360 environmental

V & V Walsh Meat Processing Facility

Application for a Native Vegetation Clearing Permit

Prepared for:
V and V Walsh

December 2018

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1 Introduction

360 Environmental Pty Ltd (360 Environmental) was commissioned by V and V Walsh to prepare a Native Vegetation Clearing Permit (NVCP) application to support the irrigation of treated waste water to native vegetation.

This clearing permit application is for the areas comprising of approximately 11.36 ha of native vegetation across the property ('the site') (Figure 1). The Proposal involves treated wastewater from V & V Walsh meat processing facility being irrigated to native vegetation ('the application area'). As the irrigated wastewater is nutrient rich, the process undertaken is known as fertigation. No clearing of native vegetation is proposed. The application area does not include stormwater areas and are not within 50 metres of any Conservation Category Wetlands.

The site is zoned 'Industrial' and as 'Special Area with Environmental Conditions' under the Greater Bunbury Region Scheme (GBRS).

1.1 Purpose of Document

The purpose of this document is to present the results of an assessment of the fertigation aspects of the Proposal against the ten clearing principles as outlined in the (then) Department of Environment Regulation (DER)'s *Guide to Assessment: Clearing of Native Vegetation under the Environmental Protection Act 1986* (EP Act). This report identifies the potential environmental impacts associated with the Proposal based on the best available data. This NVCP will be submitted to the Department of Water and Environmental Regulation (DWER) for assessment.

1.2 Responsible Person

V and V Walsh is responsible for implementation of the irrigation described within this document. Correspondence relating to this NVCP application should be addressed to:

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2 Site Overview

2.1 Location

The site is located within the City of Bunbury at 1 Rawling Road, Davenport. The site is located approximately 159 km south of Perth's Central Business District (CBD) and approximately 6 km southeast of Bunbury townsite. The V & V Walsh site totals 79.6 ha and the 11.36 ha application area will be irrigated with waste water and is the dis. The application area is the in this Native Vegetation Clearing Permit (Figure 1).

2.2 Bioregion

The site is located within the Swan Coastal Plain (SCP) biogeographic region of Western Australia (WA). The Swan Coastal Plain sub-region 2 (SWA02) is a low lying coastal plain composed of colluvial and Aeolian sands, alluvial river flats and coastal limestone rising to duricrusted Mesozoic sediments in the east. Outwash plains are extensive only in the south, while a complex series of seasonal wetlands and swamps extends from north to south. Vegetation comprises heath and/or Tuart woodlands on limestone, *Banksia* and Jarrah-Banksia woodlands on Quaternary marine dunes of various ages, Marri on colluvial and alluvial soils, *Casuarina obesa* on out-wash plains, and paperbark (*Melaleuca* spp.) in wetland areas (Mitchell, Williams, & Desmond, 2002).

2.3 Topography

The topography is gently undulating across the site with elevation ranging between 8 and 16 m Australian Height Datum AHD, sloping to the east.

2.4 Geology and Soils

2.4.1 Geology

The 1:500 000 surface geology profile mapping (Department of Mines Industry Regulation and Safety, 2018) indicates the geology of the site entirely as Warnbro Group (K-WR-ss), described as interbedded sandstone, siltstone, and shale; minor conglomerate.

2.4.2 Soil Systems

Soil subsystems mapping identified that the site is within the following nine soil subsystems (Figure 2):

- **212Bs_B1a, Bassendean B1a Phase (4.51 ha):** Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands with an intensely coloured yellow B horizon occurring within 1 m of the surface; marri and jarrah dominant;

- **212Bs__B2, Bassendean B2 Phase (37.29 ha):** Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m;
- **212Bs__B3, Bassendean B3 Phase (16.17 ha):** Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam;
- **212Bs__B4, Bassendean B4 Phase (8.38 ha):** Broad poorly drained sandplain with deep grey siliceous sands or bleached sands, underlain at depths generally greater than 1.5 m by clay or less frequently a strong iron-organic hardpan;
- **213Pj__P1b, Pinjarra P1b Phase (0.78 ha)**: Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Moderately deep pale sand to loamy sand over clay: imperfectly drained and moderately susceptible to salinity in limited areas;
- **213Pj__P3, Pinjarra P3 Phase (0.63 ha):** Deep acidic gradational yellow or grey-brown earths and mottled yellow duplex soils, with loam to clay loam surface horizons;
- **213PjSWP6a, Pinjarra P6a Phase (4.39 ha):** Very gently undulating alluvial terraces and low rises contiguous with the plain, with deep moderately well to well drained soils associated with major current river systems and larger streams. Acidic red and yellow duplex soils, less commo;
- **213PjSWP6c, Pinjarra P6c Phase (0.72 ha):** Very gently undulating alluvial terraces and fans. Moderate to moderately well drained uniform friable brown loams, or well structured gradational brown earths; and
- **213PjSWP10, Pinjarra P10 Phase (6.68 ha):** Gently undulating to flat terraces adjacent to major rivers, but below the general level of the plain, with deep well drained uniform brownish sands or loams subject to periodic flooding.

2.4.3 Acid Sulfate Soils

The stormwater areas and Preston River are mapped as High to Moderate risk of Acid Sulfate Soils (ASS) occurring within 3 m of natural soil surface (Department of Water and Environmental Regulation, 2018a). The remainder of the site is mapped as Moderate to Low risk of ASS occurring within 3 m of natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface (Department of Water and Environmental Regulation, 2018a). Acid Sulfate Soil Risk is mapped in Figure 3.

2.5 Broad Vegetation Associations

Mapping of the vegetation of the Perth of WA was completed on a broad scale (1:100,000) by Beard (1981) (Department of Primary Industries and Regional Development, 2018b). These vegetation units were re-assessed by Shepherd *et al.*

(2001) to account for clearing in the intensive land use zone, dividing some larger vegetation units into smaller units.

There are two Beard/Shepherd vegetation units mapped across the site (Figure 4). The Shepherd *et al.* (2001) vegetation type is described below, and its representation within the State, IBRA region, IBRA subregion and Local Government are shown in Table 1.

- **Bassendean 1000 (60.40 ha)**: Woodland / Low woodland / Low forest or Woodland; and
- **Bassendean 1182 (19.16 ha):** Woodland southwest - Jarrah, marri and wandoo *Eucalyptus marginata*, *Corymbia calophylla*, *E. wandoo*.

Table 1: Broad Vegetation Types and its State and Regional Representation (Government of Western Australia, 2018)

	Pre–European (ha)	Current Extent (ha)	Remaining (%)	Remaining in DBCA reserves (%)
Statewide – Western Australia				
Bassendean 1000	99,836	27,706	22.75	18.67
Bassendean 1182	23,437	6,134	26.17	55.33
IBRA Region – Swan Coastal Plain				
Bassendean 1000	94,175	24,806	26.34	19.21
Bassendean 1182	12,309	1,400	11.38	6.10
IBRA Sub Region - SWA02				
Bassendean 1000	94,1785	24,806	26.34	19.21
Bassendean 1182	12,309	1,400	11.38	6.10
Local Government Authority – City of Bunbury				
Bassendean 1000	2,172	621	28.60	2.12
Bassendean 1182	280	87	31.03	-

The EPA considers it is important that vegetation units and ecological communities are maintained above the threshold level of 30 % of pre-European extent. Vegetation units and ecological communities with levels below 30 % should be fully retained (Environmental Protection Authority, 2008). Neither vegetation unit within the site retains greater than 30 % of pre-European extent at the state, bioregion or subregion levels.

2.6 Hydrology

The site is bordered by Preston River to the east. Currently there is an 50 metre buffer between current irrigation and Preston River (Department of Water and Environmental Regulation, 2016).

Wetlands of the Swan Coastal Plain have been described and mapped by Hill *et al.* (1996) and assigned a management category reflecting their condition. The Department of Biodiversity Conservation and Attractions (DBCA) Geomorphic Wetlands dataset

(Department of Biodiversity Conservation and Attractions, 2017) and have been mapped across the site (Figure 5).

The application area intersects with one Multiple Use Wetland (MUW) – UFI: 14329 and does not intersect with any Conservation Category Wetlands (CCWs) (Figure 5).

The site is mapped across the Bunbury Groundwater Area under *RIWI Act 1914-1974* (Department of Water and Environmental Regulation, 2018f). The site is not within a Public Drinking Water Source Area (Department of Water and Environmental Regulation, 2018e).

Exact groundwater and salinity levels across the site are unknown. However, a nearby WIN bore approximately 1.5 km to the southeast of the site recorded over the course of 2018 a range in groundwater between 2.6 m and 1.6 m below ground level.

Water for the site is sourced from a single production bore drawing from the Perth-Leederville aquifer (Department of Water and Environmental Regulation, 2018g). The annual water entitlement for this groundwater licence is 360,000 KL (Department of Water and Environmental Regulation, 2018d). Under the groundwater licence the quality of this water is measured quarterly.

2.7 Conservation Features

Environmentally Sensitive Areas (ESAs) are identified and protected under the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*. Under the Notice, it is an offence to kill or destroy vegetation within an ESA.

ESA mapping indicates the application areas do not intersect the application area (Department of Water and Environmental Regulation, 2018b). The closet ESA is immediately adjacent the application area associated with the CCW of the Preston River located within the site.

The site is also mapped with the Leschenault Inlet Management Area (Figure 6) under the *Waterways Conservation Act 1976* (Department of Water and Environmental Regulation, 2018g).

The site is not within or in the vicinity of any Regional Reserves or DBCA Managed Lands.

2.8 Threatened / Priority Ecological Communities

A desktop search identified two Threatened Ecological Communities (TECs) listed under the EPBC Act as being within a five km radius of the Survey Area:

- Banksia Woodlands of the Swan Coastal Plain Ecological Community; and
- Clay Pans of the Swan Coastal Plain (Department of the Environment and Energy, 2018).

2.9 Climate

The nearest official Bureau of Meteorology (BoM) weather station currently in operation with monthly climate data is the Bunbury Station (#9965) located approximately 3 km north west of the site. The climate is described as having hot, dry summers and cool, wet winters. The annual mean maximum temperature is 23.1°C and the annual mean minimum temperature is 11.1°C. The annual average rainfall is 726.1 mm (Bureau of Meteorology, 2018).

3 Assessment Methodology

3.1 Desktop Assessment

An initial desktop assessment was undertaken which included a review of current and relevant tenure and land ownership details, literature sources, database and GIS information to determine:

- Possible environmental survey and approvals requirements; and
- The location of areas with minimal environmental sensitivities/constraints and any highly constrained areas.

The desktop study provided background information on the flora and vegetation of the site. Database searches of the Department of the Environment and Energy (DEE)'s Protected Matters Search Tool (PMST) and the Department of Biodiversity Conservation and Attractions (DBCA)'s NatureMap Search Tool were undertaken to compile a list of expected Threatened or Priority species and Threatened and Priority Ecological Communities (TECs and PECs) that may occur in the area. These database searches are described in Table 2 and Appendix A.

Table 2: Database Searches Undertaken to Identify Potential Environmental Constraints

Potential Environmental Constraint(s)	Database Searches
Matters of National Environmental Significance (MNES)	EPBC Act PMST Search, 5 km radial search (Department of the Environment and Energy, 2018).
Declared Rare Flora (DRF) and Priority Flora species	DBCA NatureMap search, 5 km radial search (Department of Biodiversity Conservation and Attractions, 2018)
TECs and / or PECs	EPBC Act PMST (Department of the Environment and Energy, 2018)
Threatened and Priority Fauna Species	DBCA NatureMap search, 5 km radial search (Department of Biodiversity Conservation and Attractions, 2018)

3.2 Flora and Vegetation Field Survey

Cape Life undertook a vegetation assessment on the site on the 25 May 2018. The assessment covered six Survey Areas to determine the presence, type and extent of native vegetation (Cape Life, 2018; Appendix B). The survey locations are shown in Figure 7.

4 Results

4.1 Desktop Results

4.1.1 Flora

The database searches identified a total 31 species of conservation significance as within 5 km of the site. Of these, 18 were Threatened flora and 13 were Priority flora (Department of Biodiversity Conservation and Attractions, 2018), including one Priority 2, six Priority three and six Priority 4. The 18 Threatened flora identified are also listed under the EPBC Act, including four Critically Endangered species, eight Endangered species and six Vulnerable species (Department of the Environment and Energy, 2018). The conservation significant flora species identified through database searches are listed in Table 3.

Table 3: Conservation Significant Flora Potentially Occurring within 5km of Site (Department of Biodiversity Conservation and Attractions, 2018; Department of the Environment and Energy, 2018)

TAXA	CONS. STATUS		SOURCE	
	DBCA	EPBC	NATURE MAP	PMST
Brachyscias verecundus	T	CR		X
Austrostipa jacobsiana	T	CR	X	X
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	T	CR		X
Synaphea sp. Serpentine (G.R. Brand 103)	T	CR		X
Andersonia gracilis	T	EN		X
Caladenia huegelii	T	EN		X
Diuris purdiei	T	EN		X
Drakaea elastica	T	EN		X
Austrostipa bronwenae	T	EN	X	X
Lambertia echinata subsp. *occidentalis*	T	EN		X
Banksia nivea subsp. *uliginosa*	T	EN		X

TAXA	CONS. STATUS		SOURCE	
	DBCA	EPBC	NATURE MAP	PMST
Synaphea stenoloba	T	EN		X
Eleocharis keigheryi	T	VU		X
Chamelaucium sp. S coastal plain (R.D.Royce 4872)	T	VU		X
Diuris drummondii	T	VU	X	X
Diuris micrantha	T	VU		X
Drakaea micrantha	T	VU		X
Banksia squarrosa subsp. *argillacea*	T	VU		X
Platysace ramosissima	P3	-	X	
Aponogeton hexatepalus	P4	-	X	
Angianthus drummondii	P3	-	X	
Carex tereticaulis	P3	-	X	
Schoenus benthamii	P3	-	X	
Acacia flagelliformis	P4	-	X	
Pultenaea skinneri	P4	-	X	
Lasiopetalum membranaceum	P3	-	X	
Verticordia attenuata	P3	-	X	
Eucalyptus rudis subsp. *cratyantha*	P4	-	X	
Thelymitra variegata	P2	-	X	
Stylidium longitubum	P4	-	X	

4.1.2 Fauna

The Nature Map report identified 32 conservation significant fauna species potentially occurring within a 5 km radius of the site (Department of Biodiversity Conservation and Attractions, 2018). These included 15 species protected under international agreement, nine Threatened species, three listed as specially protected fauna, four Priority 4 species as one Priority 3 species.

The PMST database search identified a total of 41 conservation significant fauna species protected under the EPBC Act potentially occurring within 5 km of the site. These include four Critically Endangered species, seven Endangered species, 15 Vulnerable species and 15 Migratory and/or Marine species.

A likelihood assessment was undertaken with the 55 conservation significant fauna species identified through database searches using the Cape Life (2018) vegetation assessment (Appendix C). Four species were identified to have a Medium likelihood of occurrence due to the presence of suitable habitat. The remaining 51 species were identified to have Low Likelihoods of occurrence due to inadequate habitat.

4.2 Survey Results

4.2.1 Overview of Flora

A total of 14 taxa were described across six Survey Areas. The commonly occurring taxa were Peppermint trees (*Agonis flexuosa*) occurring in five Survey Areas and Marri trees (*Corymbia calophylla*) occurring in four Survey Areas. A species matrix of species recorded is described in Table 4.

Table 4: Species Presence/Absence Matrix

Taxa	1	2	3	4	5	6
Corymbia calophylla	x	x	x			x
Agonis flexuosa	x	x	x		x	x
Eucalyptus rudis	x	x		x		
Oxalis sp.	x					
Solanum linnaeanum	x					
Introduced eucalypts		x				
Melaleuca raphiophylla		x				
Juncus pallidus		x				
Zantedeschia aethiopica			x			
Gomphocarpus fruticosus			x			
Cenchrus clandestinus				x		x
Nuytsia floribunda						x
Banksia attenuata						x
Eragrostis curvula						x

4.2.2 Introduced Flora

Where an understory was present in a Survey Area, it consisted solely of introduced species. One Survey Area contained of large plantation of introduced *Eucalyptus* spp. Seven introduced taxa were recorded during the survey, representing 50% of the recorded taxa. Three of these are listed as Declared Pests (Department of Primary Industries and Regional Development, 2018a) or WONS under the BAM Act (Table 5).

Table 5: Introduced Flora Recorded Across Survey Areas

TAXA	COMMON NAME	WA ORGANISM LIST STATUS
Cenchrus clandestinus	Kikuyu Grass	-
Eragrostis curvula	African Lovegrass	-
Gomphocarpus fruticosus	Narrowleaf Cottonbush	Declared Pest
Introduced Eucalypts	-	-
Oxalis sp.	-	-
Solanum linnaeanum	-	Declared Pest
Zantedeschia aethiopica	Arum Lily	Declared Pest

4.2.3 Vegetation Condition

All six Survey Areas were considered degraded to completely degraded with the exception of the wetland within Survey Area 2, considered to be in Good condition (Cape Life, 2018).

5 Environmental Management Measures and Rehabilitation

To minimise the risk of impact from the activities associated with the Proposal, the following environmental management measures will be implemented:

- Fertigation scheme design will be aligned with parameters specified in the Irrigation with nutrient-rich wastewater – Water Quality Protection Note (2008);
- Ongoing vegetation monitoring will be undertaken to evaluate trends in native vegetation condition;
- Monitoring of wastewater volumes and nutrients concentrations will be used to determine application rates as per licence conditions;
- Groundwater monitoring will be ongoing to evaluate infiltration rates and concentrations;
- Irrigation will not be undertaken during rainfall events or to flooded areas as per licence conditions; and
- Environmental improvement plans will continue to be developed and implemented.

6 Assessment against the Ten Clearing Principles

The proposed clearing activities have been assessed against the ten clearing principles as defined in DER's *Guide to Assessment: Clearing of Native Vegetation under the Environmental Protection Act 1986*, taking into account the current extent and condition of the native vegetation on the site. This assessment is presented in Table 6.

Table 6: Assessment Against 10 Clearing Principles

PRINCIPLE	ASSESSMENT
Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity	The Proposal involves the irrigation of wastewater to 11.36 ha of native vegetation as part of waste water treatment processes at the meat processing facility. The database searches identified a total 31 species of conservation significance as within 5 km of the site. Of these, 18 were Threatened flora and 13 were Priority flora (Department of Biodiversity Conservation and Attractions, 2018), including one Priority 2, six Priority three and six Priority 4. The 18 Threatened flora identified are also listed under the EPBC Act, including four Critically Endangered species, eight Endangered species and six Vulnerable species (Department of the Environment and Energy, 2018). Conservation significant flora is described in Table 3. V&V Walsh commissioned Cape Life to undertake vegetation assessment at the site on 25 May 2018. The survey identified a total of 14 flora species. No conservation significant flora species were recorded. The Proposed Disturbance Area falls within two broad Shepherd vegetation types. The first, Bassendean 1000: Woodland / Low woodland / Low forest or Woodland. This unit has approximately 26.3 % of its pre-European vegetation extent remaining in the SWA02 sub-region. The second Bassendean 1182: Woodland southwest - Jarrah, marri and wandoo *Eucalyptus* marginata, Corymbia calophylla, E. wandoo. This unit has approximately 11.4 % of its pre-European vegetation extent remaining in the SWA02 sub-region (Government of Western Australia 2017). Neither vegetation associations have current extents above 30% across the state,

PRINCIPLE	ASSESSMENT
	bioregion or subregion. The vegetation conditions within the application was described as mostly Degraded to Completed Degraded, except for the wetland area surveyed (Cape Life, 2018; Figure 7). Ongoing monitoring of vegetation condition and groundwater will be undertaken to evaluate the status of remnant vegetation receiving wastewater irrigation to avoid significant impacts to the vegetation. **Assessed Outcome**: The Proposal may be at variance with this Principle.
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	The Nature Map report identified 32 conservation significant fauna species potentially occurring within a 5 km radius of the site (Department of Biodiversity Conservation and Attractions, 2018). These included 15 species protected under international agreement, nine Threatened species, three listed as specially protected fauna, four Priority 4 species as one Priority 3 species. The PMST database search identified a total of 41 conservation significant fauna species protected under the EPBC Act potentially occurring within 5 km of the site. These include four Critically Endangered species, seven Endangered species, 15 Vulnerable species and 15 Migratory and/or Marine species. A likelihood assessment was undertaken with the 55 conservation significant fauna species identified through database searches using the Cape Life (2018) vegetation assessment (Appendix C). Four species were identified to have a Medium likelihood of occurrence due to the presence of preferred habitat. The remaining 51 species were identified to have Low Likelihoods of occurrence due to inadequate habitat. Majority of the conservation significant fauna species identified in the PMST and Nature Map databases included waders, waterbirds and marine species that require specific habitats (such as open water). As the site does not contain these specific habitats, they are unlikely to be impacted by the Proposal. The four species identified with a Medium likelihood of occurrence are detailed below.

PRINCIPLE	ASSESSMENT
	- The presence of marri trees (*Corymbia calophylla*) is considered preferred foraging and/or nesting habitat for the three Black Cockatoo species identified (Baudins Cockatoo, *Calyptorhynchus baudinii;* Carnaby's Cockatoo, *Calyptorhynchus latirostris*; and Forest Red-tailed Black Cockatoo, *Calyptorhynchus banksii naso*) and the site is within the known distribution of all species. The proposed irrigation to 11.36 ha of native vegetation within the site is not likely have a significant impact on the habitat available for the species. - Peppermint trees (*Agonis flexuosa*) are considered preferred habitat for the Western Ringtail Possum (*Pseudocheirus occidentalis*) and the site is within the known distribution of the species. The proposed irrigation to 11.36 ha of native vegetation within the site is not likely have a significant impact on habitat available for the species. It is not expected that the irrigation of vegetation within the site will significantly impact fauna or fauna habitat. It is more likely fauna would utilise larger patches of vegetation adjacent to the site that are not fragmented and in greater condition. Ongoing monitoring of vegetation condition and groundwater will be undertaken to evaluate the status of remnant vegetation receiving wastewater irrigation to avoid significant impacts to the vegetation. **Assessed Outcome:** Due to the potential presence of preferred habitat, the Proposal is at variance with this Principle.
Principle (c) – Native vegetation should not be cleared if it includes or is necessary for the continued existence of	The database searches identified a total 31 flora species of conservation significance as within 5 km of the site. Of these, 18 were Threatened flora and 13 were Priority flora (Department of Biodiversity Conservation and Attractions, 2018). There is no known existence of any conservation significant flora species within the site. It is considered unlikely that any species occur due to the disturbance on site. Disturbance includes vehicle traffic, high density

PRINCIPLE	ASSESSMENT
rare flora.	of weed species and continual grazing by sheep. **Assessed Outcome:** The application area may include preferred habitat containing conservation significant flora and therefore, the Proposal may be at variance with this Principle.
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 (TEC).	A desktop search identified two Threatened Ecological Communities (TECs) listed under the EPBC Act as being within a five km radius of the Site: ● Banksia Woodlands of the Swan Coastal Plain Ecological Community and ● Clay Pans of the Swan Coastal Plain (Department of the Environment and Energy, 2018). No known TEC and/or PECs are present onsite. Due to the absence of Banksia species and the mostly degraded condition of the site the Banksia Woodlands TEC cannot be present. Ongoing monitoring of vegetation condition and groundwater will be undertaken to evaluate the status of remnant vegetation receiving wastewater irrigation to avoid significant impacts to the vegetation. **Assessed Outcome:** The Proposal may be at variance with this Principle.
Principle (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 Proposed Disturbance Area falls within two broad Shepherd vegetation types. The first, Bassendean 1000: Woodland / Low woodland / Low forest or Woodland. This unit has approximately 22.8% % of its pre-European vegetation extent remaining state wide, 26.3 % of its pre-European vegetation extent remaining within the Swan Coastal Plain bioregion and 28.6 % of its pre-European vegetation extent remaining within the City of Bunbury. The second Bassendean 1182: Woodland southwest - Jarrah, marri and wandoo *Eucalyptus* marginata, Corymbia calophylla, E. wandoo. This unit has approximately 26.2% of its pre-European vegetation extent remaining state wide, 11.4 % of its pre-European vegetation extent remaining in the Swan Coastal Plain

PRINCIPLE	ASSESSMENT
	bioregion and 31% of its pre-European vegetation extent remaining within the City of Bunbury (Government of Western Australia 2017). The EPA's Guidance Statement No. 33 has identified a threshold of the retention of 30 % of pre-European extent of each unit and ecological communities with levels below 30% should be fully retained (Environmental Protection Authority, 2008). Both vegetation associations in Table 1 have current extents below than the abovementioned 30 % threshold at the state, bioregion and subregion levels. Majority of the site is disturbed from the presence of weeds with some cleared field areas. As the site is not likely to contain a significant quantity of native vegetation, the irrigation of waste water is not considered to represent a significant loss in the context of the State/IBRA representation of the Bassendean 1000 and Bassendean 1182 vegetation units. In addition, the vegetation condition within the site is mostly in 'Degraded to Completely Degraded' (Cape Life, 2018). Ongoing monitoring of vegetation condition and groundwater will be undertaken to evaluate the status of remnant vegetation receiving wastewater irrigation to avoid significant impacts to the vegetation. **Assessed Outcome**: Both vegetation units in Table 1 have current extents below than the abovementioned 30 % threshold at the state, bioregion and subregion levels, as there will be no actual removal of vegetation it is not considered significant. The Proposal therefore may be at variance with this Principle.
Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or	The Department of Biodiversity Conservation and Attractions (DBCA) Geomorphic Wetlands dataset (Department of Biodiversity Conservation and Attractions, 2017) identified one MUW intersecting with the application area (Figure 5). The site is bordered by Preston River to the east. The river is classed as a Conservation Category Wetland. Currently there is a 50 metre buffer between current irrigation and the Preston River. The site is mapped across the Bunbury Groundwater Area under *RIWI Act 1914-1974* (Department of Water

PRINCIPLE	ASSESSMENT
wetland.	and Environmental Regulation, 2018f). The site is not within a Public Drinking Water Source Area (Department of Water and Environmental Regulation, 2018e). Ongoing monitoring of groundwater will be undertaken to evaluate the status of remnant vegetation receiving wastewater irrigation to avoid significant impacts to any watercourses and wetlands. No irrigation will be undertaken within 50m of a CCW. **Assessed Outcome:** The application area is associated with vegetation within a MUW. The Proposal will be at variance with this Principle.
Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation	The (then) Department of Environment Regulation (DER) has defined land degradation as including the following (Department of Environment Regulation, 2014): ● the clearing of vegetation; ● decline in vegetation condition; ● soil erosion and soil acidity (caused by wind and water erosion due to vegetation clearing); ● salinity; or ● waterlogging/flooding. The application area includes the irrigation to 11.36 ha of native vegetation. The vegetation condition is mostly Degraded to Completely Degraded, except for one Good area. The immediate surrounding landscape to the south and east of Preston River is representative of extensive cleared land for farmland. As there is no clearing proposed, it is unlikely that sandy soils will experience wind erosion. Erosion is not likely to be significantly elevated from the present state. The topography is variable across the site with elevation ranging between 8 and 16 m AHD, sloping to the

PRINCIPLE	ASSESSMENT
	east. As the works will involve only irrigating to the vegetation, erosion is not considered to result from the Proposal. Excess stormwater runoff within the site is not considered to be significantly increased, given designated stormwater areas are in use throughout the site. Stormwater areas are all used to buffer irrigation. Any increase in potential surface water runoff during operations will be managed in accordance with Best Practice Management where necessary. ASS Risk mapping has identified the stormwater areas and Preston River are mapped as High to Moderate risk of Acid Sulfate Soils (ASS) occurring within 3 m of natural soil surface (Department of Water and Environmental Regulation, 2018a). The remainder of the site is mapped as Moderate to Low risk of ASS occurring within 3 m of natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface (Department of Water and Environmental Regulation, 2018a). It is unlikely that the irrigation to proposed areas would involve extensive natural soil disturbance and would only be impacting the soil surface. It is not likely that the works would disturb soils at a depth that would cause ASS. Ongoing monitoring of groundwater will be undertaken to evaluate the status of remnant vegetation receiving wastewater irrigation to avoid significant impacts that would cause land degradation. **Assessed Outcome:** The Proposal may be at variance with this Principle.
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	The application area does not intersect with any Environmentally Sensitive Areas (ESAs). ESAs are identified and protected under the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*. Under the Notice, it is an offence to kill or destroy vegetation within an ESA. Mapping undertaken by DWER indicates there are no ESAs within the application area (Department of Water and Environmental Regulation, 2018b). The closest ESA is associated with the Preston River CCW located within the site. The site is mapped with the Leschenault Inlet Management Area under the *Waterways Conservation Act 1976*

PRINCIPLE	ASSESSMENT
conservation area	(Department of Water and Environmental Regulation, 2018g). The site is not within or in the vicinity of any regional reserves or DBCA Managed Lands. Ongoing monitoring of groundwater will be undertaken to evaluate the status of remnant vegetation receiving wastewater irrigation to avoid significant impacts to conservation areas. Irrigation will not be undertaken with 50m of the Preston River. Due to the environmental management measures to be undertaken the irrigation it is not likely to have an impact on the environmental values of any conservation areas. **Assessed Outcome:** Due to the environmental management measures to be undertaken the irrigation it is not likely to have an impact on the environmental values of any conservation areas. The Proposal may be at variance with this Principle.
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	Given the sandy nature of the soils and the varied condition of the vegetation within the site, it is not likely that the natural surface water hydrology would be significantly altered by the irrigation of wastewater. The annual average rainfall is 726.1 mm as recorded at the nearest weather station (Bunbury #9965). Most rain falls between June and August (Bureau of Meteorology, 2018). The site is not located within or in the vicinity of any Public Drinking Water Source Areas (PDWSAs) (Department of Water and Environmental Regulation, 2018e). Preston River delineates the eastern boundary of the site. Preston River is classed as a CCW and there is currently a 50m buffer between current irrigation and the edge of the Preston River. Ongoing monitoring of groundwater will be undertaken to evaluate the status of remnant vegetation receiving wastewater irrigation to avoid significant impacts the quality of surface and groundwater. **Assessed Outcome:** The Proposal may to be at variance with this Principle.

PRINCIPLE	ASSESSMENT
Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	The site is bordered by Preston River to the east. Treated waste water is currently irrigated to fields adjacent to Preston River, leaving a 50 m buffer. The application area intersects with one MUW (UFI 14329) (Figure 5). The 100 Year ARI floodplain and flood fringe mapping did not identify the site as being within a flood risk area (Department of Water and Environmental Regulation, 2018c). Regional soil mapping and the field survey indicates that the underlying soil profile is mostly sandy in nature: ● **212Bs__B1a, Bassendean B1a Phase:** Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands with an intensely coloured yellow B horizon occurring within 1 m of the surface; marri and jarrah dominant; ● **212Bs__B2, Bassendean B2 Phase:** Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m; ● **212Bs__B3, Bassendean B3 Phase:** Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam; ● **213Pj__P1b, Pinjarra P1b Phase**: Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Moderately deep pale sand to loamy sand over clay: imperfectly drained and moderately susceptible to salinity in limited areas; ● **212Bs__B4, Bassendean B4 Phase:** Broad poorly drained sandplain with deep grey siliceous sands or bleached sands, underlain at depths generally greater than 1.5 m by clay or less frequently a strong iron-organic hardpan;

PRINCIPLE	ASSESSMENT
	• **213Pj__P1b, Pinjarra P1b Phase (0.78 ha)**: Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Moderately deep pale sand to loamy sand over clay: imperfectly drained and moderately susceptible to salinity in limited areas; • **213Pj__P3, Pinjarra P3 Phase (0.63 ha):** Deep acidic gradational yellow or grey-brown earths and mottled yellow duplex soils, with loam to clay loam surface horizons; • **213PjSWP6a, Pinjarra P6a Phase:** Very gently undulating alluvial terraces and low rises contiguous with the plain, with deep moderately well to well drained soils associated with major current river systems and larger streams. Acidic red and yellow duplex soils, less commo and • **213PjSWP10, Pinjarra P10 Phase:** Gently undulating to flat terraces adjacent to major rivers, but below the general level of the plain, with deep well drained uniform brownish sands or loams subject to periodic flooding (Department of Primary Industries and Regional Development, 2018c). Sandy soils are typically well draining, and stormwater areas are not irrigated to, therefore the irrigation is likely be able to infiltrate without waterlogging or causing excessive runoff. In addition, a large portion of the site is in a degraded condition and therefore further waste water irrigation clearing in these areas are unlikely to significantly alter the current characteristics of the site. Ongoing monitoring of groundwater will be undertaken to evaluate the status of remnant vegetation receiving wastewater irrigation that would cause or exacerbate the incidence of flooding. **Assessed Outcome:** The Proposal may be at variance with this Principle.

7 Summary of Assessment and Conclusion

In summary, after desktop and field assessments of the environmental values of the Proposed Disturbance Area, it is considered that the Proposal to irrigate approximately 11.36 ha of native vegetation is not significant.

The application area contains vegetation that is representative of preferred fauna habitat and is inclusive of geomorphic wetlands. Therefore, the Proposal is at variance with three Clearing Principles (B and F). The remaining principles are considered to may be at variance with the Proposal.

Principle (b) states that 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. The vegetation is identified as preferred habitat for four species (Baudins Cockatoo, *Calyptorhynchus baudinii*; Carnaby's Cockatoo, *Calyptorhynchus latirostris*; and Forest Red-tailed Black Cockatoo, *Calyptorhynchus banksii naso* and Western Ringtail Possum, *Pseudocheirus occidentalis*). The presence of preferred habitat across the site causes this principle to be at variance. The proposed irrigation to 11.36 ha of native vegetation within the site is not likely have a significant impact on the habitat available for the species as ongoing vegetation monitoring will be undertaken. It is therefore not expected that the irrigation of vegetation within the site would have major impacts to fauna or fauna habitat.

Principle (f) states native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland. The site includes four geomorphic wetlands (two CCWs and two MUWs) and is therefore, at variance with this principle. No irrigation will be undertaken within 50m of a CCW. Although irrigation will be undertaken within the vicinity of wetlands, it is not considered to have significant impact.

Overall, the potential impacts associated with the irrigation of 11.36 ha of native vegetation is not considered to have a significant environmental impact. The environmental management measures proposed to be implemented will ensure the risk of impacts are mitigated and minimised.

8 Limitations

This report is produced strictly in accordance with the scope of services set out in the contract or otherwise agreed in accordance with the contract. 360 Environmental makes no representations or warranties in relation to the nature and quality of soil and water other than the visual observation and analytical data in this report.

In the preparation of this report, 360 Environmental has relied upon documents, information, data and analyses ("client's information") provided by the client and other individuals and entities. In most cases where client's information has been relied upon, such reliance has been indicated in this report. Unless expressly set out in this report, 360 Environmental has not verified that the client's information is accurate, exhaustive or current and the validity and accuracy of any aspect of the report including, or based upon, any part of the client's information is contingent upon the accuracy, exhaustiveness and currency of the client's information. 360 Environmental shall not be liable to the client or any other person in connection with any invalid or inaccurate aspect of this report where that invalidity or inaccuracy arose because the client's information was not accurate, exhaustive and current or arose because of any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to 360 Environmental.

Aspects of this report, including the opinions, conclusions and recommendations it contains, are based on the results of the investigation, sampling and testing set out in the contract and otherwise in accordance with normal practices and standards. The investigation, sampling and testing are designed to produce results that represent a reasonable interpretation of the general conditions of the site that is the subject of this report. However, due to the characteristics of the site, including natural variations in site conditions, the results of the investigation, sampling and testing may not accurately represent the actual state of the whole site at all points.

It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

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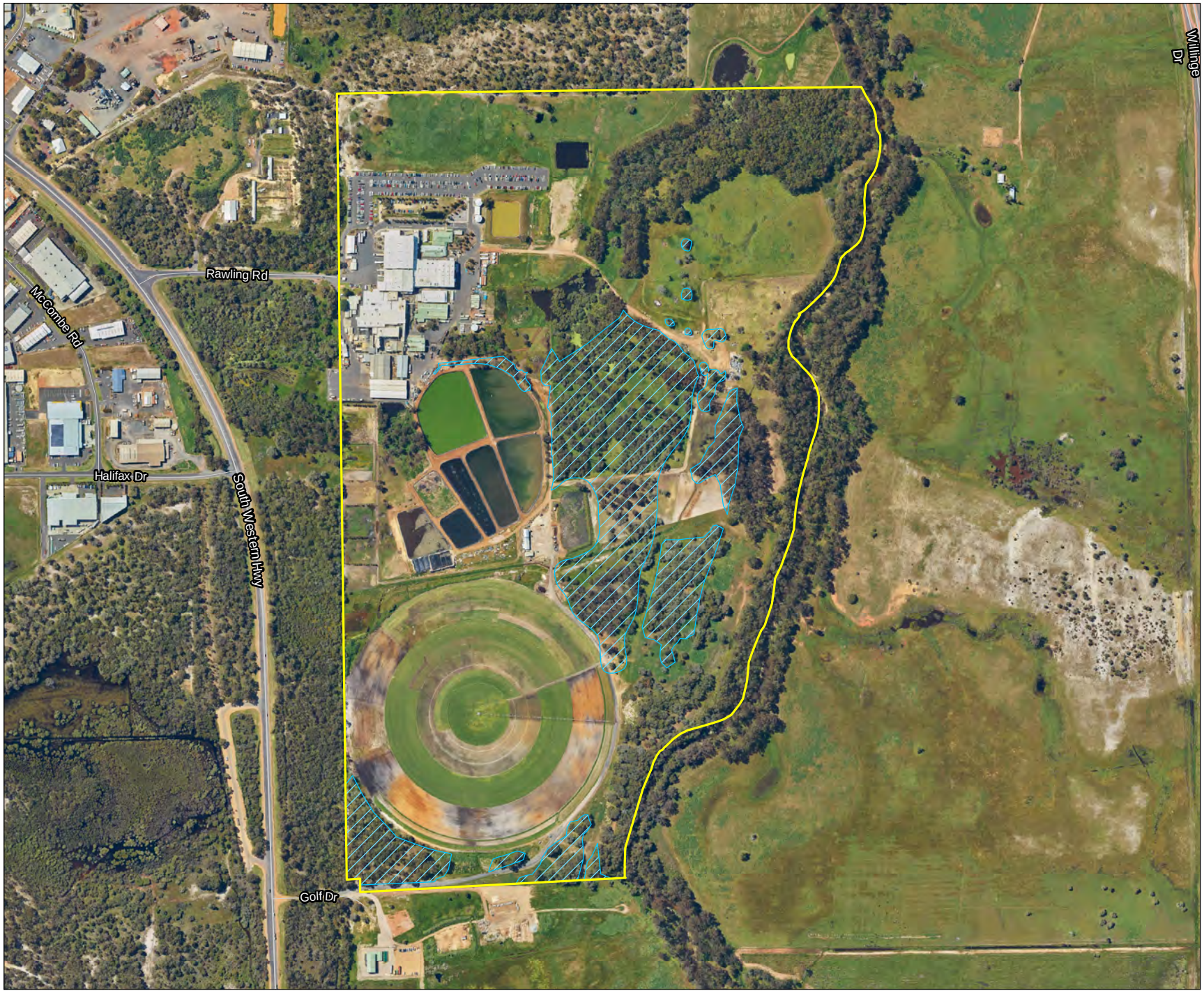
FIGURES



Legend

- Site Boundary
- Application Areas
- State Road
- Local Road

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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- OTHER DATA SOURCED LANDGATE 2018
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LOCALITY MAP

PROJECT ID	DATE
3024	20/12/2018

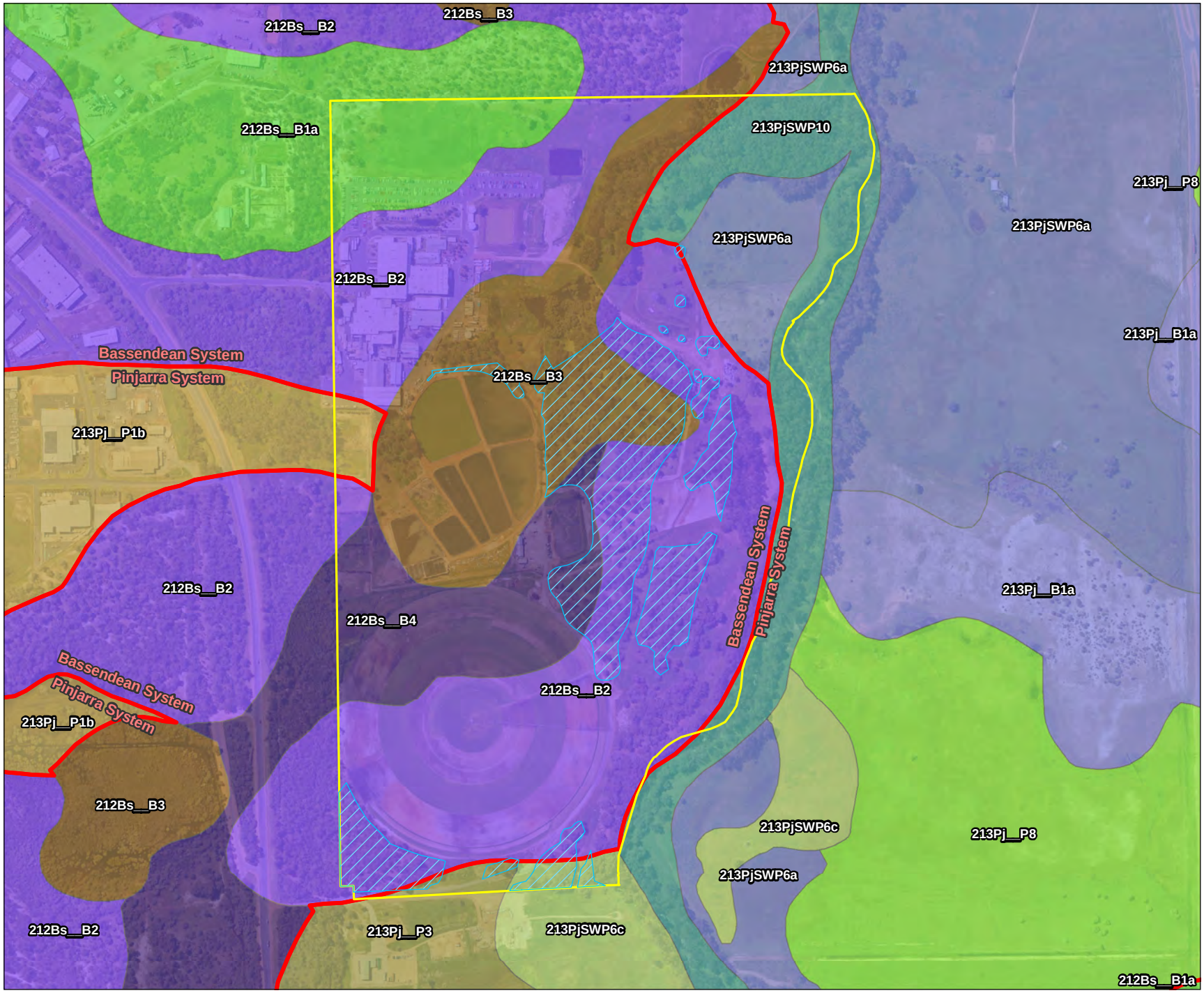
HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
SL	CM	TS	0

V & V Walsh
1 Rawlings Road, Bunbury

Native Vegetation Clearing Permit

Figure 1 Site Location and Application Area



Legend

- Site Boundary
- Application Area
- Soil Land System

Soils Subsystem

- 212Bs__B1a
- 212Bs__B2
- 212Bs__B3
- 212Bs__B4
- 213PjSWP10
- 213PjSWP6a
- 213PjSWP6c
- 213Pj__B1a
- 213Pj__P1b
- 213Pj__P3
- 213Pj__P8

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Figure 2
Soil and Land Systems

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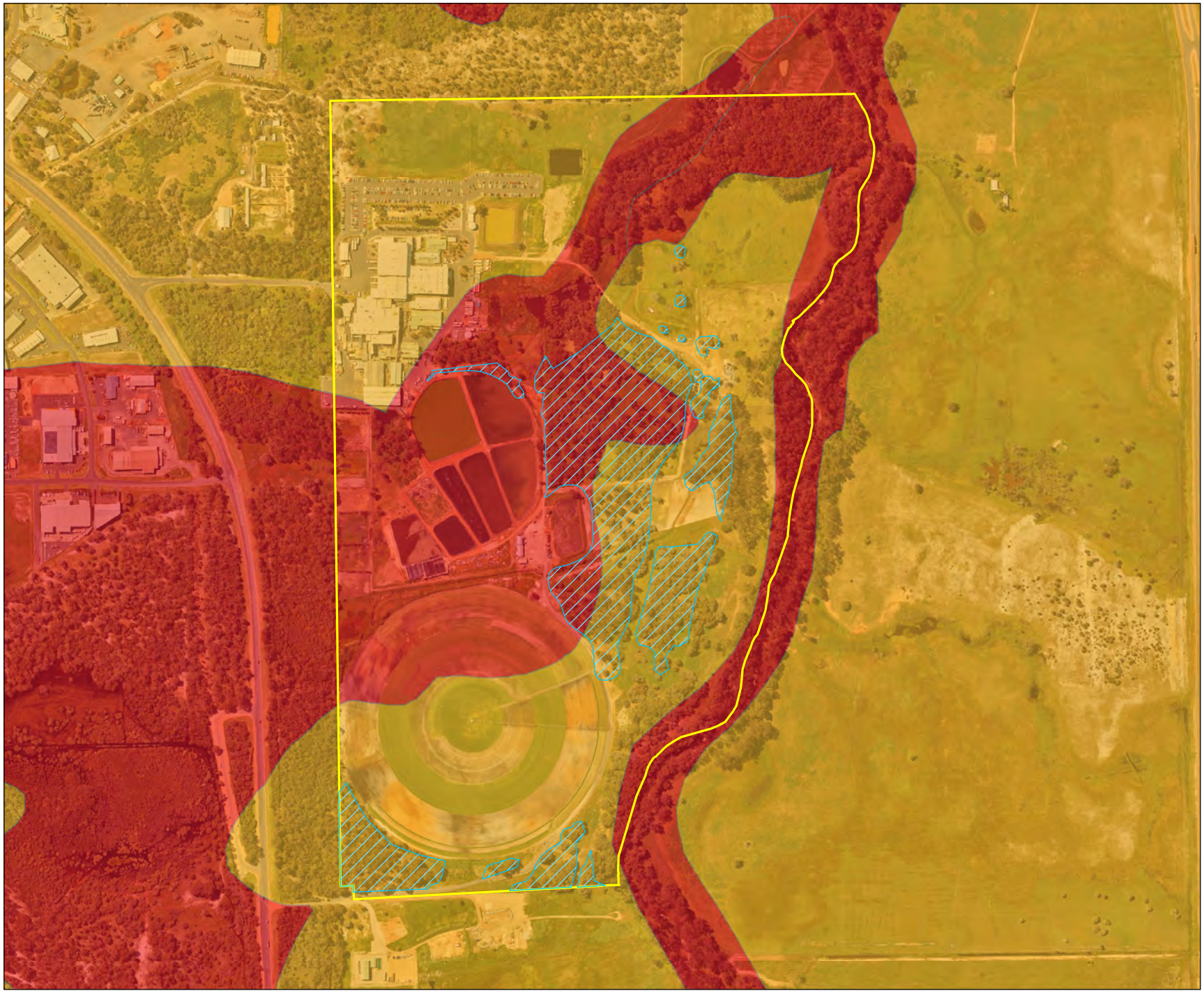

Legend

- Site Boundary
- Application Area

Acid Sulfate Soils

- High to moderate risk
- Moderate to low risk

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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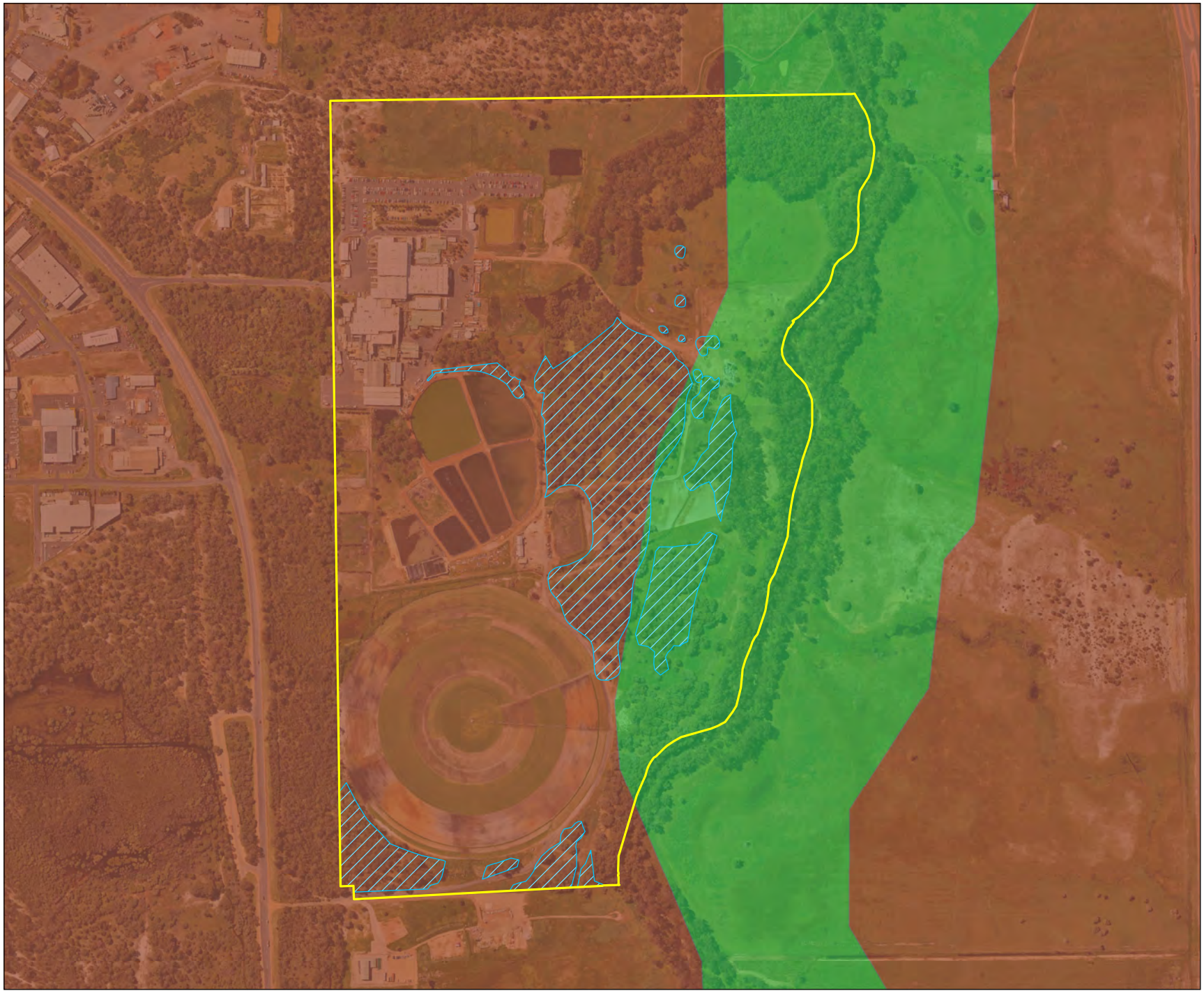
Figure 3
Acid Sulfate Soils



Legend

- Site Boundary
- Application Area

Pre-European Vegetation

- BASSENDEAN_1000
- BASSENDEAN_1182

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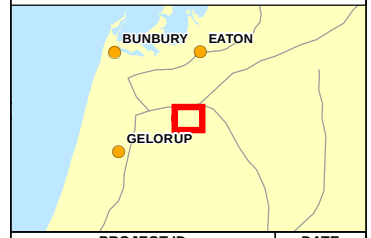

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Figure 4
Broad Vegetation Associations

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Legend

- Site Boundary
- Application Area

Geomorphic Wetlands

- Conservation Category
- Resource Enhancement Category
- Multiple Use Category
- Not Assessed

Hydrography

- Watercourse - major
- Watercourse - minor
- Drain - major
- Lake

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Figure 5
Hydrology

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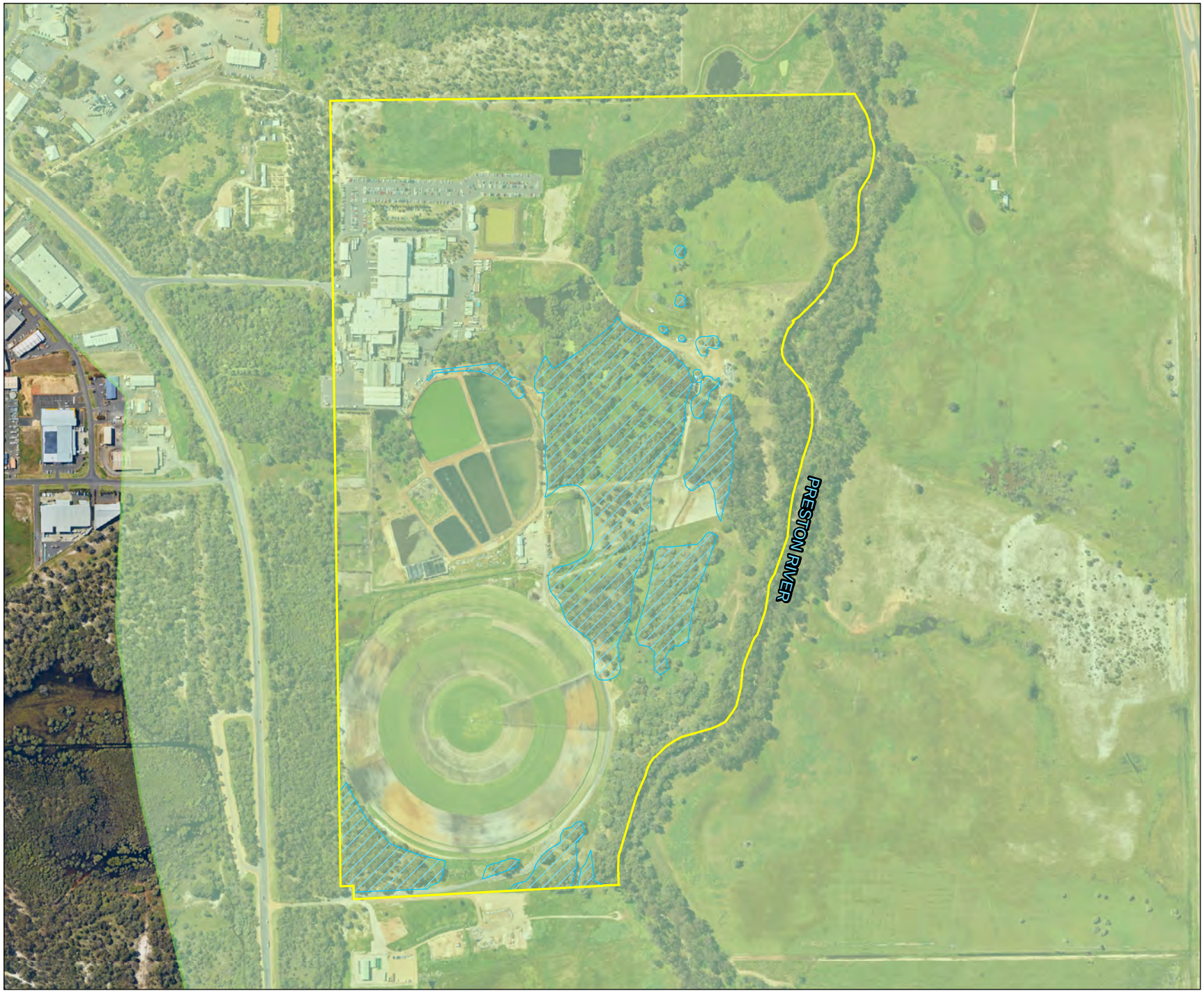

Legend

- Site Boundary
- Application Area
- Waterways Conservation Act Management Areas

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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Figure 6
Conservation Areas

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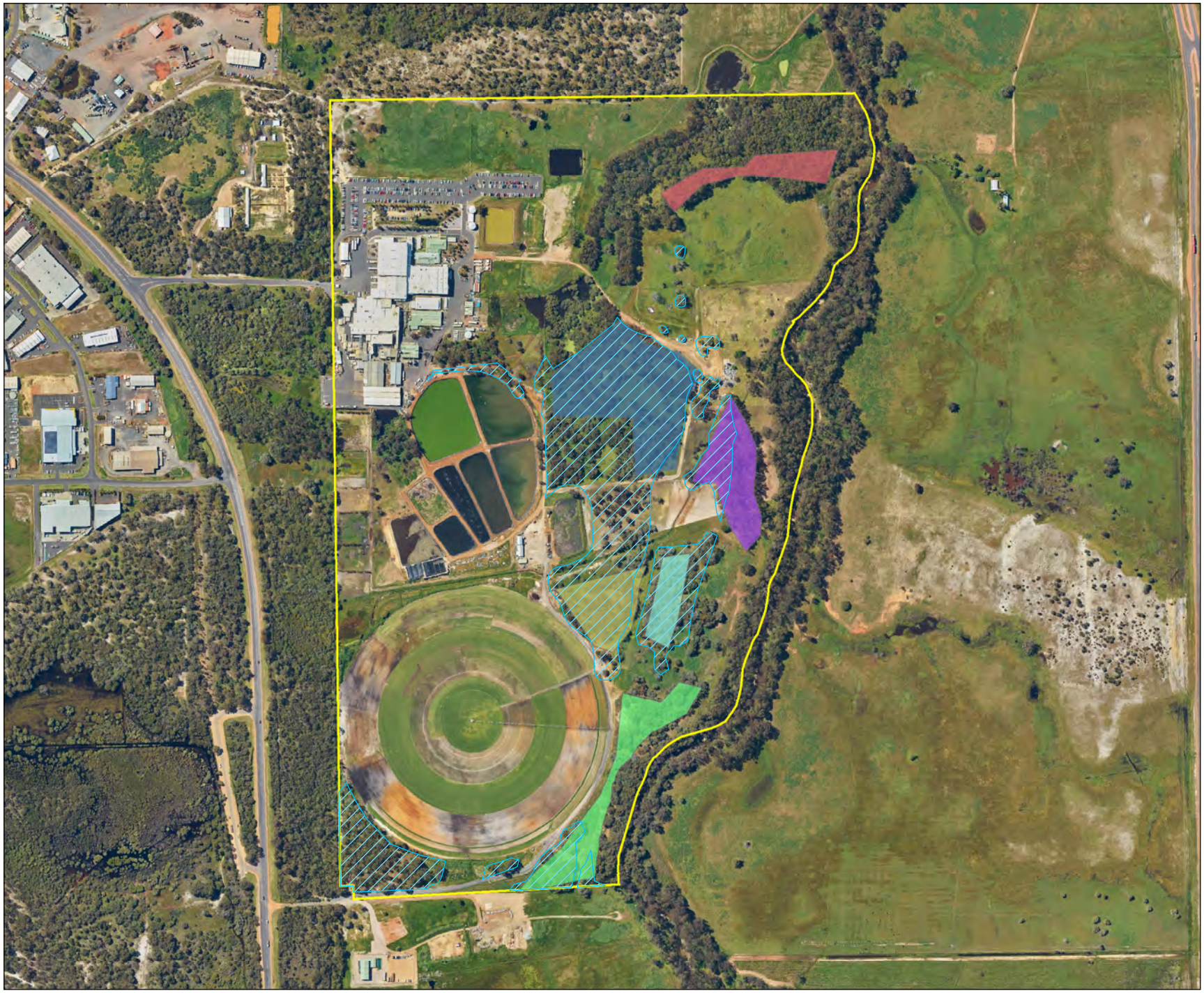

Legend

- Site Boundary
- Application Area

Previously Surveyed Areas

- Site 1
- Site 2
- Site 3
- Site 4
- Site 5
- Site 6

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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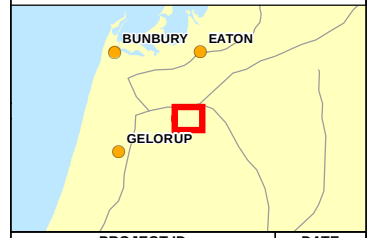

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Figure 7
Surveyed Vegetation

APPENDIX A:

Database Searches

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By Guest user on 16/11/2018

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 41' 17" E,33° 21' 48" S
Buffer 5km
Group By Family

Family	Species	Records
Acanthizidae	6	75
Accipitridae	7	44
Actinopodidae	1	10
Agamidae	2	2
Anarthriaceae	2	3
Anatidae	14	434
Ancylidae	1	1
Anhingidae	1	25
Apiaceae	5	15
Apodanthaceae	1	3
Aponogetonaceae	1	1
Araliaceae	3	4
Araneidae	7	10
Ardeidae	7	88
Arkyidae	1	3
Artamidae	2	16
Asparagaceae	13	20
Asphodelaceae	1	1
Asteraceae	14	18
Boryaceae	1	1
Bothriuridae	1	2
Bovidae	1	1
Burramyidae	1	18
Cacatuidae	1	5
Caenidae	1	1
Campanulaceae	3	4
Campephagidae	1	23
Carabidae	1	1
Caryophyllaceae	2	2
Casuarinaceae	1	1
Celastraceae	2	2
Centrolepidaceae	4	8
Charadriidae	6	57
Chenopodiaceae	2	2
Chironomidae	3	3
Cinclosomatidae	1	1
Colchicaceae	2	3
Columbidae	4	66
Commelinaceae	1	3
Convolvulaceae	1	1
Corixidae	1	1
Corvidae	1	63
Cracticidae	3	89
Crassulaceae	2	3
Cuculidae	1	3
Cyperaceae	26	39
Dasypogonaceae	1	3
Dasyuridae	2	6
Desidae	1	2
Dicruridae	4	155
Dilleniaceae	8	21
Droseraceae	5	6
Dytiscidae	1	1
Ecnomidae	1	1
Elaeocarpaceae	2	5
Elapidae	3	5
Ericaceae	6	7
Euphorbiaceae	2	3
Fabaceae	44	92
Falconidae	4	11
Felidae	1	1
Gekkonidae	1	3
Geraniaceae	1	1
Goodeniaceae	9	13
Gripopterygidae	1	1
Haematopodidae	1	41
Haemodoraceae	10	13
Halcyonidae	2	27
Haloragaceae	1	2
Hemerocallidaceae	3	6
Hirundinidae	2	64
Hydatellaceae	2	2
Hydrobatidae	1	1
Hydrocharitaceae	1	1
Hydrophilidae	1	1
Hydropsychidae	1	1
Hylidae	2	22

Hypoxidaceae	1	1
Iridaceae	3	7
Juncaceae	1	1
Juncaginaceae	1	1
Lamiaceae	1	1
Lamponidae	2	2
Laridae	6	54
Lauraceae	2	3
Lentibulariaceae	1	1
Leporidae	1	2
Leptoceridae	1	1
Leptophlebiidae	1	1
Limnodynastidae	2	152
Linyphiidae	1	1
Loganiaceae	1	1
Loranthaceae	1	1
Lycosidae	3	3
Lythraceae	1	1
Macropodidae	2	27
Maluridae	2	21
Malvaceae	1	3
Meliphagidae	6	194
Menyanthaceae	2	3
Meropidae	1	12
Miturgidae	2	2
Muridae	2	3
Myobatrachidae	4	70
Myrtaceae	25	42
Nemesiidae	2	15
Neosittidae	1	2
Nicodamidae	1	1
Oligochaeta	1	1
Onagraceae	1	1
Orchidaceae	24	59
Orobanchaceae	1	1
Pachycephalidae	2	51
Palaemonidae	1	1
Parastacidae	1	1
Pardalotidae	1	23
Pelecanidae	1	31
Peramelidae	1	3
Peronosporaceae	1	8
Petroicidae	1	15
Phalacrocoracidae	6	130
Phalangeridae	2	24
Pholcidae	1	1
Phrymaceae	1	1
Plantaginaceae	2	2
Poaceae	23	37
Podargidae	1	1
Podicipedidae	4	75
Polygalaceae	2	3
Potamogetonaceae	1	1
Primulaceae	2	2
Procellariidae	1	1
Prodidomidae	1	1
Proteaceae	10	22
Pseudocheiridae	1	536
Psittacidae	13	133
Pygopodidae	1	2
Rallidae	8	199
Recurvirostridae	3	20
Restionaceae	6	9
Rutaceae	3	8
Scincidae	13	62
Scolopacidae	12	89
Scolopendridae	1	1
Scrophulariaceae	1	1
Scutigeridae	1	1
Selaginellaceae	1	1
Simuliidae	1	1
Solanaceae	1	1
Sparassidae	1	1
Staphylinidae	1	1
Stylidiaceae	11	14
Suidae	1	1
Sulidae	1	1
Sylviidae	2	24
Theridiidae	1	7
Threskiornithidae	3	65
Thymelaeaceae	3	5
Trochanteriidae	1	2
Veliidae	1	1
Violaceae	1	1
Xanthorrhoeaceae	2	5
Zamiaceae	1	1
Zosteropidae	1	62
TOTAL	**558**	**4074**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acanthizidae					
1.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
2.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
3.	24262	*Acanthiza inornata (Western Thornbill)*			
4.	25530	*Gerygone fusca (Western Gerygone)*			
5.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
6.	30948	*Smicrornis brevirostris (Weebill)*			
Accipitridae					
7.	25536	*Accipiter fasciatus (Brown Goshawk)*			
8.	24285	*Aquila audax (Wedge-tailed Eagle)*			
9.	24288	*Circus approximans (Swamp Harrier)*			
10.		*Elanus axillaris*			
11.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*			
12.	24295	*Haliastur sphenurus (Whistling Kite)*			
13.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	
Actinopodidae					
14.		*Missulena granulosa*			
Agamidae					
15.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
16.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
Anarthriaceae					
17.	1097	*Lyginia barbata*			
18.	18049	*Lyginia imberbis*			
Anatidae					
19.	24310	*Anas castanea (Chestnut Teal)*			
20.	24312	*Anas gracilis (Grey Teal)*			
21.	24313	*Anas platyrhynchos (Mallard)*			
22.		*Anas platyrhynchos subsp. domesticus*			
23.	24315	*Anas rhynchotis (Australasian Shoveler)*			
24.	24316	*Anas superciliosa (Pacific Black Duck)*			
25.	24318	*Aythya australis (Hardhead)*			
26.	24319	*Biziura lobata (Musk Duck)*			
27.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
28.	24322	*Cygnus atratus (Black Swan)*			
29.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
30.	24328	*Oxyura australis (Blue-billed Duck)*		P4	
31.	24329	*Stictonetta naevosa (Freckled Duck)*			
32.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
Ancylidae					
33.		*Ancylidae sp.*			
Anhingidae					
34.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
Apiaceae					
35.	6222	*Homalosciadium homalocarpum*			
36.	6249	*Platysace compressa (Tapeworm Plant)*			
37.	11132	*Platysace ramosissima*		P3	
38.	6263	*Schoenolaena juncea*			
39.	6289	*Xanthosia huegelii*			
Apodanthaceae					
40.	2408	*Pilostyles hamiltonii*			
Aponogetonaceae					
41.	141	*Aponogeton hexatepalus (Stalked Water Ribbons)*		P4	
Araliaceae					
42.	6223	*Hydrocotyle alata*			
43.	6225	*Hydrocotyle bonariensis*	Y		
44.	6280	*Trachymene pilosa (Native Parsnip)*			
Araneidae					
45.		*Argiope protensa*			
46.		*Austracantha minax*			
47.		*Backobourkia brounii*			
48.		*Backobourkia heroine*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
49.		*Cyclosa trilobata*			
50.		*Eriophora biapicata*			
51.		*Nephila edulis*			
Ardeidae					
52.	25558	*Ardea ibis (Cattle Egret)*			
53.	41324	*Ardea modesta (great egret, white egret)*			
54.	24340	*Ardea novaehollandiae (White-faced Heron)*			
55.	24341	*Ardea pacifica (White-necked Heron)*			
56.		*Egretta garzetta*			
57.		*Egretta novaehollandiae*			
58.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
Arkyidae					
59.		*Arkys walckenaeri*			
Artamidae					
60.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
61.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
Asparagaceae					
62.	1287	*Dichopogon capillipes*			
63.	1223	*Lomandra caespitosa (Tufted Mat Rush)*			
64.	1228	*Lomandra hermaphrodita*			
65.	1234	*Lomandra nigricans*			
66.	1236	*Lomandra odora (Tiered Matrush)*			
67.	1239	*Lomandra preissii*			
68.	1240	*Lomandra purpurea (Purple Mat Rush)*			
69.	1246	*Lomandra suaveolens*			
70.	1318	*Thysanotus arbuscula*			
71.	1319	*Thysanotus arenarius*			
72.	1351	*Thysanotus sparteus*			
73.	1354	*Thysanotus tenellus*			
74.	1357	*Thysanotus thyrsoideus*			
Asphodelaceae					
75.	1368	*Trachyandra divaricata*	Y		
Asteraceae					
76.	7829	*Angianthus drummondii*		P3	
77.	7833	*Angianthus preissianus*			
78.	7851	*Asteridea pulverulenta (Common Bristle Daisy)*			
79.	7947	*Cotula turbinata (Funnel Weed)*	Y		
80.	13354	*Craspedia variabilis*			
81.	29054	*Crepis foetida subsp. foetida (Stinking Hawksbeard)*	Y		
82.	15137	*Euchiton sphaericus*			
83.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
84.	8179	*Podolepis nutans (Nodding Podolepis)*			
85.	8225	*Siloxerus humifusus (Procumbent Siloxerus)*			
86.	8227	*Silybum marianum (Variegated Thistle)*	Y		
87.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
88.	8255	*Ursinia anthemoides (Ursinia)*	Y		
89.	8257	*Vellereophyton dealbatum (White Cudweed)*	Y		
Boryaceae					
90.	1272	*Borya scirpoidea*			
Bothriuridae					
91.		*Cercophonius sulcatus*			
Bovidae					
92.	24251	*Bos taurus (European Cattle)*	Y		
Burramyidae					
93.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
Cacatuidae					
94.		*Eolophus roseicapillus*			
Caenidae					
95.		*Caenidae sp.*			
Campanulaceae					
96.	37500	*Grammatotheca bergiana var. bergiana*	Y		
97.	37440	*Monopsis debilis var. depressa*	Y		
98.	7389	*Wahlenbergia preissii*			

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Campephagidae					
99.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
Carabidae					
100.		*Carabidae sp.*			
Caryophyllaceae					
101.	2905	*Polycarpon tetraphyllum (Fourleaf Allseed)*	Y		
102.	2912	*Spergula arvensis (Corn Spurry)*	Y		
Casuarinaceae					
103.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
Celastraceae					
104.	4733	*Stackhousia monogyna*			
105.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
Centrolepidaceae					
106.	1117	*Aphelia cyperoides*			
107.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
108.	1125	*Centrolepis drummondiana*			
109.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
Charadriidae					
110.	25575	*Charadrius leschenaultii (Greater Sand Plover)*		IA	
111.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
112.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
113.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
114.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
115.	24386	*Vanellus tricolor (Banded Lapwing)*			
Chenopodiaceae					
116.	2483	*Chenopodium album (Fat Hen)*	Y		
117.	33500	*Dysphania ambrosioides (Mexican Tea)*	Y		
Chironomidae					
118.		*Chironominae sp.*			
119.		*Orthocladiinae sp.*			
120.		*Tanypodinae sp.*			
Cinclosomatidae					
121.	24388	*Psophodes nigrogularis subsp. nigrogularis (Western Whipbird (western heath))*		T	
Colchicaceae					
122.	12770	*Burchardia congesta*			
123.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
Columbidae					
124.	24399	*Columba livia (Domestic Pigeon)*	Y		
125.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
126.	24409	*Phaps chalcoptera (Common Bronzewing)*			
127.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
Commelinaceae					
128.	1162	*Cartonema philydroides*			
Convolvulaceae					
129.	6659	*Wilsonia humilis (Silky Wilsonia)*			
Corixidae					
130.		*Corixidae sp.*			
Corvidae					
131.	25592	*Corvus coronoides (Australian Raven)*			
Cracticidae					
132.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
133.	25595	*Cracticus tibicen (Australian Magpie)*			
134.	25596	*Cracticus torquatus (Grey Butcherbird)*			
Crassulaceae					
135.	3137	*Crassula colorata (Dense Stonecrop)*			
136.	11563	*Crassula colorata var. colorata*			
Cuculidae					
137.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
Cyperaceae					
138.	743	*Baumea juncea (Bare Twigrush)*			
139.	759	*Carex tereticaulis*			

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				P3	
140.	768	*Cyathochaeta avenacea*			
141.	792	*Cyperus eragrostis (Umbrella Sedge)*	Y		
142.	822	*Eleocharis acuta (Common Spikerush)*			
143.	907	*Gahnia trifida (Coast Saw-sedge)*			
144.	20200	*Isolepis cernua var. setiformis*			
145.	912	*Isolepis cyperoides*			
146.	917	*Isolepis marginata (Coarse Club-rush)*			
147.	919	*Isolepis oldfieldiana*			
148.	925	*Lepidosperma angustatum*			
149.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
150.	940	*Lepidosperma pubisquameum*			
151.	20398	*Lepidosperma sp. Blackwood (R. Davis 7696)*			
152.	29150	*Lepidosperma sp. Margaret River (B.J. Lepschi 1841)*			
153.	945	*Lepidosperma squamatum*			
154.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
155.	968	*Schoenoplectus pungens (Sharpleaf Rush)*			
156.	973	*Schoenus asperocarpus (Poison Sedge)*			
157.	974	*Schoenus benthamii*		P3	
158.	986	*Schoenus efoliatus*			
159.	996	*Schoenus laevigatus*			
160.	17614	*Schoenus plumosus*			
161.	1011	*Schoenus rigens*			
162.	1013	*Schoenus sculptus (Gimlet Bog-rush)*			
163.	1036	*Tetraria octandra*			
Dasypogonaceae					
164.	1218	*Dasypogon bromeliifolius (Pineapple Bush)*			
Dasyuridae					
165.	25508	*Phascogale tapoatafa (Brush-tailed Phascogale)*		S	
166.	48070	*Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale, Wambenger)*		S	
Desidae					
167.		*Baiami volucripes*			
Dicruridae					
168.	24443	*Grallina cyanoleuca (Magpie-lark)*			
169.	48096	*Rhipidura albiscapa (Grey Fantail)*			
170.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
171.	25616	*Rhipidura rufiventris (Northern Fantail)*			
Dilleniaceae					
172.	5109	*Hibbertia amplexicaulis*			
173.	20051	*Hibbertia diamesogenos*			
174.	5135	*Hibbertia hypericoides (Yellow Buttercups)*			
175.	45534	*Hibbertia hypericoides subsp. hypericoides*			
176.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
177.	5172	*Hibbertia stellaris (Orange Stars)*			
178.	5173	*Hibbertia subvaginata*			
179.	5176	*Hibbertia vaginata*			
Droseraceae					
180.	3097	*Drosera gigantea (Giant Sundew)*			
181.	11853	*Drosera menziesii subsp. menziesii*			
182.	3118	*Drosera pallida (Pale Rainbow)*			
183.	8911	*Drosera rosulata*			
184.	13205	*Drosera tubaestylis*			
Dytiscidae					
185.		*Dytiscidae sp.*			
Ecnomidae					
186.		*Ecnomidae sp.*			
Elaeocarpaceae					
187.	4524	*Platytheca galioides*			
188.	48341	*Tetratheca hirsuta subsp. viminea*			
Elapidae					
189.	25250	*Elapognathus coronatus (Crowned Snake)*			
190.	25252	*Notechis scutatus (Tiger Snake)*			
191.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			

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Ericaceae					
192.	6334	*Astroloma pallidum (Kick Bush)*			
193.	6348	*Conostephium pendulum (Pearl Flower)*			
194.	6374	*Leucopogon conostephioides*			
195.	6436	*Leucopogon propinquus*			
196.	6440	*Leucopogon racemulosus*			
197.	34736	*Lysinema pentapetalum*			
Euphorbiaceae					
198.	4585	*Amperea ericoides*			
199.	4666	*Monotaxis occidentalis*			
Fabaceae					
200.	3207	*Acacia alata (Winged Wattle)*			
201.	15466	*Acacia applanata*			
202.	3282	*Acacia cyclops (Coastal Wattle)*			
203.	3339	*Acacia flagelliformis*		P4	
204.	3383	*Acacia incurva*			
205.	17861	*Acacia longifolia*	Y		
206.	3442	*Acacia microbotrya (Manna Wattle, Kalyang)*			
207.	17860	*Acacia podalyriifolia*	Y		
208.	3502	*Acacia pulchella (Prickly Moses)*			
209.	15481	*Acacia pulchella var. glaberrima*			
210.	15482	*Acacia pulchella var. goadbyi*			
211.	3527	*Acacia saligna (Orange Wattle, Kudjong)*			
212.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
213.	3576	*Acacia tetragonocarpa*			
214.	3692	*Aotus procumbens*			
215.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
216.	3793	*Daviesia angulata*			
217.	19747	*Daviesia decurrens subsp. decurrens*			
218.	3832	*Daviesia physodes*			
219.	3834	*Daviesia polyphylla*			
220.	3835	*Daviesia preissii*			
221.	3880	*Eutaxia virgata*			
222.	20475	*Gastrolobium capitatum*			
223.	19190	*Gastrolobium cuneatum*			
224.	20473	*Gastrolobium ebracteolatum*			
225.	3956	*Gompholobium shuttleworthii*			
226.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
227.	3961	*Hardenbergia comptoniana (Native Wisteria)*			
228.	3968	*Hovea trisperma (Common Hovea)*			
229.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
230.	4017	*Jacksonia horrida*			
231.	4028	*Jacksonia spinosa*			
232.	4044	*Kennedia prostrata (Scarlet Runner)*			
233.	4059	*Lotus angustissimus (Narrowleaf Trefoil)*	Y		
234.	8564	*Lotus subbiflorus*	Y		
235.	4065	*Lupinus angustifolius (Narrowleaf Lupin)*	Y		
236.	4067	*Lupinus luteus (Yellow Lupin)*	Y		
237.	4085	*Melilotus indicus*	Y		
238.	19827	*Melilotus siculus*	Y		
239.	4183	*Pultenaea skinneri (Skinner's Pea)*		P4	
240.	19183	*Retama raetam*	Y		
241.	4291	*Trifolium arvense (Hare's Foot Clover)*	Y		
242.	4313	*Trifolium subterraneum (Subterranean Clover)*	Y		
243.	4320	*Vicia hirsuta (Hairy Vetch)*	Y		
Falconidae					
244.	25621	*Falco berigora (Brown Falcon)*			
245.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
246.	25623	*Falco longipennis (Australian Hobby)*			
247.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
Felidae					
248.	24041	*Felis catus (Cat)*	Y		
Gekkonidae					
249.	24980	*Christinus marmoratus (Marbled Gecko)*			
Geraniaceae					
250.	4336	*Erodium moschatum (Musky Crowfoot)*	Y		

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Goodeniaceae					
251.	7428	*Dampiera coronata (Wedge-leaved Dampiera)*			
252.	7454	*Dampiera linearis (Common Dampiera)*			
253.	7462	*Dampiera pedunculata*			
254.	7505	*Goodenia eatoniana*			
255.	12551	*Goodenia micrantha*			
256.	19286	*Goodenia pulchella subsp. Coastal Plain A (M. Hislop 634)*			
257.	7572	*Lechenaultia expansa*			
258.	7602	*Scaevola calliptera*			
259.	7619	*Scaevola lanceolata (Long-leaved Scaevola)*			
Gripopterygidae					
260.		*Gripopterygidae sp.*			
Haematopodidae					
261.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
Haemodoraceae					
262.	29487	*Anigozanthos manglesii var. x angustifolius*			
263.	1416	*Anigozanthos viridis (Green Kangaroo Paw, Kurulbardang)*			
264.	1418	*Conostylis aculeata (Prickly Conostylis)*			
265.	11826	*Conostylis aculeata subsp. aculeata*			
266.	12118	*Conostylis aculeata subsp. gracilis*			
267.	1472	*Haemodorum simplex*			
268.	1478	*Phlebocarya ciliata*			
269.	1481	*Tribonanthes australis*			
270.	1482	*Tribonanthes brachypetala*			
271.	1483	*Tribonanthes longipetala*			
Halcyonidae					
272.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
273.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
Haloragaceae					
274.	6189	*Myriophyllum crispatum*			
Hemerocallidaceae					
275.	1276	*Caesia micrantha (Pale Grass Lily)*			
276.	11283	*Corynotheca micrantha var. micrantha*			
277.	1295	*Johnsonia acaulis*			
Hirundinidae					
278.	24491	*Hirundo neoxena (Welcome Swallow)*			
279.	48061	*Petrochelidon nigricans (Tree Martin)*			
Hydatellaceae					
280.	1139	*Trithuria bibracteata*			
281.	1141	*Trithuria submersa*			
Hydrobatidae					
282.	24497	*Oceanites oceanicus (Wilson's Storm-petrel)*		IA	
Hydrocharitaceae					
283.	14531	*Ottelia ovalifolia subsp. ovalifolia*			
Hydrophilidae					
284.		*Hydrophilidae sp.*			
Hydropsychidae					
285.		*Hydropsychidae sp.*			
Hylidae					
286.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
287.	25388	*Litoria moorei (Motorbike Frog)*			
Hypoxidaceae					
288.	43762	*Pauridia occidentalis var. quadriloba*			
Iridaceae					
289.	19179	*Moraea flaccida (One-leaf Cape Tulip)*	Y		
290.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
291.	1556	*Romulea rosea (Guildford Grass)*	Y		
Juncaceae					
292.	1180	*Juncus capitatus (Capitate Rush)*	Y		
Juncaginaceae					
293.	18587	*Triglochin nana*			

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Lamiaceae					
294.	6839	*Hemiandra pungens (Snakebush)*			
Lamponidae					
295.		*Lampona cylindrata*			
296.		*Lampona punctigera*			
Laridae					
297.		*Chroicocephalus novaehollandiae*			
298.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
299.	24511	*Larus novaehollandiae subsp. novaehollandiae (Silver Gull)*			
300.	25638	*Larus pacificus (Pacific Gull)*			
301.	48594	*Sternula nereis (Fairy Tern)*			
302.	48597	*Thalasseus bergii (Crested Tern)*		IA	
Lauraceae					
303.	11501	*Cassytha glabella forma casuarinae*			
304.	2957	*Cassytha racemosa (Dodder Laurel)*			
Lentibulariaceae					
305.	7145	*Utricularia menziesii (Redcoats)*			
Leporidae					
306.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
Leptoceridae					
307.		*Leptoceridae sp.*			
Leptophlebiidae					
308.		*Leptophlebiidae sp.*			
Limnodynastidae					
309.	25410	*Heleioporus eyrei (Moaning Frog)*			
310.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
Linyphiidae					
311.		*Erigone prominens*			
Loganiaceae					
312.	16825	*Phyllangium divergens*			
Loranthaceae					
313.	2401	*Nuytsia floribunda (Christmas Tree, Mudja)*			
Lycosidae					
314.		*Artoria linnaei*			
315.		*Artoriopsis expolita*			
316.		*Venatrix pullastra*			
Lythraceae					
317.	5281	*Lythrum hyssopifolia (Lesser Loosestrife)*	Y		
Macropodidae					
318.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
319.	48022	*Notamacropus irma (Western Brush Wallaby)*		P4	
Maluridae					
320.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
321.	25654	*Malurus splendens (Splendid Fairy-wren)*			
Malvaceae					
322.	5038	*Lasiopetalum membranaceum*		P3	
Meliphagidae					
323.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
324.	24561	*Anthochaera carunculata (Red Wattlebird)*			
325.	25661	*Lichmera indistincta (Brown Honeyeater)*			
326.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
327.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
328.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
Menyanthaceae					
329.	36160	*Liparophyllum capitatum*			
330.	36181	*Ornduffia parnassifolia*			
Meropidae					
331.	24598	*Merops ornatus (Rainbow Bee-eater)*			
Miturgidae					
332.		*Mituliodon tarantulinus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
333.		*Mitzoruga insularis*			
Muridae					
334.	24223	*Mus musculus (House Mouse)*	Y		
335.	24245	*Rattus rattus (Black Rat)*	Y		
Myobatrachidae					
336.	25398	*Crinia georgiana (Quacking Frog)*			
337.	25399	*Crinia glauerti (Clicking Frog)*			
338.	25400	*Crinia insignifera (Squelching Froglet)*			
339.	25404	*Geocrinia leai (Ticking Frog)*			
Myrtaceae					
340.	20350	*Astartea affinis (West-coast Astartea)*			
341.	20283	*Astartea scoparia (Common Astartea)*			
342.	42801	*Astartea zephyra*			
343.	5415	*Calothamnus lateralis*			
344.	35797	*Calothamnus lateralis var. lateralis*			
345.	5458	*Calytrix flavescens (Summer Starflower)*			
346.	5708	*Eucalyptus marginata (Jarrah, Djara)*			
347.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
348.	13512	*Eucalyptus rudis subsp. cratyantha*		P4	
349.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
350.	5832	*Kunzea ericifolia (Spearwood, Pondil)*			
351.	15498	*Kunzea glabrescens (Spearwood)*			
352.	5835	*Kunzea micrantha*			
353.	17461	*Kunzea micrantha subsp. micrantha*			
354.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
355.	20297	*Melaleuca osullivanii*			
356.	5946	*Melaleuca pauciflora*			
357.	5952	*Melaleuca preissiana (Moonah)*			
358.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
359.	18598	*Melaleuca systena*			
360.	5978	*Melaleuca teretifolia (Banbar)*			
361.	5980	*Melaleuca thymoides*			
362.	6006	*Pericalymma ellipticum (Swamp Teatree)*			
363.	16477	*Pericalymma ellipticum var. ellipticum*			
364.	12392	*Verticordia attenuata*		P3	
Nemesiidae					
365.		*Aname mainae*			
366.		*Aname tepperi*			
Neosittidae					
367.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
Nicodamidae					
368.		*Nicodamus mainae*			
Oligochaeta					
369.		*Oligochaeta sp.*			
Onagraceae					
370.	6140	*Oenothera mollissima*	Y		
Orchidaceae					
371.	15332	*Caladenia attingens subsp. attingens*			
372.	15579	*Caladenia chapmanii*			
373.	1592	*Caladenia flava (Cowslip Orchid)*			
374.	15371	*Caladenia nana subsp. nana*			
375.	15503	*Caladenia paludosa*			
376.	18026	*Caladenia pendens subsp. pendens*			
377.	13862	*Caladenia speciosa*		P4	
378.	15404	*Cyanicula sericea*			
379.	10796	*Diuris drummondii (Tall Donkey Orchid)*		T	
380.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
381.	1644	*Elythranthera emarginata (Pink Enamel Orchid)*			
382.	1646	*Eriochilus dilatatus (White Bunny Orchid)*			
383.	15410	*Eriochilus dilatatus subsp. dilatatus*			
384.	15412	*Eriochilus dilatatus subsp. multiflorus*			
385.	1653	*Leporella fimbriata (Hare Orchid)*			
386.	10954	*Microtis media (Tall Mignonette Orchid)*			
387.	15419	*Microtis media subsp. media*			
388.	1676	*Prasophyllum hians (Yawning Leek Orchid)*			
389.	44084	*Prasophyllum sp. early (G. Brockman GBB 1626)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
390.	1685	*Pterostylis angusta*			
391.	11118	*Pterostylis pyramidalis (Snail Orchid)*			
392.	1694	*Pterostylis rogersii (Curled-tongue Shell Orchid)*			
393.	1698	*Pterostylis vittata (Banded Greenhood)*			
394.	1717	*Thelymitra variegata (Queen of Sheba)*		P2	
Orobanchaceae					
395.	7090	*Parentucellia viscosa (Sticky Bartsia)*	Y		
Pachycephalidae					
396.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
397.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
Palaemonidae					
398.		*Palaemonidae sp.*			
Parastacidae					
399.		*Parastacidae sp.*			
Pardalotidae					
400.	25682	*Pardalotus striatus (Striated Pardalote)*			
Pelecanidae					
401.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
Peramelidae					
402.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		P4	
Peronosporaceae					
403.		*Phytophthora cinnamomi*			
Petroicidae					
404.	48066	*Petroica boodang (Scarlet Robin)*			
Phalacrocoracidae					
405.		*Microcarbo melanoleucos*			
406.	25697	*Phalacrocorax carbo (Great Cormorant)*			
407.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
408.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
409.	25699	*Phalacrocorax varius (Pied Cormorant)*			
410.	24668	*Phalacrocorax varius subsp. hypoleucos (Pied Cormorant)*			
Phalangeridae					
411.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
412.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
Pholcidae					
413.		*Pholcus phalangioides*			
Phrymaceae					
414.	7060	*Glossostigma diandrum*			
Plantaginaceae					
415.	14282	*Gratiola pubescens*			
416.	7108	*Veronica arvensis (Wall Speedwell)*	Y		
Poaceae					
417.	184	*Aira caryophyllea (Silvery Hairgrass)*	Y		
418.	202	*Anthoxanthum odoratum (Sweet Vernal Grass)*	Y		
419.	38480	*Austrostipa bronwenae*		T	
420.	17233	*Austrostipa campylachne*			
421.	17234	*Austrostipa compressa*			
422.	38481	*Austrostipa jacobsiana*		T	
423.	17253	*Austrostipa semibarbata*			
424.	231	*Avellinia michelii*	Y		
425.	244	*Briza maxima (Blowfly Grass)*	Y		
426.	245	*Briza minor (Shivery Grass)*	Y		
427.	248	*Bromus catharticus (Prairie Grass)*	Y		
428.	41570	*Cenchrus spinifex (Spiny Burrgrass)*	Y		
429.	48259	*Cortaderia selloana subsp. selloana*	Y		
430.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
431.	444	*Holcus lanatus (Yorkshire Fog)*	Y		
432.	19955	*Lachnagrostis plebeia*			
433.	478	*Lolium rigidum (Wimmera Ryegrass)*	Y		
434.	485	*Microlaena stipoides (Weeping Grass)*			
435.	583	*Polypogon tenellus*			
436.	40426	*Rytidosperma occidentale*			
437.	636	*Stenotaphrum secundatum (Buffalo Grass)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
			Y		
438.	722	*Vulpia bromoides (Squirrel Tail Fescue)*	Y		
439.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
Podargidae					
440.	25703	*Podargus strigoides (Tawny Frogmouth)*			
Podicipedidae					
441.	25704	*Podiceps cristatus (Great Crested Grebe)*			
442.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
443.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
444.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
Polygalaceae					
445.	4554	*Comesperma flavum*			
446.	4564	*Comesperma virgatum (Milkwort)*			
Potamogetonaceae					
447.	110	*Potamogeton drummondii*			
Primulaceae					
448.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
449.	6483	*Samolus junceus*			
Procellariidae					
450.	41326	*Ardenna carneipes (Flesh-footed Shearwater, Fleshy-footed Shearwater)*		T	
Prodidomidae					
451.		*Cryptoerithus quobba*			
Proteaceae					
452.	1790	*Adenanthos meisneri*			
453.	1791	*Adenanthos obovatus (Basket Flower)*			
454.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
455.	1830	*Banksia littoralis (Swamp Banksia, Pungura)*			
456.	2212	*Hakea sulcata (Furrowed Hakea)*			
457.	2216	*Hakea varia (Variable-leaved Hakea)*			
458.	2267	*Persoonia longifolia (Snottygobble)*			
459.	2299	*Petrophile linearis (Pixie Mops)*			
460.	2316	*Stirlingia latifolia (Blueboy)*			
461.	2331	*Xylomelum occidentale (Woody Pear, Djandin)*			
Pseudocheiridae					
462.	24166	*Pseudocheirus occidentalis (Western Ringtail Possum, ngwayir)*		T	
Psittacidae					
463.		*Barnardius zonarius*			
464.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
465.	25716	*Cacatua sanguinea (Little Corella)*			
466.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
467.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
468.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)*		T	
469.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
470.	24738	*Neophema elegans (Elegant Parrot)*			
471.	25720	*Platycercus icterotis (Western Rosella)*			
472.	24745	*Platycercus icterotis subsp. icterotis (Western Rosella)*			
473.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			
474.	25722	*Polytelis anthopeplus (Regent Parrot)*			
475.		*Purpureicephalus spurius*			
Pygopodidae					
476.	25005	*Lialis burtonis*			
Rallidae					
477.	25727	*Fulica atra (Eurasian Coot)*			
478.	24761	*Fulica atra subsp. australis (Eurasian Coot)*			
479.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
480.	24763	*Gallinula tenebrosa subsp. tenebrosa (Dusky Moorhen)*			
481.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
482.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
483.	24767	*Porphyrio porphyrio subsp. bellus (Purple Swamphen)*			
484.	24771	*Porzana tabuensis (Spotless Crake)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Recurvirostridae					
485.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
486.	25734	*Himantopus himantopus (Black-winged Stilt)*			
487.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
Restionaceae					
488.	17691	*Desmocladus fasciculatus*			
489.	1070	*Hypolaena exsulca*			
490.	1071	*Hypolaena fastigiata*			
491.	17841	*Hypolaena pubescens*			
492.	1078	*Leptocarpus coangustatus*			
493.	46379	*Leptocarpus thysananthus*			
Rutaceae					
494.	4417	*Boronia dichotoma*			
495.	4441	*Boronia spathulata (Boronia)*			
496.	18529	*Philotheca spicata (Pepper and Salt)*			
Scincidae					
497.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
498.	30893	*Cryptoblepharus buchananii*			
499.	25047	*Ctenotus impar*			
500.	25049	*Ctenotus labillardieri*			
501.	41641	*Ctenotus ora (Coastal Plains Skink)*		P3	
502.	25096	*Egernia kingii (King's Skink)*			
503.	25100	*Egernia napoleonis*			
504.	25119	*Hemiergis quadrilineata*			
505.	25131	*Lerista distinguenda*			
506.	25133	*Lerista elegans*			
507.	25184	*Menetia greyii*			
508.	25191	*Morethia lineoocellata*			
509.	25519	*Tiliqua rugosa*			
Scolopacidae					
510.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
511.	25738	*Calidris canutus (Red Knot, knot)*		IA	
512.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
513.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
514.	24790	*Calidris tenuirostris (Great Knot)*		T	
515.	30932	*Limosa lapponica (Bar-tailed Godwit)*		IA	
516.	24798	*Numenius madagascariensis (Eastern Curlew)*		T	
517.	25742	*Numenius phaeopus (Whimbrel)*		IA	
518.	24803	*Tringa brevipes (Grey-tailed Tattler)*		P4	
519.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
520.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
521.	41351	*Xenus cinereus (Terek Sandpiper)*		IA	
Scolopendridae					
522.		*Cormocephalus hartmeyeri*			
Scrophulariaceae					
523.	7289	*Myoporum caprarioides (Slender Myoporum)*			
Scutigeridae					
524.		*Allothereua maculata*			
Selaginellaceae					
525.	6	*Selaginella gracillima (Tiny Clubmoss)*			
Simuliidae					
526.		*Simuliidae sp.*			
Solanaceae					
527.	7022	*Solanum nigrum (Black Berry Nightshade)*	Y		
Sparassidae					
528.		*Isopeda leishmanni*			
Staphylinidae					
529.		*Staphylinidae sp.*			
Stylidiaceae					
530.	7677	*Levenhookia stipitata (Common Stylewort)*			
531.	30278	*Stylidium androsaceum*			
532.	7693	*Stylidium brunonianum (Pink Fountain Triggerplant)*			
533.	7696	*Stylidium calcaratum (Book Triggerplant)*			
534.	7713	*Stylidium dichotomum (Pins-and-needles)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
535.	7745	*Stylidium junceum (Reed Triggerplant)*			
536.	7756	*Stylidium longitubum (Jumping Jacks)*		P4	
537.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
538.	7798	*Stylidium schoenoides (Cow Kicks)*			
539.		*Stylidium sp.*			
540.	7806	*Stylidium utricularioides (Pink Fan Triggerplant)*			
Suidae					
541.	24259	*Sus scrofa (Pig)*	Y		
Sulidae					
542.	48008	*Morus serrator (Australasian Gannet)*			
Sylviidae					
543.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
544.	25758	*Megalurus gramineus (Little Grassbird)*			
Theridiidae					
545.		*Latrodectus hasseltii*			
Threskiornithidae					
546.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
547.	24842	*Platalea regia (Royal Spoonbill)*			
548.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
Thymelaeaceae					
549.	11402	*Pimelea imbricata var. piligera*			
550.	5252	*Pimelea lanata*			
551.	5255	*Pimelea longiflora*			
Trochanteriidae					
552.		*Platorish gelorup*			
Veliidae					
553.		*Veliidae sp.*			
Violaceae					
554.	5221	*Hybanthus floribundus*			
Xanthorrhoeaceae					
555.	1280	*Chamaescilla corymbosa (Blue Squill)*			
556.	1251	*Xanthorrhoea brunonis*			
Zamiaceae					
557.	85	*Macrozamia riedlei (Zamia, Djiridji)*			
Zosteropidae					
558.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

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

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

Australian Government
Department of the Environment and Energy

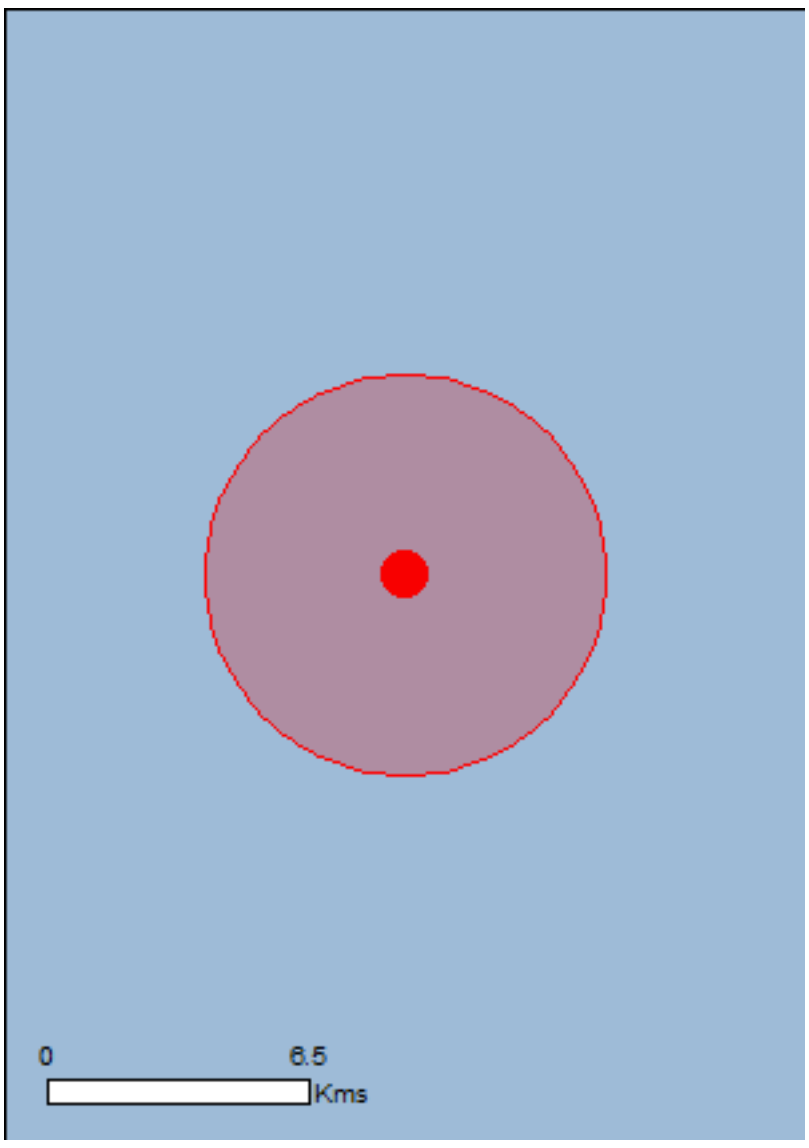
EPBC Act Protected Matters Report

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: 06/12/18 13:10:49



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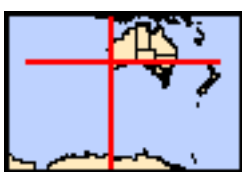

Summary

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:	2
Listed Threatened Species:	52
Listed Migratory Species:	35

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:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	36
Whales and Other Cetaceans:	4
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:	1
Regional Forest Agreements:	None
Invasive Species:	29
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Clay Pans of the Swan Coastal Plain	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
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area
Calyptorhynchus baudinii Baudin's Cockatoo, Long-billed Black-Cockatoo [769]	Endangered	Breeding known 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 dabbenena Tristan Albatross [66471]	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

Name	Status	Type of Presence
		related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
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 known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to 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		
Nannatherina balstoni Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat may occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat 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 may occur within area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat known to occur within area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat may occur within area
Other		

Name	Status	Type of Presence
[Westralunio carteri](#) Carter's Freshwater Mussel, Freshwater Mussel [86266]	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
[Austrostipa bronwenae](#) [87808]	Endangered	Species or species habitat known to occur within area
[Austrostipa jacobsiana](#) [87809]	Critically Endangered	Species or species habitat known to occur within area
[Banksia nivea subsp. uliginosa](#) Swamp Honeypot [82766]	Endangered	Species or species habitat may occur within area
[Banksia squarrosa subsp. argillacea](#) Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat may occur within area
[Brachyscias verecundus](#) Ironstone Brachyscias [81321]	Critically Endangered	Species or species habitat may 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
[Chamelaucium sp. S coastal plain (R.D.Royce 4872)](#) Royce's Waxflower [87814]	Vulnerable	Species or species habitat may occur within area
[Diuris drummondii](#) Tall Donkey Orchid [4365]	Vulnerable	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 likely to occur within area
[Eleocharis keigheryi](#) Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat likely to occur within area
[Lambertia echinata subsp. occidentalis](#) Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area
[Synaphea sp. Fairbridge Farm (D. Papenfus 696)](#) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area
[Synaphea sp. Serpentine (G.R. Brand 103)](#) [86879]	Critically Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
[Synaphea stenoloba](#)		
Dwellingup Synaphea [66311]	Endangered	Species or species habitat may occur 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 likely to occur within area
[Natator depressus](#)		
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sharks		
[Carcharodon carcharias](#)		
White Shark, Great White Shark [64470]	Vulnerable	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		
[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 dabbenena](#)		
Tristan Albatross [66471]	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
[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

Name	Threatened	Type of Presence
Thalassarche cauta		
Tasmanian 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*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may 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 likely 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 likely to occur within area
Lagenorhynchus obscurus		
Dusky Dolphin [43]		Species or species habitat may occur within area
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
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

Name	Threatened	Type of Presence
		habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known 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 known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to 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 -
Defence - BUNBURY TRAINING DEPOT

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]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	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
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to 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 known to 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 known to occur within area

Name	Threatened	Type of Presence
Puffinus carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Thalassarche cauta		
Tasmanian 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*	Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis		
Hooded Plover [59510]		Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
Mammals		
Neophoca cinerea		
Australian Sea-lion, Australian Sea Lion [22]	Vulnerable	Species or species habitat may occur 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 likely to occur within area
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		
Balaenoptera edeni		
Bryde's Whale [35]		Species or species habitat may occur within area
Caperea marginata		
Pygmy Right Whale [39]		Species or species habitat may occur within area
Lagenorhynchus obscurus		
Dusky Dolphin [43]		Species or species habitat may occur within area
Megaptera novaeangliae		
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Unnamed WA40552	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		
Anas platyrhynchos Mallard [974]		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
Mammals		
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
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		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
Asparagus declinatus Bridal Veil, Bridal Veil Creeper, Pale Berry Asparagus Fern, Asparagus Fern, South African Creeper [66908]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		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
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
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 within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and		Species or species

Name	Status	Type of Presence
Sterile Pussy Willow [68497]		habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-33.36333 115.68806

Acknowledgements

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

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

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

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

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APPENDIX B:

V & V Walsh Vegetation Assessment – Cape Life

Vegetation Assessment Report

Prepared for V & V Walsh

May 2018

ABN: 48339198308

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Contents

1. Introduction

V & V Walsh operate an abattoir at Lot 1050 South Western Hwy, Davenport, approximately 150 km south of Perth (Map 1). Due to an increase in the volume of treated waste water V & V Walsh have undertaken to expand the area of dewatering through the installation of drip irrigation at six sites within their boundary (Map 2). At the request of V & W Walsh, Cape Life conducted an assessment of the vegetation at these six sites to determine if native vegetation was present, and if so, the type and extent of the native vegetation. The assessment was conducted on the 25th May 2018, this report details the findings from that assessment. The condition of the vegetation has been rated according to the Keighery Scale (Appendix 2).

2. Vegetation Assessment

2.1 Site 1

Site 1 is the northern most site and consists of mature native trees dominated by Marri (*Corymbia calophylla*) with scattered Peppermint trees (*Agonis flexuosa*) and Flooded Gums (*Eucalyptus rudis*) over introduced grasses, *Oxalis* weeds and scattered *Solanum linnaeanum* weeds. The Marri trees form a continuous canopy over most of the site however there is no native midstorey or understorey species present. The entire site is considered degraded to completely degraded. The site is bounded by native vegetation to the north and pasture to the south.

2.2 Site 2

Area 2 consists of three main vegetation types namely plantations of introduced *Eucalyptus* species, wetlands dominated by *Melaleuca raphiophylla* and mixed stands of introduced *Eucalyptus* species with scattered Marris (*Corymbia calophylla*) and Flooded Gums (*Eucalyptus rudis*). The mixed stands consist of predominantly introduced *Eucalyptus* species. The wetland areas are party fringed by *Juncus pallidus* and

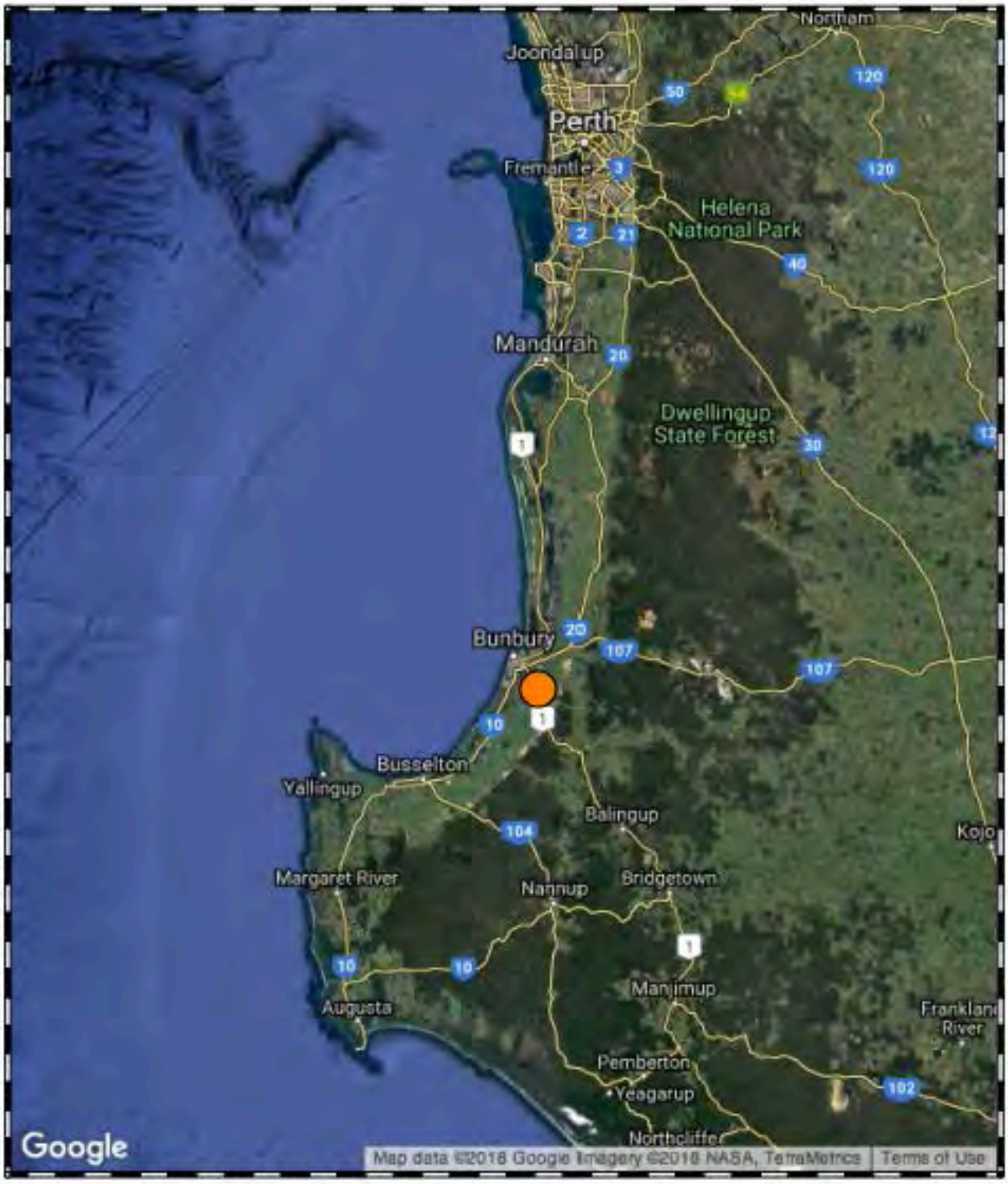
contain a few scattered *Melaleuca preisianna* trees. Within the areas dominated by Eucalypt species there are no native midstorey or understorey species and only a weedy understorey exists. The plantation of introduced *Eucalyptus* species are located within the south east portion of the site.

Wetland areas have bare damp soil with no midstorey or understory species except for fringing *Juncus pallidus. Melaleuca raphiophylla* form the over story until Flooded Gums (*Eucalyptus rudis*) comes in on the fringe. The site is considered degraded to completely degraded except for the wetland areas which are considered good.

2.3 Site 3

Site 3 consists of two distinct sections separated by a fence line. The northern section is being grazed by sheep and is dominated by large mature Flooded Gums (*Eucalyptus rudis*) species with scattered Peppermint (*Agonis flexuosa*) and Marri (*Corymbia calophylla*) trees. A temporary wetland exists across most of the northern area although there is no native midstorey or understorey species. The majority of the ground within this area is bare dark, damp soil with scattered Arum Lilys (*Zantedeschia aethiopica*) and Cotton Bush (*Gomphocarpus fruticosus*) weeds.

The southern section of Site 3 is separated by a fence line and is not being grazed. As such it is has a continuous understorey of introduced grasses. The area is dominated by mature Flooded Gums (*Eucalyptus rudis*) species with scattered Peppermint trees (*Agonis flexuosa*). There is no native midstorey or understorey species across Site 3 and the entire site is considered degraded to highly degraded.



SITE LOCATION

0 25 50 75 100 km

Cape Life Environmental Services Regional Context Map	
Drawing no: 1	
Date: 22/05/18	
Drawn by: Nick Tidmarsh	

Legend

- Site 1
- Site 2
- Site 2 - Wetland Area
- Site 3
- Site 4
- Site 5
- Site 6

0 100 200 300 400 m

N

Vegetation Assessment Areas

Drawing no: 2	Cape Life
Date: 31/05/18	
Drawn by: Nick Tidmarsh	

2.4 Site 4

Site 4 consists of mature Flooded Gums (*Eucalyptus rudis*) over a continuous groundcover of Kikuyu Grass (*Cenchrus clandestinus*) and other weeds. No native midstorey or understorey species are present. The canopy cover is not continuous and bare patches of weedy grasses are present throughout the site. The site is considered degraded to completely degraded.

2.5 Site 5

Site 5 is dominated by mature Peppermint trees (*Agonis flexuosa*) over weedy grasses. Some bare patches of weedy grasses occur throughout the site. There is no native midstorey or understorey species. The site is considered degraded to completely degraded.

2.6 Site 6

Site 6 is the southern most site. The northern end of the site consists of mature Peppermint trees (*Agonis flexuosa*) with scattered Marri (*Corymbia calophylla*), *Nuytsia floribunda* and Candle Banksia (*Banksia attenuata*). The southern end of the site consists of Peppermint trees (*Agonis flexuosa*) over Kikuyu Grass (*Cenchrus clandestinus*) and African Love Grass (*Eragrostis curvula*). There is no native midstorey or understorey across the site except where scattered *Nuytsia floribunda* and Candle Banksia (*Banksia attenuata*) form a midstorey beneath mature Peppermint trees. Throughout the site there are bare areas of African Love Grass (*Eragrostis curvula*).

3. Conclusions

All six areas assessed by Cape Life were considered degraded to completely degraded except for the wetland areas within Site 2 (good) under the Keighery Scale (Appendix 2). While most of the sites were dominated by native trees species there were no native midstorey or understorey species present. When understorey species were present they consisted solely of introduced species. Site 2 was dominated largely by a plantation of introduced Eucalyptus spp. except for the wetland areas outlined in Map 2.

Appendix 1 – Photos

Site 1 – Marri over pasture

Site 2 – Wetland area within Site 2

Site 3 – Flooded Gum over weed species

Site 4 – Northern end of Site 4

Site 4 – Southern end of Site 4

Site 6 – Bare grassy areas within Site 6

Appendix 2 – Keighery Scale

Keighery Condition Scale (Keighery 1994)
Pristine Pristine or nearly so, no obvious signs of disturbance
Excellent Vegetation structure intact; disturbance affecting individual species; weeds are non-aggressive species
Very good Vegetation structure altered; obvious signs of disturbance *For example, disturbance to vegetation structure caused by repeated fires; the presence of some more aggressive weeds; dieback; logging; grazing*
Good Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. *For example, disturbance to vegetation structure caused by very frequent fires; the presence of some very aggressive weeds at high density; partial clearing; dieback; grazing.*
Degraded Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. *For example, disturbance to vegetation structure caused by very frequent fires; the presence of very aggressive weeds; partial clearing; dieback; grazing*
Completely Degraded The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. *These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.*

APPENDIX C:

Fauna Likelihood Assessment

Key: STATE = Wildlife Conservation Act 1950 or Department of Biodiversity, Conservation and Attractions Conservation Code, EPBC = Environmental Protection and Biodiversity Conservation Act 1999, A = Listed in Naturemap Search, B = EPBC Protected Matters Search.

CR = Critically Endangered, EN = Listed as Endangered, VU = Listed as Vulnerable, IA = International Agreement, MI = Listed as Migratory, CD = Conservation dependent fauna, OS = Other specially protected fauna under the WC Act, MA = Listed as Marine under the EBPC Act, P = Listed as Priority by the DBCA.

FAMILY	SCIENTIFIC NAME	COMMON NAME	CONSERVATION CODES STATE	EPBC	A	B	HABITAT PREFERENCE	LIKELIHOOD OF OCCURRENCE
AVIAN								
Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-Eagle		MA		X	Usually coastal over islands, reefs, headlands, beaches, bays, estuaries, mangroves, seasonally flooded inland swamps, lagoons and floodplains; often far inland on large pools of major rivers[2]	Low
Anatidae	*Oxyura australis*	Blue-billed Duck	P4		X		Breeds in deep permanent, densely vegetated freshwater lakes, swamps and dams; winters on more open waters[2]	Low
Apodidae	*Apus pacificus*	Pacific Swift (Fork-tailed Swift)	IA	MI & MA		X	Low to very high airspace over varied habitat, rainforest to semi-desert[2]	Low
Ardeidae	*Ardea ibis*	Cattle Egret		MA		X	Moist pastures with tall grass; shallow open wetlands and margins, mudflats[2]	Low
Ardeidae	*Ardea modesta*	Eastern Great Egret		MA		X	Widespread in Aus wetlands, both freshwater and tidal, provided there is open shallow water in which they can wade; also use flooded grasslands[1]	Low
Cacatuidae	*Calyptorhynchus banksii naso*	Forest Red-tailed Black Cockatoo	VU	VU	X		Tall eucalypt forest, woodland, feeds on seeds of large-fruited eucalypts[1]	Medium
Cacatuidae	*Calyptorhynchus baudinii*	Baudin's Cockatoo	EN	EN	X		Forests, farm trees; feed primarily on seed from large woody capsules of marri, a common SW eucalypt; also strips bark from dead trees in search of wood-boring insects[2]	Medium
Cacatuidae	*Calyptorhynchus latirostris*	Carnaby's Cockatoo	EN	EN	X		Forests, woodlands, heathlands, farms; feeds on banksias hakeas, dryandras - often on ground; also exploits pine plantations[2]	Medium
Charadriidae	*Charadrius leschenaultii*	Greater Sand Plover	IA (& VU at subsp. level)	VU, MI & MA	X		Tidal flats, preferring sandy substrates where it mainly forages for small crustaceans. Roosts on beaches at high tide, usually in association with other small waders, but more tolerant of hot dry sand[1]	Low
Charadriidae	*Pluvialis fulva*	Pacific Golden Plover	IA	MI & MA	X		Migrant from north Siberia, Mainly coastal in Aus, most commonly associated with tidal flats but also in other tidal settings like beaches and reefs, especially those with sea-weed [1]	Low
Charadriidae	*Pluvialis squatarola*	Grey Plover	IA	MI & MA	X		Strictly coastal, restricted ot large tidal flat systems[1]	Low
Charadriidae	*Thinornis cucullatus*	Hooded Plover (Hooded Dotterel)	P4	MA		X	Ocean beaches and margins of inland salt lakes[1]	Low

[1] = (Menkhorst et al., 2017), [2] = (Morcombe, 2003), [3] = (Wilson and Swan, 2017), [4] = (Van Dyck and Strahan, 2008)

FAMILY	SCIENTIFIC NAME	COMMON NAME	CONSERVATION CODES STATE	EPBC	A	B	HABITAT PREFERENCE	LIKELIHOOD OF OCCURRENCE
Diomedeidae	*Diomedea epomophora*	Southern Royal Albatross	VU & IA	VU, MI & MA		X	Breeds ion NZ sub-Antarctic islands (mostly Campbell Island) with circumpolar distribution in Southern Ocean south to ~63°S. Regularly occurs over continental slope and pelagic waters off east Tasmania; common in small numbers between Jul and Oct; uncommon in other months. Uncommon off Victoria and South Australia, rare off south Western Austalia and New South Wales. Rarely seen from land[1]	Low
Diomedeidae	*Diomedea exulans*	Wandering Albatross	VU & IA	VU, MI & MA		X	Biennial breed on South Georgia and sub-Antarctic Island of Indian Ocean with very small breeding population at Maquarie and Heard Island; otherwise circumpolar in Southern Ocean[1]	Low
Diomedeidae	*Diomedea exulans amsterdamensis*	Amsterdam Albatross	CR & IA	EN, MI & MA		X	Tiny population breeds solely on Amsterdam Island, Indican Ocean. No confirmed sightings, though credible photographs of 1 in Great Australian Bight[1]	Low
Diomedeidae	*Diomedea exulans dabbenena*	Tristan Albatross	CR & IA	EN & MA		X	Breeds mostly on Chatham Island with much smaller numbers on some NZ sub-Antarctic Islands and small colony on South Island, NZ. Circumpolar in Southern Ocean but mostly in Pacific sector[1]	Low
Diomedeidae	*Diomedea sanfordi*	Northern Royal Albatross	EN & IA	EN & MA		X	Uses the pelagic environs, the oceans beyond the shallower continental shelf waters, their surface waters and resources[2]	Low
Diomedeidae	*Thalassarche cauta*	Shy Albatross	VU & IA	VU, MI & MA		X	Common to very common in both inshore and offshore waters to continental slope of southeast Australia, extending to south Western Australia[1]	Low
Diomedeidae	*Thalassarche cauta steadi*	White-capped Albatross	VU & IA	VU & MA		X	Common to very common in both inshore and offshore waters to continental slope of southeast Australia, extending to south Western Australia[1]	Low
Diomedeidae	*Thalassarche melanophris*	Black-browed Albatross	EN & IA	VU, MI & MA		X	Sub-Antarctic and subtropical waters from pelagic to shelf-break water habitats[1]	Low
Diomedeidae	*Thalassarche melanophris impavida*	Campbell Island Albatross	VU & IA	VU & MA		X	Sub-Antarctic and subtropical waters from pelagic to shelf-break water habitats	Low
Falconidae	*Falco peregrinus*	Peregrine Falcon	OS		X		Most environments with suitable nest sites: cliff faces preferred, including man-made ones, commonly uses stick nests built by other species[1]	Low
Hydrobatidae	*Oceanites oceanicus*	Wilson's Storm Petrel	IA	MI & MA	X		Circumpolar, breeding in summer mostly on Antarctic continent, can include Heard Island, Bishop Island. Migrates to tropical waters, crossing the equator[1]	Low
Laridae	*Anous stolidus*	Common Noddy (Brown Noddy)	IA	MI & MA		X	When breeding, coastal waters in vicinity of colony islands; otherwise oceanic[2]	Low
Laridae	*Anous tenuirostris melanops*	Australian Lesser Noddy	EN	VU & MA		X	Houtman Abrolhos Island, islands or well out to sea, infrequently storm blown to coast of mainland WA[1]	Low
Laridae	*Sterna bergii*	Crested Tern (Greater Crested Tern)	IA	MI & MA	X		Coastal - ocean beahces, offshore islands, extending out to the deeper pelagic waters; inshore on estuaries, bays, harbours, coastal lagoons; inland on major rivers, occasionally on saline lakes, salt ponds near coast[2]	Low

[1] = (Menkhorst et al., 2017), [2] = (Morcombe, 2003), [3] = (Wilson and Swan, 2017), [4] = (Van Dyck and Strahan, 2008)

FAMILY	SCIENTIFIC NAME	COMMON NAME	CONSERVATION CODES STATE	EPBC	A	B	HABITAT PREFERENCE	LIKELIHOOD OF OCCURRENCE
Laridae	*Sterna caspia*	Caspian Tern	IA	MI & MA	X		Occurs in sheltered coastal waters; also uses inland water bodies, including large rivers, fresh to saline lakes, reservoirs and temporary wetlands[1]	Low
Meropidae	*Merops ornatus*	Rainbow Bee-eater		MA		X	Open country of woodlands, open forest, semi-arid scrub, grasslands, clearings in heaver forests, farmlands; avoids heavy forests that would hinder its aerial pursuit of insects. Breeding – requires open clearing or paddock with loamy soil soft enough for nest tunnelling[2]	Low
Motacillidae	*Motacilla cinerea*	Grey Wagtail	IA	MI & MA		X	Usually near fresh sandy or rocky streams, but also on mown grass, ploughed land, sewage ponds[2]	Low
Pandionidae	*Pandion haliaetus*	Osprey		MA	X	X	Coastal waters and estuaries, beaches islets and reefs - but usually not far out to sea except on islets or exposed reefs. Follows major rivers and wetlands far inland from the coast to larger river pools, even to arid regionswhere large pools occur in gorges hundreds of kilometres inland[2]	Low
Procellariidae	*Macronectes giganteus*	Southern Giant Petrel	IA	EN, MI & MA		X	Southern oceans, will enter bays and harbours. Routinely ashore to feed and rest[1]	Low
Procellariidae	*Macronectes halli*	Northern Giant Petrel	IA	MI & MA		X	Greatest numbers occur inland on salt lakes, salty edges of waterways, brackish pools, claypans. Coastal on sheltered estuaries, salt marsh lagoons[2]	Low
Procellariidae	*Pachyptila turtur*	Fairy Prion		MA		X	Sub-Antarctic seas and islands while breeding, then waners to subtropical seas; rarely close inshore except when sheltering from storms[2]	Low
Procellariidae	*Puffinus carneipes*	Fleshy-footed Shearwater	VU & IA	MI & MA	X	X	Pelagic, usually beyond edge of continental shelf[2]	Low
Psophodidae	*Psophodes nigrogularis nigrogularis*	Western Whipbird	EN	EN	X		Dense low scrub, heath and mallee thickets, 1-2m tall with open space at ground level [1]	Low
Scolopacidae	*Calidris acuminata*	Sharp-tailed Sandpiper	IA	MI & MA		X	Fresh or salt wetlands – muddy edges of lagoons, swaps, lakes, dams, soaks, sewage farms, temporary floodwaters[2]	Low
Scolopacidae	*Calidris canutus*	Red Knot	(& VU at subsp. lev	EN, MI & MA	X	X	Restricted to coastal sites with extensive, firm tidal flats[1]	Low
Scolopacidae	*Calidris ferruginea*	Curlew Sandpiper	VU & IA	CR, MI & MA	X	X	Inter-tidal mudflats of estuaries, lagoons, mangrove channels; around lakes, dams, floodwaters, flooded saltbush surrounds of inland lakes[2]	Low
Scolopacidae	*Calidris melanotos*	Pectoral Sandpiper	IA	MI & MA		X	Usually coastal wetlands, both fresh and saline, but also inland on permanent and temporary wetlands. Uses sites with mudflats, fringing vegetation, swamps with heavy overgrowth of vegetation[2]	Low
Scolopacidae	*Calidris ruficollis*	Red-necked Stint	IA	MI & MA	X		Diverse – tidal and inland on mudflats, salt marshes, beaches, salt fields, temporary floodwaters[2]	Low
Scolopacidae	*Calidris tenuirostris*	Great Knot	VU & IA	CR, MI & MA	X		Restricted to large tidal-flat systems, typically follow tide edge when foraging. At high tide gather with other shore birds on beaches or open sites with a damp substrate[1]	Low
Scolopacidae	*Limosa lapponica*	Bar-tailed Godwit	IA (& VU at subsp. level)	MI (& VU or CR at subsp. level) & MA	X	X	Coastal sites with large tidal flats[1]	Low
Scolopacidae	*Numenius madagascariensis*	Far Eastern Curlew (Eastern Curlew)	VU & IA	CR, MI & MA	X	X	Widespread but patchily distributed along coast, most numerous at sites with extensive tidal flats[1]	Low

[1] = (Menkhorst et al., 2017), [2] = (Morcombe, 2003), [3] = (Wilson and Swan, 2017), [4] = (Van Dyck and Strahan, 2008)

FAMILY	SCIENTIFIC NAME	COMMON NAME	CONSERVATION CODES STATE	CONSERVATION CODES EPBC	A	B	HABITAT PREFERENCE	LIKELIHOOD OF OCCURRENCE
Scolopacidae	*Numenius phaeopus*	Whimbrel	IA	MI & MA	X		Widespread along Australian coast, but more common in north, especially at sites with combination of large tidal flas and mangroves[1]	Low
Scolopacidae	*Tringa brevipes*	Grey-tailed Tattler	IA & P4	MI	X		Coastal in Australia, most numerous on large tidal flat systems, but some use rocky shorelines[1]	Low
Scolopacidae	*Tringa cinerea*	Terek Sandpiper	IA	MI & MA	X		Preferring large tidal-flat systems[1]	Low
Scolopacidae	*Tringa glareola*	Wood Sandpiper	IA	MI & MA	X		Uses freshwater wetlands, especially those with emergent sedges and taller fringing vegetation[1]	Low
Scolopacidae	*Tringa hypoleucos*	Common Sandpiper	IA	MI & MA	X	X	Varied coastal and interior wetlands – narrow muddy edges of billabongs, river pools, mangroves, among rocks and snags, reefs or rocky beaches; avoids wide open mudflats. Perches on branches, posts, boats[2]	Low
Scolopacidae	*Tringa nebularia*	Common Greenshank	IA	MI & MA	X	X	Diverse inland and coastal spots. Away from the coast - uses both permanent and temporary wetlands – billabongs, swamps, lakes, floodplains, sewage farms and salt works ponds, flooded irrigated crops. On the coast – uses sheltered estuaries and bays with extensive mudflats, mangrove swamps, muddy shallows of harbours and lagoons, occasionally rocky tidal ledges. Prefers wet and flooded mud and clay rather than sand[2]	Low
MAMMALIAN								
Dasyuridae	*Phascogale tapoatafa*	Brush-tailed Phascogale			X		Arboreal, forages on mature rough-barked trees, large logs and dead standing trees[4]	Low
Dasyuridae	*Phascogale tapoatafa wambenger*	Wambenger Brush-tailed Phascogale	CD		X		Arboreal, forages on mature rough-barked trees, large logs and dead standing trees[4]	Low
Macropodidae	*Notamacropus irma*	Western Brush Wallaby	P4		X		Open forest or woodland, open seasonally wet flats[4]	Low
Peramelidae	*Isoodon fusciventer*	Quenda	P4		X		Sandy soils with dense heathy vegetation[4]	Low
Pseudocheiridae	*Pseudocheirus occidentalis*	Western Ringtail Possum	CR	CR	X		*Agonis* forest and woodland, and Tuart forest with an *Agonis* midstorey[4]	Medium
REPTILIAN								
Scincidae	*Ctenotus ora*	Coastal Plains Skink	P3		X		Open eucalypt woodland over *Banksia* and low vegetation on sandy coastal plain and coastal dunes south of Perth, from Pinjarra south to Yallingup Brook [3]	Low

[1] = (Menkhorst et al., 2017), [2] = (Morcombe, 2003), [3] = (Wilson and Swan, 2017), [4] = (Van Dyck and Strahan, 2008)

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