamaris</i>			
682.		<i>Edelia vittata</i>			
683.	34028	<i>Galaxias occidentalis</i> (Western Minnow)			
684.		<i>Gambusia affinis</i>			
685.		<i>Girella tephraeops</i>			
686.		<i>Meuschenia freycineti</i>			
687.		<i>Odax cyanomelas</i>			
688.		<i>Seriola lalandi</i>			
689.		<i>Upeneichthys stottii</i>			

Fungus

690.		<i>Alternaria alternata</i>			Y
691.	38765	<i>Battarrea stevenii</i>			
692.		<i>Byssomerulius corium</i>			
693.		<i>Calocera guepinoides</i>			
694.		<i>Coltricia cinnamomea</i>			
695.		<i>Crepidotus nephrodes</i>			
696.		<i>Hexagonia vesparia</i>			
697.	44926	<i>Ileodictyon gracile</i>			
698.	38805	<i>Lentinellus pulvinulus</i>			
699.	49003	<i>Macrolepiota turbinata</i>			
700.	49073	<i>Peziza austrogeaster</i>			
701.		<i>Peziza badia</i>			
702.		<i>Peziza</i> sp.			
703.	38819	<i>Peziza vesiculosa</i>			
704.	48853	<i>Phaeotrametes decipiens</i>			
705.		<i>Phytophthora cinnamomi</i>			
706.		<i>Poronia erici</i>			
707.	44729	<i>Porostereum crassum</i>			
708.		<i>Tremella mesenterica</i>			

Gymnosperm

709.	85	<i>Macrozamia riedlei</i> (Zamia, Djiridji)			
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Invertebrate

710.		<i>Acercella falcipes</i>			
711.		<i>Akamptogonus novarae</i>			
712.		<i>Amblyomma triguttatum</i>			
713.		<i>Aname mainae</i>			
714.		<i>Araneus cyphoxis</i>			
715.		<i>Araneus senicaudatus</i>			
716.		<i>Arkys alticephala</i>			
717.		<i>Arkys walckenaeri</i>			
718.		<i>Austracantha minax</i>			
719.		<i>Australomimetes djuka</i>			
720.		<i>Austrochthonius australis</i>			
721.	33971	<i>Austroconops mcmillani</i> (McMillan's biting midge (Swan Coastal Plain), biting midge)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
	(southwest))		P2	
722.	33973 <i>Austrosaga spinifer</i> (spiny katydid (Swan Coastal Plain), bush cricket (Swan Coastal Plain))		P2	
723.	<i>Baiami tegenarioides</i>			
724.	<i>Cercophonius granulosus</i>			
725.	<i>Cercophonius sulcatus</i>			
726.	<i>Cherax quinquecarinatus</i>			
727.	<i>Cormocephalus aurantiipes</i>			
728.	<i>Cormocephalus novaehollandiae</i>			
729.	<i>Cormocephalus rubriceps</i>			
730.	<i>Cormocephalus turneri</i>			
731.	<i>Cyclosa trilobata</i>			
732.	<i>Daphnia carinata</i>			
733.	<i>Dingosa serrata</i>			
734.	<i>Eriophora biapicata</i>			
735.	<i>Ethmostigmus rubripes</i>			
736.	48581 <i>Glossurocolletes bilobatus</i> (a short-tongued bee (southwest), short-tongued bee)		P2	
737.	48582 <i>Hurleya</i> sp. (WAM C23193) (Crystal Cave Crangonyctoid, cave shrimp)		T	Y
738.	33977 <i>Hylaeus globuliferus</i> (woolybush bee)		P3	
739.	<i>Idiommatia blackwalli</i>			
740.	48935 <i>Idiosoma sigillatum</i> (Swan Coastal Plain shield-backed trapdoor spider)		P3	
741.	<i>Indolpium</i> sp.			
742.	<i>Lampona cylindrata</i>			
743.	<i>Lampona yanchep</i>			
744.	<i>Latrodectus hasseltii</i>			
745.	<i>Lycosa godeffroyi</i>			
746.	<i>Maratus pavonis</i>			
747.	<i>Masasteron sampeyae</i>			
748.	<i>Missulena granulosa</i>			
749.	<i>Missulena occatoria</i>			
750.	<i>Occiperipatoides gilesii</i>			
751.	<i>Ommatoiulus moreletii</i>			
752.	<i>Oratemnus curtus</i>			
753.	<i>Oxidus gracilis</i>			
754.	33988 <i>Pachysaga munggai</i> (cricket)			
755.	<i>Paraplectanoides crassipes</i>			
756.	<i>Pinkfloydia harveii</i>			
757.	<i>Prionosternum scutatum</i>			
758.	<i>Protochelifer cavernarum</i>			
759.	<i>Raveniella arenacea</i>			
760.	<i>Raveniella cirrata</i>			
761.	<i>Raveniella peckorum</i>			
762.	33992 <i>Synemon gratioa</i> (Graceful Sunmoth)		P4	
763.	<i>Tamopsis perthensis</i>			
764.	<i>Taphiassa robertsi</i>			
765.	<i>Tasmanicosa leuckartii</i>			
766.	<i>Urodacus novaehollandiae</i>			
767.	<i>Venator immansueta</i>			
768.	34113 <i>Westralunio carteri</i> (Carter's Freshwater Mussel)		T	
769.	<i>Westrarchaea spinosa</i>			

Lichen

770. 27602 *Buellia georgei*

Mammal

771.	24161 <i>Bettongia lesueur</i> subsp. <i>graili</i> (Boodie (inland), Burrowing Bettong (inland))		X	
772.	24162 <i>Bettongia penicillata</i> subsp. <i>ogilbyi</i> (Woylie, Brush-tailed Bettong)		T	
773.	24251 <i>Bos taurus</i> (European Cattle)	Y		
774.	24254 <i>Camelus dromedarius</i> (Dromedary, Camel)	Y		
775.	48920 <i>Canis familiaris</i> (Dog, Dingo)	Y		
776.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
777.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattle Bat)			
778.	24187 <i>Chalinolobus morio</i> (Chocolate Wattle Bat)			
779.	24092 <i>Dasyurus geoffroyi</i> (Chuditch, Western Quoll)		T	
780.	24043 <i>Eubalaena australis</i> (Southern Right Whale)		T	
781.	24041 <i>Felis catus</i> (Cat)	Y		
782.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
783.	48588 <i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)		P4	
784.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
785.	24051 <i>Megaptera novaeangliae</i> (Humpback Whale)		S	
786.	24076 <i>Mesoplodon bowdoini</i> (Andrew's Beaked Whale)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
787.	24223 <i>Mus musculus</i> (House Mouse)	Y		
788.	48022 <i>Notamacropus irma</i> (Western Brush Wallaby)		P4	
789.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			
790.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
791.	34016 <i>Ovis aries</i> (Sheep)			
792.	24154 <i>Perameles bougainville</i> subsp. <i>bougainville</i> (Western Barred Bandicoot, Marl)		T	
793.	24155 <i>Perameles eremiana</i> (Desert Bandicoot, walliya)		X	
794.	24156 <i>Petaurus breviceps</i> subsp. <i>ariel</i> (Sugar Glider)			
795.	24142 <i>Petrogale lateralis</i> subsp. <i>lateralis</i> (Black-flanked Rock-wallaby, Black-footed Rock-wallaby)		T	
796.	24073 <i>Physeter macrocephalus</i> (Sperm Whale)		T	
797.	24243 <i>Rattus fuscipes</i> (Western Bush Rat)			
798.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
799.	24108 <i>Sminthopsis crassicaudata</i> (Fat-tailed Dunnart)			
800.	24207 <i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
801.	24167 <i>Tarsipes rostratus</i> (Honey Possum, Noolbenger)			
802.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
803.	24157 <i>Trichosurus vulpecula</i> subsp. <i>arnhemensis</i> (northern brushtail possum (Kimberley))		T	
804.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
805.	24040 <i>Vulpes vulpes</i> (Red Fox)	Y		

Monocotyledon

806.	1208 <i>Acanthocarpus preissii</i>			
807.	184 <i>Aira caryophyllea</i> (Silvery Hairgrass)	Y		
808.	185 <i>Aira cupaniana</i> (Silvery Hairgrass)	Y		
809.	1056 <i>Alexgeorgea nitens</i>			
810.	200 <i>Amphipogon turbinatus</i>			
811.	1409 <i>Anigozanthos humilis</i> (Catspaw)			
812.	11434 <i>Anigozanthos humilis</i> subsp. <i>humilis</i>			
813.	1411 <i>Anigozanthos manglesii</i> (Mangles Kangaroo Paw, Kurulbrang)			
814.	11261 <i>Anigozanthos manglesii</i> subsp. <i>manglesii</i>			
815.	1264 <i>Amocrinum preissii</i>			
816.	226 <i>Arundo donax</i> (Giant Reed)	Y		
817.	1201 <i>Asparagus officinalis</i> (Asparagus)	Y		
818.	17234 <i>Austrostipa compressa</i>			
819.	17237 <i>Austrostipa elegantissima</i>			
820.	17240 <i>Austrostipa flavescens</i>			
821.	231 <i>Avellinia michelii</i>	Y		
822.	233 <i>Avena barbata</i> (Bearded Oat)	Y		
823.	743 <i>Baumea juncea</i> (Bare Twigrush)			
824.	244 <i>Briza maxima</i> (Blowfly Grass)	Y		
825.	245 <i>Briza minor</i> (Shivery Grass)	Y		
826.	249 <i>Bromus diandrus</i> (Great Brome)	Y		
827.	253 <i>Bromus rubens</i> (Red Brome)	Y		
828.	12770 <i>Burchardia congesta</i>			
829.	1276 <i>Caesia micrantha</i> (Pale Grass Lily)			
830.	11038 <i>Caladenia bicallata</i>			
831.	1592 <i>Caladenia flava</i> (Cowslip Orchid)			
832.	15348 <i>Caladenia flava</i> subsp. <i>flava</i>			
833.	15352 <i>Caladenia georgei</i>			
834.	1595 <i>Caladenia hirta</i> (Sugar Candy Orchid)			
835.	1599 <i>Caladenia latifolia</i> (Pink Fairy Orchid)			
836.	15361 <i>Caladenia longicauda</i> subsp. <i>calcigena</i>			
837.	1213 <i>Calectasia cyanea</i> (Blue Tinsel Lily)		T	
838.	19309 <i>Calectasia narragara</i>			
839.	755 <i>Carex fascicularis</i> (Tassel Sedge)			
840.	43241 <i>Carex thecata</i>			
841.	13685 <i>Catapodium rigidum</i> (Rigid Fescue)	Y		
842.	760 <i>Caustis dioica</i>			
843.	1125 <i>Centrolepis drummondiana</i>			
844.	1132 <i>Centrolepis mutica</i>			
845.	1280 <i>Chamaescilla corymbosa</i> (Blue Squill)			
846.	1418 <i>Conostylis aculeata</i> (Prickly Conostylis)			
847.	11826 <i>Conostylis aculeata</i> subsp. <i>aculeata</i>			
848.	1425 <i>Conostylis bracteata</i>		P3	
849.	1427 <i>Conostylis candicans</i> (Grey Cottonhead)			
850.	12027 <i>Conostylis candicans</i> subsp. <i>calcicola</i>			
851.	11438 <i>Conostylis candicans</i> subsp. <i>candicans</i>			
852.	1436 <i>Conostylis juncea</i>			
853.	1443 <i>Conostylis pauciflora</i> (Dawesville Conostylis)			
854.	11388 <i>Conostylis pauciflora</i> subsp. <i>euryrhipis</i>			

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855.	11657	<i>Conostylis pauciflora</i> subsp. <i>pauciflora</i>		P4	
856.	1454	<i>Conostylis setigera</i> (Bristly Cottonhead)		P4	
857.	11597	<i>Conostylis setigera</i> subsp. <i>setigera</i>			
858.	1285	<i>Corynotheca micrantha</i> (Sand Lily)			
859.	11283	<i>Corynotheca micrantha</i> var. <i>micrantha</i>			
860.	783	<i>Cyperus congestus</i> (Dense Flat-sedge)	Y		
861.	816	<i>Cyperus tenuiflorus</i> (Scaly Sedge)	Y		
862.	10916	<i>Cyrtostylis huegelii</i>			
863.	1218	<i>Dasypogon bromeliifolius</i> (Pineapple Bush)			
864.	17663	<i>Desmocladius asper</i>			
865.	16595	<i>Desmocladius flexuosus</i>			
866.	1259	<i>Dianella revoluta</i> (Blueberry Lily)			
867.	11636	<i>Dianella revoluta</i> var. <i>divaricata</i>			
868.	306	<i>Dichelachne crinita</i> (Longhair Plumegrass)			
869.	1287	<i>Dichopogon capillipes</i>			
870.	19649	<i>Disa bracteata</i>	Y		
871.	1635	<i>Diuris longifolia</i> (Common Donkey Orchid)			
872.	347	<i>Ehrharta calycina</i> (Perennial Veldt Grass)	Y		
873.	349	<i>Ehrharta longiflora</i> (Annual Veldt Grass)	Y		
874.	1643	<i>Elythrhanthera brunonis</i> (Purple Enamel Orchid)			
875.	1644	<i>Elythrhanthera emarginata</i> (Pink Enamel Orchid)			
876.	376	<i>Eragrostis curvula</i> (African Lovegrass)	Y		
877.	1646	<i>Eriochilus dilatatus</i> (White Bunny Orchid)			
878.	20216	<i>Ficinia nodosa</i> (Knotted Club Rush)			
879.	907	<i>Gahnia trifida</i> (Coast Saw-sedge)			
880.	1520	<i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)	Y		
881.	1468	<i>Haemodorum laxum</i>			
882.	1475	<i>Haemodorum spicatum</i> (Mardja)			
883.	1293	<i>Hensmania turbinata</i>			
884.	445	<i>Holcus setiger</i> (Annual Fog)	Y		
885.	1070	<i>Hypolaena exsulca</i>			
886.	17841	<i>Hypolaena pubescens</i>			
887.	910	<i>Isolepis cernua</i> (Nodding Club-rush)			
888.	917	<i>Isolepis marginata</i> (Coarse Club-rush)			
889.	1188	<i>Juncus pallidus</i> (Pale Rush)			
890.	16091	<i>Lachenalia bulbifera</i>	Y		
891.	467	<i>Lagurus ovatus</i> (Hare's Tail Grass)	Y		
892.	28342	<i>Landoltia punctata</i> (Thin Duckweed)			
893.	11464	<i>Laxmannia sessiliflora</i> subsp. <i>australis</i>			
894.	1051	<i>Lemna disperma</i> (Duckweed)			
895.	1075	<i>Lepidobolus preissianus</i>			
896.	18074	<i>Lepidobolus preissianus</i> subsp. <i>preissianus</i>			
897.	925	<i>Lepidosperma angustatum</i>			
898.	42742	<i>Lepidosperma calcicola</i>			
899.	932	<i>Lepidosperma effusum</i> (Spreading Sword-sedge)			
900.	933	<i>Lepidosperma gladiatum</i> (Coast Sword-sedge, Kerbin)			
901.	937	<i>Lepidosperma longitudinale</i> (Pithy Sword-sedge)			
902.	940	<i>Lepidosperma pubisquameum</i>			
903.	944	<i>Lepidosperma scabrum</i>			
904.	945	<i>Lepidosperma squamatum</i>			
905.	946	<i>Lepidosperma striatum</i>			
906.	1653	<i>Leporella fimbriata</i> (Hare Orchid)			
907.	1090	<i>Lepyrodia muirii</i>			
908.	8682	<i>Lolium lolium</i> (Stiff Ryegrass)	Y		
909.	476	<i>Lolium perenne</i> (Perennial Ryegrass)	Y		
910.	478	<i>Lolium rigidum</i> (Wimmera Ryegrass)	Y		
911.	1223	<i>Lomandra caespitosa</i> (Tufted Mat Rush)			
912.	1228	<i>Lomandra hermaphrodita</i>			
913.	1231	<i>Lomandra maritima</i>			
914.	14542	<i>Lomandra micrantha</i> subsp. <i>micrantha</i>			
915.	1234	<i>Lomandra nigricans</i>			
916.	1239	<i>Lomandra preissii</i>			
917.	1243	<i>Lomandra sericea</i> (Silky Mat Rush)			
918.	1246	<i>Lomandra suaveolens</i>			
919.	1097	<i>Lyginia barbata</i>			
920.	955	<i>Mesomelaena pseudostygia</i>			
921.	485	<i>Microlaena stipoides</i> (Weeping Grass)			
922.	15419	<i>Microtis media</i> subsp. <i>media</i>			
923.	1537	<i>Orthrosanthus laxus</i> (Morning Iris)			

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924.	11749	<i>Orthrosanthus laxus</i> var. <i>laxus</i> (Morning Iris)			
925.	532	<i>Paspalum urvillei</i> (Vasey Grass)	Y		
926.	1550	<i>Patersonia occidentalis</i> (Purple Flag, Koma)			
927.	1552	<i>Patersonia rudis</i> (Hairy Flag)			
928.	20460	<i>Pheladenia deformis</i>			
929.	1478	<i>Phlebocarya ciliata</i>			
930.	573	<i>Poa drummondiana</i> (Knotted Poa)			
931.	578	<i>Poa porphyroclados</i>			
932.	1672	<i>Prasophyllum fimbria</i> (Fringed Leek Orchid)			
933.		<i>Pterostylis</i> aff. <i>nana</i>			
934.	15426	<i>Pterostylis aspera</i>			
935.	17267	<i>Pterostylis brevisepala</i>			
936.	1693	<i>Pterostylis recurva</i> (Jug Orchid)			
937.	12217	<i>Pterostylis sanguinea</i>			
938.	18645	<i>Pterostylis</i> sp. limestone (B.J. Keighery & G.J. Keighery 65)			
939.	1698	<i>Pterostylis vittata</i> (Banded Greenhood)			
940.	1556	<i>Romulea rosea</i> (Guildford Grass)	Y		
941.	48356	<i>Schoenoplectus tabernaemontani</i>			
942.	982	<i>Schoenus clandestinus</i>			
943.	984	<i>Schoenus curvifolius</i>			
944.	985	<i>Schoenus discifer</i>			
945.	992	<i>Schoenus grandiflorus</i> (Large Flowered Bogrue)			
946.	997	<i>Schoenus lanatus</i> (Woolly Bog-rue)			
947.	1002	<i>Schoenus nanus</i> (Tiny Bog Rush)			
948.	1006	<i>Schoenus odontocarpus</i>			
949.	1018	<i>Schoenus subfascicularis</i>			
950.	1026	<i>Schoenus unispiculatus</i>			
951.	1312	<i>Sowerbaea laxiflora</i> (Purple Tassels)			
952.	1558	<i>Sparaxis bulbifera</i>	Y		
953.	1260	<i>Stypandra glauca</i> (Blind Grass)			
954.	1036	<i>Tetraria octandra</i>			
955.	35581	<i>Tetraria</i> sp. <i>Chandala</i> (G.J. Keighery 17055)		P2	
956.	1708	<i>Thelymitra fuscolutea</i> (Chestnut Sun Orchid)			
957.	1319	<i>Thysanotus arenarius</i>			
958.	1338	<i>Thysanotus manglesianus</i> (Fringed Lily)			
959.	1339	<i>Thysanotus multiflorus</i> (Many-flowered Fringe Lily)			
960.	1343	<i>Thysanotus patersonii</i>			
961.	1351	<i>Thysanotus sparteus</i>			
962.	1357	<i>Thysanotus thyrsoides</i>			
963.	1358	<i>Thysanotus triandrus</i>			
964.	1361	<i>Tricoryne elatior</i> (Yellow Autumn Lily)			
965.	1363	<i>Tricoryne tenella</i>			
966.	1038	<i>Tricostularia neesii</i>			
967.	18587	<i>Triglochin nana</i>			
968.	152	<i>Triglochin trichophora</i>			
969.	708	<i>Triticum aestivum</i> (Wheat)	Y		
970.	724	<i>Vulpia myuros</i> (Rat's Tail Fescue)	Y		
971.	33101	<i>Vulpia myuros</i> forma <i>myuros</i>	Y		
972.	17910	<i>Washingtonia filifera</i>	Y		
973.	1398	<i>Wurmbea monantha</i>			
974.	1256	<i>Xanthorrhoea preissii</i> (Grass tree, Palga)			

Pteridophyte (Fern)

975.	45	<i>Pteris vittata</i> (Chinese Brake)
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Reptile

976.	42368	<i>Acritoscincus trilineatus</i> (Western Three-lined Skink)
977.	44629	<i>Anilius australis</i>
978.	25241	<i>Antaresia stimsoni</i> subsp. <i>stimsoni</i> (Stimson's Python)
979.	24991	<i>Aprasia repens</i> (Sand-plain Worm-lizard)
980.	42380	<i>Brachyuropsis fasciolatus</i> subsp. <i>fasciolatus</i> (Narrow-banded Shovel-nosed Snake)
981.	42381	<i>Brachyuropsis semifasciatus</i> (Southern Shovel-nosed Snake)
982.	25335	<i>Caretta caretta</i> (Loggerhead Turtle)
983.	43380	<i>Chelodina collieri</i> (South-western Snake-necked Turtle)
984.	25336	<i>Chelonia mydas</i> (Green Turtle)
985.	24980	<i>Christinus marmoratus</i> (Marbled Gecko)
986.	24918	<i>Crenadactylus ocellatus</i> subsp. <i>ocellatus</i> (Clawless Gecko)
987.	30893	<i>Cryptoblepharus buchananii</i>
988.	25020	<i>Cryptoblepharus plagiocephalus</i>
989.	30899	<i>Ctenophorus adelaidensis</i> (Southern Heath Dragon, Western Heath Dragon)
990.	25027	<i>Ctenopus australis</i>

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
991.	25039 <i>Ctenotus fallens</i>			
992.	25087 <i>Cyclodomorphus celatus</i> (Western Slender Blue-tongue)			
993.	30906 <i>Delma concinna</i> (Javelin Legless Lizard)			
994.	30905 <i>Delma concinna subsp. concinna</i> (Javelin Legless Lizard)			
995.	25766 <i>Delma fraseri</i> (Fraser's Legless Lizard)			
996.	24999 <i>Delma grayii</i>			
997.	25468 <i>Demansia psammophis</i> (Yellow-faced Whipsnake)			
998.	25296 <i>Demansia psammophis subsp. reticulata</i> (Yellow-faced Whipsnake)			
999.	25346 <i>Dermochelys coriacea</i> (Leatherback Turtle)		T	
1000.	24939 <i>Diplodactylus polyophthalmus</i>			
1001.	25251 <i>Echiopsis curta</i> (Bardick)			
1002.	25096 <i>Egernia kingii</i> (King's Skink)			
1003.	25100 <i>Egernia napoleonis</i>			
1004.	25119 <i>Hemiergis quadrilineata</i>			
1005.	43384 <i>Hydrophis platurus</i> (Yellow-bellied Seasnake)			
1006.	25131 <i>Lerista distinguenda</i>			
1007.	25133 <i>Lerista elegans</i>			
1008.	25148 <i>Lerista lineopunctulata</i>			
1009.	25165 <i>Lerista praepedita</i>			
1010.	25005 <i>Lialis burtonis</i>			
1011.	25184 <i>Menetia greyii</i>			
1012.	25240 <i>Morelia spilota subsp. imbricata</i> (Carpet Python)			
1013.	25191 <i>Morethia lineoocellata</i>			
1014.	25192 <i>Morethia obscura</i>			
1015.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
1016.	25249 <i>Neelaps calonotos</i> (Black-striped Snake, black-striped burrowing snake)		P3	
1017.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
1018.	25253 <i>Parasuta gouldii</i>			
1019.	25510 <i>Pogona minor</i> (Dwarf Bearded Dragon)			
1020.	24907 <i>Pogona minor subsp. minor</i> (Dwarf Bearded Dragon)			
1021.	25261 <i>Pseudechis australis</i> (Mulga Snake)			
1022.	25511 <i>Pseudonaja affinis</i> (Dugite)			
1023.	25259 <i>Pseudonaja affinis subsp. affinis</i> (Dugite)			
1024.	25258 <i>Pseudonaja affinis subsp. exilis</i> (Rottnest Island Dugite)		P4	
1025.	25008 <i>Pygopus lepidopodus</i> (Common Scaly Foot)			
1026.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
1027.	25518 <i>Strophurus spinigerus</i>			
1028.	24943 <i>Strophurus spinigerus subsp. inornatus</i>			
1029.	24942 <i>Strophurus spinigerus subsp. spinigerus</i>			
1030.	25203 <i>Tiliqua occipitalis</i> (Western Bluetongue)			
1031.	25519 <i>Tiliqua rugosa</i>			
1032.	25204 <i>Tiliqua rugosa subsp. aspera</i>			
1033.	25207 <i>Tiliqua rugosa subsp. rugosa</i>			
1034.	25218 <i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
1035.	25526 <i>Varanus tristis</i> (Racehorse Monitor)			

Slime Mould

1036.	39061 <i>Physarum bitectum</i>			
1037.	39063 <i>Physarum cinereum</i>			
1038.	39079 <i>Physarum viride</i>			
1039.	39094 <i>Trichia affinis</i>			
1040.	39098 <i>Trichia favoginea</i>			
1041.	39100 <i>Trichia persimilis</i>			

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 wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

Appendix C Flora, vegetation and Black Cockatoo habitat assessment 2016



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Flora and vegetation survey report

Brighton Business Park North
Development

DRAFT

Prepared for
Satterley
by Strategen

December 2016

Flora and vegetation survey report

**Brighton Business Park North
Development**

DRAFT

Strategen is a trading name of
Strategen Environmental Consultants Pty Ltd
Level 1, 50 Subiaco Square Road Subiaco WA 6008
ACN: 056 190 419

December 2016

Limitations

Scope of services

This report ("the report") has been prepared by Strategen Environmental Consultants Pty Ltd (Strategen) in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

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The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

Client: Satterley

Report Version	Revision No.	Purpose	Strategen author/reviewer	Submitted to Client	
				Form	Date
Draft Report	A	For Client Review	C Courtauld / D Panickar / T Bowra	Electronic	5 December 2016
Final Draft Report					
Final Report					

Filename: SPG16211_01 R003 Rev A - 5 December 2016

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Appendix 3 Photographic record of site and vegetation types
Appendix 4 Desktop assessment results (Parks and Wildlife 2007-, DEE 2016c)
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1. Introduction

This report presents the findings of a Level 2 flora and vegetation survey and black cockatoo habitat assessment undertaken to determine the environmental values located within the proposed Brighton Business Park North Development footprint.

1.1 Background

Satterley Property Group (Satterley) is proposing to lodge a subdivision application for the construction of the Brighton Business Park North development (the Project area). The subdivision plan aims to create 28 commercial lots ranging from 954 m²–4741 m² in size with an allocation for drainage/Public Open Space (POS) within the development (Figure 1).

The proposed works will require clearing of approximately 2.52 ha of native vegetation and as such, a flora and vegetation survey was deemed necessary to determine the environmental values of the potential clearing area.

Clearing of vegetation may result in the removal of vegetation within a Threatened Ecological Community (TEC), *Banksia Woodlands of the Swan Coastal Plain*, listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Banksia Woodland TEC is restricted to the Swan Coastal Plain bioregion and is a newly listed TEC under the EPBC Act (September 2016).

Clearing of vegetation may also result in the removal of vegetation potentially containing habitat for Forest Red-tailed Black-Cockatoos (FRTBC), Baudin's Black Cockatoos (BBC) and Carnaby's Black-Cockatoos (CBC). All three species of black cockatoos are listed as Threatened under the EPBC Act and the *Wildlife Conservation Act 1950* (WC Act).

1.2 Scope

The scope of this flora and vegetation survey and black cockatoo habitat assessment was to undertake a desktop assessment and field assessment within the survey area (Figure 1).

The objectives were to:

- conduct a desktop survey for Threatened and Priority flora which have been identified as being present in or around the survey area
- collect and identify the vascular plant species present within the survey area
- search areas of suitable habitat for Threatened and/or Priority flora
- define and map the native vegetation communities present within the survey area
- map vegetation condition within the survey area
- provide recommendations on the local and regional significance of the vegetation communities
- define and map black cockatoo habitat within the survey area
- prepare a report summarising the findings.

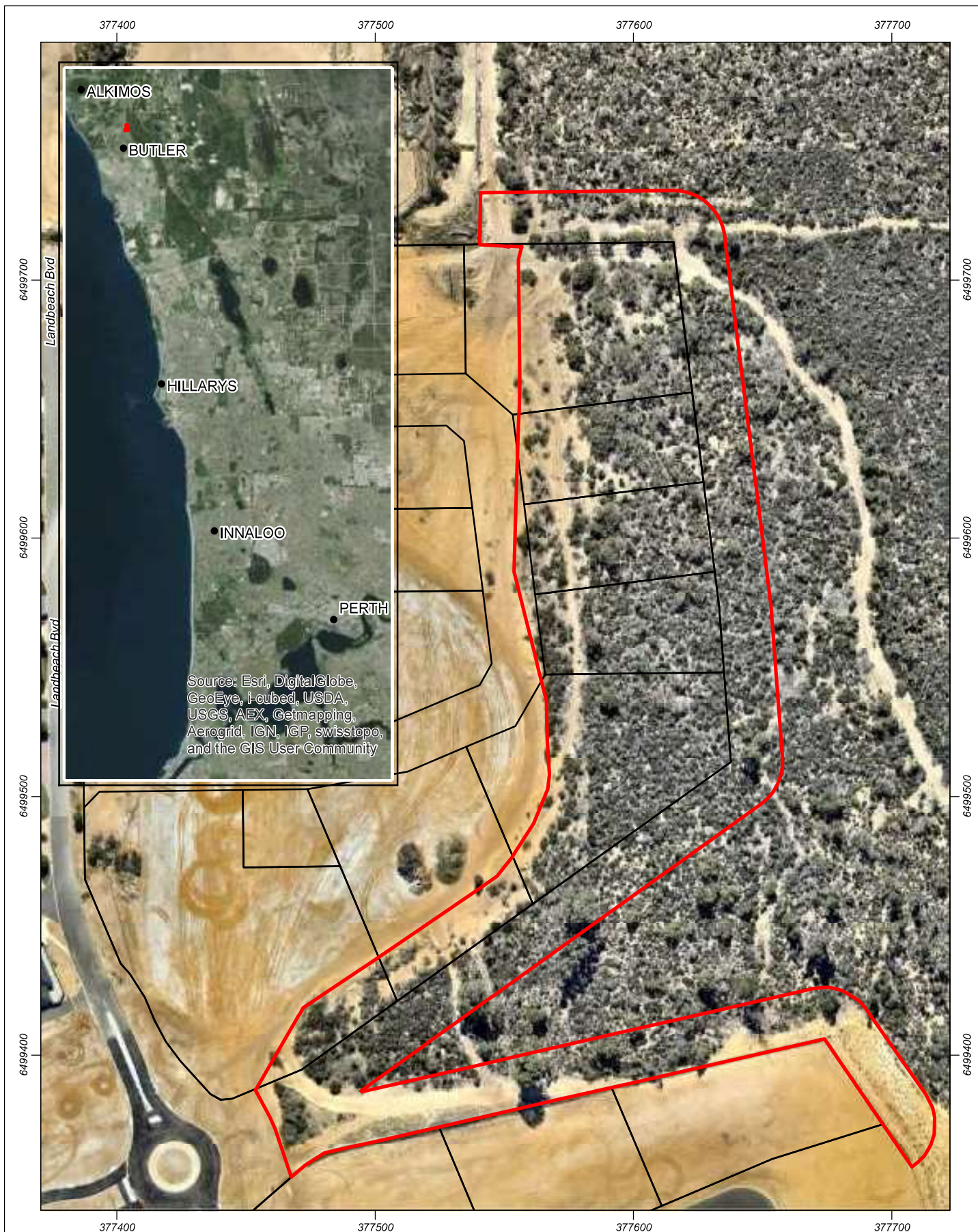
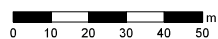


Figure 1: The survey area

Scale 1:2,000 at A4



Legend

- Survey area
- Lot layout

Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 2/12/2016

Author: JCrute
 Source: Aerial image: Nearmap, flown 04/2016.
 Subdivision plan: Client 07/2016, Topography: SLIP, Landgate 2016.



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2. Context

2.1 Legislative context

This biological survey has been conducted with reference to the following Australian and Western Australian legislation:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – Australian Government
- *Wildlife Conservation Act 1950* (WC Act) – State
- *Environmental Protection Act 1986* (EP Act) – State
- *Biosecurity and Agriculture Management Act 2007* (BAM Act) – State.

2.1.1 Conservation significant flora and ecological communities

Conservation significant flora and ecological communities are determined at a state and federal legislative level. Threatened species are listed under the EPBC Act at the Australian Government level and under the WC Act at the State level (see Appendix 1 for definitions). Priority species are listed by the Department of Parks and Wildlife (Parks and Wildlife) and include species of 'significant conservation value' (Appendix 1).

Threatened Ecological Communities (TECs) are listed under both the EPBC Act and EP Act (Appendix 1). Priority Ecological Communities (PECs) are listed by Parks and Wildlife and include species of significant conservation value (Appendix 1).

2.1.2 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are protected under the EP Act, and may include the following:

- World Heritage areas
- areas included on the National Estate Register
- defined wetlands and associated buffers
- vegetation within 50 m of a listed Threatened species
- TECs.

2.1.3 Protection of native vegetation

Native vegetation is defined under the EP Act as "indigenous aquatic or terrestrial vegetation, and includes dead vegetation unless that dead vegetation is of a class declared by regulation to be excluded from this definition but does not include vegetation in a plantation".

This definition of native vegetation does not include vegetation that was intentionally sown, planted or propagated unless either of the following applies:

- (a) the vegetation was sown, planted or propagated as required under the EP Act or another written law
- (b) the vegetation is declared to be native under Regulation 4 of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

Regulation 4 prescribes the kinds of intentionally planted indigenous vegetation that are "native vegetation" and which therefore require a clearing permit or exemption to clear and includes:

- (a) planting that was funded (fully or partly)
 - i. by a person who was not the owner of the land
 - ii. for the purpose of biodiversity conservation or land conservation
- (b) intentionally planted vegetation that has one of the following:

- i. a conservation covenant or agreement to reserve under section 30B of the *Soil and Land Conservation Act 1945*
- ii. a covenant to conserve under section 21A of the *National Trust of Australia (WA) Act 1964*
- iii. restrictive covenant to conserve under section 129B of the *Transfer of Land Act 1983*
- iv. some other form of binding or undertaking to establish and maintain, or maintain, the vegetation.

Native vegetation can only be cleared with a clearing permit, unless for some circumstances where exemptions apply pursuant to the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (the Regulations). Clearing permits issued pursuant to the Regulations may be issued as area permits or purpose permits. Exemptions for clearing under Regulation 5 of the Regulations do not apply within ESAs.

2.1.4 Fauna

Species of fauna are defined as Threatened where their populations are under threat, require protection or are protected under an international agreement. Parks and Wildlife recognises these threats of extinction and consequently applies regulations towards population and species protection.

Threatened fauna species are protected under section 16 of the WC Act. Under the Act, it is an offence to “take, destroy or possess” Threatened fauna without Ministerial approval.

Threatened fauna (Schedule 1) are further ranked by Parks and Wildlife according to their threat using International Union for Conservation of Nature (IUCN) Red List criteria that are described as follows:

- CR Critically Endangered – considered to be facing an extremely high risk of extinction in the wild
- EN Endangered – considered to be facing a very high risk of extinction in the wild
- VU Vulnerable – considered to be facing a high risk of extinction in the wild.

Priority fauna not listed as Threatened (Scheduled) under the WC Act, but are poorly known or poorly represented in the conservation estate are regarded as Priority and attention is given to their conservation by Parks and Wildlife.

Threats of extinction of fauna species are also recognised at a Commonwealth level and are categorised according to the EPBC Act, administered by the Department of Environment and Energy (DEE).

Matters of National Environmental Significance (MNES) include nationally listed threatened species and ecological communities, such as the three species of Black Cockatoos (Threatened) and the Banksia Woodlands TEC. Ramsar Wetlands and migratory species listed under the EPBC Act are also MNES. Migratory species are defined as animals that migrate to Australia and its external territories, or pass through or over Australian waters during their annual migrations (DEE 2016a). Recognised migratory species include any native species identified in an international agreement approved by the Minister and those listed under:

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
- China-Australia Migratory Bird Agreement (CAMBA)
- Japan-Australia Migratory Bird Agreement (JAMBA)
- Republic of Korea – Australia Migratory Bird Agreement (ROKAMBA).

2.1.5 Introduced species

The BAM Act provides for management and control of listed organisms, including introduced flora species (weeds). Species listed as declared pests under the BAM Act are classified under three categories:

- C1 Exclusion: Pests assigned under this category are not established in Western Australia, and control measures are to be taken to prevent them entering and establishing in the State.
- C2 Eradication: Pests assigned under this category are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.

- C3 Management: Pests assigned under this category are established in Western Australia, but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area that is currently free of that pest.

Under the BAM Act, land managers are required to manage populations of declared pests as outlined under the relevant category.

2.2 Environmental setting

2.2.1 Soils and topography

The survey area is located within the Swan Coastal Plain 2 (SWA2 – Swan Coastal Plain subregion) of Western Australia (Mitchell *et al.* 2002). The Swan Coastal Plain comprises five major geomorphologic systems that lie parallel to the coast, namely (from west to east) the Quindalup Dunes, Spearwood Dunes, Bassendean Dunes, Pinjarra Plain and Ridge Hill Shelf (Churchward & McArthur 1980; Gibson *et al.* 1994). Each major system is composed of further subdivisions in the form of detailed geomorphologic units (Churchward & McArthur 1980; Semeniuk 1990; Gibson *et al.* 1994). Beard (1990) describes the Swan Coastal Plain as a low-lying coastal plain, often swampy, with sandhills also containing dissected country rising to the duricrusted Dandaragan plateau on Mesozoic, mainly sandy, yellow soils.

2.2.2 Climate

The Brighton locality experiences a Mediterranean climate characterised by mild, wet winters and warm to hot, dry summers. The nearest Bureau of Meteorology (BoM) weather station at Gingin Aero (Station No. 009178) provides average monthly climate statistics for the Brighton locality (Figure 2). Average annual rainfall recorded at Gingin Aero since 1996 is 620.2 mm (BoM 2016). Rainfall may occur at any time of year; however, most occurs in winter in association with cold fronts from the southwest. Highest temperatures occur between December and March, with average monthly maximums ranging from 30.6°C in December to 33.3°C in February (BoM 2016). Lowest temperatures occur between June and September, with average monthly minimums ranging from 6.2°C in July to 7.4°C in September (BoM 2016).

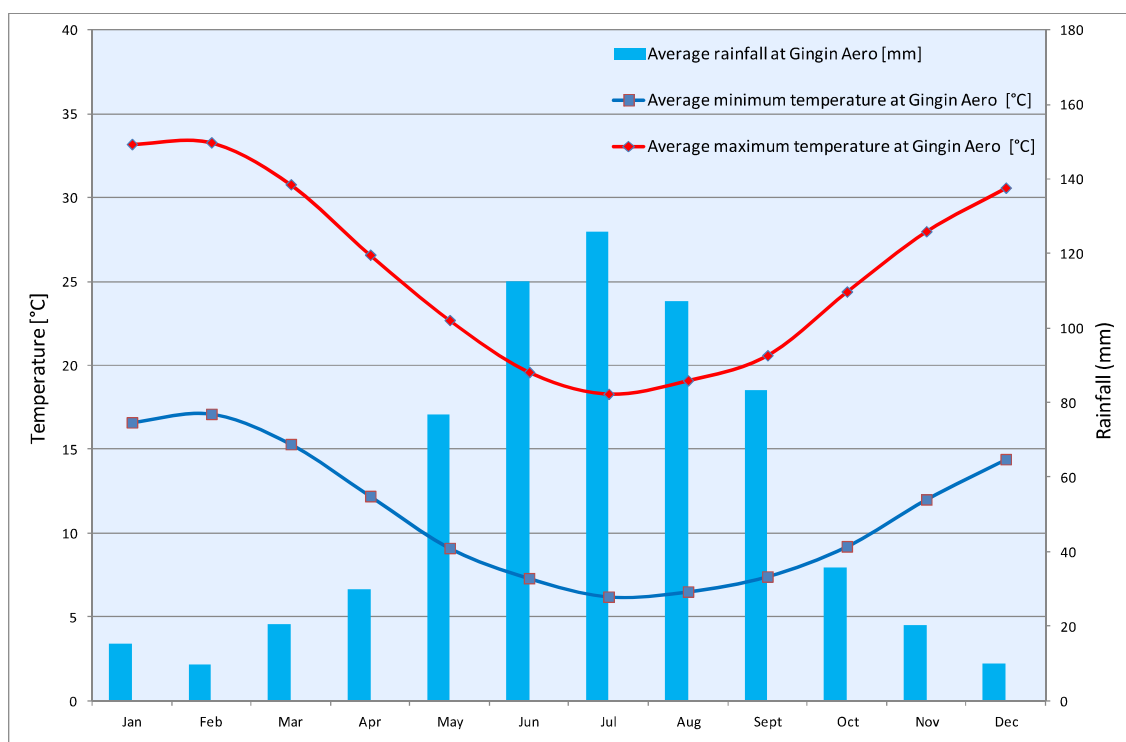


Figure 2: Mean monthly climatic data (temperature and rainfall) for Gingin Aero

2.2.3 Regional vegetation

Vegetation occurring within the region was initially mapped at a broad scale (1:1 000 000) by Beard during the 1970s. This dataset has formed the basis of several regional mapping systems, including physiographic regions defined by Beard (1981) which led to the delineation of botanical districts as described in Beard (1990); the biogeographical region dataset (Interim Biogeographical Regionalisation for Australia, IBRA) for Western Australia (DEE 2016a) and System 6 Vegetation Complex mapping undertaken by Heddle et al. (1980).

Beard (1990) Botanical Subdistrict

The survey area occurs within the Drummond Botanical Subdistrict which is characterised by low *Banksia* woodlands on leached sands; *Melaleuca* swamps on poorly-drained depressions; and *Eucalyptus gomphocephala* (Tuart), *Eucalyptus marginata* (Jarrah) and *Corymbia calophylla* (Marri) woodlands on less leached soils (Beard 1990).

IBRA subregion

IBRA describes a system of 85 'biogeographic regions' (bioregions) and 403 subregions covering the entirety of the Australian continent (Thackway & Cresswell 1995). Bioregions are defined on the basis of climate, geology, landforms, vegetation and fauna.

The survey area occurs within the Swan Coastal Plain 2 IBRA subregion which is dominated by *Banksia* or Tuart on sandy soils, *Casuarina obesa* on outwash plains and paperbark (*Melaleuca*) in swampy areas (Mitchell et al. 2002).

System 6 and vegetation system association mapping

System 6 mapping refers to vegetation mapping undertaken at a Vegetation Complex scale by Heddle *et al.* (1980). This is the primary source of information used to calculate potential impacts of proposals to clear native vegetation on the Swan Coastal Plain. The survey area occurs within the Cottesloe Complex - Central and South (Figure 3) which is described as:

Mosaic of woodland of *E. gomphocephala* and open forest of *E. gomphocephala* – *E. marginata* – *E. calophylla*; closed heath on the limestone outcrops.

At a finer scale, the survey area falls within the Guilderton vegetation system association (i.e. *Guilderton 949 - low woodland; Banksia*) as defined in Government of Western Australia (2016).

2.2.4 Black cockatoo habitat

Carnaby's Black-Cockatoos, listed as Endangered under the EPBC Act, feed on the seeds, nuts and flowers, of a variety of native and introduced plant species and insect larvae (DEE 2016b). Food plants generally occur within proteaceous genera such as *Banksia*, *Dryandra*, *Hakea* and *Grevillea*, though are known to forage on eucalypt species in woodland areas. Carnaby's black cockatoos have also adapted to feeding on exotic species such as pines and cape lilac and weeds such as wild radish and wild geranium (DEE 2016b). Carnaby's black cockatoos usually breed between July and December in the hollows of live or dead eucalypts; primarily in Salmon Gum and Wandoo, but also within Jarrah, Marri and other eucalypt species (Johnstone 2010a). Hollows are usually at least 2 m above ground, sometimes over 10 m and the depth of the hollow varies from 0.25 m to 6 m (DEE 2016b). The Western Australian Department of Parks and Wildlife (Parks and Wildlife), renewed the Carnaby's Cockatoo Recovery Plan in 2013, clearly mapping the distribution of likely breeding and non-breeding areas in south-west WA for CBC (Parks and Wildlife 2013). Based on this map, the site is situated within the CBC breeding range.

Forest Red-tailed Black-Cockatoos, listed as Vulnerable under the EPBC Act, depend primarily on Marri and Jarrah trees for both foraging and nesting. The seeds of both eucalypts are the favoured food source of the birds and hollows within live or dead individual trees are utilised for nesting purposes (Johnstone & Kirkby 1999). Breeding varies between years and occurs at times of Jarrah and Marri fruiting. These black cockatoos breed in woodland, forest or artificial nest boxes, but may also breed in former woodland or forest that has been reduced to isolated trees (DEE 2016b). Based on the *EPBC Act Referral guidelines for three threatened black cockatoo species* (DSEWPaC 2012), the site is not situated within the known FRTBC breeding range.

Baudin's Black-Cockatoos primarily occur in eucalypt forests and forage at all strata levels within the forests with a tendency to favour areas containing Marri (Johnstone and Kirkby 2008, DEE 2016b). Breeding generally occurs in the Jarrah, Marri and Karri forests of the southwest of Western Australia in areas averaging more than 750 mm of rainfall annually (DEE 2016b). As with the other two species of Threatened black cockatoos in Western Australia, breeding habitat also occurs in former woodland or forest that has been reduced to isolated trees (DEE 2016b). Based on the *EPBC Act Referral guidelines for three threatened black cockatoo species* (DSEWPaC 2012), the site is not situated within the known BBC breeding range.

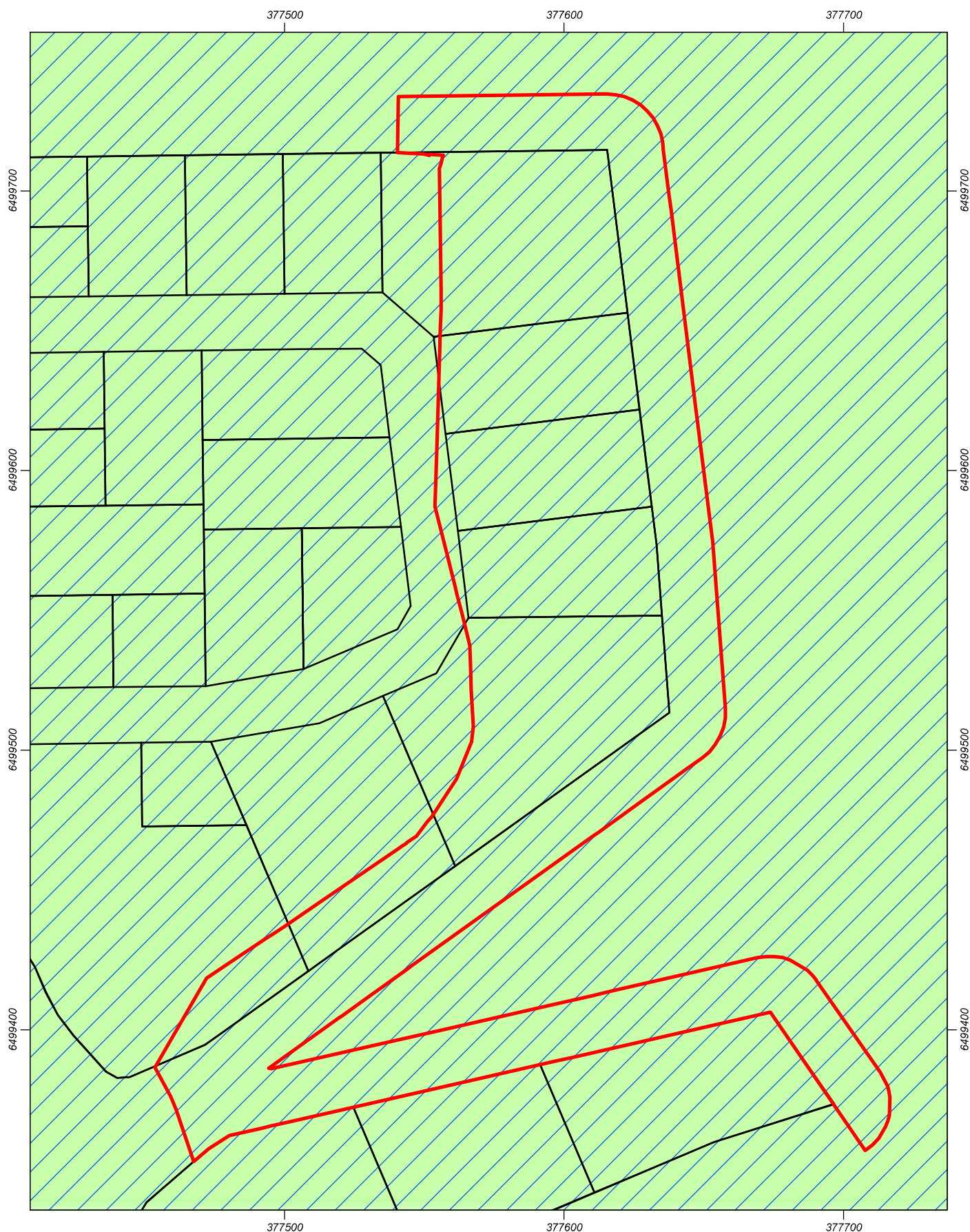


Figure 3: Regional vegetation mapping

Scale 1:1,860 at A4

0 10 20 30 40 50 m

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 2/12/2016

Author: JCrute

Source: Aerial image: Nearmap, flown 04/2016.

Subdivision plan: Client 11/2016, Vegetation Heddle: DEC 2014, Vegetation Beard: DAFWA 2014.

Path: Q:\Consult\2016\SPG\SPG16211\ArcMap_documents\R003\SPG16211_01_R003_RevB_F003.mxd

Legend

Survey area

Lot layout

Vegetation class (Heddle et al)

Cottlesloe complex - central and south

Vegetation class (Beard)

GUILDERTON_949

3. Methods

3.1 Flora and vegetation

3.1.1 Desktop assessment

A desktop assessment was conducted using Florabase, Parks and Wildlife, and Department of the Environment and Energy (DEE) databases to identify the possible occurrence of TECs, PECs and Threatened and Priority flora potentially occurring within the survey area. Reports that document regional flora, vegetation and fauna within the surrounds of the survey area were also reviewed prior to the field assessment.

A database search request was also submitted to the Threatened Communities Branch of Parks and Wildlife to identify any potential TECs or PECs within 5 km of the survey area.

3.1.2 Field assessment

The field survey was conducted according to standards set out in Guidance Statement 51 (EPA 2004). The assessment of flora and vegetation within the survey area was undertaken by two ecologists from Strategen on 14 October 2016. Table 1 identifies staff involved in the field surveys, their role and qualifications. The survey area was traversed on foot to record changes in vegetation structure and type and eight vegetation quadrats were surveyed to identify vegetation types (Appendix 2; Appendix 3).

Table 1: Personnel

Name	Role	Flora collection permit
Mr. D. Panickar Strategen (Senior Ecologist)	Planning, fieldwork, plant identification, data interpretation and report preparation	SL010993
Ms. C. Courtauld Strategen (Ecologist)	Planning, fieldwork, plant identification, data interpretation and report preparation	SL011638

Site selection for vegetation mapping was based on differences in structure and species composition of the communities present within the survey area. Vegetation mapping sites were determined from aerial photographs. The survey area was traversed on foot, allowing for opportunistic sites to be placed where a change in vegetation structure or composition was observed.

Flora and vegetation was described and sampled systematically at each quadrat and additional opportunistic collecting was undertaken wherever previously unrecorded plants were observed. At each site the following floristic and environmental parameters were noted:

- GPS location
- topography
- soil type and colour
- outcropping rocks and their type
- percentage cover and average height of each vegetation stratum.

For each vascular plant species, the average height, number of plants and percent cover were recorded.

All plant specimens collected during the field surveys were identified using appropriate reference material or through comparisons with pressed specimens housed at the Western Australian Herbarium where necessary. Nomenclature of the species recorded is in accordance with Western Australian Herbarium (1998-).

3.1.3 Data analysis and vegetation mapping

Due to the degraded and uniform distribution of vegetation within the survey area; quadrat data were grouped into a species by site matrix to delineate individual vegetation types (VTs) present within the survey area. Aerial photography interpretation and field notes taken during the survey were then used to develop VT mapping polygon boundaries over the survey area. These polygon boundaries were then digitised using Geographic Information System (GIS) software.

VT descriptions (though floristic in origin) have been adapted from the National Vegetation Information System (NVIS) Australian Vegetation Attribute Manual Version 6.0 (ESCAVI 2003), a system of describing structural vegetation units (based on dominant taxa). This model follows nationally-agreed guidelines to describe and represent vegetation types, so that comparable and consistent data is produced nation-wide. For the purposes of this report, a VT is considered equivalent to a NVIS sub-association as described in ESCAVI (2003).

Vegetation condition was recorded at all quadrats, and also opportunistically within the survey area during the field assessment where required. Vegetation condition was described using the vegetation condition scale for the South West Botanical Province (Keighery 1994). Vegetation condition polygon boundaries were developed using this information in conjunction with aerial photography interpretation, and were digitised as for vegetation type mapping polygon boundaries.

The degraded nature of the survey area did not allow for statistically valid multivariate analyses to be undertaken to determine resemblance of sites to Floristic Community Types (FCTs) as mapped and defined by Gibson *et al.* (1994). Therefore, inferences between recorded VTs, FCTs and Parks and Wildlife descriptions of TECs/PECs were used to determine any potential occurrence of a conservation significant vegetation community where necessary.

3.1.4 Survey limitations and constraints

Table 2 displays the evaluation of the flora and vegetation assessment against a range of potential limitations that may have an effect on that assessment. Based on this evaluation, the assessment has not been subject to constraints that would affect the thoroughness of the assessment and the conclusions reached.

Table 2: Flora and vegetation survey potential limitations and constraints

Potential limitation	Impact on assessment	Comment
Sources of information and availability of contextual information (i.e. pre-existing background versus new material).	Not a constraint.	The survey has been undertaken in the Drummond Botanical Subdistrict on the Swan Coastal Plain which has been well studied and documented with ample literature available (Beard 1990).
Scope (i.e. what life forms, etc., were sampled).	Not a constraint.	Due to the uniform distribution of vegetation within the survey area and timing of the survey (i.e. spring); most life forms are likely to have been sampled adequately during the time of the survey.
Proportion of flora/fauna collected and identified (based on sampling, timing and intensity).	Not a constraint.	The proportion of flora surveyed was adequate. The entire survey area was traversed and flora species were recorded systematically.
Completeness and further work which might be needed (i.e. was the relevant survey area fully surveyed).	Not a constraint.	The information collected during the survey was sufficient to assess the vegetation that was present during the time of the survey.
Mapping reliability.	Not a constraint.	Aerial photography of a suitable scale was used to map the survey area and identify potential fauna habitat. Sites were chosen from these aerials to reflect changes in community structure. Opportunistic sites were also used if differences were observed during on ground reconnaissance. Vegetation types were assigned to each site based on topography, soil type and presence/absence and percent foliage cover of vegetation.
Timing, weather, season, cycle.	Not a constraint.	Flora and vegetation surveys are normally conducted following winter rainfall in the South-West Province, ideally during spring (EPA 2004). The field assessment was conducted in October (i.e. spring) in fine weather conditions and therefore these factors are not deemed to be constraints.
Disturbances (fire flood, accidental human intervention, etc.).	Not a constraint.	The survey area and regional surrounds have been subject to disturbance from human intervention. Given the wide range of this disturbance, this is not considered to be a limitation within the survey area.
Intensity (in retrospect, was the intensity adequate).	Not a constraint.	The survey area was traversed on foot and all differences in vegetation structure were recorded appropriately.
Resources (i.e. were there adequate resources to complete the survey to the required standard).	Not a constraint.	The available resources were adequate to complete the survey.
Access problems (i.e. ability to access survey area).	Not a constraint.	Existing tracks enabled adequate access to survey the vegetation and fauna within the survey area. Where access was not available by car, the area was easily traversed by foot.
Experience levels (e.g. degree of expertise in species identification to taxon level).	Not a constraint.	All survey personnel have the appropriate training in sampling and identifying the flora of the region.

3.2 Black cockatoo habitat assessment

The survey area was inspected on 14 October 2016 by two Strategen personnel with relevant experience as specified by the *EPBC Act Referral guidelines for three threatened black cockatoo species* (DSEWPac 2012). The inspection included:

- a vegetation assessment to identify vegetation communities and potential black cockatoo foraging species
- a significant tree assessment to identify any trees with the potential to be utilised by black cockatoos for breeding.

3.2.1 Vegetation and foraging assessment

The survey area was traversed on foot to record any flora species with the potential to provide a food source for black cockatoos. Following the assessment, vegetation units defined as part of the flora and vegetation survey were assigned a foraging value based on the presence and quantity of potential food species and any evidence of foraging by black cockatoos.

3.2.2 Significant tree assessment

Significant trees are defined as trees of suitable species with a diameter at breast height (DBH) greater than 500 mm (> 300 mm for salmon gum and wandoo) (DSEWPaC [now DEE] 2012). Tree species which are considered to be potential breeding or roosting trees are outlined in Table 3. Trees with a DBH greater than 500 mm (or >300 mm for salmon gum and wandoo) are large enough to potentially contain hollows suitable for nesting black cockatoos, or have the potential to develop suitable hollows over the next 50 years. Trees of this size may also be large enough to provide roosting habitat (i.e. trees which provide a roost or rest area for the birds). The locations of such trees within the survey area were recorded using a Global Positioning System (GPS) device. In addition to the location and DBH, the species of each tree was also recorded.

Table 3: Black cockatoo potential breeding tree species (Groom 2011, DSEWPaC 2012)

Scientific name	Common name	Breeding	Roosting
<i>Corymbia calophylla</i>	Marri	Yes	Yes
<i>Corymbia maculata</i>	Spotted Gum		Yes
<i>Eucalyptus accedens</i>	Powderbark	Yes	
<i>Eucalyptus camaldulensis</i>	River Red Gum		Yes
<i>Eucalyptus citriodora</i>	Lemon Scented Gum		Yes
<i>Eucalyptus diversicolor</i>	Karri	Yes	
<i>Eucalyptus globulus</i>	Tasmania Blue Gum		Yes
<i>Eucalyptus gomphocephala</i>	Tuart	Yes	Yes
<i>Eucalyptus grandis</i>	Flooded Gum, Rose Gum		Yes
<i>Eucalyptus longicornis</i>	Red Morrell	Yes	
<i>Eucalyptus loxophleba</i>	York Gum	Yes	
<i>Eucalyptus marginata</i>	Jarra	Yes	Yes
<i>Eucalyptus megacarpa</i>	Bullich	Yes	Yes
<i>Eucalyptus occidentalis</i>	Swamp Yate	Yes	
<i>Eucalyptus patens</i>	Blackbutt	Yes	Yes
<i>Eucalyptus robusta</i>	Swamp Mahogany		Yes
<i>Eucalyptus rudis</i>	Flooded Gum	Yes	Yes
<i>Eucalyptus salmonophloia</i>	Salmon Gum	Yes	
<i>Eucalyptus salubris</i>	Gimlet	Yes	
<i>Eucalyptus wandoo</i>	Wandoo	Yes	Yes
<i>Pinus pinaster</i>	Pinaster, Maritime Pine		Yes
<i>Pinus radiata</i>	Monterey, Radiata Pine		Yes

4. Results

4.1 Flora and vegetation

4.1.1 Desktop assessment results

A total of 37 native vascular plant taxa from 20 plant families have the potential to occur within the survey area (Parks and Wildlife 2007-; DEE 2016c). The majority of taxa were from within the Fabaceae (6 taxa), Myrtaceae (5 taxa) and Proteaceae (4 taxa) families (Appendix 4).

Threatened and Priority flora

A desktop survey for Threatened and Priority flora that may potentially occur within the survey area was undertaken using NatureMap (Parks and Wildlife 2007-), the Western Australian Herbarium (Western Australian Herbarium 1998-), and the DEE Protected Matters Search Tool (DEE 2016c).

Flora within Western Australia that is considered to be under threat may be classed as either Threatened flora or Priority flora. Where flora has been gazetted as Threatened flora under the WC Act, the taking of such flora without the written consent of the Minister is an offence. The WC Act defines “to take” flora as to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means. Parks and Wildlife (2015) contains the current list of Threatened flora in Western Australia.

Priority flora are considered to be species which are potentially under threat, but for which there is insufficient information available concerning their distribution and/or populations to make a proper evaluation of their conservation status. Parks and Wildlife categorises Priority flora according to their conservation priority using five categories, P1 (highest conservation significance) to P5 (lowest conservation significance), to denote the conservation priority status of such species. Priority flora species are regularly reviewed and may have their priority status changed when more information on the species becomes available. Appendix 1 defines levels of Threatened and Priority flora (Western Australian Herbarium 1998-).

At the national level, the EPBC Act lists Threatened species as extinct, extinct in the wild, critically endangered, endangered, vulnerable, or conservation dependent. Appendix 1 defines each of these categories of Threatened species. The EPBC Act prohibits an action that has or will have a significant impact on a listed Threatened species without approval from the Australian Government Minister for the Environment. The current EPBC Act list of Threatened flora may be found on the DEE (2016d) website.

Table 4 shows the Threatened and Priority flora potentially occurring within the survey area. The desktop assessment identified six Threatened flora and three Priority flora species that have been recorded in the regional area. Of these, based on specific habitat requirements, no Threatened flora species or Priority flora species were considered to have the potential to occur within the survey area.

Table 4: Threatened and Priority flora potentially occurring within the survey area

Species	Conservation status		Description	Potential to occur
	EPBC Act	WC Act		
<i>Caladenia huegelii</i>	Threatened – Endangered	Threatened	A slender orchid from 30 to 50 cm tall. One or two striking flowers characterised by a greenish-cream lower petal with a maroon tip. Other petals are cream with red or pink suffusions. Habitat for this species occurs within well-drained, deep sandy soils in low mixed Banksia, Allocasuarina and Jarrah woodlands (Western Australian Herbarium 1998-, DEE 2016b).	Unlikely – Preferred soil type/habitat does not occur within the survey area.
<i>Diuris micrantha</i>	Threatened – Vulnerable	Threatened	A slender orchid to 60 cm tall. Yellow flowers with reddish-brown markings measuring 1.3 cm across. Habitat for this species occurs within clay-loam substrates in winter-wet depressions or swamps (DEE 2016b).	Unlikely – Preferred soil type/habitat does not occur within the survey area.
<i>Diuris purdiei</i>	Threatened – Endangered	Threatened	A slender orchid to 45 cm tall. Unusually flattened flowers, marked with brown blotches on their under surface. Habitat for this species occurs in areas subject to winter inundation within dense heath with scattered Myrtaceous trees (DEE 2016b).	Unlikely – Preferred soil type/habitat does not occur within the survey area.
<i>Drakaea elastica</i>	Threatened – Endangered	Threatened	A slender orchid to 30 cm tall with a prostrate, round to heart shaped leaf. Singular, bright green, glossy flower. Habitat for this species is within bare patches of white sand over dark sandy loams on damp areas (DEE 2016b).	Unlikely – Preferred soil type/habitat does not occur within the survey area.
<i>Eucalyptus argutifolia</i>	Threatened – Vulnerable	Threatened	Mallee to 4 m tall with smooth bark. Flowers are white and visible March to April. Habitat for this species occurs within shallow soils over limestone, on slopes or gullies of limestone ridges and outcrops (Western Australian Herbarium 1998-).	Unlikely – Preferred soil type/habitat does not occur within the survey area.
<i>Lepidosperma rostratum</i>	Threatened – Endangered	Threatened	A rhizomatous, tufted perennial, grass-like or herb (sedge), 50 cm tall. Flowers are brown and flowering occurs from May to June. Habitat for this species occurs in peaty sand or clay and within seasonally wet swamps (Western Australian Herbarium 1998-, DEE 2016d).	Unlikely – Preferred soil type/habitat does not occur within the survey area.
<i>Bossiaea modesta</i>	Not listed	Priority 2	A slender, trailing and twining shrub. Flowers are yellow and red, occurring from October to December. This species is found in soils derived from granite in damp areas close to streams (Western Australian Herbarium 1998).	Unlikely – Preferred soil type/habitat does not occur within the survey area.
<i>Pimelea rara</i>	Not listed	Priority 4	A shrub, 0.2-0.35 m tall. Flowers are white, occurring in December or January on lateritic soils.	Unlikely – Preferred soil type/habitat does not occur within the survey area.
<i>Stylidium striatum</i>	Not listed	Priority 4	A rosetted perennial herb, 0.15 to 0.55 m tall. The leaves are erect, oblanceolate to spatulate, 1.5-4 cm long, 1.5-6 mm wide, apex acute to acuminate, margin entire, glabrous, striate. Inflorescence is racemose. Flowers are yellow, occurring from October to November. This species is found in brown clay loam over laterite and on hillslopes. This species is known to occur in Jarrah/Marri forest and Wandoo woodland (Western Australian Herbarium 1998-).	Unlikely – Preferred soil type/habitat does not occur within the survey area.

Threatened and Priority Ecological Communities

A TEC is defined under the EP Act as an ecological community listed, designated or declared under a written law or a law of the Australian Government as Threatened, Endangered or Vulnerable. There are four State categories of TECs (DEC 2010)¹:

- presumed totally destroyed (PD)
- critically endangered (CR)
- endangered (EN)
- vulnerable (VU).

A description of each of these TEC categories is presented in Appendix 1. TECs are gazetted under the WC Act as such (Parks and Wildlife 2015a) and some Western Australian TECs are listed as Threatened under the EPBC Act.

Under the EPBC Act, a person must not undertake an action that has or will have a significant impact on a listed TEC without approval from the Australian Government Minister for the Environment, unless those actions are not prohibited under the EPBC Act. A description of each of these categories of TECs is presented in Appendix 1. The current EPBC Act list of TECs can be located on the DEE (2016d) website.

Ecological communities identified as Threatened, but not listed as TECs, are classified as Priority Ecological Communities (PECs). These communities are under threat, but there is insufficient information available concerning their distribution to make a proper evaluation of their conservation status. Parks and Wildlife categorises PECs according to their conservation priority, using five categories, P1 (highest conservation significance) to P5 (lowest conservation significance), to denote the conservation priority status of such ecological communities. Appendix 1 defines PECs (DEC 2010). A list of current PECs can be viewed at the Parks and Wildlife (2015b) website.

Three TECs and one PEC were identified from the Parks and Wildlife database search as occurring within 5 km of the survey area (Figure 4):

- SCP 19b Plain (TEC: Critically Endangered – WC Act)
- SCP 01 - Aquatic Root Mat Community Number 1 of Caves of the Swan Coastal (TEC: Critically Endangered – WC Act, Endangered - EPBC Act)
- SCP 26a (TEC: Endangered – WC Act)
- SCP 24 (PEC: Priority 3 – WC Act).

The TEC *Banksia Woodlands of the Swan Coastal Plain* (Endangered) also has the potential to occur within the site, and was identified on the EPBC Act protected matters search. This TEC is a newly listed TEC under the EPBC Act (September 2016) and is not depicted on Figure 4.

The *Banksia Woodlands of the Swan Coastal Plain* is considered to be the only TEC that has the potential to occur in the area, as all other identified communities are located greater than 1 km from the survey area (Figure 4).

¹ The Department of Environment and Conservation is still listed as the author of all TEC and PEC databases and have been referred to as such in this document instead of the Department of Parks and Wildlife (Parks and Wildlife).

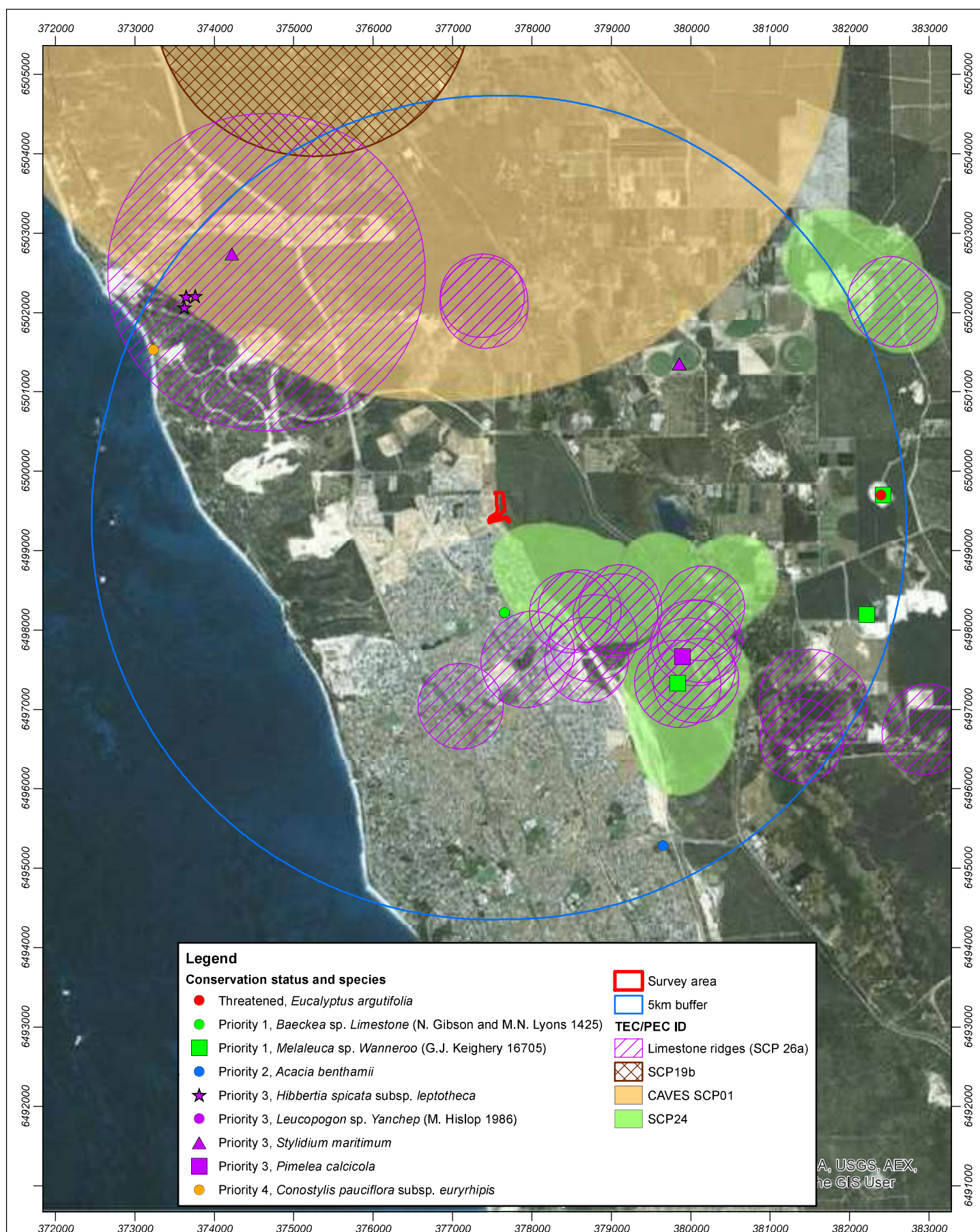


Figure 4: Location of significant flora, TECs and PECs within 5 km of the survey area

Scale 1:65,000 at A4

0 500 1,000 1,500 2,000 m

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 2/12/2016

Author: JCrute
Source: Aerial image: Nearmap, flown 04/2016. Flora, TEC/PECs: DPaW, 11/2016.

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Wetlands

No wetlands are located within the survey area. A Conservation Category Wetland (CCW) (UFI 8021) is located <1 km east of the survey area.

Bush Forever

The survey area is not situated within 5 km of a mapped Bush Forever site (Landgate 2016). Bush Forever Site 293 – Shire View Hill and adjacent bushland, Nowergup/Neerabup is located 5.5 km from the survey area.

4.1.2 Field survey results

Native flora

A total of 34 native vascular plant taxa from 26 plant genera and 19 plant families were recorded from quadrats within the survey area. The majority of taxa were recorded within the Fabaceae (14 taxa) and Proteaceae (6 taxa) families (Appendix 5). The relatively low number of plant genera recorded reflects the disturbed nature of the survey area and is also representative of vegetation in immediately adjacent land.

Threatened and Priority flora

No Threatened flora species as listed under section 178 of the EPBC Act or pursuant to Schedule 1 of the WC Act and as listed by Parks and Wildlife (2015) were recorded within the survey area and no Priority flora species as listed by Western Australian Herbarium (1998-) were also recorded within the survey area.

Introduced (exotic) taxa

A total of 17 introduced (exotic) taxa were recorded within the survey area ():

- **Avena barbata*
- **Briza maxima*
- **Bromus diandrus*
- **Carpobrotus edulis*
- **Ehrharta calycina*
- **Erodium cygnorum*
- **Euphorbia terracina*
- **Gladiolus caryophyllaceus*
- **Hypochaeris glabra*
- **Lolium rigidum*
- **Lupinus cosentinii*
- **Pettorhagia dubia*
- **Sonchus asper*
- **Trifolium campestre*
- **Ursinia anthemoides*
- **Vulpia muralis*
- **Wahlenbergia capensis*

None of these species are Declared Plant species in Western Australia pursuant to section 22 of the *Biosecurity and Agriculture Management Act 2007* (BAM Act) according to the Western Australian Department of Agriculture and Food (DAFWA 2016).

Vegetation types

Four native vegetation types (VTs) were defined and mapped within the survey area (Figure 5) and are summarised in Table 5. Areas that were cleared have not been counted as unique native VTs but have been included in Table 5 for area calculation purposes. Total areas occupied within the survey area by each of the identified VTs are set out in Table 6.

Table 5: Vegetation Types

Vegetation Type	Description
1	<i>Banksia attenuata</i> , <i>Eucalyptus tottiana</i> open woodland over <i>Jacksonia sternbergiana</i> , <i>Xanthorrhoea preissii</i> and <i>Calothamnus quadrifidus</i> mid sparse shrubland over <i>Hibbertia hypericoides</i> , <i>*Ehrharta calycina</i> , <i>Macrozamia fraseri</i> and <i>*Briza maxima</i> low shrubland/grassland mix on sandy soils.
2	<i>Jacksonia sternbergiana</i> , <i>Xanthorrhoea preissii</i> , <i>Acacia pulchella</i> and <i>Hibbertia hypericoides</i> thicket over exotic grasses including <i>*Ehrharta calycina</i> and <i>*Briza maxima</i> on sandy soils.
3	<i>Jacksonia sternbergiana</i> , <i>Xanthorrhoea preissii</i> and <i>Calothamnus quadrifidus</i> low shrubland over <i>Hibbertia hypericoides</i> , <i>*Ehrharta calycina</i> and <i>*Carpobrotus edulis</i> low shrubland/grassland mix on sandy soils.
4	<i>Hibbertia hypericoides</i> , <i>Xanthorrhoea preissii</i> , <i>Acacia pulchella</i> , <i>Hakea lissocarpha</i> and <i>Adenanthos cygnorum</i> shrubland over exotic grasses including <i>*Ehrharta calycina</i> and <i>*Briza maxima</i> with emergent <i>Eucalyptus gomphocephala</i> on sandy soils.
C	Cleared areas.

Vegetation type coverage

The total area mapped within the survey area was 3.43 ha which includes fully cleared areas (Table 6). The dominant native VT within the survey area was VT 1 which can be broadly described as a *Banksia attenuata*, *Eucalyptus tottiana* open woodland over *Jacksonia sternbergiana*, *Xanthorrhoea preissii* and *Calothamnus quadrifidus* mid sparse shrubland over *Hibbertia hypericoides*, **Ehrharta calycina*, *Macrozamia fraseri* and **Briza maxima* low shrubland/grassland mix on sandy soils.

Table 6: Area (ha) covered by each VT within the survey area

VT	Area (ha)	Percentage of the Survey area
1	1.44	41.91
2	0.31	8.91
3	0.66	19.26
4	0.12	3.37
Cleared	0.91	26.52
TOTAL	3.43	100

Vegetation condition

The survey area shows signs of having been degraded for a long period of time with evidence of human disturbance (e.g. dumping of household waste and use of vehicles through the site) and weed infestations. As such, vegetation condition within the survey was rated as Completely Degraded along the cleared tracks and Degraded to Very Good within the remnant vegetation (Keighery 1994; Figure 5; Table 7).

Table 8 gives a numerical breakdown of the area occupied by each vegetation condition rating within the survey area.

Table 7: Vegetation condition scale (Keighery 1994)

Condition rating	Description
Pristine (1)	Pristine or nearly so, no obvious sign of disturbance.
Excellent (2)	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good (3)	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.
Good (4)	Vegetation structure significantly altered by 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, grazing.
Degraded (5)	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 very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded (6)	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.

Table 8: Area (ha) covered by each vegetation condition category within the survey area

Vegetation Condition	Area (ha)	Percentage of the Survey area
Very Good	2.43	70.85
Good	0.07	2.04
Degraded	0.02	0.58
Completely Degraded	0.91	26.53
Total	3.43	100

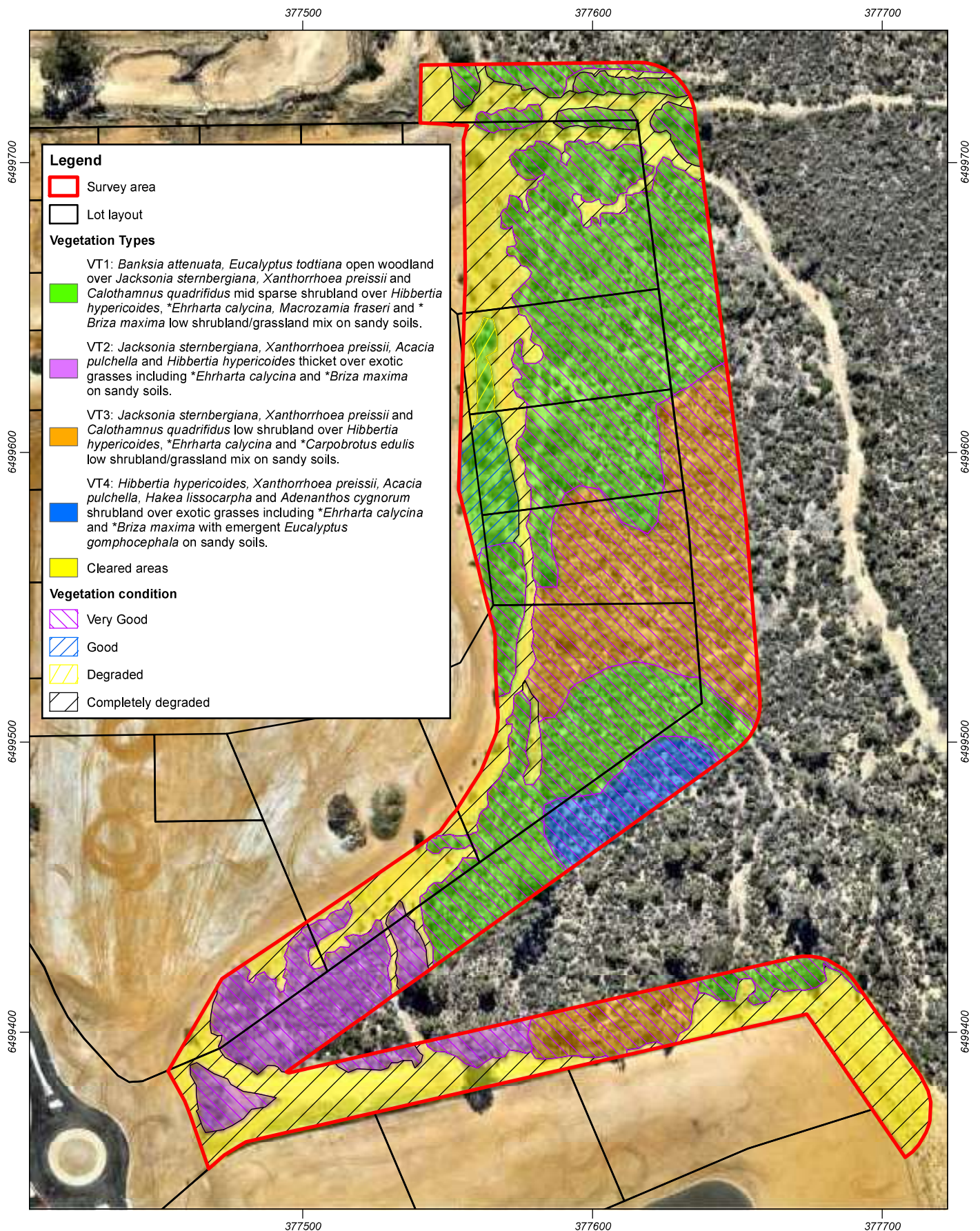


Figure 5: Location of Vegetation Types (VTs) and vegetation condition mapped within the survey area

Scale 1:1,800 at A4

0 10 20 30 40 50 m

Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 2/12/2016

Author: JCrute

Source: Aerial image: Nearmap, flown 04/2016.

Subdivision plan: Client 11/2016.

4.1.3 Threatened and Priority Ecological Communities

One TEC (*Banksia* woodlands of the Swan Coastal Plain) and no PECs were identified as having the potential to occur within 3 km of the survey area by the desktop survey (DEE 2016). Vegetation Type (VT) 1 was deemed to contain species which may be indicative of the TEC.

A comparison between VT 1 and the listing criteria for the TEC is displayed in Table 9. The condition key diagnostic characteristic has been met and consequently, vegetation within the survey area is considered to constitute the *Banksia* woodlands of the Swan Coastal Plain TEC.

Table 9: Characteristics of the *Banksia* woodland within the survey area (VT 1) compared to the TEC key diagnostic criteria as per TSSC (2016)

Key diagnostic criteria (TSSC 2016)	<i>Banksia</i> woodlands within the survey area
<u>Location:</u> Occurs in the Swan Coastal Plain or Jarrah Forest IBRA bioregions.	Yes. <i>Banksia</i> woodlands within the survey area (i.e. VT 1) occur on the Swan Coastal Plain.
<u>Soils and landform:</u> Occurs on: <ul style="list-style-type: none"> well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands sandy colluviums and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau transitional substrates and sandflats. 	Yes. <i>Banksia</i> woodlands within the survey area (i.e. VT 1) occur on Quindalup sands.
<u>Structure:</u> Low woodland to forest with: <ul style="list-style-type: none"> a distinctive upper sclerophyllous layer of low trees (occasionally large shrubs more than 2 m tall), typically dominated or co-dominated by one or more of the <i>Banksia</i> species identified below emergent trees of medium or tall (>10 m) height. <i>Eucalyptus</i> or <i>Allocasuarina</i> species may sometimes be present above the <i>Banksia</i> canopy an often highly species-rich understorey. 	Yes. <i>Banksia</i> woodlands within the survey area (i.e. VT 1) represent a woodland structure.
<u>Composition:</u> Contains at least one of the following species: <ul style="list-style-type: none"> <i>Banksia attenuata</i> <i>Banksia menziesii</i> <i>Banksia prionotes</i> <i>Banksia ilicifolia</i>. 	Yes. <i>Banksia</i> woodlands within the survey area (i.e. VT 1) contain <i>Banksia attenuata</i> .
<u>Condition (Keighery 1994):</u> 'Pristine': no minimum patch size 'Excellent': 0.5 ha 'Very Good': 1 ha 'Good': 2 ha.	Yes. <i>Banksia</i> woodlands within the survey area (i.e. VT 1) are in Good and Very Good condition as outlined below: <ul style="list-style-type: none"> Very Good: 1.4 ha. Good: 0.07 ha The mapped extent of <i>Banksia</i> Woodlands within the survey area also includes vegetation in Degraded condition (0.02 ha) as per the conservation advice which states that patches of the TEC may include small scale (<30m) variations, gaps and disturbances, such as tracks, paths or breaks, or localised variations in vegetation that do not significantly alter the overall functionality of the TEC.

No other vegetation types identified within the survey area resemble known TECs or PECs. It can therefore be reasonably assumed that no other TECs or PECs occur within the survey area.

Banksia woodlands of the Swan Coastal Plain is a broad listing which encompasses many Floristic Community Types (FCTs) within the Swan Coastal Plain. Some of these FCTs are listed as standalone TECs under the EPBC Act and/or WC Act. The species composition of VT 1 resembles that of FCT 28, which is not a listed TEC or PEC. Therefore, it can be reasonably assumed that FCT 28 and the vegetation within VT 1 is well-represented within the Swan Coastal Plain and not of conservation significance. Additionally, the TEC within the survey area is well represented in the adjacent Neerabup Nature Reserve. The inferences between the recorded vegetation in VT 1 and FCT 28, however, are not absolute and would require statistical analysis to be confirmed.

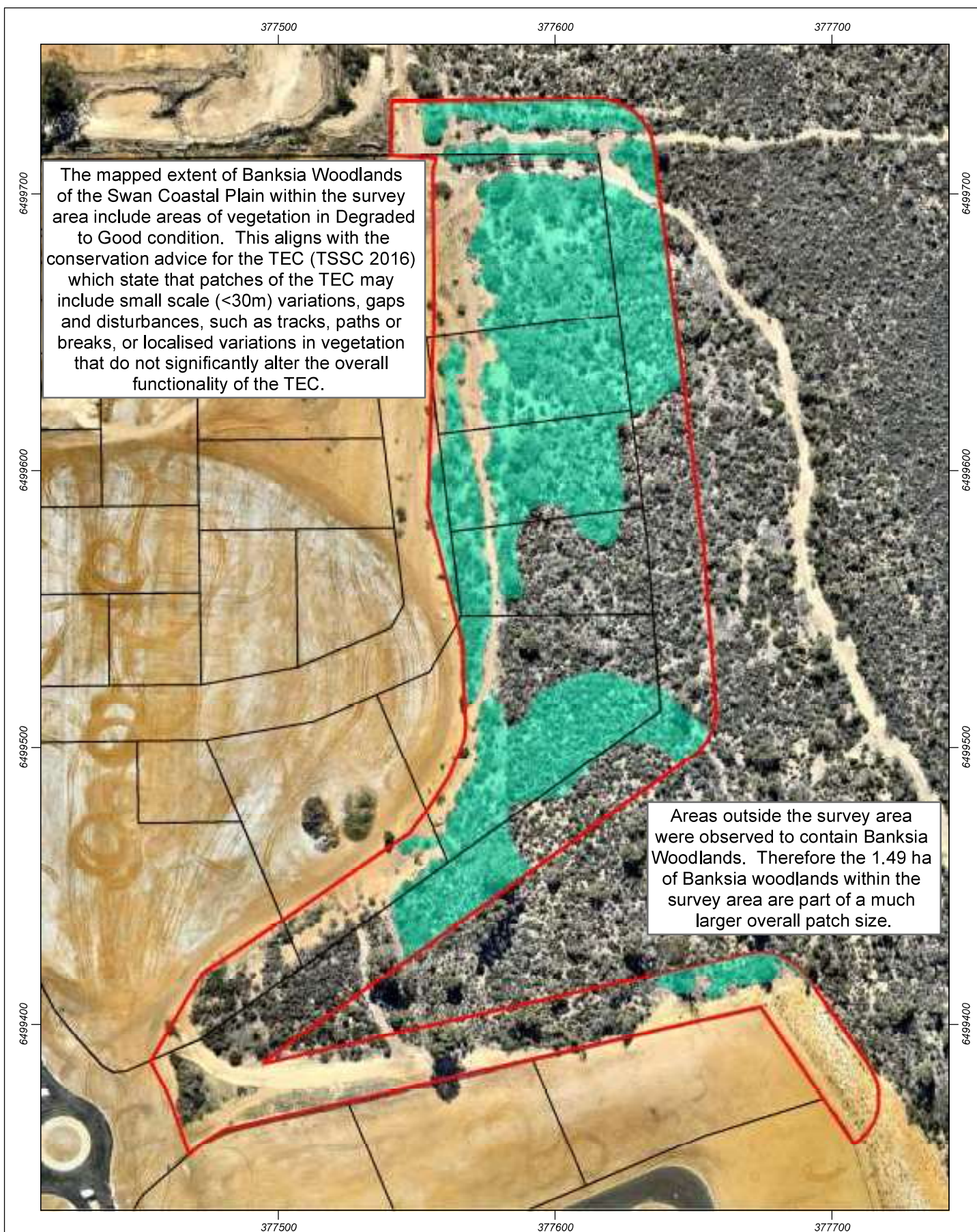


Figure 6: Location of Banksia Woodland mapped within the survey area

Scale 1:1,861 at A4

0 10 20 30 40 50 m

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 2/12/2016

Author: JCrute
Source: Aerial image: Nearmap, flown 04/2016.
Subdivision plan: Client 11/2016.

Legend

- Survey area
- Lot layout
- Banksia woodland (1.49 ha)



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4.2 Black cockatoo habitat

4.2.1 Black cockatoo presence

No black cockatoos were sighted within the survey area during the assessment on 14 October 2016.

4.2.2 Foraging assessment

The survey area was divided into four different vegetation types, as outlined in Section 4.1.2. All four VTs contain flora species which are considered to be utilised by CBC and FRTBC for foraging; thus 2.52 ha of potential foraging habitat for CBC and FRTBC exists within the survey area (Groom 2011, Johnstone 2010b, Johnstone *et al.* 2011).

Foraging habitat for black cockatoos is generally defined as the availability of plant food sources within an area (Finn 2012). Food availability for black-cockatoos is a function of the diversity, abundance, distribution, energetic and nutritional qualities, and seasonality (phenology) of the food sources within a particular area. Table 4 summarises the value of each VT in terms of the quality of foraging habitat provided for black cockatoos. Table 11 provides a justification for how foraging values were defined.

Foraging habitat quality is displayed in Figure 7. The highest quality foraging habitat for black cockatoos was noted within VT 1 which contained moderate densities of black cockatoo food species including *Eucalyptus tottiana*, *Banksia attenuata*, *Allocasuarina fraseriana* and *Xanthorrhoea preissii* at canopy and midstorey levels. The lowest quality foraging habitat for black cockatoos (not including cleared areas) was noted within VTs 2 and 3 which contained *Xanthorrhoea preissii* which provides limited food resources for CBC only.

Based on the results of the foraging assessment, the survey area is considered to contain 1.46 ha of Moderate quality foraging habitat and 1.06 ha of Poor quality foraging habitat, 2.52 ha for CBC.

Table 10: Vegetation types and black cockatoo foraging species within the survey area

Vegetation type	Black cockatoo foraging species	Foraging quality	Area (ha)
1	<u>CBC</u> – <i>Eucalyptus tottiana</i> , <i>Banksia attenuata</i> , <i>Allocasuarina fraseriana</i> , <i>Xanthorrhoea preissii</i> . FRTBC – <i>Allocasuarina fraseriana</i> .	CBC – Moderate and Poor FRTBC – Poor	CBC – 1.3 ha 0.09 ha Poor FRTBC – 1.44 ha poor
2	<u>CBC</u> – <i>Xanthorrhoea preissii</i> . FRTBC – nil.	CBC – Poor FRTBC – Nil	CBC – 0.31
3	<u>CBC</u> – <i>Xanthorrhoea preissii</i> . FRTBC – nil.	CBC – Poor FRTBC – Nil	CBC – 0.66
4	<u>CBC</u> – <i>Eucalyptus gomphocephala</i> FRTBC – nil.	CBC – Moderate FRTBC – Nil	CBC – 0.12

Table 11: Definition of black cockatoo foraging habitat within the survey area

Foraging quality	Justification
Excellent	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) and presence of food sources at several strata (i.e. canopy, midstorey and understorey).
Good	High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) but food sources only present at one or two strata (i.e. canopy and midstorey).
Moderate	Moderate foraging value density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 20-40%) and food sources only present at one or two strata (i.e. canopy and midstorey).
Poor	Low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 10-20%) and presence of food sources at only one stratum (i.e. canopy).
Very poor	Very low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species <10%) and presence of food sources at only one stratum (i.e. canopy).
Nil	Cleared areas - no suitable vegetation present.

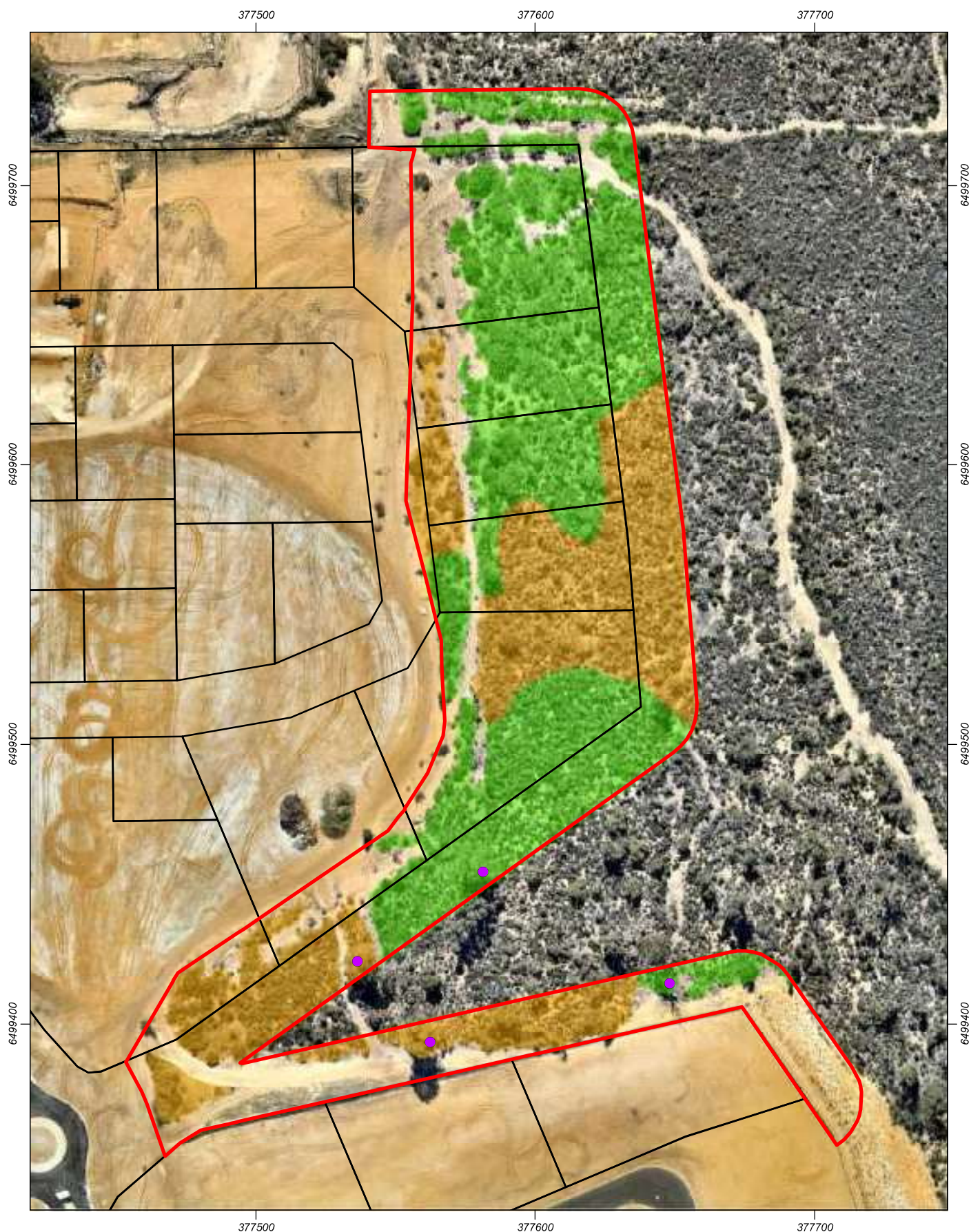


Figure 7: Black cockatoo habitat within the survey area

Scale 1:1,861 at A4

0 10 20 30 40 50 m

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 2/12/2016

Author: JCrute
Source: Aerial image: Nearmap, flown 04/2016.
Subdivision plan: Client 11/2016.

Legend

 Survey area

 Lot layout

Potentially significant trees (DBH >50 cm)

● *Eucalyptus gomphocephala*

Black cockatoo foraging habitat

Moderate quality foraging habitat

Poor quality foraging habitat

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4.2.3 Significant tree assessment

'Breeding habitat' for black cockatoos is defined in DSEWPaC (2012) as trees of species known to support breeding (Table 3) within the range of the species which either have a suitable nest hollow or are of a suitable DBH to develop a nest hollow (> 300 mm for salmon gum and wandoo, and >500 mm for other species). These trees are known as significant trees. Trees of this size may also be large enough to provide roosting habitat (i.e. trees which provide a roost or rest area for the birds). Significant trees which contain hollows that have an entrance diameter of more than 100 mm are suitable for use by black cockatoos (Whitford and Williams 2002). In general, hollows of sufficient size to support black-cockatoos do not form until trees are at least 230 years old, and the majority of nests are found in 300-500 year old trees (Johnstone 2006). Artificial hollows (nesting boxes) specifically designed for use by threatened black cockatoos may also be suitable in some circumstances (DSEWPaC 2012).

The site is located within the breeding range for CBC (Parks and Wildlife 2013; Johnstone 2010b; Johnstone and Kirkby 1999); therefore the significant tree assessment applies to only this species of black cockatoo.

A total of four potentially significant trees (with DBH >500 mm) were recorded in the survey area (Figure 7). Two of these trees contained a hollow of sufficient size to be utilised by black cockatoos for breeding purposes. Table 12 provides a summary of these recordings and relates each species to how it is utilised by black cockatoos.

Table 12: Summary of potentially significant trees recorded within the site

Species	Number recorded	Usage by black cockatoos
		CBC
<i>Eucalyptus gomphocephala</i>	4	Roosting and breeding

5. Discussion

Vegetation within the survey area comprises four VTs and cleared areas. Transitions between VTs were generally discontinuous. This discontinuity is primarily due to topography and presence of cleared areas. At a broad scale, the majority of the survey area was observed to be disturbed due to the historical land use. The vegetation condition and structure has been altered to varying degrees throughout the survey area due to clearing for tracks, dumping of household waste and use by off-road vehicles.

The flora and vegetation assessment conducted within the survey area was undertaken during October 2016, within the prime flowering time for majority of species within the area with field reconnaissance focussing on traversing the entire survey area to delineate broad vegetation types. This is consistent with the requirements of a Level 2 flora and vegetation survey as specified in GS 51.

The number of native and exotic species recorded on the survey area totalled 34 native vascular plant taxa from 26 plant genera and 19 plant families. No Declared Plant species pursuant to section 22 of the BAM Act were recorded within the survey area (DAFWA 2016).

No Threatened flora species as listed under section 178 of the EPBC Act or pursuant to Schedule 1 of the WC Act and as listed by Parks and Wildlife (2015) were recorded within the survey area. No Priority flora species as listed by Western Australian Herbarium (1998-) were recorded within the survey area.

Vegetation condition within the survey area ranged from Completely Degraded to Very Good condition (Keighery 1994).

One TEC – *Banksia woodlands of the Swan Coastal Plain* was mapped within the survey area and is represented by VT 1. *Banksia woodlands of the Swan Coastal Plain* is a broad listing which encompasses many Floristic Community Types (FCTs) within the Swan Coastal Plain. Some of these FCTs are listed as standalone TECs under the EPBC Act and/or WC Act. At a finer level of detail, vegetation within VT 1 resembles FCT28, which is not listed as a standalone TEC or PEC at state or federal levels. Therefore, it can be reasonably assumed that FCT 28 and the vegetation within VT 1 is well-represented within the Swan Coastal Plain and not of conservation significance. Additionally, the vegetation within the survey area is well represented in the adjacent Neerabup Nature Reserve. The inferences between the recorded vegetation in VT 1 and FCT 28, however, are not absolute and would require statistical analysis to be confirmed.

The survey area is considered to contain both foraging and breeding habitat for black cockatoos. The survey identified 1.46 ha of Moderate quality foraging habitat and 1.06 ha of Poor quality foraging habitat for black cockatoos, 2.52 ha for CBC. A total of four potentially significant trees (with DBH >500 mm) were recorded in the survey area and two of these trees contained a hollow of sufficient size to be utilised by CBC for breeding purposes.

6. Conclusion

The Level 2 flora and vegetation survey (conducted October 2016) has been successful in collecting data to define and assess the presence, type, extent and significance of vegetation types within the survey area.

Approximately 2.43 ha of vegetation in Very Good condition was recorded within the survey area (including vegetation regrowth areas).

No Threatened or Priority flora species as listed by Western Australian Herbarium (1998-) were recorded within the survey area.

One TEC was recorded within the survey area, however vegetation recorded within the survey area resembles that of FCT 28 which is not a listed as a standalone TEC or PEC and this vegetation is well represented in the adjacent Neerabup Nature Reserve and the Swan Coastal Plain. The inferences between the recorded vegetation and FCT 28 are not absolute therefore require statistical analysis to be confirmed.

The survey area contains 1.46 ha of Moderate quality foraging habitat and 1.06 ha of Poor quality foraging habitat for black cockatoos. A total of four potentially significant trees (with DBH >500 mm) were recorded in the survey area and two of these trees contained a hollow of suitable size to be utilised by CBC for breeding purposes.

7. References

- Beard JS 1981, *Swan, 1:1000000 vegetation series: explanatory notes to sheet 7: the vegetation of the Swan area*, University of Western Australia Press, Nedlands, Western Australia.
- Beard JS 1990, *Plant Life of Western Australia*. Kangaroo Press, Kenthurst, New South Wales.
- Brown A, Thomson-Dans C & Marchant N 1998, *Western Australia's Threatened Flora*, Department of Conservation and Land Management, Perth
- Bureau of Meteorology (BOM) 2016, *Climatic Statistics for Australian Locations: Monthly climate statistics for Gingin Aero*, [Online], Australian Government, Available from: http://www.bom.gov.au/climate/averages/tables/cw_009194.shtml [10/11/2016].
- Chao A 2005, 'Species richness estimation', in *Encyclopaedia of Statistical Sciences*, eds N Balakrishnan, CB Read & B Vidakovic, Wiley, New York, pp. 7909-7916.
- Churchward HM & McArthur WM 1980, 'Landforms and Soils of the Darling System', in *Atlas of Natural Resources, Darling System, Western Australia*, eds Department of Conservation and Environment, Perth, pp. 25-33.
- Colwell RK 2013, *EstimateS: Statistical estimation of species richness and shared species from samples. Version 9*, [Online], Available from: <http://purl.oclc.org/estimates> [10/11/2016].
- Department of Agriculture and Food (DAFWA) 2016, *Declared Pests (s22) list*, [Online], Government of Western Australia, Available from: <http://www.biosecurity.wa.gov.au/organisms/export/PER-DP> [10/11/2016].
- Department of the Environment and Energy (DEE) 2016a, *Interim Biogeographic Regionalisation for Australia, Version 7*, [Online], Australian Government, Available from: <http://www.environment.gov.au/topics/land/national-reserve-system/science-maps-and-data/australias-bioregions-ibra> [10/11/2016].
- Department of the Environment and Energy (DEE) 2016b, *Species Profiles and Threats Database*, [Online], Australian Government, available from: <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl> [10/11/2016].
- Department of the Environment and Energy (DEE) 2016c, *EPBC Act Protected Matters Search Tool*, [Online], Australian Government. Available from: <http://www.environment.gov.au/epbc/pmst/index.html> [10/11/2016].
- Department of the Environment and Energy (DEE) 2016d, *EPBC Act List of Threatened Flora*, [Online], Australian Government, Available from: <http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora> [10/11/2016].
- Department of Environment and Conservation (DEC) 2010, *Definitions, Categories and Criteria for Threatened and Priority Ecological Communities*, [Online], Government of Western Australia, Available from: <http://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/tecs/tec-definitions-dec2010.pdf> [10/11/2016].
- Department of Parks and Wildlife (Parks and Wildlife) 2007-, *Naturemap, Mapping Western Australia's Biodiversity*, [Online], Government of Western Australia, Available from: <http://naturemap.dec.wa.gov.au/default.aspx> [10/11/2016].
- Department of Parks and Wildlife (Parks and Wildlife) 2013, *Carnaby's Cockatoo (Calyptorhynchus Latirostris) Recovery Plan: WA Wildlife Management Program No.52*, Government of Western Australia, Perth.

- Department of Parks and Wildlife (Parks and Wildlife) 2015, *Wildlife Conservation (Threatened Flora) Notice 2015*, [Online], Government of Western Australia, Available from: https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/2015_flora_notice.pdf [10/11/2016].
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPac) 2012 *Environment Protection and Biodiversity Conservation Act 1999 referral guidelines for three black cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*, Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*, Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso**, Australian Government, Canberra.
- Environmental Protection Authority (EPA) 2004, *Guidance for the assessment of environmental factors (in accordance with the Environmental Protection Act 1986) No. 51 – Terrestrial flora and vegetation surveys for environmental impact assessment in Western Australia*. Government of Western Australia, Perth.
- Executive Steering Committee for Australian Vegetation Information (ESCAVI) 2003, *Australian Vegetation Attribute Manual: National Vegetation Information System, Version 6.0*, Department of the Environment and Energy and Heritage, Australian Capital Territory.
- Finn H 2012, *Assessment of habitat values for black-cockatoos within selected sites at Newmont Boddington Gold Mine*, report prepared for Newmont Boddington Gold Pty Ltd.
- Gibson N, Keighery B, Keighery G, Burbidge A & Lyons M 1994, *A Floristic survey of the southern Swan Coastal Plain*, report prepared for the Australian Heritage Commission, 1994.
- Government of Western Australia 2016, *2016 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report), Current as of 10 Nov 2016*, Department of Parks and Wildlife, Perth.
- Groom C. 2011 *Plants Used by Carnaby's Black Cockatoo* Department of Environment and Conservation, Perth.
- Heddl EM, Loneragan OW & Havel JJ 1980, *Darling System, Vegetation Complexes*, Forest Department, Perth.
- Johnstone R 2006, *Going, going, gone! Veteran and stag trees: a valuable resource*, Western Australian Museum, Perth.
- Johnstone R 2010a, *Information sheet: Carnaby's Cockatoo (*Calyptorhynchus latirostris*)*, Western Australian Museum, Perth.
- Johnstone R 2010b, *Information sheet: Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)*, Western Australian Museum, Perth.
- Johnstone R & Kirkby T. 1999, 'Food of the Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* in south-west Western Australia', *The Western Australian Naturalist*, vol. 22, pp. 167-177.
- Johnstone R & Kirkby T 2008, 'Distribution, status, social organisation, movements and conservation of Baudin's Cockatoo (*Calyptorhynchus baudinii*) in South-west Western Australia', *Records of the Western Australian Museum*, vol. 25, pp. 107 – 118.
- Keighery B 1994, *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*, Wildflower Society, Floreat.
- Mitchell D, Williams K & Desmond A 2002, 'Swan Coastal Plain 2 (SWA2 – Swan Coastal Plain subregion)', in *A biodiversity audit of Western Australia's 53 Biogeographical Subregions in 2002*, eds Department of Conservation and Land Management, Perth, pp. 606-623.
- Semeniuk V 1990, 'The geomorphology and soils of Yoongarillup Plain, in the Mandurah-Bunbury coastal zone, southwestern Australia: a critical appraisal', *Journal of the Royal Society of Western Australia*, vol. 73, pp. 1-7.

- Thackway & Cresswell 1995, *An Interim Biogeographic Regionalisation for Australia: A framework for setting priorities in the National Reserves System Cooperative Program Version 4*, Australian Nature Conservation Agency, Canberra.
- Western Australian Herbarium 1998-, *FloraBase – the Western Australian Flora*, [Online], Government of Western Australia, Available from: <http://florabase.dpaw.wa.gov.au/> [10/11/2016].
- Whitford KR & Williams MR 2002, 'Hollows in jarrah (*Eucalyptus marginata*) and marri (*Corymbia calophylla*) trees II. Selecting trees to retain for hollow dependent fauna', *Forest Ecology and Management*, vol. 160: pp. 215-232.

Appendix 1
Conservation significant flora and
ecological community definitions

Conservation Codes for Western Australia (Western Australian Herbarium 1998-)

Under the *Wildlife Conservation Act* (1950), the Minister for the Environment may declare species of flora to be protected if they are considered to be in danger of extinction, rare or otherwise in need of special protection. Schedules 1 and 2 deal with those that are threatened and those that are presumed extinct, respectively.

T: Threatened Flora (Declared Rare Flora – Extant)

Species which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such (Schedule 1 under the *Wildlife Conservation Act 1950*).

Threatened Flora (Schedule 1) are further ranked by the Department according to their level of threat using IUCN Red List Criteria:

- CR: Critically Endangered – considered to be facing an extremely high risk of extinction in the wild
- EN: Endangered – considered to be facing a very high risk of extinction in the wild
- VU: Vulnerable – considered to be facing a high risk of extinction in the wild
- X: Presumed Extinct Flora (Declared Rare Flora – Extinct).

Species that have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such (Schedule 2 under the *Wildlife Conservation Act 1950*).

Priority Flora

Species that have not yet been adequately surveyed to be listed under Schedule 1 or 2 are added to the Priority Flora List 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 flora or fauna. 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 list for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Conservation Dependent species are placed in Priority 5.

Priority One: Poorly-known Species

Species that are known from one or a few collections or sight records (generally less than 5), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.

Priority Two: Poorly-known Species

Species that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.

Priority Three: Poorly-known Species

Species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.

Priority Four: Rare, Near Threatened and other species in need of monitoring

2. Rare: Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.
3. Near Threatened: Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
4. Species that have been removed from the list of threatened species during the past 5 years for reasons other than taxonomy.

Priority 5: Conservation Dependent Species

Species that are not threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within 5 years.

Definition of Threatened Ecological Communities (DEC 2010)

Presumed Totally Destroyed (PD)

An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies:

- records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or
- all occurrences recorded within the last 50 years have since been destroyed.

Critically Endangered (CR)

An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria:

5. The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply:
 - (a) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years)
 - (b) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated.
6. Current distribution is limited, and one or more of the following apply:
 - (a) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years)
 - (b) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes
 - (c) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes.
7. The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

Endangered (EN)

An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria:

8. The geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply:
 - (a) the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years)
 - (b) modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated.

9. Current distribution is limited, and one or more of the following apply"
- (a) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years)
 - (b) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes
 - (c) there may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes.
10. The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).

Vulnerable (VU)

An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria:

- 11. The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.
- 12. The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.
- 13. The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

Definition of Priority Ecological Communities (DEC 2010)

Priority One: Poorly-known ecological communities

Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

- communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation
- communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat
- communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four

Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring. These include:

14. Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.
15. Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.
16. Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Appendix 2
Vascular plant taxa recorded within the
survey area

Family	Species
Acarosporaceae	<i>*Wahlenbergia capensis</i>
Aizioaceae	<i>*Carpobrotus edulis</i>
Amaranthaceae	<i>Ptilotus polystachyus</i>
Araliaceae	<i>Trachymene pilosa</i>
Asparagaceae	<i>Lomandra caespitosa</i>
	<i>Lomandra</i> sp.
	<i>Sowerbaea laxiflora</i>
	<i>Thysanotus manglesii</i>
Asteraceae	<i>*Hypochaeris glabra</i>
	<i>Olearia axillaris</i>
	<i>Podotrocha gnaphalioides</i>
	<i>*Sonchus asper</i>
	<i>*Ursinia anthemoides</i>
Caryophyllaceae	<i>*Petrohragia dubia</i>
Casuarinaceae	<i>Allocasuarina fraseriana</i>
	<i>Allocasuarina humilis</i>
Colchicaceae	<i>Burchardia congesta</i>
Crassulaceae	<i>Crassula colorata</i>
Cyperaceae	<i>Mesomelaena pseudostygia</i>
Dilleniaceae	<i>Hibbertia hypericoides</i>
Ericaceae	<i>Conostephium</i> sp.
Euphorbiaceae	<i>Euphorbia terracina</i>
Fabaceae	<i>Acacia pulchella</i>
	<i>Acacia saligna</i>
	<i>Gompholobium tomentosum</i>
	<i>Hardenbergia comptoniana</i>
	<i>Jacksonia calcicola</i>
	<i>Jacksonia</i> sp.
	<i>Jacksonia sternbergiana</i>
	<i>*Lupinus cosentinii</i>
	<i>*Trifolium campestre</i>
Geraniaceae	<i>*Erodium cygnorum</i>
Haemodoraceae	<i>Conostylis aculeata</i>
Iridaceae	<i>*Gladiolus caryophyllaceus</i>
Myrtaceae	<i>Calothamnus quadrifidus</i>
	<i>Eucalyptus gomphocephala</i>
	<i>Eucalyptus todtiana</i>
Poaceae	<i>*Avena barbata</i>
	<i>*Briza maxima</i>
	<i>*Bromus diandrus</i>
	<i>*Ehrharta calycina</i>

Family	Species
	<i>*Lolium rigidum</i>
	<i>*Vulpia muralis</i>
Primulaceae	<i>*Lysimachia arvensis</i>
Proteaceae	<i>Adenanthos cygnorum</i>
	<i>Banksia attenuata</i>
	<i>Banksia sessilis</i>
	<i>Synapheae</i> sp.
Restionaceae	<i>Desmocladius flexuosus</i>
Rhamnaceae	<i>Spyridium globulosum</i>
Xanthorrhoeaceae	<i>Xanthorrhoea preissii</i>
Zamiaceae	<i>Macrozamia fraseri</i>

Appendix 3
Photographic record of site and
vegetation types



VT1: *Banksia attenuata*, *Eucalyptus tottiana* open woodland over *Jacksonia sternbergiana*, *Xanthorrhoea preissii* and *Calothamnus quadrifidus* mid sparse shrubland over *Hibbertia hypericoides*, **Ehrharta calycina*, *Macrozamia fraseri* and **Briza maxima* low shrubland/grassland mix on sandy soils.



VT2: *Jacksonia sternbergiana*, *Xanthorrhoea preissii*, *Acacia pulchella* and *Hibbertia hypericoides* thicket over exotic grasses including **Ehrharta calycina* and **Briza maxima* on sandy soils.



VT 3: *Jacksonia sternbergiana*, *Xanthorrhoea preissii* and *Calothamnus quadrifidus* low shrubland over *Hibbertia hypericoides*, **Ehrharta calycina* and **Carpobrotus edulis* low shrubland/grassland mix on sandy soils.



VT4: *Hibbertia hypericoides*, *Xanthorrhoea preissii*, *Acacia pulchella*, *Hakea lissocarpha* and *Adenanthos cygnorum* shrubland over exotic grasses including **Ehrharta calycina* and **Briza maxima* with emergent *Eucalyptus gomphocephala* on sandy soils



Cleared track with evidence of dumping of household waste.

Appendix 4
Desktop assessment results (Parks and
Wildlife 2007-, DEE 2016c)

NatureMap Species Report

Created By Guest user on 10/11/2016

Kingdom Plantae
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 116° 12' 25" E, 32° 05' 32" S
Buffer 3km
Group By Family

Family	Species	Records
Anarthriaceae	1	2
Apodanthaceae	1	2
Dilleniaceae	2	2
Droseraceae	1	1
Ericaceae	1	1
Fabaceae	6	19
Goodeniaceae	1	1
Haemodoraceae	1	1
Loranthaceae	1	1
Malvaceae	1	1
Myrtaceae	5	13
Orchidaceae	2	3
Pittosporaceae	1	1
Polygalaceae	1	1
Proteaceae	4	8
Pteridaceae	1	1
Restionaceae	1	1
Rhamnaceae	1	1
Stylidiaceae	4	5
Thymelaeaceae	1	6
TOTAL	37	71

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Anarthriaceae				
1.	1062 <i>Anarthria prolifera</i>			
Apodanthaceae				
2.	2408 <i>Pilostyles hamiltonii</i>			
Dilleniaceae				
3.	5150 <i>Hibbertia nymphaea</i>			
4.	5161 <i>Hibbertia quadricolor</i>			
Droseraceae				
5.	3131 <i>Drosera stolonifera</i> (Leafy Sundew)			
Ericaceae				
6.	6436 <i>Leucopogon propinquus</i>			
Fabaceae				
7.	3331 <i>Acacia extensa</i> (Wiry Wattle)			
8.	3686 <i>Aotus cordifolia</i>			
9.	14290 <i>Bossiaea modesta</i>		P2	
10.	20475 <i>Gastrolobium capitatum</i>			
11.	19733 <i>Gastrolobium retusum</i>			
12.	3950 <i>Gompholobium knightianum</i>			
Goodeniaceae				
13.	17805 <i>Goodenia drummondii</i> subsp. <i>megaphylla</i>			
Haemodoraceae				
14.	11597 <i>Conostylis setigera</i> subsp. <i>setigera</i>			
Loranthaceae				
15.	2401 <i>Nuytsia floribunda</i> (Christmas Tree, Mudja)			
Malvaceae				
16.	5091 <i>Thomasia paniculata</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Myrtaceae				
17.	5425 <i>Calothamnus preissii</i>			
18.	5519 <i>Darwinia oederoides</i>			
19.	5739 <i>Eucalyptus patens</i> (Swan River Blackbutt, Dwuda)			
20.	12395 <i>Verticordia bifimbriata</i>			
21.	12429 <i>Verticordia huegelii</i> var. <i>decumbens</i>			
Orchidaceae				
22.	16367 <i>Pyrorchis nigricans</i> (Red beaks, Elephants ears)			
23.	1700 <i>Spiculaea ciliata</i> (Elbow Orchid)			
Pittosporaceae				
24.	25822 <i>Marianthus sylvaticus</i>			
Polygalaceae				
25.	4554 <i>Comesperma flavum</i>			
Proteaceae				
26.	13429 <i>Grevillea diversifolia</i> subsp. <i>diversifolia</i>			
27.	2029 <i>Grevillea leptobotrys</i>			
28.	2216 <i>Hakea varia</i> (Variable-leaved Hakea)			
29.	29186 <i>Synaphea</i> sp. <i>Udumung</i> (A.S. George 17058)			
Pteridaceae				
30.	12818 <i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>			
Restionaceae				
31.	17689 <i>Chordifex laxus</i>			
Rhamnaceae				
32.	14798 <i>Stenanthemum nanum</i>			
Stylidiaceae				
33.	17669 <i>Stylidium amoenum</i> var. <i>caulescens</i>			
34.	30278 <i>Stylidium androsaceum</i>			
35.	14736 <i>Stylidium</i> sp. <i>Boulder Rock</i> (A.H. Burbidge 2536)			
36.	7803 <i>Stylidium striatum</i> (Fan-leaved Triggerplant)		P4	
Thymelaeaceae				
37.	5260 <i>Pimelea rara</i> (Summer Pimelea)		P4	

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 wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



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: 10/11/16 19:11:27

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)

[Buffer: 3.0Km](#)



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:	1
Listed Threatened Species:	16
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

A [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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	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:	35
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	Endangered	Community may occur within area

Listed Threatened Species

[\[Resource Information \]](#)

Name	Status	Type of Presence
------	--------	------------------

Birds

[Calidris ferruginea](#)

Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
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[Calyptorhynchus banksii naso](#)

Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
--	------------	--

[Calyptorhynchus latirostris](#)

Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
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[Leipoa ocellata](#)

Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
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[Limosa lapponica baueri](#)

Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
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[Limosa lapponica menzbieri](#)

Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
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[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 likely to occur within area
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[Rostratula australis](#)

Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
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Mammals

[Dasyurus geoffroii](#)

Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
-------------------------------	------------	--

Plants

Name	Status	Type of Presence
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	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 likely to occur within area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area

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

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely 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		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		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
Pandion haliaetus Osprey [952]		Species or species habitat likely to 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

Commonwealth Land

[\[Resource Information \]](#)

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.

Name

Commonwealth Land -

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		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to 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 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 likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to 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 may occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
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
Neerabup	WA
Neerabup	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
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		

Name	Status	Type of Presence
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
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
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

Name	Status	Type of Presence
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		area Species or species habitat may occur within area
Protasparagus densiflorus Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to 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
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		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.

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-31.64926 115.72255

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](#)
- [-Parks and Wildlife Commission NT, Northern Territory Government](#)
- [-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, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- Other groups and individuals

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

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

Appendix 5
Vascular plant taxa recorded from
quadrats within the survey area

Site	Species
Opportunistic	<i>Acacia pulchella</i>
	<i>Acacia saligna</i>
	<i>Adenanthos cygnorum</i>
	<i>Allocasuarina humilis</i>
	<i>Banksia sessilis</i>
	<i>Burchardia congesta</i>
	<i>Calothamnus quadrifidus</i>
	* <i>Carpobrotus edulis</i>
	<i>Conostephium</i> sp.
	<i>Conostylis aculeata</i>
	<i>Hardenbergia comptoniana</i>
	<i>Jacksonia calcicola</i>
	<i>Jacksonia</i> sp.
	* <i>Lupinus cosentinii</i>
	* <i>Lysimachia arvensis</i>
	<i>Macrozamia fraseri</i>
	<i>Mesomelaena pseudostygia</i>
	<i>Olearia axillaris</i>
	<i>Spyridium globulosum</i>
	<i>Synapheae</i> sp.
	<i>Thysanotus manglesii</i>
	* <i>Wahlenbergia capensis</i>
Quadrat 1	<i>Banksia attenuata</i>
	* <i>Briza maxima</i>
	<i>Desmocladius flexuosus</i>
	* <i>Ehrharta calycina</i>
	* <i>Erodium cygnorum</i>
	<i>Eucalyptus tottiana</i>
	* <i>Euphorbia terracina</i>
	* <i>Gladiolus caryophyllaceus</i>
	<i>Gompholobium tomentosum</i>
	<i>Hibbertia hypericoides</i>
	* <i>Hypochaeris glabra</i>
	<i>Jacksonia sternbergiana</i>
	<i>Lomandra caespitosa</i>
	<i>Lomandra</i> sp.
	<i>Podotheca gnaphalioides</i>
	<i>Ptilotus polystachyus</i>
	<i>Sowerbaea laxiflora</i>
	<i>Trachymene pilosa</i>
	* <i>Ursinia anthemoides</i>

Site	Species
Quadrat 2	<i>Xanthorrhoea preissii</i>
	<i>Allocasuarina fraseriana</i>
	* <i>Avena barbata</i>
	<i>Banksia attenuata</i>
	* <i>Briza maxima</i>
	<i>Crassula colorata</i>
	* <i>Ehrharta calycina</i>
	* <i>Erodium cygnorum</i>
	<i>Eucalyptus tottiana</i>
	* <i>Gladiolus caryophyllaceus</i>
	<i>Hibbertia hypericoides</i>
	* <i>Hypochaeris glabra</i>
	<i>Jacksonia sternbergiana</i>
	<i>Mesomelaena pseudostygia</i>
	<i>Podotheca gnaphalioides</i>
	<i>Ptilotus polystachyus</i>
	* <i>Sonchus asper</i>
	<i>Trachymene pilosa</i>
	* <i>Ursinia anthemoides</i>
	* <i>Vulpia muralis</i>
Quadrat 3	<i>Xanthorrhoea preissii</i>
	* <i>Avena barbata</i>
	* <i>Briza maxima</i>
	* <i>Bromus diandrus</i>
	<i>Calothamnus quadrifidus</i>
	* <i>Carpobrotus edulis</i>
	<i>Conostylis aculeata</i>
	* <i>Ehrharta calycina</i>
	* <i>Gladiolus caryophyllaceus</i>
	<i>Gompholobium tomentosum</i>
	<i>Hibbertia hypericoides</i>
	<i>Hypochaeris glabra</i>
	<i>Jacksonia sternbergiana</i>
	* <i>Lolium rigidum</i>
	* <i>Petrorhagia dubia</i>
	<i>Podotheca gnaphalioides</i>
	<i>Sowerbaea laxiflora</i>
	* <i>Trifolium campestre</i>
	* <i>Ursinia anthemoides</i>
	<i>Xanthorrhoea preissii</i>
Quadrat 4	<i>Banksia attenuata</i>

Site	Species
	<i>*Briza maxima</i>
	<i>*Bromus diandrus</i>
	<i>*Carpobrotus edulis</i>
	<i>Conostylis aculeata</i>
	<i>*Ehrharta calycina</i>
	<i>Eucalyptus gomphocephala</i>
	<i>Hardenbergia comptoniana</i>
	<i>Hibbertia hypericoides</i>
	<i>*Lolium rigidum</i>
	<i>Mesomelaena pseudostygia</i>
	<i>Petrorhagia dubia</i>
	<i>Podotheca gnaphalioides</i>
	<i>*Sonchus asper</i>
	<i>*Trifolium campestre</i>
	<i>*Ursinia anthemoides</i>
	<i>Xanthorrhoea preissii</i>
Quadrat 5	<i>Acacia pulchella</i>
	<i>Banksia attenuata</i>
	<i>*Briza maxima</i>
	<i>*Bromus diandrus</i>
	<i>Conostylis aculeata</i>
	<i>*Ehrharta calycina</i>
	<i>*Erodium cygnorum</i>
	<i>*Gladiolus caryophyllaceus</i>
	<i>Gompholobium tomentosum</i>
	<i>Hibbertia hypericoides</i>
	<i>Jacksonia sternbergiana</i>
	<i>Macrozamia fraseri</i>
	<i>Ptilotus polystachyus</i>
	<i>*Sonchus asper</i>
	<i>*Ursinia anthemoides</i>
	<i>Xanthorrhoea preissii</i>



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