CLEARING PERMIT APPLICATION SUPPORTING DOCUMENTATION



SLK 0.00 – SLK 2.00, Harris Road, Dardanup

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1 INTRODUCTION

1.1 Applicant

The applicant for this Clearing Permit application is the Shire of Dardanup (herein referred to as the proponent) (ABN: 57 305 829 653).



1.2 Background

The clearing area is located in the Shire of Dardanup, from straight line kilometre (SLK) 0.00 to SLK 2.00 along Harris Road between the boundary of the City of Bunbury and the Shire of Dardanup; and the intersection of Harris Road and Martin-Pelusey Road (herein referred to as the subject site) (refer to **Figure 1**).

Harris Road provides access to the Picton East industrial area and access from Forrest Highway, South Western Highway and the (future) Bunbury Outer Ring Road. It is a preferred route for cyclists when accessing Ferguson Valley from Bunbury, creating conflicts and safety concerns between heavy vehicle traffic and recreational cyclists using the route. Accordingly, the Shire of Dardanup are proposing to undertake road upgrade works, involving widening of the road and verge and the inclusion of a bike path along the length.

To enable the proposed works, the sporadic removal of vegetation, totalling an area of approximately 900m² (herein referred to as the clearing area), along 1.5 km of Harris Road is required (refer to **Appendix A**).

1.3 Scope and Purpose

This document has been prepared to support an application for a Clearing Permit (Purpose Permit) pursuant to Section 51E of the *Environmental Protection Act 1986* (EP Act). This document provides information regarding the current environmental condition of the clearing area, including the predicted impacts of clearing and proposed management actions to mitigate predicted impacts. It also provides an assessment against the ten clearing principles and other relevant legislation and policy.



2 BIOPHYSICAL ENVIRONMENT

During the compilation of this Clearing Permit application, a range of specific environmental and heritage issues were explored in relation to the clearing area. This involved a detailed desktop assessment, as provided below.

2.1 Topography, Landform and Soils

A review of the mapping associated with the Australian Soil Resource Information System (ASRIS) indicates that the subject site is primarily located within the Pinjarra landscape system, part of the Swan Coastal Plain which extends from Perth to Capel and consists of poorly drained coastal plain with variable alluvial and aeolian soils.

Within this system there are areas of both the Pinjarra and Bassendean zones. The Bassendean zone originates from the mid Pleistocene era, consisting of fixed dunes inland from coastal dune zone, non-calcareous, Bassendean sands, podsolised soils with low-lying wet areas. The Pinjarra zone consists of early Pleistocene to recent alluvial deposits between the Bassendean dunes zone and the Darling Scarp, colluvial and shelf deposits adjected to the Darling Scarp, consisting of clayey to sandy alluvial soils with wet areas. Specifically, two soil types associated with the Pinjarra landscape zone and three associated with the Bassendean landscape zone have been mapped within the subject site:

- Pinjarra P1b Phase Flat to very gently undulating plain with deep acidic mottled yellow duplex soils. Moderately deep pale sand to loamy sand over clay, imperfectly drained and moderately susceptible to salinity in limited areas.
- Pinjarra P2 Phase Flat to very gently undulating plain with deep alkaline mottled yellow duplex soils which generally consist of shallow pale sand to sandy loam over clay.
- Bassendean B1a Phase Extremely low to very low relief dune, undulating sandplains 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.
- 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.
- Bassendean B6 Phase Sandplain and broad extremely low rises with imperfectly drained deep or very deep grey siliceous sands.

2.2 Acid Sulfate Soils

Acid Sulfate Soils (ASS) is the common name given to naturally occurring soil and sediment containing iron sulfides. They have become a potential issue in land development projects on the Swan Coastal Plain when the naturally anaerobic conditions in which they are situated are disturbed and they are exposed to aerobic conditions and subsequently oxidise. When oxidised, ASS produce sulfuric acid, which can result in a range of impacts to the surrounding environment. ASS that has oxidised and resulted in the creation of acidic conditions are termed "Actual ASS" (AASS), and those that have acid generating potential but remain in their naturally anaerobic conditions are termed "Potential ASS" (PASS).

Mapping prepared by the Department for Planning and Infrastructure (DPI) to support the Western Australian Planning Commission's (WAPC's) *Planning Bulletin 64: Acid Sulfate Soils* (WAPC 2003) indicates that the subject site is classified as having "moderate to low risk of ASS, occurring within 3 m of the natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface".



2.3 Hydrology

2.3.1 Groundwater

The principal groundwater aquifers for the subject site include the superficial aquifer, the Leederville aquifer and the Yarragadee aquifer. The superficial aquifer is unconfined, generally occurring with a thickness of less than 10 m. The Leederville aquifer is multi-layered and typically 150 m thick. It is recharged by direct infiltration and leakage from the above superficial aquifer. The Yarragadee aquifer is a major confined aquifer with a thickness of between 100 m to 900 m. It is primarily recharged by rainfall and downward leakage. Neither of the underlying confined Leederville and Yarragadee aquifers is known to express into the superficial aquifer at the subject site.

To protect the State's drinking water resources the Department of Water and Environmental Regulation (DWER) has defined certain Priority Classification Areas within Public Drinking Water Source Areas (PDWSA) providing three levels of groundwater quality protection. These are based on the principles of risk avoidance (Priority 1), risk minimisation (Priority 2) and pollution limiting (Priority 3). The subject site does not lie within any existing or potential PDWSAs.

2.3.2 Surface Water

The subject site is within the Ferguson River sub catchment area of the Leschenault Estuary - Preston River catchment area. The subject site does not contain any surface water features.

The Ferguson River is located approximately 1 km to the south of the subject site.

Wetlands within Western Australia are classified on the basis of landform and water permanence pursuant to the Semeniuk (1995) classification system (refer to **Table 1**).

	Landform						
Water Longevity	Basin	Channel	Flat	Slope	Highland		
Permanent Inundation	Lake	River	-	-	-		
Seasonal Inundation	Sumpland	Creek	Floodplain	-	-		
Intermittent Inundation	Playa	Wadi	Barlkarra	-	-		
Seasonal Waterlogging	Dampland	Trough	Palusplain	Paluslope	Palusmont		

Table 1. Wetland classifications (Semeniuk 1995).

Areas of wetlands have been mapped previously by Semeniuk (1995) across the entire Swan Coastal Plain. This mapping has been converted into a digital dataset that is maintained by Department of Biodiversity, Conservation and Attractions (DBCA) and is referred to as the '*Geomorphic Wetlands of the Swan Coastal Plain*' dataset. This dataset contains information on geomorphic wetland types and assigns management categories that guide the recommended management approach for each wetland area. The wetland management categories and management objectives are listed in **Table 2**.

Table 2. Wetland Management Categories.

Category	Description	Management Objectives
Conservation	Wetlands support a high level of ecological attributes and functions.	 Highest priority wetlands. Objective is to preserve and protect the existing conservation values of the wetlands through various mechanisms including: Reservation in national parks, crown reserves and State owned land,



Category	Description	Management Objectives
		 Protection under Environmental Protection Policies; and Wetland covenanting by landowners. No development or clearing is considered appropriate. These are the most valuable wetlands and any activity that may lead to further loss or degradation is inappropriate.
Resource Enhancement	Wetlands which may have been partially modified by still support substantial ecological attributes and functions.	Priority wetlands. Ultimate objective is to manage, restore and protect towards improving their conservation value. These wetlands have the potential to be restored to Conservation category. This can be achieved by restoring wetland functions, structure and biodiversity.
Multiple Use	Wetlands with few remaining attributes and functions.	Use, development and management should be considered in the context of ecologically sustainable development and best management practice catchment planning through landcare.

The majority of the subject site, excluding the western most portion, is classified as a palusplain Multiple Use (MU) wetland (UFI 14329) in accordance with the *Swan Coastal Plain Geomorphic Wetlands* dataset. In the case of MU wetlands, there is a general expectation from the DBCA that hydrological function will be retained however, these wetlands are generally suitable for development and specific buffers are not necessary. There are no conservation significant wetlands within 150 m of the subject site.

2.4 Vegetation and Flora

2.4.1 Vegetation Types

The subject site is located within the Swan Coastal Plain Biogeographic Region of the south-west Botanical Province (Thackway and Cresswell 1995, and Paczkowska and Chapman 2000), an area that extends from Jurien Bay to the north to Dunsborough to the south, and west of the Darling Scarp. Historically, this biogeographic region has been extensively cleared for both urban and agricultural purposes.

Regional vegetation has been mapped by Heddle *et al.* (1980) at a scale of 1:250,000 based on major geomorphic units on the Swan Coastal Plain and the subject site consists of vegetation of the Guildford complex, described as 'a mixture of Open Forest to Tall Open Forest of Marri - Wandoo (*Eucalyptus wandoo*) -Jarrah and Woodland of Wandoo (with rare occurrences of *Eucalyptus lanepoolei*). Minor components include Flooded Gum-*Melaleuca rhaphiophylla*'.

The mapped Heddle *et al.* (1980) complexes can be used to determine vegetation extent and status on the Swan Coastal Plain (refer to **Table 3**). The EPA has a target to retain all remaining areas of each complex where less than 30% remains on the Swan Coastal Plain (EPA 2003). The exception to this is within 'Constrained Areas' such as the Greater Bunbury Region (GBR) Constrained Area and the Perth Metropolitan Region, where the target is 10%. The subject site lies within the GBR 'Constrained Area', therefore all remaining areas of any complex where less than 10% remains is considered 'significant'.



Table 3. Regional assessment of vegetation extent.

Vegetation Complex	Pre-European (ha)	Current Area (ha)	Remaining Extent (%)
Guildford	90,513.13	4,607.91	5.09

Based on analysis of aerial photography, the majority of the subject site has been extensively cleared, resulting in highly degraded vegetation primarily consisting of introduced grasses with stands of remnant vegetation (refer to **Plate 1** and **2**).



Plate 1. Vegetation subject to clearing along Harris Road.



Plate 2. Vegetation subject to clearing along Harris Road.



The report *Advice on areas of conservation significance in the Preston Industrial Park* (EPA 2008), identified an area within Lot 200 (located immediately north of Harris Road) as having vegetation which is in "Good" to "Very Good" condition. This classification is indicative of an area of intact remnant vegetation, unlike the subject site, whereby vegetation has been subjected to a history of disturbance and edge effects associated with being in the road reserve. Accordingly, vegetation condition within the subject site is likely to be considerably reduced.

2.4.2 Ecological communities

Threatened Ecological Communities (TECs) are defined by the Department of Biodiversity, Conservation and Attractions (DBCA) and are assigned to a category of Priority 1 to Priority 5.

Selected TECs are also afforded statutory protection at a Federal level pursuant to the *Environment Protection and Biodiversity Conservation Act 1998* (EPBC Act). The EPBC Act provides for the protection of TECs that are listed under section 181 of the Act, and are defined as "Critically Endangered", "Endangered" or "Vulnerable".

In addition to listing as a TEC, a community may be listed as a Priority Ecological Community (PEC). An ecological community that is under consideration for listing as a TEC, but does not yet meet the survey criteria or has not been adequately defined, is placed on the list of PECs in either Category 1, 2 or 3.

A search was undertaken of the DBCA's Threatened Ecological Communities (TEC) database and the EPBC Act Protected Matters database within 5 km of the subject site. The TEC *Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands of the Swan Coastal Plain (SCP3c) which is Critically Endangered under the BC Act and Endangered under the EPBC Act, was listed as likely to occur.

Further to this, other TECs that have the potential to occur within in proximity to the subject site include:

- Banksia Woodlands of the Swan Coastal Plain;
- Clay Pans of the Swan Coastal Plain; and
- Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain.

The vegetation subject to clearing does not represent an intact remnant due to anthropogenic disturbances (i.e. its structure and composition has been altered). Accordingly, it is considered unlikely that this vegetation could be ascribed to a particular floristic community type, and therefore would not represent a TEC or PEC.

2.4.3 Ecological Linkages

The DBCA recognises several Regional Ecological Linkages that have been identified from studies of regionally significant natural areas (Molloy *et al.* 1999). While there is no statutory basis for regional ecological linkages, they have been recognised as an environmental policy consideration in EPA and planning policy over the last decade (EPA 2009 and references therein).

A Regional Ecological Linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinup) is located to the west of the subject site. The location and spacing of the trees to be cleared means that the clearing will have minimal impact on this linkage and not result in fragmentation on the linkage.

2.4.4 Environmentally Sensitive Areas

Section 51B of the EP Act allows the Minister to declare an Environmentally Sensitive Area (ESA). Once declared, the exemptions to clear native vegetation under the regulations do not apply in these areas. Current declared ESAs are listed in the Environmental Protection (Environmentally Sensitive Areas) Notice 2005.



There are no ESAs located within or in proximity to the clearing area.

2.4.5 Flora

A search for known rare and Priority flora within or in proximity to the subject site was undertaken through a review of the following databases:

- DBCA's NatureMap database; and
- EPBC Act Protected Matters database.

A total of eleven Priority flora and one Declared Rare Flora species have been recorded within 5 km of the subject site. The EPBC Act Protected Matters database search returned four results for listed "Critically Endangered" species, seven results for "Endangered" species and six results for "Vulnerable" flora species of which two have potential to occur within the subject site (refer to **Appendix B**). A summary of these species and their likelihood of occurring within the subject site based on preferred soil types is provided within **Table 4**.

Species	DBCA Status ¹	EPBC Act Status	Likelihood of Occurrence
Acacia flagelliformis	P4		Unlikely
Aponogeton hexatepalus (Stalked Water Ribbons)	P4		Unlikely
Andersonia gracilis		Endangered	Unlikely
Austrostipa jacobsiana		Critically Endangered	Unlikely
Banksia nivea subsp. uliginosa		Endangered	Unlikely
Banksia squarrosa susp. argillacea		Vulnerable	Unlikely
Brachyscias verecundus		Critically Endangered	Unlikely
Caladenia hueglii		Endangered	Unlikely
Caladenia speciosa	P4		Possible
Chamelaucium sp. S coastal plain (R.D. Royce		Vulnerable	Unlikely
Carex tereticaulis	Р3		Unlikely
Chamaescilla gibsonii	Р3		Unlikely
Diuris drummondii	Т	Vulnerable	Possible
Diuris micrantha		Vulnerable	Unlikely
Diuris purdiei		Endangered	Unlikely
Drakaea elastica		Endangered	Unlikely
Drakaea micrantha		Vulnerable	Unlikely
Eleocharis keigheryi		Vulnerable	Unlikely
Gastrolobium whicherense	P2		Unlikely
Lambertia echinata subsp. occidentalis		Endangered	Unlikely
Lasiopetalum membranaceum	P3		Unlikely
Ornduffia submerse	P4		Unlikely
Pultenaea skinneri (Skinner's Pea)	P4		Unlikely
Schoenus capillifolius	P3		Unlikely
Synaphea sp. Fairbridge Farm (D. Papenfus		Critically Endangered	Unlikely
Synaphea sp. Serpentine (G.R. Brand 103)		Critically Endangered	Unlikely
Synaphea stenoloba		Endangered	Unlikely
Verticordia attenuate	P3		Unlikely

Table 4. Database search results for significant flora known to occur within a 5km radius of the subject site.

¹Refer to **Appendix A** for classification descriptions.



2.5 Fauna

A search of the DBCA's NatureMap database was undertaken to establish whether species declared as 'Rare or likely to become extinct' (Schedule 1), 'Birds protected under an international agreement' (Schedule 3) and 'Other specially protected fauna' (Schedule 4) as listed under the *Biodiversity Conservation Act 2016* (BC Act) have been recorded in proximity to the subject site. Five fauna species listed as Schedule 1 species and five Schedule 3 species have been recorded within a 5km radius of the subject site. Additionally, the DBCA Priority fauna database identified three Priority 3, three Priority 4 and two other specially protected fauna species within this zone (refer to **Table 5**).

The EPBC Act Protected Matters Search Tool also identified several threatened and migratory species that could potentially occur within or in proximity to the subject site. This included five species classified as Vulnerable, four Endangered species and two Critically Endangered species. Of the listed species one is a migratory bird species (refer to **Table 5**). Marine species identified within the search were not assessed given that the subject site is not in proximity to a marine environment.

Table	5.	Significant	fauna	potentially	occurring	within	the	subject	site	as	identified	by	State	and
Comm	on	wealth datal	base sea	arches.										

Species DBCA Status ¹ EP		EPBC Act Status	Likelihood of Occurrence
Botaurus poiciloptilus (Australasian Bittern)	-	Endangered	Unlikely
<i>Calyptorhynchus banksii naso</i> (Forest Red Tailed Black Cockatoo)	S1	Vulnerable	Possible
Calyptorhynchus baudinii (Baudin's Cockatoo)	S1	Endangered	Possible
<i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo)	S1	Endangered	Likely
Ctenotus ora (Coastal Plains Skink)	P3	-	Unlikely
Dasyurus geoffroii (Chuditch)	-	Vulnerable	Unlikely
Geotria australis (Pouched Lamprey)	P3	-	Unlikely
Hydromys chrysogaster (Water-rat)	P4	-	Unlikely
Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)	Р3	-	Unlikely
Isodon fusciventer (Quenda)	P4	-	Unlikely
Limosa lapponica bauera (Bar-tailed Godwit)	-	Vulnerable	Unlikely
<i>Limosa lapponica menzbieri</i> (Northern Siberian Bar-tailed Godwit)	-	Critically endangered	Unlikely
Oxyura australis (Blue-billed Duck)	P4	-	Unlikely
Phascogale tapoatafa subsp. Wambenger (South-western Brush-tailed Phascogale)	S	-	Possible
Pseudocheirus occidentalis (Western Ringtail Possum)	S1	Critically Endangered	Possible
Setonix brachyurus (Quokka)	-	Vulnerable	Unlikely
Thalassues bergii (Crested Tern)	S3	-	Unlikely
Tringa nebularia (Common Greenshank)	S3	-	Unlikely



Species	DBCA Status ¹	EPBC Act Status	Likelihood of Occurrence
<i>Westralunio carteri</i> (Carter's Freshwater Mussel)	-	Vulnerable	Unlikely

¹Refer to **Appendix B** for classification descriptions.

Based on the habitats present and current documented distributions it is considered possible that five species of conservation significance may use the subject site for some purpose at times. These species are discussed in detail below.

<u>Black Cockatoos</u> (Carnaby's Black Cockatoo *Calyptorhynchus latirostris*, Baudin's Black Cockatoo *Calyptorhynchus baudinii*, Forest Red Tailed Black Cockatoo *Calyptorhynchus banksii naso*)

Breeding habitat for black cockatoo is defined as suitable trees species (native, endemic species only) that have a diameter at breast height (DBH) of equal to or over 50cm. A site-specific fauna survey has not been undertaken within the clearing area, however there are no confirmed breeding areas within 8 km of the subject site (DBCA 2019). Furthermore, there are no records of black cockatoo species utilising the area for night roosting with the closest confirmed night roosting area located more than 11 km from the subject site.

The following represents a list of the plant species likely to be present within the subject site known to be used by one or more of the Black Cockatoo species as a food source (i.e. foraging habitat):

- Marri C. calophylla;
- Jarrah E. marginata;
- Wandoo E. wandoo.

While no site-specific survey was undertaken, there have been recorded sightings of both the Forest Redtailed black cockatoo and Baudin's black cockatoo in proximity to the subject site in the *Advice on areas of conservation significance in the Preston Industrial Park report* (EPA 2008). Mapping developed by the DBCA (2009) indicates that the western portion of the subject site on Harris Road between SLK 0.3 to SLK 0.8 is designated as a potential feeding area for Carnaby's black cockatoo.

The subject site is unlikely to be comprised of habitat critical for the survival of these species given the availability of better quality habitat immediately to the north and west.

Pseudocheirus occidentalis Western Ringtail Possum (WRPs)

WRPs are recognised as Critically Endangered species under State and Commonwealth legislation. Mapping prepared by Shedley and Williams (2014) in *An assessment of habitat for western ringtail possum (Pseudocheirus occidentalis) on the southern Swan Coastal Plain* indicates that the area located between SLK 0.3 km to 0.8 km is mapped as having habitat with medium suitability for WRPs. The clearing footprint within this area equates to approximately 80 m². The adjoining vegetation within Lot 2 has been identified as being in 'Good' to 'Very Good' condition, and with the absence of anthropogenic impacts, is likely to provide better quality habitat for WRPs than the subject site.

South-western Brush-tailed Phascogale (Phascogale tapoatafa subsp. Wambenger)

The South-western Brush-tailed Phascogale is listed as a Priority 3 species (BC Act) observed in dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover. While no targeted fauna survey was undertaken it is possible that this species may be present within the subject site, although as noted previously, better quality habitat is located immediately to the north.



2.6 Aboriginal Heritage

All Aboriginal sites in Western Australia are provided protection under the *Aboriginal Heritage Act 1972* in which it is an offence for anyone to excavate, damage, destroy, conceal or in any way alter an Aboriginal site without the Minister's permission.

An online search for relevant Aboriginal heritage information was undertaken using the Department of Planning, Lands and Heritage's Aboriginal Inquiry System that incorporates both the heritage site register and the heritage survey database. The Aboriginal Heritage Site Register is maintained pursuant to Section 38 of the *Aboriginal Heritage Act 1972* and contains information on over 22,000 listed Aboriginal sites throughout Western Australia.

Results of the Aboriginal Inquiry System database search revealed the presence of one Aboriginal heritage site within the subject site and three Aboriginal heritage sites within 1km of the subject site (refer to **Figure 2**) including:

- The Bunbury Bypass Archaeological Site 3 (Site ID 18886) which is associated with artefacts and scatter and is within the subject site;
- The Natgas 262 site (Site ID 5168) which is associated with artefacts and scatter and is approximately 200m from the subject site;
- The Bunbury Bypass Individual Find 1 site (Site ID 18889) which is associated with artefacts and scatter and an isolated artefact located approximately 320m from the subject site; and
- The Ferguson River (Site 19796) which is a mythological site located between 0.5 and 1.0 km from the subject site.

2.7 European Heritage

In order to determine the actual or potential presence of sites or features of European Heritage significance within the subject site, a review of readily available information was undertaken to determine the presence of any of the following:

- World Heritage sites;
- National Heritage sites;
- Commonwealth Heritage sites;
- Sites listed on the Register of the National Estate;
- Heritage Council of WA sites; and
- Sites listed on the local municipal (Shire of Murray) Heritage Inventory.

These searches revealed that there are no sites of European heritage significance located within the subject site.



3 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

Any clearing of native vegetation requires a permit in accordance with Part V of the EP Act, except where an exception applies under Schedule 6 of the Act or is prescribed by regulation in the *Environmental Protection (Clearing Native Vegetation) Regulations 2004*.

The clearing of native vegetation (approximately 900 m²) for the upgrade of Harris Road will require an approved clearing permit. Clearing applications are assessed against the ten Clearing Principles outlined in Schedule 5 of the EP Act. These principles aim to ensure that all potential impacts resulting from the removal of native vegetation can be assessed in an integrated manner.

An examination of the ten Clearing Principles applied against a desktop investigation is provided below.

a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

The subject site consists of vegetation of the Guildford complex described as 'A mixture of Open Forest to Tall Open Forest of Marri - Wandoo (*Eucalyptus wandoo*) -Jarrah and Woodland of Wandoo (with rare occurrences of *Eucalyptus lanepoolei*). Minor components include Flooded Gum-*Melaleuca rhaphiophylla*'. Based on analysis of aerial photography, the majority of the subject site has been subject to clearing and anthropogenic impacts, altering the structure and composition of the remnant vegetation. Accordingly, the vegetation is unlikely to be representative if the Guildford complex.

As discussed in **Section 2.4**, while a site-specific flora and vegetation survey has not been undertaken within the subject site, due to the history of disturbance it is considered unlikely that any flora of conservation significance are present within the limited clearing area.

Furthermore, the subject site is not expected to contain habitat critical to the survival of conservation significant fauna. As a consequence, the vegetation within the limited clearing area can be considered to have minimal regional or local significance when compared to larger adjacent remnants.

While it is noted that a Regional Ecological Linkage (McLarty/Kemerton/Twin Rivers/Preston River/Gwindinup) is located to the west of the subject site, the removal of very small and isolated vegetation patches from the subject site will not impact fauna movement in the general area or isolate existing remnant vegetation within this linkage. The proposed cleared is therefore unlikely to compromise any existing values of the nearby ecological linkage.

In consideration of the above information, the proposal is not considered to be at variance to this Principle.

b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

While a targeted fauna survey has not been undertaken within the subject site, opportunistic data was recorded during the preparation of the *Advice on areas of conservation significance in the Preston Industrial Park* (EPA 2008). During this period, two threatened species (Red-tailed Black Cockatoo and Baudin's Black Cockatoo) and three species listed as conservation significant on the Swan Coastal Plain (Inland Thornbill, Yellow-rumped Thornbill and New Holland Honeyeater) were sighted from the roadside within Lot 200 Harris Road. WRPs were also sighted within Lot 200 Harris Road during this investigation (EPA 2008).

While conservation significant species may occur in the general area, the subject site is likely to provide marginal quality fauna habitat attributed to edge affects from the road. Furthermore, the small and



sporadic clearing area is unlikely to result in fragmentation of any ecological linkages. On this basis, the proposal is unlikely to impact habitat critical for the survival of conservation significant species. Therefore, the proposal is not considered to be at variance to this Principle.

c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

While a targeted flora survey has not been undertaken within the subject site, it is considered unlikely that any flora of conservation significance is present within the limited clearing area. Therefore, the proposal is not considered to be at variance to this Principle.

d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threated ecological community.

A search of the DBCAs TEC database and the EPBC Act Protected Matters database within a 5 km radius of the clearing area revealed the possible presence of the Endangered TECs *Corymbia calophylla – Xanthorrhea preissii* woodlands and shrublands of the Swan Coastal Plain and Banksia Woodlands of the Swan Coast Plain.

The vegetation subject to clearing does not represent an intact remnant due to anthropogenic disturbances (i.e. its structure and composition has been altered). Accordingly, it is considered unlikely that this vegetation could be ascribed to a particular floristic community type, and therefore would not represent a TEC or PEC. Therefore, the proposal is not considered to be at variance to this Principle.

e) Native vegetation should not be cleared if it is a remnant of native vegetation in an area that has been extensively cleared.

The EPA has a target to retain all remaining areas of each vegetation complex where less than 30% remains on the Swan Coastal Plain (EPA 2003). The exception to this is within 'Constrained Areas' such as the Greater Bunbury Region (GBR) Constrained Area and the Perth Metropolitan Region, where the target is 10%. As discussed in **Section 2.4** the subject site lies within the GBR "Constrained Area', therefore all remaining areas of any complex where less than 10% remains is considered 'significant'.

The remnant vegetation in the subject site is classified as being of the Guildford complex of which only 5% of the pre-European extent is remaining and is therefore considered 'significant'. While it is considered that the vegetation subject to clearing is unlikely to be representative of this vegetation complex (due to its current condition), the proposal may be at variance to this Principle.

f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

While the majority of the subject site is classified as a 'Multiple Use' wetland, the clearing area does not contain any defined natural surface water features or channels with the closest watercourse being the Ferguson River to the south. It is not located within a 'Public Drinking Water Source' area (EPT 2019).

Accordingly, the proposal is not considered to be at variance to this Principle.

g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

The clearing area is located within the following land phases:



- Pinjarra P1b Phase Flat to very gently undulating plain with deep acidic mottled yellow duplex soils. Moderately deep pale sand to loamy sand over clay, imperfectly drained and moderately susceptible to salinity in limited areas.
- Pinjarra P2 Phase Flat to very gently undulating plain with deep alkaline mottled yellow duplex soils which generally consist of shallow pale sand to sandy loam over clay.
- Bassendean B1a Phase Extremely low to very low relief dune, undulating sandplains 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.
- 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.
- Bassendean B6 Phase Sandplain and broad extremely low rises with imperfectly drained deep or very deep grey siliceous sands.

The clearing area has been mapped within the following land degradation risk categories (NRInfo, 2019):

- Less than 3% of the map unit has a moderate to high flood risk;
- 30-70% of the map unit has high to extreme phosphorous export risk;
- 3-10% of the map unit has a moderate salinity risk;
- 3-10 % of the map unit has a moderate to very high waterlogging risk;
- Less than 3% of the map unit has a very high to extreme water erosion risk; and
- 30-70 % of the map unit has a high to extreme wind erosion risk.

Based on the above and with the inclusion of management measures such as drainage features in the design of the road improvement, the proposed clearing is not likely to lead to land degradation through waterlogging, eutrophication, salinity, water erosion or wind erosion. Therefore, the proposed clearing is not at variance to this Principle.

h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

The clearing area does not provide a continuous link to any nearby or adjacent conservation areas. The closest conservation area is located approximately 800 m from the subject site. Accordingly, the proposed clearing is not at variance to this Principle.

i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface of underground water.

The clearing area does not contain any defined natural surface water channels and is not located within a 'Public Drinking Water Source' area (EPT 2019). Given the small area of vegetation subject to clearing and the distance to the nearest watercourse, it is unlikely that the proposed clearing will reduce the quality of surface or groundwater and therefore the proposal is not at variance to this Principle.

j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

Given the topography, soil type and implementation of drainage within the road design, it is considered unlikely that the proposed clearing will increase the incidence of flooding. The proposal is not at variance to this Principle



4 ENVIRONMENTAL MANAGEMENT MEASURES

In order to mitigate potential impacts associated with the proposed clearing activities, the following sitespecific management activities will be implemented.

4.1 Avoidance and Mitigation Measures

The clearing area has been significantly reduced as original designs required additional widening of the road. Following consultation with the project team, the design has been considerably refined which has resulted in a limited clearing area of 900 m². This minimal clearing is necessary to undertake the required road upgrade works to provide a safe environment for all road users.

On this basis, it is considered that no other reasonable and practicable avoidance measures can be implemented within the clearing area.

4.2 Potential Impacts and Management

The Environmental Management Plan (EMP) prepared for the proposed road construction works is provided in **Table 6** which collates the management actions detailed in this Section. The EMP details the environmental management measures to be implemented during roadworks to deliver the project in an environmentally acceptable manner. **Table 6** is presented to be used as a 'stand alone' EMP during the proposed road construction works.

4.2.1 Acid Sulfate Soils

Based on the existing risk mapping there is a moderate to low potential for ASS to occur at a greater depth than 3.0 m. It should be noted however, that these risk categories are based on regional mapping. The risk category boundaries developed at the regional scale are not intended to be used as site-specific classifications.

Nonetheless, dewatering will not be required, and the proposed ground disturbing works are not expected to exceed 1.0 m below ground level. On this basis, the risk associated with ASS disturbance is low.

Management Measures

Should the construction activities require dewatering or soil disturbance in excess of 3.0 m below ground level, further preliminary site assessments for ASS will be required. If all activities in the subject site only involve excavations up to 1.0 m below ground level, no further investigation or management is considered necessary for ASS.

4.2.2 Surface Water and Wetlands

The subject site does not contain any surface water features.

The subject is mapped as a MU wetland in accordance with the *Swan Coastal Plain Geomorphic Wetlands* dataset. MU wetlands have few remaining functions, values and typically their attributes have been considerably degraded such that they provide limited ecological values. The management objective for MU wetlands is to preserve the hydrological functions in the context of the proposed development.

In respect to environmental impacts, the construction works will not significantly alter the natural surface water regime. The potential risks to the local surface water quality from project activities include the following:



- Spillage of hydrocarbons and unauthorised rubbish dumping may contaminate soils and surface water; and
- Increased sediment and turbidity from road construction earthworks.

The project design will include erosion control and sediment management measures to reduce water quality risks during the ongoing operation of the highway as discussed below.

The construction works will not require surface water abstraction and therefore a licence pursuant to the RiWI Act will not be necessary.

Management Measures

Potential impacts on wetlands and watercourses should be managed by:

- Maintaining existing local drainage patterns and minimise disruption and pollution from potential contaminants such as sediment and hydrocarbons from reaching natural drainage systems.
- Construction in the vicinity of water bodies/courses should, if possible, be scheduled within the drier months of the year to avoid/minimise turbidity from erosion.
- All potentially contaminated stormwater (sediment and hydrocarbons) should be treated prior to discharge to the environment.
- Spill clean-up kits should be kept onsite for the clean-up of any accidental spillages of hydrocarbons.
- Temporary storage of bitumen, asphalt, concrete or aggregate should only occur at designated depots or controlled hardstands. Precoating of aggregate will only occur in approved areas.

4.2.3 Groundwater

No dewatering or groundwater abstraction is expected to be required for the construction works. It is expected that water required for road construction and any dust suppression will be sourced from a scheme supply or a dedicated bore under licence.

Management Measures

While impacts to groundwater are not anticipated, the following management measures are proposed to further ensure the protection of groundwater:

- No bulk on-site storage of fuel, oils and other contaminant materials should be permitted during road construction.
- Spill clean-up materials should be kept on site for the clean-up of any accidental spillages.
- Major vehicle and plant servicing should not be permitted within the subject site.
- Overnight parking of machinery and vehicles shall be on a dedicated hardstand area that is not in proximity to any watercourse.

4.2.4 Flora and Vegetation

Vegetation clearing will be predominately restricted to the areas demarcated on Appendix A.

Management Measures

In order to minimise the potential impacts associated with vegetation clearing, the following management measures are proposed:

- Clearing operations should be conducted in accordance with the dieback/weed hygiene requirements.
- Clearing should be kept to the minimum within the clearing envelope.



- The limits of clearing should be clearly marked on site and relevant plans to inform site personnel to contain all activities in the clearing envelope.
- Trees to be removed should be felled in a manner that ensures they fall within the approved clearing envelope.
- The remainder of cleared vegetation should be salvaged, chipped on site for *in situ* site rehabilitation and/or soil stabilisation (note: consider the dieback and weed status of the material and its location of dispersal).
- Existing cleared areas should be utilised for locating site access, site offices and any temporary laydown areas (but not adjacent to waterways or drainage lines).
- No burning of cleared vegetation should be permitted on site.

Earthworks, topsoil transportation and vehicle movement have the potential to introduce and/or spread weeds and *Phytophthora* dieback within the subject site. Accordingly, the following management measures are proposed to manage weeds and *Phytophthora* dieback:

- Vehicles/machinery/equipment should be cleaned free of weeds and soil prior to arrival onsite.
- Prevent weed or dieback-affected road building materials, mulch or fill being brought into the subject site.
- Restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

4.2.5 Fauna

Based on the vegetation subject to clearing, the construction works are not expected to result in any impacts to fauna of conservation significance.

Management Measures

Any other native fauna utilising the subject site will be protected during and post construction. The following actions will be implemented to ensure native fauna are protected:

- Restrict the speed limit on the construction site to 10 km/h;
- Place food scraps and domestic waste into covered bins;
- No feeding of the native fauna on site;
- No pets on site during clearing/construction works;
- When native fauna are encountered on site they should be allowed to move on without interference if there is no threat to worker safety;
- Excavations and trenches should only be kept open for the minimum period necessary. Trenches should be regularly inspected for fauna present and prior to backfilling. Any trapped fauna should be safely removed to adjacent habitats;
- If sick or injured fauna are observed contact DPaW; and
- Undertake inductions for all workers prior to construction outlining the above actions.

4.2.6 Aboriginal Heritage

As discussed in **Section 2.6** one Aboriginal heritage site, the Bunbury Bypass Archaeological Site 3 (Site ID: 18886) which is associated with artefacts and scatter, is located within the subject site.

Management Measures

It is recommended that the following is undertaken in relation to Aboriginal heritage:

• Consult with Aboriginal heritage consultants to determine the requirement for Ethnographic and Archaeological site surveys.



- If deemed necessary, prepare and submit an application pursuant to Section 18 of the *Aboriginal Heritage Act 1972* to disturb and Aboriginal heritage site.
- Engage Aboriginal heritage monitors during construction works.
- Provide training to all personnel during the safety and environment induction course. This will include an explanation of the provisions and sanctions of the *Aboriginal Heritage Act 1972*.

4.2.7 Noise

Noise has the potential to be of nuisance to nearby residents. Noise will be generated by activities associated with clearing and earthworks. Noise from these activities at sensitive receptors can be further exacerbated by certain meteorological conditions, such as atmospheric temperature inversions and the speed and direction of wind.

Nonetheless, given the distance to the nearest sensitive receptor and that the construction noise will be indistinct from the typical road noise generated on the road, noise is not considered to be a significant issue.

Management Measures

The following management measures are proposed to further mitigate any potential noise issues:

- The Construction Contractor should observe the obligations under the EP Act, the *Environmental Protection (Noise) Regulations 1997* and section 6 of AS 2436 1981: *Guide to Noise Control on Construction, Maintenance and Demolition Sites.*
- For construction work between 7:00 am and 7:00 pm (excluding Sunday and public holidays), the construction contractor should minimise the effects of noise on the occupants of adjacent properties. This may include using silenced plant, operating plant as far away as practicable from occupied properties, or by limiting working hours on those construction activities which generate significant noise.
- At least seven days prior to any after-hours construction work commencing, the Construction Contractor should submit a Noise Management Plan to the Chief Executive Officer of the Shire of Dardanup.
- A complaints register shall be maintained to record any complaints regarding noise during construction works.

4.2.8 Dust

Construction activities, such as clearing and earthworks, and general vehicle movements on unsealed roads in and around the subject site are likely to increase the risk of atmospheric dust emissions. These emissions may result in off-site environmental impacts and public concern. Dust also has the potential to smother vegetation close to the dust source and irritate fauna.

The following aspects of the proposed construction works have been identified as requiring management to ensure dust emissions do not affect the amenity of nearby dust-sensitive premises:

- physical disturbance of the land surface during clearing and earthworks;
- vehicle movement on unsealed roads and movement of heavy vehicles with uncovered loads;
- wind erosion of dry exposed surfaces such as cleared area.

Management Measures

The following management measures are proposed to minimise potential impacts associated with dust emissions:



- Clearing and earthworks shall not be undertaken during unfavourable weather conditions (e.g. high wind speed under dry conditions).
- When required, wet down dust-prone unsealed surfaces using a water cart.
- Restrict vehicles to designated roads and access tracks.
- Observe on-site vehicle speed limits to reduce dust lift-off from unsealed roads.
- Cover (i.e. with tarps) all trucks transporting dusty materials.
- A complaints register shall be maintained to record any complaints regarding dust during construction works.

4.2.9 Summary of Management Measures

This EMP has been developed for the subject site following the completion of the environmental assessment. The aim of this EMP is to minimise the environmental impacts associated with the proposed works including the identification of responsibilities required for the implementation of the management strategies.

Due to the scale and nature of the project, no specific contingency measures are identified as the inherent environmental risks are minor.



Table 6. Summary of environmental management measures.

Aspect	Objective	Management Measure	Responsibility
Inductions	Ensure all project staff are aware of the environmental management requirements.	 Site inductions and tool box meetings for construction staff and contractors should include details of the environmental management requirements. 	Project Manager / Construction Manager
Acid sulfate soils	Prevent disturbance of ASS material.	• Ensure ground disturbing works do not exceed 1.0 m below ground surface and no dewatering is undertaken.	Construction Manager
Site contamination	To prevent adverse health related and/or environmental impacts to construction personnel from contamination.	• If any suspected contaminated material is encountered during construction, works should cease in the area and the site Construction Manager contacted for advice.	Site Personnel / Construction Manager
Hydrology	Minimise potential impacts on wetlands and watercourses.	 Maintain existing local drainage patterns and minimise disruption and pollution from potential contaminants such as sediment and hydrocarbons from reaching natural drainage systems. All potentially contaminated stormwater (sediment and hydrocarbons) should be treated prior to discharge to the environment. Spill clean-up kits should be kept onsite for the clean-up of any accidental spillages of hydrocarbons. Temporary storage of bitumen, asphalt, concrete or aggregate should only occur at designated depots or controlled hardstands. Precoating of aggregate will only occur in approved areas. 	Construction Manager / Construction Contractor.
Vegetation clearing	Minimise and manage clearing impacts.	 Clearing operations should be conducted in accordance with the dieback/weed hygiene requirements. Clearing should be kept to the minimum within the clearing envelope. The limits of clearing should be clearly marked on site and relevant plans to inform site personnel to contain all activities in the clearing envelope. Trees to be removed should be felled in a manner that ensures they fall within the approved clearing envelope. 	Construction Manager / Construction Contractor.



Aspect	Objective	Management Measure	Responsibility
		 The remainder of cleared vegetation should be salvaged, chipped on site for <i>in-situ</i> site rehabilitation and/or soil stabilisation (note: consider the dieback and weed status of the material and its location of dispersal). Existing cleared areas should be utilised for locating site access, site offices and any temporary lay-down areas (but not adjacent to waterways or drainage lines). No burning of cleared vegetation should be permitted on site. 	
Dieback and Weeds	Minimise the spread of weeds and dieback.	 Vehicles/machinery/equipment should be cleaned free of weeds and soil prior to arrival onsite. Prevent weed or dieback-affected road building materials, mulch or fill being brought into the subject site. Restrict the movement of machines and other vehicles to the limits of the areas to be cleared. 	Construction Manager / Construction Contractor.
Fauna	Minimise and manage clearing impacts upon native fauna.	 Restrict the speed limit on the construction site to 10 km/h. Place food scraps and domestic waste into covered bins. No feeding the native fauna on site. No pets on site during clearing/construction. When native fauna are encountered on site they should be allowed to move on without interference if there is no threat to worker safety. Excavations and trenches should only be kept open for the minimum period necessary. Trenches should be regularly inspected for fauna present and prior to backfilling. Any trapped fauna should be safely removed to adjacent habitats. If sick or injured fauna are observed contact DBCA. Undertake inductions for all workers prior to construction outlining the above actions. 	Construction Manager / Construction Contractor.
Aboriginal Heritage	No impacts to Aboriginal heritage sites.	• Undertake consultation with Aboriginal heritage consultants and determine requirement for Section 18 approvals and/or heritage monitors.	Construction Manager / Construction Contractor.



Aspect	Objective	Management Measure	Responsibility
		 Ensure all site personnel are aware of their obligations under the Aboriginal Heritage Act 1972, in contractual documents and site inductions prior to commencing site work. Should any evidence of Aboriginal occupation be uncovered during works, all activities shall cease in accordance with the Aboriginal Heritage Act 1972 pending an assessment by a recognized consultant. 	
Noise	Ensure that the construction of the project does not become a nuisance or safety risk to the public.	 The Construction Contractor should observe the obligations under the EP Act, the Environmental Protection (Noise) Regulations 1997 and section 6 of AS 2436 – 1981: Guide to Noise Control on Construction, Maintenance and Demolition Sites. For construction work between 7:00 am and 7:00 pm (excluding Sunday and public holidays), the construction contractor should minimise the effects of noise on the occupants of adjacent properties. This may include using silenced plant, operating plant as far away as practicable from occupied properties, or by limiting working hours on those construction activities which generate significant noise. At least seven days prior to any after-hours construction work commencing, the Construction Contractor should submit a Noise Management Plan to the Chief Executive Officer of the Shire of Murray. A complaints register shall be maintained to record any complaints regarding noise during construction works. 	Construction Manager / Construction Contractor.
Dust		 Any complaints regarding noise, dust or vibration will be attended to as soon as possible and recorded. Clearing and earthworks shall not be undertaken during unfavourable weather conditions (e.g. high wind speed under dry conditions). When required, wet down dust-prone unsealed surfaces using a water cart. Restrict vehicles to designated roads and access tracks. Observe on-site vehicle speed limits to reduce dust lift-off from unsealed roads. 	Construction Manager / Construction Contractor.



Aspect	Objective	Management Measure	Responsibility
		• Cover (i.e. with tarps) all trucks transporting dusty materials.	
Waste	Waste is managed and disposed of appropriately leaving the site free of construction generated waste.	• Domestic and site generated waste will not be disposed by burning. All waste associated with the project shall be disposed of at an authorized waste site, or as agreed with the Shire of Murray.	Construction Manager / Construction Contractor.
Monitoring	Ensure compliance with the management measures.	• During the construction works, compliance with the management measures will be monitored. Any non-conformances will be documented and addressed as soon as possible.	Project Manager / Construction Manager



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FIGURES







PROJECT	Harris Road, Dardanup
DRAWING TITLE	FIGURE 2 - Aboriginal Heritage
CLIENT	Sites Shire of Dardanup

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Date 4.9.2019 Sheet 1 of 1

APPENDIX A. Clearing Area





APPENDIX B. Conservation Codes for Flora



Conservation Codes for Western Australian Flora

<u>T: Threatened Flora (Declared Rare Flora — Extant)</u>

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

Threatened Flora (Schedule 1) are further ranked by the Department according to their level of threat using <u>IUCN Red List criteria</u>:

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

X: Presumed Extinct Flora (Declared Rare Flora — Extinct)

Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such (Schedule 2 of the Wildlife Conservation (Rare Flora) Notice under the Wildlife Conservation Act 1950).

Taxa that have not yet been adequately surveyed to be listed under Schedule 1 or 2 are added to the Priority Flora List under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened flora or fauna. Taxa that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Conservation Dependent species are placed in Priority 5.

1: Priority One: Poorly-known taxa

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

2: Priority Two: Poorly-known taxa

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

3: Priority Three: Poorly-known taxa

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

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

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

5: Priority Five: Conservation Dependent taxa

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

APPENDIX C. Conservation Codes for Fauna



Category	Code	Description
Extinct	E	There is no reasonable doubt that the last member of the species has died.
*Extinct in the wild	EW	A species (a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
*Critically endangered	CE	A species is facing an extremely high risk of extinction in the wild in the immediate future.
*Endangered	EN	A species: (a) is not critically endangered; and (b) is facing a very high risk of extinction in the wild in the near future.
*Vulnerable	VU	A species (a) is not critically endangered or endangered; and (b) is facing a high risk of extinction in the wild in the medium-term future.
Conservation dependent	CD	A species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered
*Migratory	Migratory	 (a) all migratory species that are: (i) native species; and (ii) from time to time included in the appendices to the Bonn Convention; and (b) all migratory species from time to time included in annexes established under JAMBA, CAMBA and ROKAMBA; and (c) all native species from time to time identified in a list established under, or an instrument made under, an international agreement approved by the Minister.
Marine	Ма	Species in the list established under s248 of the EPBC Act

Note: Only species in those categories marked with an asterix are matters of national environmental significance under the *EPBC Act*.

Western Australian Wildlife Conservation Act (1950) Threatened Fauna Categories

Category	Code	Description	
Schedule 1	S1	 Fauna which is rare or likely to become extinct Threatened fauna (Schedule 1) are further ranked by the DEC according to their level of threat using IUCN Red List criteria: CR: Critically Endangered - considered to be facing an extremely high risk of extinction in the wild. EN: Endangered - considered to be facing a very high risk of extinction in the wild. VU: Vulnerable - considered to be facing a high risk of extinction in the wild. 	
Schedule 2	S2	Fauna which is presumed extinct	
Schedule 3	S3	Birds which are subject to an agreement between the governments of Australia and Japan (JAMBA) relating to the protection of migratory birds and birds in danger of extinction	
Schedule 4	S4	Fauna that is otherwise in need of special protection	

Western Australian DEC Priority Fauna Categories

Category	Code	Description
Priority 1	P1	Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.
Priority 2	P2	Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.
Priority 3	P3	Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.
Priority 4	Ρ4	 (a) Rare. Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands. (b) Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying
		for Vulnerable.(c) Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.
Priority 5	P5	conservation program, the cessation of which would result in the taxa becoming threatened within five years.

IUCN Red List Threatened Species Categories

Category	Code	Description	
Extinct EX		Taxa for which there is no reasonable doubt that the last individual has died.	
Extinct in the EW Wild		Taxa which is known only to survive in cultivation, in captivity or and as a naturalised population well outside its past range and it has not been recorded in known or expected habitat despite exhaustive survey over a time frame appropriate to its life cycle and form.	
Critically Endangered	CR	Taxa facing an extremely high risk of extinction in the wild.	
Endangered	EN	Taxa facing a very high risk of extinction in the wild.	
Vulnerable	VU	Taxa facing a high risk of extinction in the wild.	
Near Threatened	NT	Taxa which has been evaluated but does not qualify for CR, EN or VU now but is close to qualifying or likely to qualify in the near future.	
Least Concern	LC	Taxa which has been evaluated but does not qualify for CR, EN, VU, or NT but is likely to qualify for NT in the near future.	
Data Deficient	DD	Taxa for which there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status.	

A full list of categories and their meanings are available at:

http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categoriescriteria

APPENDIX D. EPBC Act Protected Matters Search Report



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 <u>Environment Assessments</u> and the EPBC Act including significance guidelines, forms and application process details.

Report created: 04/09/19 13:57:46

Summary Details Matters of NES Other Matters Protected by the EPBC Act Extra Information Caveat Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates Buffer: 5.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	51
Listed Migratory Species:	30

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 <u>permit</u> may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	36
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	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
Corymbia calophylla - Xanthorrhoea preissii woodlands and shrublands of the Swan Coastal Plain	Endangered	Community known to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area
Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anous tenuirostris melanops		• • • • • • •
Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat likely 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 may occur within area
Calyptorhynchus banksii naso		
Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat

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

Name	Status	Type of Presence
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat 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 may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
<u>Sternula nereis</u> Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Species or species habitat likely to occur within area
<u>Thalassarche impavida</u> 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		
<u>Nannatherina balstoni</u> Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	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

Name	Status	Type of Presence
		area
<u>Pseudocheirus occidentalis</u> 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		
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 jacobsiana		
[87809]	Critically Endangered	Species or species habitat may 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

<u>Diuris micrantha</u> Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
<u>Diuris purdiei</u> 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
<u>Eleocharis keigheryi</u> 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
<u>Synaphea sp. Fairbridge Farm (D. Papenfus 696)</u> Selena's Synaphea [82881]	Critically Endangered	Species or species

Name	Status	Type of Presence
		habitat likely to occur within
		area
Synaphea sp. Serpentine (G.R. Brand 103)		
[86879]	Critically Endangered	Species or species habitat
		may occur within area
Synaphea stenoloba		
Dwellingup Synaphea [66311]	Endangered	Species or species habitat
	Endangerod	likely to occur within area
		,
Reptiles		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat
		known to occur within area
Chalonia mudaa		
Croop Turtlo [1765]	Vulnoroblo	Spaciae or openioe hebitat
Green Turtle [1765]	Vullierable	species of species habitat
		Known to beeur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat
	C C	may occur within area
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Species or species habitat
		known to occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on t	he 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
		,
<u>Apus pacificus</u>		
Fork-tailed Swift [678]		Species or species habitat
		likely to occur within area
Ardenne corneines		
Elesh-footed Shearwater, Eleshy-footed Shearwater		Spacies or spacies habitat
[82404]		likely to occur within area
		intery to beeur within area
Diomedea amsterdamensis		
Amsterdam Albatross [64405]	Endangered	Species or species habitat
	C .	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	Species or species habitat
	Vaniorabio	likely to occur within area
Diomedea exulans		
Wandering Albatross [89223]	Vulnerable	Species or species habitat
		likely to occur within area
Northorn Devel Albertrees [04450]		Oppoint an an article letter
Northern Royal Albatross [64456]	⊏nuangered	Species or species habitat
		incerv to occur within area
Macronectes diganteus		
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	meatened	Type of Tresence
Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable*	Species or species habitat likely to occur within area
Migratory Marine Species		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	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
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Species or species habitat 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]

Calidris acuminata Sharp-tailed Sandpiper [874]

Calidris canutus Red Knot, Knot [855]

Calidris ferruginea Curlew Sandpiper [856]

<u>Calidris melanotos</u> Pectoral Sandpiper [858]

Limosa lapponica Bar-tailed Godwit [844]

Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847] Species or species habitat known to occur within area

Species or species habitat known to occur within area

Endangered

Species or species habitat known to occur within area

Critically Endangered

Species or species habitat may occur within area

Species or species habitat may occur within area

Species or species habitat known to occur within area

Critically Endangered

Species or species

Name	Threatened	Type of Presence
		habitat may occur within
Pandion haliaetus		area
Osprey [952]		Species or species babitat
Osprey [902]		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

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

Name		
Commonwealth Land -		
Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name of	on the EPBC Act - Threa	atened 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]

Apus pacificus Fork-tailed Swift [678]

Ardea alba Great Egret, White Egret [59541]

Ardea ibis Cattle Egret [59542]

Calidris acuminata Sharp-tailed Sandpiper [874]

Calidris canutus Red Knot, Knot [855]

Calidris ferruginea Curlew Sandpiper [856] Vulnerable

Species or species habitat may occur within area

[Resource Information]

Species or species habitat likely to occur within area

Breeding known to occur within area

Species or species habitat may occur within area

Species or species habitat known to occur within area

Endangered

Species or species habitat known to occur within area

Critically Endangered

Species or species habitat may occur within area

Name	Threatened	Type of Presence
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	Species or species habitat likely to occur within area
Diomedea exulans		
Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Diomedea sanfordi		
Northern Royal Albatross [64456]	Endangered	Species or species habitat 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		
Grev Wagtail [6/2]		Species or species habitat

Grey wagtan [042]

Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]

Pachyptila turtur Fairy Prion [1066]

Pandion haliaetus Osprey [952]

Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]

Rostratula benghalensis (sensu lato) Painted Snipe [889]

Endangered*

Species or species habitat likely to occur within area

Thalassarche cauta Tasmanian Shy Albatross [89224] Species or species habitat may occur within area

Species or species habitat likely to occur within area

Species or species habitat known to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

may occur within area

Critically Endangered

Vulnerable*

Name	Threatened	Type of Presence
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
<u>Thalassarche melanophris</u> Black-browed Albatross [66472]	Vulnerable	Species or species habitat
Thalassarche steadi	N / 1 1 4	may occur within area
Trings pobularia	Vulnerable*	Species or species habitat likely to occur within area
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	Species or species habitat known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Unnamed WA40552	WA
Unnamed WA46108	WA

Invasive Species

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

Name	Status	Type of Presence
Streptopelia chinensis Spotted Turtle-Dove [780]		within area 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 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,

Species or species habitat likely to occur within area

Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643] Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]

Asparagus declinatus Bridal Veil, Bridal Veil Creeper, Pale Berry Asparagus Fern, Asparagus Fern, South African Creeper [66908]

Asparagus plumosus Climbing Asparagus-fern [48993]

Brachiaria mutica Para Grass [5879]

Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]

Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]

Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat may occur within area

Species or species habitat may occur within area

Species or species habitat may occur within area

Species or species

Name	Status	Type of Presence
Broom [2800]		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 willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]	reichardtii	Species or species 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

-33.35574 115.72564

Acknowledgements

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-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 Government National Environmental Scien

-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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